A Patent History
&
Design Study of the Chicago Coin Band Box®

Including Early Mechanical Automata Designs

Information Compiled in 2024-2025

By: Matt Potter, College Station, Texas

Hello Chicago Coin's Band-Box®™ Enthusiasts, 9/28/2025

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This free compilation of US and Great Britain Patents stems from my interest in early mechanical automata, vintage jukeboxes and other vintage mechanical apparatuses. During a search of some 20,000 resulting patents from 1850 through 1955 for several hobbies, I found numerous and interesting designs of early mechanical automata, figures playing musical instruments and dancing figures. I decided to compile the information of selected patents that contained design elements that are pre-cursor to, or similar in operation to the mechanical automation of Chicago Coin's Band-Box®.

This is not an absolute complete reference as searched results are based on keywords and cited reference patents in the patent documents themselves. I also had to have cut-off limits as to what constitutes a similarity. An example of this are some extremely simple mechanical actions I will call "bump and jump" are included as a basic reference but are on the fringe of what I would call articulated or animated movements. A simple lobe on a cam "bump" a rod attached to a flat riveted figure and the resulting "jumping" movement is purely random. The mechanical actions of the Band Boxes are not random and automated figure designs naturally evolved as the industrial revolution of the late 1800s and early 1900s ensued. On the opposite design end limit, some automations are so complex that they would have been cost prohibitive to a relatively simple design concept for what these were designed to be…Accessory novelty speakers to increase revenue from jukebox locations. They had to be able to be produced inexpensively yet reliable in order for the operator or location to afford them.

There are several early patents discovered that reference a mechanical band or orchestra whether complex or titled as a toy. I included several as many show novel ways of connecting the driving mechanisms to the various figures and their respective movements.

What follows is a listing of patents in reverse order with the most relevant patent first. You will discover the patents might not always follow numerical order, but rather by patent filing date which is the actual date a design prototype had to tangibly exist in order to file. The listed patents are also included in this single pdf compilation. Said patents are also bookmarked and you can jump to the desired patent by clicking the patent number in the listing.

In summary, this patent history is presented solely to be educational and I have no business connection to present trademark owner, but feel it is only proper to post their respective trademark information and contacts…

Patent Number	Patent Country	Patent Filing Date	Inventor	Assignor	Patent Title	Description of Patent & Relevance, Interesting Designs, and/or Similarities to The Chicago Coin Band Box® Control Mechanisms
US2558490	USA	30-Aug-1949	Koci	Chicago Coin Machine Co.	Electrical Control System for Orchestral Display	Early Band Box Electrical Control Diagram
US2528968	USA	25-Oct-1948	Nelson & Wallace	Nelson & Wallace	Automaton	Automaton Shoe Cobbler for Advertising
US2466881	USA	25-May-1945	Eastman	Eastman	Acoustic Switch	Acoustic Control of an Automated Device
US2467040	USA	24-May-1945	King	King/Williams	Dancing Figure Toy	Electro-Magnetically Actuated Dancing Figure
US2334212	USA	7-Jan-1941	Monkres	Monkres	Dancing Toy	Coin Operated Dancing Figure
US2307296	USA	14-Nov-1940	Peyton	Peyton/Stahl/Harrison/Simon	Orchestral Apparatus	Simulated Orchestra in Conjunction w/Mechanically Reproduced Music
US2242442	USA	31-Aug-1939	Smith	The Rudolph Wurlitzer Co.	Rythym Operated Device	Rhythm Operated Jointed Figures
US2254089	USA	30-Aug-1939	Peyton	Peyton/Stahl/Harrison/Simon	Orchestral Apparatus	Simulated Orchestra in Conjunction w/Mechanically Reproduced Music
US2202915	USA	11-May-1939	Maltese	Maltese	Advertising Device	Mechanical Animated Announcer Used for Advertising
US2254091	USA	13-Dec-1938	Rossi	Peyton/Stahl/Harrison/Simon	Mechanical Orchestra	Simulated Orchestra in Conjunction w/Mechanically Reproduced Music
US2115533	USA	23-Jul-1935	Myers	Myers	Sound Actuated Automaton	Sound Actuated Jointed Figures
US2065965	USA	6-Mar-1935	Brown	Brown	Display Device	Smoothly Animated Organ/Piano Player in Conjunction w/ Music
US2009337	USA	28-Sep-1933	Brewer	Brewer	Synchronized Sound & Action Reproduction	Sound/Rhythm Controlled Animated Instrument Players
USRE18239	USA	26-Aug-1931	Yates	Deutschmann	Re-Issue of US1726283	Magneto-Acoustically Controlled Figure
US1919188	USA	11-Jun-1931	Allen	Allen	Actuated Figure	Acoustically Actuated Figure by Sound Intensity
US1913926	USA	17-Apr-1931	High	Radio Corp. of America - RCA	Amusement Device	Acoustically Actuated Figure by Sound Intensity
GB334373A	G. Britain	27-Aug-1929	Wincott	Wincott	A Mechanical India Rubber Figure	Invisibly Articulated Rubber Figures
US1804265	USA	3-Aug-1929	Minick	Minick	Electrical Toy	Magneto-Acoustically Controlled Figure
US1764330	USA	6-Jan-1928	Marx	Marx	Walking Manikin	Walking Articulated Clockwork Mechanism Toy
US1770455	USA	18-Apr-1927	Berger	Berger	Mechanically Operated Figure Toy	Mechanically Actuated Figures
US1726294	USA	24-Apr-1926	Greene	Deutschmann	Radio Activated Figure Toy	Electro-Magnetically Actuated Toys From Loud Speaker Signal
US1726283	USA	10-Jun-1925	Yates	Deutschmann	Electrodynamically Controlled Figure	Magneto-Acoustically Controlled Figure
US1519410	USA	13-Mar-1923	Marx	Marx	Toy Amusement Device	Mechanically Articulated Musicians
US1589432	USA	1-Feb-1923	Sapp	Kiddie's Karnival Corp.	Toy Carnival	Motor Driven Mechanically Animated Toy Carnival Figures
US1628628	USA	13-Dec-1922	Hunt	Beers	Mechanical Miniature Theatrical	Mechanically Animated Figures & Control Linkages
GB208851A	G. Britain	26-Oct-1922	Heming	Heming	Improvements in Automatons & Display Figures	Motor Driven Automaton for Advertising Displays
US1462006	USA	18-Jun-1921	Hall	Hall	Mechanical Orchestra	Mechanically Animated Orchestra
US1641213	USA	10-Mar-1921	Williams	Williams	Amusement Device	Coin Controlled Mechanically Animated Figures
US1429382	USA	19-Oct-1920	Vaughn	Vaughn & Cothran	Toy Circus	Motor Driven Mechanically Animated Toy Circus Figures
US1348386	USA	17-Feb-1920	Wronowski	Wronowski	Mechanical Toy	Mechanically Animated Band Figures & Dancers
US1422436	USA	20-Nov-1919	Gorgellino	Gorgellino	Motion Device for Automatons	Articulated Clockwork Mechanism Figures & Linkages
US1264947	USA	7-Apr-1917	Leggett	Leggett	Advertising Device	Mechanically Animated Figures & Control Linkages
US1264946	USA	1-Aug-1916	Leggett	Leggett	Advertising Device	Mechanically Animated Figures & Control Linkages
US1001395	USA	29-May-1911	Herbst	Herbst	Figure Toy	Mechanically Animated Band Figures & Dancer
US955407	USA	6-Jul-1909	Jackson	Jackson	Amusement Device	Coin Controlled Mechanically Animated Figures
US895312	USA	17-May-1907	Stubert	Stubert & Thomas	Toy	Mechanically Animated Figures & Control Linkages
US711511	USA	26-Apr-1902	Little	Mandelbaum	Automaton Figure	Mechanical Eating and Offering Automaton Figure
US711510	USA	5-Apr-1902	Little	Mandelbaum	Automaton Figure	Mechanical Drinking Automaton Figure
US638793	USA	19-Jun-1899	Anson	Anson	Mechanical Toy	Mechanically Animated Band Figures & Dancers
US496324	USA	14-Feb-1893	Pursell & Price	Pursell & Price	Coin Controlled Automaton	Coin Controlled Mechanically Animated Figures
US487510	USA	6-Dec-1892	Birdsall	Birdsall	Coin Controlled Theatrical Show	Coin Controlled Mechanically Animated Figures
US420351	USA	29-Jul-1889	Music	Music	Advertising Automaton for Store Windows	Electro-Magnetically Actuated Advertising Figure
US284338	USA	1-Aug-1883	Shute	Shute	Androides or Automaton Shoe Factory	Mechanically Actuated Figures & Linkages

June 26, 1951 J. C. KOCI 2,558,490

ELECTRICAL CONTROL SYSTEM FOR ORCHESTRAL DISPLAY

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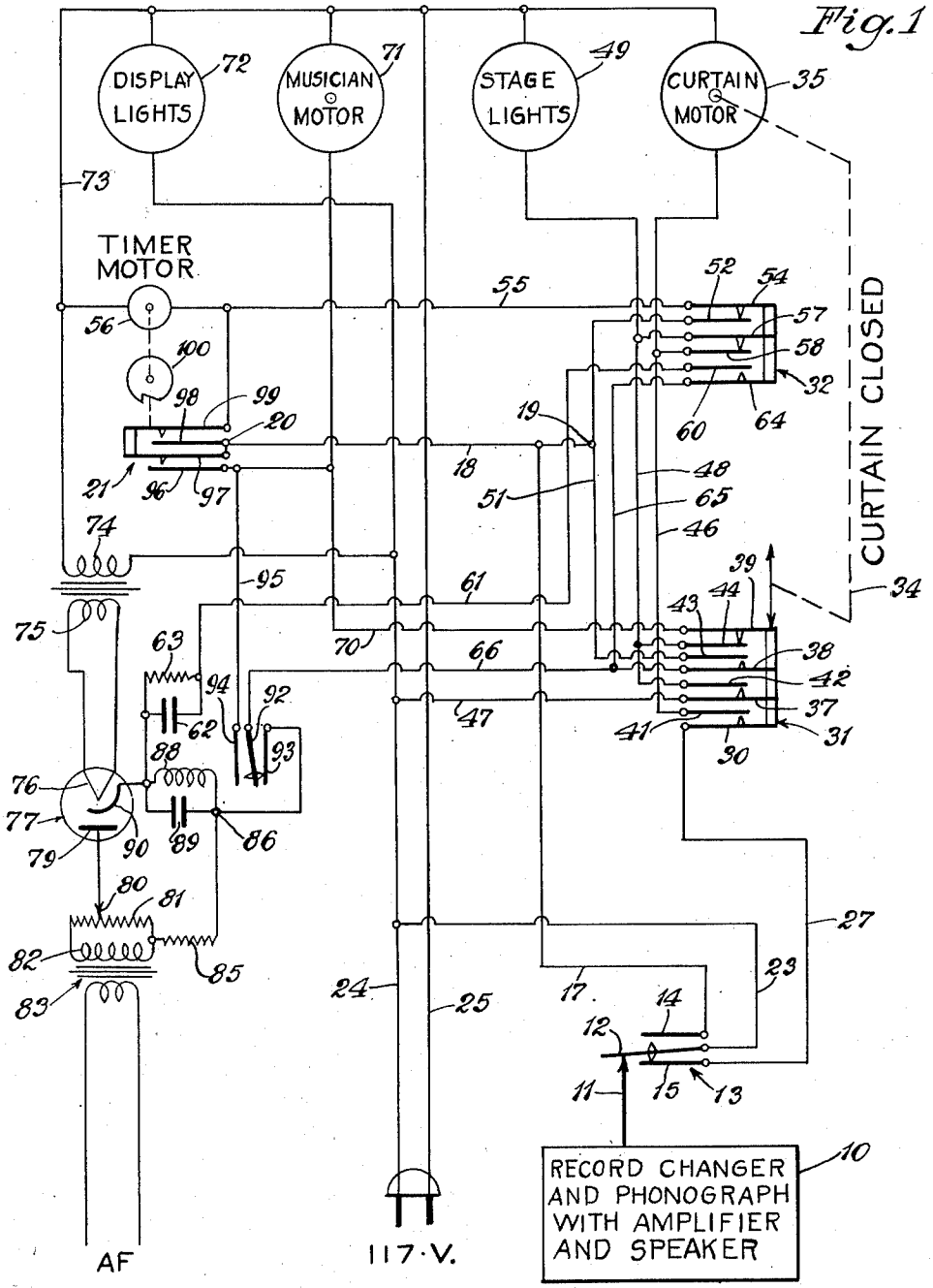
Fig. 1



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ELECTRICAL CONTROL SYSTEM FOR ORCHESTRAL DISPLAY

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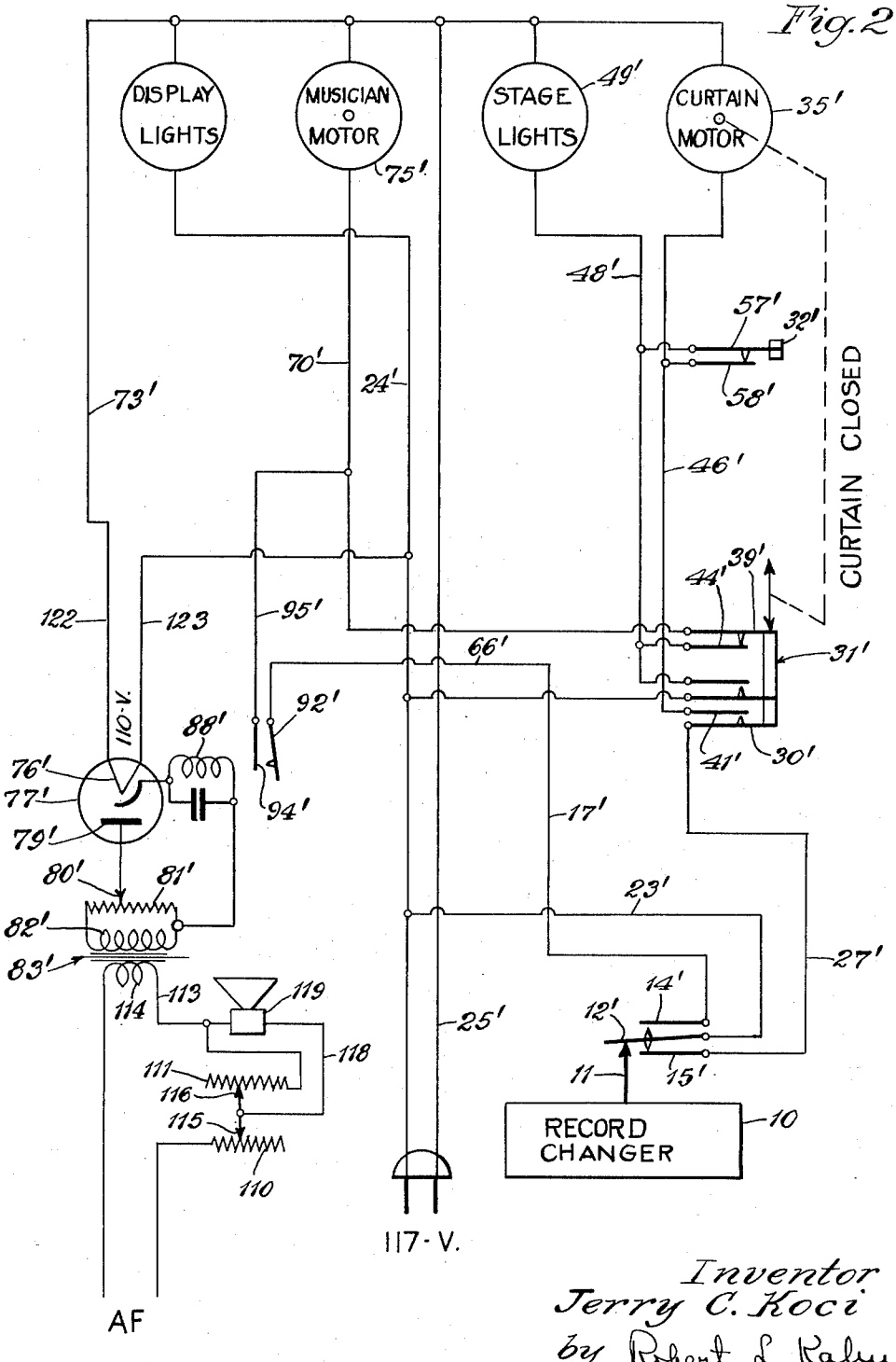
Fig. 2



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Patented June 26, 1951 2,558,490

UNITED STATES PATENT OFFICE

2,558,490

ELECTRICAL CONTROL SYSTEM FOR ORCHESTRAL DISPLAY

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Application August 30, 1949, Serial No. 113,185

4 Claims. (Cl. 46—118)

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This invention relates to an electrical apparatus and particularly to a mechanical orchestra attachment for use with a sound reproducing system. The invention disclosed herein is an improvement upon the matter disclosed and claimed in Peyton 2,254,089 issued August 25, 1941. In this patent there is disclosed a mechanical orchestra having one or more musicians adapted to be mechanically actuated in simulation of real musicians during sound reproduction from an electric phonograph or the like. In the system hereinafter described, suitable switching means are provided for controlling the energization of musicians and activation of curtain mechanism as well as stage lights in connection with sound reproduction from an electric phonograph.

The invention generally provides for sound reproduction voice current control over the mechanical orchestra. Normally, the mechanical orchestra is motionless and unseen when no record is being reproduced. However, upon initiation of a record playing cycle, the orchestra is animated and exhibited. Thereafter during the playing cycle, the orchestra remains animated and visible as long as voice currents are present.

In one form of the invention, voice currents exercise a direct supervisory control over the animation and exhibition of the orchestra. In another form of the invention a timer system initially takes over the supervisory control for a minimum playing time and releases control to the voice current means after the expiration of some minimum playing time.

The details of the mechanical orchestra as far as operating means for individual players are not described here and may be found in the above mentioned Peyton patent.

In order that the invention may be explained, reference will now be made to the drawings wherein Figure 1 is a diagrammatic showing of a system embodying one form of the invention while Figure 2 is a diagrammatic showing of a modified form of the invention.

The system forming the subject matter of the present invention is adapted to operate with record changer 10 of any type. Changer 10 has plunger 11 which is normally in a down position but is elevated during the time that a record is on a turntable. Plunger 11 cooperates with movable contact 12 of switch 13. This switch has fixed contacts 14 and 15 with which movable contact 12 cooperates. Contact 14 is connected by wire 17 going to wire 18 extending between junction 19 and terminal 20 of locking switch 21.

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Changer operated contact 12 is connected by wire 23 to line 24 of a power circuit. The power circuit includes line 25. Changer switch contact 15 is connected by wire 27 to a terminal of contact 30 of switch block 31. Switch block 31 is one of two switch blocks 31 and 32 which are mechanically inter-connected to curtain 34 operated by motor 35. Switch block 31 is in the position shown when the curtain is closed and is adapted to be moved to its other position when the curtain is away from a fully closed position. Similarly switch block 32 is in the position shown when the curtain is away from a fully opened position and moved to its other position when the curtain is fully open. The means for operating the switch blocks may assume a variety of forms. Thus motor 35 will generally have a range of forward and reverse motion for operating the curtain and an arm or other means may be provided for moving between the extreme curtain positions. An example of a diagrammatic mechanism for accomplishing this is disclosed in my copending application Serial No. 92,591, filed May 11, 1949.

Referring now to switch block 31, this has movable leaves 36, 37, 38, 39 connected together by an insulating block to move as a unit. These contact leaves cooperate respectively with fixed contact leaves 41 to 44 inclusive. It will be noted that contact pair 39 and 44 is closed in the curtain closed position while the remaining contact leaves are open.

Contact leaf 41 is connected by wire 46 to curtain motor 35. Contact leaf 37 is connected by wire 47 to line wire 24 while contact leaf 42 is connected by wire 48 to stage lights 49. Contact leaf 43 is connected by wire 51 to junction 19 and also to contact leaf 52 of switch 32. Contact leaf 44 is connected to wire 48.

Switch block 32 has contact leaf 54 connected by wire 55 to one terminal of timer motor 56. Contact leaf 57 is connected to wire 48 while leaf 58 with which it cooperates is connected to wire 46. Contact leaf 60 is connected to wire 61 and to condenser 62 and shunt resistor 63. Contact leaf 64 is connected by wire 65 to wire 66 going to contact 38. It will be noted that leaves 54 and 52 form one normally closed switch while leaves 57 and 58 form another normally closed switch. Leaves 60 and 64 form a normally open switch.

Contact leaf 39 is connected by wire 70 to musician's motor 71 for actuating the automatons while line wire 24 is connected to display lights 72. Motors 35, 71 and 56 and lights 49 and 72 are connected to common wire 73 going to one

terminal of filament winding 74, the other terminal of which is connected to line 24. Winding 74 cooperates with transformer secondary 75 for energizing heater 76 of rectifier 77.

Rectifier 77 has anode 79 connected by tap 80 to potentiometer resistor 81 connected across secondary 82 of audio-frequency transformer 83. Resistor 81 has one terminal connected through resistor 85 to point 86. Point 86 forms one terminal of a relay having winding 88 shunted by condenser 89. Relay winding 88 is connected to cathode 90 of rectifier 77. Cathode 90 is also connected to condenser 62 and resistor 63.

Relay winding 88 cooperates with movable relay contact 92 normally resting against contact 93 connected to the winding and movable to off-normal contact 94. Movable contact 92 is connected to wire 66 while off-normal contact 94 is connected by wire 95 to switch contact 96 and wire 70. Contact 96 cooperates with movable contact 97 connected to fixed contact 98 and junction 20. Movable contact 99 connected to wire 55 cooperates with fixed contact 98. Movable contacts 99 and 97 are tied together and operated by cam 100 driven by timer motor 56. Motor 56 is preferably a clock motor with suitable gearing so that cam 100 turns at a slow speed, about one turn in two minutes.

The operation of the system will now be explained. When changer 10 operates to select a record, rod 11 will be elevated and remain in elevated position during the time that the selected record is playing. When rod 11 is elevated, movable contact 12 moves to fixed contact 14. This circuit may be traced from line wire 24 to wire 23, movable contact 12, fixed contact 14, wire 17 to wire 18 and wire 51 to contact 52. In the normal position of the system, the curtains are closed and switch block 32 is in the position shown with contact 52 touching movable contact 54. The circuit therefore continues from contact 54 along wire 55 to motor 56 along wire 73 to line wire 25. Thus timer motor 56 will become energized and turn cam 100 in a clockwise direction. After cam 100 has turned a few degrees, switch block 21 will be closed. This will result in switch leaves 52 and 54 being by-passed as far as the timer motor is concerned and the circuit continuing from wire 17 to wire 18 and junction 20 to contact leaf 98 and movable contact 99 then to timer motor 56 and along wire 73 to line wire 25.

After timer motor 56 has started and closed the cam contacts, the timer motor will continue to operate independently of switch block 32. The closure of the contacts by cam 100 will also result in a circuit being established from wire 17 through wire 18 to movable contact 97 and fixed contact 96 to wire 70 and contact leaf 39 of switch block 31. The circuit continues from contact leaf 39 to fixed contact 44 to wire 48 through stage lights 49 and line wire 25. Thus stage lights 49 will be lit. A circuit will also be established from wire 48 to movable contact 57 of switch block 32, fixed contact 58 to curtain motor 25. Thus curtain motor 35 will start to operate. As disclosed more fully in the copending application of Jerry C. Koci, Serial No. 92,591, filed May 11, 1949, after curtain motor 35 has begun to operate to move the curtain from the closed position, switch block 31 has its position changed after the curtain has started to open but before it has reached a fully opened position and switch block 32 is changed after the curtain has reached a fully opened position. Upon reverse movement to close the curtain, switch block 32 will be changed first to be followed by switch block 31. Hence curtain motor 35 will be energized until the curtain is in a fully opened position. When the curtain has finally reached its opened position and switch block 32 has been changed, contacts 57 and 58 open to cut curtain motor 35 off.

When curtain motor 35 has moved the curtain to a fully opened position, switch block 31 has also been changed from the position shown. Thus, the circuit for stage lights 49 will remain closed by virtue of the closure of contacts 37 and 42, this circuit being traced from line 24 to wire 47, contact 37, contact 42 to wire 48 and stage lights 49 back to line wire 25.

Continuing with the operation of the system, closure of cam operated contacts 96 and 97 will also establish a circuit for musician's motor 71. Thus beginning with wire 17, the circuit continues to wire 18, junction point 20, contacts 97 and 96, wire 70, musician's motor 71 and line wire 25. Assuming that sound reproduction is occurring from the record, audio-frequency energy taken from a suitable point on the amplifier is fed to transformer 83. Secondary winding 82 develops an alternating potential across the terminals of resistor 81. Tap 80 feeds alternating energy to rectifier 77 so that a pulsating direct current through relay winding 88 is provided. Condenser 89 prevents the relay from chattering. When relay winding 88 is energized, relay contact 92 is pulled up against contact 94. This effectively places a short across contacts 97 and 96 of the cam operated switch. This may be traced as follows: contact 96 to wire 95, contact 94, contact 92, wire 66, contact 38, contact 43, wire 51 to junction 19 and then wire 18 to contact 97. Thus after cam 100 has made a complete turn, motor 56 shuts itself off with the cam driven contacts being opened. The time of revolution of cam 100 is set to be less than the shortest record which is to be played, this time being of the order of about two minutes. It will be remembered that switch contacts 52 and 54 are open with the curtain open so that when timer motor 56 has turned cam 100 almost a complete revolution, the cam-operated switch contacts will open and open the circuit for the timer motor. Thus when relay winding 88 is energized, the entire power circuit for operating the musician's motor may be traced as follows: from line wire 24 to wire 23, movable changer contact 12, fixed contact 14, wire 17 to junction 19, wire 51 to switch leaf 43, switch leaf 38, wire 66 to relay contact 92, relay contact 94 along wire 95 to wire 70 and then to motor 71 and back to line wire 25.

Continuing the operation of the system, let it be assumed that the record is finished and the changer is operating. In order to prevent momentary operation of relay 88, resistor 63 and condenser 62 are provided, this combination preferably having a time constant of the order of about ten seconds.

Assuming now that the record reproduction is through and no more audio-frequency currents are being fed to transformer 83, relay winding 88 releases the relay so that movable contact 92 drops back to the position shown against normal contact 93. Thus the shunt around cam-operated contacts 96 and 97 is broken. In order to prevent false relay operation from noise currents when no record reproduction occurs, condenser 62 is connected across relay winding 88. This circuit may be traced as follows: condenser 62 to wire 61, contacts 60 and 64 (the curtain is still open and the record changer is beginning to op-

erate), wire 65, wire 66, contacts 92 and 93 to relay winding 88 and thence to condenser 62. Condenser 62 has a large capacitance, such as about 100 m.m.f. so that transients are effectively by-passed across relay winding 88.

When changer 10 has removed a record, contact 12 drops against 15 and closes a circuit for the curtain motor as follows: line 24, wire 23, contacts 12 and 15, wire 27, contacts 30 and 41, wire 46, motor 35 and line 25. When the curtain has closed, switch block 31 is changed to cut motor 35 out.

Timer motor 56 and cam operated contacts 98 and 99 are provided for the purpose of determining a minimum time before a curtain closing part of the cycle may be initiated. The timer motor and its associated parts may be omitted if desired and reliance had upon the presence of audio-frequency currents due to phonograph reproduction for maintaining the automatons in animated condition. Thus referring to Figure 2, a modified system is shown wherein corresponding portions of the circuit bear similar primed numbers.

Audio-frequency transformer 83' is preferably disposed in the speaker circuit. Thus resistors 110 and 111 are connected into line 113 going to primary 114 of transformer 83'. Cooperating with resistors 110 and 111 are wipers 115 and 116 coupled together to function as a unit. It will be noted that resistors 110 and 111 are in reversed relation and together with the wipers provide a so-called L pad type of volume control. Wire 118 is connected to wipers 115 and 116 and goes to speaker 119. The other terminal of speaker 119 is connected to resistor 111. By virtue of this arrangement a substantially constant impedance in series with primary 114 is provided and thus a substantially constant level of audio-frequency energy will be present in primary 114.

Transformer secondary 82' has resistor 81' connected across the same with wiper 80' connected to anode 79' of diode rectifier 77'. The remaining diode connections are generally the same as in Figure 1. However, in Figure 2, heater 76' of the rectifier is adapted to be supplied by 110 volt current obtained by wires 122 connected to wire 73' and 123 connected to line wire 24'. It will be noted that the circuits connected to the diode rectifier have been eliminated and simplified with the relay now being a simple relay with the normal contact dead.

Referring to switch block 32', it will be noted that leaves 57' and 58' are the only ones remaining, these being connected respectively to 48' and 46' going to the stage lights and curtain motor. Similarly switch block 31' has been simplified by the omission of contact leaves 43 and 38 in Figure 1 together with their associated wiring. It will be noted that wire 17' of contact 14' is joined to wire 66' going to relay contact 92'.

The operation of the system shown in Figure 2 will now be explained. Assuming that a record changer cycle has been initiated and that a record is being played, push rod 11 will be elevated so that movable contact 12' will close against fixed contact 14'. A circuit will be established from line wire 24' to wire 23', contacts 12' and 14', wire 17', wire 66' to relay contact 92'. Upon the presence of audio-frequency energy in primary 114, this being connected to the phonograph reproducer amplifier, it will be apparent that relay 88' will be energized to draw relay contact 92' against fixed contact 94'. Hence the circuit from relay contact 92' will continue after the music has started to fixed contact 94' wire 95' to wire 70'

to switch leaves 39' and 44' of switch block 31' then to wire 48' through stage lights 49' to line wire 25'. At the same time another circuit will be established from wire 48' through closed contact leaves 57' and 58' of switch block 32' to wire 46' then through curtain motor 35' to line wire 25'. Thus curtain motor 35' will have its circuit closed and start to operate.

When curtain motor 35' has fully opened the curtains, contacts 57' and 58' will be opened thus stopping motor 35'. At the same time, another circuit from wire 70' through musician's motor 75' to line wire 25' will be established and energize the musicians. By virtue of the L pad volume arrangement, an adequate level of audio-frequency energy will be maintained to insure that the relay will remain closed during phonograph reproduction under all conditions or positions of the volume control. When phonograph reproduction ceases, relay 88' will be opened to cut off the power to musician's motor 75' and to stage lights 49'. At the same time, changer 10 will operate causing rod 11 to drop and complete a circuit between fixed contact 15' and movable contact 12'. This will establish a power circuit for curtain motor 35' as follows: line wire 24', wire 23', contacts 12' and 15', wire 27', contacts 30' and 41', wire 46', curtain motor 35' and line wire 25'. When the curtain has reached a closed position, contacts 30' and 41' will open and the system will revert to the condition in Figure 2.

It is understood that the system shown in each figure includes a complete phonograph with reproducer, amplifier and speaker. The L pad volume control shown in Figure 2 is preferably included in the system of Figure 1.

What is claimed is:

1. In a system of the character described, a mechanical orchestra, a curtain for said orchestra, an electric motor for animating said mechanical orchestra and electric motor mean for moving said curtain for controlling the display of the orchestra, an electric phonograph, means controlled by the initiation of a record playing cycle in said electric phonograph for energizing the animating motor and for energizing the curtain motor so as to exhibit the animated orchestra, means for deenergizing said curtain motor after said curtain has reached an orchestra displaying position, a voice current responsive relay system, connections between said relay system and the electric phonograph, means controlled by said voice current responsive relay system for deenergizing the orchestra animating motor and for energizing the curtain moving motor to terminate the display upon the cessation of voice currents, and means for deenergizing said curtain display motor after said curtain has reached an orchestra concealing position.

2. In a system of the character described, a mechanical orchestra, a curtain for said orchestra, an electric motor for animating said mechanical orchestra, a motor for opening or closing said curtain for displaying or hiding said orchestra, an electric phonograph, means responsive to the initiation of a record playing cycle in said electric phonograph for energizing the orchestra animating motor and for energizing the curtain motor to open the curtain and display the orchestra, means for deenergizing said curtain moving motor after said curtain has reached an orchestra displaying position, a voice current responsive relay system, connections between said relay system and said electric phonograph so that said system is supplied with voice currents from the

electric phonograph and connections between said relay system and said two motors, said relay system connections to said motors providing for a closed circuit for the orchestra motor and an open circuit for the curtain moving motor in the voice current energized position of the relay system and providing for an open circuit for the orchestra motor and a closed circuit for the curtain moving motor in the voice current deenergized position of the relay system, and switch means for opening the circuit of the curtain moving motor after said curtain has been moved to an orchestra-concealing position upon the cessation of voice currents.

3. In a system of the character described, a mechanical orchestra, a curtain for said orchestra, an electric motor for animating said mechanical orchestra, an electric motor for opening or closing said curtain in connection with displaying the orchestra, an electric phonograph, means responsive to the initiation of a record playing cycle in said electric phonograph for energizing said orchestra animating motor and for energizing the curtain motor to open the curtain and display the orchestra, means for deenergizing said curtain moving motor after said curtain has reached an orchestra displaying position, a voice current responsive relay system, connections between said electric phonograph and said relay system so that said system is supplied by voice currents from the electric phonograph, connections between said relay system and said two motors, said relay system connections to said motors

in voice current energizing position providing for a closed circuit for the orchestra motor and an open circuit for the curtain moving motor and in the voice current deenergized position providing for an open circuit for the orchestra motor and a closed circuit for the curtain moving motor, timing means including switch contacts, connections between said timing switch contacts and said relay system so that when said timing system is operative said relay system is maintained in a voice current responsive condition and means for rendering said timing means operative at the beginning of a record playing cycle and for a predetermined minimum time and means for opening the circuit of the curtain moving motor when said curtain has reached a closed position in a curtain closing operation.

4. The system according to claim 3 wherein said timing means comprises a timing motor and contacts driven by said motor and connections for shorting out the voice current relay during the timing cycle.

JERRY C. KOCI.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

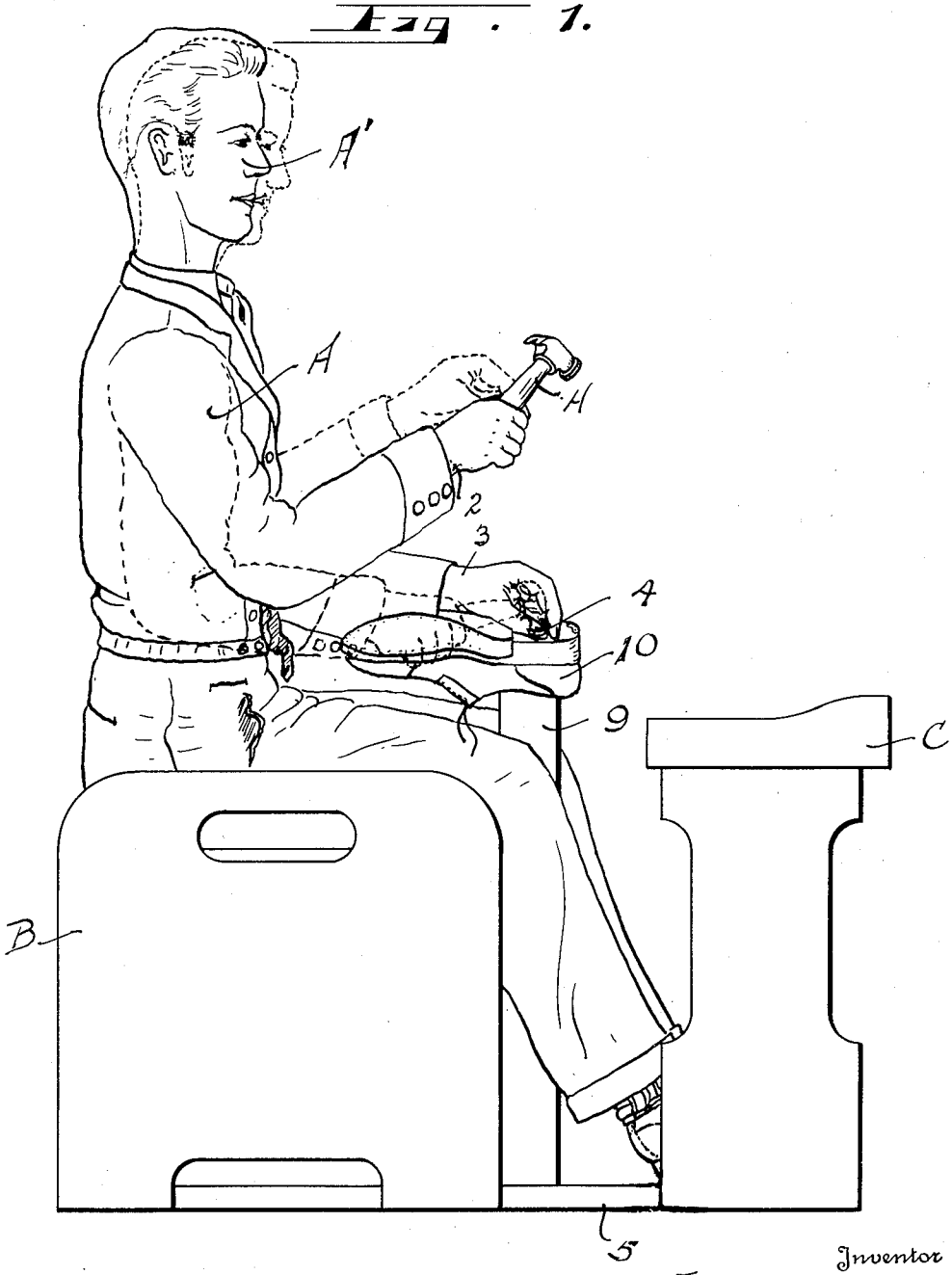
Number	Name	Date
2,254,089	Peyton	Aug. 26, 1941
2,307,296	Peyton	Jan. 5, 1943

Nov. 7, 1950 I. NELSON ET AL 2,528,968

AUTOMATON

Filed Oct. 25, 1948 5 Sheets-Sheet 1

Fig. 1.



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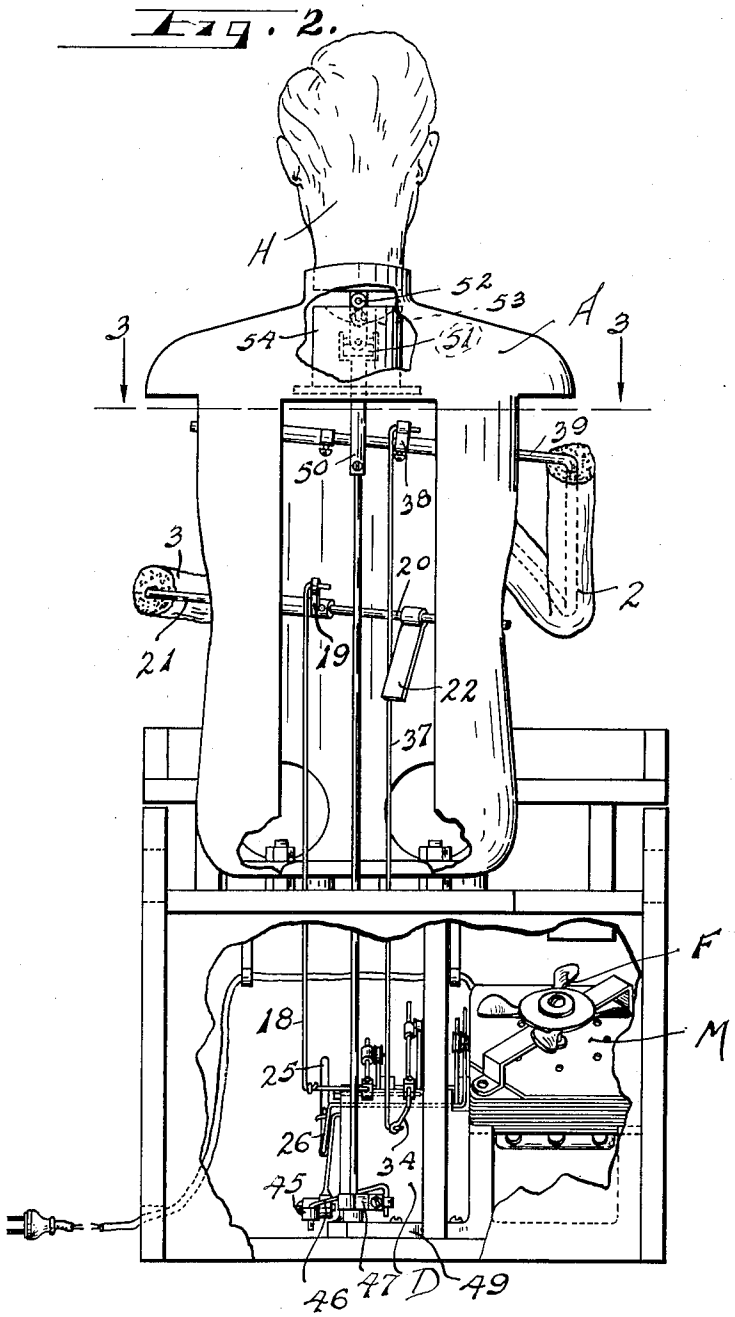
AUTOMATON

Filed Oct. 25, 1948 5 Sheets-Sheet 2

Fig. 2.



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AUTOMATON

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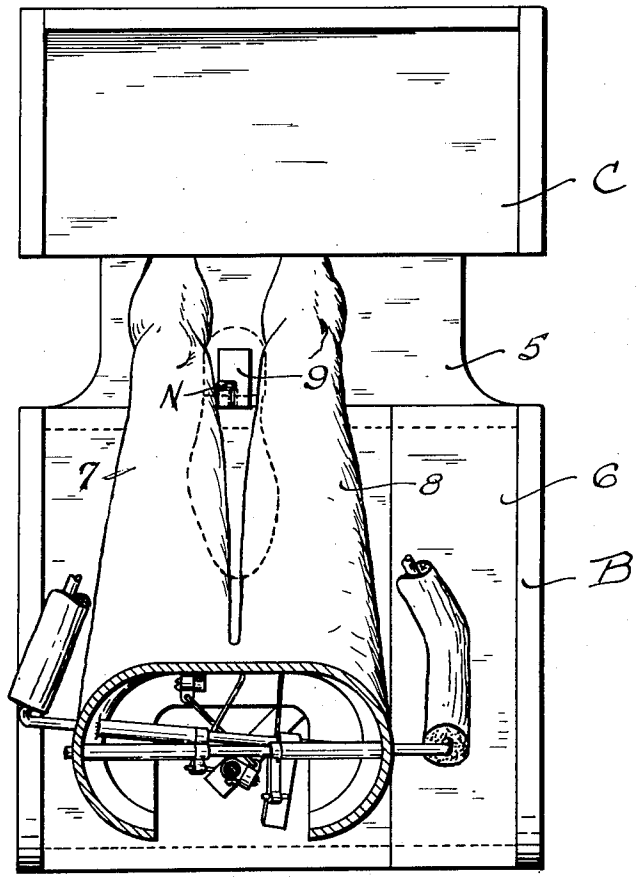
Fig. 3.



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AUTOMATON

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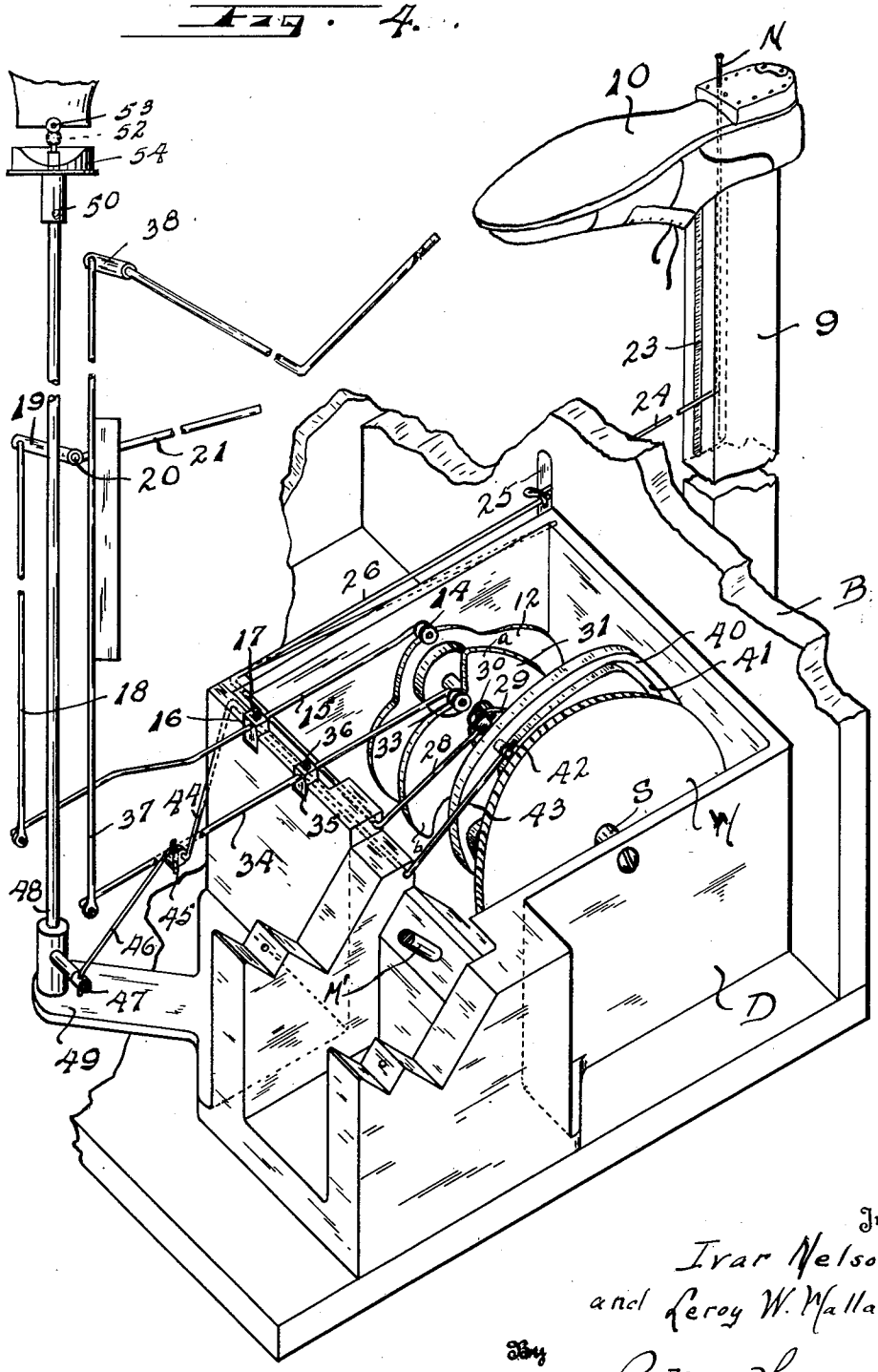
Fig. 4.



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Nov. 7, 1950 I. NELSON ET AL 2,528,968

AUTOMATON

Filed Oct. 25, 1948 5 Sheets-Sheet 5

Fig. 5.

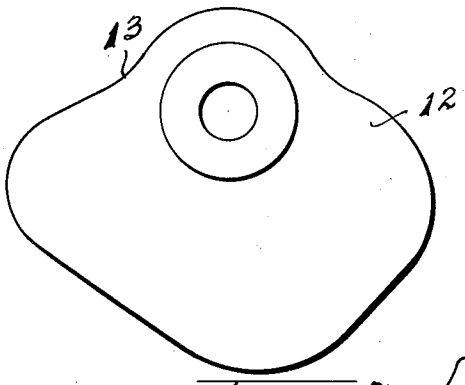


Fig. 6.

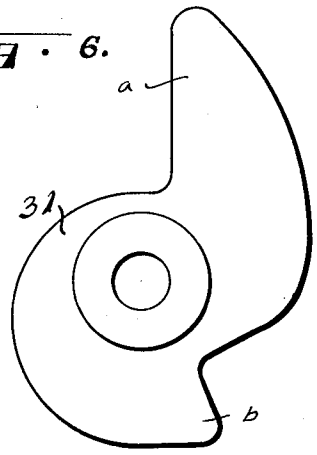


Fig. 7.

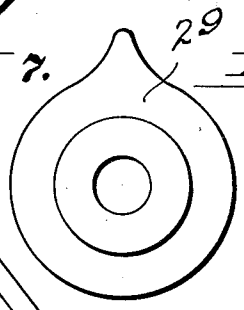


Fig. 9.

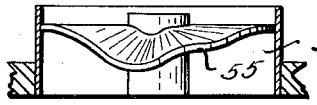


Fig. 8.

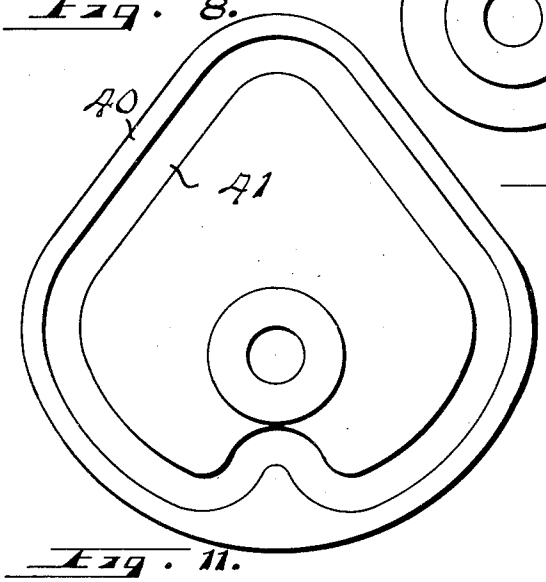


Fig. 10

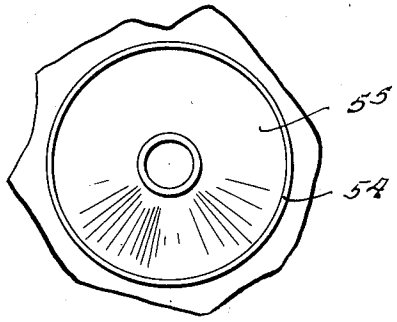
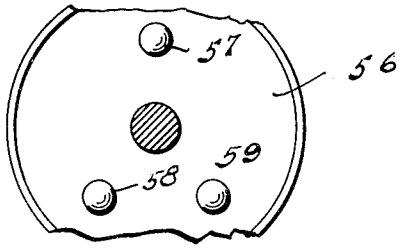


Fig. 11.



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By R. M. Thomas Attorney

Patented Nov. 7, 1950 2,528,968

UNITED STATES PATENT OFFICE

2,528,968

AUTOMATON

Ivar Nelson and Le Roy W. Wallace,
Los Angeles, Calif.

Application October 25, 1948, Serial No. 56,422

6 Claims. (Cl. 40—126)

1

The invention relates to an automaton or manikin, namely a self-moving machine which imitates life like motions.

An object of the invention is to provide an automaton having a movable head, with means for turning the head from one side to the other and for tilting the same in a life like manner.

Another object of the present invention is to provide an automaton having a movable head and movable arms which are operated in timed relation with each other in a life like manner, particularly to simulate the act of cobbling a shoe.

Our invention relates to advertising mediums and has for its object to provide a new and highly efficient means for and method of attracting attention of traffic passing down a busy street to the fact that cobbling or shoe rebuilding is being done.

A further object is to provide an automaton which simulates the act of nailing a work piece.

A further object is to provide a puppet shoemaker working on a shoe with all appearances of driving a nail into the heel of the shoe.

The invention provides a miniature man giving all the movements of hands and arms and head of a shoemaker driving nails into a shoe, the hammer driving the nail, the hand traveling to the mouth as though getting another nail and then down to the heel of the shoe where, when the hand again leaves the shoe a nail is visible sticking up from the heel of the shoe and which nail is then struck by the hammer and driven down into the shoe.

The claims in this case are being limited to the nailing feature, while claims generic to this case and to co-pending application Serial No. 101,522 filed June 27, 1949, for AUTOMATON are being made in the latter case, particularly with regard to the head cam, the cam assembly and to cams for elevating an arm or arms supported to drop by gravity.

These objects we accomplish with the device illustrated in the accompanying drawings, in which similar numerals and letters of reference indicate like parts throughout the several views and as described in the specification forming a part of this application and pointed out in the appended claims.

In the drawings Figure 1 is a side elevation of the puppet, showing how the finished model appears and giving the positions of the hands at two different positions of the operation.

Figure 2 is a rear elevation of Figure 1, parts cut away to show the operating parts of the device.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a perspective diagrammatic illustration of the various cams, shafts, and operating parts of the invention.

Figure 5 is a plan view of the cam for operating the left arm.

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Figure 6 is a plan view of the cam for operating the hammer-operating arm.

Figure 7 is a view of the cam for operating the nail simulating wire.

Figure 8 is a view of the cam race for operating the head.

Figure 9 is a cut away view of the neck collar of the figure showing the ramp for causing the head to tilt and move the chin up and down.

Figure 10 is a plan view of Figure 9.

Figure 11 is a view of the base of the neck which rests on the ramp shown in Figure 9.

In the drawings we have shown our mechanism as a model of a man A, seated on a cobbler's bench B, to which the cobbler's tray C is attached by mounting the entire device on a base 5. One arm 2 of the body is provided with a hammer 4 and the other arm 3 is provided with the hand 4 showing the fingers as though they were grasping a shoe nail. The hands are operated to simulate the work of a cobbler. The left hand 4 is raised to the mouth as though taking a tack or nail from the mouth and then lowered to the heel of the shoe 10, while simultaneously the right arm is raised and driven down quickly as though driving a nail or tack with the hammer H. When the hand 4 is raised from the heel of the shoe a nail N is shown ready to be driven by the hammer. This nail N is the top end of a rod which extends down through the heel and is raised and held by friction until the hammer strikes it, being raised to the elevated position while the fingers of the hand 4 are in contact with the heel, as shown in Figure 1. The head A' is slightly raised and lowered while it is being partially rotated from side to side in such a manner that it gives all the appearances of a natural person working on a cobbler's bench repairing shoes. Each time the hammer drives down it forces the nail down into the shoe heel and each time the right hand is raised and the left hand lowered to simulate placing a nail the nail N is elevated to the raised position so that when the hand leaves the shoe heel it gives all the appearances of having left a nail sticking in the heel ready for the hammer.

The operating mechanism for the device consists of a casing D in which the worm gear for driving the device is mounted and in which the operating cams and races are all mounted and operated, the casing being adapted to be completely enclosed and filled with oil to prevent wear on the cams and their coacting rollers and arms. Transversely through the case D there is a shaft S which carries all of the cam races and the driving worm wheel W. The worm wheel W is driven by a worm driven directly by the motor M, the shaft M' extending down from the motor to the worm inside the gear boxing. The motor M is mounted on a bracket extension on the back side of the casing D and the motor is mounted on an angle and provided with a cooling fan F to

direct air currents over the motor to keep it from overheating from constant running.

On the shaft S there is a cam 12, the perimeter 13 of which is formed to actuate the left arm in its desired motions by the connecting or contacting roller 14, shaft 15 and pivot block 16. The pivot block 16 is provided to enable the builder to get the shaft perfectly placed by use of the set screw 17 in the block 16. The end of the shaft 15 is pivotally attached to the vertical rod 18 which is connected to the lever 19 mounted on the transverse shaft 20 across the body A of the man. An extended arm 21 connects the shaft 20 with the arm 3 and supports and operates the arm. A counter weight 22 is attached to the shaft 20 to aid in raising the arm.

The nail N is mounted through the heel of the shoe 10 and is the upturned end of a rod 24 which operates in the slot 23 of the last support 9 which supports the shoemaker's shoe 10. The rod 24 extends through the slot 25 in the seat B and is attached to the rod 26 which is pivoted through the back of the case D with the other end bent forward at 28 carrying a roller 30 operating on the cam 29, which cam is also mounted on the shaft S.

A cam 31 is mounted between the cams 12 and 29 and actuates the right arm by a roller 33 operating over the two ramp or cam surfaces *a* and *b*. The longer surface *a* is to simulate the full hammer stroke, while the shorter surface *b* is to simulate the short stroke of the hammer when just setting the nail. This stroke is when the hand 4 is resting on the heel and appears or simulates the setting of the nail after which the hand is removed and the hammer strikes the nail N, driving it down into the heel hole. The roller 33 is on the end of a rod 34 which is pivotally mounted in the block 35 by the set screw 36. The end of the rod 34 is attached to the shaft 37 which extends up into the body of the man and the top end of the shaft 37 is attached to the lever 38 which is mounted on the transverse shaft 39 mounted across the body of the man. The end of the shaft 39 is bent forward and the arm 2 is formed thereon.

The head A' is operated by a cam race plate 40 carrying a cam groove or race 41 in one face thereof in which cam 42 is operated. This cam 42 is mounted on the rod 43 which is passed through the rear face of the case D using the case as a bearing therefor and the other end is turned down at the rod 44 which rod is attached to a block 45. The block 45 is then attached to a rod 46 which is mounted through an arm 47 on a vertical shaft 48. The top end of the shaft 48 is carried in an operating sleeve 50 and the top end of the sleeve 50 is formed as a universal 51 to allow for the nodding motion imparted to the head. A T coupling is attached to the universal with rollers 52 and 53 thereon to operate the head. A collar 54 is provided in which a curved irregular race 55 is secured and on this race 55 the spaced contact knobs 57, 58, and 59 engage. These knobs are semi-spherical in form and ride the race 55 to give the head the nodding movement, and partial movement which makes it so lifelike.

Interrupted motion is more lifelike and attractive than continuous motion. An advantage of the radial type of cams, see Figs. 5, 6 and 7, is that a period of dwell is provided by the concentric portion of the cam. Also this type of cam provides a cam assembly which is compact.

Having thus described our invention; we claim:

1. An automaton comprising a replica of a shoe maker seated on a stool; a shoe placed between his knees; a movable right arm holding a hammer, a movable left arm holding the fingers in a position simulating holding a nail; said shoe slidably holding said nail in the path of said hammer and in the path of said fingers of the left arm, a movable neck and head simulating looking down and then around; and a multiplicity of cams, and connecting arms to cause the movable parts of the body to be actuated by the rotation of the cams, one of said cams and connecting arms being operative to raise said nail to a position projecting above said shoe, and another of said cams and connecting arms being operative to lower said hammer into driving relation with said nail.

2. An automaton comprising a body having a movable arm carrying a hammer, a work piece for simulated nailing, a rod projecting upwardly through said work piece and slidable to one position with a free end of the rod in the path of said hammer and projecting above said work piece and simulating a nail, said rod being slidable to a lower position with said free end within said work piece, cam means for raising said rod to said first position, and other cam means for operating said arm.

3. An automaton according to claim 2, said work piece having an aperture therethrough for frictionally holding said rod in said first position, said other cam means being adapted to drop said arm with its hammer and cause said hammer to drive said free end of said rod to its said lower position.

4. An automaton according to claim 2, a shaft, each of said cam means comprising a radial type cam having a dwell and mounted on said shaft.

5. An automaton for simulating nailing a work piece, said automaton comprising a rod projecting upwardly through said work piece and movable to one position with a free end of the rod projecting thereabove and simulating a nail, said rod being movable to another position within said work piece, a body having an arm having fingers movable into and out of the path of said free end, said body having another arm carrying a hammer movable to strike said free end, and a separate cam means for each of said arms and for said rod, said cam means being operable in timed relation with each other to simulate nailing said work piece.

6. An automaton according to claim 5, each of said three cam means comprising a radial type cam having a dwell, and a shaft supporting said radial type cams.

IVAR NELSON.
LE ROY W. WALLACE.

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April 12, 1949. A. R. EASTMAN 2,466,881

ACOUSTIC SWITCH

Filed May 25, 1945

Fig. 1

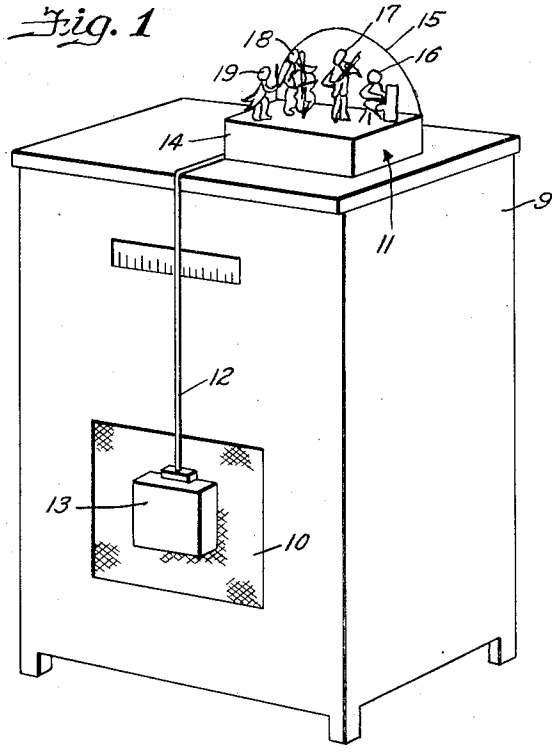


Fig. 4.

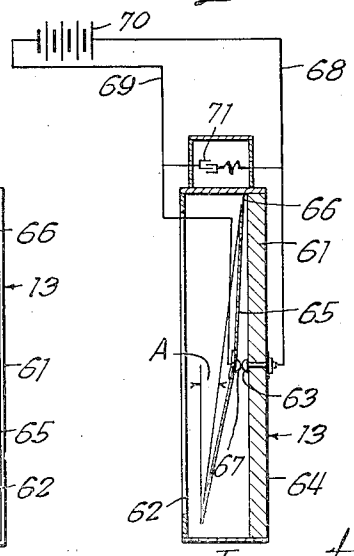


Fig. 3

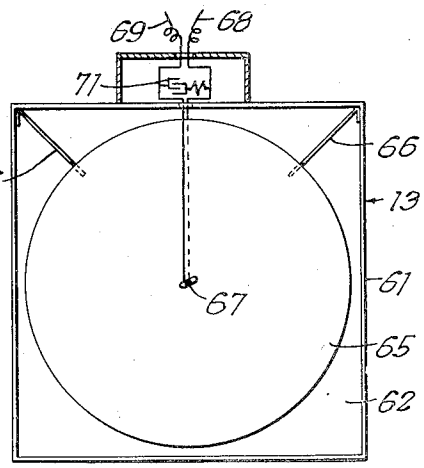
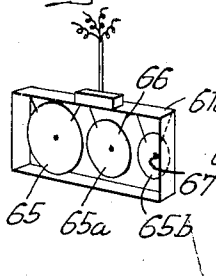


Fig. 2



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Patented Apr. 12, 1949 2,466,881

UNITED STATES PATENT OFFICE

2,466,881

ACOUSTIC SWITCH

A. Reyner Eastman, Rockford, Ill.

Application May 25, 1945, Serial No. 595,699

8 Claims. (Cl. 200—52)

1

This invention relates to a new and improved acoustic switch especially designed and adapted for use with an electrically actuated amusement or advertising device.

The principal object of my invention is to provide an improved acoustic switch sensitive enough to respond easily to sound waves picked up by said switch from a radio, phonograph, player piano, orchestra, or individual performer, so that an electro-mechanically animated figure or figures controlled by said switch will be given movements in time with the music.

The acoustic switch made in accordance with my invention comprises a nearly flat paper or parchment cone suspended in a nearly vertical position, so that a contact on the apex portion of the cone has very light but steady pressure on its cooperating contact by gravity, the sound waves being directed against the concave side of the cone tending to flatten it so that the contacts are opened in the recoil action, as the cone after deflection springs back to normal shape causing momentary separation of the contacts. To obtain a greater range of response to different sound frequencies, a plurality of different diameter cones may be used in combination with a series of figures to be actuated, the smallest diameter cone responding to high frequencies only, and the largest diameter cone responding to all frequencies, the contacts for the various cones being connected in circuit to appropriate figures to produce separate actuation of these figures as desired, as, for example, in an orchestral group the piano player and violinist may be made to respond to one frequency and the bass viol player to another, but the conductor should respond to all frequencies.

The invention is illustrated in the accompanying drawing, in which—

Fig. 1 is a perspective view of a radio cabinet on top of which has been placed an amusement or advertising device actuated in response to an acoustic switch made in accordance with my invention and suspended in front of the loud speaker;

Fig. 2 is a perspective view of a set of three acoustic switches having cones of different diameters, and

Figs. 3 and 4 are two views of an acoustic switch on a larger scale.

Similar reference numerals are applied to corresponding parts throughout the views.

Referring to Fig. 1, the cabinet 9 contains a radio or radio-phonograph combination, 10 being the conventional screen or grill in the opening in front of the loud speaker. The amusement

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or advertising device controlled by the acoustic switch of my invention is indicated generally by the reference numeral 11 and, in this case, is shown as placed on top of the cabinet, although of course it may be placed at some distance from the cabinet, assuming the extension cord 12, which interconnects my improved acoustic switch 13 with the device 11, is provided of sufficient length. For example, in a store window where the device 11 may be used for advertising purposes, it may be desired to place the device close to the window and to have the cabinet 9 with the switch 13 somewhere in the background. Also in the use of the acoustic switch of this invention in conjunction with an amusement device in the home, it is frequently desired to place the amusement device on the mantel-piece, or a table, or at any other convenient place for the entertainment of those present, whereas the cabinet 9 with the switch 13 may be at some distance from the device 11 and not necessarily in the same room.

The device 11, as illustrated in Fig. 1, comprises a stage or platform 14, with a suitable back 15, and an orchestral group consisting of a piano player 16, a violin player 17, base viol player 18, and conductor 19 in suitably spaced relation on the platform. However, the invention is by no means limited to this specific application, inasmuch as I may provide a single animated figure in combination with an acoustic switch 13, and, although the figures 16–19 happen to have movable arms, it will be obvious that I may provide figures having movable legs, movable bodies, movable heads, movable eyes, movable ears, movable noses, movable jaws, movable tails, movable trunks, movable horns, et cetera. In fact, the animated figure may be that of some machine or any mechanical contrivance, the movable element of which it is desired to have actuated in response to the energization of an acoustic switch.

Any other device such as a piano, or a sound reproducing device sounded in response to electrical or mechanical impulses furnished in a predetermined manner, as, for example, from a roll like that on a player piano or from a phonograph record, can be used to cause the actuation of the acoustic switch so as to produce movements of the actuated figure or figures, or other animated device employed.

The acoustic switch 13 with which my invention is particularly concerned is illustrated in Figs. 3 and 4 and comprises a generally rectangular frame or housing 61, which has an open front

62 and a stationary electrical contact 63 suitably mounted in a substantially central position in the back wall 64, and, of course, suitably insulated with respect to the frame 61 in the event the frame is made of conducting material. A nearly flat cone 65, made of fairly stiff paper or parchment, is suspended at two laterally spaced points near the top on strings 66 from the top of the housing in an inclined position, as indicated by the angle A in Fig. 4, so that the electrical contact 67, that is affixed to the apex of the cone and is arranged to engage the contact 63, will engage the contact 63 very lightly by gravity when the housing 61 is disposed in a substantially vertical position. The conical shape lends stiffness to the sheet material of the sound sensitive element 65, and the shallowness of the cone, on the other hand, accounts for its sensitiveness of response to sound waves impressed upon it. It is important to note that the concave side of the cone 65 is toward the open front 62 of the housing. When a sound wave strikes the cone, the cone flattens to a certain extent under the impact and in the spring-back to normal the cone bounces away from the contact 63, thereby causing a momentary "breaking" of contacts 63—67. In other words, the movement of the cone is due to the alternate compression and expansion of a sound wave, and to vibrations set up in the thin wall of the cone by the wave. The loose suspension of the cone is essential for sensitivity and accuracy of response. Now, the contacts 63 and 67 have wires 68 and 69 connected thereto, and these wires are connected in an electrical circuit with the coil of a solenoid and a storage battery 70, or any other suitable source of electric current, as, for example, an electric light socket, whereby in the make and break operation of the contacts intermittent current is supplied to the solenoid acting as the motor means for the operation of the movable elements of the mechanical figures 16–19 of the amusement or advertising device. A condenser 71 is connected between the wires 68 and 69 to absorb the sparking incident to the breaking of the contacts 63—67, so that there will be no electrical interference with the smooth performance of the radio set. The wires 68 and 69 may be in a single extension cord 12, like that shown in Fig. 1, thus permitting suspension of the acoustic switch by means of the cord, in the manner illustrated. Obviously, this extension cord may be of any suitable or preferred length, depending upon how far it is desired to place the device 11 away from the switch 13. Devices made in accordance with the present disclosure have been found to operate satisfactorily in close rhythm with the music from a phonograph or radio, giving a most amusing and entertaining performance.

In order to obtain a greater range of response to different sound frequencies, a series of various sized cones, like those indicated at 65, 65*a*, and 65*b* in Fig. 2, may be provided, the smallest 65*b* responding to high frequencies only, and the largest 65 responding to all frequencies. A circuit connecting the contacts 63—67 of each of these cones with appropriate figures, or other devices, will produce separate actuation of these figures in response to the different frequencies. Thus, for example, in an orchestral group, the conductor 19 would be operated by a solenoid energized in response to the movements of the cone 65 which responds to all frequencies, inasmuch as it is desired to have the conductor in continuous operation. On the other hand a certain figure or figures representing a member or members of the orchestra would have their solenoid or solenoids connected with the contacts 63—67 of the cone 65*b*, so as to be given movements in response only to high frequencies, and the rest of the orchestra would have their solenoid or solenoids connected in circuit with the contacts 63—67 of the cone 65*a* to have movements in response to certain other intermediate frequencies. The three cones are shown mounted in a housing or frame 61*a* that is open at the front, similarly as the housing 61, and, of course, the three cones are all suspended on strings 66 with the concave side toward the open front of the housing and in the same inclination from a vertical as the cone 65 in Figs. 3 and 4, so as to operate in the same way as that cone.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn with a view to covering all legitimate modifications and adaptations.

I claim:

1. A wave-actuated switch comprising, in combination, a support, a stationary contact thereon, a wave-actuated hollow cone element of resilient sheet material loosely suspended on said support by its one edge portion in an inclined position so that its apex portion tends to gravitate toward said stationary contact, the concave side of the cone facing away from said contact toward the wave source, and a movable contact carried on the apex portion of said cone arranged to engage the first contact.

2. An acoustic switch comprising, in combination, a support, a stationary contact thereon, a hollow, nearly flat, cone of light weight, resilient sheet material loosely suspended on said support by its one edge portion in an inclined position so that its apex portion tends to gravitate toward said stationary contact, the concave side of the cone facing away from said contact toward the sound source, and a movable contact carried on the apex portion of said cone arranged to engage the first contact.

3. An acoustic switch comprising, in combination, a support, a stationary contact thereon, a hollow, nearly flat, cone of light weight, resilient sheet material loosely suspended on said support by its one edge portion in an inclined position so that its apex portion tends to gravitate toward said stationary contact, the concave side of the cone facing away from said contact toward the sound source, and a movable contact carried on the apex portion of said cone arranged to engage the first contact, the cone being of a diameter bearing a predetermined relationship to the frequency of the sounds that it is desired shall cause operation thereof.

4. A wave-actuated switch comprising, in combination, a support, a stationary contact thereon, a wave-actuated hollow cone element of resilient sheet material loosely suspended on said support by its one edge portion in an inclined position so that its apex portion tends to gravitate toward said stationary contact, the concave side of the cone facing away from said contact toward the wave source, and a movable contact carried on the apex portion of said cone arranged to engage the first contact, said switch being devoid of adjustments but being variable in sensitivity of operation by inclination more or less of said support relative to a vertical.

5. An acoustic switch comprising, in combination, a support, a stationary contact thereon, a

hollow, nearly flat, cone of light weight, resilient sheet material loosely suspended on said support by its one edge portion in an inclined position so that its apex portion tends to gravitate toward said stationary contact, the concave side of the cone facing away from said contact toward the sound source, and a movable contact carried on the apex portion of said cone arranged to engage the first contact, said switch being devoid of adjustments but being variable in sensitivity of operation by inclination more or less of said support relative to a vertical.

6. In an acoustic switch, a hollow cone of light weight, resilient, sheet material adapted to serve as a sound pick-up, said cone being of shallow depth in relation to diameter, and electrical contact means operable by the apex portion of said cone, said cone being supported so as to be free to move bodily relative to said contact means and being disposed so that it gravitates toward said contact means, said cone having its concave side toward a source of sound, so that the cone is more or less flattened toward said contact means by the impact thereon of sound waves from said source, whereby said cone upon recoil action thereof is adapted to spring away from said contact means to open an electrical circuit.

7. In an acoustic switch, a hollow cone of light weight, resilient, sheet material adapted to serve as a sound pick-up, said cone being of shallow depth in relation to diameter, electrical contact means operable by the apex portion of said cone, and means for suspending said cone by one edge portion so that it normally tends to gravitate to a position holding the contacts closed, said cone being disposed so that it is flattened more or less

by impact therein of sound waves, whereby it serves to open the contacts in the recoil action of the cone.

8. A wave-actuated switch comprising, in combination, a support, a stationary contact thereon, a wave-actuated hollow cone element of resilient sheet material loosely mounted so that its apex portion tends to gravitate toward said stationary contact, the concave side of the cone facing away from said contact toward the wave source, and a movable contact carried on the apex portion of said cone arranged to engage the first contact under gravitation of said cone toward said first contact, said cone being adapted to cause the movable contact to move into and out of engagement with the first contact in response to the resilient recoil action of said cone each time the cone is flattened more or less under impact of a wave on the concave side thereof.

A. REYNER EASTMAN.

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April 12, 1949. B. C. KING 2,467,040

DANCING FIGURE TOY

Filed May 24, 1945 2 Sheets-Sheet 1

Fig. 1.

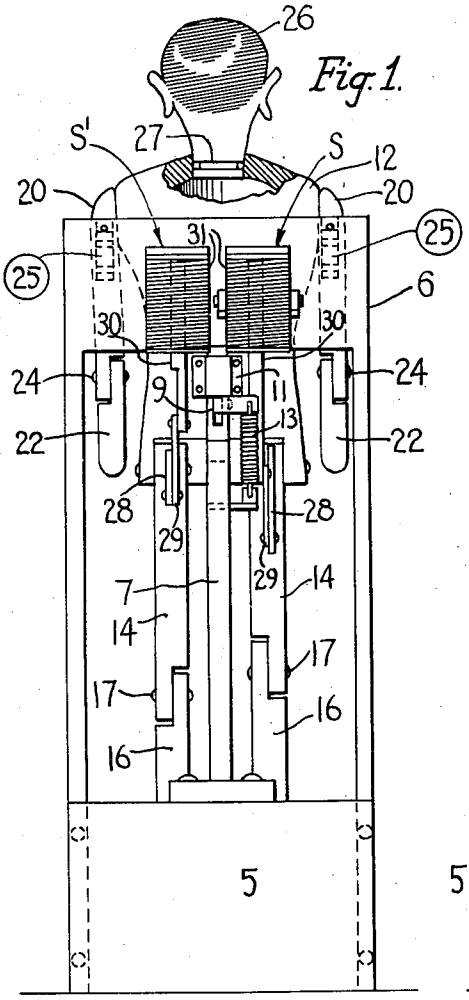
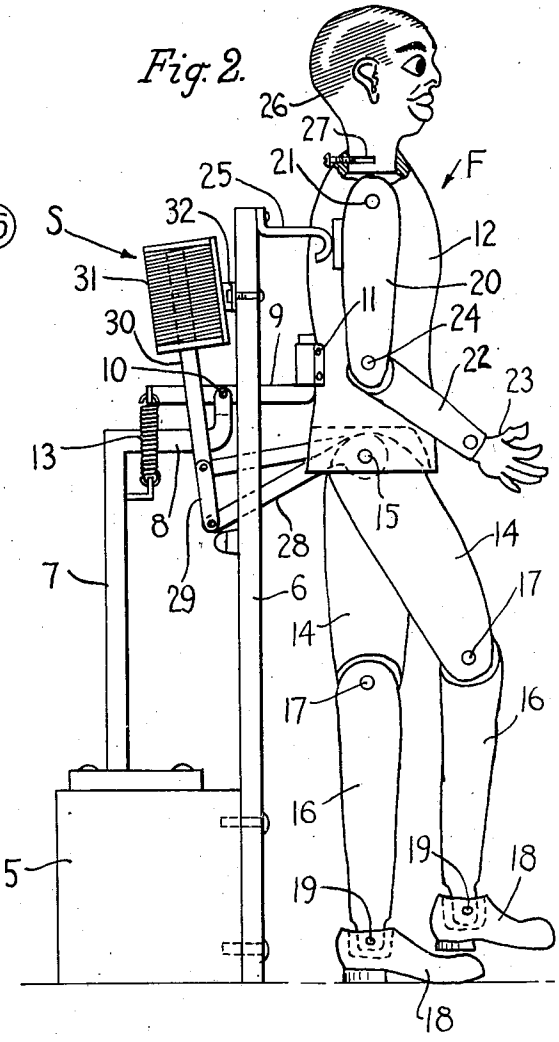


Fig. 2.



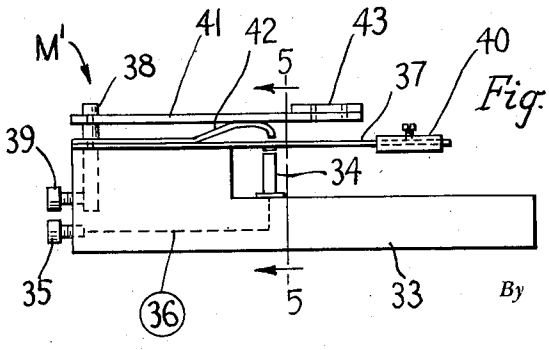


Fig. 3.

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Attorneys

April 12, 1949. B. C. KING 2,467,040

DANCING FIGURE TOY

Filed May 24, 1945 2 Sheets-Sheet 2

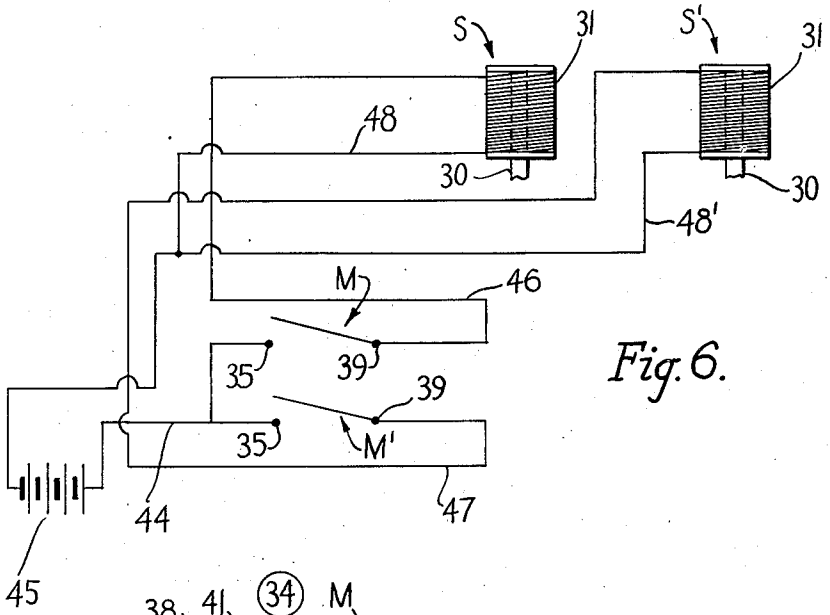

Fig. 6.

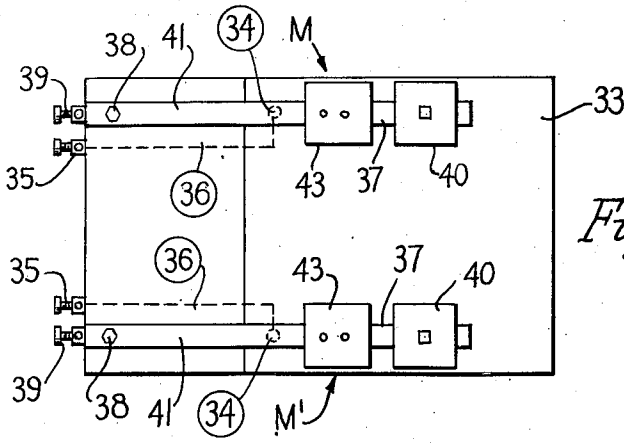

Fig. 4.

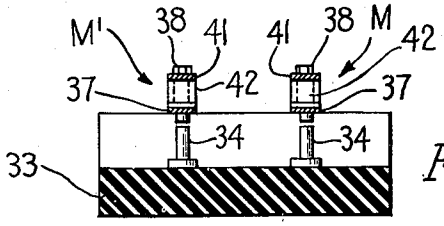

Fig. 5.

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Patented Apr. 12, 1949 2,467,040

UNITED STATES PATENT OFFICE

2,467,040

DANCING FIGURE TOY

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Application May 24, 1945, Serial No. 595,557

9 Claims. (Cl. 46—139)

1

This invention relates to dancing figure toys, and the primary object of the invention is to provide a toy of this kind including a toy figure yieldingly mounted for vertical vibration and having jointed legs, and means for independently rapidly oscillating the upper segments of the jointed legs so as to cause tapping of the foot portions of the legs on the surface upon which the toy is placed and simultaneous vertical vibration of the figure to accentuate relative movement between the segments of the legs.

A further object of the present invention is to provide a toy of the above character embodying electro-magnetic means for oscillating the upper leg segments of the toy figure, and manually operable means for independently energizing said electro-magnetic means.

Still another object of the invention is to provide a toy of the above character in which the toy figure is vertically vibrated in an arcuate path, wherein the toy figure is provided with jointed arms, and wherein abutments are provided for the upper segments of the jointed arms whereby rapid movement of the arm segments is effected upon vibration of the toy figure.

A still further object of the present invention is to provide a toy of the above character in which the toy figure is provided with a swiveled head mounted for limited turning movement, whereby turning of the head from side to side is effected by the vertical vibration of the figure.

Yet another object of the present invention is to provide a toy of the above character in which manually operable normally open switches are provided for controlling energization of the electro-magnetic means, and wherein such switches are of a quick-action type and specially constructed to readily facilitate changing the length of time each electro-magnetic means is energized so that fast or slow tapping may be selectively produced for attaining a most realistic dancing operation.

Still another object of the invention is to provide a toy of the above kind which is comparatively simple and durable in construction, economical to manufacture, and easy to control.

The present invention consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawings and claimed.

In the drawings, wherein like reference characters indicate corresponding parts throughout the several views:

Figure 1 is a rear elevational view, partly broken away and in section, of a dancing figure toy constructed in accordance with the present invention.

Figure 2 is a side elevational view thereof.

Figure 3 is a side elevational view of the switch unit employed for controlling energization of the

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electro-magnetic means forming part of the toy shown in Figures 1 and 2.

Figure 4 is a top plan view of the unit shown in Figure 3.

Figure 5 is a vertical transverse section taken on line 5—5 of Figure 3.

Figure 6 is a wiring diagram showing how the electro-magnetic means and the switch unit are included in circuits with a source of current.

Referring in details to the drawings, the present toy includes a suitable base 5 having a wall or vertically elongated plate 6 rigid with and rising from the front thereof, said wall or plate 6 being preferably slotted or cut away for sake of lightness and economy of material and to permit passage of certain parts therethrough as later described. Rigid with and rising from the base 5 behind the wall or plate 6 is a post or standard 7 having a forwardly and upwardly projecting angular upper end portion 8. A lever 9 is pivoted intermediate its ends, as at 10, to the free end of the upper end portion 8 of upright 7, for vertical oscillation. The lever 9 projects forwardly through the slot of wall or plate 6 and has its forward end attached at 11 to the back of the body portion 12 of a toy figure F. The rear end of lever 9 is connected by a helical tension spring 13 with the upright 7 so that downward movement of the toy figure F is yieldingly resisted by said spring 13.

The toy figure F includes legs, each embodying an upper leg segment 14 pivoted at 15 to the body portion 12 for forward and rearward oscillation, and a lower leg segment 16 hingedly jointed to the upper leg segment 14, as at 17. A foot member 18 is provided on the lower end of each lower leg segment 16 and is preferably pivoted to the latter at 19 for limited tilting movement relative thereto about a horizontal axis or joint corresponding to the ankle joint of the human foot. The arrangement is such that when the legs are straightened, the foot members 18 will just touch a surface on which the base 5 is placed. The toy figure further includes arms embodying inner segments 20 hinged at 21 to the body portion 12 and forearm segments 22 provided with hands 23 and hingedly jointed to the inner arm segments, as at 24.

It will be noted that the toy figure is thus mounted for vertical vibration in an arcuate path about the pivot 10, such vibration being yieldingly resisted in one direction by the spring 13. Attached to and projecting forwardly from the upper portion of wall or plate 6 are abutments 25, one arranged directly behind the inner segment of each arm of the toy figure. The arrangement is such that upon upward movement of the toy figure during its vertical vibration, the abutments 25 will contact the inner arm segments 20 and accelerate swinging movement of the arms

of the figure as well as change in angular relation between the arm segments. This causes a realistic action of the toy figure as in the act of actually dancing. The toy figure still further includes a head 26 having a neck portion swiveled in the top of the body portion 12 for limited turning movement about a vertical axis. Thus, upon vertical vibration of the toy figure, the head 26 of the figure will turn from side to side to also realistically simulate an action which normally takes place in actual dancing.

Means is provided for independently rapidly oscillating the upper leg segments 14 so as to cause tapping of the foot portions 18 on the surface upon which the base 5 is placed and simultaneous vertical vibration of the figure due to straightening of the legs and engagement of the foot portions with said surface. Such a means is associated with the upper segment of each leg of the toy figure, and description of one of such means will suffice for both. An arm 28 is rigid with the pivoted upper end of each leg segment 14 and projects rearwardly therefrom through the wall or plate 6. The rear end of this arm 28 is connected by a link 29 with the core 30 of a solenoid that also includes a coil 31 in which the core is movable. The core 30 may be normally projected by gravity or spring means and is retracted or elevated by energization of the coil 31. Such coil 31 may be mounted by any suitable means rigidly upon the back of the upper portion of wall or plate 6, as at 32. Obviously, by alternately and intermittently energizing the coils 31, the leg segments 14 may be independently and rapidly oscillated to secure the tapping or dancing operation referred to above. The solenoid for actuating the right leg of the figure is indicated at S and that for actuating the left leg of the figure at S'.

A switch unit embodying two independent normally open circuit makers mounted upon a common base 33 is provided for independently energizing the coils 31 of the solenoids. As both circuit makers are of the same construction, description of one will suffice for both. As shown, the base 33 is formed of suitable insulating material and has a thin end portion on which is secured an upstanding contact 34 connected with a binding post 35 at the other end of the base by means of a conductor 36. The other thicker end of the base has one end of a flexible contact 37 secured thereon by means including an upstanding pin 38 embedded and secured in the base and electrically connected at its lower end with a second binding post 39. The contact 37 projects forwardly from the thicker end of the base 33 over and in spaced relation to the thinner end thereof and its intermediate portion overlies and coacts with the contact 34. Slidably adjustable on the free forward end portion of contact 37 is a weighted finger piece 40 that is used to depress the contact 37 into engagement with contact 34. Contact 37 is tensioned to normally spring upwardly out of engagement with contact 34, and by adjusting the finger piece 40 longitudinally of contact 37, its sensitivity and action may be varied to suit the user's requirements. A flexible key 41 is also mounted on the pin 38 in spaced relation to and above the contact 37, and downward flexing of this key may be yieldingly resisted by a leaf spring 42 mounted on the pin 38 and engaging the under side of said key 41. This leaf spring has a downturned free forward end adapted to be depressed into engagement with the contact 37 by the key 41 so as to in turn depress said contact 37 into engagement with contact 34. The free forward end of key 41 has a finger piece 43, and it will be noted that the key 41 is shorter than the contact 37 so that its finger piece 43 is located rearwardly of the finger piece 40 of contact 37. Thus either finger piece 40 or 43 may be depressed to effect the engagement of contact 37 with contact 34. When very rapid and instantaneous closing and opening of a circuit is desired, the finger piece 40 of the contact 37 is directly actuated. A slightly slower and more prolonged circuit-closing action may be effectively had by depressing the key finger piece 43 to in turn depress the contact 37 into engagement with contact 34. Thus, by selective use of the flexible contact direct and use of the contact-actuating key, the number and duration of circuit-closing and opening operations may be varied so as to provide for long or short tapping action of the feet of the figure toy, thereby making it possible to effect a dancing operation which is very realistic. The circuit maker for controlling the solenoid S is generally indicated at M and that for controlling the solenoid S' at M'. As it is intended to operate the switch unit from a point behind the toy with the operator facing the back of the toy and with the thin end of the switch unit nearest the operator, it will be apparent that the circuit maker M will be located at the right of the operator and the circuit maker M' will be located at the left of the operator to correspond with the respective positions of the solenoids S and S'. As shown in Figure 6, the binding posts 35 of the circuit makers are connected at 44 to one side of a battery or source of current 45. The binding post 39 of circuit maker M is connected at 46 to one side of the coil 31 of solenoid S, and the binding post 39 of the circuit maker M' is connected at 47 to one side of the coil 31 of solenoid S'. The other sides of the coils 31 of both solenoids are connected at 48 and 48' to the other side of battery or source of current 45. Thus, closing of circuit maker M will energize the coil 31 of solenoid S so as to attract and elevate its core 30 and actuate the right leg of the toy figure. On the other hand, closing of circuit maker M' will cause energization of the coil 31 of solenoid S' so as to attract and raise its core 30 for actuation of the left leg of the toy figure. As soon as the flexible contact or key of either circuit maker is released, the circuit of the associated solenoid will be broken, and it will therefore be evident that rapid vibration of the legs of the toy figure may be readily effected to produce short or long taps and thereby realistically simulate a tap dancing operation.

From the foregoing description, it is believed that the construction and operation, as well as the advantages of the present invention, will be readily understood and appreciated by those skilled in the art. Minor changes may be made in details of construction illustrated and described, such as fairly fall within the spirit and scope of the invention as claimed.

What I claim is:

1. A dancing figure toy including a toy figure, said toy figure including a body portion having jointed legs, said legs embodying upper leg segments pivoted to the body portion for forward and rearward swinging movement and lower leg segments pivoted to said upper leg segments for forward and rearward swinging movement, said lower leg segments having foot portions engageable with a supporting surface on which the toy is placed, means yieldingly mounting said body

portion for vertical vibration, electro-magnetic means for independently rapidly oscillating said upper leg segments so as to cause tapping of the foot portions on said surface and simultaneous vertical vibration of the figure, and means including key-type quick-action normally open switches for independently energizing said electro-magnetic means.

2. The construction defined in claim 1, wherein the upper segment of each leg is provided with a rigid rearwardly projecting arm, and wherein each electromagnetic means includes a solenoid having a core operatively connected to said arm.

3. The construction defined in claim 1, wherein the toy includes a base provided with a standard, and wherein the means for yieldingly mounting the toy figure includes a lever pivoted intermediate its ends to the standard for vertical oscillation, one end of said lever being attached to the body of the figure, and a helical tension spring connecting the other end of said lever with said standard so as to yieldingly resist downward movement of the figure.

4. A dancing figure toy comprising a toy figure having a body portion yieldingly mounted for vertical vibration in an arcuate path, said toy figure having jointed arms and jointed legs, said legs including upper leg segments pivoted to the body portion for forward and rearward movement and lower leg segments pivoted to said upper segments for forward and rearward swinging movement, said lower leg segments having foot portions engageable with a supporting surface on which the toy is placed, electro-magnetic means for independently rapidly oscillating said upper leg segments so as to cause tapping of the foot portions on said surface and simultaneous vertical vibration of the figure, means including key-type quick-action normally open switches for independently energizing said electro-magnetic means, and a supporting base having an upstanding plate provided with forwardly projecting abutments respectively arranged behind and engageable with the inner segments of the jointed arms of the figure upon upward movement of the latter during vibration, whereby to effect movement of the arms and relative movement of the segments of the arms.

5. The construction defined in claim 1, wherein said manually operable means includes a flexible contact operable for closing the circuit of each solenoid and a supplemental flexible key for actuation of the flexible contact.

6. A dancing figure toy including a toy figure having a body portion, means yieldingly mounting said body portion for vertical vibration, said toy figure having jointed arms and jointed legs, said

jointed legs embodying upper leg segments pivoted to the body portion for forward and rearward movement and lower leg segments pivoted to said upper leg segments for forward and rearward swinging movement, said lower leg segments having foot portions engageable with a supporting surface on which the toy is placed, electro-magnetic means for independently rapidly oscillating said upper leg segments so as to cause tapping of the foot portions on said surface and simultaneous vertical vibration of the figure, and a key-type quick-action normally open switch for controlling the circuit of each electro-magnetic means.

7. A dancing figure toy including a toy figure including a body portion having a swivelled head mounted for limited turning movement, means yieldingly mounting said body portion for vertical vibration in an arcuate path, said toy figure further having jointed arms and jointed legs, said legs embodying upper leg segments pivoted to said body portion for forward and rearward swinging movement and lower leg segments pivoted to said upper leg segments for forward and rearward swinging movement, said lower leg segments having foot portions engageable with a supporting surface on which the toy is placed, electro-magnetic means for independently rapidly oscillating said upper leg segments so as to cause tapping of the foot portions on said surface and simultaneous vertical vibration of the figure, and a key-type quick-action normally open switch for controlling the circuit of each electro magnetic means.

8. The construction defined in claim 6, in combination with abutments respectively arranged behind and engageable with the inner segments of the jointed arms of the figure upon upward movement of the latter during vibration.

9. The construction defined in claim 7, in combination with abutments respectively arranged behind and engageable with the inner segments of the jointed arms of the figure upon upward movement of the latter during vibration.

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DANCING TOY

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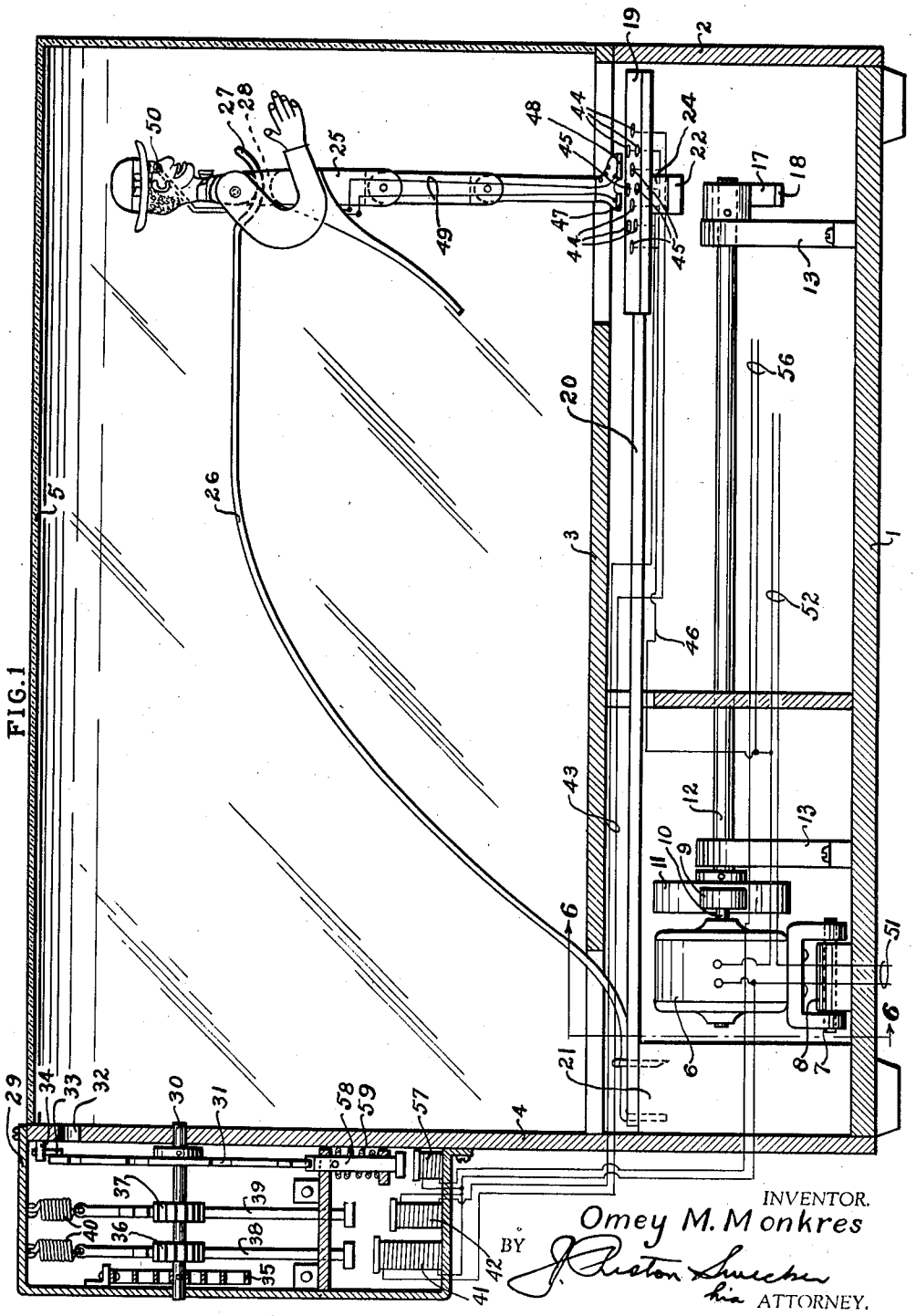

FIG. 1

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DANCING TOY

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FIG. 2

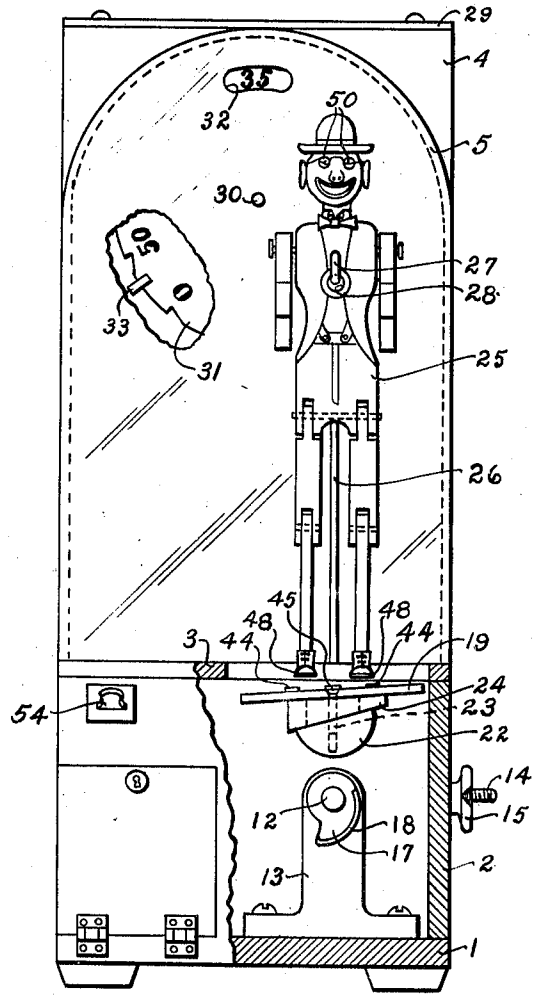
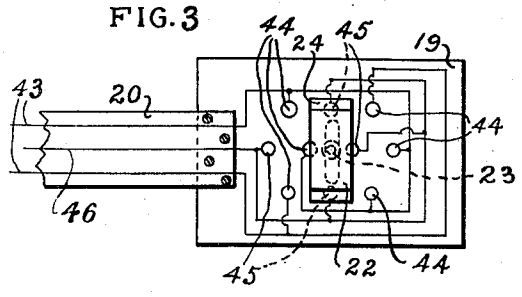


FIG. 3



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DANCING TOY

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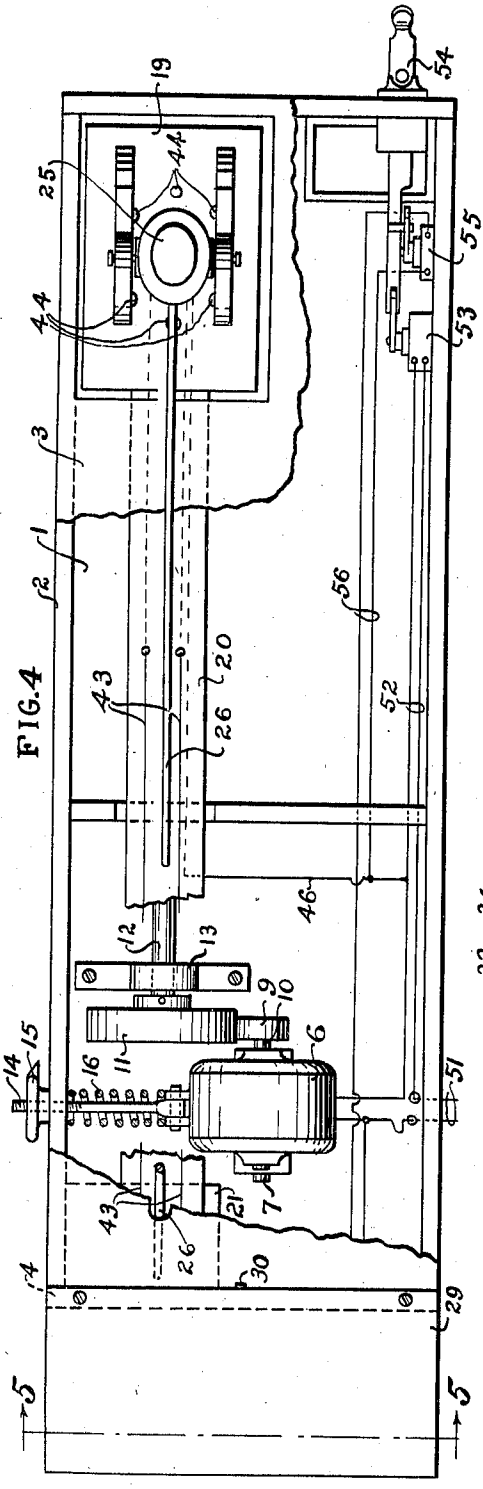

FIG. 4

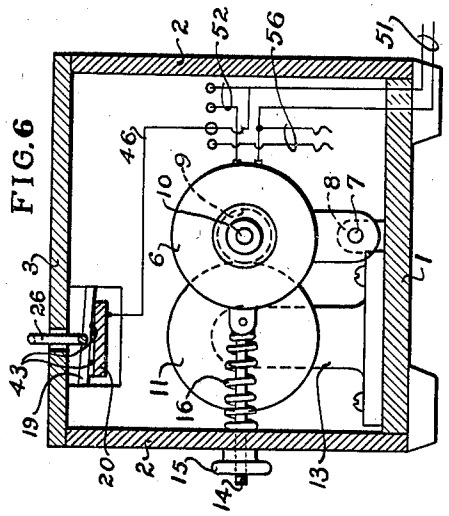

FIG. 6

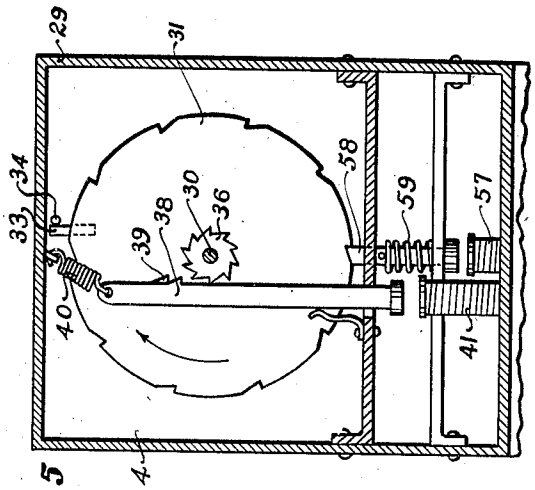

FIG. 5

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DANCING TOY

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Application January 7, 1941, Serial No. 373,494

5 Claims. (Cl. 46—137)

This invention relates to an improvement in dancing toys of the type in which a figure is mechanically operated to produce dancing motions.

The object of the invention is to improve dancing toys of this character by providing entertaining motions of an articulated figure, of unusual character, which may be operated mechanically for its entertaining characteristics.

A preferred embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view through the toy device, showing the wiring thereof diagrammatically;

Fig. 2 is a front elevation thereof, with parts broken away and in section;

Fig. 3 is a bottom plan view of the dance platform, showing diagrammatically the electrical connections thereof;

Fig. 4 is a top plan view of the toy device, with parts broken away, and with the wiring connections shown diagrammatically;

Fig. 5 is a transverse sectional view through the register structure, on the line 5—5 of Fig. 4; and

Fig. 6 is a transverse section through the operating structure, on the line 6—6 of Fig. 1.

The toy device is shown as formed with a lower portion enclosing an operating structure and with a display portion thereabove constructed for enclosing an articulated figure adapted for dancing motions upon proper operation.

The lower portion is constructed of a base 1 surrounded by an enclosing casing 2 having a cover 3 extending thereover. The back wall of the casing 2 is extended above the cover 3 to form an upstanding wall 4. A glass or other transparent case 5 extends over the cover 3 in front of the wall 4, enclosing a display department for the figure, as shown in Figs. 1 and 2.

Within the lower portion of the device is the driving mechanism, including an electric motor 6 pivotally supported at 7 on a bracket 8 carried by the base 1, as shown in Figs. 1 and 6. The motor 6 has a drive pulley 9 mounted on the armature shaft 10 in position to bear frictionally against pulley 11 mounted on a drive shaft 12 journaled in upstanding supports 13 carried on the base 1.

The motor 6 is free to swing transversely on its pivot 7 to move the pulley 9 toward and from the pulley 11, under the control of an eyebolt 14 pivotally connected with the motor housing and extending through a wall of the casing 2, having a nut 15 threaded thereon for adjusting the bolt to move the motor 6 forward against the tension of a spring 16 sleeved over the eyebolt 14 and interposed between the latter and the casing 2 normally tending to move the motor back to separate the pulley 9 from engagement with the pulley 11. By varying the bearing relation between the pulleys 9 and 11, the speed of rotation of the shaft 12 may be varied or controlled, as desired.

The forward end of the shaft 12 carries a cam 17 for the purpose of operating the toy, which is shown as having one lobe, although other desired shapes may be used, as may be found desirable. The cam 17 is provided preferably with a facing 18 of rubber or other yieldable material on the contact side thereof for eliminating noise.

Mounted over the cam 17 is a platform 19 carried on the free end of a yieldable or flexible support 20, the opposite end of which is fixed to an upstanding support or block 21 mounted in the base portion adjacent one end thereof, whereby the platform 19 is supported for vertical oscillatory movement. The platform 19 is supported preferably in an oblique position, as shown in Fig. 2, to impart a lateral swaging motion to the dancing figure upon contact therewith, to increase the interest and amusement effect of the device.

The platform 19 supports a bearing member 22 on the under side thereof, as by a screw 23, capable of adjustment both angularly and vertically relative to the platform 19, and a wedge 24 is shown as interposed between the bearing member 22 and the platform 19 so as to adjust the bearing member 22 relative thereto to vary the effective stroke of the cam, the parts being held in adjusted positions by the screw 23.

An articulated figure is shown at 25 having jointed limbs and body capable of free relative swinging movement upon vertical motion of the figure, which figure may be constructed of the desired shape and appearance according to the amusement effect desired. The articulated figure 25 is supported by a spring wire 26, one end of which is of hook shape engaging in a hole 28 in the body of the figure, while the opposite end of the spring wire 26 extends down to, and is supported upon, the upstanding support or block 21. The wire 26 is constructed as an upwardly arched leaf spring having sufficient yieldability for freedom of motion of the figure both vertical and laterally under the influence of the upwardly vibrating platform 19. The hole 28 receives the hook 27 and has its edges rounded off transversely

of the figure at the front and back thereof to prevent binding engagement with the support.

Provision may be made for electrically indicating the extent of movement or operation of the device, which may be coin-controlled if desired. For this purpose, I have provided a housing 29 secured to the back face of the wall 4, within which housing is journaled a shaft 30 carrying a ratchet wheel 31 fixed thereon, as shown in Figs. 1 and 5. The ratchet wheel 31 may be provided with figures or other indications on the face thereof in position to be viewed through an opening 32 in the wall 4, and carries a lug 33 in position to engage a stop pin 34, when the ratchet wheel is turned to a zero position in the direction indicated by the arrow in Fig. 5, under the influence of a spiral spring 35 (Fig. 1), one end of which is attached to the shaft 30 while the opposite end is attached to the housing 29.

For turning the ratchet wheel 31 in a forward direction against the tension of the spiral spring 35, two separate ratchet gears 36 and 37 are fixed on the shaft 30 in position to be engaged and actuated by reciprocating pawl devices 38 and 39 respectively, the former being shown as provided with one tooth and the latter, with two teeth, for selective engagement and operation of the shaft 30 and its ratchet wheel 31 through predetermined distances according to which of the pawl devices is actuated. Each of the pawl devices 38 and 39 is held in a retratced position by a coil spring 40 which returns the same ready for subsequent operation. The pawl devices 38 and 39 extend to operative relation with electro-magnets 41 and 42 respectively adapted for alternate energizing under the control of the figure, for which purpose, one side of each of these electro-magnets is connected with a source of electrical supply, while the opposite side is connected in series through the respective wires 43 with selected ones of a plurality of contacts 44 arranged in different positions in the surface of the platform 19. Additional contacts 45 in said surface are connected through a wire 46 leading to the other side of the source of electrical supply.

The articulated figure is constructed to provide for bridging relation between the contacts 44 and 45, for which purpose, it has contact members 47 and 48 spaced and insulated from each other, and preferably attached to the feet of the figure, as by the heels and soles of the shoes thereof. The contact members 47 and 48 are adapted to be connected together through a circuit 49 which includes electric lamps 50 preferably arranged to form the eyes of the figure so as to be energized when the circuit is closed through the figure.

The source of electrcal supply is designated generally by the numeral 51 and supplies current to the several electrically actuated elements through a control circuit 52 that includes a time delay switch 53 adapted to be actuated by a coin-controlled device 54. A second control switch 55 is connected with the coin device 54 for controlling a circuit 56 that includes an electro-magnet 57 in position to actuate a pawl 58 against the tension of a spring 59 acting thereon. The pawl 58, as shown in Fig. 5, engages the teeth of the ratchet wheel 31 tending to oppose return movement thereof under the influence of the spring 35.

In the operation of the toy constructed as described, it is necessary to insert a coin into the device 54 to close the switches 53 and 55 for connecting electric current with the several parts of the device. The insertion of the coin momentarily closes the circuit 56 to energize the electro-magnet 57 and attract the pawl 58 from engagement with the ratchet wheel 31, releasing the latter and permitting its return to zero position by the spiral spring 35, immediately after which, the electro-magnet 57 becomes deenergized, and the pawl 58 is returned to its engaged position by the spring 59.

The closing of the circuit 52 by the switch 53 energizes the electric motor 6, operating through the friction gearing 9—11 to drive the shaft 12, and rotate the cam 17 mounted thereon in the direction indicated by the arrow in Fig. 2. This rotation of the cam will cause an upward vibration of the platform 19, causing it to strike against the suspended feet of the articulated figure, jarring the figure and moving it upward and downward on its yieldable support 26, resulting in amusing gyrations thereof that are highly entertaining. These are enhanced by the lateral swaying of the figure resulting from the oblique position of the surface of the platform 19.

As the contact members 47 and 48 engage the respective contacts 44 and 45 in bridging relation therebetween, a circuit is closed from the wire 46 to one of the wires 43, through the series circuit 49 and the bulbs 50, energizing the latter and the selected one of the electro-magnets 41—42. This will actuate one of the pawl devices 48—49, moving it downward and causing the tooth or teeth thereof to engage and rotate the corresponding ratchet gear upon the shaft 30, turning the ratchet wheel 31 to a predetermined extent.

This operation will continue repeatedly during the dancing motions of the figure, causing a step-by-step movement of the ratchet wheel 31, presenting succeeding figures or other indications for view through the window 32, representing the number of times that the energizing circuits have been closed or the contacts engaged.

After a predetermined length of time of operation, as governed by the predetermined setting of the switch 53, the circuit 52 is broken, stopping the operation of the device, but the high score represented on the ratchet wheel 31 will remain in the window 32 until the start of the next operation when it will be cleared by the return of the ratchet wheel to its zero position as described above, when the device will be ready again for another operation.

I claim:

1. A dancing toy comprising an articulated figure, resilient supporting means for said figure, a platform arranged beneath the figure in position for engagement thereby, resilient supporting means for said platform, said platform having contacts in the surface thereof, contact members carried by the figure to bridge the contacts on the platform, and electrical indicating means connected with the contact members for indicating the extent of engagement of the figure with the contacts.

2. A dancing toy comprising an articulated figure, resilient supporting means for said figure, a platform arranged beneath the figure in position for engagement thereby, resilient supporting means for said platform, said platform having spaced contacts thereon, contact members carried by the feet of the figure in position to engage said contacts in bridging relation, and an electric circuit connected in series between said contact members and including one or more indicating lamps on the figure.

3. A dancing toy comprising a resiliently supported articulated figure, a resiliently supported platform beneath the figure in position for bearing engagement therewith to move the figure, said platform having spaced contacts thereon, said figure having means for bridging the contacts to close an electric circuit upon engagement of the platform by the figure, and electrical indicating means connected with the contacts for operation upon said engaging action.

4. A dancing toy comprising a resiliently supported articulated figure, a resiliently supported platform beneath the figure in position for bearing engagement therewith to move the figure, said platform having spaced contacts thereon, said figure having means for bridging the contacts to close an electric circuit upon engagement of the platform by the figure, electrical indicating means connected with the contacts for operation upon said engaging action, said electrical indicating means including a step-by-step counter device, and an electro-magnet for actuating said counter device and electrically conneected with the platform contacts.

5. A dancing toy comprising a resiliently supported articulated figure, a resiliently supported platform beneath the figure in position for bearing engagement therewith to move the figure, said platform having spaced contacts thereon, said figure having means for bridging the contacts to close an electric circuit upon engagement of the platform by the figure, electrical indicating means connected with the contacts for operation upon said engaging action, said electrical indicating means including a step-by-step counter device and an electro-magnet for actuating said counter device and electrically connected with the platform contacts, and coin-controlled means for controlling the supply of electric current thereto.

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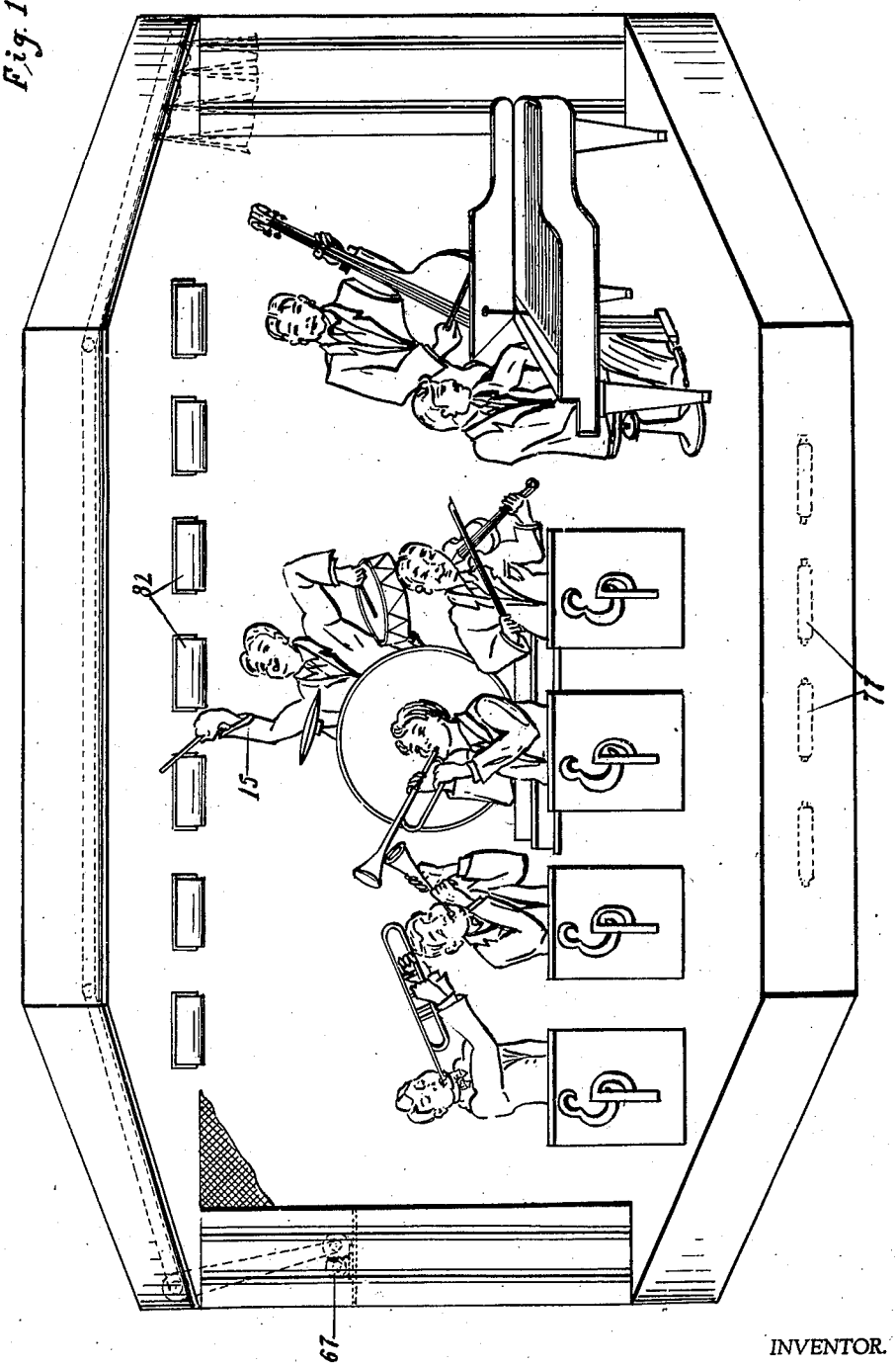
Fig. 1.



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ORCHESTRAL APPARATUS

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Fig. 2.

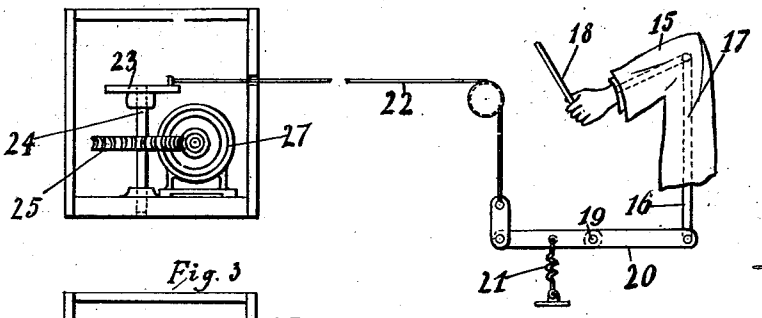


Fig. 3

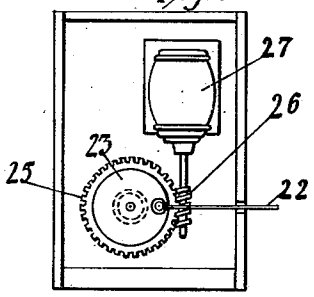


Fig. 4.

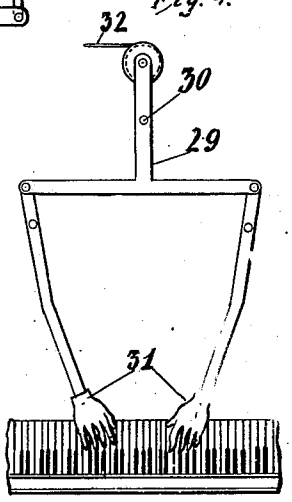


Fig. 5.

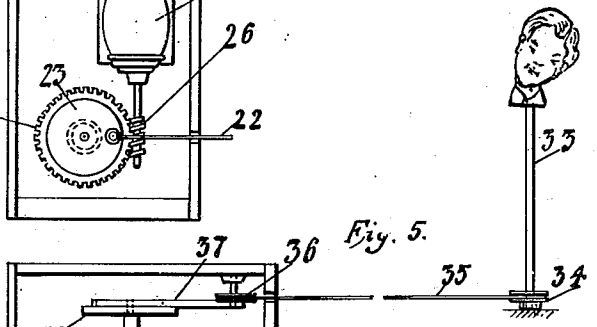


Fig. 6.

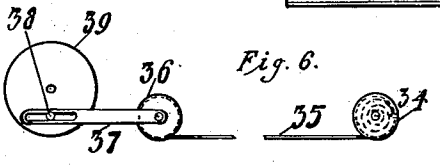
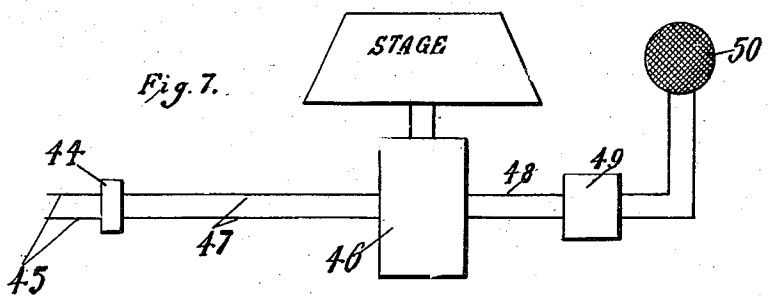


Fig. 7.



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ORCHESTRAL APPARATUS

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Fig. a.

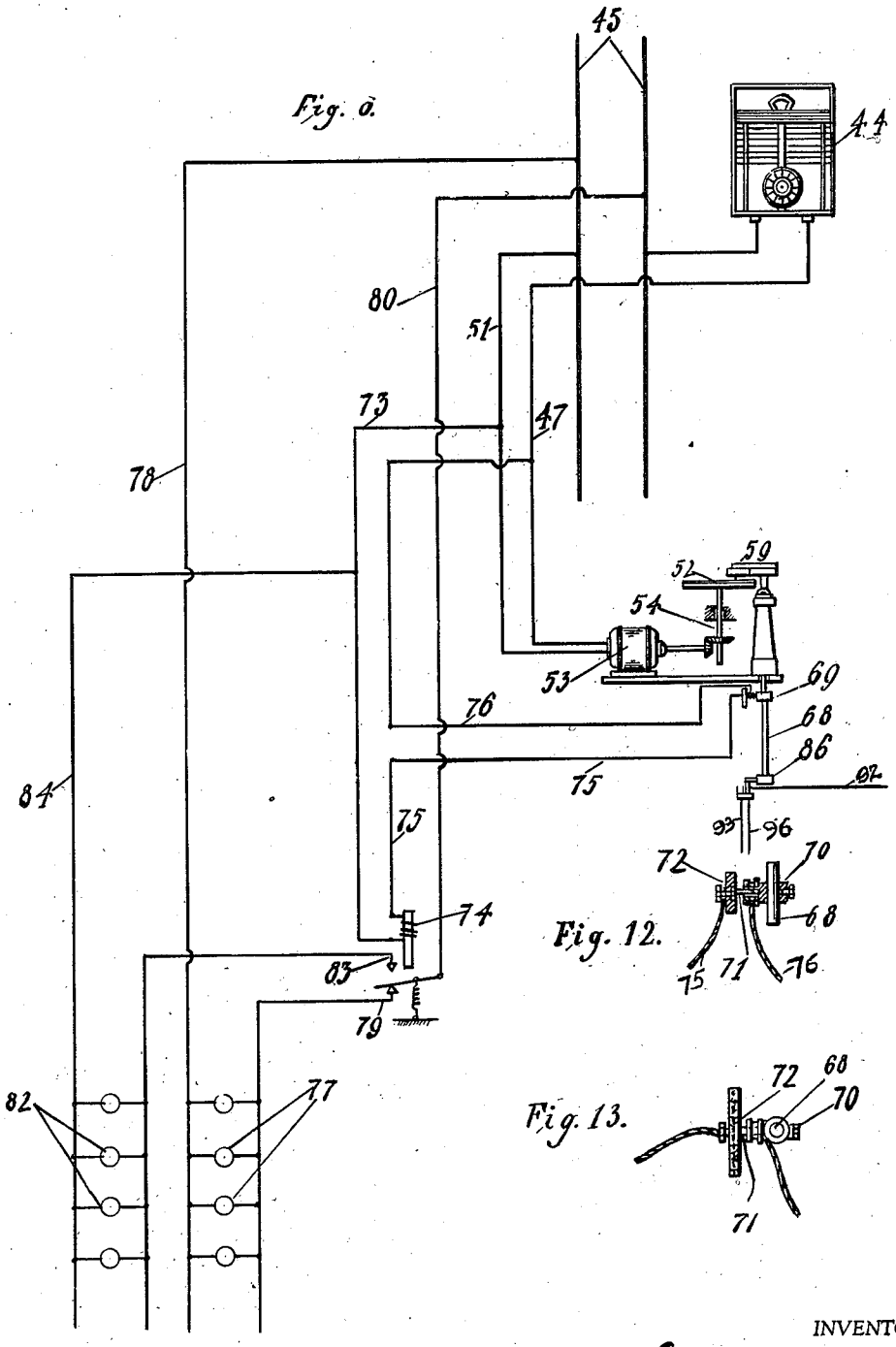

Fig. 12.

Fig. 13.

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ORCHESTRAL APPARATUS

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Fig. 9.

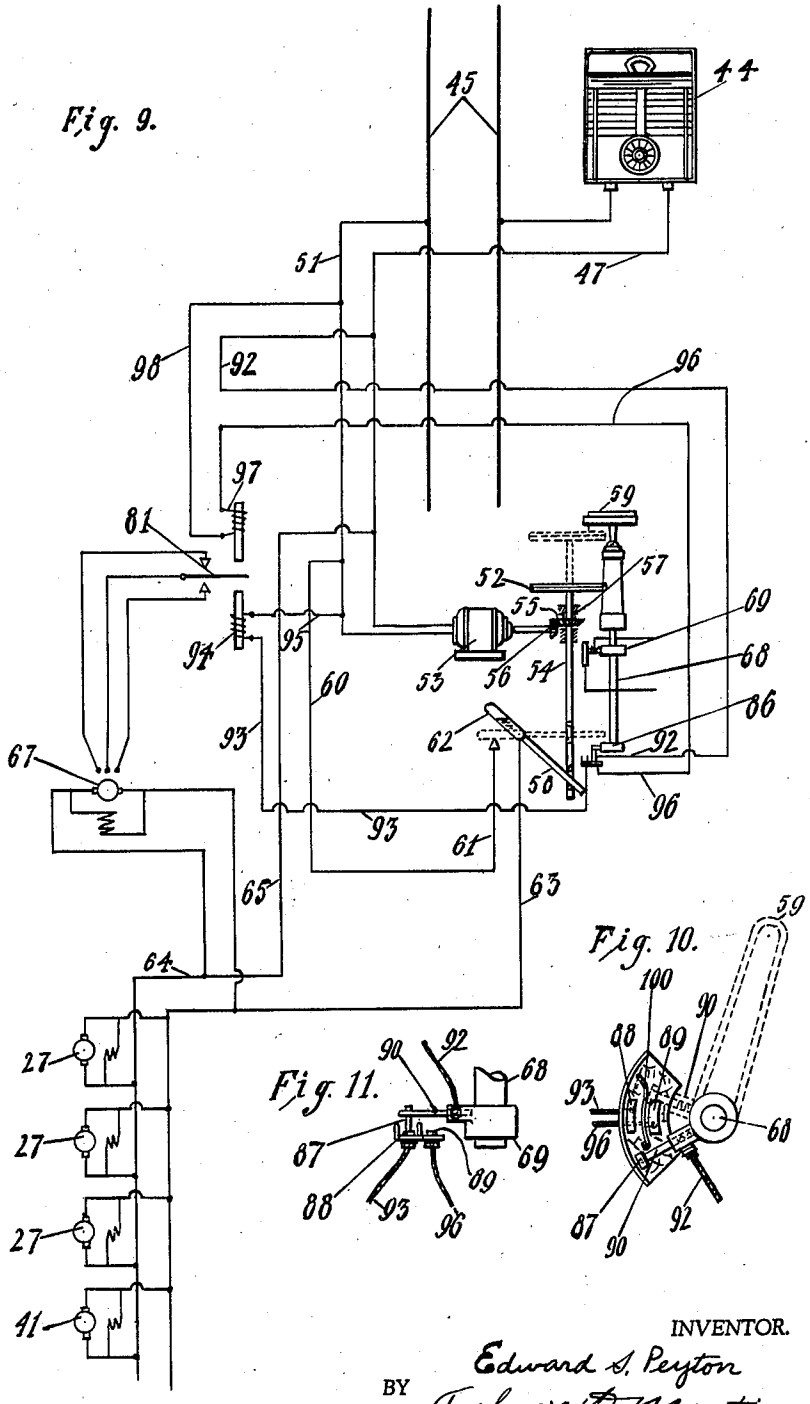

Fig. 10.

Fig. 11.

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UNITED STATES PATENT OFFICE

2,307,296

ORCHESTRAL APPARATUS

Edward S. Peyton, Crafton, Pa., assignor of one-fourth to Samuel Strahl, Pittsburgh, Pa., one-fourth to Thomas J. Harrison, McKees Rocks, Pa., and one-fourth to Irene Simon, Pittsburgh, Pa.

Application November 14, 1940, Serial No. 365,605

3 Claims. (Cl. 46—118)

My invention relates to orchestral apparatus, including automatons operated in simulation of musicians, and certain stage and lighting effects, preferably operated in conjunction with sound-reproducing apparatus such as phonographs.

One object of my invention is to provide an improved form of orchestral apparatus wherein automatons representing musicians of an orchestra will have movements imparted thereto simulating movements of orchestra players, and wherein the stage lighting and movements of the automatons will be automatically effected and controlled in an improved manner, in conjunction with the mechanical reproduction of music.

Another object of my invention is to provide automaton musicians of such form and operated in such manner that they will appear more life-like than do automatons as heretofore made and operated.

In the accompanying drawings, Figure 1 represents a front view of a stage containing an orchestra; Fig. 2 is a view showing apparatus for operating the arm of a musician; Fig. 3 is a plan view of a portion of the apparatus of Fig. 2; Fig. 4 is a view showing the manner in which the arms of a piano player may be operated; Fig. 5 is a view showing apparatus for imparting oscillatory movements to the head of a player; Fig. 6 is a plan view of a portion of the apparatus of Fig. 5; Fig. 7 is a diagrammatic view showing the general arrangement of parts entering into the apparatus of the other figures; Fig. 8 is a diagrammatic view showing the manner in which certain of the electrical circuits for controlling the lights are controlled through movements of various parts of a phonograph; Fig. 9 shows certain of the other circuits of the apparatus and control thereof by phonograph parts; Fig. 10 is a plan view on an enlarged scale of a switch shown in Fig. 9 for controlling a motor which opens and closes the stage curtain; Fig. 11 is an elevational view of the switch of Fig. 10; Fig. 12 is a side view showing one of the other switches of Fig. 9, which controls the lights at the stage, and Fig. 13 is a plan view of the switch.

As shown in Fig. 1, the automatons can be of life size or in miniature and may suitably be in the form of hollow rubber shells with the rubber in a resilient condition. By making the automations of rubber, they will have a flexibility that will render them less artificial in appearance than if they were made of rigid material, and furthermore, they can be operated in a simpler manner than if they were formed of a rigid material. That is to say, they can to a large extent be operated simply by pull strings, to move the arms or the heads in one direction, the inherent resiliency of the rubber returning them to their original positions upon release of the pulling force.

The motors for operating the automatons will usually be placed beneath the stage floor and pull strings will extend from the driving apparatus up through the bodies of the automatons. In Fig. 2, an arm of the drummer is represented by the numeral 15. A link 16 extends into the said arm and pivotally carries at its inner end a bar 17 that in turn carries the hand and drumstick 18 of the drummer. A fixed pivot 19 is provided in the body of the drummer for supporting a lever 20. As the lever 20 is oscillated, the arm of the drummer will be moved, and there will be additional movement of the forearm of the drummer because of the flexibility of the arm itself and the pivotal mounting of the bar 17, so that on a down stroke of the drummer's arm, the movement of the hand and the drumstick will continue slightly after the lever 20 has come to the end of its stroke, the drummer's forearm, however, being returned to its sharply bent position shown in Fig. 2, by reason of the resiliency of the rubber. The lever 20 is pulled against the tension of a spring 21 which may also be mounted in the body, by a pull string 22 that extends down through the body of or behind the drummer, to beneath the stage where it has connection with a crank disk 23 which is secured to a shaft 24. The shaft 24 carries a worm gear 25 that is driven by a worm 26 from a motor 27.

In some cases the pull cord could extend directly around suitable guide pulleys into the arm of a player and be, for example, connected to the elbow of the trombone player or a violin player to periodically pull the hand of the player rearwardly, the outer movement of the hand occurring through the flexibility of the rubber, when pulling force on the cord is relieved.

In Fig. 4 I show a lever 29 mounted on a fixed pivot 30 within the body of the piano player, for oscillating the arms and hands 31. A cord 32 for moving the lever 29 may periodically be pulled in the same manner as the cord 22.

In Fig. 5 I show a rod 33 extending upwardly through the body of a player and connected at its upper end to the head of the player, it being understood that the head and neck of the player are also of rubber and formed unitarily with the body portion. The rod 33 carries at its lower end a grooved disc 34 around which a cord 35 is partially wrapped, so that when the cord is pulled, the bar 33 will be turned a slight distance to twist

the head, which will return to its original position when the cord is slackened. The cord at its other end is secured to and partially wrapped around a grooved disc 36 that has rigidly secured thereto a slotted crank arm 37, through the slot of which extends a pin 38 that is carried by a disc 39. The disc 39 is secured to a shaft 40 that is driven from a motor 41, through worm reduction gearing 42. It will be understood that the speed of the motor and the gear reduction is such that the head will be turned very slowly during oscillation of the disc 36 and its crank arm 37, the head being held against snap movement back to its original position by constant tension on the cord 35. A coil spring may be utilized, in addition to the resiliency of the rubber, if desired, to return the head to its original position when tension on the cord 35 is relieved, the spring having one of its ends connected to the disc 34 and its other end to the bearing that supports the shaft 33.

The motors for operating the automatons are controlled from a moving part of a phonograph or other form of sound reproducer which is in turn controlled by a suitable switch, as for example, a coin box 44 that controls flow of current from a house lighting circuit 45 to a phonograph 46. The coin box may have certain selector mechanism therein, whereby a patron can select the musical number to be played and upon insertion of a coin, a circuit 47 is established through the coin box to the phonograph. The coin-controlled mechanism is well known in the patented art and need not be here described in detail. Similarly, the movement of phonograph records and the needle arm of the phonograph will automatically be effected in various of well-known ways. The phonograph 46 can be mounted at any desired place—back-stage or elsewhere—and musical impulses are transmitted from the tone arm or needle arm thereof through wires 48 and an amplifier 49 to a loud speaker 50. The loud speaker may be mounted in the ceiling of the stage or behind a mesh screen.

As is common in devices of this character, the phonograph record which has been selected automatically as above stated, and brought into position upon a turntable 52 that is driven by a motor 53, is elevated to playing position, as indicated in Fig. 8 and in dotted lines in Fig. 9, whereupon the needle arm 59 is swung into position to engage the record. The record table is mounted upon a vertical shaft 54 that has splined connection with a bevel gear wheel 55 that is driven from the motor 53 through a bevel pinion 56. Suitable stationary bearings 57 (Fig. 9) are provided to vertically guide the shaft 54 and to maintain the gear wheel 55 in meshed engagement with the pinion 56. As above stated, these movements can be effected in any one of well known ways.

At its lower end, the shaft 54 has loose connection with a switch arm 58 which, when the shaft is raised, will close a circuit through the motors 27 and 41 that operate the automatons. This circuit will be from one side of the house lighting circuit 45 through a conductor 51; a conductor 61; the switch 62; a conductor 63, to one side of the motors, and from the other side of the motors will be through a conductor 64; a conductor 65, to conductor 47 and thence to the other side of the line 45. A motor 67 for operating the stage curtain may also be supplied with current through the lines 63 and 65. It is desirable to start the automatons in motion before the curtain is drawn aside and the music begins, and for this reason the circuit for the automaton motors is closed through movement of the record toward playing position.

In phonographs of this type, when a record has been raised to playing position, the needle arm 59 is automatically swung into place upon the record. I utilize this swinging movement to energize certain of the other parts of the apparatus and to control the stage lights. To this end, I provide on the shaft 68 which swings the needle arm 59, a switch 69 that comprises a member 70 (Fig. 12) secured to the shaft 68 and carrying a movable contact member 71 for engagement with a stationary contact member 72. The contact member 71 is in the form of a brush and the contact member 72 is in the form of a plate across which the member 71 moves to make and break a circuit during swinging of the needle arm. When the needle arm swings to playing position, the switch member 71 moves into engagement with the switch member 72, thereby closing a circuit that leads from one side of the line 45 through the conductor 51; a conductor 73; a solenoid coil 74; a conductor 75; switch elements 71—72, and a conductor 76 to the conductor 47 and the other side of the line 45. Normally, foot lamps 77 are illuminated through a conductor 78, a switch 79 and a conductor 80. Upon starting of the apparatus, it is desired to illuminate the stage lamps 82. The swinging of the needle arm to playing position causes energization of the coil 74, as above explained, to open the switch at 79 and close a circuit through a switch member 83. This interrupts the circuit through the foot lamps and closes a circuit through the conductor 80; switch element 83; the lamps 82; a conductor 84; and the conductors 73 and 51. The lamps 77 and 82 are indicated on Fig. 1 of the drawings, but will ordinarily, of course, be so mounted as not to be directly visible to the audience.

The movement of the needle arm to playing position also closes a switch at 86, to energize the motor 67 in a direction to open the curtain, while when the needle arm swings to retracted position at the completion of a record, it causes the motor 67 to operate in a direction to close the curtain, the motor being of the reversible type, whose direction is controlled by a switch element 81. As shown more clearly in Figs. 10 and 11, the switch 86 comprises a movable contact member 87 that in one direction of swinging movement by the shaft 68 will move along a stationary contact member 88, while when moving in its other direction, it will travel along a contact member 89. The contact member 87 is carried by an arm 90 which is spring pressed in an outward direction, as indicated in Fig. 10, so that the contact member 87 can be moved from one switch plate to the other.

When the switch member 87 is in engagement with the contact member 88, a circuit is established from one side of the line 45 through the coin box and line 47; a conductor 92; contact members 87—88; a conductor 93; a solenoid 94; a conductor 95, and the conductor 51 to the other side of the line 45. When the switch member 87 has been moved into engagement with the member 89, current will flow from conductor 47, through conductor 92; contact members 87—89; conductor 96; solenoid 97, and conductors 98 and 51 to the other side of the line 45.

Reversal of the switch contacts at 87—88—89 is effected by a spring leaf 100 of insulating material behind which the brush 87 moves when

the needle arm is swung in a clockwise direction to cause the contact member 87 to move across the contact member 88. When the switch arm 90 approaches the end of its movement in that direction, the contact member 87 will snap past the spring arm 100. Upon swinging of the needle arm 59 in a counter-clockwise direction, the leaf 100 will serve as a cam to guide the contact member 87 into engagement with the contact plate 89, to energize the motor 67 in a direction to close the curtain. The motor is stopped automatically at each end of curtain travel, by the contact 87 passing from 88 or 89, as the case may be.

Summarizing the operation of the parts and their sequence of movement, upon the placing of a coin in the box 44 or the closing of the switch in some other manner at that point, a circuit is thereby established through the operating motor 53 of the phonograph, to not only set the turn table 52 in motion, but to initiate movements of the other usual parts of phonographs of this nature. The raising of the turntable closes the circuit through the automaton motors 27—41, so that said automatons will be in motion when the curtain is opened. When the turntable with its contained record is at or near its uppermost position, the needle arm 59 is swung into playing position, and during such movement, closes the switch 69 that in turn closes the circuit of stage lamps 82. The switch at 86 is so set that the contact member 87 will not engage the contact member 89, through which the coil 97 is energized to move the switch member 81 into a position to cause energization of the motor 67 in a direction to close the curtain, until after the switch 59 is closed and the stage lamps lit. Therefore, not only are the automatons moving, but the stage is also illuminated when the curtains begin their parting movement. The switch members 71—72 remain in engagement while the needle arm is in playing position, but are disengaged when the needle arm is in its off position.

When the playing of a record has been completed, the needle arm will be swung away from the record and during such swinging movement will move the contact member 87 across the contact plate 88 to temporarily energize the solenoid 94 to effect movement of the switch 81 toward the solenoid 94 and thus cause energization of the motor 67 in a direction for closing the curtain, the circuit through the switch 69, and hence through the lamps 82, remaining unbroken until the contact member 87 has passed out of engagement with the contact member 88 and the circuit through the solenoid 94 broken, at which time the curtain is completely closed, the switch member 81 returning to neutral position. When the circuit through the switches 69 and 86 have been broken, the turntable shaft 84 will have reached its lowest position and caused interruption of the circuit through the automaton motors 27—41.

I claim as my invention:

1. Orchestral apparatus comprising a member for moving a phonograph record to and from playing position, a member for moving a sound-reproducer arm to and from playing position, automaton musicians, electrical devices for operating the said musicians, electric lamps, a curtain movable from and to a position in front of the automatons, an electrical device for operating the curtain, and means operated by movement of said members toward playing position, for closing the circuits of said electrical devices, lamps and curtain-operating devices, in the order named, whereby the automatons are in motion and the lamps energized before withdrawal of the curtain.

2. Orchestral apparatus comprising a member for moving a phonograph record to and from playing position, a member for moving a sound-reproducer arm to and from playing position, automaton musicians, electrical devices for operating the said musicians, electric lamps, a curtain movable from and to a position in front of the automatons, an electrical device for operating the curtain, means operated by movement of said members toward playing position, for closing the circuits of said electrical devices, lamps and curtain-operating devices, in the order named, whereby the automatons are in motion and the lamps energized before withdrawal of the curtain, and means operated by movement of said members from playing position, to effect closing movement of the curtain and for thereafter interrupting the circuits through said electrical devices and the lamps.

3. Orchestral apparatus comprising automaton musicians of resilient material, operating elements connected to portions of the musicians, a sound reproducer, and means controlled by operation of said reproducer, for periodically pulling said elements in one direction, to effect flexing of the material and thus move the musicians, and then relaxing the pulling force, to permit the musicians to return to their former positions.

EDWARD S. PEYTON.

May 20, 1941. G. G. SMITH 2,242,442

RHYTHM OPERATED DEVICE

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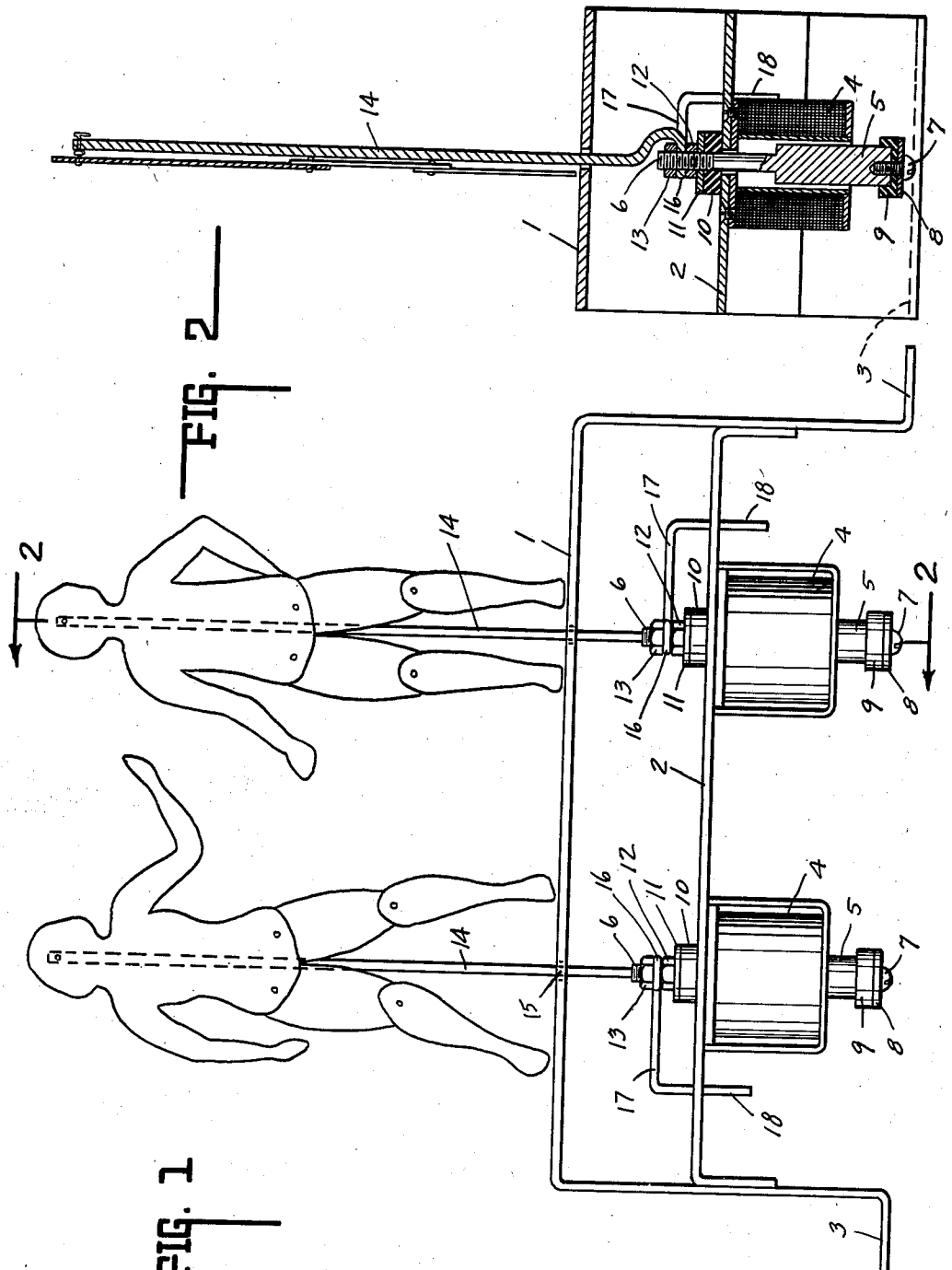

FIG. 2

FIG. 1

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RHYTHM OPERATED DEVICE

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FIG. 3

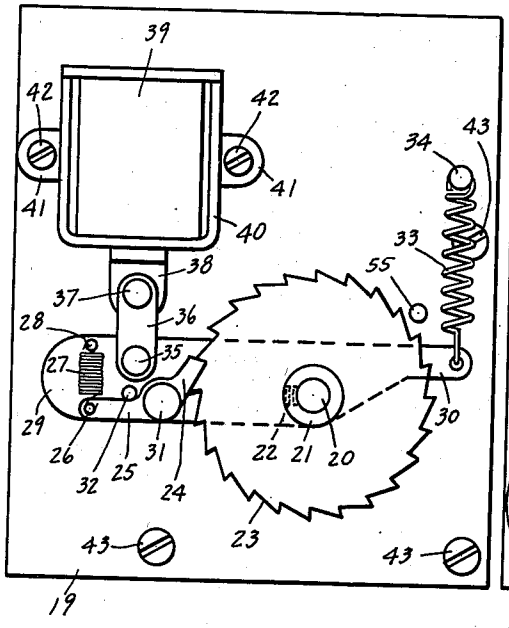


FIG. 4

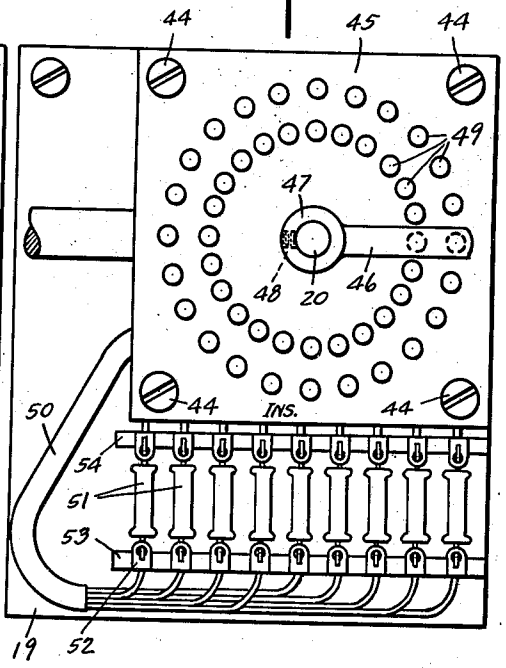


FIG. 5

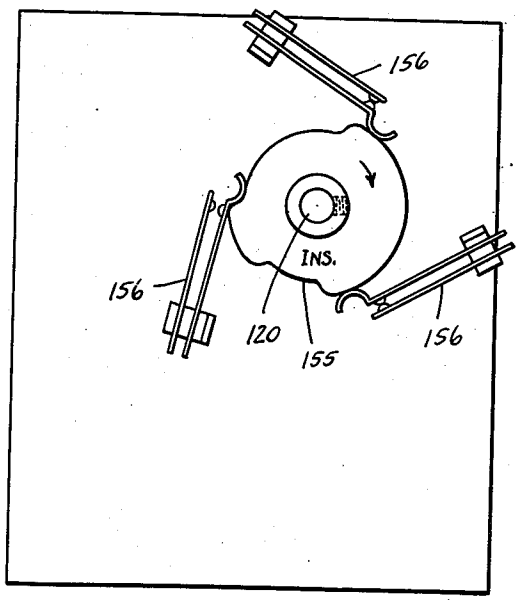
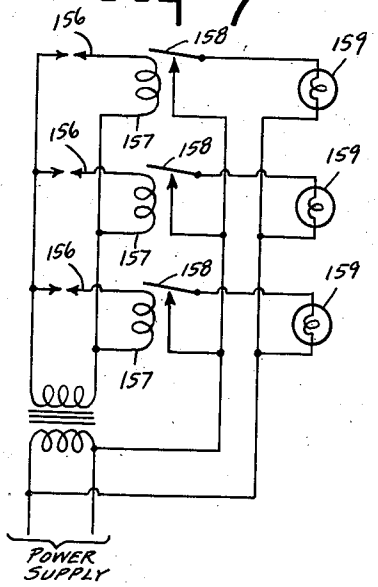


FIG. 7



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RHYTHM OPERATED DEVICE

Filed Aug. 31, 1939 3 Sheets-Sheet 3

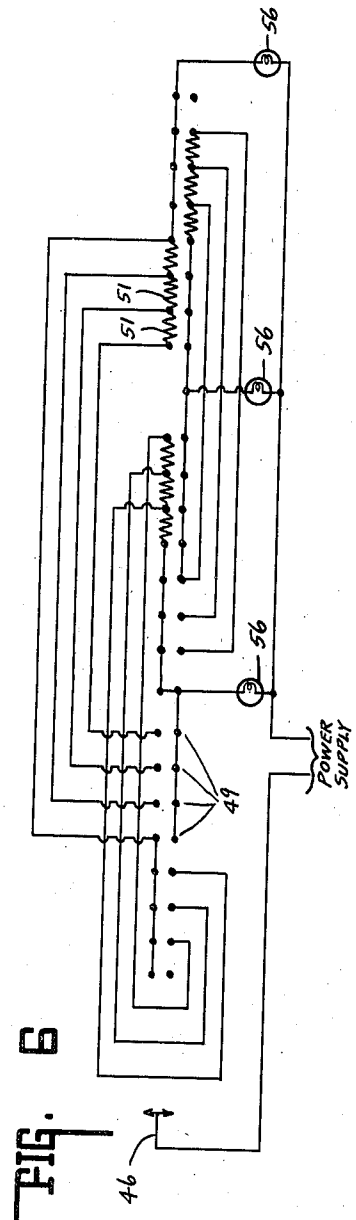

FIG. 6

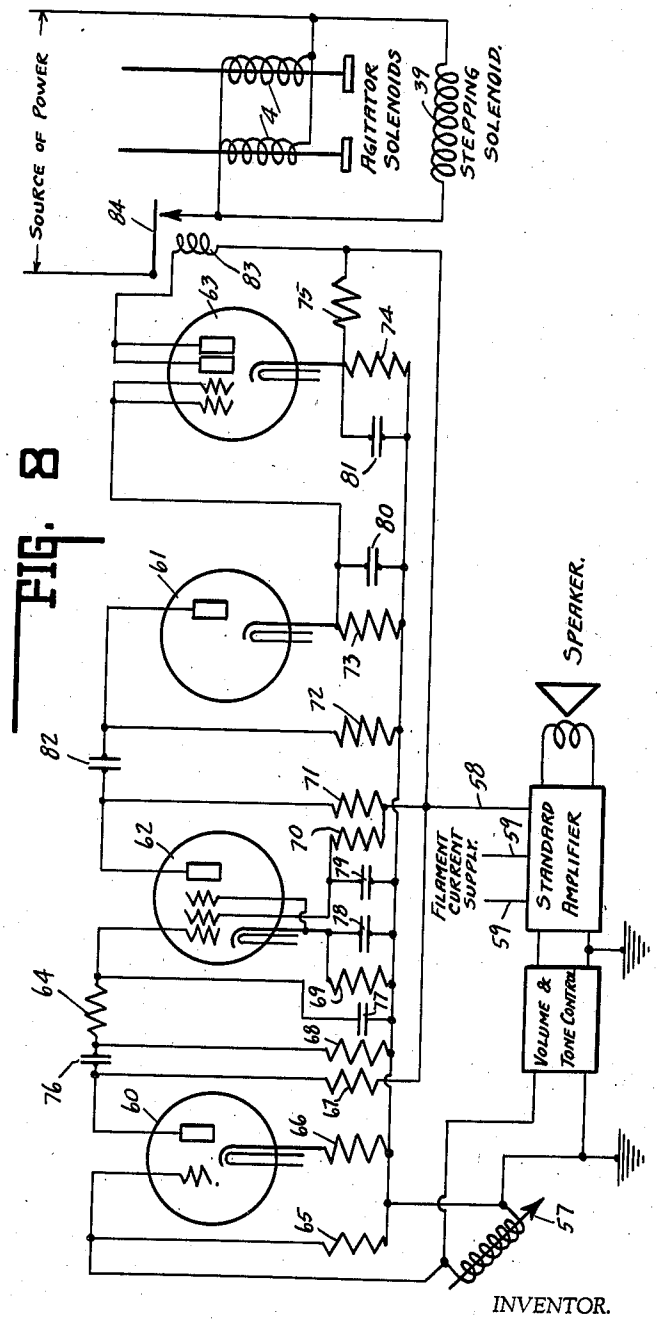

FIG. 8

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Patented May 20, 1941 2,242,442

UNITED STATES PATENT OFFICE

2,242,442

RHYTHM OPERATED DEVICE

Gerald G. Smith, Kenmore, N. Y., assignor to The Rudolph Wurlitzer Company, Cincinnati, Ohio, a corporation

Application August 31, 1939, Serial No. 292,900

5 Claims. (Cl. 179—100.4)

This invention relates to rhythm operated devices with particular reference to apparatus operated by the rhythm of music as recorded on phonograph records.

More particularly this invention relates to a device for selecting rhythmic sounds as they are reproduced from a record and converting them into power to control or initiate the movements of marionettes, advertising displays, changes of illumination and other visible apparatus.

The invention as herein disclosed selects from among the audible vibrations recorded on a phonograph disc those which occur rhythmically, amplifies them, converts them into surges of electrical energy synchronized with the selected vibrations and transmits said surges to apparatus devised to convert them into mechanical movement.

In the present invention the surges are utilized to energize electro-magnets which operate rods for the movable support of jointed marionettes to agitate them, causing them to simulate dancers; to revolve cams, gears, levers and the like to close and open switches which illuminate and extinguish lamps, cause the shifting of stages, scenery, signs, pictures or other visible objects.

It is well known to me that many devices exist for the conversion of audible vibrations into power to cause mechanical movement, but to the best of my information, no device has so far been created that has selectivity for rhythmic sounds; neither does any known to me take the electrical impulses generated in a pickup by the recordings of said sounds, amplify them and convert them into electrical energy and mechanical movement in the manner disclosed herein.

One object of the invention is to provide apparatus adapted to cause rhythmic movements of such objects in timed relation with music reproduced by a phonograph.

Another object of the invention is to provide apparatus adapted to control lighting effects or scene changes timed with the operation of a phonograph record.

Other objects and features of the invention will be understood from the accompanying drawings and the following description and claims:

Fig. 1 is a front elevation of apparatus adapted for the operation of dancing marionettes. Fig. 2 is a sectional view on the line 2—2 of Fig. 1. Fig. 3 is an elevational view of one side of a control unit used for operation of light changes, scene changes or other electrically controlled mechanical movements. Fig. 4 is a similar view of the opposite side of said control unit. Fig. 5 is a similar view of a structure which may be used alternatively to that shown in Fig. 4. Fig. 6 is a diagram of electrical connections by means of which the control unit of Fig. 4 may control certain lighting effects. Fig. 7 is a similar diagram for use with the control unit of Fig. 5. Fig. 8 is a diagram of electrical connections for the operation of either of said control units and the apparatus of Figs. 1 and 2 from a phonograph.

In the preferred form of the invention shown in the drawings, referring particularly to Figs. 1 and 2, a stage 1 supports a shelf 2 and is provided with feet 3 for support and attachment to a phonograph cabinet or other foundation. Suitably attached to the under side of shelf 2 there are a plurality of electromagnets 4 of well known construction, each of which is furnished with a core 5 slidable longitudinally in the axial orifice thereof. In each solenoid the core 5 is made of magnetic material, preferably iron, and is in the form of a cylinder with a coaxial integral threaded neck portion 6 which protrudes upwardly through a suitable opening provided therefor in shelf 2. At its lower extremity core 5 has a tapped axial hole into which is inserted an ordinary iron screw 7 for the support of a washer 8 which in turn holds a buffer 9 of elastic material such as rubber snugly against the lower end of core 5 with its edge protruding circumferentially in such manner as to come into circular contact with the lower end of solenoid 4 when core 5 is raised by the magnetic action of the solenoid. A similar buffer 10 surrounds the threaded neck 6 to cushion the fall of core 5 by contact with the upper surface of shelf 2. A washer 11 stiffens buffer 10 and is held in place by a nut 12 screwed to neck 6. Raising or lowering nut 12 regulates the amount of rise of core 5.

A wire or rod 14 passes through an opening 15 in stage 1 and extends substantially perpendicularly to said stage a distance suitable for the support of a marionette of desired size. At a point between stage 1 and shelf 2 the wire 14 is bent into a horizontal loop 16 which fits snugly around neck 6 and is secured thereto by nut 13. The lower end 17 of rod 14 extends horizontally from loop 16 a short distance and is then bent at substantially a right angle into a tailpiece 18 extending downwardly through a suitable perforation provided for it in shelf 2. The purpose of tailpiece 18 is to prevent rod 14 and core 5 from revolving about their common vertical axis, thus presenting the wrong or unfinished side of a flat marionette to the observer. In the case of use of a marionette "in the round," the omis-

sion of tailpiece 18 permits such revolution and permits the marionette to present a more life-like appearance by turning about as it simulates a dance.

As core 5 rises and falls under the influence of the magnetic field with a rhythmically controlled energization and de-energization of solenoid 4, the rod 14 rises and falls therewith rhythmically in time to the music emanating from the phonograph and thereby imparts motion to a marionette attached to it. It is obvious that the apparatus may be inverted or by the addition of springs, weights, levers and the like, be successfully operated in positions other than that shown and it is my intention to use my invention in such manners, as convenience or other circumstances may require.

The control unit shown in Fig. 3 includes a frame plate 19 suitably perforated to provide a bearing for a shaft 20. Attached to shaft 20 by a hub 21 and a set screw 22 there is a ratchet wheel 23 provided with a sufficient number of teeth to make its angular movement with each impulse of the pawl 24 relatively small. Fulcrumed on shaft 20 is a lever 30 having a broad lower end 29 to which pawl 24 is pivoted at 31. Pawl 24 has a tail 25 from which protrudes an anchor pin 26 to hold one end of a coil spring 27 which is anchored at its opposite end to a similar pin 28 protruding from lever 30. A similar pin 32 serves as a stop for the tail 25 of pawl 24 to limit its motion under the pull of spring 27.

At its upper end lever 30 is perforated to provide anchorage for a tension spring 33 which is anchored at its opposite end to a pin 34 protruding from the face of frame plate 19. The end 29 of lever 30 bears a shoulder screw 35 providing a pivot for one end of a link 36 which is pivoted at its opposite end by a similar shoulder screw 37 to the core 38 of a solenoid 39. The latter, of common construction, is held in a frame 40 which is mounted on plate 19 by means of lugs 41 and screws 42.

Screws 43 and 44, Fig. 4, hold opposite ends of spacers (not shown) which separate frame plate 19 and a switchboard 45, made of insulating material such as Bakelite, by a distance sufficient to accommodate the necessary wiring of switchboard 45. Said switchboard is penetrated by the shaft 20 to which a wiper arm 46 is attached by means of a hub 47 and a set screw 48. Arranged in circles on switchboard 45 and concentric with shaft 20 and in the path of wiper arm 46 are pairs of contact members 49. Said contacts have attached to them in well known manner wires which are collected into a cable 50, thence to connecting strips 52, thence to resistors 51, thence to connector strip 54, thence to the lamps or other electrical apparatus shown in Fig. 6.

In the operation of the control unit just described, as solenoid 39 is energized lever 30 is drawn into the position shown in Fig. 3, which extends spring 33 and advances ratchet wheel 23 one tooth. De-energization of solenoid 39 allows spring 33 to draw the upper end of lever 30 against a stop pin 55. Pawl 24 thereupon rises over a tooth and spring 27 expands. As the latter contracts it draws pawl 24 into engagement with the following tooth, ready for repetition of the action. Ratchet 23 being affixed to shaft 20, the latter is revolved step by step, carrying wiper arm 46 around with it. This brings arm 46 into contact with successive pairs of contacts 49, bridging them and closing electric circuits through them and connected conductors.

Referring now to Fig. 6, the wiper arm 46 is connected to one terminal of a power supply, the opposite terminal of which is connected to a plurality of lamps 56. Lamps 56, contact members 49 and resistors 51 are connected together as shown in the diagram in such manner that each lamp is lighted with gradually increasing brilliance and then is gradually extinguished as the wiper arm 46 progressively engages the contact members 49. The circuits by which this result is accomplished will be obvious from an inspection of the diagram and need not be described in detail. The operation of the lamps is in timed relation to the operations of solenoid 39 and they may be located to give desired lighting effects to the stage 1. Of course the particular circuits shown in the drawings are purely illustrative. Variations in lighting effects may be made by obvious variations in the circuits.

Referring now to Fig. 8 in which there is shown a wiring diagram for operation of the mechanical parts already described, there are indicated by name the volume and tone control unit, standard amplification unit and the speaker of a phonograph which may be of the usual construction. A pickup 57 is also shown and is preferably the usual magnetic pickup operated by a stylus travelling in the sound grooves of the records and is connected in the usual manner to the volume and tone control unit of the phonograph. A plate current lead 58 and a pair of filament current supply leads 59 are connected to the phonograph amplifier at suitable points in its circuits to supply plate voltage and filament current respectively to a plurality of electron discharge tubes 60, 61, 62 and 63. The electrical circuits by which said tubes are interconnected include resistance units numbered 64 to 75, inclusive, and condensers numbered from 76 to 82, inclusive.

The tube 60 operates as an amplifier tube having the usual input and output circuits in which the resistors 65, 66 and 67 have their usual functions. The input circuit of said tube is connected to the pickup 57 and receives a portion of the energy therefrom. The output circuit of tube 60 is coupled to the input circuit of tube 62 by means of the condenser 76. The tube 62 is herein shown as a standard form pentode amplifier tube in the circuits of which the resistors 68, 69 and 70 and condensers 78 and 79 perform their usual function. The resistor 64 and the condenser 77 interposed in the input circuit of tube 62 serve as an interstage filter having a rising characteristic below a predetermined frequency, preferably in the neighborhood of 500 cycles per second.

The tube 61 is connected as a half wave rectifier and is adapted to supply a substantially continuous current through a rectifier circuit leading from the cathode of said tube through resistors 73 and 72 to the anode thereof. A condenser 80 is connected in parallel with the resistor 73 and said circuit is coupled by means of condenser 82 to the output circuit of tube 62. By this means the flow of current in the rectifier circuit is controlled by the output of tube 62. The tube 63 is an amplifier tube of large current carrying capacity in the circuits of which the resistors 74 and 75 perform their usual functions. The input circuit of the tube 63 is connected to a point in the rectifier circuit between the resistor 73 and the cathode of tube 61. The

output circuit of tube 63 includes a relay coil 83 adapted to operate an electric switch 84. Said switch is connected in circuit with the solenoids 4 and 39 which operate the mechanical movements of the marionettes and the control movement for lighting effects as previously described.

In constructing the circuits just described, satisfactory operation is obtained when tubes commercially designated as type 6C8 are used for tubes 60 and 61, type 6C6 is used for tube 62, type 79 is used for tube 63 and the resistors and condensers have the following ratings:

Resistors

No.	Ohms	No.	Ohms
64	1,000,000	70	3,000,000
65	1,000,000	71	500,000
66	15,000	72	2,000,000
67	500,000	73	2,000,000
68	2,000,000	74	3,000
69	2,300	75	50,000

Condensers

No.	Microfarads	No.	Microfarads
76	0.05	80	0.05
77	0.006	81	10.0
78	4.0	82	0.05
79	0.0		

The foregoing figures are given for illustrative purposes only since other combinations giving good results are possible.

In the operation of the circuits of Fig. 8, energy received from the pickup is amplified by tubes 60 and 62. The provision of the interstage filter consisting of the resistor 64 and condenser 77 provides for greatly increased amplification of frequencies below 500 cycles, the lower the frequency, the greater the amplification. In the absence of frequencies below 500 cycles, little or no alternating current flows in the circuit of tube 62 and the rectified current in the circuit of tube 61 is correspondingly small. The rectified current impresses some charge on condenser 80 but the leakoff through resistance 73 is sufficient to prevent an appreciable increase in voltage across said condenser. When lower frequency impulses are received by tube 62, alternating current is correspondingly increased, the rectified current is similarly increased and the charge on condenser 80 rises in proportion. When this charge is sufficiently high, the grid of tube 63 becomes positive with respect to the cathode thereof and plate current is drawn through relay coil 83.

The switch 84 may be adjusted to respond to any desired quantity of current flow in the coil 83. Since the current flow in said coil is greatest for lower frequencies, the switch may be adjusted to respond only to the low frequencies commonly employed in the bass to mark the tempo of the music. The controlled apparatus then operates in time with the rhythmic sounds produced by bass instruments, strings or tympani. As sounds below 150 cycles per second are usually drum beats the switch may be adjusted to respond to drum beats alone.

As the grid potential of tube 63 is raised above that of the cathode, grid current is drawn and tends to discharge condenser 80. Within a certain range of rectifier current the alternate charging and discharging of the condenser results in a series of operations of the switch 84. With greater current in the rectifier circuit the discharge of the condenser is not sufficiently rapid to produce such a series of operations. By suitable adjustment the apparatus may then be adjusted to produce a series of brief actuations of the switch 84 in response to a sustained bass note in a given frequency range, for example, from 150 to 500 cycles, and more positive and relatively longer actuations of the switch 84 in response to drum beats of lower frequency. The solenoids 4, like all electromagnets, have a certain time lag in their operation which may be increased or decreased by suitable design in a well known manner. They may thus respond to the briefer actuations of the series by less violent movements than to the more positive actuations of the drum beats. The result is a more or less continuous movement in time with sustained bass notes punctuated by more vigorous movements timed with the drum beats.

The solenoid 39 is actuated to move the control unit of Figs. 3 and 4 through one step of the ratchet wheel 23 each time the switch 84 is closed and then reopened. Said solenoid may be constructed by suitable design to give a complete operation only in response to sound impulses below 150 cycles. The lighting effects controlled by said unit then progress through a predetermined cycle in time with the drum beats occurring in the music being reproduced. Other devices, such as scene shifting mechanism, may be operated by solenoid control from the control unit in timed relation with the operation of the lighting effects.

Referring now to Fig. 5 in which there is illustrated an alternative form of switch structure for use with the apparatus of Fig. 3, plate 119 and shaft 120 correspond to plate 19 and shaft 20 of Fig. 3. A cam wheel 155 of insulating material is secured to shaft 120 and engages electrical switches 156 to open and close the same in timed relation to the rotation of said shaft. Each of the switches 156 is in circuit with one of a number of relay coils 157 as shown in Fig. 7 and said relay coils operate switches 158 in the circuits of lamps 159 or other suitable electric devices. Thus said lamps may be lighted and extinguished in timed relation with the operation of solenoid 39 and may be located to give desired lighting effects to the stage 1.

The invention has been described in its present preferred form. The details thereof may be varied without departing from the scope of the invention as defined by the appended claims.

The invention claimed is:

1. The combination with an electrical phonograph having an electrical circuit in which energy flow is in accordance with frequencies of musical tones reproduced by said phonograph, of electrical apparatus receiving energy from said circuit and selectively amplifying the same to emphasize bass frequencies in progressively increasing degree as said frequencies decrease, and electrically operated apparatus actuated by said amplified energy and adapted to produce a series of mechanical movements in response to a sustained bass note within a given frequency range and to produce a single mechanical movement of greater amplitude in response to a note of lower frequency.

2. The combination with an electrical phonograph having an electrical circuit in which energy flow is in accordance with frequencies of musical tones reproduced by said phonograph, of electrical apparatus receiving energy from said

circuit and amplifying the same in progressively increasing degree as the frequencies thereof diminish, and electrically operated apparatus actuated by said amplified energy and adapted to produce a series of mechanical movements in response to a sustained note within a given frequency range and to produce a single mechanical movement of greater amplitude in response to a note of lower frequency.

3. Apparatus of the class described adapted for operation with an electronic phonograph, said apparatus including a circuit receiving energy from a circuit of said phonograph, said energy being modulated in accordance with frequencies of the sounds being reproduced, a two-stage electronic amplifier receiving energy from said first mentioned circuit, an interstate filter having a rising characteristic below a predetermined frequency interposed between the stages of said amplifier, a rectifier circuit connected to the output circuit of said amplifier, current flow in said circuit being controlled by the volume of said output, a condenser and resistor in parallel in said rectifier circuit so adjusted as to charge said condenser above a predetermined potential only in response to the flow of a predetermined current in said rectifier circuit, an electronic relay connected to said rectifier circuit and operating only when said condenser is charged above said predetermined potential, and means for producing mechanical movements operated by said relay.

4. Apparatus of the class described adapted for operation with an electronic phonograph, said apparatus including a circuit receiving energy from a circuit of said phonograph, said energy being modulated in accordance with frequencies of the sounds being reproduced, an amplifier selectively amplifying said energy to emphasize frequencies below a predetermined frequency, a rectifier circuit connected to the output circuit of said amplifier, current flow in said circuit being controlled by the volume of said output, a condenser and resistor in parallel in said rectifier circuit so adjusted as to charge said condenser above a predetermined potential only in response to the flow of a predetermined current in said rectifier circuit, an electronic relay connected to said rectifier circuit and operating only when said condenser is charged above said predetermined potential, and means for producing mechanical movements operated by said relay.

5. Apparatus of the class described adapted for operation with an electronic phonograph, said apparatus including a circuit receiving energy from a circuit of said phonograph, said energy being modulated in accordance with frequencies of the sounds being reproduced, an amplifier selectively amplifying said energy to emphasize frequencies below a predetermined frequency, a rectified circuit connected to the output circuit of said amplifier, current flow in said circuit being controlled by the volume of said output, a condenser and resistor in parallel in said rectifier circuit so adjusted as to charge said condenser above a predetermined potential only in response to the flow of a predetermined current in said rectifier circuit, an electronic relay connected to said rectifier circuit and operating only when said condenser is charged above said predetermined potential, said relay operating to discharge said condenser at least partially at each operation thereof whereby a series of operations of said relay is produced in response to a sustained note below a given frequency, and means for producing mechanical movements operated by said relay.

GERALD G. SMITH.

Aug. 26, 1941. E. S. PEYTON 2,254,089

ORCHESTRAL APPARATUS

Filed Aug. 30, 1939 2 Sheets-Sheet 1

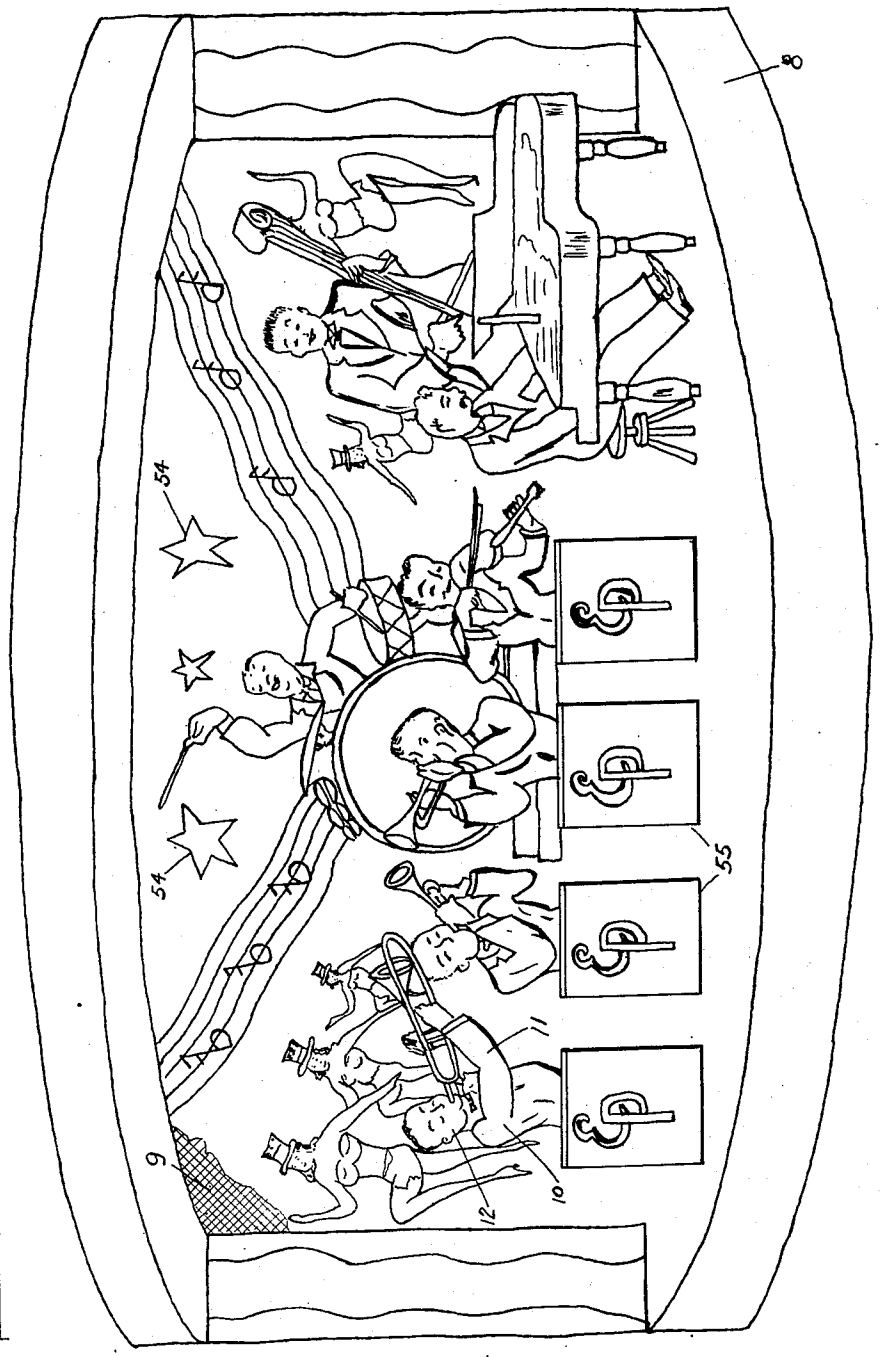

Fig. 1

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ORCHESTRAL APPARATUS

Filed Aug. 30, 1939 2 Sheets-Sheet 2

Fig. 3

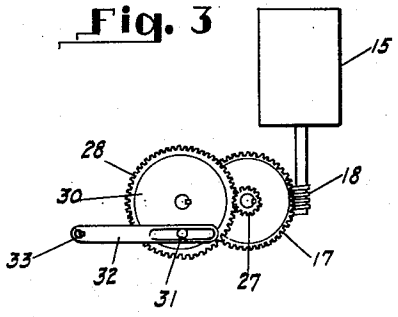


Fig. 4

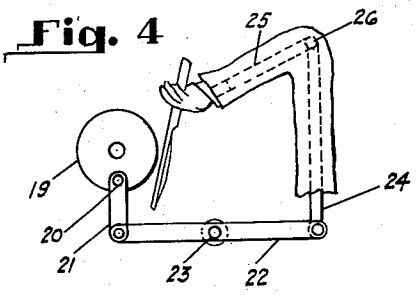


Fig. 5

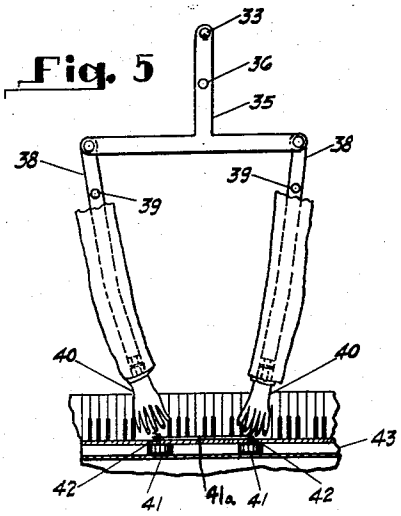


Fig. 2

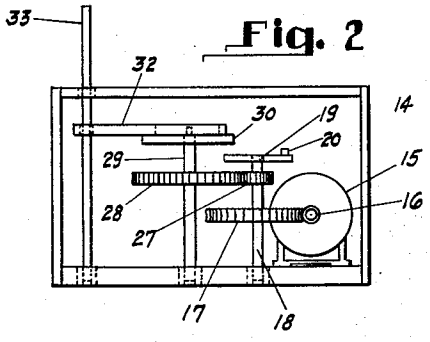


Fig. 6

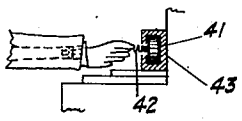
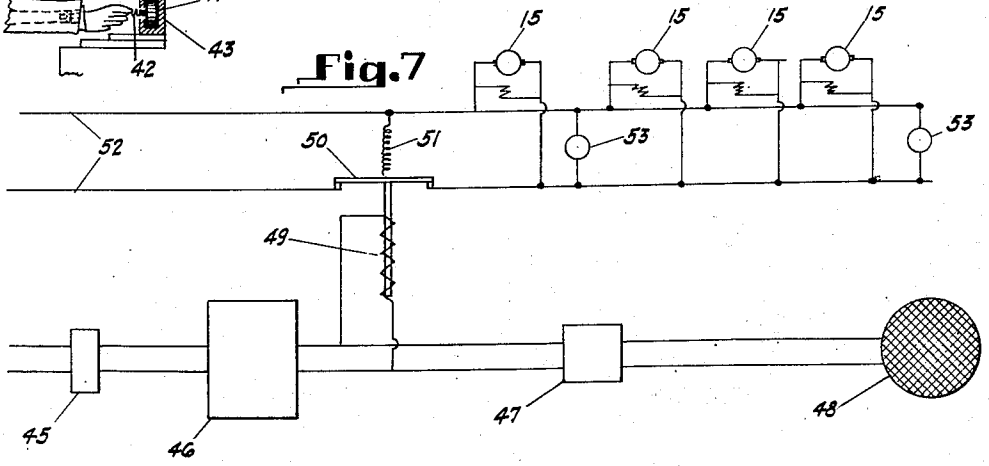


Fig. 7



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Patented Aug. 26, 1941 2,254,089

UNITED STATES PATENT OFFICE

2,254,089

ORCHESTRAL APPARATUS

Edward S. Peyton, Crafton, Pa., assignor of one-fourth to Samuel Strahl, Pittsburgh, one-fourth to Thomas J. Harrison, McKees Rocks, and one-fourth to Irene Simon, Pittsburgh, Pa.

Application August 30, 1939, Serial No. 292,627

6 Claims. (Cl. 46—118)

My invention relates to the use with electro-mechanical sound reproducing apparatus of automatons and lighting effects, whereby there will be similarity to an orchestra produced in connection with the sound reproducing apparatus.

One object of my invention is to provide an improved form of orchestral apparatus wherein automatons representing musicians of an orchestra will have movements imparted thereto simulating movements of orchestra players, and wherein the stage lighting and movements of the automatons will be automatically effected and controlled in an improved manner, in conjunction with the electro-mechanical reproduction of music.

In the accompanying drawings, Figure 1 represents a front view of a stage containing an orchestra; Fig. 2 is a vertical sectional view showing the gearing and driving mechanism for moving the arms and heads of the automations; Fig. 3 is a sectional plan view of a portion of the apparatus of Fig. 2; Fig. 4 is a view showing the manner in which the mechanism of Figs. 2 and 3 may be employed in operating the arms of the automations; Fig. 5 is a view showing the manner in which the driving mechanism of Fig. 2 can be employed for operating the arms of a piano player; Fig. 6 is a vertical sectional view of a portion of the apparatus of Fig. 5; and Fig. 7 is a diagrammatic view showing the manner in which the various parts of the orchestral apparatus are arranged and electrically connected.

The orchestra stage is represented by the numeral 8 and is preferably provided with a screen or curtain 9 of gauze material which is disposed across the front of the stage and in front of the orchestra. The gauze screen is of a material through which the orchestra can be seen when the stage is illuminated at the rear side of the curtain, but which will present an unbroken appearance when illuminated only at the front. The automatons which represent the orchestra players and which may be of approximately life size or can be made in miniature, have certain of their parts movable. Thus, the trombone player 10 will have one of his arms 11 jointed for reciprocation, as hereinafter described, to reciprocate the slide of his trombone. His head 12 will be pivotally supported for oscillatory movements by mechanism to be hereinafter described. Similarly, the bow arm of the violin player and the arms of the drummer will be jointed for movements by the mechanism, as will also their heads.

As shown more particularly in Fig. 2, a gear casing 14 is mounted within the body of each player whose arms or head or both are to be moved. The gear case is concealed by the clothing of the automaton. An electric motor 15 is mounted in each gear case and has a worm 16 formed on its shaft that meshes with a worm wheel 17 which is secured to a shaft 18. The shaft 18 carries a crank disc 19 at its upper end and has pivotal connection at 20 with a link 21. The link 21 is in turn pivotally connected to a lever 22 that is pivotally mounted on a fixed axis 23, within the body of the automaton, one side of the gear case 14 being open to permit the lever 22 to project therethrough. The outer end of the lever 22 is pivotally connected to an arm portion 24 of an automaton, such portion 24 being rigidly connected to a forearm portion 25. The parts 24 and 25 are normally rigid with respect to one another, but may be relatively adjusted at 26 to provide for the proper angularity of the forearm 25, in accordance with the character of instrument which the automaton has. Such instrument can be a violin bow, the slide of a trombone, a drum stick etc. It will be seen that as the shaft 18 is driven by the motor, the arm of the automaton will be reciprocated.

The shaft 18 carries a pinion 27 that meshes with a gear wheel 28 which is mounted on a shaft 29. At its upper end, the shaft carries a crank disc 30 that is provided with a pin or stud 31 which extends through a slot formed in a lever 32. The lever 32 is rigidly connected to a vertical shaft or spindle 33 upon whose upper end is mounted the head of an automaton. The gear reduction at 27—28 is such that the head of the automaton will be oscillated slowly relative to the rate at which the arm lever is oscillated.

In Figs. 5 and 6 I show an arrangement for operating the arms of the piano player. In this structure a lever 35 is mounted within the shoulders of the player on a fixed pivot 36 and the lever can be rigidly connected at one end to one of the vertical shafts 33, so that the lever 35 will be oscillated about its pivot 36. The laterally-extending arms of the lever 35 are pivotally connected to arm members 38 that are mounted upon fixed pivots 39 in the shoulders of the piano player. The hands 40 of the piano player have guide rollers 41 yieldably or flexibly connected thereto by springs 42, through the medium of a spacer bar 41a on which the rollers are journalled. The rollers 41 are contained within a slotted guide rail 43 that is positioned above the keyboard of the piano. The hands of the piano

player are thereby supported and guided during oscillation of his arms along the keyboard.

In Fig. 7 I indicate a switch box 45 that may suitably be of the coin-operated type and a reproducer 46 for playing recordings. Also I show an amplifier 47 and a loud speaker 48. These members 45, 46, 47 and 48 may be of various well-known conventional forms. Thus when the switch 45 is operated to close the circuit, the reproducer is automatically set into motion to play a record, and the sound impulses are amplified at 47 and sound emitted from the loud speaker 48. As is common in devices of this character, the circuit can automatically be broken when a record has been played, and the apparatus can be again set in motion by inserting a coin in the box 45 or by otherwise reclosing the circuit. The loud speaker 48 can suitably be positioned in the bass drum, which may have a foraminous front wall or head to permit passage of the sound. Other loud speakers can be placed behind the screens or tables 55 that are located in front of some of the players. The reproducer and amplifier may be placed back-stage or in any other suitable location, and switches or coin boxes 45 can be located at suitable points in the auditorium.

An electromagnet 49 is provided for closing a switch 50 that is normally held open by a tension spring 51. The switch 50 controls an electrical circuit 52 which may suitably be an ordinary house lighting circuit. The various motors 15 which operate the automatons are connected in the circuit 52 and are hence controlled by movements of the switch 50. Similarly, lamps 53 are connected in the circuit 52 and controlled by the switch 50. These lamps are disposed in the rear of the curtain 9 and may be positioned as foot lamps and behind representations of stars 54.

It will be seen that on first view the stage behind the curtain or screen 9 will not be visible. However, when the electro-mechanical reproducing apparatus is set into operation, the electromagnet 49 will automatically be energized to close the switch 50 and thus initiate movement of the motors 15 and illumination of the lamps 53 simultaneously with the energizing of the sound reproducing apparatus. When a recording has been played and the circuit in the reproducer broken, the solenoid 49 will simultaneously be de-energized to permit th eswitch 50 to be opened by its spring 51, thus also de-energizing the motors 15 and the lamps 53.

By reason of these interrelated operations, and also because the orchestra is not visible through the screen 9 when no music is being played, the illusion of a real orchestra is more pronounced than if the orchestra were constantly visible to the audience, or if the sound reproducer and movements of the figures were set into operation in sequence instead of simultaneously. Also, the gauze curtain serves to largely eliminate the artificial appearance of the automatons. It has been found that with only three or four actual orchestra-men on the stage, in front of the gauze curtain, and a number of automatons back of the curtain and under illumination, the resemblance to a live full orchestra is remarkable. The live members of the orchestra will play as accompanists or supplemental to the mechanically reproduced music.

I claim as my invention:

1. Orchestral apparatus comprising an electro-mechanical sound reproducer, automaton musicians, electric motors of the rotor type, driving connections between each motor and a movable part of each automaton, for actuating said part, a power circuit for the motors, independent of the circuit for the reproducer, and means operable upon making and breaking of the reproducer circuit, to make and break the said power circuit.

2. Orchestral apparatus comprising an electro-mechanical sound reproducer, an automaton musician, an electric motor of the rotor type, operating connections between the motor and the head and an arm of the automaton, a power circuit for the motor, independent of the circuit for the reproducer and means operable upon making and breaking of the reproducer circuit, to make and break the said power circuit.

3. Orchestral apparatus comprising an electro-mechanical sound reproducer, automaton musicians, an electric motor of the rotor type in each automaton, driving connections between each motor and a movable part of each automaton, for actuating said part, a power circuit for the motors, independent of the circuit for the reproducer, and a single control device for making and breaking the said circuits.

4. Orchestral apparatus comprising an electro-mechanical sound reproducer, a stage having a gauze screen at the front thereof, lamps behind said screen, automaton musicians behind the screen, electric motors of the rotor type, driving connections between each motor and a movable part of each automaton, for actuating said part, a power circuit for the motors and the lamps, independent of the circuit for the reproducer, and means operable upon making and breaking of the reproducer circuit, to make and break the said power circuit.

5. Orchestral apparatus comprising a sound reproducer, an automaton musician, an electric motor of the rotor type, operating connections between the motor and the head and an arm of the automaton, a power circuit for the motor independent of the reproducer, and means operable upon starting and stopping the reproducer to make and break the said power circuit.

6. Orchestral apparatus comprising a sound reproducer, an automaton musician, an electric motor, operating connections between the motor and a movable part of the automaton, an electrical circuit for the motor independent of the reproducer, and means operable upon starting and stopping the reproducer to make and break the said circuit.

EDWARD S. PEYTON.

June 4, 1940. F. MALTESE 2,202,915

ADVERTISING DEVICE

Filed May 11, 1939

Fig. 1.

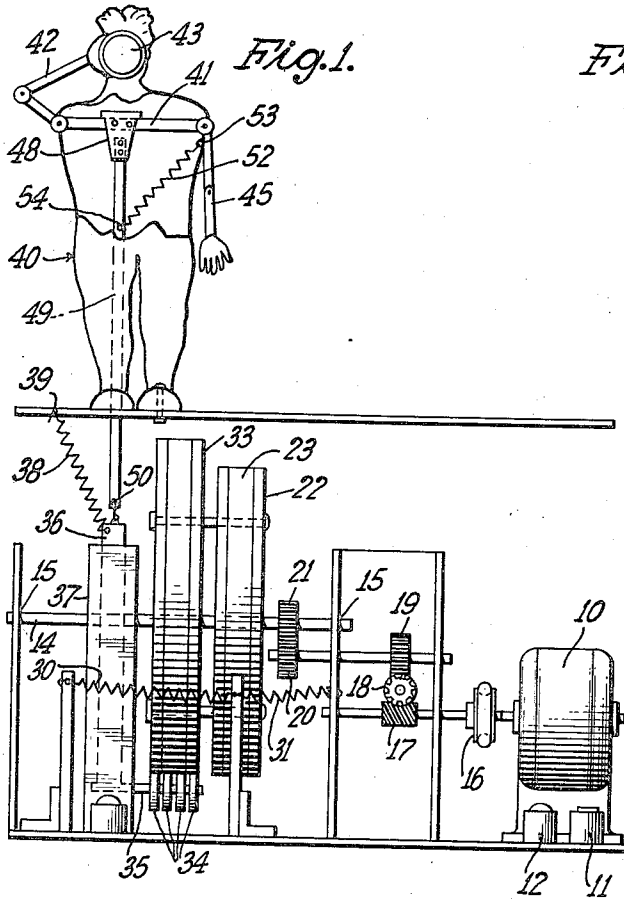

Fig. 3.

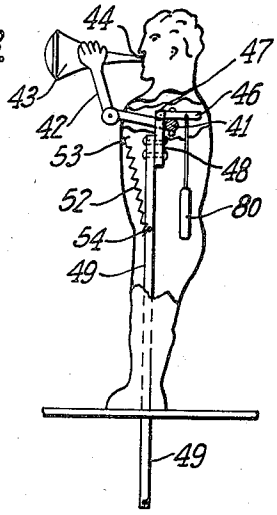

Fig. 4.

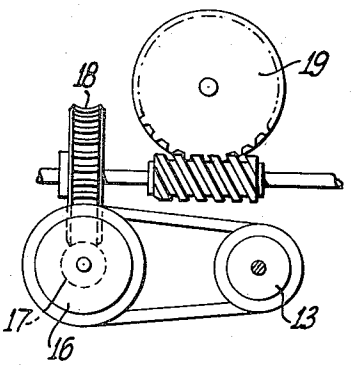

Fig. 2.

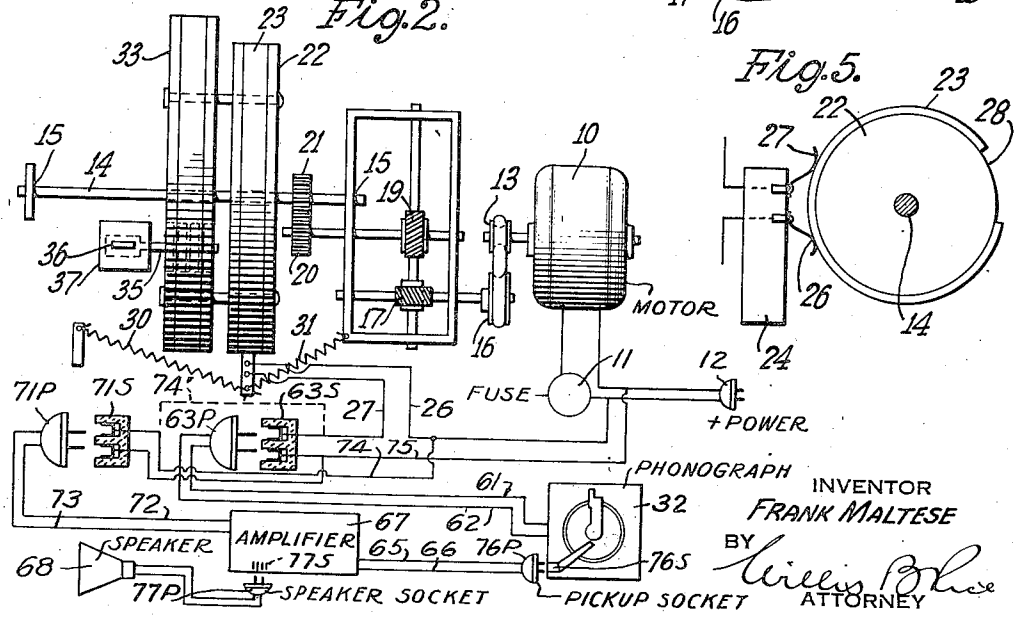

Fig. 5.

Patented June 4, 1940 2,202,915

UNITED STATES PATENT OFFICE

2,202,915

ADVERTISING DEVICE

Frank Maltese, Brooklyn, N. Y.

Application May 11, 1939, Serial No. 272,945

2 Claims. (Cl. 46—118)

This invention relates to advertising devices. More particularly to a device intended to give oral announcements timed with the movement of a human figure.

It is an object of this device to simulate an announcer making announcements through a megaphone and to provide such a figure in which the announcer places a megaphone to his lips and in timed relation thereto the announcement is given forth.

The invention accordingly comprises the features of construction, combination of elements and arrangements of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawing, in which:

Figure 1 is a front elevation of the device embodying this invention.

Figure 2 is a diagram showing diagrammatically the operating mechanism therefor.

Figure 3 is a side elevation thereof.

Figures 4 and 5 are mechanical details.

In the drawing numeral 10 designates an electric motor adapted to be protected by a fuse block 11 connected to a power socket 12. The electric motor has upon its shaft a pulley 13 which in turn, through a reduction gear device, drives a shaft 14 mounted in suitable bearings 15. This reduction gear device comprises any train of gears which will reduce the speed of the motor such as to make the shaft 14 revolve once for each time that the announcer is to make his announcement. This gear train is here illustrated diagrammatically by pulley 16, worm gear 17—18 and by gears 19—20 and 21, but they are not more specifically referred to, as details of them form no part of this invention.

The shaft 14 mounted in suitable bearings 15—15 has upon it a concentric roller 22 upon which is mounted a copper band 23 which is of a length partially but not completely to encircle the roller as seen in Figure 5. An insulating block 24 carries a pair of conducting arms 26—27 in position to make a circuit through the copper band whenever both arms are in contact with it but to break the circuit when either contact arm reaches the segment 28 between the ends of the copper band.

The block 24 may be pivoted at its base and spring arms 30 and 31 may be connected to the upper portion thereof to hold the contact arms 26 and 27 in engagement with the copper band. The function of this circuit breaker is to close the circuit from the socket 12 to the motor of a phonograph 32, which will be later described, to cause the operation of the phonograph when the circuit is closed and this opening and closing of the circuit is in timed relation with the operation of the figure as will be hereinafter described.

Mounted upon the shaft 14 is an eccentric disc or cam 33 adapted to cooperate with rollers 34 carried by a pin 35 fixed upon a vertical post 36 slidable in vertical bearings 37. A spring 38 attached to the frame at 39 is also attached to the post 36 to urge the post upwardly and hold the rollers 34 in engagement with the eccentric 33.

The numeral 40 represents in general a figure of a man having journaled across the shoulders a shaft 41 to which is rigidly attached at one end an arm 42 carrying in the hand thereof a megaphone 43. The shaft and arm and megaphone are rigidly connected together so that the rotation of the shaft will move the megaphone to the lips 44 of the figure or allow it to fall to the side thereof. Upon the other end of the shaft 41 is loosely mounted the other arm 45 which by reason of its weight may be allowed to hang always in the downward position, the extension of the shaft being used merely as a convenient means of hanging the left arm. Mounted upon the shaft 41 is a bracket arm 46 to which is pivoted at 47 an arm 48 attached to the upper end of a rod 49 which is connected at 50 to the post 36. With this construction the arm 46 serves as a two-ended lever one end extending forwardly and pivotally connected by the arm 48 to the rod 49, and the other extending rearwardly to support the counterweight 80. Thus the forward end serves as a crank arm to impart a partial rotary movement to shaft 41 as rod 49 is reciprocated. A spring 52 is connected to the framework at 53 and to the rod 49 at 54 so as to hold the rod in its upward position as far as it will go consistent with the engagement of the rollers 34 upon the eccentric disc 33. The rod 49 will be drawn downwardly by the eccentric disc and this will cause the figure to drop the megaphone from his lips. As the eccentric disc rotates, however, the springs 38 and 52 draw the rod 49 upwardly.

The phonograph 32 is conventionally illustrated by a turntable 60 operated by a motor not shown which is fed through wires 61 and 62 from a plug 63P insertable in socket 63S which

in turn is connected to the power plug 12 through the contacts 26 and 27.

The numeral 64 designates the electric pick-up of the phonograph connected by wires 65 and 66, pick-up socket 76S and plug 76P to an amplifier 67 which in turn operates a loud speaker 68 through wires 69, 70, speaker socket 77S and plug 77P. Power is furnished the amplifier from a socket 71S through plug 71P and wires 72 and 73 connected to the power plug 12 by wires 74 and 75. A weight 80 is now used to counterbalance the arm 48.

In the above described circuit, the amplifier is always "on" or connected to the power circuit, but if desired, the amplifier can be made to be "on" only when the phonograph is operating by disconnecting wire 74 and using wire 74' as shown dotted, instead. In this circuit, the power supplied to the amplifier is regulated by contacts 26—27.

With the foregoing construction it will be clear that when the power is connected to the motor 10 the eccentric 33 will cause the figure to raise the megaphone to his lips once for each revolution of the shaft 14 and similarly the copper strip 23 will make contact with the phonograph motor once for each revolution of the shaft 14 and these are so timed that the message delivered by the phonograph occurs during the time when the phonograph is placed to the lips of the figure.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A figurine resembling a living figure having a horizontal shaft pivoted therein at the shoulder, for oscillatory rotary movement, an arm rigidly attached to said shaft,—a simulated sound instrument carried by said shaft, constructed and arranged to move from the lips of the figure to the side thereof as said shaft is oscillated; a motor driven shaft mounted below said figure having a cam and circuit breaker thereon, connection between said cam and horizontal shaft for oscillating said horizontal shaft,—a phonograph, means for operating said phonograph controlled by said circuit breaker in timed relation to said oscillation of said horizontal shaft.

2. A device according to claim 1 in which the means for connecting the cam to the horizontal shaft comprises a follower for said cam, a reciprocating rod operated by said follower, and a crank cam on said horizontal shaft and connected to said reciprocating rod.

FRANK MALTESE.

Aug. 26, 1941. F. ROSSI 2,254,091

MECHANICAL ORCHESTRA

Filed Dec. 13, 1938 2 Sheets-Sheet 1

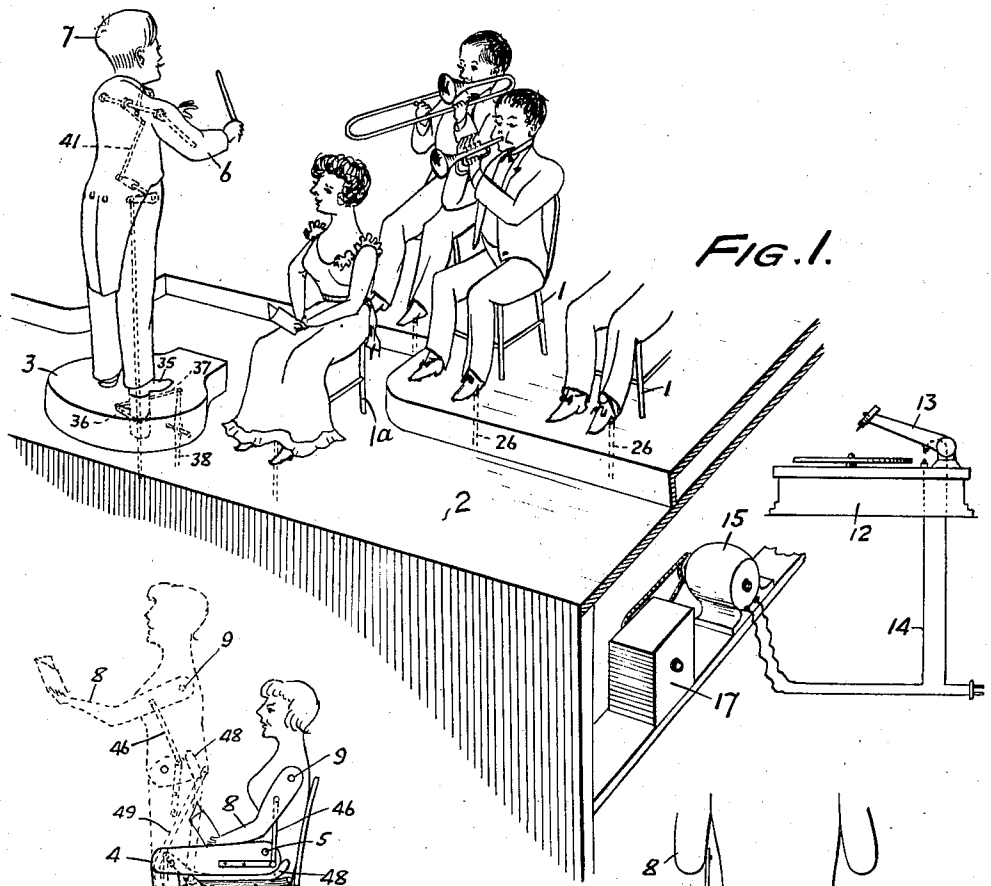

FIG. 1.

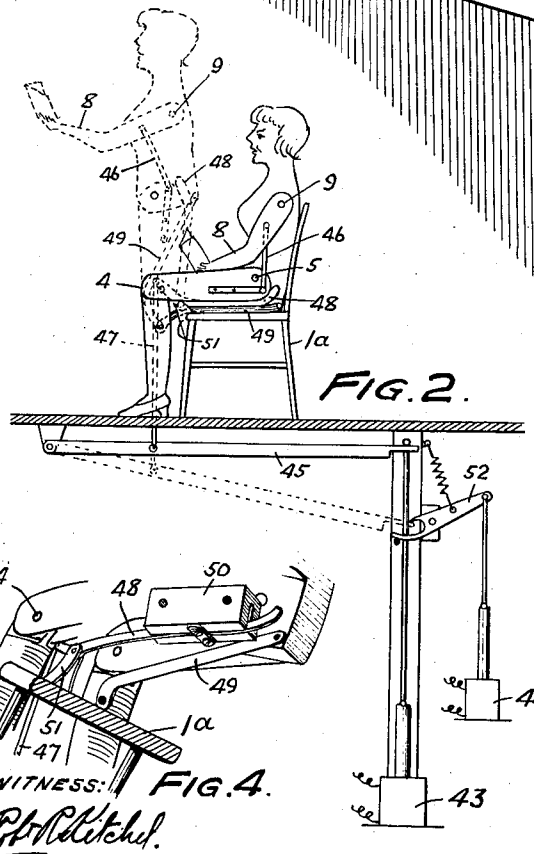

FIG. 2.

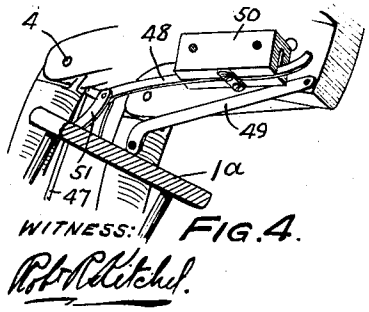

FIG. 4.

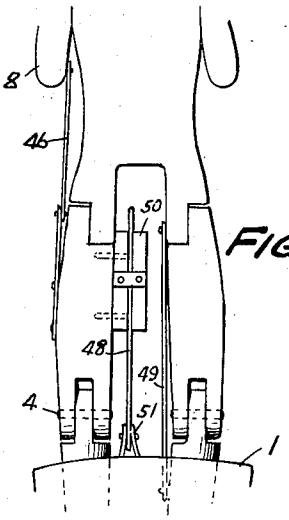

FIG 3.

WITNESS:

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Aug. 26, 1941. F. ROSSI 2,254,091

MECHANICAL ORCHESTRA

Filed Dec. 13, 1938 2 Sheets-Sheet 2

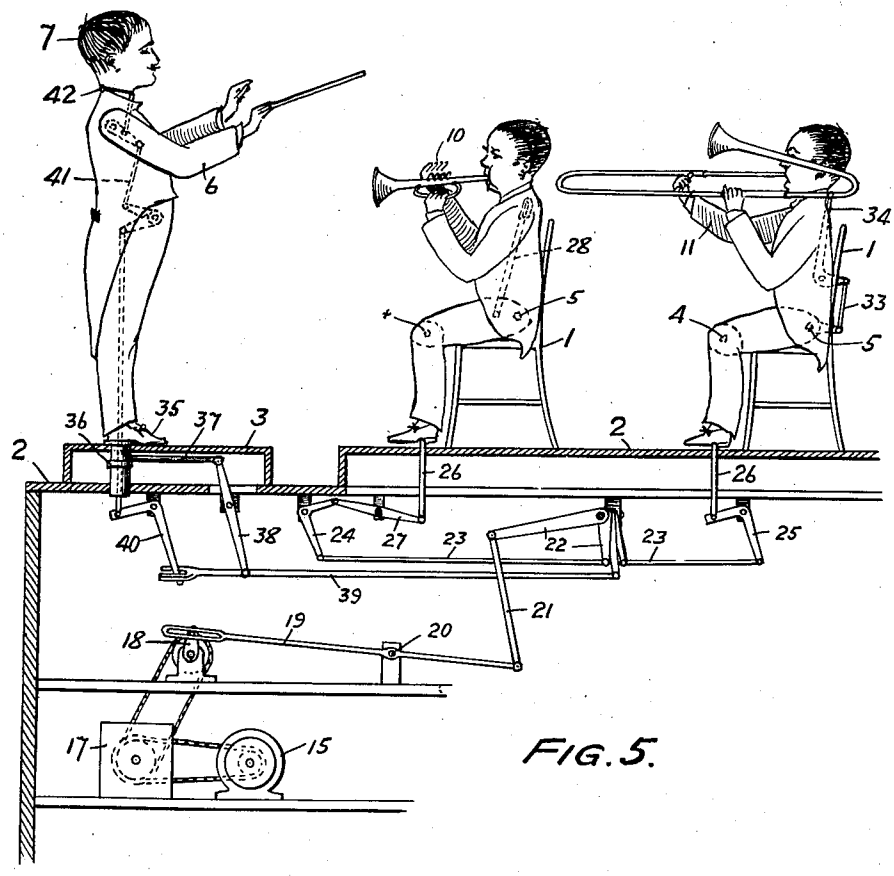

FIG. 5.

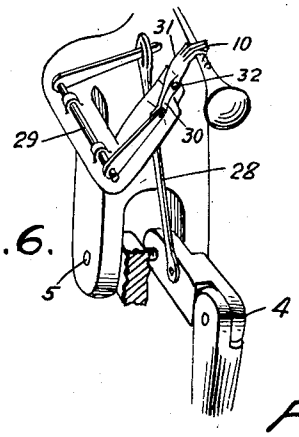

FIG. 6.

WITNESS:

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INVENTOR

Fred Rossi

BY

Augustus B. Stoughton

ATTORNEY.

Patented Aug. 26, 1941 2,254,091

UNITED STATES PATENT OFFICE

2,254,091

MECHANICAL ORCHESTRA

Fred Rossi, Philadelphia, Pa., assignor, by direct and mesne assignments, of one-fourth to Edward S. Peyton, Crafton, one-fourth to Samuel Strahl, Pittsburgh, one-fourth to Thomas J. Harrison, McKees Rocks, and one-fourth to Irene Simon, Pittsburgh, Pa.

Application December 13, 1938, Serial No. 245,349

8 Claims. (Cl. 46—118)

The principal objects of the present invention are to provide an attractive, interesting and amusing orchestra consisting of miniature figures, or midget-like dolls representing the orchestra players and their leader and which partake of appropriate movements such as lifting and returning their feet to the floor, such as consist in movements of the arms, fingers and head and also consisting of a soloist or of like character who is seated and rises, all the movements being in synchronism with music produced by a phonograph with the exception of the soloist whose movements of rising and seating are manually controlled in consonance with the orchestration; to provide motor driven phonograph controlled link and bell crank mechanism for actuating the movable parts of the figures in synchronism with the music produced by the phonograph; and to provide an orchestra of the character mentioned which is simple in construction and durable and reliable in operation.

Other objects of the invention will appear from the following description at the end of which the invention will be claimed.

The invention comprises or consists of the improvements to be presently described and finally claimed.

In the following description reference will be made to the accompanying drawings forming part hereof and in which,

Figure 1 is a diagrammatic perspective view showing so much of the orchestra as will convey a general conception of the same.

Figure 2 is a sectional view illustrating the solo performer and the mechanism by which the performer is made to rise from and return to seated position.

Figure 3 is a view drawn to an enlarged scale and illustrating details of construction of the figure and operating mechanism shown in Figure 2.

Figure 4 is a perspective view looking from the right and upward in Figure 2 and illustrating parts of the mechanism.

Figure 5 is a transverse sectional view illustrating some of the performers and their actuating mechanism; and

Figure 6 is a front view with parts broken away and illustrating the mechanism for moving the fingers.

Referring to the drawings, the orchestra figures are shown as seated upon chairs 1 placed upon a platform 2. The leader is shown as standing upon a stand 3 arranged on the platform 2. Referring to the orchestra figures each has a leg pivoted at the knee 4 and at the hip 5 so that the foot is capable of upward movement clear of the platform and of return movement. The feet of the leader are movable for turning motion in respect to the stand 3 but in this case the legs are not jointed but the arms 6 are pivoted and the head 7 is also pivoted. Referring to the soloist there is provided a chair 1^a, Figure 2 and the figure is jointed at the knees 4 and at the hips 5. One arm 8 is pivoted at 9, Figure 2. The fingers 10 of the cornetist and the arm 11 of the trombonist are also pivoted. There is a phonograph 12 and its tone arm 13, by means of the switch and circuit connections 14, control the stopping and starting of the motor 15. The motor 15 actuates the movable parts of the figures by means of link and bell crank mechanism which will be described so that the movement of the parts of the figures starts with the commencement of the music provided by the phonograph and continues in synchronism with the music. The motor 15 through a suitable speed reduction mechanism 17 drives the crank arm 18, Figure 5. The crank arm oscillates a lever 19 pivoted at 20. The movement of the lever 19 acting through the link 21 operates a set of bell cranks 22. These bell cranks or arms are respectively connected by links 23 with bell cranks 24 and 25 which are connected directly at the right hand side in Figure 1 with a rod 26 to which the movable foot of the right hand figure is connected, and are indirectly connected through a lever 27 with the rod 26 of the movable foot of the figure which represents a cornetist. The operation of the described linkage raises and lowers one foot of each player in unison. The movement of the foot of each player actuates the movable parts of the figure, for example in the case of the cornetist, Figure 6, the link 28 rocks the bell crank lever 29 of which one end is pivoted to the shank 30 of the lever 31 pivoted at 32 and which carries the fingers 10. In a similar way and referring to the trombonist, the link 33 connects the movable leg with the lever 34 which is connected to the trombone slide.

In the case of the leader, one of his feet 35 is pivotally mounted and is turned by the arm 36, Fig. 1, link 37, and pivotal lever 38, Fig. 5, through the intervention of a rod 39 by one of the bell cranks or arms 22 so that in this case the leader's feet are turned in respect to the

platform so that the leader faces the orchestra or the audience. A bell crank 40 serves to actuate the linkage 41 which not only moves the arms of the leader but also his head which is pivoted at 42.

At this point it may be said that the link lever and bell crank mechanism operates the movable parts of all of the figures and in the case of some of them the movement of the feet through similar mechanism operates the movable parts of the respective figures. The soloist is made to rise and sit down and raise the arm 8 by electro-magnetic mechanism under the control of the attendant so that the soloist may be made to rise and sit down in proper time with the orchestration. For this purpose there are an actuating magnet 43, and a release magnet 44, Figure 2. The core of the magnet 43 is connected with a lever 45 which when the magnet is energized assumes the position shown in Figure 2 which is the sitting position of the figure and it also occupies the position shown in dotted lines which is the standing position of the figure. It may be remarked that the pivotal link 46, Figure 3, moves the arm 8 of the figure as it is shifted from sitting position to rising position. The rod 47 connected with the lever 45 operates upon a lifting lever 48, Fig. 4, by which the figure is raised to standing position. The link 49 limits the rising movement of the figure so that it will not fall frontward. The lever 48 is pivoted and its free end is connected to the rod 47. 50 is a slide bearing for the lever 48. There is a bracket 51 which provides a fixed bearing for the lever 48. The bracket 51 may be attached to the chair 1a. When the magnet 43 is energized and the figure lifted to standing position the spring pressed detent 52 catches under the rod 45 and holds the figure in standing position even though the magnet 43 be deenergized. At the end of the song recital or whatever is attributable to the standing figure, the attendant energizes the magnet 44 which releases the lever 45 because the upper prong of the detent is pulled clear of the end of the lever 45 and then the figure falls onto the chair by its own weight, being started by the lower fork of detent 52.

From the foregoing description those skilled in the art will understand that figures and parts may be duplicated by the use of mechanism substantially as described. Therefore, the invention is not limited to details of construction and mere matters of form or otherwise than the prior art and the appended claims may require.

I claim:

1. In a mechanical orchestra the combination of figures simulating miniature orchestra performers having movable parts, motor driven mechanism for moving said parts, a phonograph controlling said mechanism, a chair, a jointed figure, means for shifting the jointed figure to standing and to seated positions, and manually controlled electro-magnetic devices for operating said means.

2. In a mechanical orchestra the combination of, a platform, a chair thereon, a jointed figure arranged on the platform and simulating in miniature a soloist and having movable parts, a phonograph mounted adjacent said figure but concealed from view so that vocal sounds from said phonograph appear to come from said figure, and manually-controlled means for shifting said figure to standing and to seated positions in respect to said chair and for moving said parts whereby said phonograph and said means may be started in synchronism to produce the illusion of the soloist performing.

3. In a mechanical orchestra the combination of, a platform, chairs and a stand on the platform, figures seated on the chairs and simulating miniature orchestra performers and a leader standing on the stand, said figures having movable parts, linkage and bell-crank mechanism for moving said parts, a motor for moving said mechanism, a phonograph having a tone-arm, and electrical connections between said arm and said motor whereby said phonograph controls said motor.

4. A soloist performer for a mechanical orchestra comprising, a platform, a chair thereon, a jointed figure arranged on the platform adjacent the chair and having movable parts, a lever pivotally supported from said platform adjacent the back of said figure, a bracket providing a sliding connection between one end of said lever and said figure adjacent the hips of said figure, a rod having pivotal connection with the opposite end of said lever, and manually-controlled electro-magnetic actuating means controlling the movement of said rod for moving said rod and said lever to cause said figure to rise from said chair when said electro-magnetic means is energized and to sit on said chair by gravity when said electro-magnetic means is de-energized.

5. A soloist performer for a mechanical orchestra comprising, a platform, a chair thereon, a jointed figure arranged on the platform adjacent the chair and having movable parts, a lever pivotally supported from said platform adjacent the rear of said figure, an actuating magnet having control of said lever and arranged to cause said figure to rise from said chair when said magnet is energized, and a detent arranged to hold said lever and consequently said figure in raised position even though said magnet is de-energized and to free said lever to allow said figure to return to sitting position on said chair under the control of gravity.

6. In a mechanical orchestra, the combination of, a platform, a chair thereon, a jointed figure arranged on the platform adjacent the chair and simulating a miniature soloist and having movable parts, a lever pivotally mounted from said platform, an actuating magnet arranged to actuate said lever in one direction of movement of said magnet to cause said figure to rise from said chair and free from said lever in the opposite direction of movement of said magnet so that said figure may sit on said chair under the influence of gravity when said magnet is de-energized, and a link having pivotal connection with said figure adjacent the hips and adjacent the knees of said figure to prevent the figure from falling forward when in raised position.

7. A toy amusement device for simulating a soloist singer for a mechanical orchestra comprising, a jointed toy figure having an arm pivotally connected thereto and having pivotal joints at the hips and knees of said figure, a link having pivotal connection with said figure adjacent the hips thereof and having pivotal connection with said pivoted arm at a point spaced from the pivot of said arm so that when said figure moves to standing position the arm is raised and when said figure moves to sitting position the arm is lowered, a second lever pivotally supported on said platform and having connection with said figure, and an actuating magnet arranged to

actuate said lever to move said figure to standing position when said magnet is energized, and to allow said figure to return to said sitting position when said magnet is de-energized.

8. A mechanical orchestra comprising automaton musicians, electrical motor mechanism for operating the musicians, a phonograph having an element movable to and from playing position, an electrical circuit for energizing said mechanism, and a switch for said circuit, which is actuated through movement of the said element.

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April 26, 1938. J. W. MYERS 2,115,533

SOUND ACTUATED AUTOMATON

Filed July 23, 1935 2 Sheets-Sheet 1

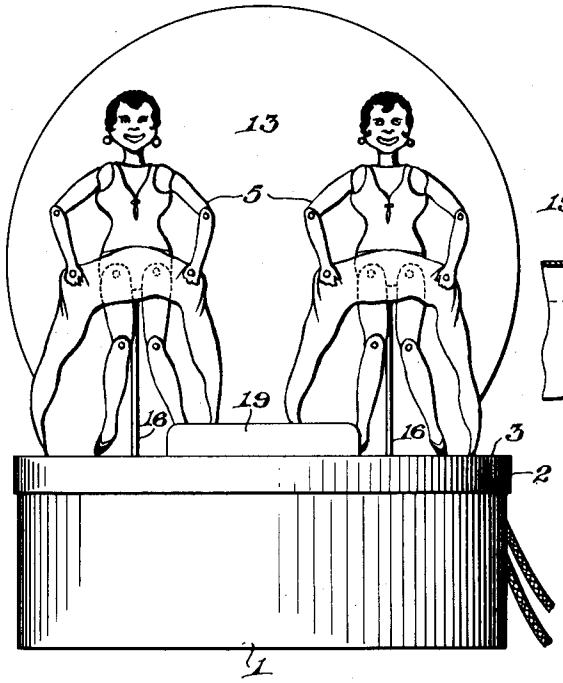

Fig. 1.

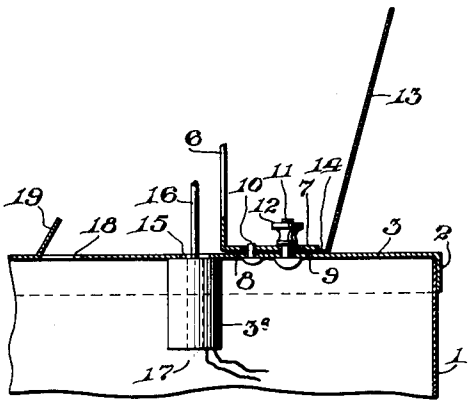

Fig. 3.

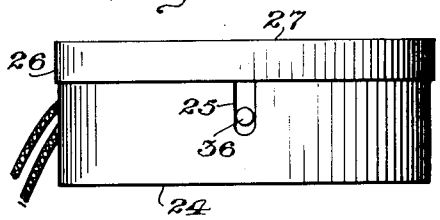

Fig. 4.

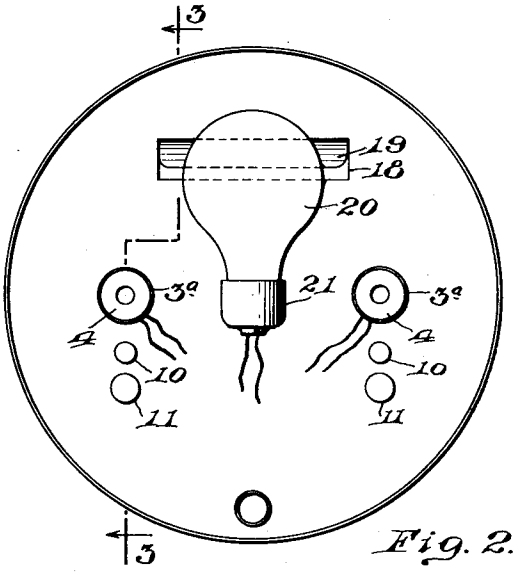

Fig. 2.

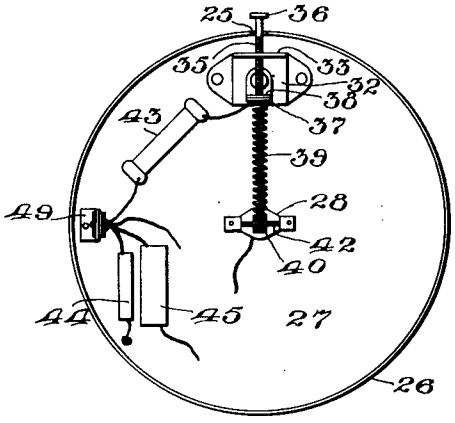

Fig. 5.

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SOUND ACTUATED AUTOMATON

Filed July 23, 1935 2 Sheets-Sheet 2

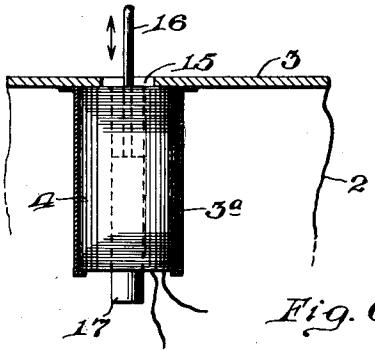

Fig. 6.

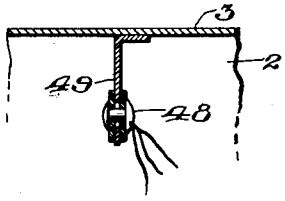

Fig. 7.

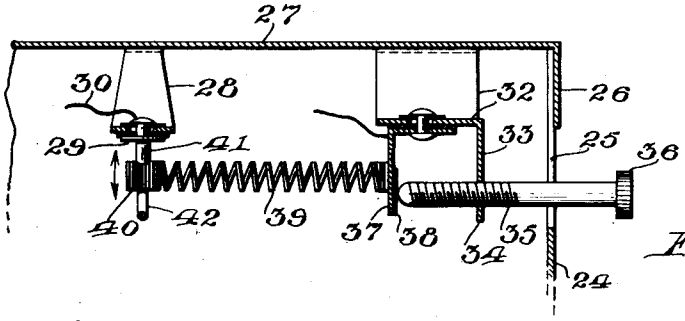

Fig. 8.

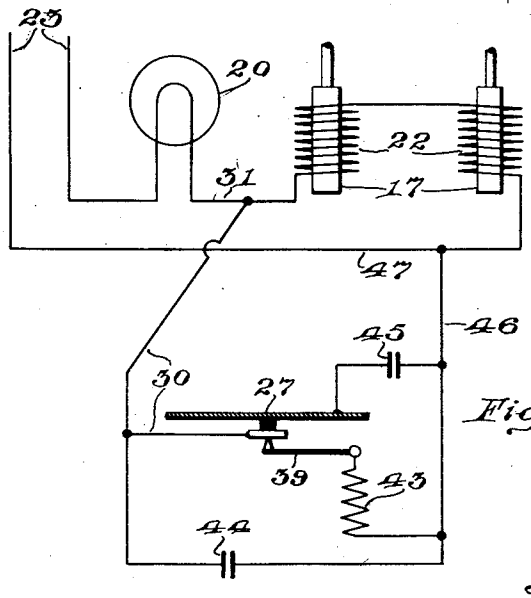

Fig. 9.

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UNITED STATES PATENT OFFICE

2,115,533

SOUND ACTUATED AUTOMATON

Joseph W. Myers, Mount Airy, Pa.

Application July 23, 1935, Serial No. 32,757

6 Claims. (Cl. 46—45)

This invention relates particularly to sound-actuated automatons, but more especially embodying the inherent idea or principle of the automaton's being adapted to operate in substantially exact synchronism with the voice characteristics of a speaker, or with the sound reproduced by radio, talking machine, or other form of electrical or electro-mechanical devices.

The general purpose of such an automaton is to attract attention, as for instance in advertising displays of various kinds, as well as to entertain and hold one's interest, as in the case of toys and general amusement devices, wherefore instead of providing merely a movable object of no particular shape, it is found desirable to employ an automaton having the likeness of a well-known cartoon, actor, or other person, so that the movements of such automaton, when reproducing the movements of the corresponding person or his impersonator, will recall to those watching it the intimate movements, which are associated with the party with whom the sounds are originating, or originated in the first instance in the case of reproduction of sounds from a suitable record.

Heretofore, it is believed that most if not all such devices have depended upon the inclusion of a relay, and various other elements which have together contributed to make the devices in question relatively expensive. By contrast, an object of the present invention is to eliminate all relays, to provide a much simplified sound-actuatable switch, to provide a relatively inexpensive yet most attractive device, to make the mechanism as a whole operable upon either direct or alternating current from common lighting circuits, to make the automaton function more nearly perfect than has heretofore been possible, to employ an electric resistance which also serves for "stage lighting" purposes, and to provide further improved details of construction and operation, as are hereinafter brought out.

With this initial statement of the objects of the invention, its construction and operation are fully brought out in the following description, when read in conjunction with the accompanying drawings, in which

Fig. 1 is a front elevational view of the stage and automaton supporting element per se;

Fig. 2 is a plan view of the underside of the cover of the said element;

Fig. 3 is a fragmentary section of a portion of such element on the line 3—3 of Fig. 2;

Fig. 4 is an elevational view of the vibration-actuated switch element per se;

Fig. 5 is a plan view of the underside of the cover of said switch element;

Fig. 6 is an enlarged fragmentary sectional view of a portion of the supporting element, especially showing one of the solenoids and associated automaton-carried armature;

Fig. 7 is a similar sectional view of a binding post mounting;

Fig. 8 is a fragmentary sectional view of the switch members and associated parts; and

Fig. 9 is a diagrammatic wiring diagram of the electrical connections within the system, comprising the two elements hereinbefore referred to.

Referring to the drawings, the automaton supporting and activating unit per se is shown in Figs. 1, 2, 3 and 6, and broadly this unit comprises essentially a hollow container 1 which may be of any desired shape, size and construction, but in the present instance is shown as comprising a relatively shallow cylindrical metal box, having a removable metal closure 2, said closure having a substantially horizontal top wall 3 to which are secured and from which are suspended by suitable means 3a any desired number of solenoids 4, representing any suitable form of electro-magnetic element capable of actuating the corresponding automatons 5. Each automaton is supported by an L-shaped bracket 6, the lower angularly directed portion 7 of which is preferably provided with a pair of spaced apertures 8 and 9 thru which normally extend respectively a positioning lug 10, carried by the closure wall 3, and the stem 11 of a suitable bolt or other locking device 12, which latter normally secures said bracket firmly to said closure wall, and cooperates with the lug 10 to prevent said bracket from moving angularly about a vertical axis, but permits said bracket to be detached and another automaton and its own bracket substituted. When desirable there may be also provided a back-ground member 13, formed of cardboard, light wood, metal or the like, and normally extending upwardly to the rear of the automaton, the lower forwardly extending angularly directed portion 14 of said member, being preferably also directly secured beneath the locking device 12, or beneath the angularly directed portion 7 of each of the brackets with which said automatons are supported.

Slightly forwardly of the brackets 6 said closure wall is provided with apertures 15, thru which loosely extend rods 16, which are suitably connected to the movable portions of the respective automatons 5, and at their opposite or lower

ends are provided with a relatively larger armature 17, which will slide loosely thru the solenoids 4.

Still forwardly of the apertures 15 is another aperture 18, which extends transversely across the forward portion of said closure wall, the metal 19 removed to provide said aperture being deflected upwardly and forwardly so as to provide a shield and reflector for rays from a lamp 20 also carried by said closure wall, and directly supported by any suitable form of bracket 21 secured thereto.

The windings 22 of the solenoids (or other form of electro-magnetic actuating means) are connected in series with each other, as shown in Fig. 9, and also in series with the lamp 20 and a suitable source of electric current to which wires 23 lead. It is to be noted that the inactive position of each of the armatures 17 is such that its center of mass is somewhere below the center of the magnetic field of the corresponding solenoid, with the result that after the solenoid is energized and the armature is raised temporarily, thereby causing the automaton attached thereto to move in a given manner, deenergizing of the solenoid permits said armature to drop by gravity, thereby causing a reaction or substantial reversal of the previous movements on the part of the automaton connected thereto. It is therefore obvious that intermittent and irregularly alternating the energizing and de-energizing of the solenoid causes the automaton to move in a corresponding manner, and that by properly selecting the type, appearance, and detailed structure of the particular automaton involved, such for instance to represent a given person, impersonator, or cartoon, the automaton can be made to move in a manner so similar to the originator of the sound, as thru the intermediacy of sound waves from a radio, loud speaker, or talking machine, that the actual movements of the sound originator can be faithfully reproduced or mimicked to a remarkable degree of accuracy.

Referring to Figs. 4, 5, 7 and 8, there are shown details of the sound actuatable switch mechanism used in conjunction with the automaton actuating device above described. In the present embodiment of the invention, this switch mechanism is preferably mounted within a hollow container 24 of any suitable shape, size, material, etc., and is provided upon one side with an aperture 25, and normally having its upper and otherwise open side spanned by a removable closure 26, which closure is characterized by a sound sensitive vibratory wall 27, which may comprise the entire upper wall of said closure, or instead may comprise only the central portion of the same. In either case the center of said vibratory wall obviously oscillates to a greater degree than any other portion of the same, and is therefore preferably provided with a depending bracket 28, to which is secured an electric contact member 29, which, however, is preferably insulated from said bracket and is connected by means of a wire 30 to that wire 31, which in the automaton actuating device connects the solenoid to the lamp.

The closure 26 is also provided at any suitable position with a bracket 32, having a depending angular portion 33, provided with a threaded aperture 34 in which is secured an adjustably positioned set-screw 35, the outer and manually engageable end portion 36 of which extends freely thru the container aperture 25, and is preferably at all times accessible to the operator. The second bracket 32 also supports but is preferably insulated from a depending resilient member 37, against the free end portion of which abuts the set-screw 35, except for the inter-positioning of an insulating washer or other suitable member 38 therebetween. The member 37 has secured fixedly to it, and thereby supports one end of a transversely resilient member 39, which in this instance is shown as comprising a coil spring, but may be formed of any suitable electrically conductive metal, and comprises any desired shape and construction. The free end portion 40 of this resilient member is provided with an electrical contacting member 41, which engages the contact member 29, when, as and in accordance with the vibration of the bracket 28 under the influence of the vibratory closure wall 27, which in effect constitutes a diaphragm such as is responsive to at least certain of the sound waves emanating from a radio, talking machine, or the voice of one speaking or other suitable source of sound. Preferably also the bracket 28 is provided with a U-shaped guard member 42, which when this device is being handled and transported from place to place, prevents the nicely balanced end portion 40 of the resilient member 39 from moving or swaying, beyond a certain predetermined distance away from the bracket 28 and possibly becoming unduly bent or flexed, it being understood that the resiliency of the member 39 is such as to just slightly cause the contacts 29 and 41 to engage each other, the degree of contact between these members being nicely adjustable by means of the set-screw 35.

In order to reduce the amount of current flowing between the brackets 29 and 41, a suitable resistance 43 is interposed in the circuit as indicated in Fig. 9, while a condenser 44 is shunted across the make and break contacts, also as indicated. Still further, a second condenser 45 may if desired ground the metal container with the wire 46, which connects the opposite end of the resistance 43 to the wire 47, which wire in turn connects the opposite line wire 23 to the solenoids 22. The said condensers 44 and 45, and the resistance 43 may for the sake of convenience be connected together, thru a single binding post 48 supported by a suitable bracket 49, in turn carried by the closure 3, as indicated in Fig. 7.

With the automaton supporting mechanism and the sound actuated device constructed along the lines herein described and connected together as indicated by the wiring diagram Fig. 9, it will be evident that within a certain range, determined by the position of the set-screw 35, when the vibratory closure wall 27 vibrates it will intermittently break the delicate contact normally established between the members 29 and 41, since the frequency of free vibration of the member 39 and its contact 41 is very low, and it is unable to follow the sound frequencies imposed on contact 29, supported by the vibrating diaphragm 27. Thus, any considerable sound will cause a separation of, and substantially stop the current normally flowing thru, these contacts. Therefore, when these contacts are separated the solenoids 22 being in series with the lamp 20, and their impedance being greater than that of the resistor 43, the brilliancy of the lamp is lowered, and its light will thus flicker as the contact is made and broken. At the same time the armatures 17 are lifted into the solenoids suddenly and positively actuating the automatons connected thereto each time the contact is broken for a sufficient period of time to overcome their inertia. It should be

understood that the solenoid-short-circuiting currents normally flowing thru the contacts, when disturbed by sound are not of the same frequency as the sound, but are intermittent currents of the same frequency as the natural frequency of the spring member **39**, which may be as low as four vibrations per second, and this resulting current through the resistor **43** is sufficient to prevent solenoids **22** raising their armatures, to which the automatons are attached. When the sound stops for a fraction of a second, or its intensity lowers substantially, the contacts begin to act as a substantial short circuit for the current around the solenoids, and each armature drops or lowers to some intermediate position. It will thus be evident that the armature **17** will rise and fall in accordance with changes in the intensity of sound vibrating the diaphragm **27**, and the current in the solenoids is substantially independent of the frequency of the diaphragm, but is extremely sensitive to the intensity of its vibration and somewhat proportional thereto. This intermittent making and breaking of the said contacts produce a jiggling, gyration, or other movement, of the automatons simultaneously with a flickering of the rays of the lamp **20**, which cooperate to produce a most unique, novel and highly interesting result in synchronism with speech or music.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a vibration actuated mechanism, the combination of a source of current, an automaton, an armature connected to said automaton, an electro-magnetic element for actuating said armature, a resistance in series with said element and said source of current, and a vibration-sensitive switch shunted across said element, to permit current from said source to energize and de-energize said element in accordance with extraneous vibrations, current from said source being limited by said resistance when said switch is closed.

2. In a vibration actuated mechanism, the combination of a source of current, an automaton, an electro-magnetic element, an armature connected to said automaton and having its center of mass normally positioned when inactive below the center of the magnetic field of said element, a resistance in series with said element and said source of current, and a normally closed vibration-sensitive switch shunted across said element, which switch when open permits current to flow through said element from said source and to thereby raise said armature, and which switch when closed by lack of vibrations short-circuits and thereby de-energizes said element and permits said armature to fall.

3. In a vibration actuated mechanism, the combination of a source of current, an electro-magnetic element, an automaton actuatable by said element, a resistance in series with said element and said source of current, a vibration-sensitive switch, a resistance connected in series with said switch and together with said switch being shunted across said element, and a condenser shunted across said resistance and said switch, whereby said element is alternately energized and de-energized as said switch is opened and closed respectively, so as to actuate said automaton in accordance with sound waves or vibrations, and whereby radio disturbing electrical oscillations are prevented by said resistance and condenser.

4. In a vibration actuated mechanism, the combination of a base, an automaton supported by said base, an armature carried by said automaton, an electro-magnetic element also carried by said base to actuate said armature, a lamp also carried by said base and in series with said element, and a vibration-actuated switch shunted across said element, causing said lamp to cast a flickering illumination upon and in accordance with the gyrations of said automaton.

5. In a vibration actuated mechanism, the combination of a container, an automaton supported upon said container, an electro-magnetic element carried by and within said container, an actuating armature carried by said automaton and operatively associated with and in the magnetic field of said element, a lamp carried by and within said container and adapted to illuminate said automaton, and a vibration-actuated switch controlling the flow of current through said element, causing said lamp to cast a flickering illumination upon and in accordance with the gyrations of said automaton.

6. In a vibration actuated mechanism, the combination of a source of current, an automaton, an armature connected to said automaton, an electro-magnetic element for actuating said armature, a resistance in the form of a lamp so positioned as when lighted to illuminate said automaton, and connected in series with said element, and said source of current, and a vibration-sensitive switch shunted across said element, to permit current from said source to energize and de-energize said element in accordance with extraneous vibrations, current from said source being limited by said resistance when said switch is closed.

JOSEPH W. MYERS.

Dec. 29, 1936. H. O. BROWN 2,065,965

DISPLAY DEVICE

Filed March 6, 1935

Fig. 1.

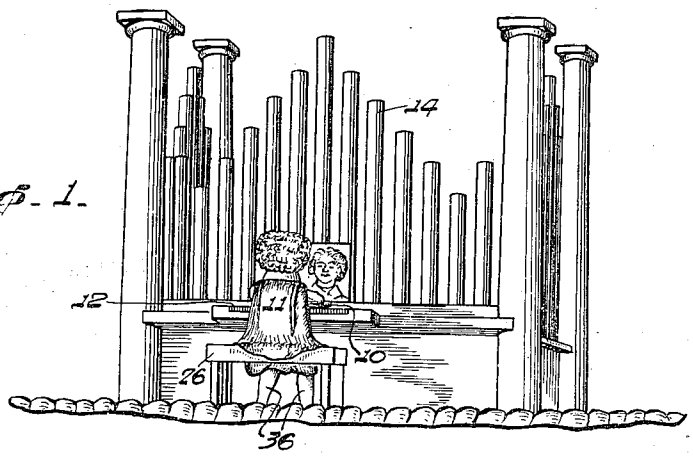

Fig. 2.

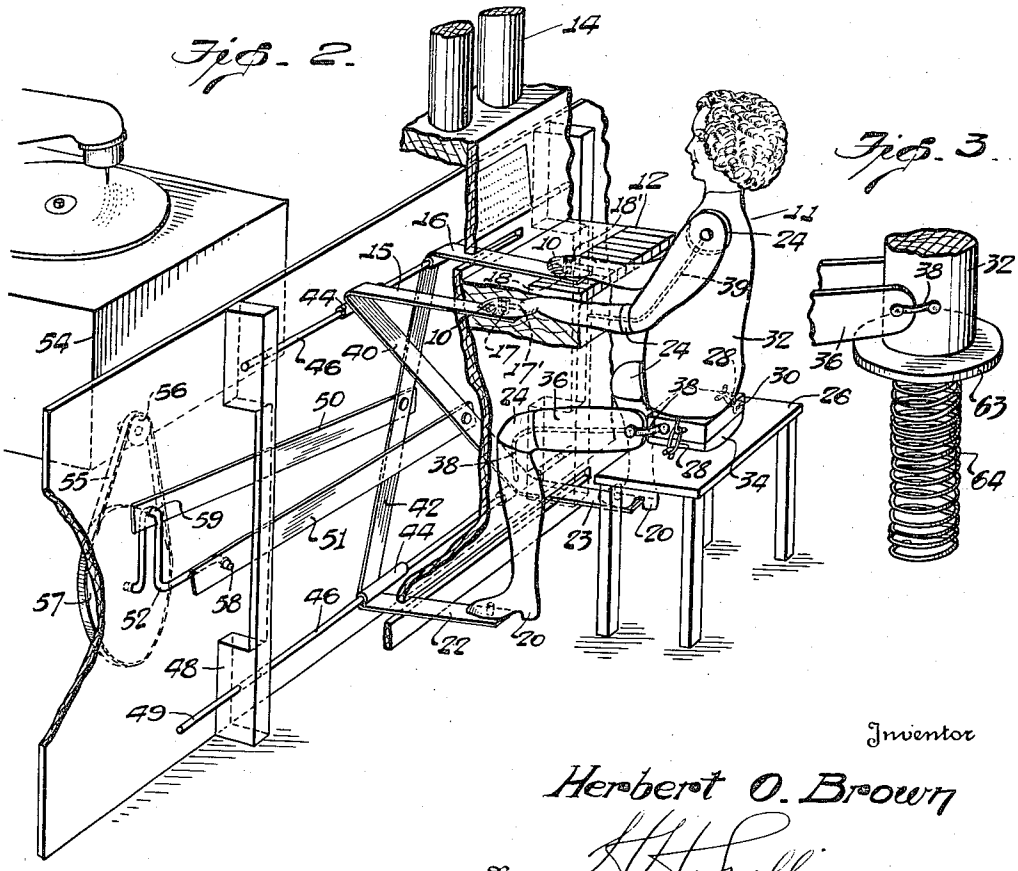

Fig. 3.

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Patented Dec. 29, 1936 2,065,965

UNITED STATES PATENT OFFICE

2,065,965

DISPLAY DEVICE

Herbert O. Brown, Fairfield, Maine

Application March 6, 1935, Serial No. 9,679

19 Claims. (Cl. 46—144)

This invention relates to mechanical attractions especially for stores and in particular to a musical display device for seasonal exhibition as at Christmas time in which a figure representing a robed organist simulates playing on an organ, in a pleasing and life-like manner.

A universal objection to many mechanical toys is the presence of a jerky, uneven movement far from life-like. Some inventors have tried to overcome this fault by making the movements absolutely smooth and regular but this in turn is also unnatural and produces an inanimate monotonous effect which is not pleasing. Therefore the main object of this invention is to provide a mechanical figure having pleasing animated movements which are neither mechanically jerky nor monotonously inanimate.

A particular object of the invention is to provide a figure which closely simulates the movements of a human being in playing a musical instrument such as a piano or an organ. Another object is the provision of a figure which has a smooth and non-jerky motion when operated by a simple mechanical means such as a crank.

Still another object is to provide an attractive front for a radio or phonograph before which a mechanical figure moves as if playing the instrument represented by the front and to provide a simple mechanical device for translating the rotary motion of a motor into harmonic reciprocating motion and transmitting this motion to the hands or feet, and preferably both, of such figure.

In the drawing:

Figure 1 is a perspective view of a pipe organ and a player operating the same in accordance with my invention.

Figure 2 is a perspective view of the mechanism used to operate the player's hands and feet.

Figure 3 is a view of a modified detail.

Referring to Figures 1 and 2, it wil be seen that the hands 10 of the figure 11 are supported just above the keyboard 12 of the pipe organ 14 by means of supports 15 and 16 which reciprocate toward and away from each other to give the figure the appearance of playing the organ. The supports preferably have upright pins 17 and 18 thereon to be received in sockets 17' and 18' provided in the hands 10 of the figure with sufficient looseness of engagement to give the desired lost motion. The feet 20 of the organist 11 similarly engage supports 22 and 23 located under the keyboard in about the same relative position as the ordinary foot pedals of an organ. When these pedals or supports are operated out of unison with the upper supports they give the feet of the doll a movement simulating closely that of a real player.

I have discovered that the jerky movement so common in mechanical toys is still further eliminated by providing yielding pads 24, preferably of sponge rubber, between some and preferably all the joints of the figure. The torso 32 of the organist is secured to a rocker 30 and is held in a yielding upright position on the bench 26 by means of elastic cords 28 so as to provide a limited amount of freedom. A still simpler form is to affix the sponge rubber cushion 34 to the block 30 and the bench 26 as by suitable adhesive material.

The elastic cushion 34, preferably of sponge rubber, is positioned between the rocker 30 and the bench 26 which construction permits the body of the figure to sway slightly while the hands and feet are being moved which swaying makes the playing remarkably realistic. The thighs and legs 36 of the figure are joined together and are secured to the rocker by means of elastic cords 38 of usual construction and the upper and lower portions of the arms are held together and to the body 32 by means of similar elastic cords or tendons 39.

In the rear of the organ is arranged a device for giving the supports 15, 16, 22 and 23 different harmonic motions so that, while the hands and feet of the organist shall move in unison, these movements shall not always be in the same direction or at the same speed. As will be seen in Figure 2, the diagonally positioned supports 15 and 23 are connected together by means of the sloping member 40 and that similarly, opposite supports 16 and 22 are connected together by the sloping member 42 which crosses member 40. The supports in the present instance are shown as connected to tubular sliders 44 which are constrained to move in parallel paths by the rails or bars 46 rigidly secured one above the other in the uprights 48, this being the preferable construction.

Each pair of diagonally connected supports, one member operating an arm and the other operating a foot, is adapted to be given harmonic motion by its respective connecting rod 50 or 51 in response to rotation of a double crank 52 which may be operated by the motor of a phonograph or any other available means. In practice I use the organ front as a screen or shield for a phonograph 54 and drive the crank 52 by means of a belt 55 which encircles a pulley 56 driven by the phonograph motor and a second pulley 57 on the

crank shaft. Obviously the crank may be actuated by any other means without changing my invention. The rod **50** pivoted to the sloping member **42** somewhat above its center is connected to the middle arm **59** of the crank while the corresponding connecting rod **51** is connected to a point somewhat below the center of the diagonal member **40** and is pivoted to the end **58** of the crank which may be of the same or different length than the middle arm **59** of this crank, but preferably the two arms are of somewhat different lengths so that the travel of the diagonal members **40** and **42** are likewise different, the left or bass arm of the figure having a greater length of travel than the right or treble arm, or vice versa, if desired.

In Figure 3 is shown a modified form of support for the doll which is more economical than the bench and eliminates the necessity of the rocker and rubber cushion. The torso **32** of the figure may be rigidly secured to the top of the piano stool **63** which is supported by a helical spring **64** to permit limited motion of the doll.

As illustrated in Figure 1 the figure is pleasingly represented as a girl organist whose robe is in front of the bench as in the figure but may hide the helical spring **64** in the modified and simpler form shown in Figure 3. It will be understood that while the invention covers the entire combination illustrated and also equivalent structures I also intend to protect the individual items as well, for example, a figure with stationary legs but employing the arm movement shown.

The movement of the arms and legs of the figure can probably be best understood by assuming that the middle arm **59** of the crank is directly above the shaft of the pulley **57**, at which time the end **58** is projecting to the right as seen in Figure 2 so that the connecting rod **51** is slightly above the central pivot of the crank. Assuming the pulley **57** is turning clockwise, the left hand support **15** is at one limit of its motion as the end arm **58** is about on dead center. The right hand support **16** and with it the left foot support **22** will be moving toward the right at almost its highest speed. Just prior to the position shown in Figure 2 the two connecting rods are nearly parallel and both hands and both feet are moving to the right. In the position shown the end **58** of the crank is pointing to the right, the left hand support **15** and the right foot support **23** are at a dwell and consequently substantially stationary as the rod **51** is at dead center. At such time, however, the right hand and left foot of the figure are moving to the right at approximately maximum speed. At 90° from the position shown the right hand support **16** has reached the right limit of its travel but the left hand is still moving to the left. From this point on both hands and both feet of the figure are moving to the left at approximately the same rate of speed and this movement continues until 180° of travel from the position shown in Figure 2 at which time the connecting rod **51** is again on dead center and consequently the left hand support **15** and the right foot support **23** have reached their left hand end of travel and are substantially still altho the other hand and the other foot of the figure are moving toward the left at maximum speed. From this point back to 360° the two hands of the figure are approaching each other but the feet are moving away from each other. Because of the crossed position of the diagonal members **40** and **42** the two hands of the figure will be closest together when the feet are farthest apart as at 50° and likewise, the hands will be farthest apart when the feet are closest together as at 230°. While in some of the models I drive the connecting rods **50** and **51** by cranks revolving at different speeds, it will be noted that practically the same effect is had by the simpler mechanism illustrated in Figure 2 in which, as just shown, the hands of the figure are sometimes moving in the same direction and are sometimes moving in opposite direction and one hand will be moving at almost maximum speed when the other hand is substantially still, thus simulating quite closely the movement of the hands of a living organist.

What I claim is:

1. In combination, a figure having two independently movable arms, means for moving one of said arms in a chosen path at varying speeds, and means for moving the other of said arms in a second chosen path, the movement of the second arm being sometimes in the direction of the movement of the first arm and sometimes moving in opposite direction to the first arm.

2. The device of claim 1 in which the two arms move in substantially horizontal paths.

3. The device of claim 1 in which the two arms of the figure move in parallel paths which partially overlap and in which each of the arms moves while the other arm is relatively stationary.

4. In combination, a figure having two independently movable arms and two independently movable legs, means for moving the arms and legs of said figure in chosen paths so that the arms of said figure will sometimes move in the same direction and sometimes move in opposite directions, and the feet of the figure will sometimes move in the same directions and shall sometimes move in opposite directions.

5. The device of claim 4, in which the two arms move in a substantially horizontal plane and the two legs of the figure move in a substantially horizontal plane.

6. The device of claim 1 in which the figure has a resiliently supported upright body and the arms are pivoted to the body of the figure whereby the body of the figure will sway as the hands are moved in opposite directions and causing the head of the figure to move forward and backward with the body.

7. The device of claim 4 in which the body of the figure is resiliently supported on a fixed seat and the arms of the figure are pivoted to the shoulders of the figure, and the hands of the figure being constrained by said means to move in fixed and substantially straight parallel paths located in a plane which is at a fixed distance from said seat whereby as the arms of the figure are spread apart the head of the figure will move forwardly and when the two arms are moving in the same direction the body of the figure will sway sideward by the yielding of the resilient mounting.

8. The device of claim 4 in which the arms of the figure are resiliently secured to the shoulders of the figure, the legs of the figure are resiliently secured to the lower part of the body of the figure, and the body of the figure is mounted on a fixed support, and a resilient cushioning means is provided between the body and the body support whereby the various movements of the arms and legs will cause the body of the figure to sway forward and backward and from side to side.

9. An automatic musical instrument, a shield for said instrument representing a different musical device having a keyboard, a figure having

independently movable hands and feet, means for supporting the hands above the keyboard in playing position, pedals under the keyboard for supporting the feet in playing position, means for moving the hand supports toward and away from each other along the keyboard and for simultaneously moving the pedals with the feet whereby the figure appears to play the device as the musical instrument plays music.

10. A simulation of musical instrument having a keyboard, a figure seated in front of said keyboard, pedals under the keyboard for supporting the feet of the figure, and means for moving the hands of the figure in horizontal paths along the keyboard to simulate playing.

11. A musical toy comprising a screen shaped to simulate the front of a pipe organ and having a keyboard, and having horizontal slots above the keyboard, a pair of supporting means projecting thru said slots and having their ends located immediately above the keys of the keyboard, a bench for supporting a figure in front of the keyboard, means for connecting the hands of the figure to the ends of said supporting means, and means at the rear of the screen for moving said supporting means toward and away from each other whereby the figure appears to be playing the organ.

12. The device of claim 11 in which said screen has horizontal slots below the keyboard and a pair of pedals projecting thru the slots for supporting the feet of the figure, diagonal bars connecting the pedals at the back of the screen to said hand supporting means whereby the feet move toward each other as the hands move away from each other and vice versa thus giving the doll life-like motion.

13. A commercial display comprising a screen adapted to be placed in front of a music producing appliance, said screen having a keyboard and otherwise simulating the front of a pipe organ, a seat in front of the screen for supporting a figure in a sitting position, a loose jointed figure on said seat and having its arms arranged in a key playing position, a support for holding each hand of the figure above the keys, the legs of the figure being arranged under the keyboard in a pedal operating position, pedals for supporting the figure's feet, said screen having apertures for accommodating the pedals and hand supports to permit the same to be moved in paths parallel to the keyboard, means behind the screen for constraining the supports and the pedals to move in said paths and a rotating member for giving motion to said supports and pedals, whereby said figure appears to play the organ in a life-like manner.

14. In combination, a figure, a mechanical means for moving the limbs of the figure, a bench, a rocker secured to the torso of the figure, a resilient cushion between the rocker and the bench and resilient means for holding the figure in an upright sitting position on the bench whereby movement of the limbs by said mechanical means causes the figure to sway slightly in a life-like manner.

15. In combination, a crank having two arms, a connecting rod secured to each arm, two upper members constrained to move in chosen paths, two lower members constrained to move in chosen paths, a diagonal connecting one upper member with one lower member, a second diagonal connecting the other upper member with the other bottom member, and means joining the free ends of the two arms to the said diagonals respectively.

16. The device of claim 15 in which one arm of the crank is of greater radial length than the other.

17. In a musical toy, the combination of a doll and a musical instrument having a keyboard, means for supporting the doll in an upright position before said keyboard, means horizontally and reciprocably movable above said keyboard for supporting the hands of the doll to simulate playing movements, and lost motion connections between the hands of the doll and said hand supporting means whereby there is a slight life like dwell of the hands at each end of the playing motions.

18. In combination with an automatic musical instrument, a shield for said instrument representing a different musical device and having a keyboard, a doll in front of said keyboard and having a body pivotally supported for oscillation, arms connected to said body and having hands supported adjacent said keyboard and means operatively connected to said instrument for reciprocating one of said hands in a horizontal path along the keyboard whereby the body of the doll is caused to sway in unison with the movement of the reciprocating hand to thus simulate the playing of said different musical instrument during the operation of said automatic instrument.

19. In combination with a phonograph, a screen for hiding the phonograph, said screen shaped to simulate the front of a pipe organ and having a keyboard, means for supporting a doll in front of said keyboard, a doll on said support and having hands supported adjacent said keyboard, and means for reciprocating at least one of said hands in a horizontal path adjacent the keyboard, said reciprocating means being actuated by the phonograph motor whereby the doll appears to be playing the pipe organ when the phonograph is operating.

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July 23, 1935. E. BREWER 2,009,337

SYNCHRONIZED SOUND AND ACTION REPRODUCTION

Filed Sept. 28, 1933 7 Sheets-Sheet 1

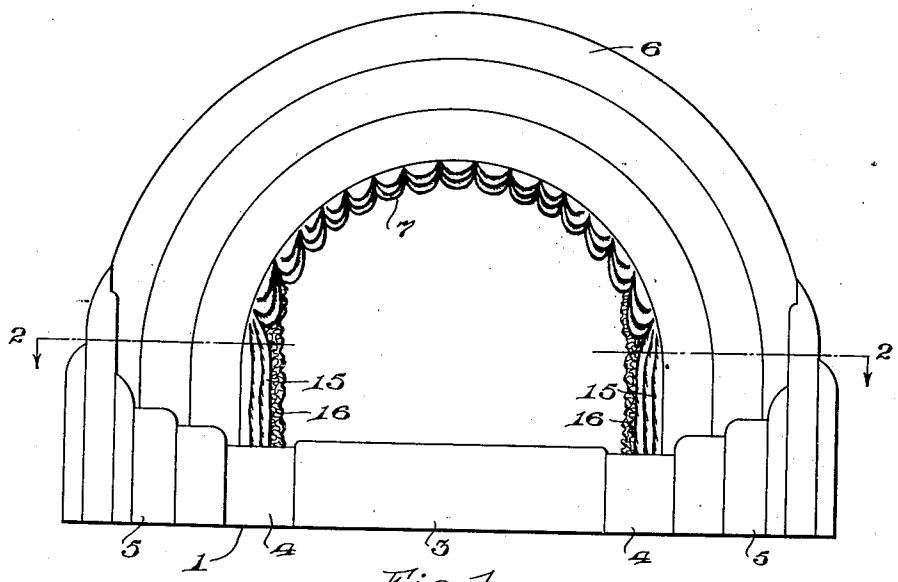

Fig. 1.

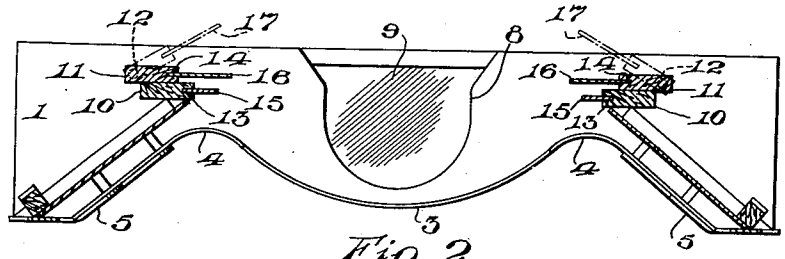

Fig. 2.

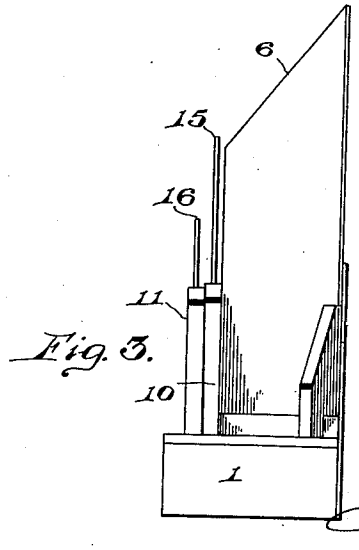

Fig. 3.

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SYNCHRONIZED SOUND AND ACTION REPRODUCTION

Filed Sept. 28, 1933 7 Sheets-Sheet 2

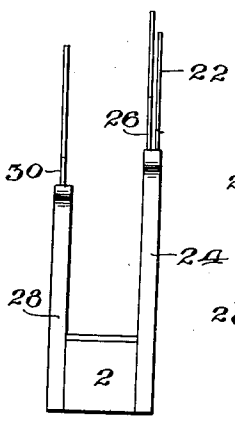

Fig. 5.

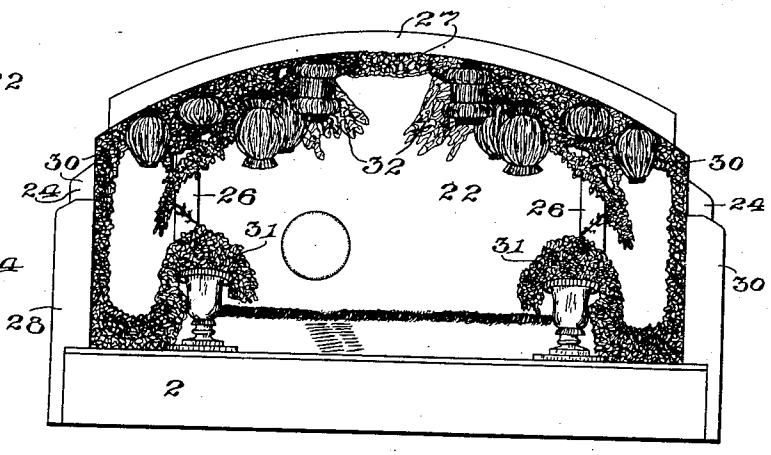

Fig. 4.

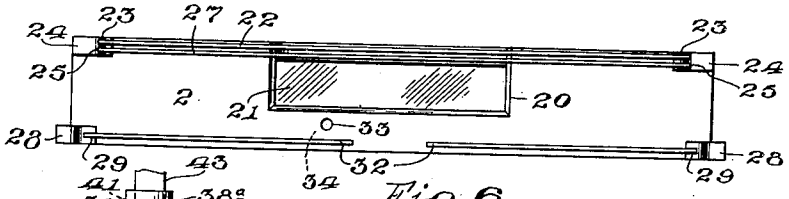

Fig. 6.

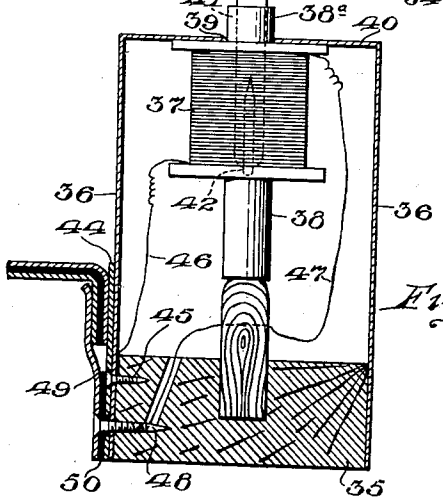

Fig. 11.

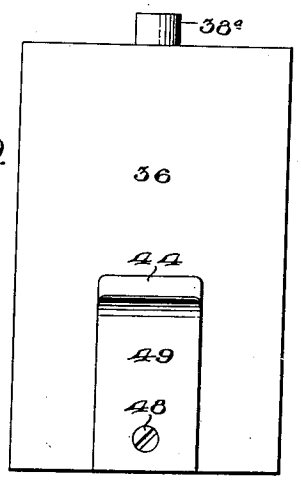

Fig. 10.

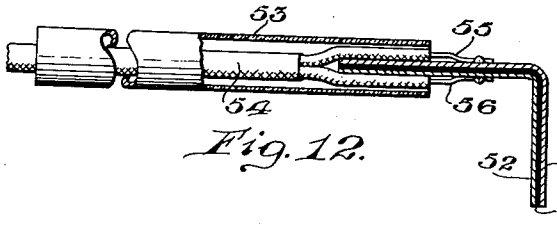

Fig. 12.

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SYNCHRONIZED SOUND AND ACTION REPRODUCTION

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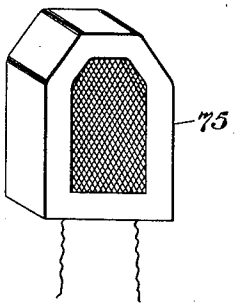

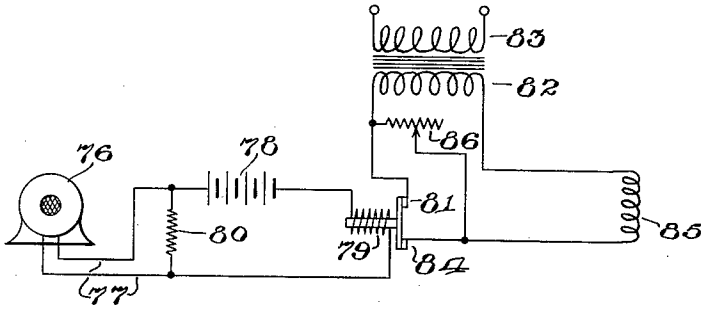

Fig. 7.

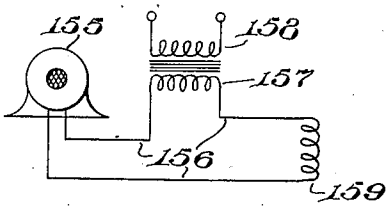

Fig. 8.

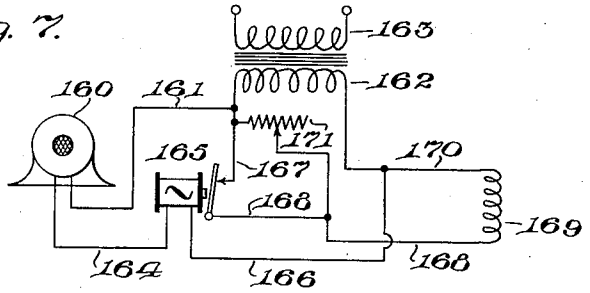

Fig. 9.

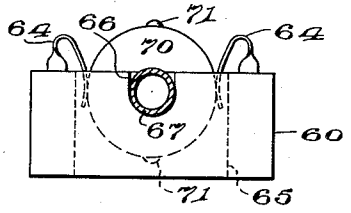

Fig. 13.

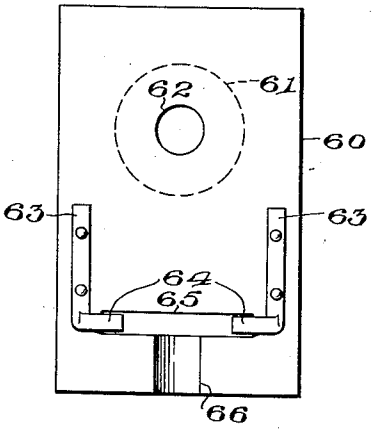

Fig. 14.

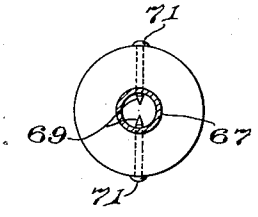

Fig. 17.

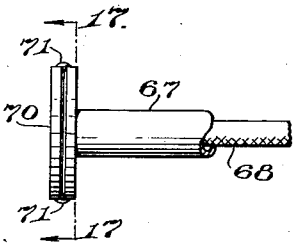

Fig. 16.

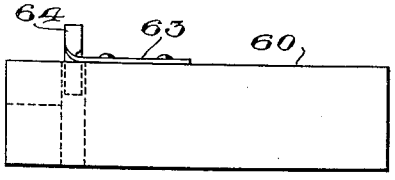

Fig. 15.

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SYNCHRONIZED SOUND AND ACTION REPRODUCTION

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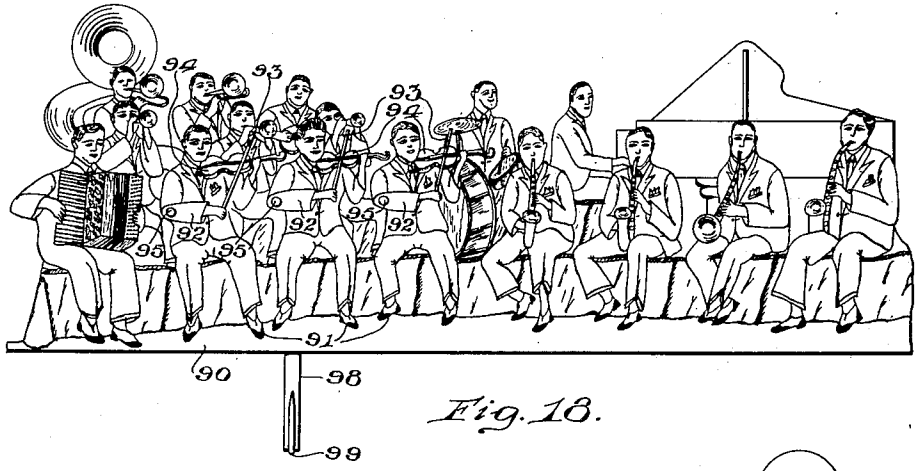

Fig. 18.

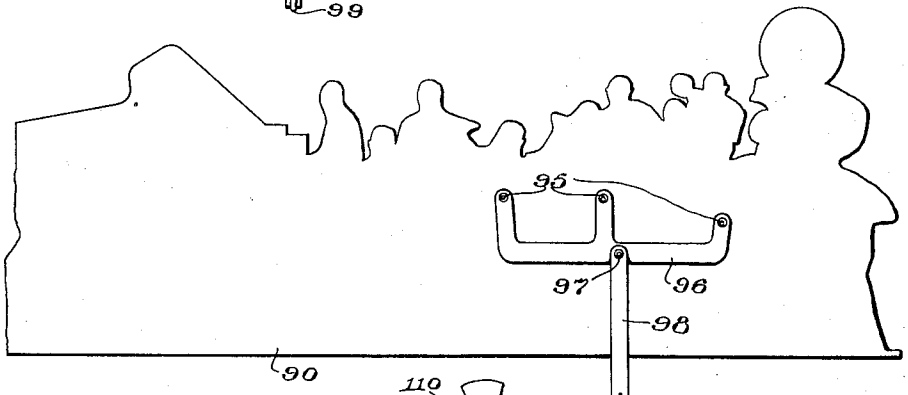

Fig. 19.

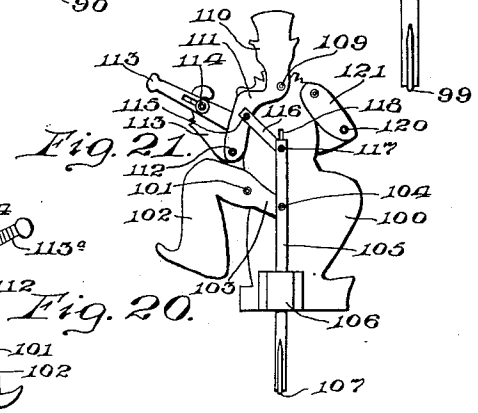

Fig. 21.

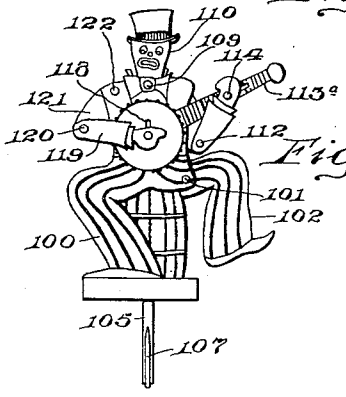

Fig. 20.

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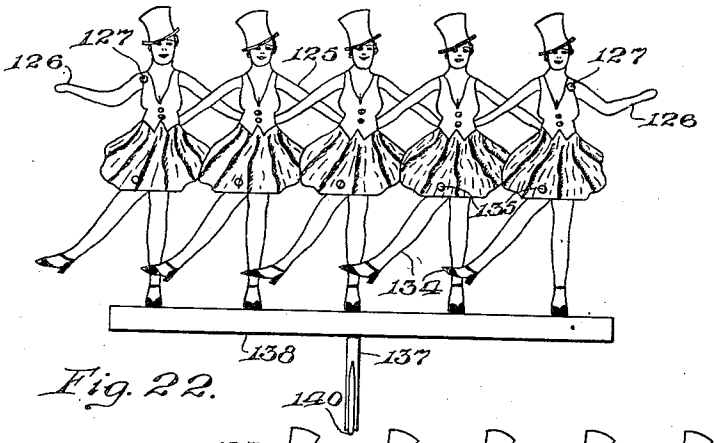

Fig. 22.

Fig. 24.

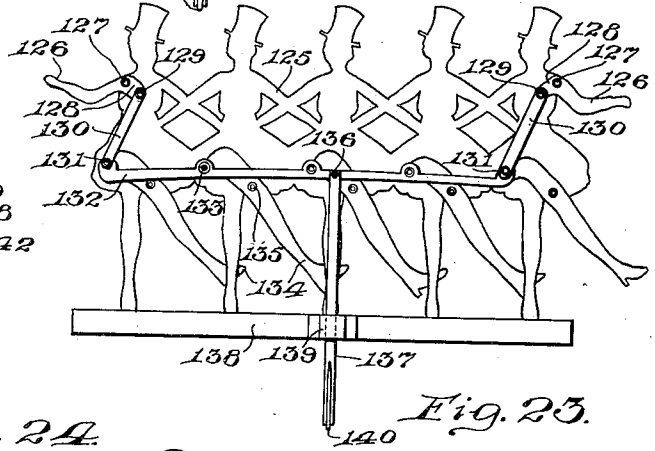

Fig. 23.

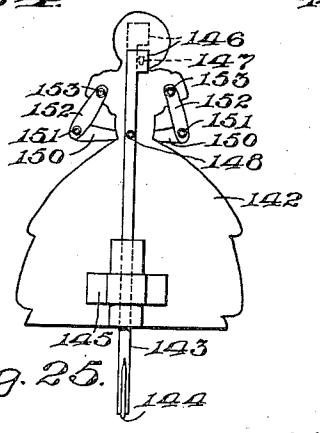

Fig. 25.

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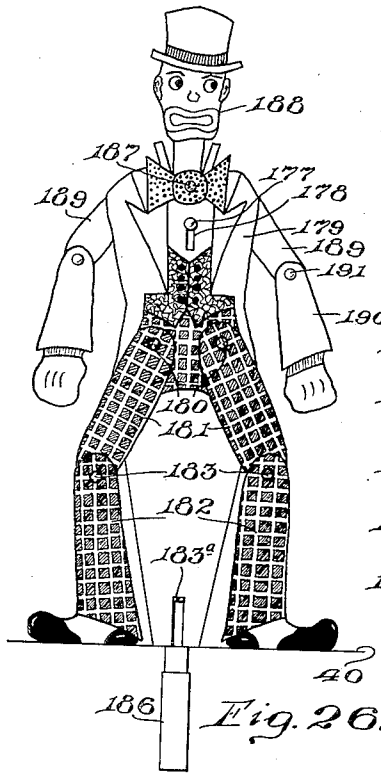

Fig. 26.

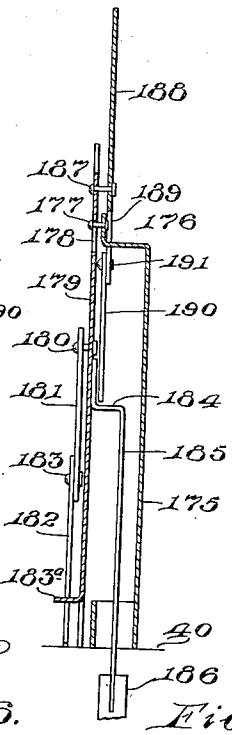

Fig. 28.

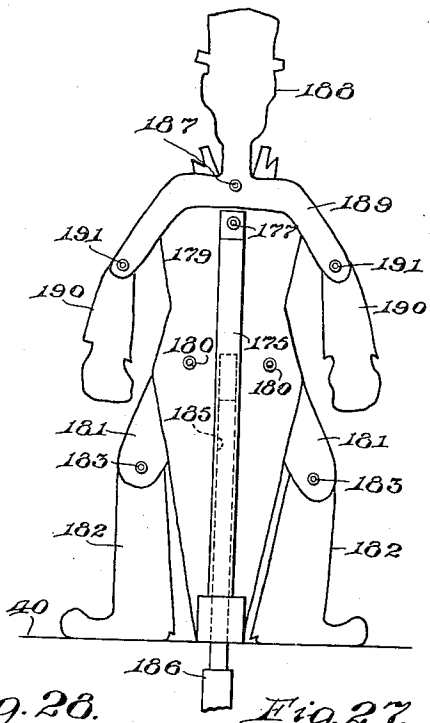

Fig. 27.

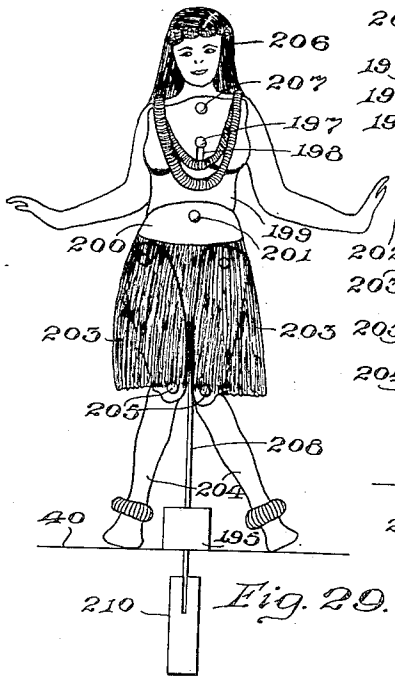

Fig. 29.

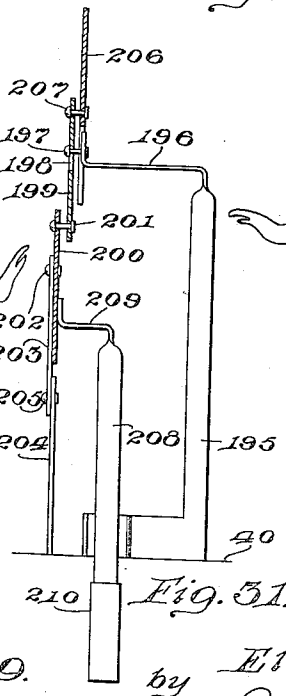

Fig. 31.

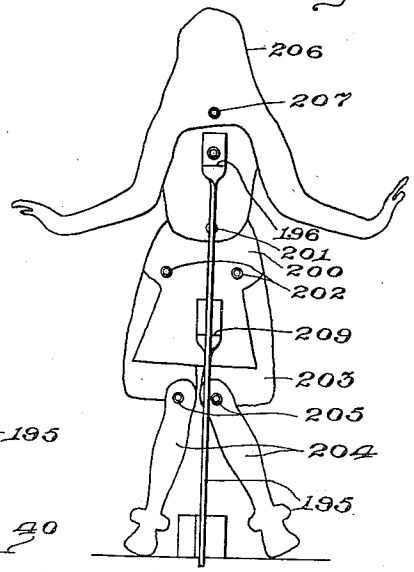

Fig. 30.

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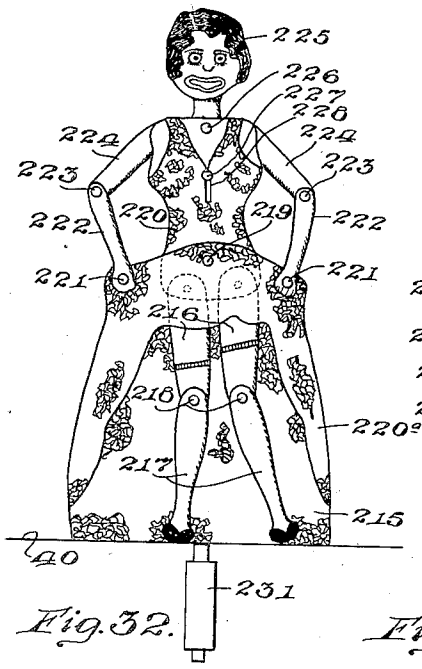

Fig. 32.

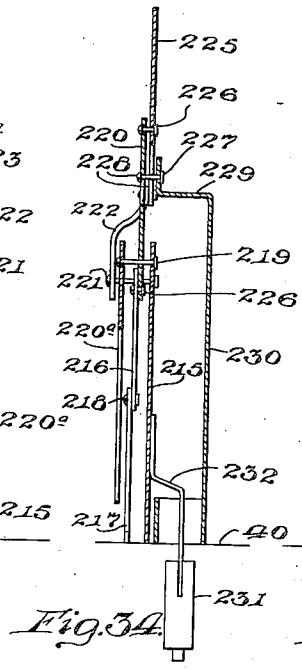

Fig. 34.

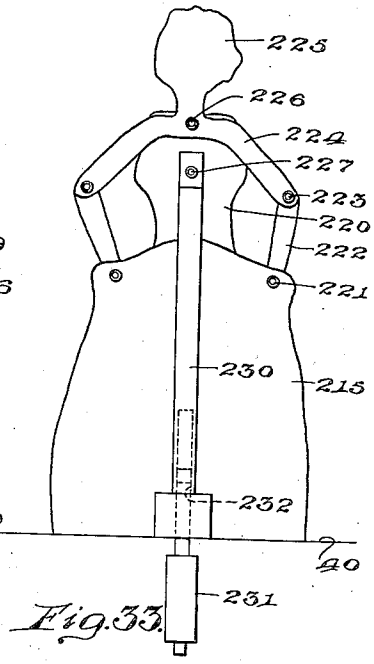

Fig. 33.

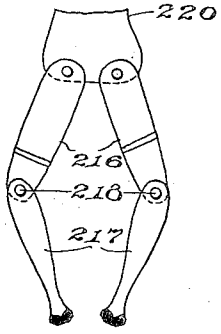

Fig. 35.

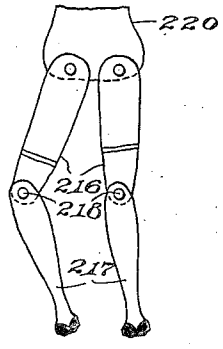

Fig. 36.

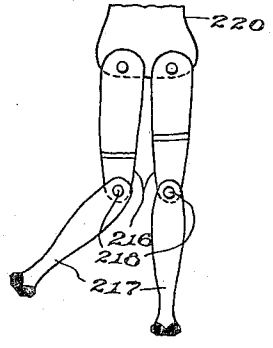

Fig. 37.

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Patented July 23, 1935 2,009,337

UNITED STATES PATENT OFFICE

2,009,337

SYNCHRONIZED SOUND AND ACTION REPRODUCTION

Elliott Brewer, St. Davids, Pa.

Application September 28, 1933, Serial No. 691,273

5 Claims. (Cl. 46—49)

The object of the invention is broadly to provide improvements in devices for the reproduction of action, as by automatons, in full synchronism with sound reproduced by radio, by mechanical and electro-mechanical sound-reproducing machines, or otherwise, such automatons or the like and their movements being designed to simulate the appearance and movement of the actors or other characters which they are intended to represent.

While the invention clearly embodies the use of the mechanisms hereinafter described in conjunction with mechanical and electro-mechanical sound reproducing machines, said invention will hereinafter be described as used in conjunction with radio, it being understood that such specific reference is in no way intended to limit the scope of the basic ideas involved.

In the absence of so-called television, or seeing a pictorial representation of the actor, or other source of sound or music, in motion in exact conformity with that of the actual actor or the like, radio reception to-day comprises merely the reproduction of the sound from such actor or other source, and it is becoming widely realized that such sound reproduction must be augmented with as faithful reproduction of the original action as may be possible, in order to sustain the radio's appeal to the public.

Another object therefore is to provide various constructions of automatons, as representative of an infinite number which can be produced, together with means for actuating the same in as realistic a manner as possible, coupled with electrically actuated means to actuate said first means in accordance with the vibrations reproduced by the usual electro-magnetic reproducer, and also if desired with a suitable setting for such reproduced action, such for instance as a portable stage setting or equivalent "atmosphere".

A further object more specifically is to provide improvements in electro-magnetic devices, including solenoids, for the actuation of the automatons, together with improved means for electrically connecting the same into the operating circuits of the mechanism as a whole, said connecting means also being adapted to perform the function of a means for shifting the automatons into and out of operative position with respect to a given setting, without the manipulator being seen in the operation.

Still another object is to provide improved electrical circuits for the operation of the invention in the most efficient and inexpensive manner, and with a minimum degree of lost motion or motions which differ materially from that of the action in the first instance.

With these and still further objects in mind, the invention comprises further details of construction and operation, which are hereinafter fully brought out in the following description, when read in conjunction with the accompanying drawings, in which

Fig. 1 is a front elevation of a stage setting to illustrate one type of setting which may be used;

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1;

Fig. 3 is an elevation of the setting of Fig. 1;

Fig. 4 is a front elevation of a simple form of background, representing the equivalent of a theatrical backdrop, which may be used in combination with the setting of Fig. 1;

Fig. 5 is a side elevation of the same;

Fig. 6 is a top plan view of the same;

Fig. 7 is a diagrammatic view of one form of the electric circuit employed to actuate the device, and the microphone of said circuit positioned in operative relation to a so-called loud speaker of an ordinary radio set;

Fig. 8 is a diagrammatic view of another type of circuit;

Fig. 9 is a similar view of a still further type of circuit;

Fig. 10 is a side elevation of a support for the automatons interchangeably;

Fig. 11 is a central vertical section of the same in operative relation with one of the combined shifting and electrical contact elements;

Fig. 12 is a fragmentary sectional view of one of said elements per se;

Fig. 13 is a side elevation of a modified form of automaton base;

Fig. 14 is a top plan view of the same;

Fig. 15 is a front elevation of the same;

Fig. 16 is a fragmentary elevation of a modified form of combined shifting and contact element;

Fig. 17 is a vertical section on the line 17—17 of Fig. 16;

Fig. 18 is an elevational view of an automaton representing an orchestra ensemble;

Fig. 19 is a rear elevation of the same;

Fig. 20 is a front elevation of an automaton representing a banjo player;

Fig. 21 is a rear elevation of the same;

Fig. 22 is a front elevation of an automaton representing the concerted team action of a group of chorus girls;

Fig. 23 is a rear elevation of the same;

Fig. 24 is a front elevation of an automaton representing a vocal singer;

Fig. 25 is a rear elevation of the same;
Fig. 26 is a front elevation of an automaton representing a male dancer;
Fig. 27 is a rear elevation of the same;
Fig. 28 is a central vertical section of the same;
Fig. 29 is a front elevational view of an automaton representing a so-called "hula" dancer;
Fig. 30 is a rear elevation of the same;
Fig. 31 is a central vertical section of the same;
Fig. 32 is a front elevational view of a female dancer;
Fig. 33 is a rear elevation of the same;
Fig. 34 is a central vertical section of the same;
Figs. 35, 36 and 37 are diagrammatic views of as many different positions of the legs of said last-named dancer, which are assumed as the result of the construction here presented.

Referring to Figs. 1 to 17 inclusive, a representative form of stage or similar setting is shown as comprising forward and rear elements, characterized by bases 1 and 2, which elements are in practice designed to be positioned one in front of the other to provide an intervening space, for a purpose hereinafter described. The forward surface of the base 1 may be shaped in horizontal cross-section, so as to provide a central forwardly extending convex portion 3, representing the corresponding portion of the usual theatrical stage, and in opposite directions merging into recessed portions 4, and thence into diagonally forwardly extending wings 5. Said central and wing portions may be decorated in any desired manner, while above said wings rise the laterally opposite sides of the inverted U-shaped portion 6, which represents the procenium arch which surmounts the usual theatrical stage, and from which apparently hangs the representation 7 of a draped curtain. The upper surface of the base 1 is preferably interrupted by a recess 8, spanned by any desired arrangement or combination of clear or colored transparent material 9, thru which shine upwardly and rearwardly the rays from otherwise hidden lamps (not visible) within said recess. Slightly to the rear of each of the wings 5 and extending upwardly from the said base, are fixed and movable standards 10 and 11, the latter being pivotally mounted upon a vertical axis 12, while they are provided with vertically extending slots 13 and 14, respectively. The draped curtain 7 above referred to is in reality a substantially semicircular decorated member of cardboard or the like, the laterally opposite legs 15 of which are slidably positioned within the slots 13 of the forward pair of standards 10, while positioned in the slots 14 of the rearward standards 11 are upright decorated elements 16 representing lateral settings and adapted to be oscillated into angularly directed positions, as for instance those represented by the dot-and-dash lines 17. As hereinbefore stated, this construction is intended to represent any given stage structure and appearance, and may be varied in an infinite number of ways as desired.

Normally spaced to the rear of the base 1 is the base 2, having a recess 20 spanned by any desired arrangement or combination of clear or colored transparent material 21, within said recess there being any desired number or type of lamp or lamps (not visible) for illuminating the forwardly directed surface of a "back drop" 22, comprising a cardboard or similar plaque which is vertically slidably within, and is operatively supported by the sides of, slots 23 in the adjacent faces of a pair of upwardly extending posts 24, respectively secured to the laterally opposite rear portions of said base 2. Said posts are also provided with one or more additional slots 25 in which are also slidably positioned the laterally opposite portions 26 of a decorative element, which also comprises a central section 27 connecting said lateral portions. The rays of light from within the recess 20 normally shine upwardly and rearwardly upon said back drop 22 and the said decorative element 26—27. From the forward laterally opposite portions of said base 2, additional posts 28 extend, such posts having slots 29 in which are slidably positioned the laterally outer portions 30 of scenic elements, which if desired may also comprise inwardly extending portions 31, representing urns or other suitable objects, and overhanging portions 32, representing trees and branches of the same, in position forwardly of the back drop and decorative element 26—27. Said rear base 2 also is provided with an aperture 33 for a purpose hereinafter described, while within said base beneath said aperture is a solenoid similar to that shown in Fig. 11, or an electro-magnet as the case may be, as hereinafter described.

Referring specifically to Figs. 10, 11 and 12, there is here shown an automaton support, comprising a base member 35 from the lateral peripheral sides of which rise walls 36, surrounding a space within which is positioned a solenoid (or electro-magnet) 37, carried by a standard 38 which is in turn supported by said base member in any suitable manner. Said solenoid may be of any desired construction, but in the present instance is shown as comprising a tubular core 38a, which extends upwardly thru an aperture 39 in the top wall 40, which wall connects the upper portions of said side walls and incloses the space containing the solenoid, while said core provides an axial bore 41 within which is adapted to oscillate the armature 42, carried by a rod 43 which directly actuates the automatons, as hereinafter described.

The side walls 36 and top 40 are preferably formed of insulation material, while against one of said walls is positioned a contact plate 44, secured by a screw or other suitable means 45 to said base 35, and connected by means of a wire 46 to the solenoid 37. The opposite end of the coil of said solenoid is connected by means of a wire 47, and a screw 48, or other suitable attaching means, with a second and preferably resilient contact member 49, said contact members being separated from each other by suitable insulating means 50, and their free end portions being spaced apart, so as to receive terminal contact members 51 and 52, which form angularly downwardly directed terminal portions of an automaton shifting device.

This shifting device preferably comprises a hollow tube 53 of any desired length, thru which extends the duplex conductor cord 54, the two wires 55 and 56 of which are secured at suitable points to the respective contact members 51 and 52, which latter are spaced apart by a suitable insulating medium 57, and said contact members and intervening insulation as a unit extending into and being fixed with respect to the free end portion of the tube 53. With this construction the terminal portion of said shifting device may be inserted between the contact members 44 and 49 of the automaton support, as shown in Fig. 11, or may be removed therefrom at will. When in operative relation, it is obvious that by means of said shifting device, said support and any automaton carried thereby can be

readily shifted laterally into position between the forward and rear bases 1 and 2 of the stage replica, and also into view thru the arch of Fig. 1 or out of view laterally thereof. At this point it should be mentioned that the aperture 33 in the base 2 is positioned above a solenoid which may be similar to that hereinbefore described, and indicated by the dotted line 34, for actuation of said automaton as that hereinafter described, and as illustrated in Figs. 18 and 19.

Referring to Figs. 13 to 17 inclusive, a modified form of automaton base and shifting means is here shown as comprising a partially hollow base 60, containing a solenoid indicated by the dotted line 61 axially disposed with respect to the aperture 62, which extends thru the upper wall of said base, the terminal wires from said solenoid being connected to the base portions 63 of electric contact members, which comprise upwardly and thence reversely downwardly converging resilient terminal contact portions 64, which in turn project into the recess 65, extending downwardly into said base from the uppermost surface thereof. Said axial groove 66, extending longitudinally thru the upper portion of said base, is adapted to rotatably receive a cylindrical tube 67 of a modified form of shifting device. Thru this tube, which may be of any desired length, extends a duplex electric cord 68, the ends of the wires of which (not shown specifically) are normally connected to the radially inner end portions 69 of nails or brads, which extend radially outwardly thru a circular disc head 70, secured to the free end of the tube 67, so that the heads 71 of said nails or brads may come in contact with the terminal contact portions 64, upon rotating the shifting device in either direction from neutral position shown in Fig. 13, where said nails or brads are free of electrical contact with said contact members. With a device of this character, when an automaton base together with its particular automaton is operatively positioned within the stage setting, said automaton may be set into motion in synchronism with the electric reproduction from the radio loud speaker, as hereinafter described, by merely turning said shifting device as above mentioned, while said automaton and its base may be shifted into such operative position, or laterally away from such position, either while said automaton is in operation or idle, by merely moving said shifting device to and fro while the head 70 thereof is positioned within the recess 65 of said modified form of base.

Referring to Fig. 7, there is here shown a diagrammatic system of wiring for energizing the solenoid hereinbefore described, or as many such solenoids as may be desired. This system of wiring presupposes that a radio loud speaker 75 is electrically connected to a radio receiving circuit in accordance with accepted practice, so that the said loud speaker accurately reproduces the sound produced by the broadcaster, wherever he may be. Connected either in parallel with said loud speaker, or thru a suitable switch 76 actuated by non-electric vibratory means and in effectively close proximity to said loud speaker, is a pair of wires 77, which in turn are connected to a battery 78 and a double contact relay 79, a suitable impedance coil 80 being connected across said wires 77.

One of the contacts 81 of said relay is connected through the secondary coil 82 of a transformer which has its primary coil 83 connected to a suitable source of alternating current, such for instance as the lighting circuit of the average residence or office, while the opposite side of said secondary coil and the other of the relay contacts 84 are connected to the opposite ends of the solenoid coil 85, either directly, or thru the medium of an intervening shifting device, such as those hereinbefore described. A variable resistance 86, if desired, may also be connected across said relay contacts 81 and 84, in order to absorb any desired operation of the potential produced in said transformer secondary. With this construction and wiring arrangement, the sound vibrations produced by the loud speaker 75, even before reaching the listener positioned before said loud speaker and viewing of the automaton, in association with or separate from said stage setting, reach and impinge against the said switch 76, thereby sending current from the battery 78 thru the relay coil 79 and intermittently bridging contacts 81 and 84, so as to intermittently energize the solenoid coil 85, and operate the automation as hereinafter described.

In practice it has been found that by carefully adjusting the various elements involved, the operation of the automaton will be in minute accord with the sounds emitted by said loud speaker, as the latter reach the operator, the distance between the operator and the loud speaker with consequent lag in sound transmission being sufficient to correspond with the slight lag in time, due to the distance between the loud speaker and the said vibration actuated switch 76, the slight time loss in the operation and the relay, and the even more abbreviated time loss in the automaton itself.

Having thus described the mechanism by which the various types of automatons are operated in synchronism, and indirectly by the audible vibrations emitted by a radio loud speaker, talking machine, or other source of sound, even to the original speaker or singer direct, the construction of several types of automaton construction will now be considered.

Referring to Figs. 18 and 19, a plaque 90 is here shown as being so decorated and shaped as to represent an orchestra of several musicians, including three violinists 91 as representative of all of the musicians which can equally well be animated. Each of these violinists has an arm 92, which is separate from said plaque, but provided with an extension 93, representing a bow in operative relation to a violin 94, said arms being pivotally carried by pins 95, which extend thru said plaque and upon their opposite ends are connected to a common lever 96 of suitable shape, which lever is in turn connected thru a pivot 97 with a reciprocatory member 98, in turn provided with an iron armature 99, adapted to normally enter the aperture 33 and the solenoid 34 therebencath, when the plaque rests directly upon the rear stage base 2. Thus, as said solenoid is intermittently energized with varying degrees of current value, in accordance with varying intensities of the sound emitted by said loud speaker, or the like, the bow arms of the said violinists reciprocate to and fro to all intents and purposes in exact synchronism with the said sounds, and therefore in synchronism with the movements of the original actors in the broadcasting orchestra itself. This orchestra plaque it is obvious can be placed upon or removed from association with said solenoid and said stage setting at will, so that it is only present in operative position as long as orchestral music is being re-

ceived by said loud speaker, or being produced by a talking machine, or the like.

Referring to Figs. 20 and 21, there is here shown an automaton representing a banjo player, and comprising a body portion **100** to which is pivotally secured at **101** a lever, comprising one arm **102** which upon its forward face is decorated to represent one leg of the actor, the other lever arm **103** being connected by means of a pivot **104** to a reciprocatory member **106**, which in turn is attached to the rear surface of said automaton player or actor by means of a strap **106**, and carried upon its free end portion an iron solenoid **107**, adapted to enter the solenoid **34** or more especially a solenoid mounting of the type shown in Figs. 10 and 11, so that the automaton can be shifted into and out of operative relation with respect to the stage setting by means of either type of shifting devices hereinbefore described. In this case, there is pivotally secured to said body portion **109** a lever comprising an arm **110**, which upon its normally forward surface is decorated to represent the head of the actor, while the other lever arm **111** is made to represent the upper arm of the actor, there being pivotally secured thereto at the "elbow" **112** a "forearm" extension **113**, which slidably engages the "banjo" representation **113a** thru the medium of a pivot **114**. The lever arm **111** is pivotally connected at **115** with a link **116**, which is in turn connected thru a pivot **117** to the adjacent portion of the reciprocatory member **105**. Said last-named pivot also extends slidably thru a slot **118** in said body portion of the automaton, and connects with a "hand" and "forearm" unit **119**, the opposite end of which unit is connected by means of a pivot **120** with a second upper arm **121**, pivotally supported at the "shoulder" by means of a pivot **122**. By means of this construction, reciprocation of the member **105** causes no less than four quasi-natural movements of the automaton actor to take place, namely, movement of one leg, the head, one arm with respect to the shaft of the "banjo", and the other arm with respect to the body of the banjo, all in accordance with the natural movements of the original actor when playing a given musical selection.

In the dancing group shown in Figs. 22 and 23, the plaque **125** is shaped in silhouette to represent the bodies of several girls, with one leg and the head of each integral therewith, the oppositely directed arms **126** of the two end girls each comprising one "arm" of a lever, which is pivotally connected at **127** with "shoulder" portions of the said plaque, the other lever arm **128** in each case being connected thru a pivot **129** with a link **130**. Each link is pivotally connected at **131** with one of the opposite end portions of a connecting rod **132**, to intermediate portions of said rod there being connected thru pivots **133** extensions of levers **134** the forward faces of which are decorated to represent "legs", which are pivotally mounted upon said plaque by means of pivots **135**. At **136** said rod is connected also to a reciprocatory member **137**, which is slidably secured to the base portion **138** of said plaque by means of a strap **139** or the like, the lower free end portion of said member being provided as in other cases with a suitably shaped iron armature **140**, which is adapted to enter and be operatively associated with the solenoid of such an actuating unit as those hereinbefore described.

The automaton illustrated in Figs. 24 and 25 represents a vocal singer and comprises a body portion **142**, adapted as in previous cases to rest upon a supporting unit, while the lower end of a reciprocatory member **143** and its armature **144** enter an actuating solenoid as hereinbefore described. Said member is slidably secured to said body portion by means of a strap or the like **145**, while its upper free end **146** is normally adapted to extend over or free of an aperture **147**, to provide the appearance of the intermittent and alternate opening and closing of the mouth of a singer. To an intermediate portion of said member is secured a pivot **148**, which extends thru an elongated aperture **149** in said body portion **142** and connects both with and together the "hand-like" terminal portions of links **150**, representing "forearms", the opposite ends of said links being pivotally connected as at the "elbows" **151** with the "upper arm" links **152**, pivotally carried by pivots **153** at the "shoulders" of the automaton. Reciprocation of the member **143** in this case, under the influence of electric pulsations in the solenoid of the usual supporting unit, causes the "hands" to rise naturally as and in accordance with the opening of the "mouth", or otherwise as may be desired, depending upon the design and relationship of the parts involved. These automatons, as hereinbefore stated, may be actuated by means of an electrical hook-up such as that illustrated in Fig. 7 and hereinbefore described. On the other hand, modified forms of this hook-up may be arranged as shown in Figs. 8 and 9. In the former, Fig. 8, the switch **155** adapted to be actuated by non-electric vibratory means is connected by wires **156** to and thru the secondary winding **157** of a transformer, having a primary winding **158** connected to any suitable source of alternating current, and also to and thru the solenoid **159**, which is the same as the solenoid **85** in Fig. 7, and represents the solenoid **37** in Fig. 11. In the hook-up illustrated by Fig. 9 the microphone **160** is connected by a wire **161** to the secondary winding **163**, in turn connected to any suitable source of alternating current, the opposite sides of said microphone being connected by a wire **164**, to an A. C. relay **165** and thence by a wire **166** to the opposite side of said secondary winding.

The non-electric-vibration-actuated switch side of the secondary winding is connected by a wire **167** thru the relay contact mechanism, and by a wire **168** to one side of the solenoid **169** (equivalent to the solenoids **37**, **85** and **159**), the opposite end of said solenoid being connected by a wire **170** to the opposite side of said secondary winding **162**. A variable choke coil **171** is then connected between the said switch side of the secondary winding and the relay side of said solenoid **169**, in order to vary the ratio of the current passing thru said relay contact mechanism and said solenoid.

Returning to the various forms of automatons and to Figs. 26, 27 and 28 in particular, there is here shown an upright supporting member **175**, adapted to be detachably mounted upon and supported by the upper wall **40** of a solenoid unit, such as that shown in Fig. 11. The upper end portion of this member is extended angularly at **176** and is provided with a pin **177**, which extends thru an upright slot **178** in any suitable part of the body portion **179** of an automaton, such for instance as the representation of a male actor as illustrated. The body portion of this automaton is in a single piece, and to it by means of pivots **180** are connected leg sections **181** and **182**, in turn pivotally connected together at **183**,

the lower free end portions of said leg sections or units being prevented from coming together and overlapping by virtue of the fact that there extends laterally between them an angularly deflected extension 183a of the lower portion of the body 179. This lower portion of said body, not being colored, is intended to serve as a screen in order to obscure from the audience the mechanism to the rear thereof. To a suitable intermediate portion of the rear surface of the body 179, there is secured in any suitable manner the upper portion 184 of a reciprocatory member 185, the lower portion of which is secured to an armature 186, which is in turn adapted to enter and be vertically reciprocated under the influence of the usual solenoid beneath the supporting wall 40. In this instance the body portion 179, at substantially its uppermost limit has connected to it by means of a pivot 187 a laterally oscillatable head-and-hat (for example) extension 188, from which latter there extends integrally and divergingly downwardly the upper arm sections 189, to which are secured lower arm sections 190 by means of pivots 191. With this construction, oscillation of the actuating member 185 under the control of the guiding pivot 177 provides vertically reciprocatory movement of the body 179, and due to the lack of accurate balance of said head and arms, the units comprising elements 188 and 190 jiggle laterally in a manner representative of an actor when shuffling his feet in a well-known manner, the legs at the same time doing an in-and-out motion of similar character.

Referring to Figs. 29 and 30 and 31, a supporting member 195 is shown, the upper end portion 196 of which is provided with a pivot 197, slidably extending thru an upright slot 198 in the upper section 199 of the body portion of an automaton which also comprises a lower section 200, pivotally connected together by means of a pin 201. To said lower section is pivotally secured by pins 202 the leg units, in turn comprising upper leg sections 203 and lower leg sections 204, pivotally connected together by pins 205. A head-and-arm unit 206 is connected by a pivot 207 to the uppermost portion of the upper body section 199. With this construction, said upper body portion is restrained by the supporting member 195 and pin 197 to move primarily in a substantially vertical path, while the lower body portion 200, is actuated in a similar substantially vertical path by means of the actuating member 208, the upper portion 209 being directly connected to said lower body portion 200, while the lower end portion of said actuating member carries the usual arm joint 210 in normally cooperative relation with the solenoid beneath the supporting surface 40, as hereinbefore described. Having in mind therefore that the lower body portion 200 is oscillated substantially vertically, but without the path of the member 208 being guided, other than by the supporting member 195, the motion of the upper body portion 199, with the weight of the head-and-arm element 206 being carried by the uppermost portion of the body section, and the resulting actions of the automaton as a whole are very remarkably similar in nature to that of the so-called hula girl.

Referring to Figs. 32 to 37 inclusive, there is here shown an automaton representing a different type of dancer, primarily comprising a widened lower portion 215 representing a skirt, a portion of which is cut away to make visible the upper leg sections 216 and the lower leg sections 217 connected together by pivot pins 218. Said skirt portion is pivotally connected to a secondary forwardly positioned skirt section 220a, and it will be noted that the rear skirt section 215 and the auxiliary or forward skirt section 220a are spaced apart but are unitarily connected thru pivots 219 and 211. The laterally opposite upper portions of said skirt sections are then connected by pivots 211 to the lower arm sections 222, in turn pivotally connected at 223 to upper arm sections 224, which in turn comprise integral forwardly and laterally extending projections of a head section 225, which is pivotally connected at 226 to the uppermost portion of said body section 220. Connected to the body section 220 by means of a pivot 227, vertically slidable in a slot 228 in said body section, is the upper laterally directed end portion 229 of a supporting member 230, normally carried by the upper surface 40 which is positioned thru the solenoid and adapted to actuate the armature 231, carried by the lower end portion of an actuating member 232, the uppermost portion of which is in turn connected by suitable means to the rear surface of the rear skirt section 215. In the operation of this device, the oscillatory movement of the actuating member 232 moves the skirt 215 in a generally upward and downward path, restrained only thru the pivot connection with the body section 220, in turn under the lateral restraining influence of the pivot 227 carried by the supporting member 230. By connecting the laterally opposite portions of the skirt sections thru links or pivotally connected arm sections to the head element, and thereby to the upper portion of the body section, there is provided the compound action which with surprising faithfulness represents the actions of one form of dancer.

Figs. 35, 36 and 37 are presented to show suggestions of an almost unlimited number of relatively positioned upper and lower leg sections when this form of automaton is in operation. With respect to the automatons thus described, it should be distinctly noted that the transverse thickness of the same from front to rear has been greatly exaggerated in each case, in order to separate the various pivotally connected sections, whereas in practice the several sections are formed of paper or thin cardboard and the pivots are but relatively short members, such as a small type of eyelet in common use for pivotally securing two or more sheets of paper or cardboard members together.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having thus described my invention what I claim as new and desire to protect by Leters Patent, is:—

1. The combination of a pick-up device for electric impulses, with a solenoid, a source of current connected to said device and to said solenoid, an automaton, and an armature carried by said automaton, and normally maintained by gravity in spaced relation to one side of the centre of the magnetic field of said solenoid, movement of said armature under the influence of said solenoid in one direction and by gravity in the opposite direction, operating to positively actuate said automaton intermittently to varying degrees in proportion to and in accordance

with variations in the impulses received by said device.

2. The combination of a switch actuatable by non-electric vibratory means, with a solenoid, a source of electric current with connections to said switch and said solenoid, an automaton adapted to act in a manner similar, to an original actor, and an armature connected to said automaton, and normally maintained by gravity in spaced relation to one side of the centre of the magnetic field of said solenoid, movement of said armature under the influence of said solenoid in one direction and by gravity in the opposite direction, operating to positively actuate said automaton intermittently to varying degrees in proportion to and in accordance with variations in the impulses received by said device, and thereby in synchronism with sounds produced by said original actor.

3. The combination of a base, a solenoid carried by said base, an automaton also carried by said base, an armature connected to said automaton and normally spaced by gravity to one side of the center of the magnetic field of said solenoid, a source of electric current, and connections whereby said solenoid alternating with gravity positively actuates said automaton intermittently thru said armature in exact synchronism with variations in the current pulsations within the range of certain sound frequencies.

4. The combination of a sectional automaton, with a solenoid, an armature connected to a section of said automaton and normally maintained by gravity in spaced relation with and upon one side of the centre of the magnetic field of said solenoid, to positively actuate said automaton section in accordance with variations in the electric pulsations within said solenoid, a wave-sensitive switch operable within the range of certain sound frequencies, and connections for positively energizing said solenoid in direct accordance with variations in the electric waves received by said switch from an extraneous source.

5. The combination of a sectional automaton, the sections of which are relatively movable and are connected together, with a solenoid, an armature normally maintained by gravity below the centre of the magnetic field of said solenoid, means connecting said armature to a section of said automaton, to positively actuate said connected section, and thereby indirectly actuate the other sections, in accordance with variations in electric pulsations within said solenoid, a wave-sensitive switch operable within the range of certain sound frequencies, and connections for positively energizing said solenoid in direct accordance with variations in the electric waves received by said switch from an extraneous source.

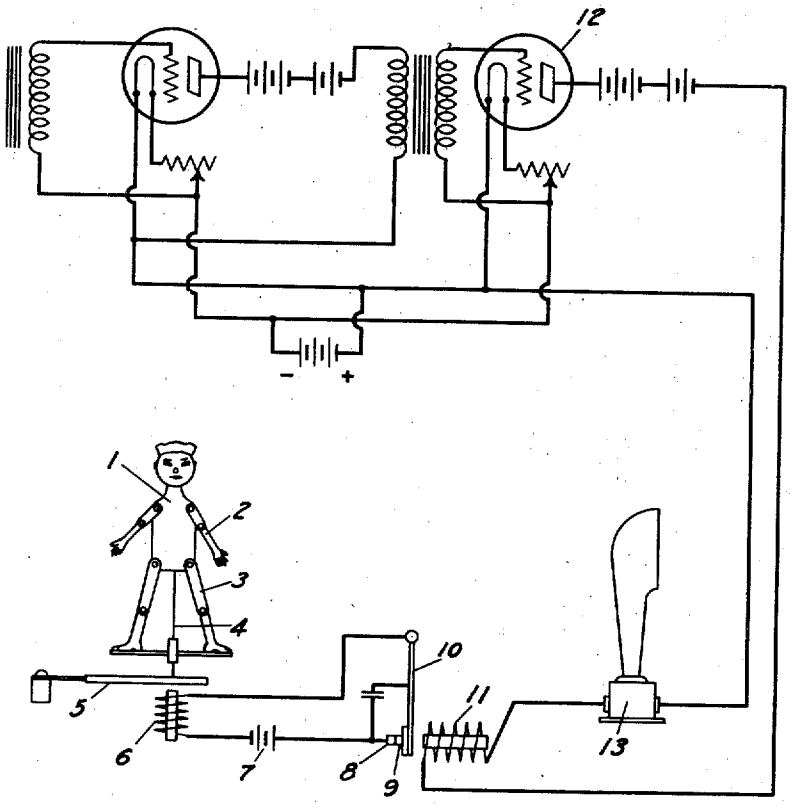
ELLIOTT BREWER.

Oct. 27, 1931. R. F. YATES Re. 18,239

ELECTRODYNAMICALLY CONTROLLED FIGURE

Original Filed June 10, 1925 2 Sheets-Sheet 1

Fig. 1



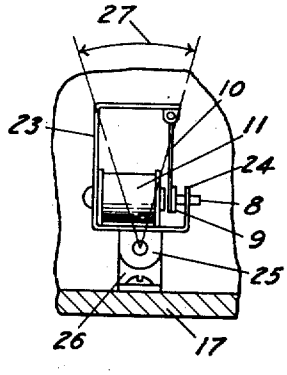


Fig. 5

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ELECTRODYNAMICALLY CONTROLLED FIGURE

Original Filed June 10, 1925 2 Sheets-Sheet 2

Fig. 2

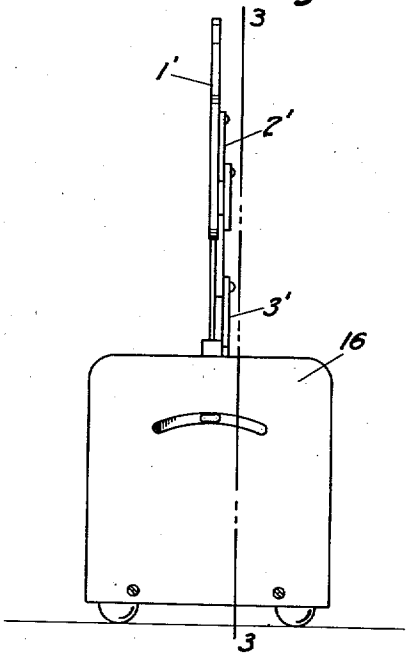


Fig. 3

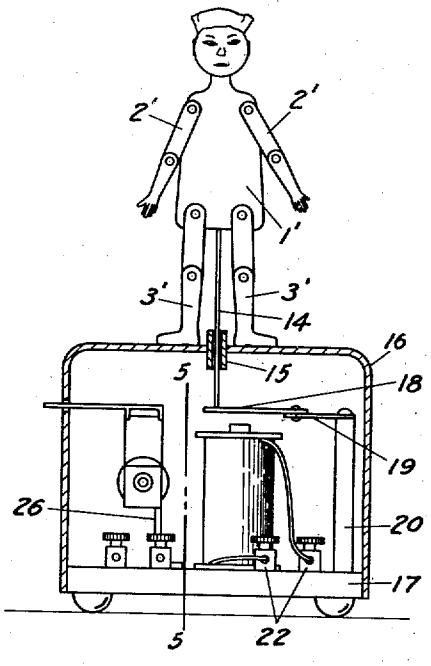
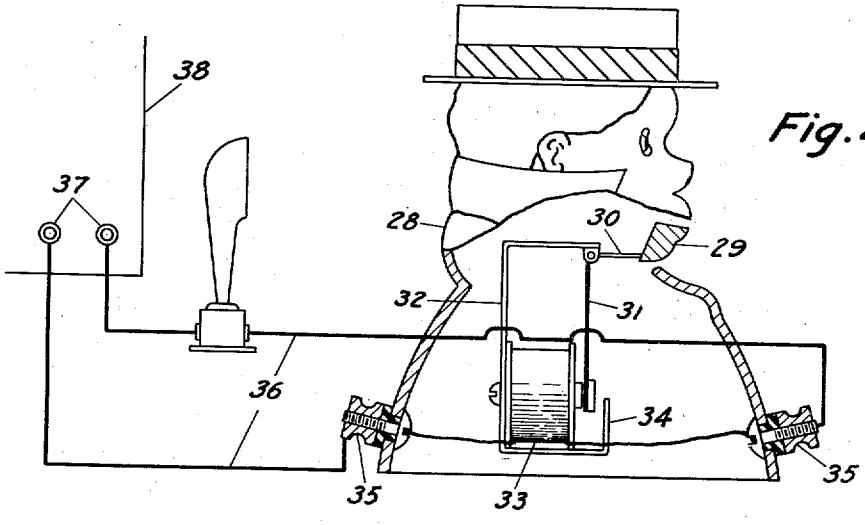


Fig. 4



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Reissued Oct. 27, 1931

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UNITED STATES PATENT OFFICE

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ELECTRODYNAMICALLY-CONTROLLED FIGURE

Original No. 1,726,283, dated August 27, 1929, Serial No. 36,207, filed June 10, 1925. Application for reissue filed August 26, 1931. Serial No. 559,580.

This invention relates to electrodynamically controlled figures and particularly to a dancing figure toy, or the like, used in advertising or for amusement or the like.

An object of the invention resides in providing a figure with which is connected suitable apparatus for electrical operation for setting the figure in motion, in response to the undulating or varying electric currents received in the apparatus which may result from voice or music being impressed upon the current flowing in the circuit to the apparatus.

Another object of the invention resides in providing a figure movably supported or having movable portions connected to suitable apparatus operated by the modulated current flowing in a circuit receiving signals or sounds, in order that the figure will be operated in accordance with the variations in the flow of the current in the circuit, resulting from the transmission and reception of the signals or sounds.

The invention is more fully and completely set forth in the accompanying drawings, and in the following detailed description and claims, directed to a preferred form of the invention, it being understood, however, that numerous variations in the practical embodiments of the invention may be made, without departing from the principle or scope of the invention as set forth therein.

In the drawings, forming a part of this application:

Figure 1 is a diagrammatic view showing principally the wiring diagram for a sound receiving and amplifying circuit adapted to operate the figure.

Figure 2 is a side elevation of a structure mounting the figure and containing the apparatus for receiving the electrical impulses to operate the same.

Figure 3 is a sectional view, taken on the line 3—3 of Figure 2.

Figure 4 is a side elevation, showing portions in section, of a slightly different and simplified form of figure, utilizing the same principle of operation as in the above illustrated structure for operating a portion of the figure.

Figure 5 is a sectional view, taken on the line 5—5 of Figure 3.

Referring particularly to Figure 1, a figure, such as a dancing figure or the like, is indicated at 1, which may have movable arms and legs 2 and 3 respectively, or other movable portions, according to the character of figure used. A connection is made, as indicated at 4, between the figure and a suitable vibrating or movable member 5, which may be in the form of an armature for an electro-magnet, as illustrated or of any other desired form or character, suitable in operation to produce movement of the figure for causing the figure to dance or in any other manner produce movements of the various movable parts thereof. An electro-magnet is indicated at 6, for operating the movable member 5, which, as illustrated, forms the armature of the electromagnet, while the terminals of said electromagnet are connected in an independent circuit with the source of energy 7, and the stationary and movable contacts 8 and 9 respectively, which are alternately engaged and disengaged through the movement of the movable contact 9 carried by the armature 10.

For this purpose, the stationary and movable contacts 8 and 9 and the armature 10 carrying the movable contact is provided to be suitably operated by the electromagnet 11, having the opposite terminals connected to the output circuit of an electron operated device 12, forming part of a suitable sound or signal amplifying unit. A suitable sound reproducing device may be included in the output circuit with the electromagnet 11, such as indicated at 13, which may be of any desired form or structure for reproducing the sound transmitted or received in the output circuit of the amplifying unit.

Figure 1 illustrates essentially the diagrammatic view of the wiring connection for a suitable receiver for amplifying and reproducing signals and sounds carried by a music or voice modulated current of irregular character, and it is to be understood that the circuit transmitting said signals or currents might well be used as a receiver circuit for controlling and operating the elec-

tromagnet 11 adapted to reproduce the essential variations through the operation of the armature 10, in the circuit including the electromagnet 6, for operating the movable member 5 to mechanically reproduce by vibration the variations or moduations of the received currents and operate the figure 1 to move in accordance therewith. In this way, it will be seen that the figure will be operated to move or dance in accordance with the variations of current in the output circuit of the amplifying unit. The same results would be obtained by including the electromagnet 11 in the output circuit or some other portion of the circuit of a sound amplifying device.

Figures 2, 3, and 5 illustrate particularly a mechanical embodiment of the idea heretofore described, in which the figure 1′ has movable arms 2′ and movable legs 3′ formed of jointed sections pivotally connected together and to the body of the figure. The body of the figure is supported on the rod 14 slidably fitted in the sleeve 15 carried by the housing 16 suitably connected to the base 17. The lower end of the rod 14 is rested on the armature 18, resiliently supported through the spring strip 19 on the post 20, carried by the base 17. Suitable electromagnet 21 is mounted on the base 17, with the pole piece positioned for actuating the armature 18 upon energization of the electromagnet, the terminals being connected in series with contacts 8 and 9 associated with armature 10, (Figure 5) and binding posts 22, so that the same may be interposed in circuit, as illustrated in Figure 1. It will be seen that by connecting the electromagnet 11, (Figure 5) in a circuit and impressing modulated or varying currents thereon, that the armature 18 will be operated to produce a movement of the figure, the vibration of which will cause the legs and arms to move on their pivoted joints, in accordance with the vibration of the armature 18, resulting from the current interruptions in the circuit containing the electromagnet 21.

In Figures 3 and 5 a substantially sensitive relay construction is illustrated, showing a practical embodiment of the electromagnet 11, armature 10, and stationary and movable contacts 8 and 9 respectively. A suitable frame is provided at 23 which supports the electromagnet 11 in the bottom portion thereof, and carries the stationary contact 8 in the upturn end 24, while the opposite end extends laterally and pivotally mounts for suspended swinging movement the armature 10. This armature normally maintains a vertical position by gravity, in suspension from the bracket 23, and is moved through the energization of the electromagnet 11, in accordance with current pulsations or variations, in the circuit in which the electro-magnet is connected. The lower side of the bracket carries a depending extension 25, which is pivotally connected with the bracket 26, carried by the base 17, so that the magnet and armature may be adjusted relative to the vertical to vary the position of the armature 10, under the action of gravity, between limits, such as indicated by the numeral 27, in order that the sensitiveness and distance that the armature is required to move to engage the stationary contact may be varied within desired limits.

Where it is desired to operate the figure directly from the output circuit of the amplifying unit, it has been found preferable to use a relay, similar to that illustrated in Figure 5, but minus the contacts, for directly operating the movable portions of the figure, such as is illustrated in the construction shown in Figure 4. In this figure of the drawings, a suitable form of figure structure is illustrated at 28, having a movable portion 29 which is directly mounted on the lateral projecting arm 30 of the suspended armature 31. The lateral projection of the bracket member 32 forms a pivotal suspending element or mounting for the armature 31, the lower end of which extends into proximity with one end of the relay coil 33 mounted in the bracket member, while the upturn end 34 of the bracket member limits the stroke of movement of the armature. The relay magnet is connected to suitable terminals 35 mounted on the body of the figure 28, with which are connected the wires 36 connected with the terminals 37 of the output circuit of a suitable amplifying unit 38. In operation, the fluctuation or variation due to varying the sound intensities impressed upon the current in the circuit including the relay 33 will move the armature 31 and correspondingly the movable part 29 of the figure, which will reproduce the current fluctuations and modulations in the output circuit of the amplifying unit.

From the above description, it should be understood that an electro-dynamically operated figure is produced which will be operated in accordance with the variations of current in the output circuit of a suitable electrical apparatus, which receives or transmits sounds or other forms of energy by the variations or oscillation of an electric current flowing in suitable circuits and apparatus which may include the modulated currents in radio or telephone circuits, so that the figure will mechanically reproduce these variations.

It is to be understood that this invention may be applied in many ways in connection with the production of advertising and amusement devices as well as toys adapted for general use, and that the structure of the elements for reproducing the electrical variations in mechanical movement may be

of any desired character of which the forms shown serve as illustrations.

What is claimed is:

1. In a device of the class described, a toy figure, and means for agitating said figure in direct response to the variations of an electric current varying at audio frequencies, said means comprising a vibratile armature mechanically connected to said figure, an electro-magnet associated with said armature, and means for electrically connecting said electromagnet with a source of variant currents of audio frequency.

2. In combination, a toy figure, and means for agitating said figure, said means comprising a radio-receiving set constructed and arranged to produce audio frequency electric currents in response to electromagetic waves, an electromagnetic device operatively connected with said receiving set, and means actuated by said electromagnetic device for agitating said figure in response to audio frequency currents received from said set.

3. In a device of the class described, a toy figure having loosely attached limbs, a support for said figure comprising a pivotally mounted armature, means connecting the figure with said support, and means directly responsive to variations in radio waves for vibrating said support, said vibrating means comprising an electromagnet and radio-receiving apparatus capable of sending variant electric currents through the coil of said electromagnet in response to variations in radio waves received thereby.

4. In a device of the class described, a radio-receiving set comprising apparatus for setting up oscillatory currents in response to radio waves and delivering corresponding currents varying at audio frequencies, in combination with an electromagnet having a flux variable by said variant current and a vibratile armature response to said variations of flux, a toy figure, and a support for said figure mechanically connected with said armature, whereby toy and support are vibrated by said armature.

5. A device of the class described comprising in combination, a toy figure, means for agitating said figure in direct response to the variations of an electric current varying at audio frequencies, means for converting radiant energy into variant electric currents of audio frequencies, and means for operatively connecting said agitating means with said converting means.

6. A device of the class described comprising in combination, a toy figure, means for agitating said figure in direct response to the variations of an electric current varying at audio frequencies, said means comprising a supporting member for said figure, a vibratile armature connected thereto, and an electromagnet associated with said armature; means for converting radiant energy into variant electric currents and means for operatively connecting said electromagnet with said converting means.

7. In a device of the class described, a toy figure and means for agitating said figure in direct response to the variations of an electric current, varying at audio frequencies, said means comprising a vibratable means operably supporting said figure, electromagnetic means including in part said vibratable means for operating the latter, and means for electrically connecting said electromagnet with a source of variant current of audio frequency.

8. In a device of the class described, a toy figure having loosely attached limbs and means for agitating said figure comprising means electrically operated for producing mechanical vibrations corresponding to variant currents of audio frequency and means operatively connecting said electrically operated means to said figure.

9. In a device of the class described, a toy figure and means for agitating said figure in direct response to variations of an electric current varying at audio frequencies, said means comprising a vibratable element operably supporting said figure and electrical means operating at audio frequency current variations for operating the vibratable element.

10. In a device of the class described, a toy figure and means for agitating said figure rhythmically in response to varying electrical currents whose characteristics may be the same as speech, music and phonetic vibrations comprising an audio frequency amplifying unit and an electromagnetic unit having a vibratable element operatively connected thereto, and means operatively connecting said vibratable element to said toy figure.

11. In a device of the class described, a toy figure and means for agitating said figure rhythmically in response to varying electrical currents whose characteristics may be the same as speech, music and phonetic vibrations comprising an electromagnetic unit having a vibratable element and means operatively connecting said vibratable element to said toy figure.

RAYMOND FRANCIS YATES.

July 25, 1933. S. B. ALLEN 1,919,188

ACTUATED FIGURE

Filed June 11, 1931

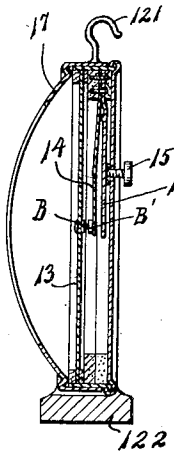

Fig. 1.

Fig. 2.

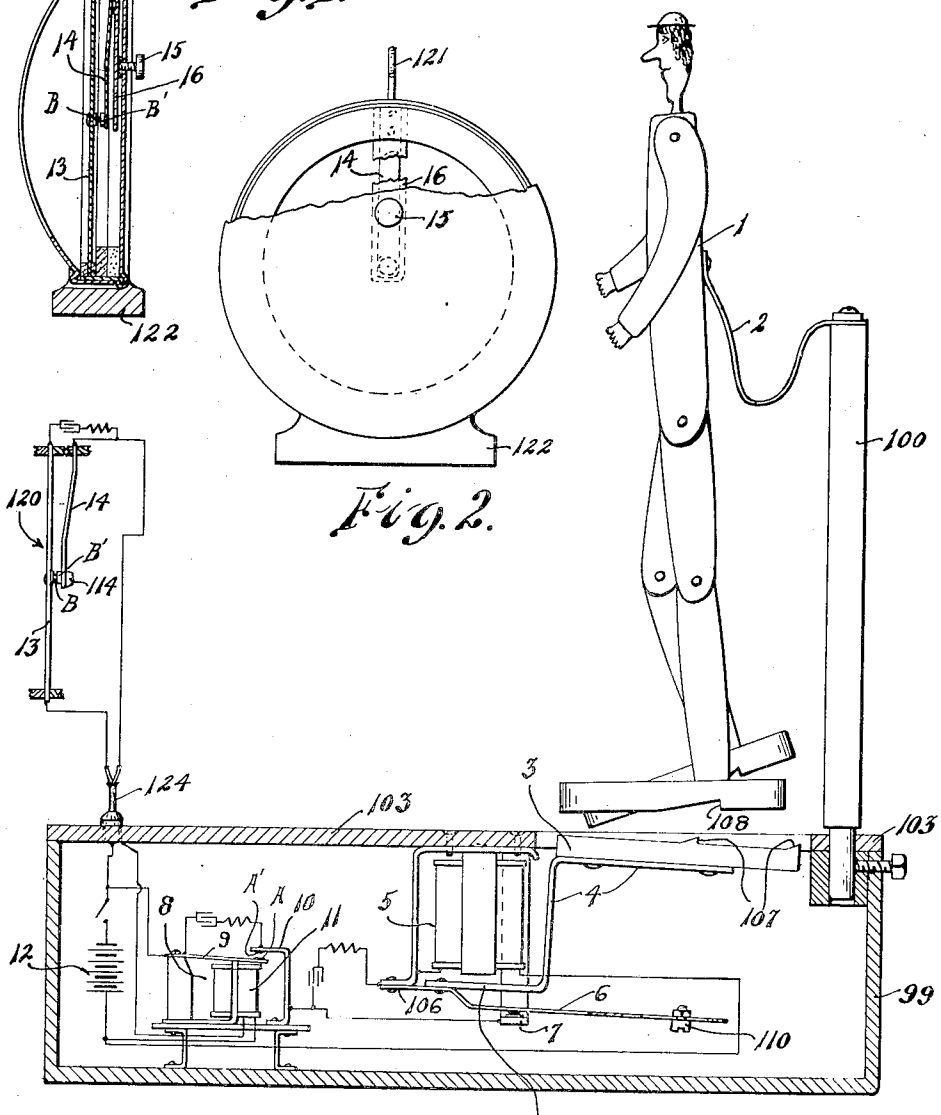

Fig. 3.

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Patented July 25, 1933 1,919,188

UNITED STATES PATENT OFFICE

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ACTUATED FIGURE

Application filed June 11, 1931. Serial No. 543,561.

This invention relates to improvements in actuated figures.

More particularly it relates to electro-mechanically animated figures, such as dolls, or the like. The animating current may be under any suitable control. In one embodiment it may be acoustically controlled, actuation of the figure depending upon sounds received. Using this embodiment for explanation, as here illustrated, this invention provides a figure, as for example a grotesque jointed figure, which is so constructed and so mounted and actuated that it responds by starting into action when the sound of music is heard, as, for example, by beginning to dance.

In efforts heretofore made to produce this result it has been thought necessary to connect apparatus to the electrical system which actuates a loud speaker or the like, by which a current of audio frequency actuates electrical apparatus which is supposed to actuate the figure. But none of the apparatus produced for this method of operation has been successful, so far as I am aware; and the present invention approaches the problem from the totally different direction of receiving its initiation acoustically, instead of electrically, or, it may be receiving some form of physical vibration which is other than sonorous, but which, in the form of the invention here illustrated, is first detected and becomes operative in the mechanism in the form of physical vibrations of a solid body through space, or of a plurality of solid bodies more or less interacting. In the latter case, where these bodies oscillate with a difference of period and with a difference of amplitude of vibration or of throw, an irregularly occurring beat or vibratory kick is produced which is slow enough in period to constitute a control of means effective for moving the limbs of the dancing body in a manner simulating realism. While electricity is used in the transmission and actuation of the apparatus, preferably with a make and break circuit, or with pronounced undultions, the electrical circuit and electrical operation is very different from that which is found in the transmission of sound by electricity or in the use of thermionic tubes; and the necessary or desired amplification is obtained by electro-mechanical means which make the use of thermionic tubes quite unnecessary. By this means a notably low cost of apparatus, sturdiness of construction, and great durability result, as well as the actuating advantages above stated, which make the invention as a whole capable of being manufactured and marketed at a very low price.

It is one feature of the invention that by the construction by which the figure is supported and actuated the electric current does not serve the function of supporting the figure, but merely of actuating it; and yet that, at the same time, the mechanical supporting means contributes to the motivated response, as regards direction and amplitude of motions of the figure, and thus amplifies and makes more fascinating the actuation which would result from the simple effect of the electric current alone.

These results are attained by providing the figure, which as here represented for illustrating the invention is a figure in the grotesque form of a man and consisting of a light wooden body with arms and legs jointed loosely, with counter balancing means herein shown as a spring support which is capable of holding the whole figure in such position that the feet fall by gravity to a certain level where they are within the stroke of a bouncing section of floor which is immediately under them and which is capable of delivering an upward stroke to the feet,—if it happens that the feet are at the moment within position to receive such stroke,—these strokes occurring at regular intervals, or as may be determined by the control portion of the apparatus. The upward stroke upon the feet lifts, to a certain extent, the load which is being carried by the spring support of the figure, therefore the figure as a whole rises and becomes animated from top to toe with a free and irregular activation which results from the interaction of the impulses of the bouncing floor and the elastic effect of the spring support.

The apparatus of the invention may be embodied in many forms, one of which is herein shown for illustrating the principles

of the invention by means of the accompanying drawing, in which,

Figure 1 shows acoustic apparatus, for receiving and responding to sound vibrations derived through the air, and for extracting therefrom occasional impulses at a frequency far less than audio frequency of vibration, this being in side elevation and in medial section;

Figure 2 is a face elevation of the same; and

Figure 3 is a side elevation of the apparatus as a whole, including the dancing figure, its actuating apparatus more or less in diagram, and the operating connections.

In the drawing the reference character 100 indicates a fixed support of a suitable sort, usually portable, on which the Figure 1 is sustained by a rather flexible spring 2. The figure is of such design as may be desired and in the present instance is that of a man made of wood or of other suitable light material, with joints at the shoulders, sides and knees; the feet being set stiffly on the lower legs, so that when a foot is kicked upward or forward the figure bends at the knee, and consequently at the thigh. The figure being in equilibrium, with the spring 2 sustaining its weight, an upward thrust on the feet lets the spring 2 lift the whole body higher, and this motion, with the interplay of inertia of the body and arms, sets the figure into motion in all of its parts.

The spring has a horizontal extent and also a vertical extent from its base in post 100 to a point where it is attached to the figure, which in this instance is arranged by forming a deep depression or U on the free end of which the figure is attached; and the point of attachment is in the midst of the back of the figure, about the middle of its body portion, so that a substantial part of the figure is above the point of attachment, although the center of gravity of the whole is below it. In consequence the figure not only can move up and down, but also can throw its body from its normal slight forward inclination to an inclination slightly backward, when suitably impelled from below.

A simulation 103 of a floor may be provided, which may conveniently be the front of a small cabinet 99 containing the apparatus later to be described and supporting the fixed support 100; and at the approximate level of this floor there is a bouncing section 3, which may also simulate the floor in appearance, but which really is mounted on an extension 4 of an armature 104 of an electro-magnet 5. This extension serves the double purpose of strengthening the electro-magnet and of extending the armature to a position which is convenient for holding the said bouncing section, for its coaction with the figure 1, and especially with the feet of that figure. It strengthens the magnet because by running alongside the spool of convolutions to the anchored end thereof it provides additional path for magnetic flux. The magnet 5 is set with its core vertical, and with its armature 104 moving vertically; and the extension of the armature which has the bouncing section 3 also moves vertically, or at least with a vertical component, while it also has a lateral component of motion, so that in fact, moving about the place 106 where the armature is anchored, it has a motion upward to the left, in Figure 3, at an angle of about 45° from the vertical, in which direction it delivers a sharp blow whenever the armature 104 is attracted by the magnet 5 and whenever any part of the Figure 1 is in position to receive such blow. Cooperating in this are ridges 107 on the bouncing section, and there may be corrugations or angles 108 on the under side of the feet of the Figure 1. The providing of these angles results in a particularly violent blow whenever one of the ridges happens to strike back of the heel, while the effect of the blow is less violent if the ridge happens to strike a part of the other surface of the foot, according to the angle at which that surface lies.

The vibrations of the armature 104, and therefore the blows of the bouncing section 3, are controlled and modified, as to frequency, strength of blow, etc., in any suitable way. They are particularly interesting when controlled acoustically through the electrical connections and with the mechanical retardant-of-period connections hereinafter described, for producing a periodicity adapted to the apparatus above described.

For the action of armature 104 an ordinary fixed stop 7 and vibrating contact spring 6 provide an interrupting switch in a constant current from battery 12. The spring 6 is prolonged and carries at its end a weight 110 which by its inertia modifies the period of vibration of the spring 6, and which can itself be changed in position or by substitution of another size, as may be desired for getting a particular effect.

The current for this vibrating system is controlled by a master circuit containing the closed-circuit relay 8, the tip of whose armature 9 has contact A which swings upward against contact A′ on stop arm 10 whenever current fails in its magnet 11, and thereupon the main current can pass from the battery 12 through the relay switch contacts A, A′, stop arm 10 and wires to make the break, 7, 6, of the main electro-magnet 5, and through that magnet back to the battery. The electro-magnet 11 of the relay 8 may preferably be of relatively high resistance, as for example about 500 ohms to operate on a six volt source of energy at the dry battery 12; and the circuit of this relay magnet 11 passes through an acoustic switch 120, comprising apparatus shown in diagram at

the left of Figure 3 and shown more fully in Figure 1, where there are contacts B, B′ which constitute the acoustic switch.

In this acoustic switch a vibratory plate or diaphragm 13 is mounted so as to receive sound waves through the air, and to vibrate tremulously in response to sound waves whether reaching it through air or other medium; and this plate carries in its middle portion the contact B. This vibration will naturally be at audio frequency, or at whatever frequency tremors are received.

The contact B′ is mounted on the free end of a light flexible strip or leaf spring 14 whose setting and path of vibration are such that the contact B′, when at rest, lies against the contact B. The spring 14 and its loading 114 are such that the contact B′ has a period of vibration lower than that of the contact B. Adjustment of the at-rest or zero position of the contact B′ can be had by means of the screw 15 and the adjustment spring 16, for moving the spring 14 toward or from the diaphragm 13.

In operation, the contact B′ being set lightly against the contact B, and the latter being at rest, a current flows from the battery 12 through the contacts B, B′ and spring 14 and relay 11 back to the battery, holding armature 9 with its point A away from A′, so that an extremely small current which does not deplete the battery much is flowing through the relay 11 and no current is flowing through the electromagnet 5. When the diaphragm 13 begins to vibrate, due to the receipt of sound vibration through the air, or indeed, of tremors from any source and through any medium as for example through its physical support, the oscillation of the point B knocks the point B′ away from it and out of contact, thus interrupting the current through the relay 11. The vibratory return of the contact B′ may restore the electrical connection, but as this contact has only a low period of vibration the intervals between contacts would become relatively considerable, particularly when the intensity of the received sounds has risen so that the smartness of the blows drives the contact B′ further away, or keeps it away for a longer time, thus reducing the portion of elapsed time during which current is flowing through the relay 11. This reduction is not dependent upon the cycle or period of vibration of any particular note which may be received through the air upon the diaphragm 13, but rather upon the intensity of the received sound. With the less current flowing through the relay 11, the armature 9 rises from the relay and makes the contact A′ which lets a current pass through the electromagnet 5 and vibrates the bouncing floor 3. As the undulations of sound loudness vary, there may often be temporary restorations of power of the relay to draw its armature 9 and to break the circuit A′, with restoration again at visual intervals. These intervals, however, may be so close as to be not observable except upon most careful observation. They produce the effect of still further departure from the vibrations of the dancing figure having a mechanical aspect. By striking the feet of Figure 1, the bouncing floor 3 upsets the equilibrium of the said figure, causing it to bob up and down, the jointed legs to swing, and generally to produce the semblance of a dance, which is roughly in time to the beat or variation in sound level or intensity of the actuating music, otherwise called rhythm.

The transmitter indicated by the diaphragm assembly 120, which is the ear or acoustic device which controls the electromechanical action of the figure, may be hung near or behind a piano, or may rest upon one. Also, it may hang in or near a phonograph or a radio receiving set, without requiring any electrical connection therewith, or it may be used as a voice pick-up to operate on speech or music made elsewhere in the room, so that talking or singing into the transmitter would cause the figure to dance.

Provision may be made for suitable adjustment of the parts relative to each other so as to produce the best or any desired operating effect, and the drawing illustrates conventional means to this end. Thus by raising the post 100 the relation between the bouncing floor 3 and the level at which the feet of the figure come to rest can be changed. To vary the timing of the make and break the weight 110 can be moved. The acoustic switch can be hung at a desired location for receiving sound, by supporting hook 121 or may stand on a table at its base 122, the wires which connect it with the cabinet being in a cord 124 so that it will not be influenced by a vibration of the figure or of the mechanism. The screw 15 can be set so that a proper relation exists between the diaphragm 13 and spring 14, and their respective contacts. It will be observed that whatever may be the pitch of the sound vibrations registered in the diaphragm they will be of an order recurring far more frequently than do the vibrations of the contact point B′, and that the effect is to deliver repeated blows of contact B against contact B′, driving off the latter, and letting currents flow through the relay 11 only upon the return of the latter and during the brief times of the re-contacts. Inasmuch as a change of amplitude of vibration, resulting from the hearing of a louder sound, is not supposed to change the rate of vibration, and inasmuch as all audio frequency vibrations of the diaphragm 13 are alike of an order much more rapid than vibrations of the spring 14, it might be thought that the hearing of music would not produce the effects stated, for the

contact B′ might be expected to return and make a re-contact in the same period of time whatever the softness or the loudness of the music, and without any practical difference, whatever may be its pitch. But I explain the observed result by reasoning that whether the amplitude of vibration of contact B be small or large, the actual physical distance through which B and B′ are in contact and before B′ is thrown off again is probably approximately the same whether the amplitude be small or large, but that when the amplitude is large this physical distance is a smaller proportion of the total arc of travel between contacts and is therefore a smaller proportion of the elapsed time between contacts (even though that time remains unchanged) and that therefore the quantity of electricity flowing through the relay 11, consisting of a summation of the fragments that flow during contacts of B and B′, is less when the amplitude of vibration of B is greater. And when this becomes sufficiently less so that the magnet 11 does not hold its armature 9, current can flow into the magnet 5 and actuate the figure. These periods of flow correspond to the periods when sound is loudest at the diaphragm 13, which ordinarily correspond with the beat of the music.

As the electro-magnet 5 and the bouncing floor 3 do not have ordinarily to sustain the weight of the figure they do not have to overcome its inertia when they leap into motion. They merely move its lower part; but when these are lifted they relieve the supporting spring, and the tension thereof which is thus set free is instantly applied to the lifting of the remainder of the figure. Thus the separating of these forces of support of actuation, contributes to the activity of response of the figure and to the amplitude and control of its animation. And the response can be further controlled by the spring which supports the figure.

I claim:

1. In a mechanically actuated figure wherein a spring suspends the figure, and a bouncing floor sets the figure into activity; the combination of said spring, engaging the figure at a point a substantial distance below the top of the figure, but above its centre of gravity; the said spring being shaped and mounted with resilience in both vertical and horizontal directions; and said bouncing floor, being mounted for movement around a point which is offset sufficiently from the plane of that portion of its surface which engages the figure to cause said portion during its bouncing strokes to move obliquely upward at a pronounced angle from the vertical, thereby intermittently engaging the figure, and coacting with the spring to lift and tilt up the figure when so engaging it.

2. In a mechanically actuated figure, wherein a spring suspends the figure, and a bouncing floor sets the figure into activity, intermittently engaging the figure, and coacting with the spring to lift a part of the figure when so engaging it, the combination therewith of an electro magnet and an armature thereof connected with said floor; a swinging switch controlling the circuit through said electro magnet; a vibratory tremor-detecting device; and electro-magnetic means intermittently actuated thereby for operating said switch and thereby the bouncing floor; the whole being organized with the vibrations of the vibratory device and switch continuing to control the bouncing floor after operation is initiated.

3. In an actuated figure having a body with jointed limbs and having a spring support, feet to be engaged, and a bouncing floor to engage them; the combination therewith of the said feet having a considerable horizontal extent, and the said floor mounted to have an oblique upward thrust on the feet; the coacting surfaces of the floor and feet having faces with angular variations from the horizontal general line of face, whereby variations in the violence of blow occur, according to relative position at instant of stroke.

4. The combination with a mechanically actuated figure of actuating means therefor comprising a magnet and armature; a floor thereover; a bouncing floor approximately in the plane of the said floor and mounted on the armature beside the portion of floor which is over the magnet; and a support about which the armature moves to and from the magnet, located below the magnet and on the other side of the magnet from where the bouncing floor section is, the bouncing floor being on an extension of the armature, which extension runs up beside the winding of the magnet, whereby the stroke of the end of said extension, to and fro about said point of support, is oblique with respect to the axis of said magnet and with respect to the plane of the floor.

5. A mechanically actuated figure, wherein a spring suspends the fig ire; and a bouncing floor, intermittently engaging the figure, and coacting with the spring to lift a part of the figure when so engaging it, sets the figure into activity; there being an electro-magnet and a vibratory armature thereof connected with said floor; said armature having a projecting spring arm actuated by and with the armature, on the projecting part of which spring is a vibration-retarding weight whereby the vibratory period of the armature becomes more nearly of the order of frequency of the vibratory period of the figure and its loose parts.

6. In combination, a dancing figure spring-mounted for continuous agitation; an electro-magnet with vibratory armature for agi-

tating the said dancing figure; a self-closing switch in the circuit of said electro-magnet; a master circuit having means to open said switch, by flow of current through the master circuit; an acoustic sound-detecting device, responding tremulously when affected by vibratory force; and, in the said master circuit, a make and break device of which the said tremulous device is a part; the whole being organized with the make and break device constituting a valve reducing the flow in the master circuit so much, when the detecting device is in a state of tremor and thereby operating the make and break, that the said switch opening means therein fails to open the switch; whereby the said dancing figure is continuously agitated by the first mentioned electro-magnet and armature during such period of tremor.

7. In combination, an element and mounting means therefor permitting said element to be continuously in agitation; an electro-magnet with vibratory armature for agitating said element; a self-closing switch in the circuit of said electro-magnet; a master circuit having means for opening said switch by flow of current in said master circuit; a vibration detecting device, responding tremulously when affected by vibratory force; and, in said master circuit, a make and break device of which the said tremulous device is a part; the whole being organized with the make and break device constituting a valve in the master circuit reducing the flow therein so much, when the detecting device is in a state of tremor, that the said means in the master circuit fails to open the switch; whereby the said element is continuously actuated during the period while the detecting device is in a state of tremor.

STRATFORD B. ALLEN.

June 13, 1933. J. S. HIGH 1,913,926

AMUSEMENT DEVICE

Filed April 17, 1931

Fig.1.

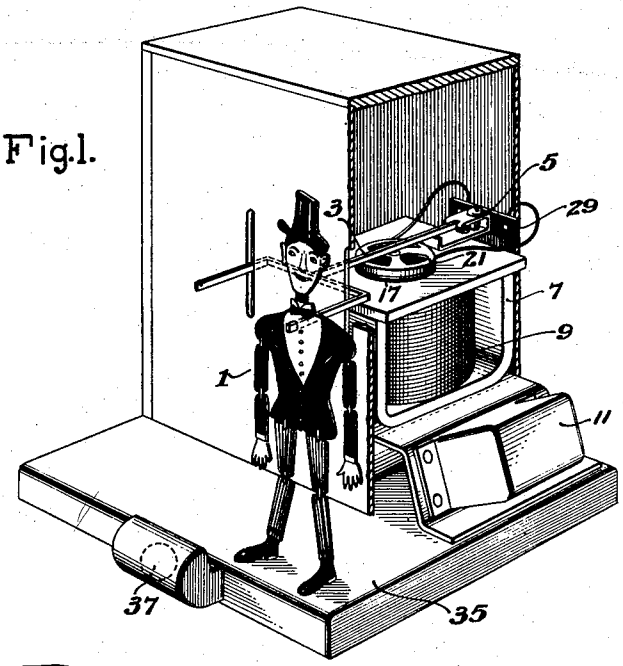


Fig.2.

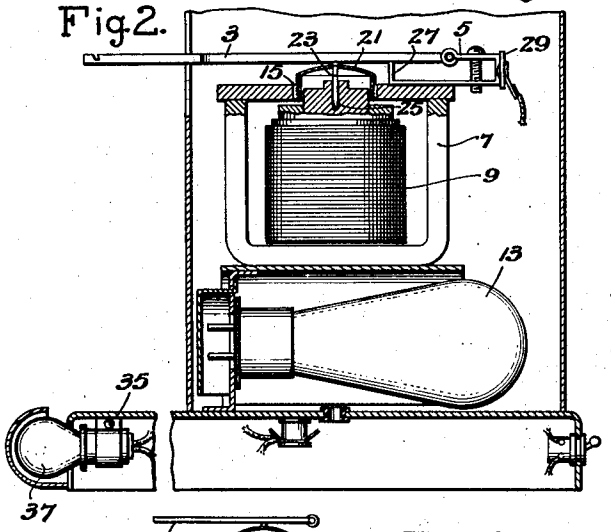


Fig.3.

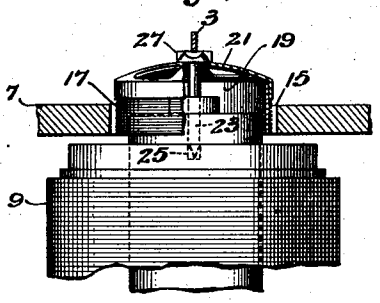
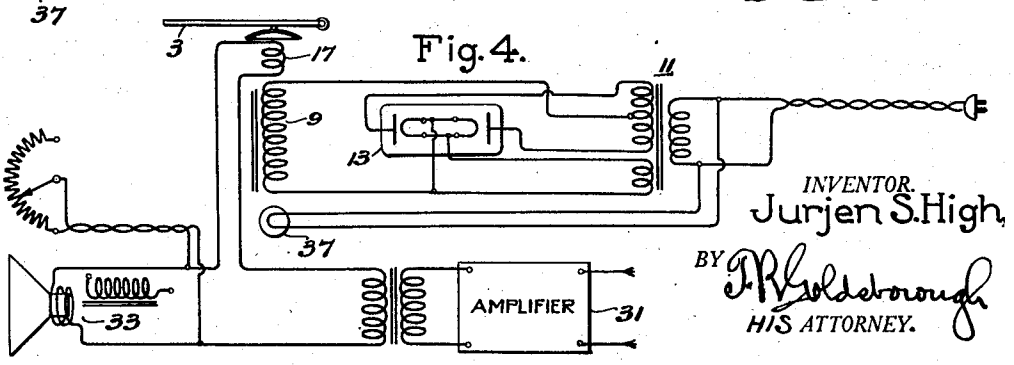


Fig.4.



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Patented June 13, 1933 1,913,926

UNITED STATES PATENT OFFICE

JURJEN S. HIGH, OF OAKLYN MANOR, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO RADIO CORPORATION OF AMERICA, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

AMUSEMENT DEVICE

Application filed April 17, 1931. Serial No. 530,818.

My invention relates to amusement devices and it has particular relation to animated toys and the like.

More specifically stated, my invention pertains to amusement devices of the type including a toy figure designed to imitate the movements of a performer when dancing in time to instrumental or other music, wherein the motive power for the toy and, also, the music is supplied from an amplifier that forms a part of an electric phonograph or of a radio receiver.

Rhythm in music is the regular recurrence of stress or accent. The rhythmic pulsation of a musical performance is usually indicated by the accentuated notes produced by low-pitched instruments and sometimes by an accentuation of the notes produced by higher pitched instruments. The audio frequency currents which issue from a radio or phonograph set amplifier when rhythmic music is played contain the rhythm in the form of trains of alternations of greater than average amplitude which occur at definite intervals.

A living person, when dancing, executes movements in accordance with the rhythm of the music and not, as a rule, in accordance with the occurrence of the separate notes sounded in the intervals between the beats. A toy figure, therefore, if the illusion of an actual performance is to be conveyed to the observer, should dance in time with the aforementioned trains of alternations and should be relatively unresponsive to the separate alternations.

I am aware that it has previously been proposed to actuate small toys such as dolls or marionettes by electric impulses derived from an appropriate source. Such devices are exemplified by British Patent #10,470 of 1912 and by U. S. Patents Nos. 171,216, 1,280,307, 1,726,283 and 1,726,294.

It is apparent, however, upon careful consideration of the devices proposed prior to my invention, that they fail to properly simulate the actual movements made by a living performer when dancing to instrumental music and that, consequently, the illusion conveyed by them to the observer is imperfect.

It is, accordingly, an object of my invention to provide an animated toy that shall effectively simulate the movements of a living performer.

Another object of my invention is to provide an animated toy capable of movement in synchronism with the rhythm of sounds derived from a phonograph record or the like.

A still further and more specific object of my invention is to provide a "dancing doll" or the like that shall be preferentially responsive to the rhythm of the sounds corresponding to electric currents utilized for its actuation and relatively unresponsive to unaccentuated notes.

A careful investigation of the problems to be solved in the design of a satisfactory dancing toy has indicated to me that the following requirements should be met:

(1) The device should be motivated by impulses conveyed by mechanism, aperiodic in character or having a long natural period, wherein the restoring force is slight;

(2) The currents representing the music should be rectified, or the driver for the toy should provide "motional rectification", in order that the device shall be preferentially responsive to the rhythm of the music;

(3) Means must be provided for exerting a choking effect on audio frequency currents of large amplitude and long duration.

The manner in which my improved amusement device meets the foregoing requirements will hereinafter become apparent.

An amusement device constructed according to my invention comprises a loosely jointed toy figure and means for conveying unidirectional impulses thereto in accordance with music. Preferably, the figure is so supported from a pivoted lever-arm that the weight of the lower limbs is partially carried by a platform or stage. Motion is imparted to the lever-arm from a driver, similar, in some respects, to a loudspeaker driver of the electrodynamic type, which may be supplied with energizing current from an audio frequency amplifier or from any other convenient source of fluctuating current.

The manner in which the device is rendered

preferentially responsive to the rhythm or tempo of the energizing current is an important feature of my invention; it results from the utilization of a new principle, insofar as the actuation of toy figures and the like is concerned, which principle was above designated "motional rectification".

The novel features that I consider characteristic of my invention are set forth with particularity in the appended claims. The invention itself, in its entirety, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawing, in which

Fig. 1 is a perspective view of an amusement device constructed according to my invention,

Fig. 2 is an end view of the motive device,

Fig. 3 is an enlarged view, partly, in section of a portion of the driver, and

Fig. 4 is a circuit diagram showing one manner in which my improved amusement device may be supplied with energizing potentials.

The apparatus illustrated in the drawing comprises a toy figure 1, constructed of light material such as cardboard or the like, which is suspended from the free end of a light lever-arm 3, the opposite end of which is loosely pivoted in a bracket 5. The limbs and head of the figure are loosely jointed. Preferably, the pivoted arm 3 is made of aluminum and it is slightly flexible both horizontally and vertically. The arm may be bifurcated, as illustrated, for the support of an additional figure (not shown).

The driver, which supplies impulses to the lever-arm, includes an electromagnet 7 having a field winding 9. Energizing potential for the field winding may be supplied from any available AC source. I find it expedient, however, to provide means whereby such potential may be derived from the nearest convenient lamp socket. The complete device, therefore, includes a power transformer 11 and a rectifier such as, for example, a thermionic device 13 of the type commercially known as Radiotron UX–280. A permanent magnet may, of course, be substituted for the electromagnet, if desired.

The poles of the electromagnet are so shaped as to provide a circular air-gap 15. A voice-coil 17 is disposed in the air-gap, the coil being wound upon an insulating form 19 which is suspended from a spider 21 of non-magnetic material. A centering pin 23 depends from the spider and slidably engages a small opening 25 formed axially in the upper end of the central pole piece. The pin, in the absence of current in the voice-coil, rests on the bottom of the opening to provide a rigid stop for downward movements thereof.

The bracket 5, in which the lever-arm is pivoted, is mounted upon the electromagnet, the said bracket being so disposed that the arm 3 extends diametrically across the upper surface of the spider 21, which surface is slightly concave, the axis of the concavity being parallel to the lever-arm.

An abutment device 27 is disposed beneath the lever-arm intermediate the spider and the pivot, the height of the abutment being such that the lever-arm and the spider are maintained out of contact with each other when no current flows in the voice-coil. It also lies within the scope of my invention to provide clearance between the spider and the lever-arm through the use of any other convenient means. In certain instances, also, depending upon the material from which the lever-arm is made and upon other factors, I find it advisable to omit the abutment device.

The terminals of the voice-coil are brought out to a suitable terminal board 29, mounted upon the electromagnet, for connection to any suitable source of current at audio frequency. Such source may be provided, as shown in Fig. 4, by an audio frequency amplifier 31 of an electric phonograph or of a radio receiver in which event the voice-coil may be connected either in series or in parallel with a loudspeaker 33 energized from the said amplifier, the mode of connection being determined by the relative impedances of the voice-coil and the source of the current.

The distance between the free end of the lever-arm 3 and a platform 35, provided with a foot-light 37, which forms a part of the device, is so correlated to the dimensions of the toy figure that, in the absence of energizing current in the voice-coil, the weight of the lower limbs of the figure is partially carried by the platform.

As was stated above, the successful operation of the electro-dynamically driven doll depends on not having any centering means which will exert a return force on the moving coil. When the coil of the ordinary electro-dynamic loudspeaker has a simple harmonic current flowing through it, the loudspeaker diaphragm executes corresponding simple harmonic motion. When a simple harmonic current flows through the coil which has been described for the doll mechanism the motion is far from simple harmonic.

In the first place, when in its rest position with no current flowing, the coil is held by gravity, with the pin resting on a rigid support, so that it is free to move upwards and not downwards. When operation starts, the force exerted by the coil will push the lever supporting the doll upwards for a certain distance and then as the current reverses the

coil will start on a downward path. This downward course is soon interrupted, however, by having the pin strike the base of its support and if the pin and base are elastic enough the downward momentum will be transferred into upward momentum, which will give the doll lever an additional impulse. It has been found that this change in momentum without loss is important for the most successful operation of the doll.

When material was placed in the pin support so as to eliminate some of the noise of operation with consequent absorption of energy at the time when the pin strikes the base, the response of the dolls was considerably less lively.

When a continuous wave of low frequency is impressed on the coil, it will be found that the coil will no longer remain in the gap but will rise and oscillate about a new position such that the larger part of its windings are outside of the stronger part of the magnetic field of the polepieces. This effect is made possible by the unconstrained vertical motion of the coil and is due to the tapering nature of the transverse magnetic field.

It will be found that the distance moved by the coil in an upward direction is considerably greater than the distance moved through in a single oscillation; thus, giving added motion to the lever 3. It will also be found that the amplitude of oscillation of the coil when it is in this raised position is much less than it would be if in the stronger part of the field. We thus have automatically two effects which are desired. The first is rectification action in which oscillations are transformed into motion in a single direction. The second is choking action in which oscillations which extend over periods of time are materially reduced in amplitude after the first few cycles.

The exact solution of the equations of motion of a cylindrical coil of wire in a transverse magnetic field, the strength of which decreases as we move outward in space, is very difficult. An approximate solution may, however, be obtained which is suitable for the purpose of explaining this action.

If m is the mass of the coil, x is the distance in a vertical direction measured from some fixed origin, $I_o \sin pt$ is the current through the coil, k, the length of wire in the coil, and $F(x)$ represents the transverse field strength as a function of the distance above the zero of coordinates, the equation of motion of the coil is then exactly as specified by:

$$m\frac{d^2x}{dt^2} = I_o k F(x) \sin pt - mg$$

where "g" is the gravitational constant.

As mentioned above, this equation is not amenable to simple mathematical treatment. The problem is simplified by assuming a field which decreases linearly rather than one which decreases in a general manner, and the essential points will be brought out if this assumption is made. $F(x)$ will be taken as the form $A - ax$. With this simplification, the above equation becomes:

$$mx = I_o k(A - ax) \sin pt - mg$$

This equation is still not in a form to give a simple solution and it is well to consider the physics of the motion before proceeding further with the mathematical solution. When a coil of the kind described moves in a magnetic field under the influence of simple harmonic currents, the upward acceleration is imparted to the coil during the lower half of the displacement cycle, while the downward acceleration is imparted to the coil during the upper half of the displacement cycle.

If the magnetic field is weaker in an upward direction, the downward acceleration given to the coil will not be as great as the upward acceleration and the coil will tend to move upward until it reaches a field of such intensity that the excess of upward over downward acceleration is balanced by the acceleration of gravity.

An approximate determination of the upward force on the coil may be obtained by assuming that it is constrained to move in a simple harmonic fashion over a single cycle and by computing the upward force on the basis of this motion. Suppose that A_o is the transverse field strength at the point x_o about which the coil is oscillating. If the field were uniformly of that strength the motion would be:

$$x = x_o - \frac{A_o k I_o}{p^2} \sin pt$$

The forces acting on the coil going through this motion in the non-uniform field are determined by substituting for x in

$$kI_o(A - ax) \sin pt$$

giving the result:

$$kI_o(A - ax_o) \sin pt + \frac{k^2 I_o^2 a A_o}{p^2} \sin^2 pt$$

The second term can be reduced to:

$$\frac{k^2 I_o^2 a A_o}{2p^2} - \frac{k^2 I_o^2 a A_o}{2p^2} \cos 2pt$$

representing a force upwards plus a second harmonic term.

If a more exact result were required, it could be obtained by substituting this motion in the equation and proceeding by a method of successive approximations. Since, however, the main facts are shown by this result, no attempt will be made for further refinement.

Inspection of the last equation shows that the upward force which is developed by the motion in the non-uniform field depends on

the amplitude of motion which would take place if the field were uniform and approximately of the strength of the field at the center of motion and on the rate of change of the field as determined in this case by the parameter, a. Since the amplitude of motion of a mass-controlled body is inversely proportional to the square of the frequency, much greater upward thrust can be expected at low frequencies. That this result is correct is shown by an experiment in which a current of constant magnitude but of varying frequency is imposed on the coil. As the frequency is lowered, the coil oscillates with more and more of its windings out of the field structure. At any frequency it will move upwards until its amplitude of motion is so reduced due to oscillating about a position in a weaker field that the upward force generated due to the motion will just equal the downward force due to gravity.

In this manner a succession of harmonic waves which are really of too high a frequency to give the dolls a desirable motion are translated into an upward motion of the coil. After the upward motion has taken place the coil is in a weaker magnetic field so that its oscillation due to musical frequency components is much reduced and miscellaneous undesirable rattles due to the same motion are, therefore, eliminated. The motion of the coil coincides with rhythm frequency rather than voice frequency.

In addition to conveying vertical impulses to the figure still further realism may be obtained by causing the said impulses to have a component directed at an angle to the vertical movement of the voice-coil. This result is attained by the concavity provided in the upper surface of the spider.

It will be apparent from the foregoing description of my improved amusement device that the "motional rectification" provided by the driver constitutes a radical improvement in the art of animated toys. The impulses conveyed to the toy figure are unidirectional, they have sufficiently high amplitude to motivate the figure, and they are variegated in character. As a consequence, the arms and head of the figure move in perfect synchronism with the tempo of the music, while the lower limbs execute a sort of shuffle interrupted at intervals by eccentric dance steps corresponding to the more violent impulses conveyed to the lever-arm. Objectionable noises are not present, yet there is a slight clicking sound which very effectively simulates the effect of tap-dancing.

Although I have illustrated and described a specific embodiment of my invention, numerous modifications thereof will be apparent to those skilled in the art to which it pertains. My invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

I claim as my invention:

1. In combination, a magnetic structure defining an air-gap, a movable conductor disposed in said gap, a pivoted support for a toy figure and means for conveying motion from said movable conductor to said support, said motion-conveying means being biased away from said support in the absence of current in said conductor.

2. The combination as set forth in claim 1 characterized in that the toy figure is connected to the pivoted support at a point adjacent to the center of gravity of the said figure.

3. The combination as set forth in claim 1 characterized in that the weight of the movable conductor and the motion-conveying means supplies the biasing force.

4. The combination as set forth in claim 1 characterized in that the motion-conveying means is so constructed as to convey impulses to the pivoted support in a direction at an angle to the direction of movement of said means.

5. In combination, a loosely jointed toy figure, means providing a platform on which said figure is adapted to stand, and means for conveying to said figure unidirectional impulses in accordance with rhythm in music, said means including a magnet having an air gap, a coil having a position of rest from which it is freely movable in said air gap in one direction, a circuit connection with the coil for applying directly thereto a fluctuating electric current corresponding electrically to rhythmic musical sounds, a spider arranged to carry said coil, a pivoted resilient lever arranged to contact with said spider when said coil moves in said air gap and being adapted to pivotally support said toy figure in operative relation to said platform.

6. In combination, a loose-jointed composite toy figure comprising articulated limbs and body members, a platform, a pivoted lever providing a suspension means for said figure, stop means contacting with said lever for normally so holding the figure with respect to said platform that the weight of the lower limb members of the figure is partially removed from the joints for the said limbs, a coil, means providing a magnetic air gap in which said coil is freely movable in one direction from a position of rest, a rigid stop arranged to prevent movement of the coil in the opposite direction, means connected with the coil for contacting with the pivoted support for the figure to provide an intermittent driving connection therewith, and a circuit connection with the coil for applying directly thereto a fluctuating electric current corresponding electrically to rhythmic musical sounds.

7. In combination, a loose-jointed com-

posite toy figure comprising articulated limb and body members, a platform, a pivoted lever providing a suspension means for said figure, a coil, means providing a magnetic air gap in which said coil is freely movable in one direction outwardly thereof from a position of rest, a rigid stop arranged to prevent movement of the coil in the opposite direction, means connected with the coil for contacting with the pivoted support for the figure to provide an intermittent driving connection therewith, a spider arranged to carry said coil, said lever being arranged to contact with said spider when said coil moves out of said air gap and being adapted to pivotally support said toy figure in movable contact relation to said platform, and said coil having terminals adapted to receive directly a fluctuating electric current corresponding electrically to rhythmic musical sounds.

8. An apparatus for visibly indicating rhythmic pulsations in audio frequency electrical currents corresponding electrically to rhythmic musical sounds, including in combination, an elongated lever arranged to lie substantially horizontally and pivoted adjacent to one end thereof, a loosely jointed figure adapted to be animated by vertical motion provided with an articulated connection with and adapted to depend from the opposite end of the lever, a platform means for normally partially supporting the figure in cooperation with the lever, a movable electrical coil, means providing a magnetic field from which the coil is movable in one direction from a position of rest therein, means providing a driving connection between the coil and the lever for raising the lever when the coil is energized, stop means for the lever and independent stop means for the coil for limiting movement of the lever to a single direction in which the coil drives the lever, and circuit means for applying directly to the coil audio frequency currents to be translated by said apparatus into motion of said figure.

9. In apparatus for visibly indicating rhythmic pulsations in audio frequency electrical currents corresponding electrically to rhythmic musical sounds, including in combination, an elongated lever arranged to lie substantially horizontally and pivoted adjacent to one end thereof, a loosely jointed figure adapted to be animated by vertical motion provided with an articulated connection with and adapted to depend from the opposite end of the lever, a platform means for normally partially supporting the figure in cooperation with the lever, a movable electrical coil, means providing a magnetic field from which the coil is movable in one direction from a position of rest therein, means providing an intermittent driving connection between the coil and the lever for raising the lever when the coil is energized, stop means for the lever and independent stop means for the coil for limiting movement of the lever and coil from a normal position of rest to a single and the same direction in which the coil drives the lever, said stop means for the lever being adjacent to the pivoted end thereof and the stop means for the coil being arranged to permit the coil to move freely out of the magnetic field in said single direction and said driving connection between the coil and the lever being such that the lever is movable away from the stop means provided therefor independently of movement of the coil, and circuit means for applying directly to the coil audio frequency currents to be translated by said apparatus into motion of said figure.

10. In combination, a toy figure, means for deriving unidirectional impulses from fluctuating electric current, and means for utilizing said impulses to animate said figure, said impulse deriving means including elements constituting a magnetic circuit having an air gap wherein is disposed a movable conductor for the fluctuating current.

11. In combination, a mechanical device to be animated, means providing a magnetic air gap, means, including a movable coil in said air gap, stop means for holding the coil against movement through said air gap in one direction and a circuit connected with said coil for applying fluctuating electric currents thereto, for applying forces to the coil to move it with non-uniform linear motion alternately away from and toward said stop means in response to said currents when flowing in the coil, whereby said force moving the coil away from the stop means is greater than the initial force moving the coil toward the stop means, and means for intermittently applying said forces to said device through movement of said coil.

12. In combination, a mechanical device to be animated, means for producing a magnetic field, means, including a movable coil in the field, an alternating signal current supply circuit connected with said coil and stop means for the coil limiting the movement of said coil from said field to one direction, for causing a reaction between said coil and said magnetic field in response to an alternating signal current applied to said coil, whereby the force of the reaction is applied to the coil to move it alternately away from and toward said stop means, and whereby said force moving the coil away from the stop means is greater than the initial force moving the coil toward the stop means, and means for applying the moving force of said reaction to said mechanical device.

13. A device for producing motion corresponding to alternating signal currents, comprising in combination, a field magnet, a coil lying in the field of said magnet and being movable therein in response to said signal currents, a stop means for limiting in

one direction the movement of the coil in the magnetic field, circuit means for applying alternating current signals to said coil to alternately move said coil away from and toward said stop means, whereby said force moving the coil away from the stop means is greater than the initial force moving the coil toward the stop means, a mechanical device to be animated, and means providing an articulated connection between the coil and said device.

In testimony whereof, I have hereunto subscribed my name this 9th day of April, 1931.

JURJEN S. HIGH.

PATENT SPECIFICATION

334,373

Application Date: Aug. 27, 1929. No. 26,056/29.

Complete Left: Feb. 11, 1930.

Complete Accepted: Sept. 4, 1930.

PROVISIONAL SPECIFICATION.

A Mechanical India Rubber Figure.

I, EDWARD WINCOTT, of English nationality, 24, Gresham Road, Brixton, London, S.W. 9, do hereby declare the nature of this invention to be as follows:—

A figure of solid india rubber or substitute therefor is mechanically worked by means of a steel rod bent in the center and placed in the figure when rubber is in liquid form. Part of the rod projecting at the bottom of figure is inserted into a pedestal and is attached to a gear wheel mechanically revolved causing the figure to produce a motion and various movements similar to the human being, said figure having no visible joints.

27th day of August, 1929.

EDWARD WINCOTT.

COMPLETE SPECIFICATION.

A Mechanical India Rubber Figure.

I, EDWARD WINCOTT, of 24, Gresham Road. Brixton, London, S.W. 9, a British Subject do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to mechanical toys, advertising devices or the like, and has for its principal object to provide an improved, simple and effective construction of mechanically-actuated figure which, owing to the absence of visible articulated joints and to the construction of mechanical means employed for imparting movements to the figure, has a much more lifelike appearance than the mechanical figures heretofore in use.

According to the present invention, the improved mechanical toy, advertising device or the like comprises a figure of solid indiarubber or equivalent resilient substance having no visible articulated joints and having incorporated thereinto a bent wire, rod or tube adapted, as by means of gearing located in a base member or pedestal, to be rotated relatively to the figure and to cause the latter to execute more or less lifelike movements. The lower portion of the wire, rod or tube is straight and may be guided, for example, in a stationary tube or the like fixed to the base member or pedestal so that the wire, rod or tube rotates about a fixed axis. An auxiliary member or members may be incorporated into the figure and driven from the main wire, rod or tube, such auxiliary member or members being adapted to cause movements of the limbs or local parts of the figure. For instance, an auxiliary member may be provided comprising a wire, or the like fixed to a sleeve loosely engaging a part of the main wire, rod or tube inclined relatively to the axis of rotation thereof. When a tubular member is provided, this may be adapted to house a flexible shaft for driving an auxiliary member or members, and such auxiliary member or members may be arranged to effect movement of eyes, lips or other parts of the face of the figure.

The invention is hereinafter described by way of example with reference to the accompanying diagrammatic drawing, in which:—

Figure 1 is a part sectional elevation illustrating one construction of figure according to the invention;

Figure 2 is a view similar to Figure 1, illustrating the manner in which the figure moves on rotation of the bent wire, rod or tube;

Figure 3 is a part sectional front elevation of a modified construction of figure having auxiliary moving members driven from the main wire, rod or tube; and

Figure 4 is a sectional side elevation showing on an enlarged scale a head of a figure according to the invention provided with auxiliary members for effecting movements of the eyes and lips.

In carrying the invention into effect according to one construction and with

reference to Figures 1 and 2 of the accompanying diagrammatic drawing, the figure *a* is made of solid rubber or equivalent resilient substance, for example, by moulding such substance while in a liquid or plastic condition. By constructing the figure of rubber or the like, it will be understood that the figure is capable of movements within wide limits without the necessity of providing any visible articulated joints, while, owing to the resilient flexible character of the substance of which the figure is constructed, movements of one part of the figure are distributed to other parts and result in their lifelike movements.

As shown, the figure *a* is fixedly mounted upon a base member or pedestal *b* and has incorporated thereinto a guiding tube *c* fixed to the base member *b* and a wire, rod or tube *d* the lower portion of which is straight and extends through the tube *c*, while the upper portion is, as shown in the drawing, bent or curved in any suitable manner. The lower end of the wire, rod or tube *d* extends downwardly beyond the tube *c* for the connection of a bevel gear wheel *e* meshing with a bevel pinion e^1 mounted upon a shaft *f* which may be fitted with a crank handle or may be connected by any suitable means to driving mechanism, such as the turntable spindle of a gramophone. The upper bent portion of the wire, rod or tube *d* although incorporated into the solid rubber, is capable of rotating with respect to the figure and consequently, when the wire is rotated through half a revolution from the position shown in Figure 1 to the position shown in Figure 2, the figure moves somewhat in the manner shown.

In the modified construction shown in Figure 3, the tube *c* may extend upwardly in one of the legs of the figure *a*, such tube *c* and the leg into which it extends, being fixed to the base member or pedestal *b*. The wire, rod or tube *d* is bent so as to provide a portion d^1 which is disposed at an inclination with respect to the axis of the tube *c*, and a short sleeve *g* or the like is arranged to engage loosely with this portion d^1 of the wire, rod or tube *d*, such sleeve *g* being fitted with a wire g^1 or the like which extends downwardly to a suitable position in the other leg of the figure *a*. It will be readily understood that as the wire, rod or tube *d* is rotated, the wire g^1 or the like will be caused to cant upwardly, while at the same time the body of the figure *a* moves towards the right, thus giving the effect of kicking. Movement may be imparted to the arms of the figure by means of bent wire members *h* incorporated into the arms and driven by means of bevel pinions h^1 meshing with a bevel gear wheel d^2 mounted upon the wire, rod or tube *d*, such bevel gearing being accommodated within a box *i* through which the wire, rod or tube *d* extends and which is moulded into the figure. As in the previous construction, the drive may be effected by the bevel gear wheel *e* and the bevel pinion e^1 driven by the shaft *f*.

As shown in Figure 4, the main bent member *d* extending into the head of the figure *a* may be of tubular form to accommodate a flexible driving shaft *j*, fitted at its upper end with a bevel gear wheel j^1 driving bevel pinions *k* mounted upon the ends of shafts k^1 which at their outer extremities have bent portions k^2 upon which artificial eyes k^3 are fixed, for example, somewhat as shown in the drawing. The bevel gearing j^1, *k* is accommodated in a box or casing *l* moulded into the head of the figure. Obviously, at the same time as the member *d* causes the head to move bodily, the rotation of the member k^1 will cause the eyes to roll round. Movement of the lips or other parts of the face may be similarly effected. Conveniently, the member k^1 may be formed with a cranked portion k^4 accommodated in a box or casing l^1 through which the member k^1 extends, a member *m* being pivoted to the crank and extending through a slot in the box or casing l^1 and thence downwardly into the upper lip of the face so that as the member k^1 rotates, the lips are opened and closed.

It will be understood that the invention is not limited to the particular details of construction hereinbefore described. For example, in the case of a figure such as shown in Figure 3, two bent wires, rods or tubes *d* may be arranged to extend up the respective legs of the figure, while the auxiliary movement-effecting members may be arranged and driven in any other suitable manner.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A mechanical toy, advertising device or the like comprising a figure of solid indiarubber or equivalent resilient substance having no visible articulated joints, and having incorporated thereinto a bent wire, rod or tube adapted, as by means of gearing located in a base member or pedestal, to be rotated relatively to the figure to cause the latter to execute more or less lifelike movements, substan-

tially as described.

2. A mechanical toy, advertising device or the like as claimed in Claim 1, wherein the lower portion of the wire, rod or tube is straight and is guided in a stationary tube or the like fixed to the base member or pedestal so that the wire, rod or tube rotates about a fixed axis.

3. A mechanical toy, advertising device or the like, as claimed in Claim 1 or in Claim 2, wherein an auxiliary member or members is or are incorporated into the figure and adapted to be driven from the main wire, rod or tube and to cause movement of the limbs or local parts of the figure.

4. In a mechanical toy, advertising device or the like as claimed in Claim 3, the provision of an auxiliary member comprising a wire or the like fixed to a sleeve loosely engaging a part of the main wire, rod or tube inclined relatively to the axis of rotation thereof, substantially as described.

5. A mechanical toy, advertising device or the like as claimed in any of the preceding claims, wherein the main rotatable member is of tubular formation and is adapted to house a flexible shaft for driving an auxiliary member or members.

6. A mechanical toy, advertising device or the like as claimed in Claim 5, wherein the auxiliary member or members is or are arranged to effect movement of eyes, lips or other parts of the face of the figure.

7. The improved mechanical toy, advertising device or the like, substantially as hereinbefore described with reference to the accompanying diagrammatic drawing.

Dated this 11th day of February, 1930.
F. J. CLEVELAND & Co.,
29, Southampton Buildings,
Chancery Lane, London, W.C. 2,
Agents for the Applicant.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1930.

Fig. 1.

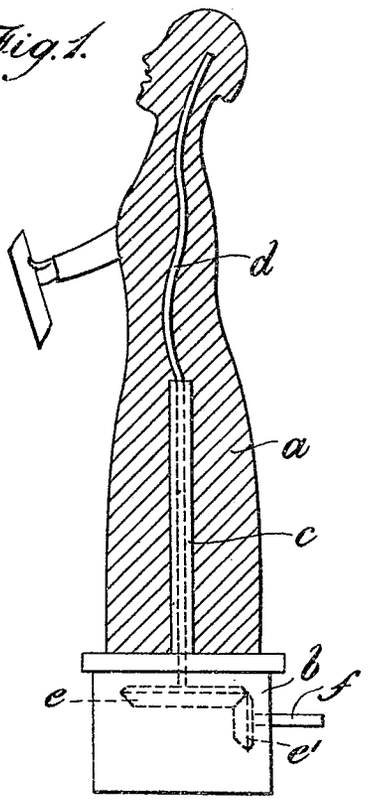


Fig. 2.

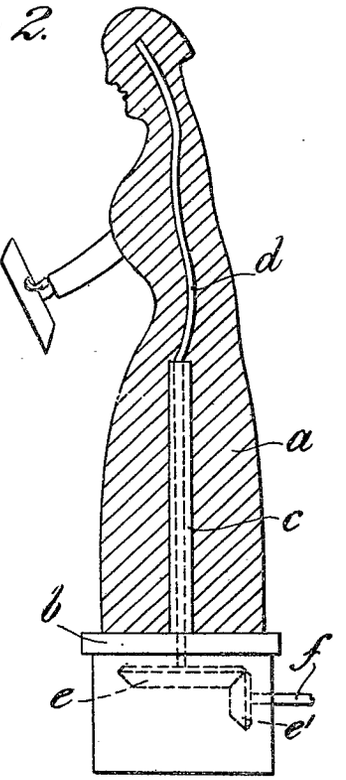


Fig. 3.

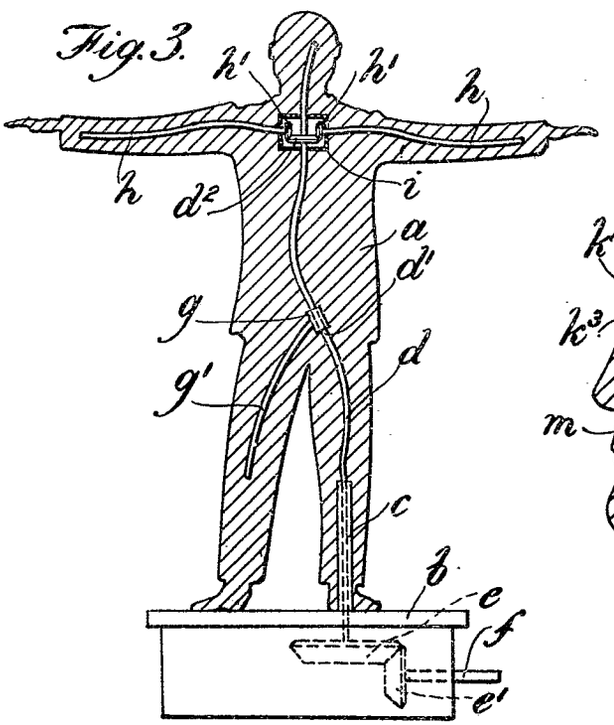
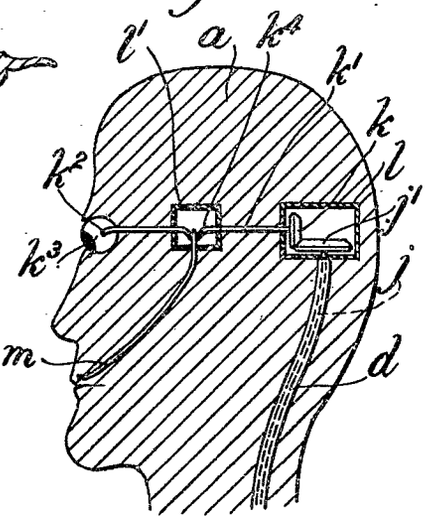


Fig. 4.



Charles & Read Ltd. Photo Litho.

May 5, 1931. W. L. MINICK, JR 1,804,265

ELECTRICAL TOY

Filed Aug. 3, 1929 2 Sheets-Sheet 1

Fig. 1.

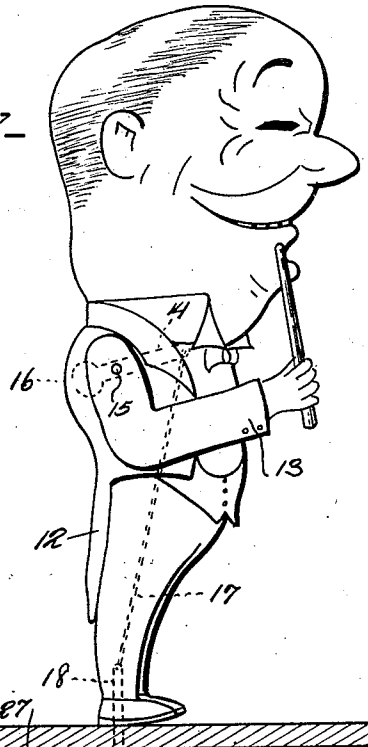
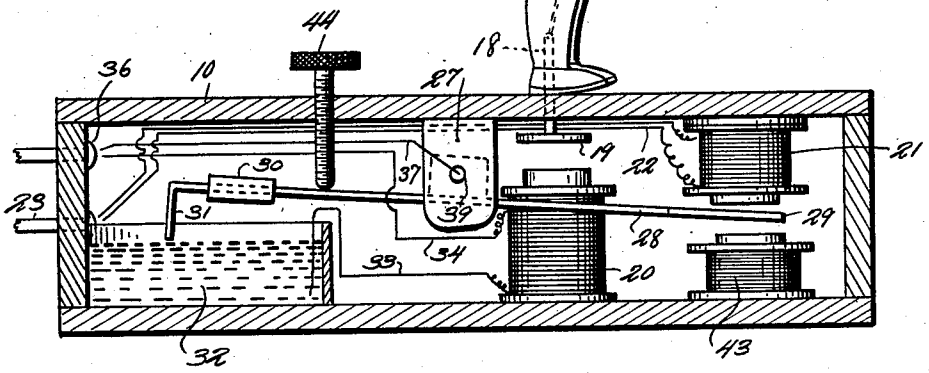


Fig. 3.



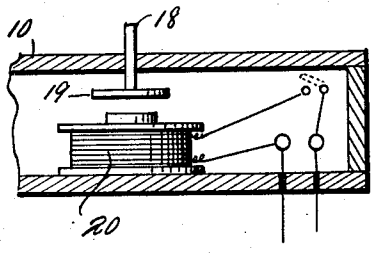


Fig. 4.

Inventor

W. L. Minick, Jr.

By Watson & Coleman

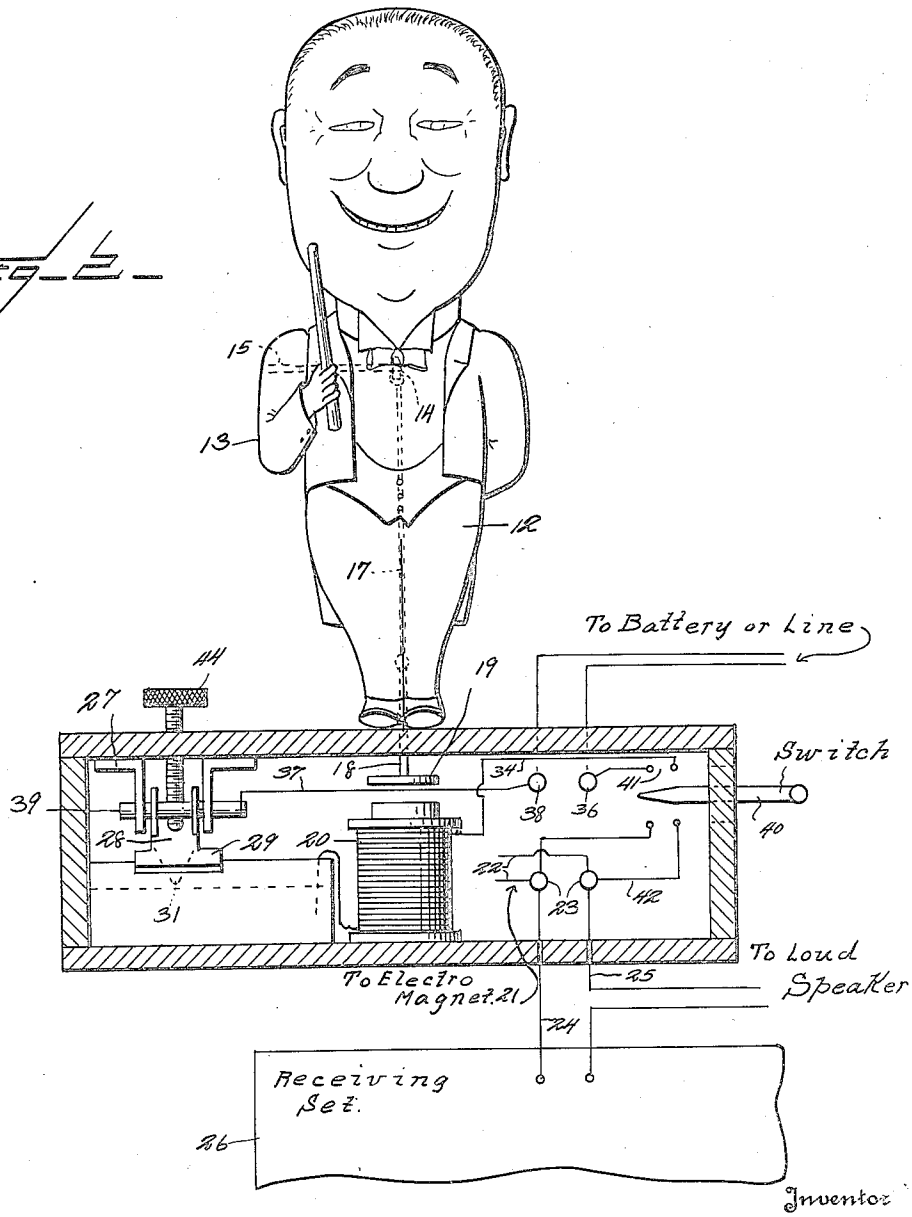
Attorney

May 5, 1931. W. L. MINICK, JR 1,804,265

ELECTRICAL TOY

Filed Aug. 3. 1929 2 Sheets-Sheet 2

Fig. 2



Inventor

W. L. Minick, Jr

By Watson E. Coleman

Attorney

Patented May 5, 1931 1,804,265

UNITED STATES PATENT OFFICE

WILLIAM L. MINICK, JR., OF WAYNESBORO, PENNSYLVANIA

ELECTRICAL TOY

Application filed August 3, 1929. Serial No. 383,198.

This invention relates to electrical toys and more particularly to a device adapted to be attached to a radio, victrola or any structure in which electric current is delivered to a receiving apparatus, reproducer, telephone or the like and which cause sound vibrations, the device including a figure or manikin which moves in time and accordance with said sound vibrations.

A further object is to provide a device of this character which is particularly adapted to be connected to a radio set and which is so constructed that the figure will dance, move its jaws, move its head, arms, legs, or other movable part or parts in time with said vibrations.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical sectional view through a device constructed in accordance with my invention;

Figure 2 is a vertical sectional view at right angles to Figure 1;

Figure 3 is a side elevation of the interior arm of the figure;

Figure 4 is a fragmentary sectional view through a modified form of the device.

Referring to these drawings, 10 designates a case or cabinet of any suitable size and structure. Upon this case or cabinet is mounted a figure designated generally 12, which figure may be that of an animal, a human being or have any other form. This figure may be constructed so as to have movable legs, arms, a movable jaw or a movable head but as illustrated, the figure has only a movable arm 13 shown as carrying the baton of the leader of an orchestra. This figure is purely illustrative and it is to be particularly understood that I do not wish to be limited to such a figure.

The arm 13 as shown is connected to an interior arm 14 pivoted at 15 upon the figure, this interior arm 14 having a counter-weight 16 or equivalent means for urging the outer end of the arm 14 upward and from this arm 14 extends a connection 17 which may be a flexible connection to the shank 18 of the armature 19 which coacts with an electromagnet 20 which is disposed within the case 10.

Also disposed within the case 10 is an electro-magnet 21 having wires 22 connected to binding posts 23 which in turn are connectible to the wires 24 and 25 leading from a receiving set 26 and from a loud speaker (not shown). Pivotally mounted within the case 10, as for instance upon the depending brackets 27, is a metallic lever 28 which constitutes in effect a switch, one end 29 of this lever constituting an armature coacting with the electro-magnet 21. The other end of this lever preferably carries an adjustable counterweight 30 and is downwardly extended as at 31. This lever when the electro-magnet 21 is energized tilts so as to cause the end 31 to electrically engage a contact member hereafter more particularly adverted to and designated 32 which is electrically connected by a wire 33 to the magnet 20. From the magnet 20, a wire 34 passes to a binding post 36 leading to the line or battery and a second conductor 37 passes to the binding post 38 also connected to the line or battery, this conductor 37 being connected to the switch lever 28, as for instance by being connected to the pivot pin 39 thereof.

Preferably a switch 40 is mounted in connection with the wire 34, there being a break in the line 34 at 41 adapted to be closed by this switch. Preferably also the contacts 23 will have conductors adapted to be connected to each other by means of the switch 40. By means of this switch 40, the impulses coming from the receiving set may be caused to travel directly to the loud speaker with the figure actuating mechanism cut out entirely or by shifting the switch 40 to close the gap 41, impulses coming from the receiving set will be transmitted to the electro-magnet 21.

This will cause the lever 28 to vibrate, intermittently, energizing the magnet 20 which will thus cause the armature 19 to vibrate in turn causing the arm 13 of the figure to oscillate as if the figure were beating time to music or if the figure has a movable jaw, causing the jaw to oscillate in time with any speech or music coming in over the radio.

The armature 29 is also adapted to be nor-

mally urged downward to thus raise the end 31 out of contact with the element 32 by means of an electro-magnet designated 43, and disposed below the armature 29 of the lever 28. The space between the armature 29 and the electro-magnet 21 can be controlled by means of the regulating screw 44 extending from the top of the casing.

The wires from the set 26 may be connected either in parallel or in series with the loud speaker and obviously the wiring may be changed in many respects without departing from the spirit of the invention. When the switch 40 is thrown to close the gap 41, current will pass from the battery or from the house wiring and current from the machine or receiving set must pass through the coil 21. When the switch 40 has been shifted to close the circuit between the wires 42, the current to magnet 20 is cut off and the current passes to the speaker, thus missing the coils in the toy and rendering it inoperative.

One of the distinctive features of my invention resides in the fact that the terminal end 31 of switch 28 dips to a greater or less degree into the liquid contact element 32 depending entirely upon the strength of the current passing through the electro-magnet 21 from the receiving set. If the terminal end of the switch 28 only touches the liquid contact element 32, the motions made by the toy are not nearly so strong as when the terminal dips into the liquid contact element. It has been found in actual practice that weak notes transmitted through the receiving set do not dip this switch terminal 31 as deeply into the liquid contact element 32 as strong notes do as the resistance is greater and the attraction of the magnet 20 is varied. Thus my construction is capable of producing varying beats in accordance with fluctuations in the loudness of the music or the strength of the beat. Loud notes which cause strong electrical impulses make the apparatus beat with much more force and amplitude than weak notes which cause only weak impulses. Thus the toy orchestra leader will accent those notes which are strong and should be accented, while weak notes are only relatively slightly accented.

It is to be understood that I have illustrated only one form of this toy and that it is within the purview of this invention to use many other figures in place of the figure of a man illustrated and to move other parts of the body than the arms.

The figure may be that of a person or animal or have any other desired form and may have both arms movable, the jaw movable, the head movable or the legs movable or a number of parts movable; thus the arms may beat time, the jaws may move as in talking, the arms and legs can move as in dancing, the figure may have a movable skirt which can be shifted to represent the skirt of a "hula hula" dancer and any number of actions can be caused to occur in exact time with the music or speech as above mentioned.

In Figure 4, I have illustrated a similar form of toy in which the case 10 simply encloses the electro-magnet 20 which coacts with the armature 19 as before described. In this construction, the electro-magnet receives its current from the set and is electrically connected to the set and speaker as will be clear from Fig. 4, there being a switch to close the circuit through the electro-magnet 20 and open it.

The end 31 of the switch lever 28 is designed to make a preferably non-arcing contact with element 32. The element 32 may be of any desired form for this purpose, as for instance, a vessel containing an aqueous solution, mercury or any other conducting material into which the member 31 will dip. Where an aqueous solution is used, this solution is weak enough to act as a resistance as well as a conductor and the resistance is greatest when the rod only touches the solution, which means that the greater the resistance, the less strong is the impulse which actuates the manikin or figure. Thus by using a weak aqueous solution the figure produces the varying beats in accordance with the fluctuations in the loudness of the music.

The city current can enter the device through a resistance or not as desired. This being obvious, it is not illustrated. Obviously also the electrical connections might be changed in many ways without departing from the spirit of the invention as defined in the appended claims. Thus, for instance, the member 32 may be a contact point or surface and wires 33 and 37 may or may not be crossed by a condenser or any other device as desired. In place of the electro-magnet 43, a permanent magnet might be used for the purpose of causing the retraction of the armature 28 or a spring might be used for this purpose, and as before stated, either a portion of the figure may move or the entire figure may move or any part or parts of the figure.

I claim:—

1. A toy of the character described, including a figure having a movable part, an armature operatively connected to said movable part to oscillate the latter as the armature is oscillated, an electro-magnet associated with the armature, a pivoted switch adapted when shifted in one direction to close a circuit and when shifted in the other direction to open the circuit, means urging the swicth to a position where the circuit is open, a second electro-magnet for which the switch constitutes an armature, the last named magnet having current conducting means adapted to be connected in circuit with a radio receiving set and a loud speaker, a shiftable weight mounted upon one end of the switch, and means limiting the movement of that end

of the switch adjacent the electro-magnet coacting therewith away from said electro-magnet.

2. A toy of the character described including a figure having a movable part and means for moving the part in correspondence with impulses received from a receiving set including an electro-magnet, an armature operatively connected to the movable part of the figure and coacting with said electro-magnet, a pivoted switch, an electro-magnet adapted to be connected to a radio receiving set and receiving impulses therefrom, one end of the switch acting as an armature for said magnet, an aqueous solution contact element into which the other end of said switch is adapted to dip when the last named electro-magnet is actuated, the aqueous solution element being in circuit with the first named electro-magnet and a source of current, and means urging the switch to a position out of contact with the aqueous solution element.

3. A toy of the character described, including a figure having a movable part and means for moving the part in correspondence with impulses received from a receiving set including an electro-magnet, an armature operatively connected to the movable part of the figure and coacting with the electro-magnet, a pivoted switch, a liquid contact element into which one end of said switch is adapted to dip when the switch is oscillated, said last named end of the switch having a portion extended toward the electric contact element, the switch and the liquid contact element being in circuit with the electro-magnet and a source of current, means urging the switch to one position, and means connected to a radio receiving set and receiving variable impulses therefrom and acting to variably vibrate said switch.

In testimony whereof I hereunto affix my signature.

WILLIAM L. MINICK, JR.

June 17, 1930. L. MARX 1,764,330

WALKING MANIKIN

Filed Jan. 6, 1928

Fig. 1.

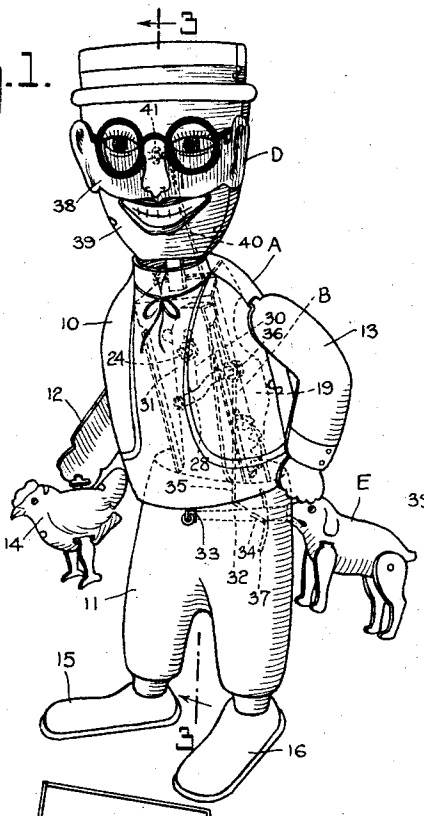


Fig. 2.

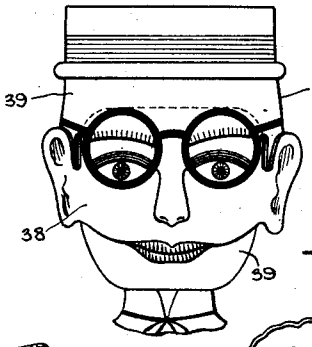


Fig. 3.

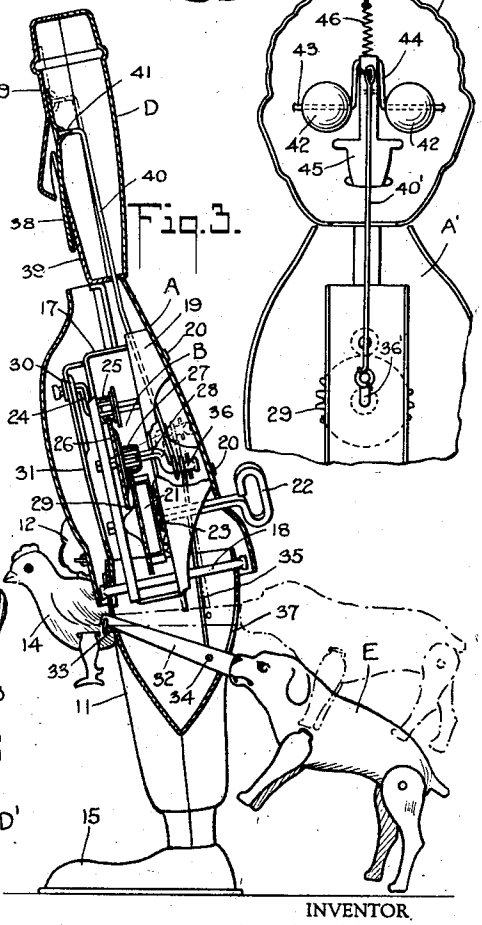


Fig. 4.

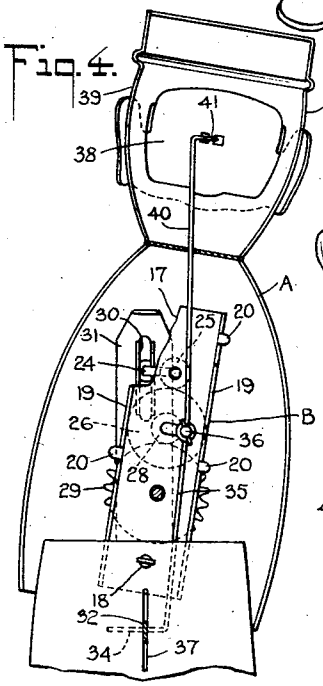


Fig. 5.

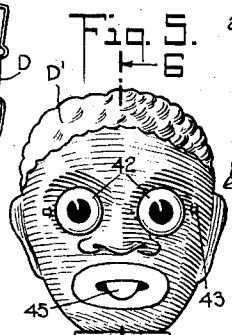


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Fig. 6.

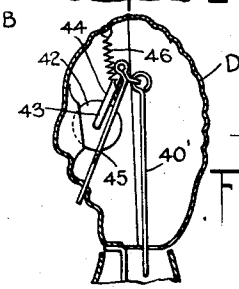
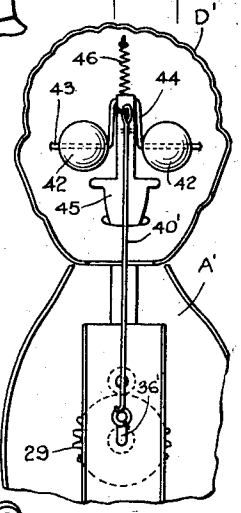


Fig. 7.



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Patented June 17, 1930 1,764,330

UNITED STATES PATENT OFFICE

LOUIS MARX, OF NEW YORK, N. Y.

WALKING MANIKIN

Application filed January 6, 1928. Serial No. 244,810.

This invention relates to a figure toy, and relates more particularly to a walking figure toy or manikin.

The prime desideratum of my present invention centers about the provision of improvements in figures or manikins of the type embodying motor mechanism operative for setting the figure into a simulating walking or running action, the improvements residing in the provision of means for imparting further or supplementary movements to the walking figure to enhance and render more lifelike the simulating actions thereof.

To the accomplishment of this desideratum one of the principal objects of the invention comprehends the provision of a walking figure preferably in the form of a manikin provided with a head embodying means for changing the expression thereof, such means being operated during a walking movement of the figure for the purpose of effecting a change of expression of the head during the walking action of the figure.

A further principal object of the invention resides in the provision of a walking manikin or figure, which is preferably designed to simulate a person in flight, combined with a second figure simulating preferably an animal in pursuit thereof, the combination embodying a mechanism for imparting to the simulated animal figure during the walking or fleeing movements of the manikin figure a movement characteristic of an animal in pursuit.

In the particular and preferred embodiment of the invention disclosed herein, the walking figure is designed to characterize a person fleeing with an article of theft and the pursuing animal is designed to represent a dog "hanging onto" the fleeing figure; and a further principal object of the invention in this preferred embodiment thereof relates to the provision of an ensemble in which the walking or fleeing movements of the figure and the change in the facial expressions thereof are harmonized and coordinated with the pursuing movements of the animal or dog and of the subject depicted.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the elements and their relation one to the other, as hereinafter more particularly described and sought to be defined in the claims, reference being had to the accompanying drawings which show the preferred embodiments of my invention, and in which

Fig. 1 is a perspective view of one form of the walking figure or manikin embodying my invention showing the operated parts in one position thereof,

Fig. 2 is a view of the head section of said figure taken on an enlarged scale and showing an expression of the head different than that shown in Fig. 1,

Fig. 3 is a vertical elevational view thereof taken in cross section in the plane of the line 3—3, Fig. 1,

Fig. 4 is a rear elevational view thereof with parts shown in section and other parts shown broken away,

Fig. 5 is a front elevational view of a modified form of head which may be used in combination with the walking figure of the invention,

Fig. 6 is a view taken in cross section in the plane of the line 6—6, Fig. 5, and

Fig. 7 is a rear view of a modification, with parts broken away, showing the manner of connecting the head with the motor mechanism.

Referring now more in detail to the drawings and having reference first to Figs. 1 to 4 thereof, the walking figure or manikin of the invention is shown to comprise in the particular combination exemplified herein a figure A representing a manikin embodying a motor mechanism B for imparting a walking movement to the figure, the said figure being provided with a head D having means for changing the expression such as the facial expression thereof connected to and operated by the motor mechanism B, the ensemble further including a figure E representing an animal also connected for movement to the motor mechanism B. As shown in Fig. 1 of the drawings, the subject depicted, by way of a preferred example, is that of the theft of an object such as a fowl; and in simulation of the action portrayed, the motor mechanism

B, in addition to setting the figure A into a simulating walking action, operates the pursuing animal E in a manner characteristic of the natural behaviour of a pursuing dog, and further operates the head D to produce a change in facial expression preferably characteristic of dismay and pain incident to the behaviour of the pursuing animal.

The walking figure A is of the type comprising the relatively movable upper and lower sections 10 and 11 each made out of sheet material suitably fashioned to provide hollow sections, the section 10 including the loosely mounted arms 12 and 13, the arm 12 loosely carrying a simulated chicken or other fowl 14, and the section 11 being provided with preferably weighted feet portions 15 and 16 also made preferably of sheet material. The upper body section 10 concealingly contains the motor mechanism B and is affixed thereto in a manner to be described presently so that the upper body section 10 is free to partake of the movements imparted by the motor mechanism B.

The motor mechanism B includes a frame 17 which is oscillatably mounted in a longitudinal median plane of the figure on a spindle or rod 18 which is journaled anteriorly and posteriorly on the lower body section 11, the said frame including two rearwardly extending flange portions 19, 19 provided with bendable fins 20, 20 (see Figs. 3 and 4 of the drawings) which are received in suitable apertures in the rear of the body section 10 and which are bent over the wall thereof, these being provided for affixing the upper body section 10 to the motor mechanism frame.

The motor mechanism proper supported in said frame 17 comprises a spring motor 21 provided with a winding key 22 and a ratchet means 23 for preventing reverse rotation thereof, the said spring motor being connected to a crank arm 24 by means of motion increasing gearing which includes a pinion 25 fixed to the shaft of the crank 24, a gear 26 and pinion 27 fixed to a crank shaft 28, the said pinion 27 meshing with a gear 29 fixed to one end of the spring motor 21. The operating arm of the crank 24 is arranged to ride in a slot 30 provided in an upstanding plate 31 which is fixedly attached at its bottom to a frontal portion of the bottom of the lower body section 11.

With this recited construction of the motor mechanism B and its attachment to the body sections of the figure A it will be seen that when the motor 21 is energized and the figure is set on a support, motion will be imparted to the free crank arm of the crank 24 causing the same to move constrainingly in the slot 30 of the plate 31, this resulting in imparting a side to side oscillating movement to the body section 10 about the axis of the spindle or rod 18, the mounting of the motor mechanism, the inclination of the parts of the figure such as shown in Fig. 3 of the drawings, and the weight of the parts being such that this oscillating movement of the upper body section throws the weight of the figure from side to side causing the same to oscillate to an extent sufficient to impart a walking movement to the figure as a whole.

In accordance with one of the objects of my present invention, the pursuing animal E is caused to move in simulation of the natural or lifelike behaviour of a pursuing dog; and to accomplish this the simulated animal figure E which may be made in any approved manner of sheet material or the like, is fixedly attached to a lever 32 having its fulcrum in an aperture 33 provided in the front of the body section 11, the said lever being pivotally connected at 34 to a rod 35, the upper end of which is connected to the crank arm extension 36 of the shaft 28. The lower rear portion or seat of the body section 11 is provided with an elongated and narrow guide slot 37. With this recited construction it will be seen that upon operation of the motor mechanism B and simultaneously with the walking movement imparted to the figure A, the lever 32 will be oscillated to cause the animal figure E to ascend and descend between the positions shown in full and dotted lines in Fig. 3 of the drawings, thus imparting the characteristic and desired movement to the animal figure E in simulation of its pursuing activity.

As aforestated, the head D of the manikin is operated to change the facial expression thereof, and in consonance with the subject portrayed, the head D being so mechanically designed that a movement imparted to the parts thereof will register dismay or distress. In Figs. 1 to 4 of the drawings, this is accomplished by the provision of a plate 38 having thereon a representation of the eyes and cheek as well as ears, the said plate being movable relatively to the remaining portion 39 of the head, the said remaining portion containing a representation of the chin, the nose, the spectacles and hat as clearly shown in Figs. 1 to 4 of the drawings. The face plate 38 is arranged as shown in Figs. 3 and 4 of the drawings so that the upper part moves interiorly of and the lower part moves exteriorly of the head section 39. The said plate section 38 comprises the movable member, and the same is moved between the full and dotted line position shown in Fig. 3 of the drawings by means of a rod 40 loosely affixed at its upper end as at 41 to the face plate 38 and connected at its lower end to the crank arm extension 36 of the shaft 28. With this construction it will be seen that operation of the motor mechanism B will cause the face plate 38 to move between the positions mechanically represented in Fig. 3 of the drawings for producing a change of expression from that shown in Fig. 1 of

the drawings to that shown in Fig. 2 of the drawings, the movement of the face plate causing the eyes to move relatively to the rim of the spectacles and relatively to the eyebrows of the figure, and also causing the lips to vary in expression from an open position to a closed position. This change in expression is between the extreme of joy and utter dismay, and such change in facial expression produces a resulting effect of distress and pain which appears naturally incident to the behaviour of the pursuing animal E.

In Figs. 5 to 7 of the drawings I show a modification embodying a different type of head wherein a similar expression of distress and dismay is produced. In the form shown in these Figs. 5 to 7, the head D′ is provided with a set of oscillatable or rolling eyes 42 movable in the usual eye-sockets provided in heads of this character, the said eye set 42 including a pivotal support 43 for the eye set journaled in the wall of the head D′, as clearly shown in Figs. 5 and 7 of the drawings, the said support 43 being provided with an upturned U-shaped section 44 forming, in effect, an arm to which is connected the operating rod 40′, which latter is affixed to a crank arm 36′ similar to the crank arm 36 heretofore described in connection with Figs. 1 to 4 of the drawings. Preferably also a tongue-shaped element 45 simulating a tongue and protruding from the simulated mouth of the head of the manikin is pivotally connected to the U arm 44 so as to partake of the movements thereof, the tongue being thus operated in consonance with the rolling movements of the eyes 42. To assist in the return action of the parts there may be provided a spring 46 anchored to the head D′ and to the arm 44 in the manner clearly depicted in the drawings. With this construction, operation of the motor B for imparting a walking action to the manikin causes the expressive rolling of the eyes of the head, creating a distinct impression of pain and distress.

The use and operation of the improved walking figure of my present invention will, in the main, be fully apparent from the above detailed description thereof. It will be further apparent that while I have shown and described my invention in the preferred forms, many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention, defined in the following claims.

I claim:

1. In combination, a manikin figure having relatively movable body sections, motor mechanism carried by the figure operative for relatively moving said body sections so as to impart a walking movement to the manikin in simulation of a figure in flight, a second figure simulating an animal in pursuit movably attached to said manikin figure, and means connecting the animal figure with said motor mechanism operative for imparting movement to said animal figure during the walking movement of the manikin.

2. In combination, a manikin figure having relatively movable body sections, motor mechanism carried by the figure operative for relatively moving said body sections so as to impart a side to side oscillating walking movement to the manikin in simulation of a figure in flight, a second figure simulating an animal in pursuit movably suspended from said manikin figure at a lower rear portion thereof, and means connecting the animal figure with said motor mechanism operative for imparting an up and down oscillating movement to said animal figure during the walking movement of the manikin.

3. In combination, a manikin figure, motor mechanism carried by the figure operative for imparting a walking movement to the manikin in simulation of a figure in flight, a second figure simulating an animal in pursuit movably carried by said manikin figure, and means connecting the animal figure with said motor mechanism operative for imparting to the said animal figure a movement in simulation of pursuit during the walking movement of the manikin.

4. In combination, a manikin figure, motor mechanism carried by the figure operative for imparting a walking movement to the manikin, a second figure movably carried by said manikin finger, and means connecting the second figure with said motor mechanism operative for imparting thereto a cooperative movement during the walking movement of the manikin.

5. In combination, a manikin figure having relatively movable upper and lower body sections, motor mechanism carried by the figure operative for relatively moving said body sections so as to impart a walking movement to the manikin in simulation of a figure in flight, a second figure simulating an animal in pursuit movably attached to said manikin figure at the lower rear portion of its lower body section, and crank and rod means connecting the animal figure with said motor mechanism operative for imparting an ascending and descending movement to said animal figure during the walking movement of the manikin.

6. In combination, a manikin figure having body sections and a head, the said head having means movable for changing the facial expression thereof, motor mechanism carried by the figure operative for imparting a walking movement to the manikin in simulation of a figure in flight, a second figure simulating an animal in pursuit movably carried by said manikin figure, means connecting the animal figure with said motor mechanism operative for imparting to the said animal figure a movement in simulation of pursuit during

the walking movement of the manikin, and means connecting the movable means of the head with said motor mechanism for changing the facial expression of the head during the said movements of the manikin and animal figures.

7. In combination, a manikin figure having body sections and a head, motor mechanism carried by the figure operative for imparting a walking movement to the manikin in simulation of a figure in flight, a second figure simulating an animal in pursuit carried by said manikin figure at a rear portion thereof, the said head having means movable for changing the expression thereof, and means connecting the movable means of the head with said motor mechanism for changing the expression of the head during the walking movement of the manikin.

8. In combination, a manikin figure having relatively movable body sections and a head, motor mechanism carried by the figure operative for relatively moving said sections and imparting a walking movement to the manikin in simulation of a figure in flight, the said head having means movable for changing the expression thereof, means connecting the movable means of the head with said motor mechanism for changing the expression of the head during the walking movement of the manikin, a second figure simulating an animal in pursuit movably carried by said manikin figure, and means connecting the animal figure with said motor mechanism operative for imparting to the said animal figure a movement in simulation of pursuit during the walking movement of the manikin.

Signed at New York city, in the county of New York and State of New York this 5th day of January, A. D. 1928.

LOUIS MARX.

July 15, 1930. S. I. BERGER 1,770,455

MECHANICALLY OPERATED FIGURE TOY

Filed April 18, 1927 2 Sheets-Sheet 1

Fig. 1.

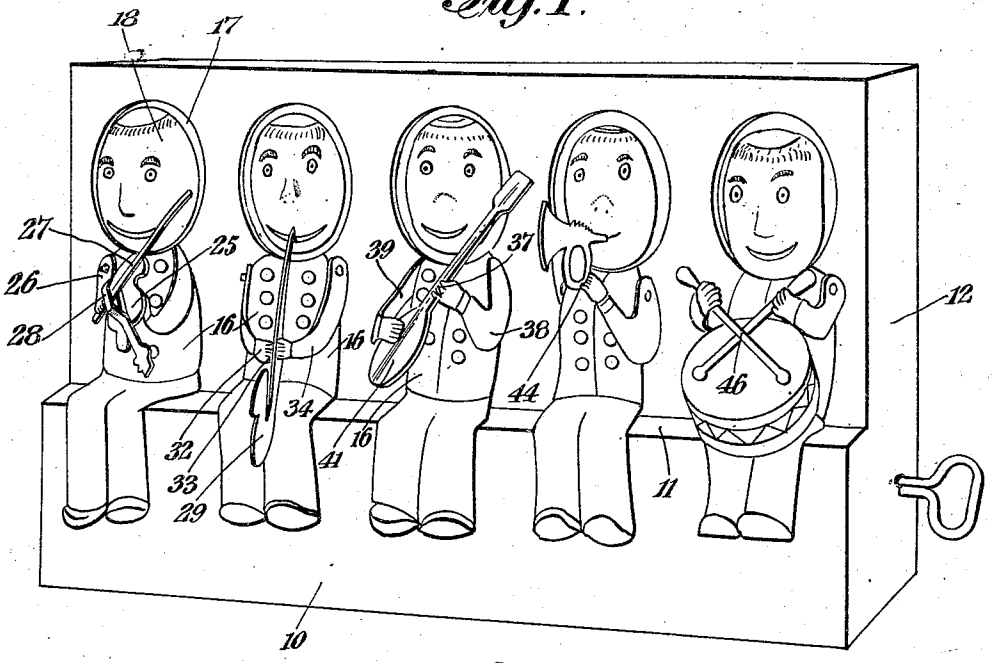
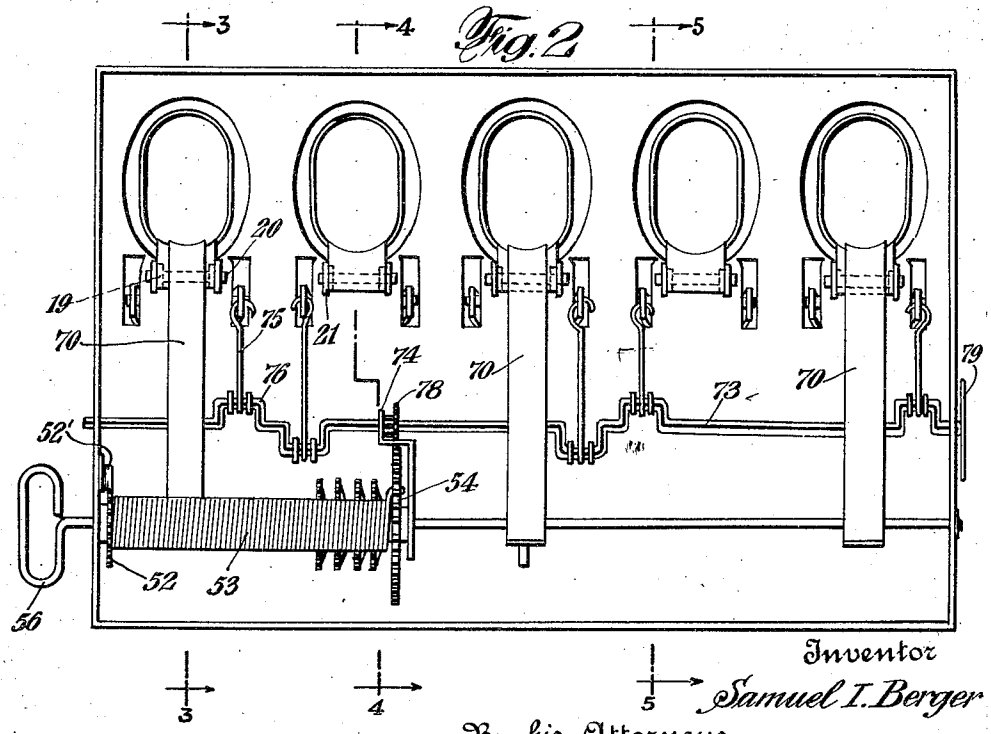


Fig. 2.



Inventor

Samuel I. Berger

By his Attorneys

Dean, Fairbank, Albright & Hirsch

July 15, 1930. S. I. BERGER 1,770,455

MECHANICALLY OPERATED FIGURE TOY

Filed April 18, 1927 2 Sheets-Sheet 2

Fig. 3.

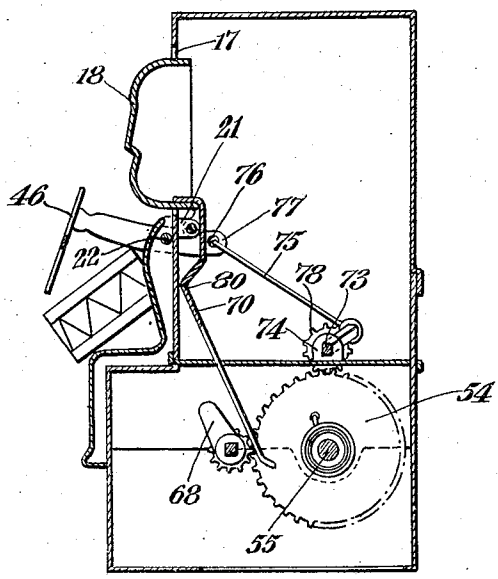


Fig. 4.

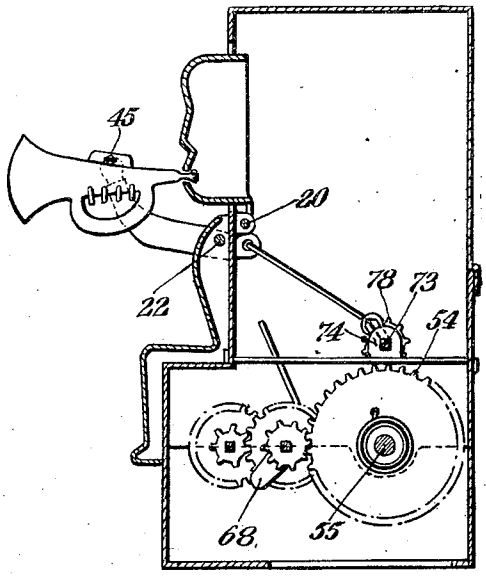


Fig. 5.

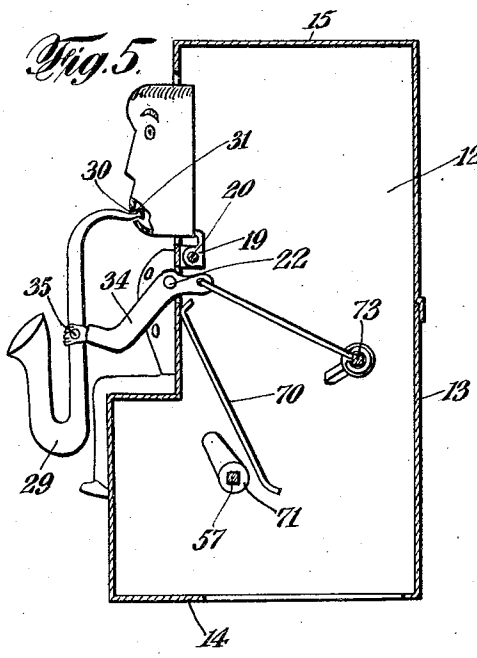
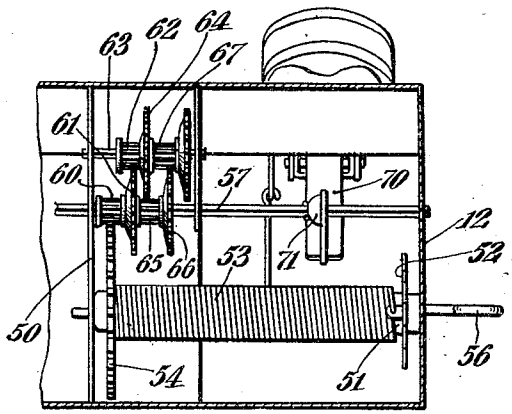


Fig. 6.



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Patented July 15, 1930 1,770,455

UNITED STATES PATENT OFFICE

SAMUEL I. BERGER, OF NEWARK, NEW JERSEY

MECHANICALLY-OPERATED FIGURE TOY

Application filed April 18, 1927. Serial No. 184,570.

My present invention relates to mechanical toys, and has a specific application to a toy representing a jazz band.

It is an object of the invention to provide a mechanical toy of the above type of simple construction readily manufactured, in quantity production at small expense, and which in operation will realistically simulate the action which it represents.

In the accompanying drawings, in which is shown one of the various embodiments of the several features of the invention, Fig. 1 is a front perspective view of the toy, Fig. 2 is a rear elevation with the rear plate removed, Figs. 3, 4, and 5 are views in longitudinal section on the respective lines of Fig. 2, and Fig. 6 is a fragmentary plan view of the inverted device with the bottom removed.

In the drawings I have shown an elongated sheet metal casing 10 representing a front wall including a bench or seat 11, end walls 12, a rear wall 13, a bottom wall or floor 14, and a top wall 15. Upon the bench I have shown seated illustratively five musicians, the legs and bodies 16 of the musicians being embossed outward from the casing by the forming die operation and being unitary therewith. The heads 18 of the figures preferably extend through corresponding oval openings 17 near the upper end of the casing. Each of said heads is formed unitary with a support yoke 19, which has a pintle or pin 20 transversely therethrough carried by corresponding instruck tongues 21 stamped from the front of the casing.

Each of the figures also is provided with at least one movable arm, the two figures at the extreme right illustratively having both of their arms movable. Each of the arms is pivoted on a pin 22 in front of the casing about which it moves in operation.

Illustratively the five figures represent respectively, from left to right, a violinist, a saxophonist, a banjoist, a cornetist, and a drummer. The violin 25 of the left hand player is preferably secured rigidly to the body by soldering or otherwise, and to the right arm 26 of the performer. The bow 27 of the violinist is formed as a rigid part of the right arm. The violin 25 is preferably slit longitudinally at the string forming part to form a bridge 28 under which the bow 27 extends and by which it is retained in position, substantially as in my prior Patent No. 1,607,231 of November 16, 1926.

The saxophonist includes a saxophone forming part 29, the mouth end of which extends loosely through a corresponding opening 30 in the mouth of the figure and is enlarged at its inner end at 31 to prevent separation. The right arm 32 of the saxophonist preferably grasps the shank of the instrument and is clasped thereto as at 33, while the end of the left arm 34 has a tongue 35 extending through a corresponding hole in the instrument.

The banjo has a pair of slots, the upper or shorter one accommodating a tongue 37 on the left arm 38 of the corresponding player figure, the right arm having a reversely bent tongue extending in a corresponding slot. The left arm of the cornetist similarly has a pivoted connection 44 at the lower part of the cornet and the right arm has a similar pivot connection 45 at the upper part of the cornet. The mouth piece of the cornet is related to the head in the same manner as in the case of the saxophone. The arms of the drummer are formed as integral stampings with the drum sticks 46.

The figures described are caused to operate by the mechanism now to be described, so as to simulate the playing of a jazz band. This mechanism includes a spring motor of any suitable, more or less conventional construction.

The motor is preferably secured between the end wall 12 and a cross brace 50 attached to the front and rear walls and serving to stiffen the casing. The motor comprises a drum 51 having the usual ratchet wheel 52 at one end thereof restrained by pawl 52′ and to which is anchored one end of a coil spring 53 the other end of which is anchored to a driving gear 54 near the cross brace 50. The ratchet wheel is rigid with the mounting axle 55 conformed as a winding key 56 at the outer end.

Parallel to the drum of the spring motor is an operating shaft 57 extending preferably

the entire length of the casing and having bearings in the end walls 12 as well as in the cross brace 50. Preferably the usual governor or retarding mechanism is associated with the driving gear 54 and comprises a pinion 60 with an associated gear 61 meshing with the pinion 62 on a countershaft 63 mounted in the cross brace. The pinion 62 has a gear 64 meshing with the pinion 65 on the shaft 57 which in turn has a gear 66 meshing with the pinion 67 on the countershaft.

The shaft 57 which is preferably at substantially the level of and in front of the spring drum, has a plurality of tappet arms 68 rigidly affixed thereto and aligned with the respective operating figures. These arms serve to move or oscillate the heads 18 of the figures for which purpose each of those players who have hand rather than mouth instruments are provided with rigid metal strips or arms 70 extending downward therefrom and normally resting on the hubs 71 of the respective tappet arms.

The arms of the various figures are operated from a second shaft 73 preferably directly above the motor drum, said shaft having bearings in the end walls and also in an upstanding fin 74 of the cross brace. To operate the arms of the figures, links 75 are provided each having an eye encircling a corresponding eccentric or crank 76 on the shaft and hooked at its opposite end into a corresponding opening 76 in the rearwardly extending portion 77 of the arm. The shaft 73 is driven by means of a pinion 78 meshing with the driving gear, 54.

Preferably the outer end of shaft 57 has a thumb piece 79 by which it is held against rotation during winding. When the winding action is completed and the thumb piece is let go, the expansion of the spring 53 causes rotation of the driving gear, retarded by the governor gears 60 to 67. The shafts 57 and 74 are caused to rotate by their meshing relation with the driving gear 54. Shaft 57 in its rotation causes each of its tappet arms intermittently to engage and push rearward the corresponding strip 70 thereby causing the head of the corresponding figure to nod forward. As the tappet arm moves past the strip 70 the latter will return by gravity against the shaft causing the corresponding head to return to its original position. In order to insure such return, each of the strips has a forward bend 80 therein so that the centre of gravity of the pivoted mass of the head and its pendent strip is so disposed as to compel such gravity return. In a similar manner the shaft 74 in its rotation causes the links 75 to oscillate the arms of each of the figures, thereby effecting the characteristic movements of the respective musicians. The heads of the saxophonist and the cornetist are devoid of any special tappet movement since by the movement of the corresponding arms the movement of the associated musical instrument will cause the head to be drawn forward and rearward therewith, but yet permit relative movements by virtue of the looseness between said parts.

The tappet arms 68 and the crank arms 76 are in such phase relation with respect to each other as to simulate the movement of the players. Thus the head of the violinist is preferably caused to bob backward prior to the advance stroke of the bow and to return prior to the return stroke of the bow. The head of the banjoist is caused to advance prior to the plucking stroke on the instrument and the drummer is caused to move his sticks prior to the forward bobbing of the head. The various tappets and eccentrics are so correlated to each other that the head and arm movements of the various players do not occur in phase with each other. As a consequence, the effect of the toy is a realistic simulation of a jazz band.

While the toy has its preferred application for showing a jazz band it will be understood that the mechanism and principle are applicable in other relations for simulating other actions.

It will thus be seen that there is herein described apparatus in which the several features of this invention are embodied, and which apparatus in its action attains the various objects of the invention and is well suited to meet the requirements of practical use.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A mechanical toy comprising a casing having openings therein, a shaft longitudinally of said casing, a spring motor for driving said shaft, a plurality of figures, the body portions of which are rigidly mounted on the exterior of the casing and the heads of which are pivotally mounted in openings in said casing, said shaft having offsets and connections therefrom to said heads to cause them to oscillate during the rotation of the shaft.

2. A mechanical toy comprising a casing, a spring motor shaft longitudinally of said casing, toy figures including body portions rigidly mounted on the exterior of the casing and head portions pivotally connected to said casing in side by side relation, tappet arms on said shaft and strips secured to the heads of said figures and intermittently displaced by

said arms during the rotation of the shaft to cause the heads of said figures to oscillate.

3. A mechanical toy comprising a casing having openings therein, a shaft extending longitudinally thereof, a spring motor for revolving the shaft, a plurality of figure-heads extending through said openings in the casing and mounted for oscillating movement, metal strips rigid with the oscillating heads and tappets on the shaft to intermittently engage the strips and causing said heads to oscillate, the exterior of the casing having toy bodies displayed thereon in operative relationship to the movable heads.

4. A mechanical toy comprising a casing, a shaft longitudinally therethrough, a spring motor, the front wall of said casing having inturned ears, figures of heads each having a pintle pivoted in the corresponding ears, strips rigid with the lower parts of said heads, said shaft having tappet arms intermittently engaging said strips to cause said heads to nod during the rotation of said shaft.

5. A mechanical toy comprising the combination of a casing, a shaft longitudinally therethrough, a spring motor for driving said shaft, a plurality of figures the body portions of which are fixed to the front wall of said casing, each of said figures having a pivoted head element, said shaft having offsets and links connecting said offsets to said pivoted head elements to cause the latter to oscillate during the rotation of said shaft.

6. A mechanical toy comprising a casing, a spring motor therein, a pair of shafts longitudinally of said casing, both driven from said spring motor, a plurality of toy figures exposed from the front of said casing, each of said toy figures having a movable head and another movable part, transmission means between one of said shafts, and said heads, and transmission means between said other shaft and said other movable parts, said transmission means being out of phase relation with each other.

7. A mechanical toy comprising the combination of a casing, a series of figures of musicians exposed from the front of said casing, each having a moving head and each having a a moving arm, a spring motor within said casing, a shaft longitudinally of said casing operated from said motor, transmissions between said shaft and said heads causing the latter to be intermittently moved thereby, a second shaft driven from said motor and transmissions from said second shaft to said arms to cause the latter to move out of phase relationship with said heads.

8. A mechanical toy comprising a casing, a group of figures of musicians exposed from the front of said casing, each of said figures having a pivoted head, each of said figures also having a pivoted arm carrying a musical instrument, a shaft driven from said motor and having off-sets, and parts connecting said heads with said offsets for causing the heads to move intermittently in the rotation of the shaft, a second shaft driven from said motor and mechanical connection between said second shaft and said arms to cause the latter to oscillate.

9. A mechanical toy comprising an elongated casing, a group of figures of musicians exposed from the front of said casing, each of said figures including a pivoted head, and a pivoted arm carrying a musical instrument, a spring motor within said casing, a shaft near the front of said casing and longitudinally thereof driven from said motor, each of said heads having a metal strip, said shaft having tappet arms aligned with said strips so as to intermittently displace said strips in the rotation of the shaft to cause said heads to nod, a second shaft longitudinally of said casing above the motor and above said first shaft, said shaft having offsets substantially aligned with the respective arms of the figures and linkages connecting said offsets with said arms to cause the latter to oscillate in the rotation of said second shaft.

10. A mechanical toy comprising a casing, a plurality of figures exposed from the front of said casing representing musicians, some of said musicians having hand operated instruments, others mouth instruments, a spring motor within said casing, transmissions from said motor, to each of said figures, each of those figures with hand operated instruments, having two separate and distinct transmissions, one to cause the arm and the other to cause the head of said figures to move, said transmissions being out of phase relation with each other.

11. A mechanical toy comprising in combination, a casing, a plurality of figures of musicians exposed from the front of said casing, each of said figures including a pivoted head and a pivoted arm, some of said figures including musical instruments connected to said heads, a spring motor in said casing, a pair of shafts longitudinally of said casing, both driven from said motor, each of said shafts having offsets, transmissions between said offsets and the respective arms to cause the latter to oscillate during the operation of said motor and simultaneously therewith to cause the heads of those figures, the musical instruments of which are connected to the heads, to oscillate therewith, and a transmission from the second shaft to the heads of the remaining figures to cause the latter to oscillate out of phase relationship with the arms thereof.

12. A mechanical toy comprising the combination of a casing, a plurality of musician figures having their bodies rigid with the casing, each of said figures having a pivoted head exposed through a corresponding opening in the casing, each of said figures having

a pair of pivoted arms exposed through the front wall of said casing and extending rearward therethrough, each of said arms having a musical instrument element secured thereto, some of said figures having the corresponding musical instruments loosely extending through the mouth of the corresponding head, some of said musical instruments having a loose connection to the arms of the figures, and a spring motor within said casing having transmissions to said figures to cause the latter to simulate the operation of a musical band.

13. A mechanical toy comprising the combination of a casing, a plurality of musician figures having their bodies rigid with the casing, said figures having pivoted heads exposed through corresponding openings in the casing, each of said figures having a pair of pivoted arms exposed through the front wall of said casing and extending rearward therethrough, each of said arms having a musical instrument element secured thereto, some of said figures having the corresponding musical instruments loosely extending through the mouth of the corresponding head, some of said musical instruments having a loose connection to the arms of the figures, a spring motor within said casing, a pair of shafts longitudinally of said casing operated from said motor, eccentrics on said shafts, connections from said heads to the eccentrics of one of said shafts and other connections from said arms to the eccentric parts of the other of said shafts, said parts being arranged in phase relations such as to simulate the movements of musicians.

14. A figure of a musical toy comprising a body, a head having a mouth opening and pivoted thereto, an arm independently pivoted thereto, a mouth instrument loosely extending through the mouth opening of the head, and a means loosely pivotally connecting the arm to another part of said instrument, and means for actuating the arm, connected to the instrument.

Signed at Newark in the county of Essex and State of New Jersey this 15th day of April A. D. 1927.

SAMUEL I. BERGER.

Aug. 27, 1929. L. C. GREENE 1,726,294

RADIO ACTUATED FIGURE TOY

Filed April 24, 1926

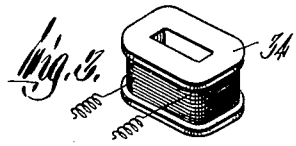


Fig. 3.

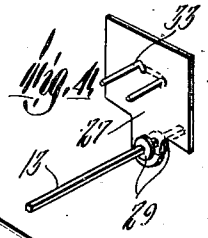


Fig. 4.

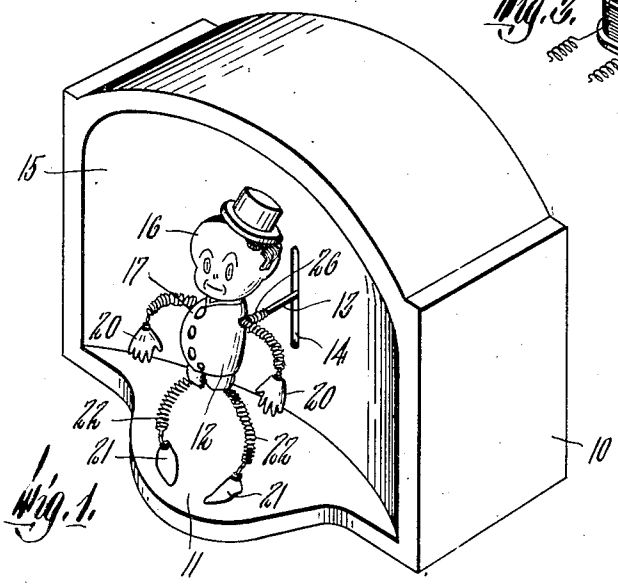


Fig. 1.

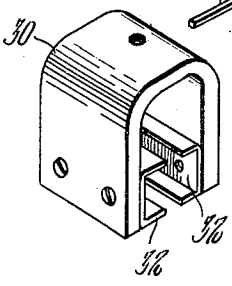


Fig. 5.

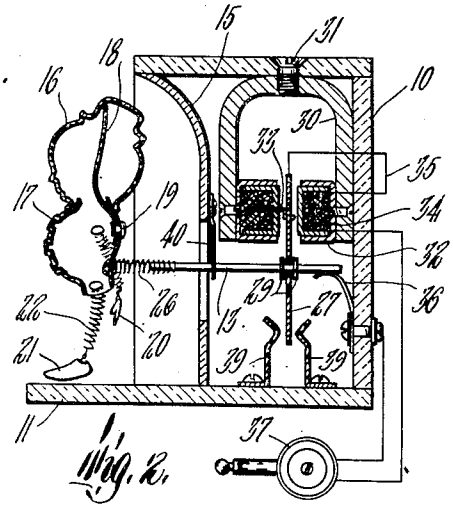


Fig. 2.

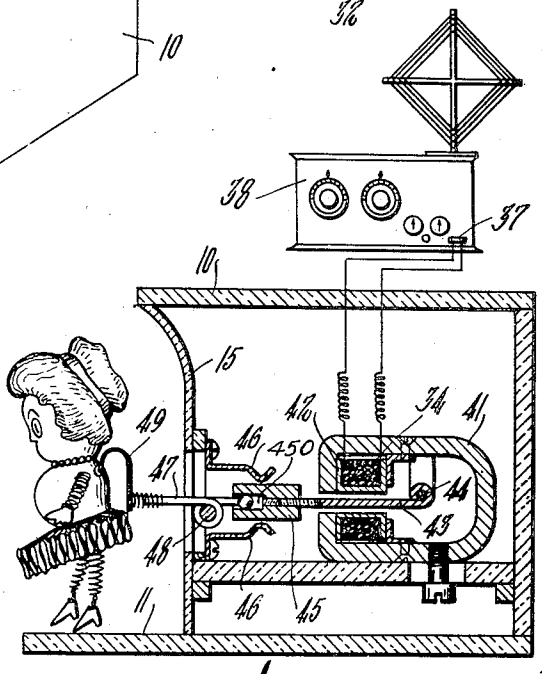


Fig. 6.

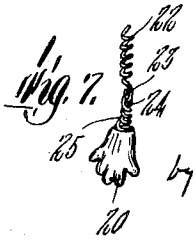


Fig. 7.

Inventor:
Lloyd C. Greene,
by Wright Brown Quinby & Mayo
attys.

Patented Aug. 27, 1929. 1,726,294

UNITED STATES PATENT OFFICE.

LLOYD C. GREENE, OF WINTHROP, MASSACHUSETTS, ASSIGNOR TO TOBE C. DEUTSCHMANN, TRUSTEE, OF CAMBRIDGE, MASSACHUSETTS.

RADIO ACTUATED FIGURE TOY.

Application filed April 24, 1926. Serial No. 104,266.

This invention relates to electromagnetically vibrated objects and is particularly directed to means for vibrating or agitating such objects in response to pulsating or oscillating electric currents.

More specifically, an object of my invention is to provide a toy figure capable of being automatically agitated in time with music received by radio through a receiving set capable of operating an ordinary "loud speaker." Toy figures or dolls with loosely attached limbs, which can be agitated so as to imitate a clog or similar dance, provide a popular source of amusement and entertainment. Such toys have been constructed to be agitated manually or mechanically in various ways, but so far as I am aware, no means has heretofore been provided for automatically agitating or dancing toy figures in time to music, particularly to music received by radio.

The advantageous features and combinations of my invention will be apparent from the disclosure thereof in the following specification and the drawing, of which:—

Figure 1 represents in perspective the toy figure and the housing for the mechanism.

Figure 2 is a section of the entire device through the middle on the vertical plane.

Figure 3 is a perspective view of an electromagnet winding.

Figure 4 represents the support for the toy figure including the electromagnet armature.

Figure 5 is a perspective view of permanent horseshoe magnet.

Figure 6 is a section of a modified form of the invention, a radio-receiving set and an antenna being conventionally shown as connected therewith.

Figure 7 is a detail of the construction of an arm of a toy figure.

Referring to the drawing in detail, 10 represents a cabinet which may be constructed in any desired ornamental form and is preferably provided with a platform 11 over which a toy figure 12 or a similar object is suspended as by a rod 13 which projects horizontally through a slot 14 in the front wall 15 of the cabinet 10 and is attached to the back of the figure. As indicated in Figure 2, the toy figure should be constructed of light weight materials, the head member 16 being preferably made of thin celluloid or any suitable equivalent, and loosely supported on a torso 17 by an upright wire or spring 18 secured as at 19 to the back of the torso. The torso 17 may also be made of celluloid, but I prefer to use buckram or its equivalent to minimize the noise of the chatter of the head member against the torso during the vibration or agitation of the figure. Suitable hands 20 and feet 21 may be attached to the torso as by helical springs 22. In order to permit freer motion or play of the hands and feet during the vibration of the figure, the connection of these members with the torso may be made as indicated in Figure 7, the end of the helical spring 22 being formed into a loop 23 through which is threaded a loop 24 on the end of a short spring 25 attached directly to the hand or foot.

The figure 12 may be rigidly attached to the bar 13, but I prefer to use therewith a short helical spring 26, one end of which is secured to the torso 17, the other end being slipped over the outer end of the rod 13, which is preferably of square or flattened cross section as shown in Figure 4 to maintain the figure 12 in an upright position. If the spring 26 fits snugly on the rod 13, no additional means is required to hold it in place satisfactorily, but if desired a drop of adhesive may be used for additional security. The support for the toy figure is illustrated in Figure 4 and comprises the rod 13 and an armature 27. The rod 13 and the armature 27 may be rigidly connected as by a soldered joint, or a slightly loose connection such as is indicated in Figure 2 may be used. As there shown, the rod 13 fits loosely in an aperture in the armature 27 and is preferably provided with a pair of flanges 29 which are disposed close to the armature on either side of the aperture. The spacing between the armature 27, the rod 13 and the flanges 29, is greatly exaggerated in Figure 2, and it is to be understood that the play between these parts is preferably very slight. Mounted within the cabinet 10 is an electromagnetic device for agitating or vibrating the toy figure without. This may comprise parts similar to those used in certain well known types of loud speakers. As shown, the device comprises a permanent magnet 30 of the horseshoe type suitably secured as by a screw 31 within the cabinet 10. This magnet may be provided with double pole-pieces 32, between which the armature 27 is rockably supported as by a wire bracket 33 or

other suitable means. Nested between the pole-pieces is a coil 34 of windings which surround a portion of the armature and are spaced therefrom, the flux of this electromagnetic coil 34 thus passing through the armature and polarizing the ends thereof. The magnet coil 34 is preferably electrically connected as by a wire 35 to the armature 27, so that the circuit which includes the magnet coil 34 thus also comprises a portion of the armature 27 and a portion of the rod 13. Lightly touching the latter is a spring 36 which makes with the rod 13 a loose electrical connection in the circuit variable by the vibration of the rod. The magnet coil 34 is preferably connected electrically through the armature 27 and spring 36 to a suitable plug 37 for convenience in connecting the whole device with a radio receiving set conventionally indicated at 38. Pulsating currents of audio frequency set up in the radio receiver in the usual manner are thus led through the magnet coil 34 and cause vibrations in the armature 27 and the rod 13 which constitute the support for the figure. These vibrations are transmitted to the figure, causing it to tremble or shiver in response to sustained tones and to be more violently agitated periodically in response to changes in the amplitude of the waves received such as are caused by the rhythmic sounding of musical instruments in the broadcasting of music by radio waves. Thus the rhythm of the music is transmitted through surges in the plate current to the electromagnet 34, which causes the figure to dance with considerable liveliness in time with the radio music. With the support rockably suspended as shown in Figure 2, the outer end of the rod 13 is given considerable up and down motion by these periodic actuations of the armature causing the figure to be agitated up and down in a manner to shake the limbs with more or less violence according to the strength of the radio reception and to make the head vibrate and tilt on its loose support in a comic and entertaining manner. Stop members 39 are preferably provided at any suitable point to engage some portion of the armature 27 when at its limiting position in either direction and to prevent the armature from coming in actual contact and sticking to either of the pole-pieces 32.

The front wall 15 of the cabinet 10 is preferably made of comparatively thin vibratile material so as to act as a sounding board to reproduce the radio music transmitted by the pulsating current passing through the magnet 34. In order to set up sound-producing vibrations in this wall or diaphragm 15, a light spring 40 of phosphor bronze wire or other suitable material may be rigidly attached to the wall and allowed to rest lightly against the side of the supporting bar 13. This acts satisfactorily to transmit the audio frequency vibrations of the music from the rod to the diaphragm 15 without materially damping the agitation or dancing of the toy figure.

In Figure 6 is indicated a modified form of my device wherein a horseshoe magnet 41 is horizontally mounted within the cabinet and is provided with single pole-pieces 42, the armature 43 being rockably supported as at 44. At the outer end of the armature a plug 45 is mounted having a slot 450, the sides of which engage the end of a supporting rod 47 attached to the toy figure which is rockably mounted as at 48, the short arm of the lever formed by the mounting of the rod 47 being the one engaged in the slot 450 so that motion of the plug 45 up and down in response to actuation by the electromagnet will be magnified in transmission to the toy figure by the lever 47. In order to prevent excessive vibrations of the armature 43 and to prevent physical contact between the armature 43 and either of the pole-pieces of the magnet 41, suitable stops 46 may be provided to limit the motion of the plug 45. As shown in this figure, the toy figure may be attached to the supporting lever 47 as by a member 49 from which the figure may be rockably suspended, this manner of mounting giving more looseness to the connection between the figure and the support.

Having thus described one form of my invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the spirit and scope of my invention as defined by the appended claims.

I claim:

1. In a device of the class described, a toy figure, a support therefor comprising a pivotally mounted armature, means for vibrating said support comprising an electromagnet with windings, an electric circuit connecting said windings with a source of pulsating energy, said circuit including a portion of said support, and a member making a loose electrical connection therewith.

2. In a device of the class described, a toy figure, a support therefor comprising a pivotally mounted armature, a horseshoe magnet, said armature being positioned between the ends of the magnet, stop members positioned to prevent contact of said armature with said magnet, a coil of windings surrounding a portion of said armature and spaced therefrom, a spring contact member, and wiring connecting said coil in series with said armature and said spring member, the armature and spring member forming a loose electrical connection.

3. In a device of the class described, a toy figure, a support for said figure mounted for vibratory motion, an electromagnet having an armature responsive to changes in flux of

audio frequency, means including said armature and actuable by said magnet for vibrating said support and toy, a source of variant electric current, a loose connection associated with said support, and an electric circuit connecting the magnet with the source of current and loose connection, said source of current being capable of causing relatively small tremors in the toy, said loose connection being adjustable to break the circuit momentarily when said tremors exceed a certain amplitude.

4. In a device of the class described, a toy figure, a support therefor comprising a pivotally mounted armature, a pair of magnetic pole pieces of opposite sign, said armature being positioned between said pole pieces, a coil surrounding a portion of said armature and spaced therefrom, a spring contact member, and wiring connecting said coil in series with said armature and spring member, the armature and spring member forming a loose electrical connection.

5. In a device of the class described, a toy figure, a sounding board associated therewith, and means for simultaneously agitating said figure and setting up audible vibrations in said sounding board in response to variant electric currents of audio frequency, said means comprising a vibratile armature mechanically connected to said figure, an electromagnet associated with said armature, means for connecting said electromagnet with a source of variant currents of audio frequency, and a vibration transmitting connection between said armature and said sounding board.

6. A device of the class described comprising in combination, a toy figure, a sounding board, means for simultaneously agitating said figure and vibrating said board in response to variant electric currents of audio frequency, means for converting radiant energy into variant electric currents of audio frequency, and means for operatively connecting said agitating and vibrating means with said converting means.

In testimony whereof I have affixed my signature.

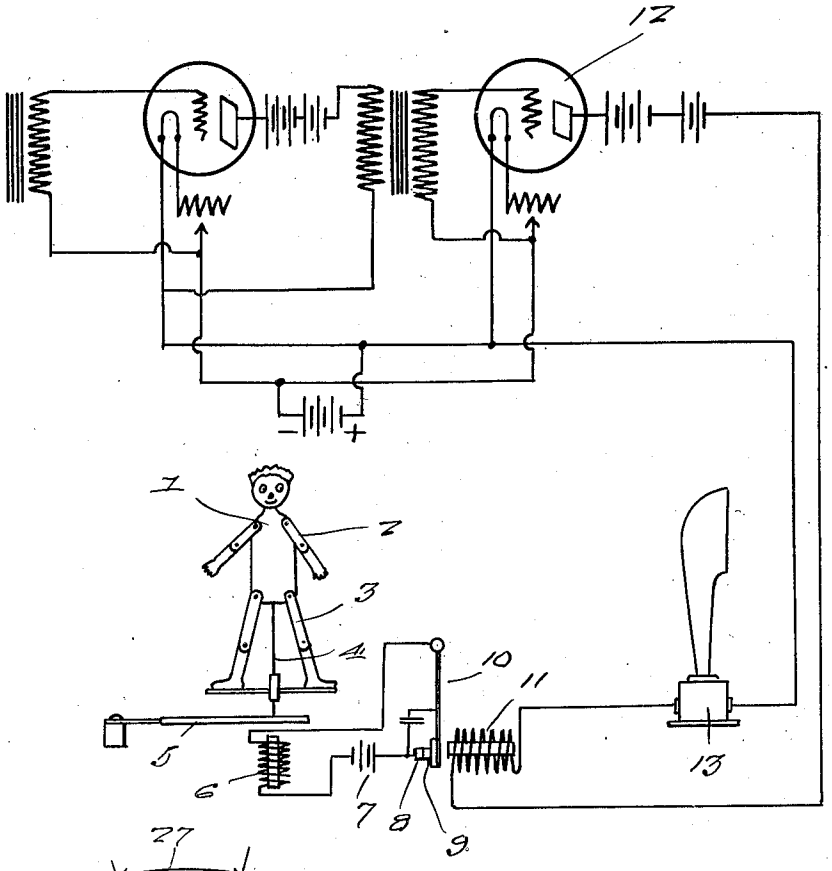
LLOYD C. GREENE.

Aug. 27. 1929. R. F. YATES 1,726,283

ELECTRODYNAMICALLY CONTROLLED FIGURE

Filed June 10, 1925 2 Sheets-Sheet 1

Fig. 1.



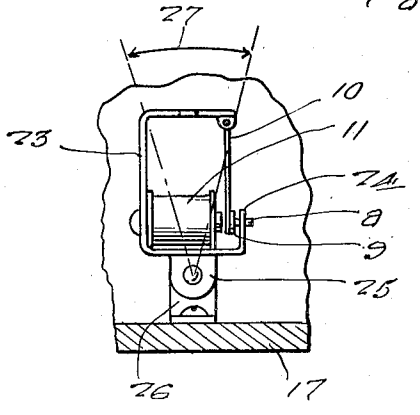


Fig. 5.

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By Clarence A. O'Brien
Attorney

Aug. 27, 1929. R. F. YATES 1,726,283

ELECTRODYNAMICALLY CONTROLLED FIGURE

Filed June 10, 1925 2 Sheets-Sheet 2

Fig. 2.

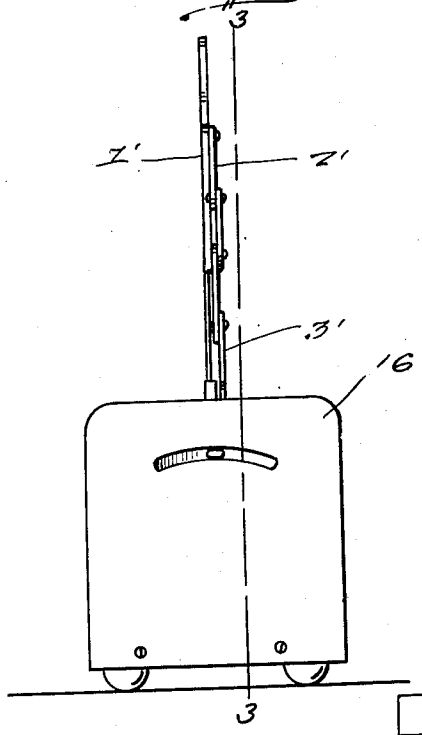


Fig. 3.

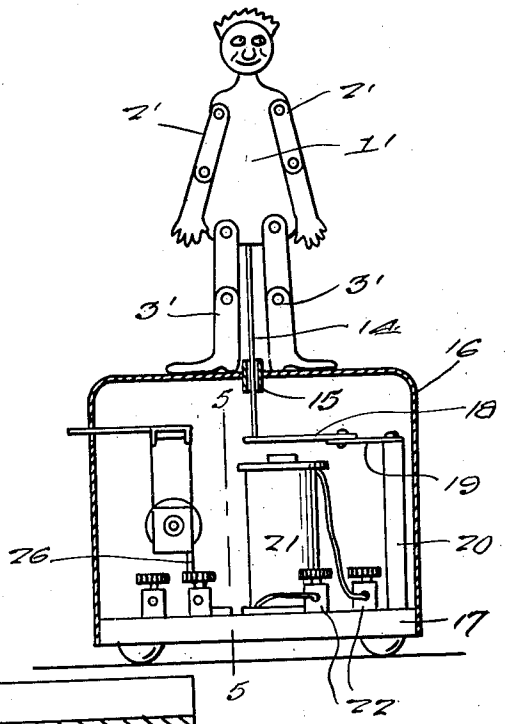
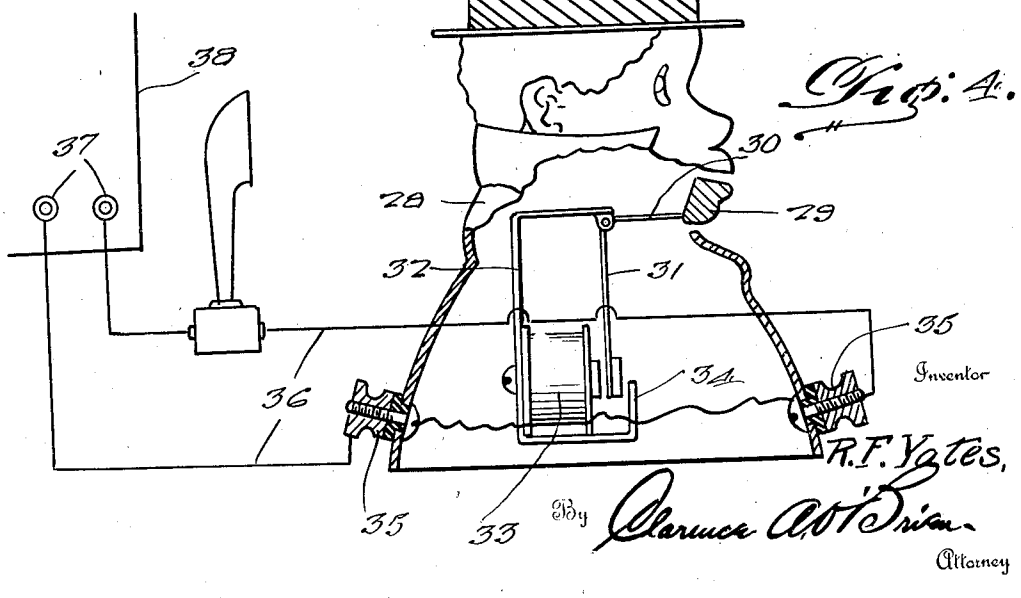


Fig. 4.



Inventor

R. F. Yates,

By Clarence A. O'Brien

Attorney

Patented Aug. 27, 1929. 1,726,283

UNITED STATES PATENT OFFICE.

RAYMOND FRANCIS YATES, OF BRONX, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO TOBE DEUTSCHMANN, TRUSTEE.

ELECTRODYNAMICALLY-CONTROLLED FIGURE.

Application filed June 10, 1925. Serial No. 36,207. REISSUED

This invention relates to electrodynamically controlled figures and particularly to a dancing figure toy, or the like, used in advertising or for amusement or the like.

An object of the invention resides in providing a figure with which is connected suitable apparatus for electrical operation for setting the figure in motion, in response to the undulating or varying electric currents received in the apparatus which may result from voice or music being impressed upon the current flowing in the circuit to the apparatus.

Another object of the invention resides in providing a figure movably supported or having movable portions connected to suitable apparatus operated by the modulated current flowing in a circuit receiving signals or sounds, in order that the figure will be operated in accordance with the variations in the flow of the current in the circuit, resulting from the transmission and reception of the signals or sounds.

The invention is more fully and completely set forth in the accompanying drawings, and in the following detailed description and claims, directed to a preferred form of the invention, it being understood, however, that numerous variations in the practical embodiments of the invention may be made, without departing from the principle or scope of the invention as set forth therein.

In the drawing, forming a part of this application:

Figure 1 is a diagrammatic view showing principally the wiring diagram for a sound receiving and amplifying circuit adapted to operate the figure.

Figure 2 is a side elevation of a structure mounting the figure and containing the apparatus for receiving the electrical impulses to operate the same.

Figure 3 is a sectional view, taken on the line 3—3 of Figure 2.

Figure 4 is a side elevation, showing portions in section, of a slightly different and simplified form of figure, utilizing the same principle of operation as in the above illustrated structure for operating a portion of the figure.

Figure 5 is a sectional view, taken on the line 5—5 of Figure 3.

Referring particularly to Figure 1, a figure, such as a dancing figure or the like, is indicated at 1, which may have movable arms and legs 2 and 3 respectively, or other movable portions, according to the character of figure used. A connection is made, as indicated at 4, between the figure and a suitable vibrating or movable member 5, which may be in the form of an armature for an electro-magnet, as illustrated or of any other desired form or character, suitable in operation to produce movement of the figure for causing the figure to dance or in any other manner produce movements of the various movable parts thereof. An electro-magnet is indicated at 6, for operating the movable member 5, which, as illustrated, forms the armature of the electromagnet, while the terminals of said electromagnet are connected in an independent circuit with the source of energy 7, and the stationary and movable contacts 8 and 9 respectively, which are alternately engaged and disengaged through the movement of the movable contact 9 carried by the armature 10.

For this purpose, the stationary and movable contacts 8 and 9 and the armature 10 carrying the movable contact is provided to be suitably operated by the electromagnet 11, having the opposite terminals connected to the output circuit of an electron operated device 12, forming part of a suitable sound or signal amplifying unit. A suitable sound reproducing device may be included in the output circuit with the electromagnet 11, such as indicated at 13, which may be of any desired form or structure for reproducing the sound transmitted or received in the output circuit of the amplifying unit.

Figure 1 illustrates essentially the diagrammatic view of the wiring connection for a suitable receiver for amplifying and reproducing signals and sounds carried by a music or voice modulated current of irregular character, and it is to be understood that the circuit transmitting said signals or currents might well be used as a receiver circuit for controlling and operating the electromagnet 11 adapted to reproduce the essential variations through the operation of the armature 10, in the circuit including the electromagnet 6, for operating the movable member 5 to mechanically reproduce by vibration the variations or modulations of the received currents and operate the figure 1 to move in accordance therewith. In this way, it will be seen that the figure will be operated to move or dance in accordance

with the variations of current in the output circuit of the amplifying unit. The same results would be obtained by including the electromagnet 11 in the output circuit or some other portion of the circuit of a sound amplifying device.

Figures 2, 3, and 5 illustrate particularly a mechanical embodiment of the idea heretofore described, in which the figure 1′ has novable arms 2′ and movable legs 3′ formed of jointed sections pivotally connected together and to the body of the figure. The body of the figure is supported on the rod 14 slidably fitted in the sleeve 15 carried by the housing 16 suitably connected to the base 17. The lower end of the rod 14 is rested on the armature 18, resiliently supported through the spring strip 19 on the post 20, carried by the base 17. Suitable electromagnet 21 is mounted on the base 17, with the pole piece positioned for actuating the armature 18 upon energization of the electromagnet, the terminals being connected in series with contacts 8 and 9 associated with armature 10, (Figure 5) and binding posts 22, so that the same may be interposed in circuit, as illustrated in Figure 1. It will be seen that by connecting the electromagnet 11, (Figure 5) in a circuit and impressing modulated or varying currents thereon, that the armature 18 will be operated to produce a movement of the figure, the vibration of which will cause the legs and arms to move on their pivoted joints, in accordance with the vibration of the armature 18, resulting from the current interruptions in the circuit containing the electromagnet 21.

In Figures 3 and 5 a substantially sensitive relay construction is illustrated, showing a practical embodiment of the electromagnet 11, armature 10, and stationary and movable contacts 8 and 9 respectively. A suitable frame is provided at 23 which supports the electromagnet 11 in the bottom portion thereof, and carries the stationary contact 8 in the upturn end 24, while the opposite end extends laterally and pivotally mounts for suspended swinging movement the armature 10. This armature normally maintains a vertical position by gravity, in suspension from the bracket 23, and is moved through the energization of the electromagnet 11, in accordance with current pulsations or variations, in the circuit in which the electro-magnet is connected. The lower side of the bracket carries a depending extension 25, which is pivotally connected with the bracket 26, carried by the base 17, so that the magnet and armature may be adjusted relative to the vertical to vary the position of the armature 10, under the action of gravity, between limits, such as indicated by the numeral 27, in order that the sensitiveness and distance that the armature is required to move to engage the stationary contact may be varied within desired limits.

Where it is desired to operate the figure directly from the output circuit of the amplifying unit, it has been found preferable to use a relay, similar to that illustrated in Figure 5, but minus the contacts, for directly operating the movable portions of the figure, such as is illustrated in the construction shown in Figure 4. In this figure of the drawing, a suitable form of figure structure is illustrated at 28, having a movable portion 29 which is directly mounted on the lateral projecting arm 30 of the suspended armature 31. The lateral projection of the bracket member 32 forms a pivotal suspending element or mounting for the armature 31, the lower end of which extends into proximity with one end of the relay coil 33 mounted in the bracket member, while the upturn end 34 of the bracket member limits the stroke of movement of the armature. The relay magnet is conected to suitable terminals 35 mounted on the body of the figure 28, with which is connected the wires 36 connected with the terminals 37 of the output circuit of a suitable amplifying unit 38. In operation, the fluctuation or variation due to varying the sound intensities impressed upon the current in the circuit including the relay 33 will move the armature 31 and correspondingly the movable part 29 of the figure, which will reproduce the current fluctuations and modulations in the output circuit of the amplifying unit.

From the above description, it should be understood that an electro-dynamically operated figure is produced which will be operated in accordance with the variations of current in the output circuit of a suitable electrical apparatus, which receives or transmits sounds or other forms of energy by the variations or oscillation of an electric current flowing in suitable circuits and apparatus which may include the modulated currents in radio or telephone circuits, so that the figure will mechanically reproduce these variations.

It is to be understood that this invention may be applied in many ways in connection with the production of advertising and amusement devices as well as toys adapted for general use, and that the structure of the elements for reproducing the electrical variations in mechanical movement may be of any desired character of which the forms shown serve as illustrations.

What is claimed is:

1. In a device of the class described, a toy figure, and means for agitating said figure in direct response to the variations of an electric current varying at audio frequencies, said means comprising a vibratile armature mechanically connected to said figure, an electro-magnet associated with

said armature, and means for electrically connecting said electromagnet with a source of variant currents of audio frequency.

2. In combination, a toy figure, and means for agitating said figure, said means comprising a radio-receiving set constructed and arranged to produce audio frequency electric currents in response to electromagnetic waves, an electromagnetic device operatively connected with said receiving set, and means actuated by said electromagnetic device for agitating said figure in response to audio frequency currents received from said set.

3. In a device of the class described, a toy figure having loosely attached limbs, a support for said figure comprising a pivotally mounted armature, means connecting the figure with said support, and means directly responsive to variations in radio waves for vibrating said support, said vibrating means comprising an electromagnet and radio-receiving apparatus capable of sending variant electric currents through the coil of said electromagnet in response to variations in radio waves received thereby.

4. In a device of the class described, a radio-receiving set comprising apparatus for setting up oscillatory currents in response to radio waves and delivering corresponding currents varying at audio frequencies, in combination with an electromagnet having a flux variable by said variant current and a vibratile armature responsive to said variations of flux, a toy figure, and a support for said figure mechanically connected with said armature, whereby toy and support are vibrated by said armature.

5. A device of the class described comprising in combination, a toy figure, means for agitating said figure in direct response to the variations of an electric current varying at audio frequencies, means for converting radiant energy into variant electric currents of audio frequencies, and means for operatively connecting said agitating means with said converting means.

6. A device of the class described comprising in combination, a toy figure, means for agitating said figure in direct response to the variations of an electric current varying at audio frequencies, said means comprising a supporting member for said figure, a vibratile armature connected thereto, and an electromagnet associated with said armature; means for converting radiant energy into variant electric currents and means for operatively connecting said electromagnet with said converting means.

In testimony whereof I affix my signature.

RAYMOND FRANCIS YATES.

Dec. 16, 1924. 1,519,410

L. MARX

TOY AMUSEMENT DEVICE

Filed March 13, 1923 2 Sheets-Sheet 1

Fig. 1,

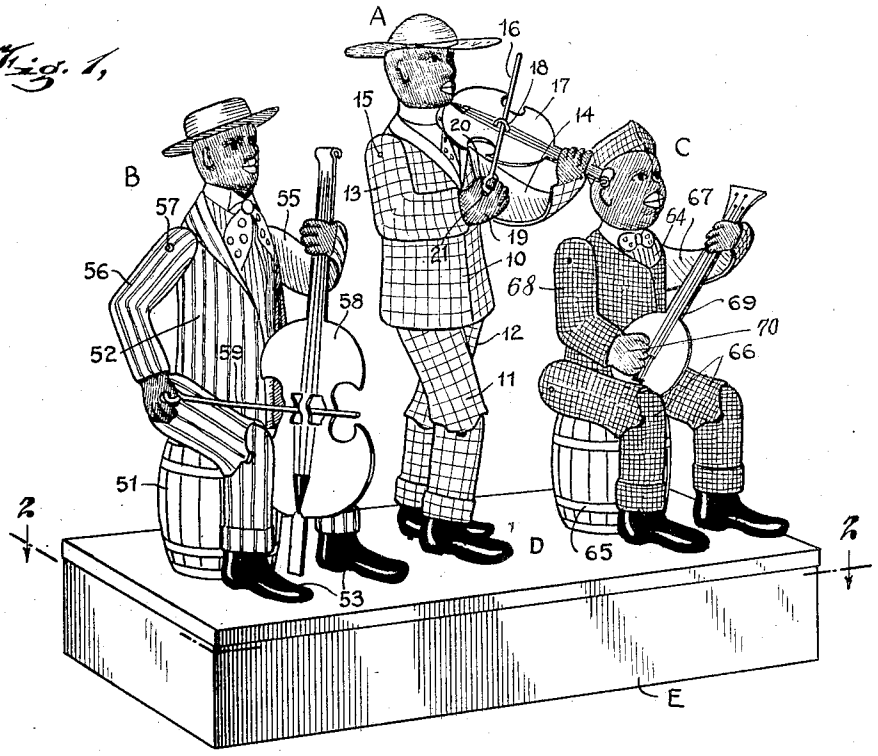
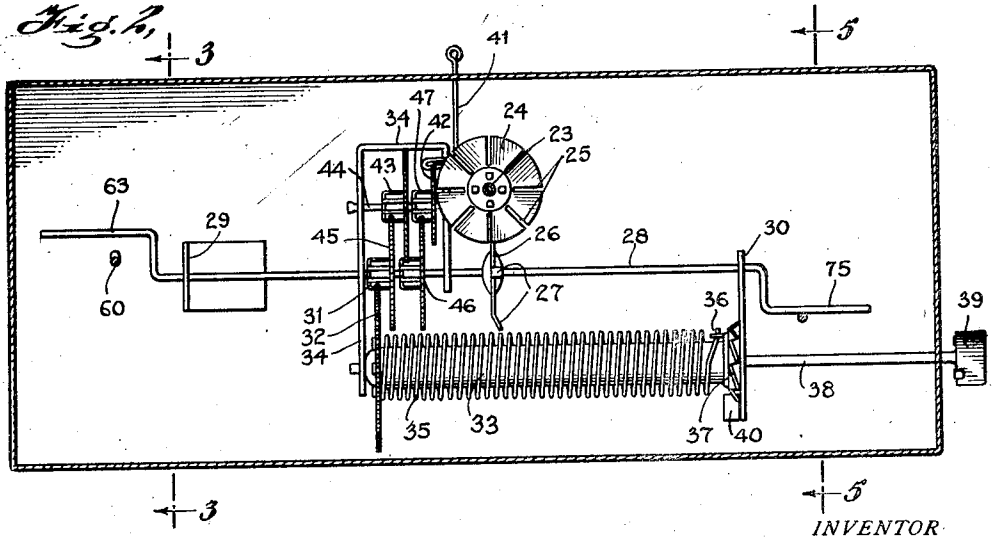


Fig. 2,



INVENTOR
LOUIS MARX

BY
Meyers, Cavanagh & Whitehead
ATTORNEYS

Dec. 16, 1924. 1,519,410

L. MARX

TOY AMUSEMENT DEVICE

Filed March 13, 1923 2 Sheets-Sheet 2

Fig. 3.

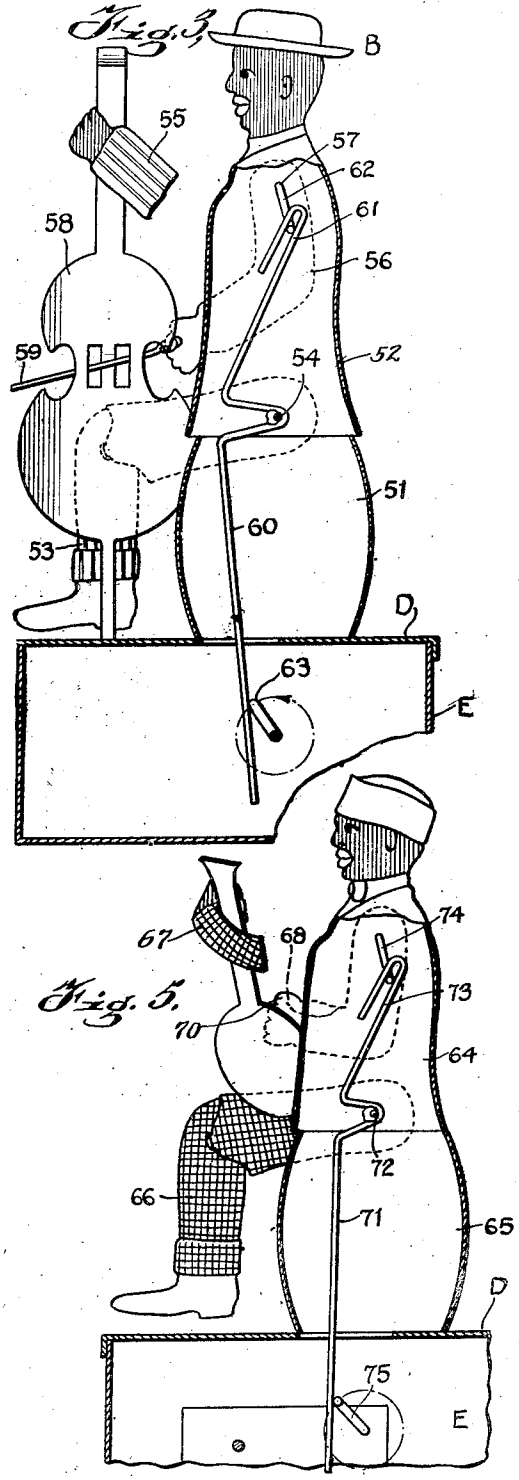
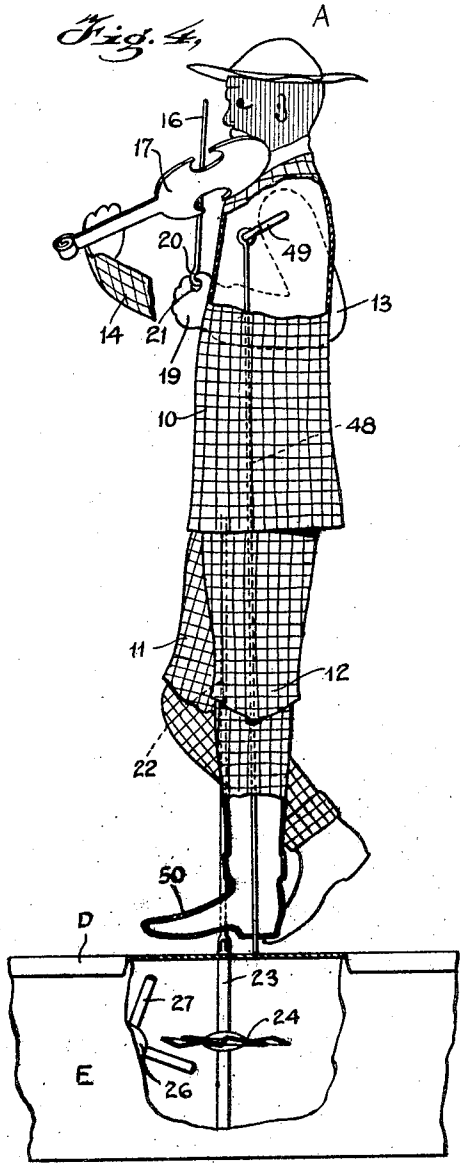


Fig. 4.



INVENTOR
LOUIS MARX
BY
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Patented Dec. 16, 1924. 1,519,410

UNITED STATES PATENT OFFICE.

LOUIS MARX, OF NEW YORK, N. Y.

TOY AMUSEMENT DEVICE.

Application filed March 13, 1923. Serial No. 624,696.

To all whom it may concern:

Be it known that I, LOUIS MARX, a citizen of the United States, and resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Toy Amusement Devices, of which the following is a specification.

This invention relates to a top amusement device, and more particularly to an amusement device in which a group of toy figures is co-ordinated and mechanically operated to effect a representation or simulation of a syncopated orchestra in life-like action.

The principal objects of my present invention may be said to include the provision of a toy amusement device presenting a group or ensemble of figures supplied with simulated musical instruments and harmoniously co-ordinated to produce a true and life-like characterization of a syncopated or "jazz" orchestra; the further provision of an orchestral group of this nature in which one member of the group comprises a dancing figure and the other members comprise playing figures, the dancing figure being adapted to be set in motion to render a "dancing" or "jigging" act in harmony with the playing action of the other figures; the still further provision of a syncopated orchestral group in which the dancing figure is operated to play a simulated musical instrument to produce action bearing a striking natural resemblance to an orchestral member of this character; the further provision of a co-ordinated orchestral unit in which the playing figures are constructed and operated to produce bodily movements in time-beating relation or co-operation with the playing motion of the figures; and the still further provision of a figure toy forming part of the group which comprises a novel dancing figure provided with a musical instrument adapted to be set into operation by the dancing action of the figure.

To the accomplishment of the foregoing and such other objects as may hereinafter appear, my invention consists in the elements and their relation one to the other, as hereinafter particularly described and sought to be defined in the claims; reference being had to the accompanying drawing forming a part thereof, wherein:

Fig. 1 is a perspective view of the amusement device of my invention,

Fig. 2 is a plan view taken in cross-section on the line 2—2, Fig. 1,

Fig. 3 is an elevational view taken in cross-section on the line 3—3, Fig. 2 and showing one of the figures in detail on an enlarged scale,

Fig. 4 is an elevational view with parts in cross-section showing another figure in detail on an enlarged scale, and

Fig. 5 is a detail view of the remaining figure of the group shown in cross-section and taken on the line 5—5, Fig. 2.

Referring now more in detail to the drawings, and particularly to Fig. 1 thereof, the orchestral group of my invention comprises generically a group of figures which preferably consists of the three figures generally designated as A, B and C arranged on a stage D which constructionally may comprise a removable cover or closure for the casing E, the said figures being adapted to be set into action by motor mechanism housed by the said casing E for the simulated rendition of a musical and dancing performance.

In the preferred arrangement the member or figure A of the orchestral group is constructed to be set into a dancing and playing act, as will be described more in detail hereinafter, the said figure being preferably arranged centrally on the stage D and between the figures B and C, the latter being preferably positioned in sitting posture as will clearly appear from the drawings, the seated figures B and C being constructed to be set into operation for producing a simulated playing action.

The figure A preferably is made to represent a "darky" character comprising a body 10 provided with the loosely jointed lower limbs 11 and 12 and the relatively movable upper limbs 13 and 14, the limb 14 being stationarily attached to the body and the limb 13 being oscillatably mounted on the body as at 15, the said upper limbs holding a musical instrument, which may for example be a violin, comprising the relatively movable bow and violin parts 16 and 17 held respectively in the movable and stationary upper limbs or arms 13 and 14, the construction being such that when the movable arm 13 is oscillated about the pivot or axis 15, the bow 16 will move on the

violin 17 in life-like simulation of the playing of a violin selection. Constructionally the bow 16 may conveniently comprise a rod reciprocally guided on the violin by a yoke piece 18 fixed centrally on the violin, the said rod being loosely connected to the hand member 19 of the arm 13, as by providing a loop 20 in the rod 16 which loosely engages in an aperture 21 in the arm 19.

The dancing figure A is operatively supported by means of a rod 22 and so movably related to the stage D that when the figure is reciprocated with an ascending and descending motion and rotated about the rod 22, the joints of the lower limbs are broken and the movement of the body synchronized therewith to produce a dancing or "jigging" act. For effecting the desired reciprocating and rotating motion of the figure and its supporting rod, there is provided a slide rod 23 in which the supporting rod 22 is removably inserted, said slide rod 23 being mounted for slidable motion in suitable brackets attached interiorly of the casing E, said slide rod projecting through an aperture in the closure D, the said slide rod carrying a rotor 24 provided with a plurality of vanes or blades defining the radial slots 25. Cooperating with the rotor 24 there is provided an actuating disk 26 including a plurality of radially arranged fingers 27, each of the said fingers being forwardly bent as clearly shown in Fig. 2 of the drawings so that upon rotation of the actuating disk the fingers will successively engage the rotor 24 to impart reciprocating motion to the same and will successively ride in the radial slots 25 to impart rotative motion to the rotor.

For operating the actuating disk 26, the said disk is fixed on a shaft 28 which may be journalled in the spaced brackets 29 and 30 attached to the bottom of the casing E, the said shaft fixedly carrying a pinion 31 meshing with a gear 32 fixed to a motor 33, the said motor comprising a drum journalled in the spaced brackets 34 and 30, to which drum the gear 32 is fixed and on which drum is wound the spring motor 35, one end of the spring motor being attached to the drum 33 and the other end of the same being attached as at 36 to a ratchet 37 freely rotatable on the drum, the said ratchet being fixedly attached to an operating shaft 38 provided with a winding key 39, a stop pawl 40 being provided for cooperating with the ratchet 37 during winding action of the device, the cooperation being such that upon rotation of the winding key 39 the spring motor will be energized or wound for effecting actuation of the rotor 24 to set the figure A into dancing activity.

For controlling the operation of the motor, I provide a stop and starting device which may comprise a bell crank lever 41 pivoted on the bracket 34, the said lever cooperating with the teeth of a braking gear 42, the said gear being driven from the pinion 31 by means of a system of gearing which comprises a gear and pinion unit 43 loosely mounted on a shaft 44 and meshing with a gear 45 attached to the pinion 31 and also meshing with a gear and pinion unit 46, the latter in turn being arranged for meshing engagement with a pinion 47 fixedly attached to the braking gear 42. With this construction it will be apparent that with the motor wound if the lever 41 is moved clockwise as viewed in Fig. 2 for moving the same out of engagement with the braking gear 42, the motor will be free to unwind; and when the lever 41 is returned to the position shown in Fig. 2, the braking of the motor will be effected.

As hereinbefore stated, a desideratum of the present invention comprehends the provision of a dancing figure provided with a musical instrument, which latter may be set into action or operation by the dancing action of the figure. To this end I provide means for relatively moving the parts of the musical instrument carried by the figure A, the said means being operable by the dancing action of the figure. To accomplish this, the movable arm 13 of the figure is adapted to be oscillated by means of a rod 48 (see Fig. 4) which is loosely connected to a crank arm 49 fixedly attached to the arm 13, the said rod 48 extending through the body 10 of the figure and through the members of the lower limb 12, the lower end of the rod projecting from the foot portion 50 as clearly appears from Fig. 4 of the drawings, the construction being such that as the figure A is vertically reciprocated, the lower end of the rod 48 strikes against the stage D and is reciprocated to produce the desired oscillation of the arm 13 and the playing motion of the violin bow 16. While I have shown the figure A supplied with the movable parts of a violin, it will be apparent that other musical instruments may be substituted and the relatively movable parts thereof operated by the dancing action of the figure.

The figure B also preferably comprises a representation of a darky character arranged in sitting posture on a barrel-shaped support 51, the said figure B comprising a body 52 provided with the movable lower limbs 53 pivotally mounted on the body as at 54 (see Fig. 3) and with relatively movable upper limbs or arms consisting of the fixed arm 55 and the movable arm 56, the latter being oscillatably mounted on the body about a pivot 57. The figure B is supplied with a musical instrument which may comprise a violin cello having the body 58 fixedly positioned and held by the fixed

arm 55 and the bow 59 guidedly movable over the violin body 58 and loosely held by the arm 56 in a manner as heretofore detailed in connection with figure A, the construction being such that as the arm 56 is oscillated about the pivot 57, the bow 59 is moved in natural simulation with respect to the violin body 58.

For effecting the oscillation of the arm 56, there is provided an operating lever 60 fulcrumed on the pivot 54 and fixedly attached to the same, the upper arm of the lever terminating preferably in a hook-shaped portion 61 which engages a crank arm 62 to which is attached the movable arm 56, the lower end of the said lever extending through the closure D and into the casing E, the said lower arm being adapted to be engaged by a crank arm 63 forming part of the shaft 28, the construction being such that as the shaft is rotated the crank arm rotates in a direction indicated by the arrow in Fig. 3 to effect the oscillation of the lever 60 about the pivot 54, this producing the oscillating movement of the arm 56 and the reciprocating movement of the violin bow 59.

In the preferred construction the movable lower limbs 53 of the figure B are set into action during the operation of the device to produce a time-beating movement in consonance with the performance rendered by the group. This is accomplished by the attachment of the lever 60 to the shaft or pivot 54, and with this construction it will be seen that as the lever 60 is oscillated, the limbs 53 will be elevated and lowered to produce the time-beating effect.

The figure C is constructed and operated in a manner similar to the figure B, and may also comprise a representation of a darky character provided with the body 64 arranged in sitting position on a barrel-shaped support 65, the said body being provided with the movable lower limbs 66 and the relatively movable upper limbs comprising a stationary arm 67 and the movable arm 68, the said stationary arm holding a banjo or similar instrument 69 over which the hand 70 of the arm 68 is adapted to move in characterization of the ordinary manner of playing this instrument. For operating the arm 68 and for moving the limbs 66 also in time-beating relation, I provide means similar to that heretofore described, which preferably comprises an operating lever 71 fulcrumed at and attached to a shaft 72 to which the lower limbs 66 are fixed, the upper arm of the lever being provided with a hook-shaped portion 73 which engages a crank arm 74 to which the movable arm 68 is attached, and the lower arm of the said lever extending through the closure D and into the casing E to be engaged by a crank arm 75 which may also be formed integrally with the shaft 28, the said crank arm being preferably arranged in a position 180° with respect to the crank arm 63 and being arranged for rotation in the direction of the arrow shown in Fig. 5 to successively engage and disengage the rod 71 to impart to the same the desired oscillating motion.

The manner of making and operating my musical device will in the main be fully apparent from the above detailed description thereof. It will be further apparent that I have provided an orchestral unit in which a number of movements is produced to effect a natural characterization of a syncopated or "jazz" orchestra, all the movements being effectuated in a simple and harmonious way by mechanism which may be produced at a comparatively low cost. It will be further apparent that numerous changes and modifications may be made in the construction of the figures and the arrangement of the same without departing from the spirit of the invention defined in the following claims.

I claim:

1. A toy amusement device comprising a group of figures representing a syncopated orchestra, one of said group comprising a bodily movable dancing figure having relatively movable arms holding relatively movable parts of a representation of a musical instrument, the other figures of the group each having relatively movable arms and being each supplied with a representation of a musical instrument, and means for operating the group to set the dancing figure in motion and to set the relatively movable arms of all the figures into action for simulating the playing of the musical instruments.

2. A toy amusement device comprising a group of figures representing a syncopated orchestra, one of said group comprising a bodily movable central figure constructed to be set into a jigging motion and having relatively movable arms provided with relatively movable parts of a representation of a musical instrument, the remainder of the group comprising figures arranged on both sides of the central figure and each having relatively movable arms supplied with a representation of a musical instrument, and means for operating the group to set the jigging figure in motion and to set the relatively movable arms of all the figures into action for simulating the playing of the musical instruments.

3. A toy amusement device comprising a group of figures representing a syncopated orchestra, one of said group comprising a bodily movable dancing figure having relatively movable arms holding relatively movable parts of a simulated musical instrument, another figure of the group being provided with relatively movable parts of a

representation of a musical instrument, and means for operating the group to set the dancing figure in motion and to set the relatively movable parts of all the figures into action for simulating the playing of the musical instruments.

4. A toy amusement device comprising a group of figures representing a syncopated orchestra, one of said group comprising a bodily movable dancing figure having relatively movable arms holding relatively movable parts of a simulated musical instrument, another figure of the group being also provided with relatively movable arms holding relatively movable parts of a simulated musical instrument, and means for operating the group to set the dancing figure in motion and to set the arms of all the figures into action for relatively moving the parts of the instruments in simulation of the natural playing thereof.

5. A toy amusement device comprising a group of figures with musical instruments representing a syncopated orchestra, one of said group comprising a dancing figure having relatively movable arms holding relatively movable parts of a representation of a violin, the remainder of the group comprising seated figures, one supplied with relatively movable arms holding relatively movable parts of a representation of a violin cello and the other with relatively movable arms holding a banjo, and means for operating the group to set the dancing figure in motion and to set the arms of all the figures into action for simulating the playing of the musical instruments.

6. A toy amusement device comprising a group of figures representing a syncopated orchestra, the group including a central dancing figure holding a simulated musical instrument and playing figures on each side thereof, means for operating the said musical instrument actuated by the dancing action of the dancing figure at least one of the playing figures being provided with lower limbs movable to produce a beating of time in cooperation with the dancing figure and each being supplied with a simulated musical instrument and with means for operating the same to effect a simulated playing thereof, and means for operating the group to set the dancing figure in motion and to set the remaining figures into action for moving the said lower limbs and for simulating a playing of the musical instruments.

7. A toy amusement device comprising a stage, a group of figures thereon representing a syncopated orchestra, the group including a central jigging figure holding a simulated musical instrument, and playing figures on each side thereof, means for operating the said musical instrument actuated by the jigging of the figure on the stage each of the playing figures being provided with lower limbs movable to produce a beating of time in cooperation with the jigging figure and being each supplied with a simulated musical instrument and with means for operating the same to effect a simulated playing thereof, and means for operating the group to set the jigging figure in motion and to set the remaining figures into action for moving the lower limbs and for simulating a playing of the musical instruments.

8. A toy amusement device comprising a group of figures representing a syncopated orchestra, the group including a dancing figure holding a simulated musical instrument and having means operated by the dancing action of the figure for operating the musical instrument, and a seated playing figure, the playing figure being provided with at least one lower limb movable to produce a beating of time in cooperation with the dancing figure and being supplied with a representation of a musical instrument and with means for operating the same to effect a simulated playing thereof, and means for operating the group to set the dancing figure in motion and to set the remaining figure into action for moving the lower limb and for simulating a playing of the musical instrument.

9. A toy amusement device comprising a casing providing a stage, a group of figures thereon, the group including a central dancing figure holding a simulated musical instrument and having means operated by the dancing action of the figure for operating the musical instrument and playing figures on each side thereof, each of the playing figures being provided with lower limbs movable in time beating cooperation with the dancing figure and each being supplied with a representation of a musical instrument and with means for operating the same to effect a simulated playing thereof, at least one of the musical instruments including relatively movable parts, and means for operating the group to set the central figure in dancing and playing motion and to set the remaining figures into action for moving the lower limbs and for simulating a playing of the musical instruments, the said means including a motor mechanism housed by the casing.

10. A toy amusement device comprising a bodily movable dancing figure provided with a simulated musical instrument and with means actuated by the dancing action of the figure for operating the musical instrument, and means for setting the said figure into dancing motion.

11. A toy amusement device comprising a bodily movable dancing figure having loosely jointed lower limbs, the said figure holding a simulated musical instrument, means operated by the dancing action of

the figure for operating the musical instrument, and means for setting the said figure into dancing motion.

12. A toy amusement device comprising a dancing figure holding a simulated musical instrument, the said musical instrument comprising relatively movable parts, means for setting the figure into dancing action, and means for relatively moving the parts of the instrument directly operated by the dancing motion of the figure.

13. A toy amusement device comprising a bodily movable dancing figure holding a simulated musical instrument, the said musical instrument comprising relatively movable parts, means for setting the figure into dancing action, and means for relatively moving the parts of the instrument operated by the dancing motion of the figure.

14. A toy amusement device comprising a figure provided with loosely jointed lower limbs and with relatively movable upper limbs, the said figure being supported for a dancing motion, a simulated musical instrument comprising relatively movable parts held by the relatively movable upper limbs, means for setting the said figure into dancing action, and mechanism for relatively moving the parts of the musical instrument, the said mechanism being operated by the dancing action of the figure on a support.

15. A toy amusement device comprising a dancing figure having loosely jointed lower limbs and relatively movable upper limbs, a simulated musical instrument including relatively movable parts held in the upper limbs, and means for relatively moving the said parts comprising an operating rod connected to the movable upper limb and projecting through one of the lower limbs so that when the figure is bodily moved on a support to effect a dancing action thereof the rod will be operated by contact with the support to operate the musical instrument.

Signed at New York city, in the county of New York and State of New York, this 1st day of March A. D. 1923.

LOUIS MARX.

June 22, 1926. 1,589,432

P. A. SAPP

TOY CARNIVAL

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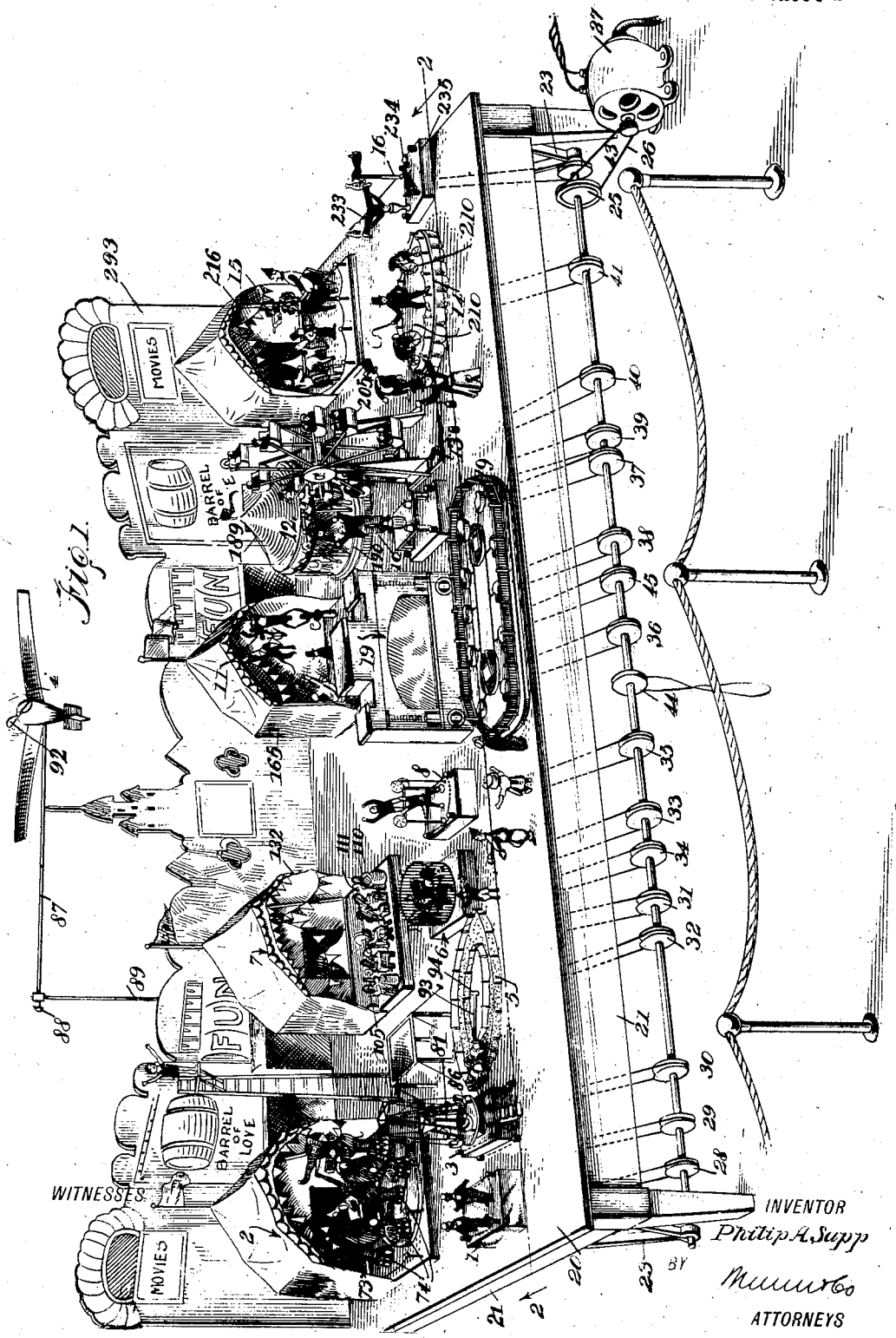

Fig. 1.

June 22, 1926. 1,589,432

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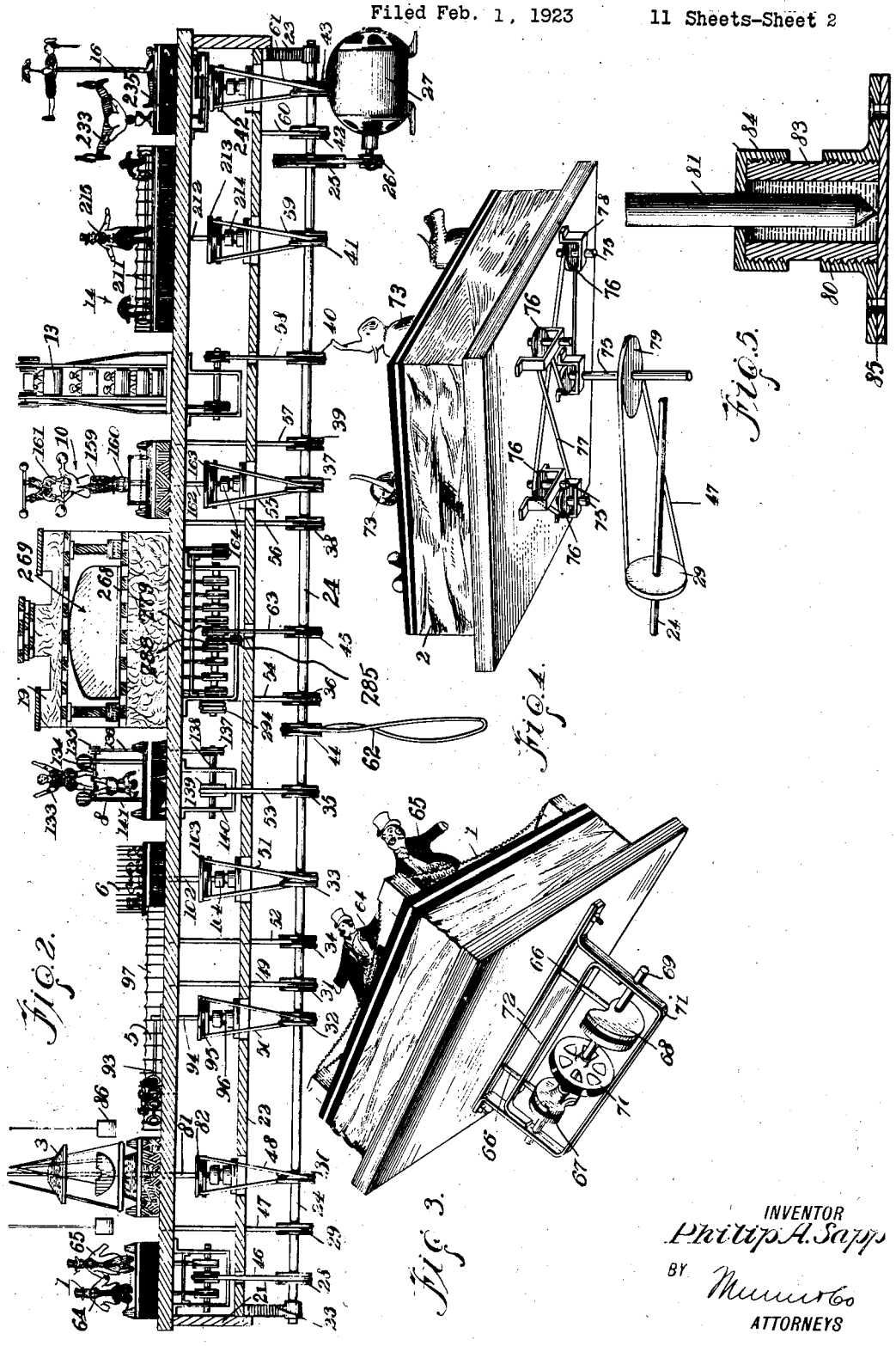

Fig. 2.

Fig. 4.

Fig. 5.

Fig. 3.

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Fig. 7.

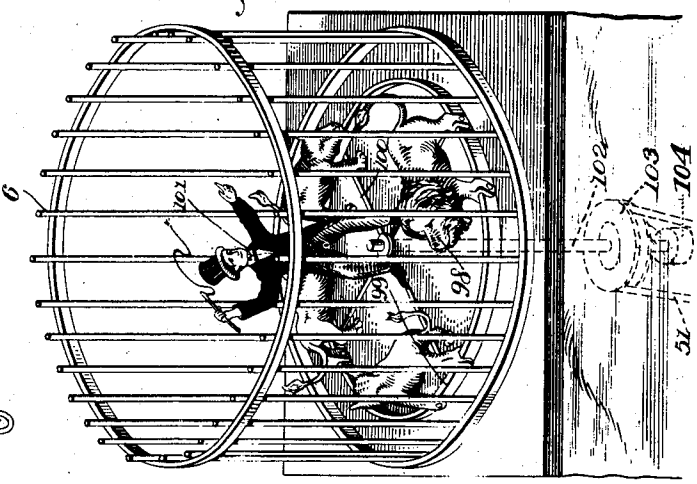

Fig. 6.

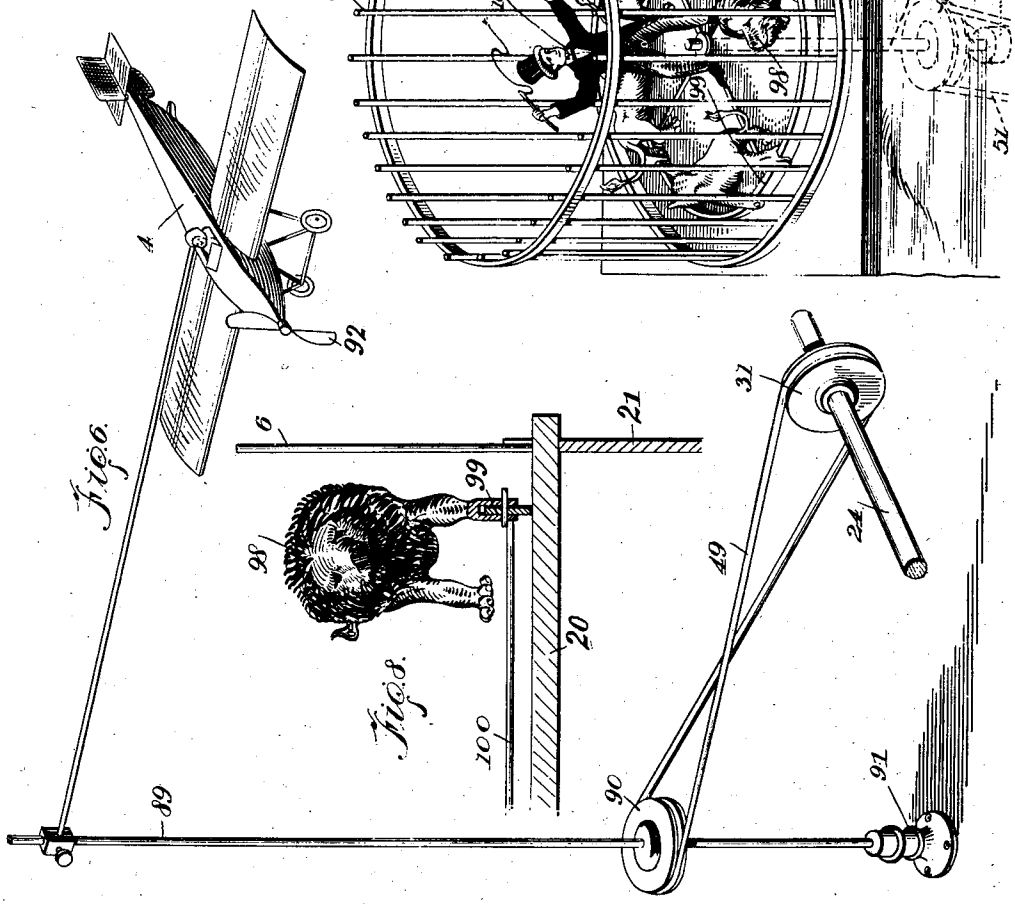

Fig. 8.

WITNESSES
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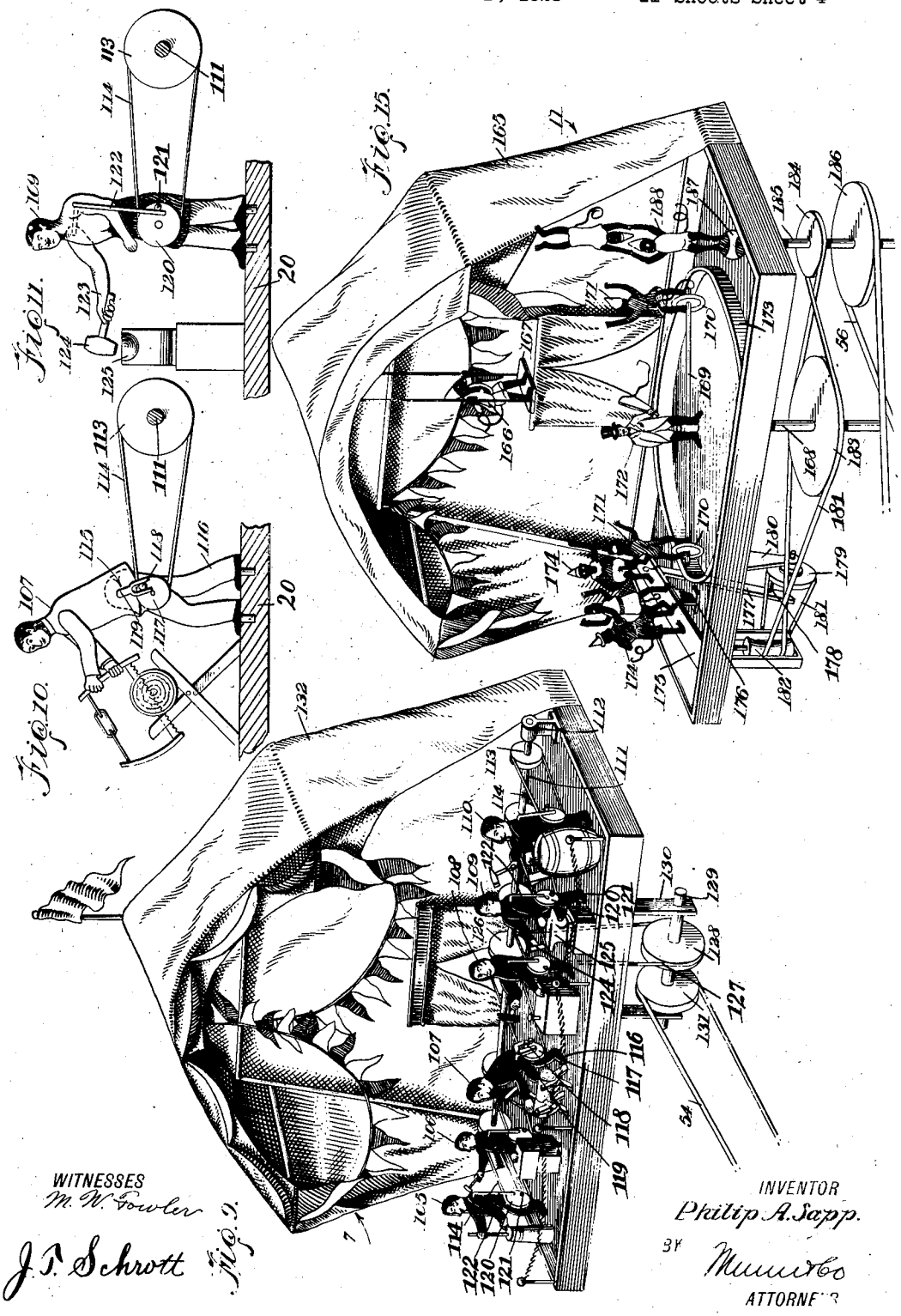

WITNESSES
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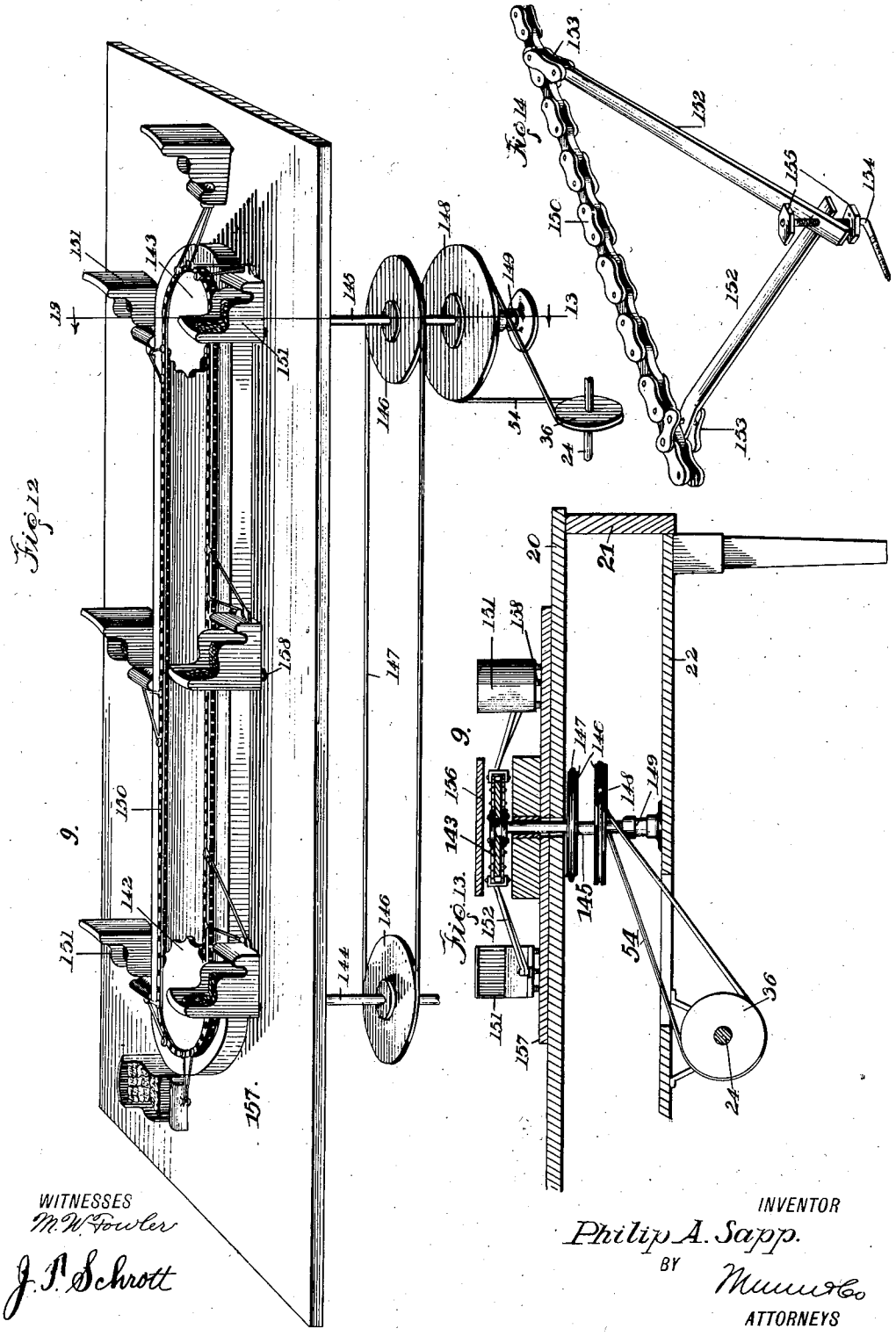

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P. A. SAPP

TOY CARNIVAL

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Fig. 17.

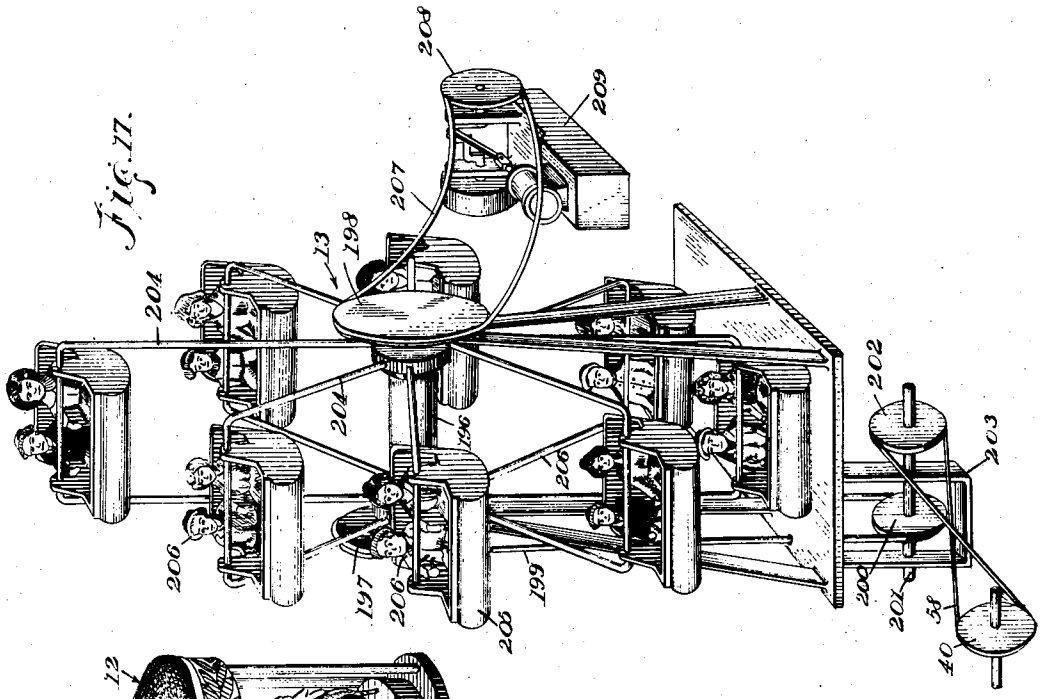
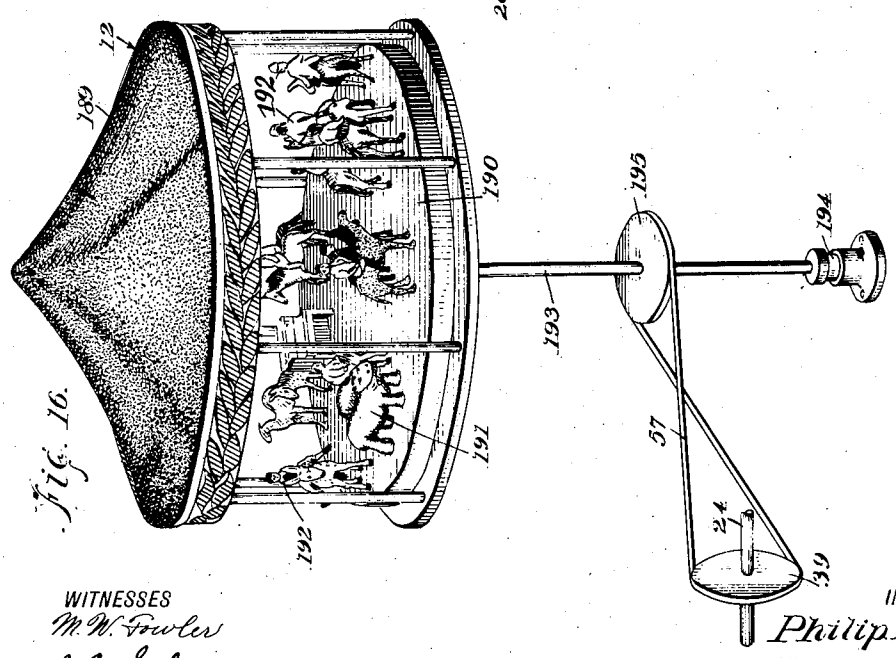


Fig. 16.



WITNESSES

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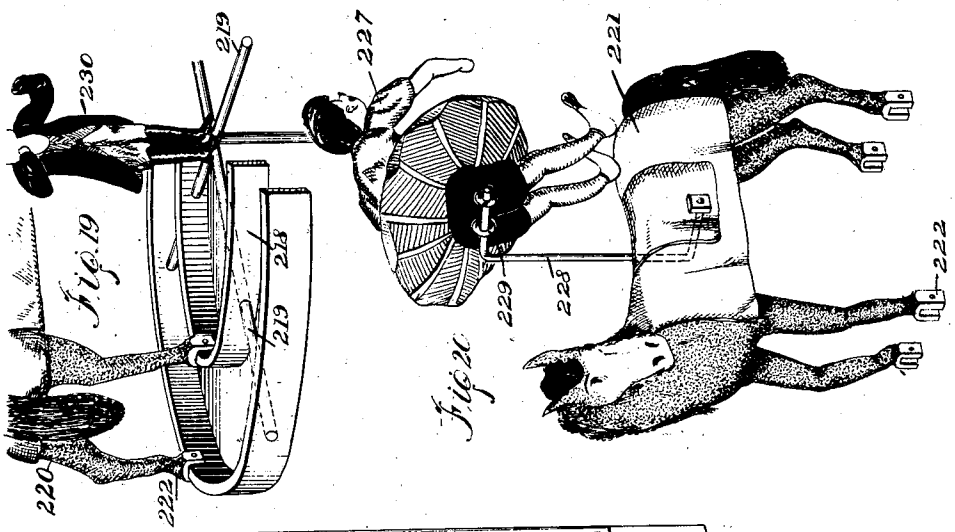

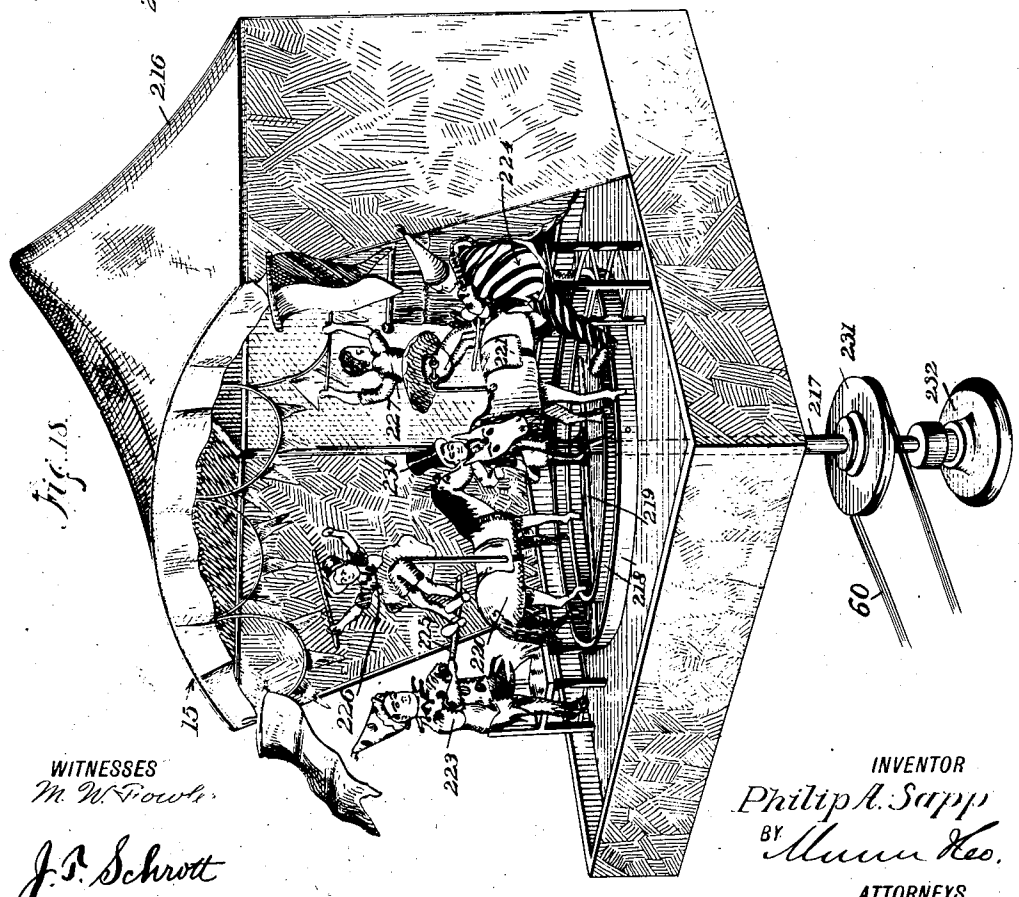

WITNESSES

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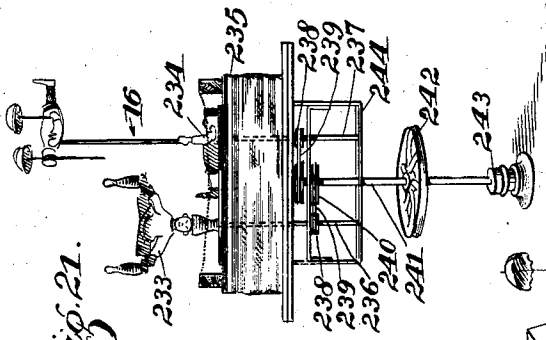

Fig. 21.

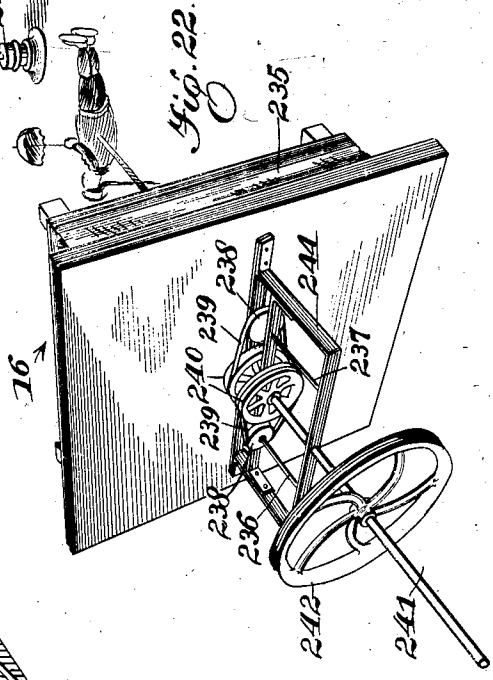

Fig. 22.

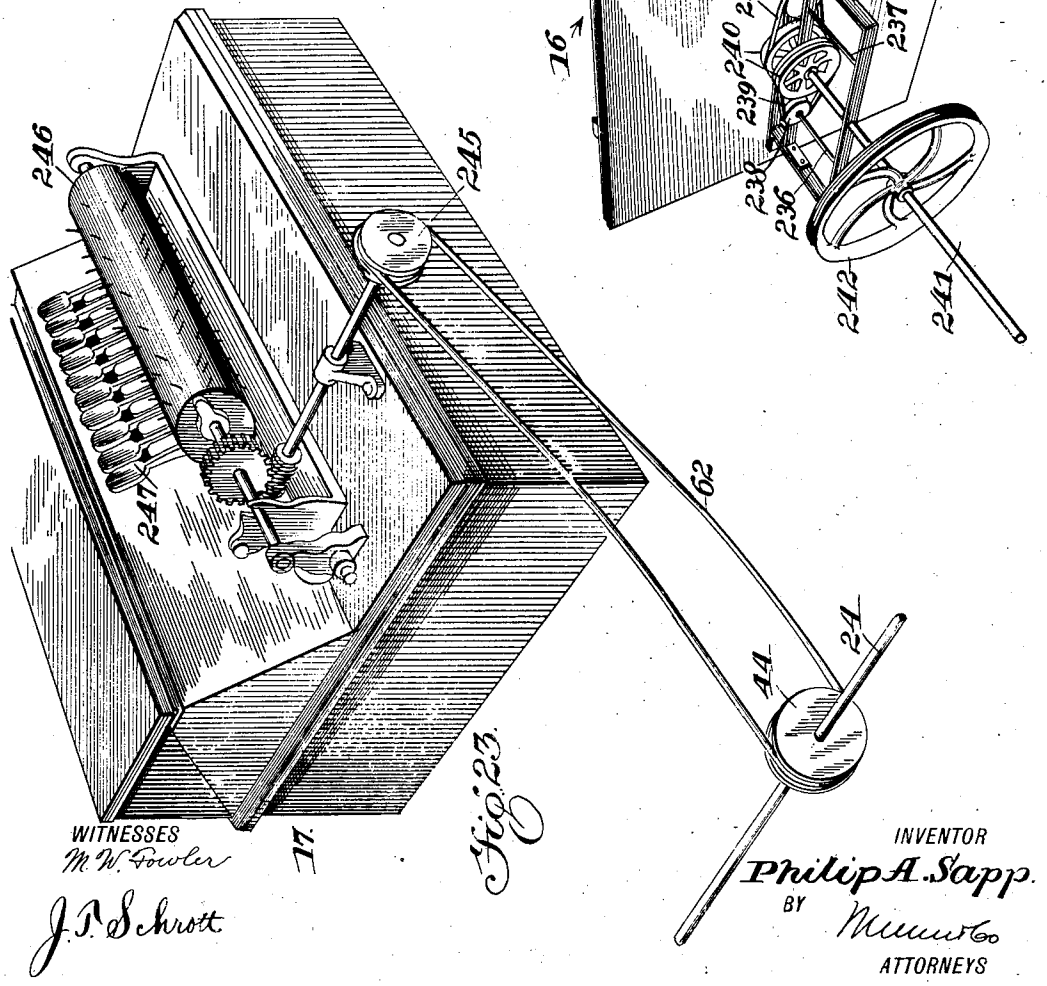

Fig. 23.

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Filed Feb. 1, 1923 11 Sheets-Sheet 9

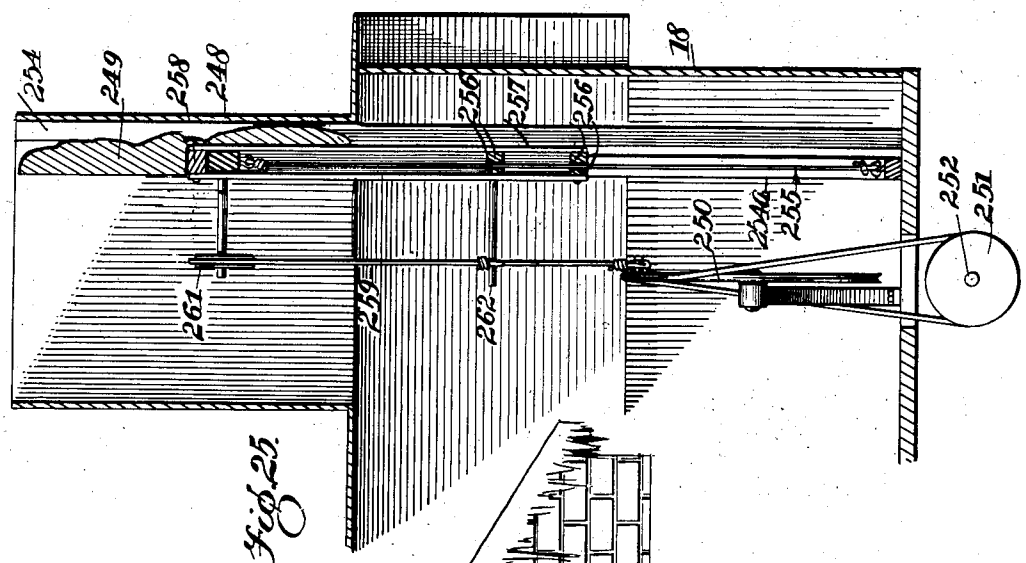

Fig. 25.

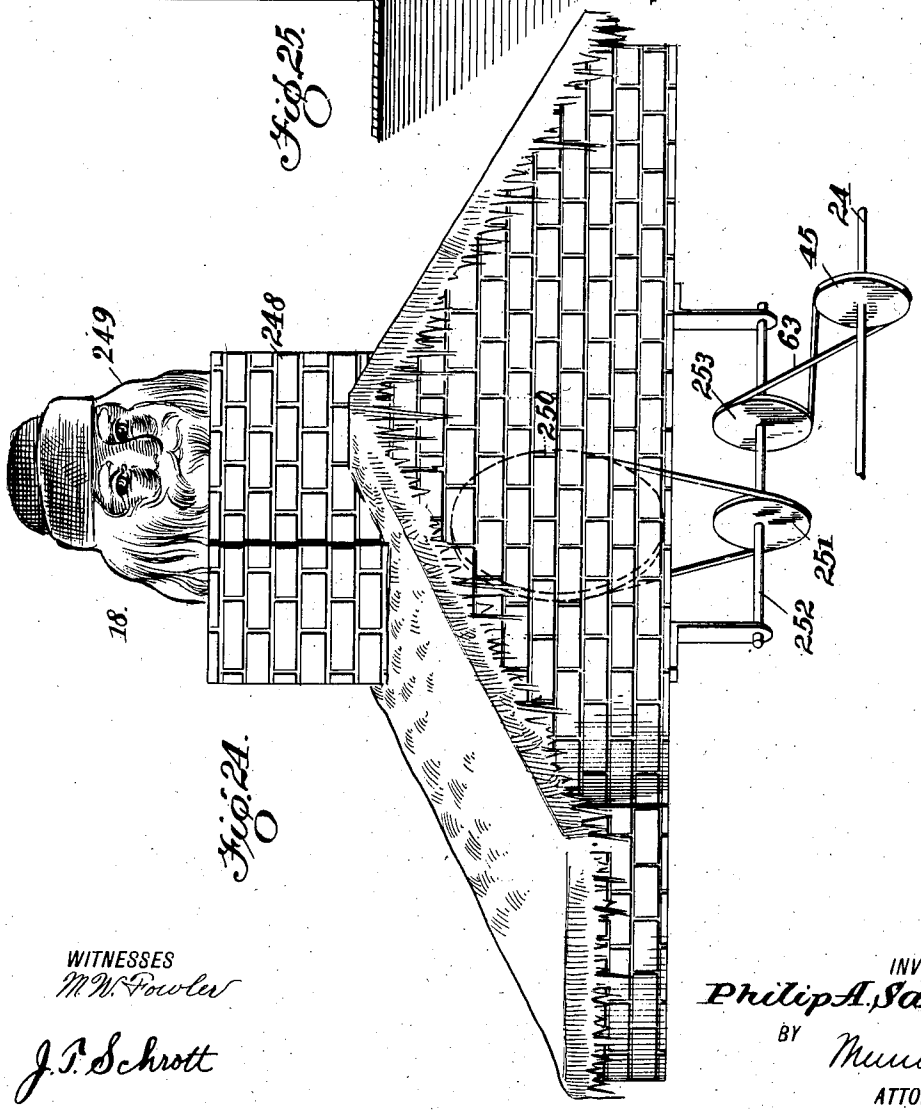

Fig. 24.

WITNESSES

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Filed Feb. 1, 1923 11 Sheets-Sheet 10

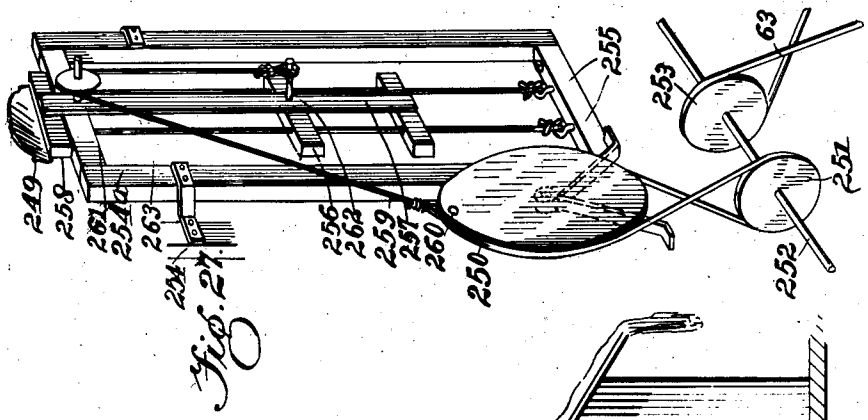

Fig. 27.

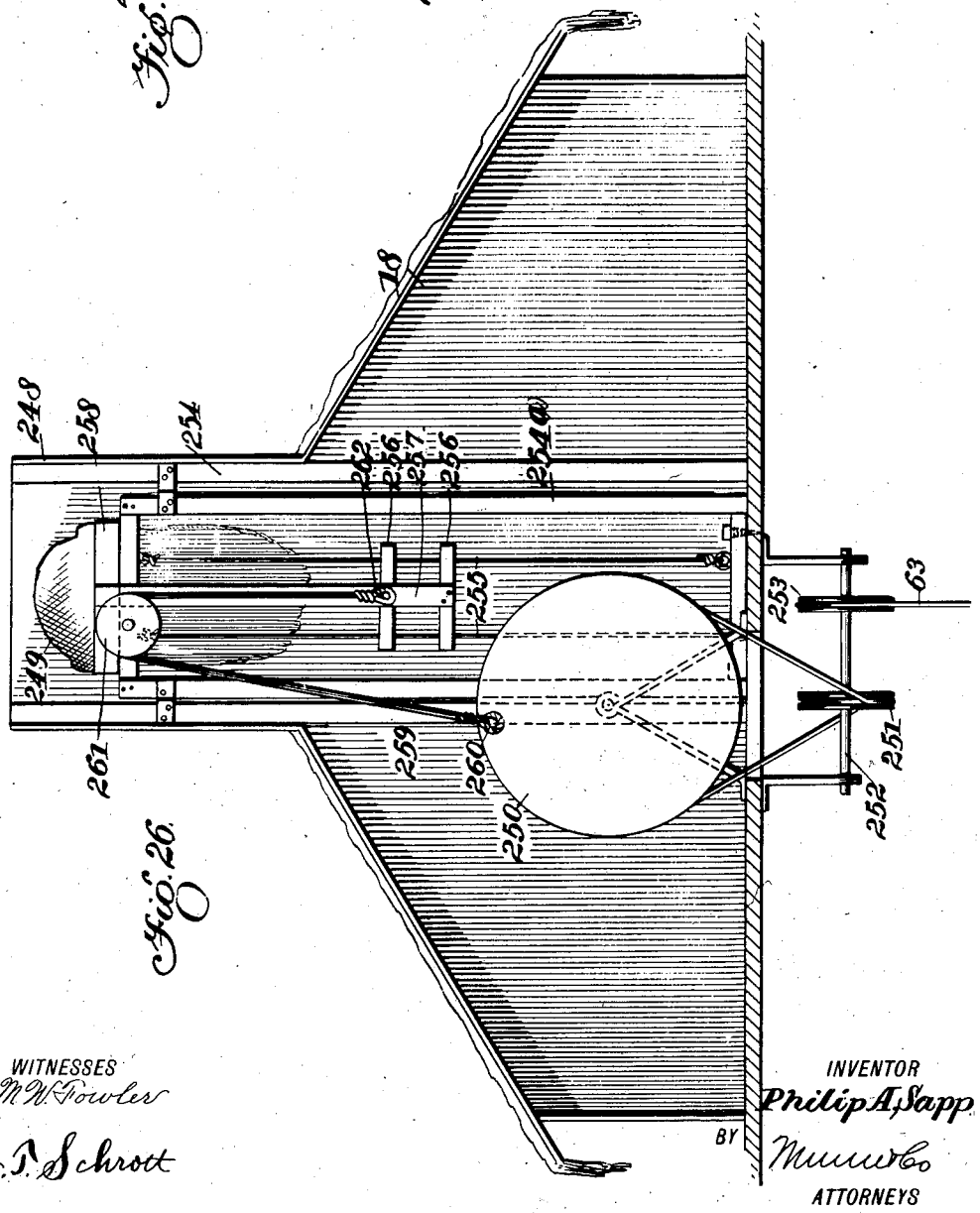

Fig. 26.

WITNESSES
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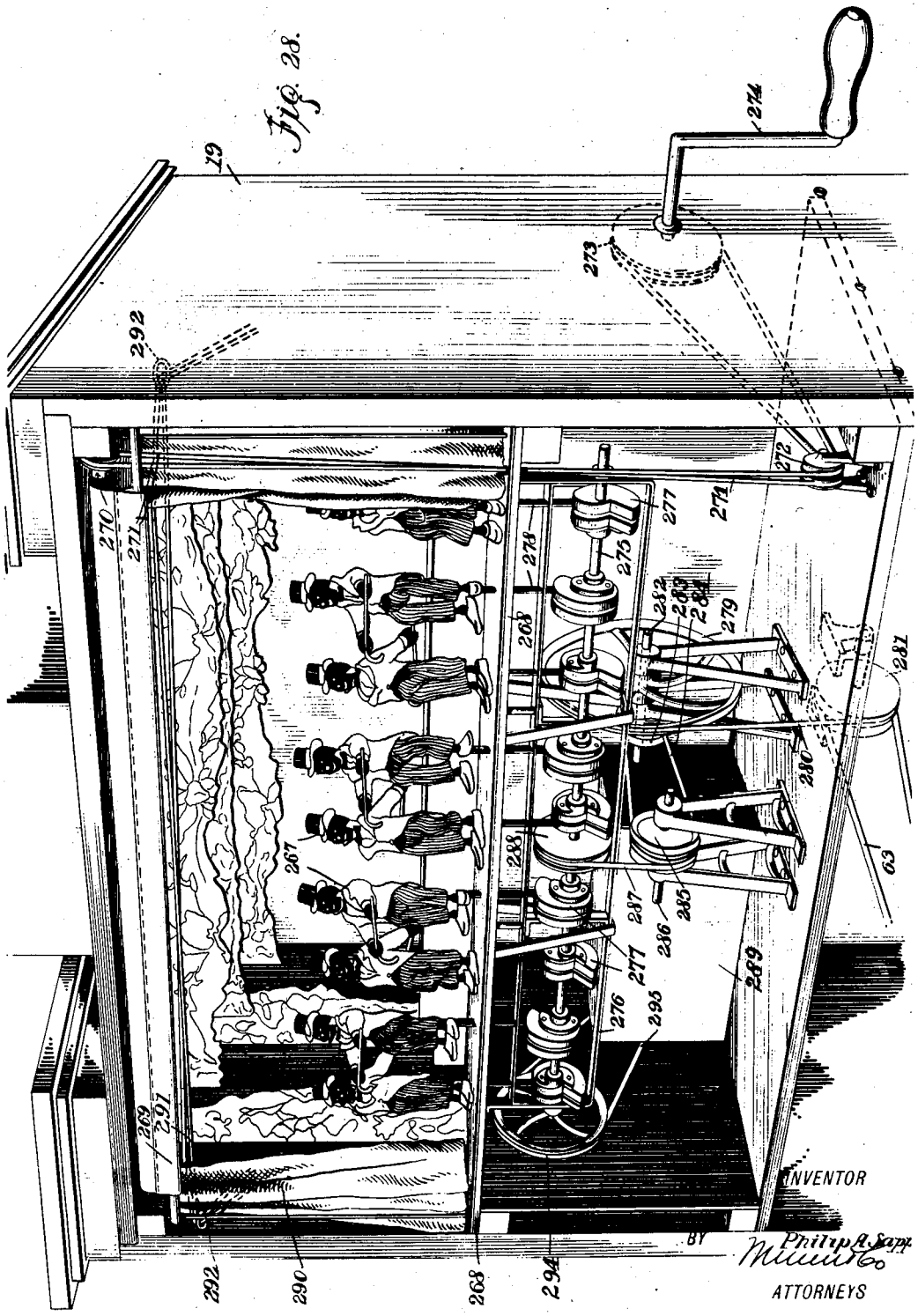
Fig. 28.



Patented June 22, 1926. 1,589,432

UNITED STATES PATENT OFFICE.

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TOY CARNIVAL.

Application filed February 1, 1923. Serial No. 616,409.

My invention relates to improvements in toys and it consists of the construction, combination and mode of operation herein described and claimed.

An object of the invention is to provide a plurality of mechanical toys with common means for operating all of them simultaneously in their respective modes of operation, the general resulting effect being that of a toy carnival.

A further object of the invention is to provide a toy carnival in which certain ones of the toys, for example, the minstrel show and the Santa Claus house, are interchangeable to suit the season of the year.

A further object of the invention is to provide a toy carnival which has a common source of operating power for all of the toys, some of which are operated therefrom with a reciprocating motion, others being operated therefrom in a rotational movement.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawings, in which:

Fig. 1 is a perspective view illustrating the general aspect of the toy carnival,

Fig. 2 is a longitudinal section taken substantially on the line 2—2 of Fig. 1,

Fig. 3 is a partly inverted perspective view of the negro clog dancers,

Fig. 4 is a partly inverted perspective view of the performing elephants,

Fig. 5 is a detail sectional view of the step bearing of one of the rotating toys,

Fig. 6 is a detail perspective view showing the manner of mounting and operating the airplane,

Fig. 7 is a perspective view of the trained wild animals,

Fig. 8 is a detail sectional view through the foot of one of the animals showing how the fastening to the rotating ring is effected,

Fig. 9 is a perspective view of the busy shop,

Fig. 10 is a detail side elevation showing how the sawyer (one of the manikins in the busy shop) is operated,

Fig. 11 is a detail side elevation showing how the blacksmith (another one of the manikins in the busy shop) is operated,

Fig. 12 is a detail perspective view of the miniature whip,

Fig. 13 is a detail cross section taken substantially on the line 13—13 of Fig. 12,

Fig. 14 is a detail perspective view showing how one of the chairs is mounted on the chain,

Fig. 15 is a detail perspective view of the monkey show,

Fig. 16 is a perspective view of the carousal,

Fig. 17 is a detail perspective view of the Ferris wheel,

Fig. 18 is a detail perspective view of the bare-back riders.

Fig. 19 is a detail perspective view showing how the hoofs of the horses are fastened to the concentric rings,

Fig. 20 is a detail perspective view showing how the rider is pivotally mounted on the horse,

Fig. 21 is a detail front elevation of the Chinese balancers,

Fig. 22 is an inverted perspective view clearly showing the revolving mechanism of the Chinese balancers,

Fig. 23 is a detail perspective view of a roller organ which is adaptable, at times, to furnish music for the toy carnival,

Fig. 24 is a perspective view of the Santa Claus house,

Fig. 25 is a central vertical section thereof,

Fig. 26 is a rear elevation of the Santa Claus house illustrating the mechanism by which the figurehead is made to move up and down the chimney,

Fig. 27 is a detail perspective view of the operating mechanism, and

Fig. 28 is a perspective view of the minstrel show which may be interchanged with the Santa Claus house at seasons other than Christmas.

The toy carnival comprises the following mechanical toys: 1 the negro clog dancers, 2 the performing elephants, 3 the aerial swing, 4 the aeroplane, 5 the racing automobiles, 6 the trained wild animals, 7 the

busy workshop, 8 the horizontal bar performers, 9 the whip, 10 the acrobats, 11 the monkey show, 12 the carousel, 13 the Ferris wheel, 14 the trained sea lions, 15 the bare-back riders, 16 the Chinese balancers, 17 the roller organ (Fig. 23), 18 the Santa Claus house and 19 the minstrel show.

All of these toys are mounted on the top 20 of a table. They are not necessarily mounted on a table top but may be mounted on any other plane board. There is no particular limitation in respect to the manner of mounting of the mechanical toys because they may even be mounted otherwise than in a horizontal plane, for example, they may be mounted on a base which is on a stepped formation, somewhat on the order of the scenery furnished for certain classes of toys, such as toy railroad trains. No illustration of the various modes of mounting the toy carnival (other than on the plane table top) is made, because the manner of mounting the toy is not of prime importance.

The table includes the sides 21 which may be utilized as the supporting means for a false bottom 22 (Fig. 2). Pendent from the false bottom 22 is a plurality of bearings 23 in which the main shaft 24 is journalled. This shaft carries a pulley 25 to which the belt 26 of an electric motor 27 is applied for driving the main shaft and in turn operating all of the toys on top of the table. This operation is accomplished by means of pulleys and belts. In addition to the pulley 25, the main shaft 24 carries pulleys 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44 and 45. These are not stationed on the main shaft 24 in the order named, but rather in the order of the mechanical toys which they operate.

For example, the pulley 28 has a belt 46 which operates the negro clog dancers 1; the pulley 29 has a belt 47 which operates the performing elephants 2; the pulley 30 has a belt 48 to operate the aerial swing 3; the pulley 31 has a belt 49 to operate the aeroplane 4, and in the same order of application, the pulleys 32, 33, etc. have belts 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62 and 63 for operating the other toys 5, 6, etc.

In tracing the main shaft pulleys in connection with the mechanical toys to be operated, the reader will find that the number of pulleys on the main shaft is one less than the number of toys to be operated. In other words, there are nineteen mechanical devices to be operated but only eighteen pulleys on the main shaft (this excepting the driving pulley 25). The reason for the omission of one pulley is this: The Santa Claus house 18 and minstrel show 19 are interchangeable. Either may be driven from the pulley 45. The Santa Claus house is more appropriate for the Christmas season, whereas the minstrel show 19 may be kept in place throughout the rest of the year. As it is anticipated that both will not be used at one time, provision of only one common driving pulley is made, and this accounts for the omission of one pulley. In order that the reader may become familiar with each of the mechanical toys, a detailed description of each toy in its numerical order, follows:

The negro clog dancers 1 comprises two manikins 64 and 65 (Figs. 2 and 3) which are carried by rods 66, the ends of which remain in engagement with cams 67 and 68 by virtue of the weight of the manikins. The cams are mounted on a countershaft 69 which has a pulley 70 to which the belt 46 (Fig. 2) is applied. As the cams are fixed in different radial positions on the countershaft 69, it follows that the manikins will be operated alternately and simulate the action of dancing. The countershaft is mounted in a bearing bracket 71, the rods 56 being guided by other portions 72 of the bracket structure. The bracket structure may either be mounted beneath the table top 20 or under a separate base as suggested by Fig. 3. The operation of the manikins is identical in either case.

The performing elephants 2 comprise a number of elephant figures 73 each of which stands on a tub 74 (Fig. 1). The various tubs are carried by shafts 75 (Fig. 4), each of which carries a pulley 76, to all of which a belt 77 is applied in such a manner as to make some of the elephants turn in one direction and others in the opposite direction. The shafts 75 are supported in bearing brackets 78 which, like the bearing structure 71 in Fig. 3, may either be mounted under the table top 20 or under a separate base, as suggested by Fig. 4. One of the shafts 75 is longer than the rest and carries a pulley 79, to which the belt 47 from the pulley 29 on the main shaft 24, is applied.

The aerial swing 3 comprises a vertical shaft 81 (Fig. 2) which carries a pulley 82 to which the belt 48 of the pulley 30 on the main shaft 24, is applied. The lower end of the shaft 81 rests in a step bearing which consists of an ordinary floor flange 80 (Fig. 5) into which a short nipple 83 is screwed. The top of the nipple is closed by a pipe cap 84, and the bottom of the flange and nipple is closed by a circular plate 85. A hole is drilled in the cap to admit the end of the shaft 81. Oil in the nipple furnishes lubrication for the lower end of the shaft. A number of swings 86 are suspended from the top of the shaft 81, and upon rotation of the latter, the swings fly out by centrifugal force.

The aeroplane 4 is suitably mounted on the end of a rod 87 (Figs. 1 and 6) which in turn is adjustably mounted at 88 on a

vertical shaft 89. The shaft carries a pulley 90 (Fig. 6), and the lower end of the shaft has bearing in a step bearing 91 which in construction is precisely like the bearing 83 of the shaft 81. The belt 49 (Fig. 2) of the pulley 31 on the main shaft 24, is applied to the aforesaid pulley 90. In operation, the aeroplane 4 moves in a circle over the toy carnival. The propeller 92 is loose on the front of the aeroplane and is caused to spin as the aeroplane moves.

The racing automobiles 5 consist of two toy automobiles mounted on the end of a rod 93 which is carried by a vertical shaft 94. This shaft has a pulley 95 to which the belt 50 of the pulley 32 is applied. The shaft 94 is supported in a step bearing 96 which is identical with the bearing 83 in Fig. 5. The automobile race track is surrounded by a suitable wire fence 97.

The trained wild animals 6 consist of a number of lions or other figures 98. The extremities of the outermost legs of each of these figures is slit so as to fit over a ring 99 and to be pinned in place thereon. The ring is supported by a number of spokes 100 from a shaft 102. The figure 101 of a trainer is mounted on the upper end of this shaft. The shaft carries a pulley 103 to which the belt 51 of the pulley 33 on the main shaft 24 is applied, (Fig. 2). The lower end of the shaft 102 is supported by a step bearing 104 like the bearing 83 in Fig. 5.

The busy work shop 7 consists of six manikins 105, 106, 107, 108, 109 and 110 (Fig. 9) which are individually made to simulate the performance of various occupations. A shaft 111, supported in bearings 112 (of which only one is shown in Fig. 9) carries pulleys 113 by which the various manikins are operated. Belts 114 are provided for this purpose.

The manikin 107 consists of a sawyer. The body is pivoted in the middle at 115. The legs 116 are adapted to be fixed and carry a pulley 117 to which the belt 114 is applied. This pulley carries a pin 118 which operates in the slot of a bent rod 119 which is made to perform the function of a pivot for the upper part of the body. The rotation of the pulley 117 causes the rod 119 to rock back and forth and correspondingly move the manikin 107 so as to simulate sawing wood.

Others of the manikins move only one arm instead of the upper part of the body. This is true, for example, of the blacksmith 109 (Fig. 11). A pulley 120 carries a pin 121 which is adapted to periodically strike the rod 122 so as to cause the lifting of the arm 123. The rod 122 is released when the pin 121 passes the end thereof, letting the hammer 124 fall upon the anvil 125. Others of the manikins operate in the same way, and the result is a rapid succession of taps which suggests the busy work shop. The arm 123 is carried by the horizontally bent part of the rod 122 which also functions as a pivot for the arm.

The shaft 111 carries a driven pulley 126 to which a belt 127 from a pulley 128 of a countershaft 129 is applied. The shaft is carried by a bracket structure 130. The countershaft also carries another pulley 131 to which the belt 54 (Fig. 2) from the pulley 36 on the main shaft 24 is applied.

It should be stated that in practice the busy work shop may contain more than six operating manikins. In such event, the shaft 111 would carry a corresponding increase in number of pulleys. It is quite obvious that another row of manikins may be ranged along the back of the tent 132, all of the manikins being driven from the one shaft.

The horizontal bar performers 8 comprise two manikins 133 (Fig. 2) which are fixed at the feet upon a horizontal shaft 134 from which they extend in opposite directions. The shaft 134 carries a pulley 135 which is belted at 136 to a pulley 137 on a countershaft 138. This shaft carries a pulley 139 which is driven by the belt 53 from the pulley 35 on the main shaft 24. The countershaft 138 is supported in a bracket structure 140. Rotation of the shaft 134 causes the figures to describe a circle about the bar or shaft. The shaft is journalled in uprights 141.

The whip 9 comprises two sprockets 142 and 143 which are respectively carried by shafts 144 and 145. These shafts have pulleys 146 to which a belt 147 is applied so that uniform driving motion is imparted to both shafts. The shaft 145, however, carries another pulley 148 to which the belt 54 (Fig. 2) of the main shaft pulley 36 is applied. The shafts 144 and 145 are in practice supported by step bearings of which one is shown at 149 in Fig. 12.

A chain 150, applied to the sprockets 142 and 143, carries a plurality of chairs 151. These are mounted on the sprocket chain by means of braces 152 (Fig. 14). The diverging ends of the braces are suitably secured to extra links 153 of the chain. The converging ends of the braces are secured by the upright and threaded portion of a hook 154, the horizontal portion of which is screwed into the lower sill of a chair. Nuts 155 keep the braces in place on the hooks.

In practice, the sprockets 142, 143 and the chain 150 are concealed by a cover 156 (Fig. 13). This cover is supported above these parts in any suitable manner. The chairs move over a base 157 which is applied to the table top 20. Each chair has a plurality of casters 158 which, in operation, cause the chairs to partake of the familiar

sliding movement as they are drawn over the plate or base 157.

The acrobats 10 comprise a manikin 159 (Figs. 1 and 2) which stands on a barrel 160 and supports another manikin 161 on the shoulders. The barrel 160 is carried by a vertical shaft 162. This shaft has a pulley 163 driven by the belt 55 of the pulley 37 on the main shaft. The shaft 162 is supported in a step bearing 164. The turning of the shaft turns the barrel and the two manikins.

The monkey show 11 is housed in a tent 165 on the top of which the figure 166 of a monkey is supported by a swing 167. This swing remains stationary, no provision for moving it being made.

A shaft 168 carries a rod 169 on the ends of which bicycle wheels 170 are mounted. The monkey figures 171 are so mounted on the ends of the rod 169 above the bicycle wheels as to simulate the act of riding them. A trainer 172 stands in the middle of the ring 173 and revolves with the shaft and rod.

At one side a number of monkeys 174 are fixed on a seesaw 175. The monkeys on the ends move up and down with the seesaw but the monkey in the middle merely sways from side to side. The seesaw is pivoted at 176 and is operated by a pitman 177 which has connection with one end of the seesaw (Fig. 15) and with the wrist pin 178 of a pulley 179. The pulley is supported by a bracket 180 and is driven by a belt 181.

This belt passes around an idler spool 182, around the pulley 183 on the central shaft 168 and around a pulley 184 on a shaft 185 at the other side of the monkey show. The shaft is driven by the belt 56 (Fig. 2) which receives its motion from the main shaft pulley 38 and is applied to a pulley 186 on the shaft 185. Mounted on the upper end of this shaft is a ball 187 upon which the monkeys 188, which assume an acrobatic pose, are mounted. In operation, the monkeys 188 revolve, the bicyle riders 171 move around the ring, the trainer following, and the monkeys 174 ride up and down on the seesaw.

The carousal 12 is housed in a pavilion 189. The circular platform 190 carries a plurality of animal figures 191 upon which riders 192 are mounted. The circular platform 190 is carried by a shaft 193 which is supported at the bottom in a step bearing 194. All of the step bearings are identical in construction with the step bearing 83 in Fig. 5. The shaft 193 carries a pulley 195 to which the belt 57 of the main shaft pulley 39 (Fig. 2) is applied.

The Ferris wheel 13 comprises a hub 196 (Fig. 17) on the ends of which pulleys 197 and 198 are mounted. The former of these is driven by a belt 199 from a pulley 200 on a countershaft 201. This countershaft carries another pulley 202 which is driven by the belt 58 (Fig. 2) of the main shaft pulley 40. The countershaft is supported by a bearing bracket 203.

A plurality of wire loops 204 radiates from the hub 196. Carriages 205 swing on the closed ends of the loops 204. Toy figures 206 are seated in each of the carriages. A belt 207 runs from the pulley 198 to the pulleys 208 of a horizontal engine 209. The Ferris wheel is actually revolved by the belt and pulley connections with the pulley 197 but the belt 207 and the engine 209 are more prominent and there is therefore the appearance of the Ferris wheel being operated by the engine.

The trained sea lions 14 are mounted on velocipedes 210 (Fig. 1) which in turn, are carried by the extremities of a horizontal rod 211. This rod is supported in the middle by the shaft 212 which carries a pulley 213 (Fig. 2) to which the belt 59 of the main shaft pulley 41 is applied. The shaft 212 is supported by a step bearing 214. The trainer 215 stands in the middle of the ring and follows the sea lions around. The trainer is affixed to the upper end of the shaft and to the cross rods for this purpose.

The bare-back riders 15 are housed in a tent 216 which, like the other three large tents in the back row (Fig. 1) is open in front so that the performance may be seen. A shaft 217 carries a pair of concentric rings 218 which are supported by radiating spokes 219. The two horses 220 and 221 are secured to the rings by having pins passed through where the split roofs 222 (Figs. 19 and 20) fit over the rings.

Situated at each side of the tent is a clown 223 and 224 holding a stick 225 over which the riders 226 and 227 are supposed to jump. Each rider (227, for example) is supported by a rod 228 (Fig. 20), the lower end of which is suitably secured on the body of the horse. The upper end of the rod is bent over at right angles and passes through screw eyes 229 which in turn are fastened in the body of the rider 227. This arrangement provides a pivotal mounting upon which the rider swings when the heels come into contact with the rigid stick held by a clown, simulating the act of jumping.

A trainer 230 stands in the middle of the rings and follows the riders and horses around by virtue of being attached to the upper end of the shaft. This shaft carries a pulley 231 (Fig. 18) to which the belt 60 of the main shaft pulley 42 (Fig. 2) is applied. The shaft is supported at the bottom by a step bearing 232.

The Chinese Balancers 16 consist of three toy figures, one of which 233 (Fig. 21) is

standing on his head on a large goblet and is balancing two large bottles on his feet. The other figure 234 is prostrate on the stand 235 and is supporting another figure on the end of a pole.

The respective figures specifically described are made to turn with vertical shafts 236 and 237. Each of these has a pulley 238 to which belts 239 are applied. These belts are driven by larger pulleys 240 on a vertical shaft 241. This shaft carries a pulley 242 which is driven by the belt 61 of the main shaft pulley 43 in Fig. 2. The shaft 241 is supported by a step bearing 243. The smaller shafts are supported by a bracket bearing structure 244.

The roller organ 17 is fitted with a pulley 245 by which the organ is adapted to be operated by the belt 62 of the main shaft pulley 44 (Figs. 2 and 23). This roller organ is intended to be used only when the minstrel show 19 is not in use, and at such times the organ furnishes the music for the toy carnival. When the minstrel show 19 is in use, the belt 62 may be disconnected (Fig. 2) because the minstrel show carries its own music. This appears under the detailed description below. Little need be said in reference to the roller organ 17 other than that it comprises the familiar music roller 246 which is adapted to operate the keys 247.

The Santa Claus house 18 includes a chimney 248 (Fig. 24) out of which the Santa Claus head 249 moves periodically. This movement is produced by a large pulley 250 which is driven by a smaller pulley 251 on a countershaft 252. The countershaft carries another pulley 253 to which the belt 63 of the main shaft pulley 45 (Fig. 2) may be applied when the Santa Claus house is substituted for the minstrel show 19. The one belt 63 is intended to operate either device.

A frame 254 (Fig. 26) supports the Santa Claus house and a smaller frame 254ª supports a pair of parallel wires 255 upon which the cleats 256 are guided. These cleats carry a pair of iron rods 257 which are connected at the top to a block 258 upon which the head 249 is mounted in any suitable manner. The block 258 serves as a spacer for the iron bars and as the latter are situated on opposite sides of the top rail of the frame, they too, assist in guiding the up and down movement of the head and tend to prevent it from swaying too far forward. A cable 259 runs from a wrist pin 260 on the large pulley 250 over an idler 261 to a point of connection 262 on one of the cleats 256.

The minstrel show 19 suggests a construction somewhat like that of the clog dancers 1. The minstrels 267 appear upon a stage 268 when the curtain 269 is drawn. This is a roll curtain, mounted at the top and provided with a pulley 270 by means of which the curtain is let up and down. A belt 271 is applied to this pulley thence running over a double pulley 272 to a wheel 273 which controls it. The wheel 273 is mounted on the shaft of a crank handle 274. Turning of the crank shaft either raises or lowers the curtain 269. This mode of operating the curtain is only one of several which might be employed.

A countershaft 275, supported in a bearing bracket structure 276 beneath the stage 268, carries a plurality of cams 277 with which the stems 278 contact. The minstrel figures are carried by these figures and the weight of the figures keeps the stems in contact with the cams. It is to be observed that the cams are fixed in various positions on the countershaft, the result of turning the countershaft being to make the figures simulate clog dancing.

The main pulley 279 is adapted to be driven by a belt 280 which runs to one side of a double pulley 281 which is adapted to be driven by the belt 63 (Fig. 2) when the minstrel show is substituted for the Santa Claus house 18.

It would be quite an obvious expedient to provide an independent drive for the main pulley 279 in the event that it be desired to operate the minstrel show entirely separate and apart from the rest of the toy carnival. Such an independent drive would consist of an electric motor or the like. In this case, the belt 280 would be applied to a pulley on the motor shaft. The shaft 282 carries a pulley 283. The belt 284 is applied to this pulley and to a similar pulley 285 on a countershaft 286 for the purpose of driving a belt 287 which, besides being applied to a part of the pulley 285, is also applied to a pulley 288 on the shaft 275.

Mounted on one end of the countershaft 275 is a pulley 294 which has a belt 295 running back to the roller organ 289. It is obvious that when the minstrel show is a part of the toy carnival, the roller organ 17 (Fig. 23) may be dispensed with. As stated above, the belt 62 is then released from the organ pulley 245 and permitted to simply hang down as shown in Fig. 1. It is to be observed in Fig. 28 that the minstrel show has a proscenium curtain 290 in addition to the drop curtain 269.

The proscenium curtain 290 is operated by cords 291 which are suitably affixed to the respective halves of the curtain and pass through suitable guide means 292 before they reach the back of the stage whence they are adapted to be operated. By properly manipulating the two curtains and starting the manikins 267 at the proper time, the performance of the minstrel show may be rendered very life-like.

The effect of the toy carnival is greatly improved by providing a background 293

(Fig. 1). This background consists of a sheet of suitable material having the pictures of various places of amusement, such as are usually found in amusement resorts, painted thereon. The upper outline of these buildings is cut out to further aid the suggestion of a carnival.

While the construction and arrangement of the improved toy carnival as herein described and claimed is that of a generally preferred form, obviously modifications and changes may be made without departing from the spirit of the invention or the scope of the claims.

I claim:—

1. A toy carnival comprising a table top, a plurality of toy units arranged upon the table top, bearing means pendent from the table top, a main shaft journalled in said means, a plurality of pulleys mounted on the main shaft one for each toy unit, means embodied in some of the toy units adapted to be driven by corresponding pulleys on the main shaft to operate said toy units with a reciprocating motion, and means embodied in others of the toy units adapted to be operated by others of the pulleys to produce a rotating motion.

2. A toy carnival comprising a table, a bottom spaced beneath the table, bearing means depending from the bottom, a driving shaft journalled in the bearing, a plurality of pulleys carried by the driving shaft, a plurality of toy units arranged upon the table, a vertical shaft for each of certain ones of the units extending through the table, bearing means for said shaft mounted upon the bottom, a horizontal shaft for others of the units disposed in the space between the table and bottom, bearing means depending from the table for supporting said shafts, and means by which all of said shafts are adapted to be driven from the various pulleys on the drive shaft.

3. A toy carnival comprising a table, a background at one side of the table, a plurality of large tents each containing independently operable toys arranged in front of the background, a plurality of smaller untented toy units arranged on the table in front of the tents, a common drive shaft, and individual driving connections for said operable toys and said toy units.

4. A toy carnival comprising a table, a background arranged at one side of the table, a plurality of large tents arranged adjacent to the background each containing a toy unit, a plurality of smaller toy units arranged in front of the tents, an airplane, supporting means therefor by which the airplane is caused to move over the toy carnival, a main drive shaft, and individual driving connections to each of the toy units and to the supporting means of the airplane whereby all are caused to operate at once.

5. A toy carnival comprising a table, a drive shaft, a Santa Claus house including a chimney on the table, a Santa Claus head, a weighted carrier to which the head is attached, revoluble means having connection with the carrier to move it and the head up and down in respect to the chimney, means by which the carrier is guided, a countershaft, driving connections between the countershaft and said revoluble means, and driving connections between the countershaft and said main shaft.

6. A toy carnival comprising a table, a main drive shaft, a vertical shaft extending through the table, means by which the vertical shaft, is driven from the main shaft, concentric rings carried by the vertical shaft, horses affixed to the rings, a bare-back rider for each horse, means carried by each horse upon which the rider is pivotally mounted, and a figure at each side of the ring holding a stick adapted to engage the heels of the riders causing a pivotal movement to simulate jumping.

7. A toy carnival comprising a table, a main drive shaft, a busy work shop on the table, a driving shaft in said work shop carrying a pulley, a countershaft beneath the table adapted to be driven by the drive shaft and adapted to drive the aforesaid driving shaft, a manikin comprising a fixed body portion and a movable body portion, a pulley carried by said fixed body portion adapted to be driven by the pulley on the driving shaft, a pin on the pulley of said fixed body portion, and means extending from said movable body portion into a position to be periodically engaged by said pin.

8. A toy carnival comprising a table, a main drive shaft, a countershaft, driving connections between the main and counter shafts, a Ferris wheel mounted on the table including a hub, a pulley on each end of the hub, a driving connection between one pulley and the countershaft, and a dummy engine having connection with the other pulley and adapted to be driven thereby thus simulating the driving of the Ferris wheel by the engine.

9. A toy carnival comprising a table, a main drive shaft having a pair of pulleys, a pair of belts one being driven by one of the pulleys, the other normally hanging idly from the second pulley, a minstrel show upon the table including a countershaft, a pulley on said shaft, driving means including a double pulley receiving the driven belt from the first main drive shaft pulley, a roller organ embodied in the minstrel show being driven from the countershaft, a Santa Claus house exchangeable for the minstrel show including a countershaft having a pulley to receive said driven belt and be driven by said main drive shaft pulley, and a roller organ to be mounted upon the table having

a pulley to receive and be driven by said normally idly hanging belt when the Santa Claus house is substituted for the minstrel show.

10. In a toy, a table, a main shaft having two main driving pulleys, a main drive belt on each of the driving pulleys, a minstrel show to be mounted upon the table, a stage forming part of the minstrel show, said show including a plurality of figures, rods by which the figures are carried extending through the stage, a countershaft having cams upon which the rods rest, an organ driven by a belt on a pulley on the countershaft when the minstrel show is in operation, driving means for the countershaft including a double groove pulley with one groove of which one of the main drive belts is engageable; a Santa Claus house which is exchangeable for the minstrel show having an operating pulley to which said one main drive belt is applicable, and an organ mountable upon the table having a pulley to which the other main drive belt is applicable when the Santa Claus house is in operation in exchange for the minstrel show.

11. A device of the character described comprising a table, a main drive shaft, a pair of belts for operating selective toy units mountable upon the table, one belt being driven by the main drive shaft, the other normally hanging idle, one of said toy units comprising a minstrel show including a countershaft, a pulley on said shaft, driving means including a double pulley receiving the driven belt, a roller organ embodied in the minstrel show being driven from the countershaft; another of said toy units comprising a Santa Claus house exchangeable for the minstrel show including a countershaft having a pulley to receive said driven belt, and an organ mountable upon the table having a pulley to receive and be driven by said normally idly hanging belt when the Santa Claus house is substituted for the minstrel show.

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May 10, 1927. 1,628,628

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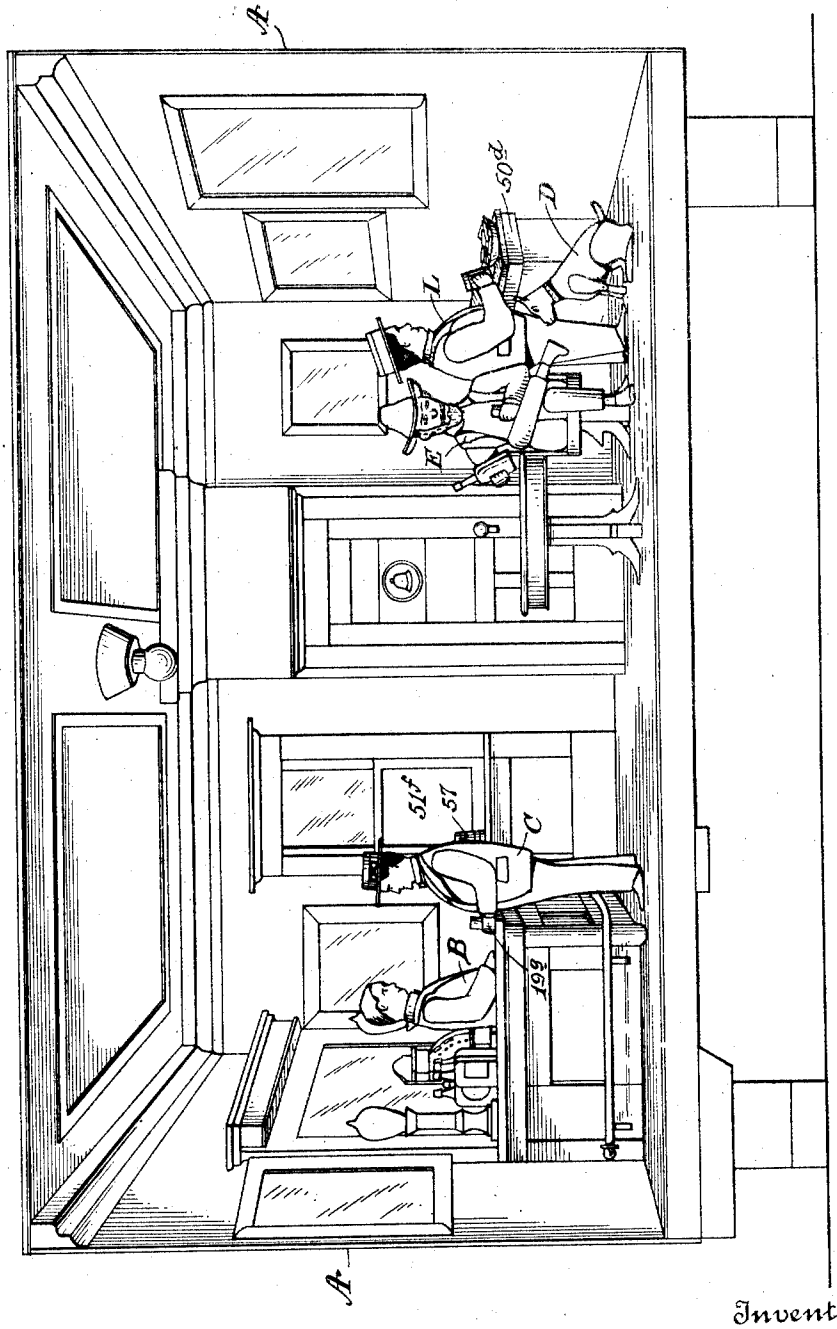

Fig. 1.

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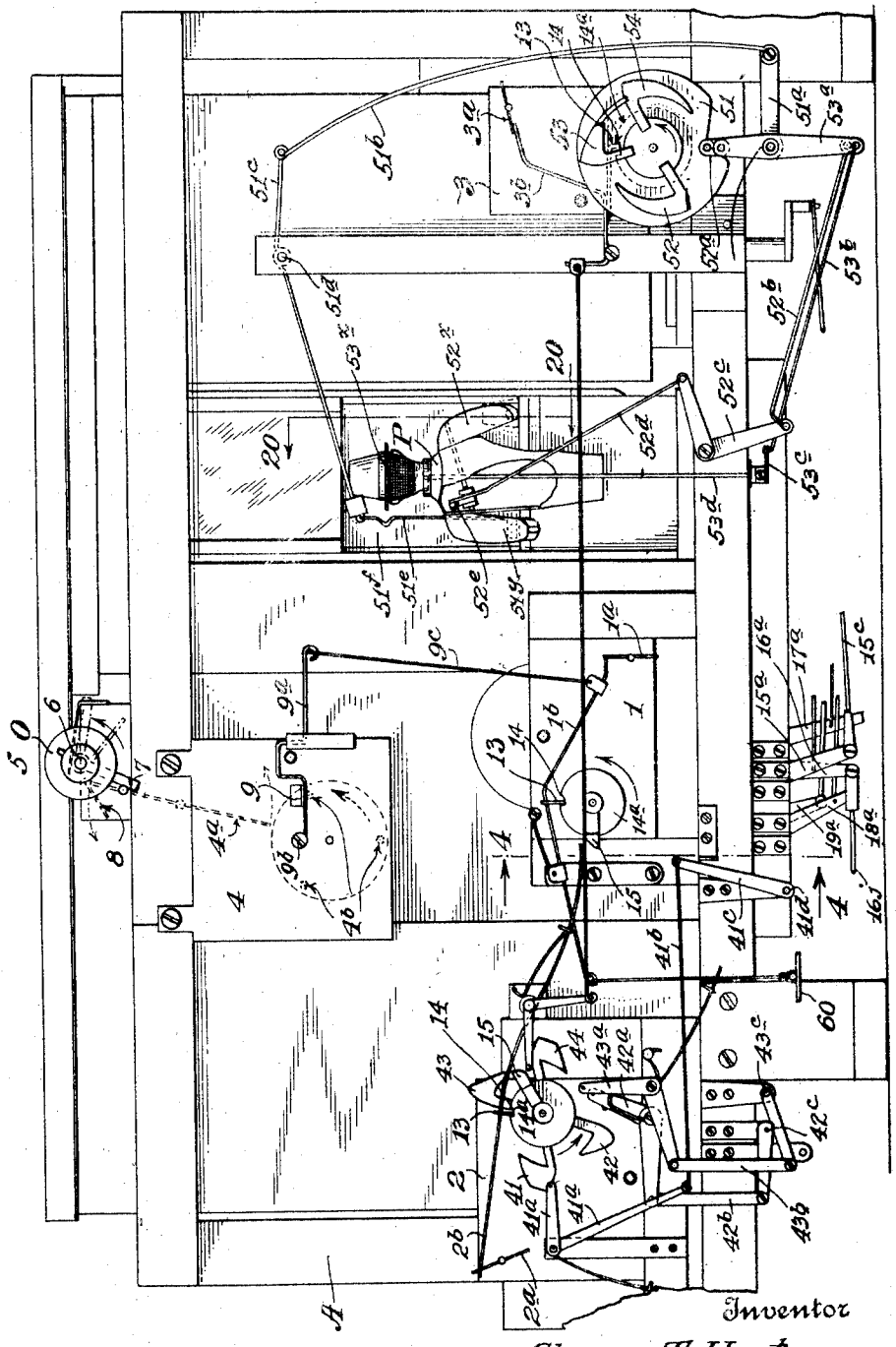

Fig. 2.

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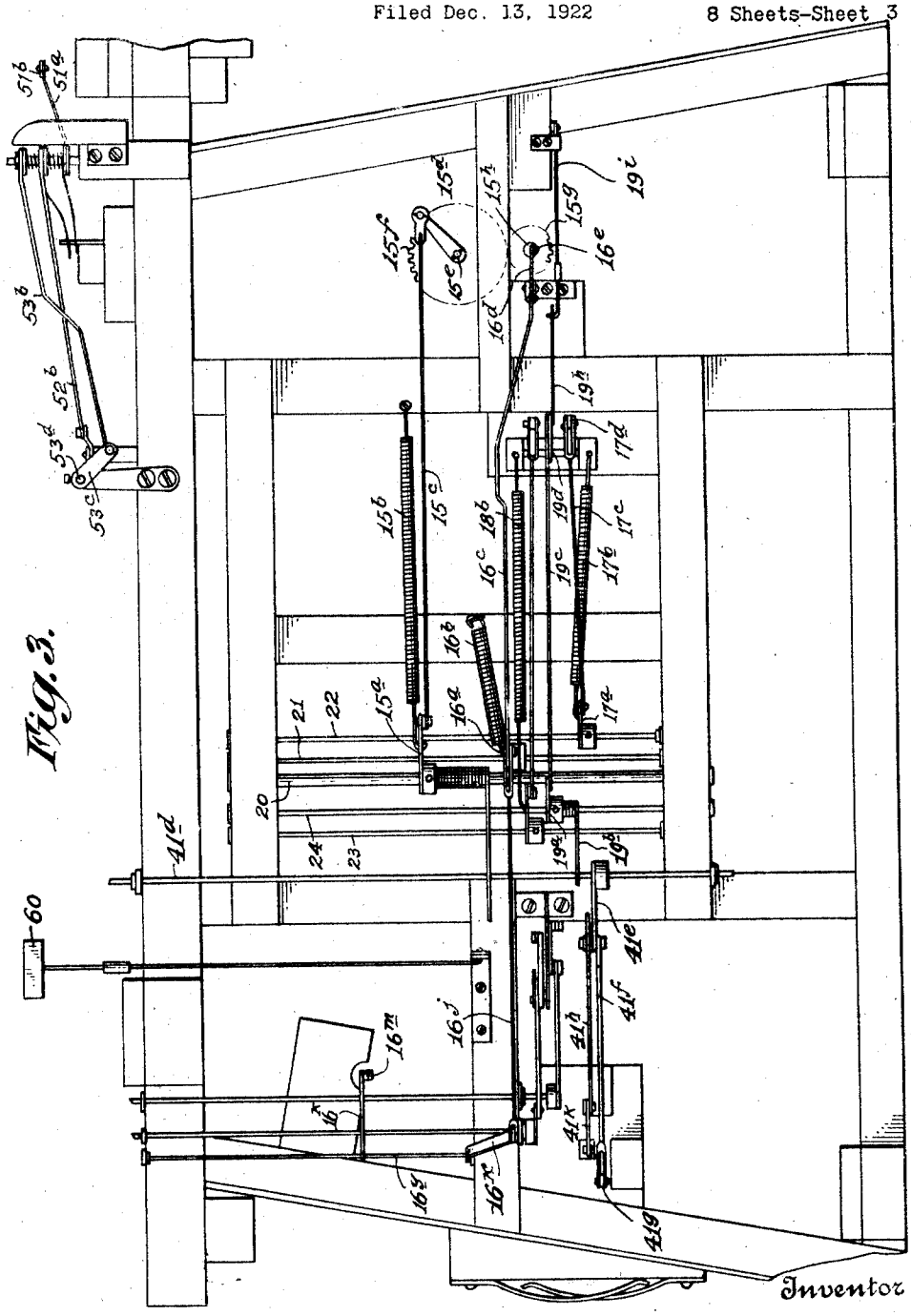

Fig. 3.

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May 10, 1927 1,628,628

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Fig. 4.

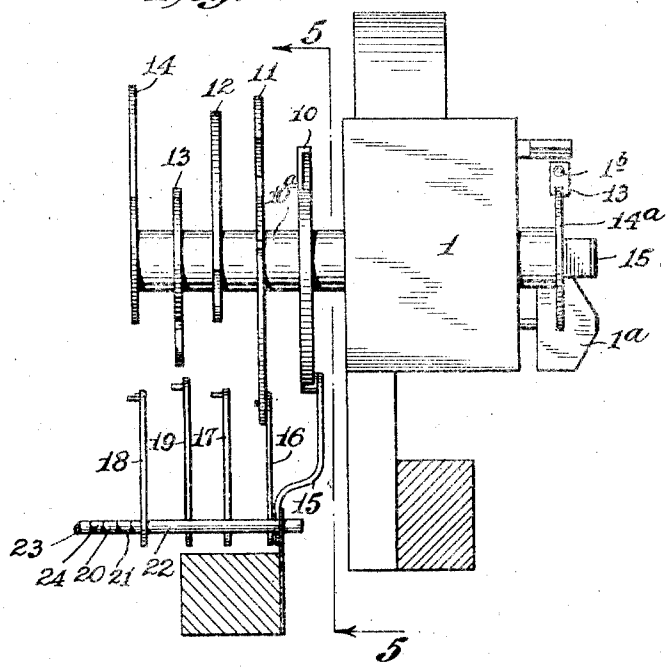
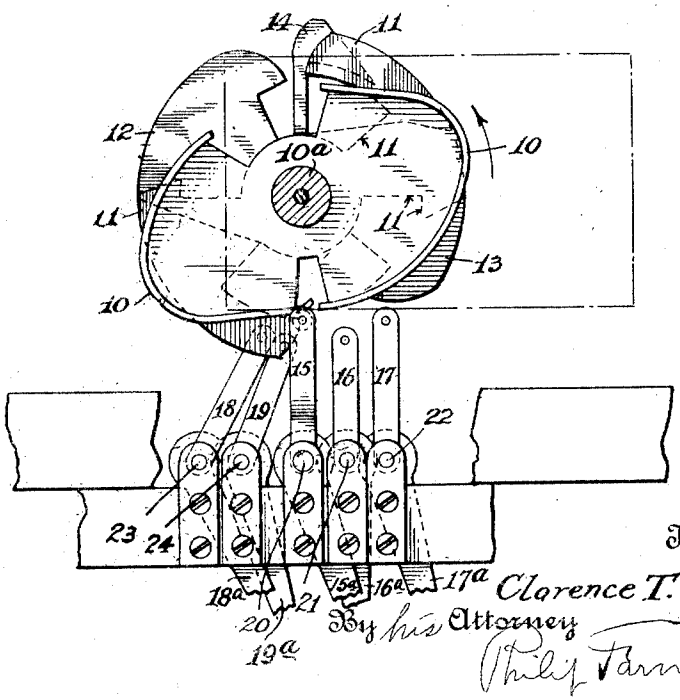


Fig. 5.



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May 10, 1927. 1,628,628

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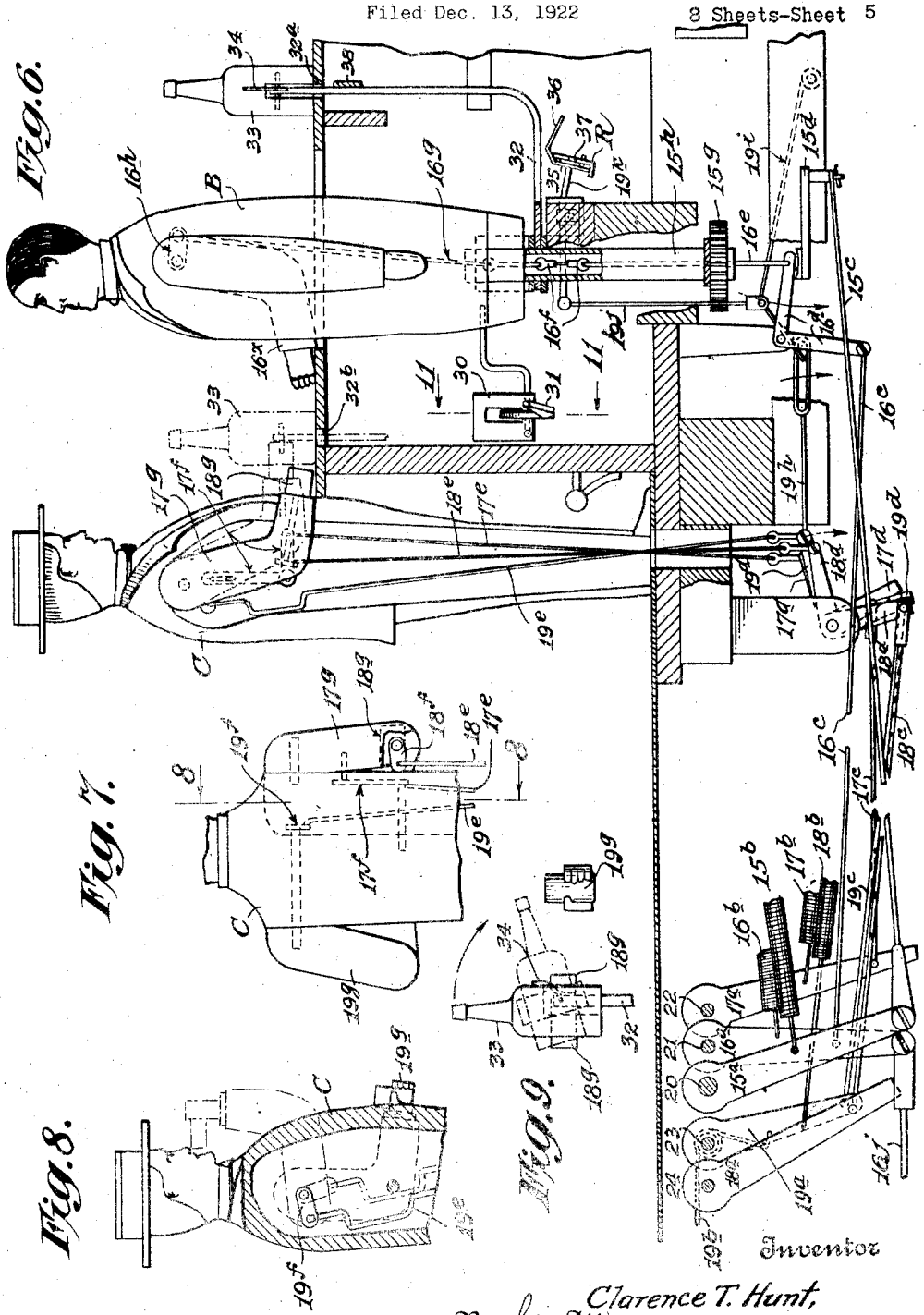

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

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Fig. 10.

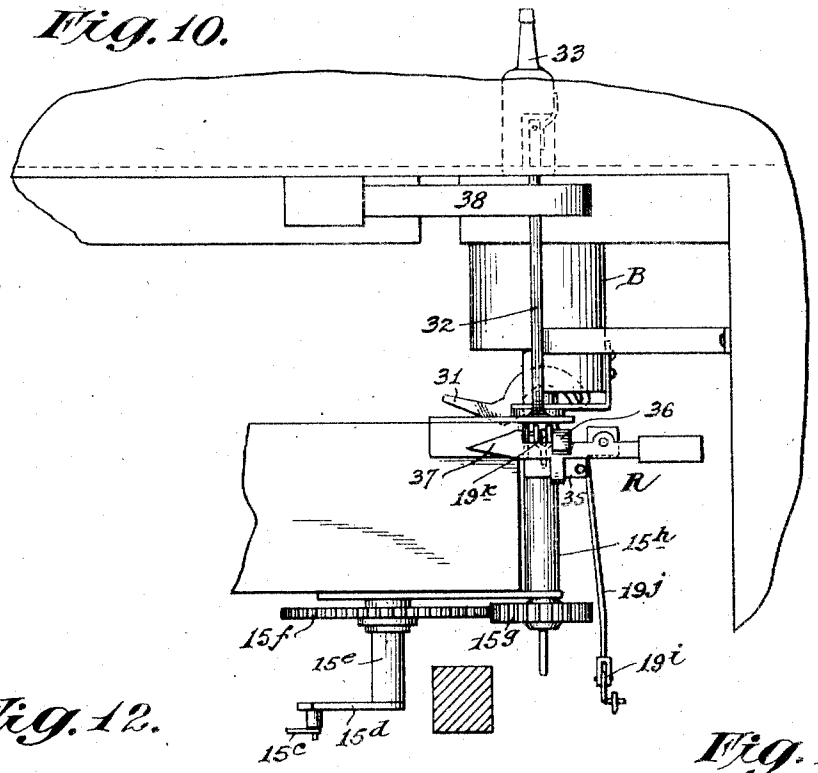

Fig. 12.

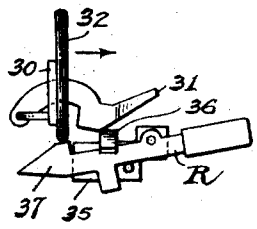

Fig. 13.

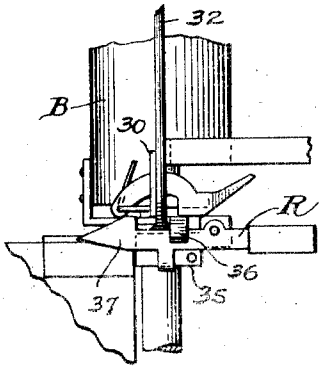

Fig. 11.

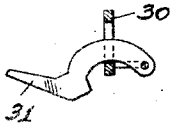

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Fig. 14.

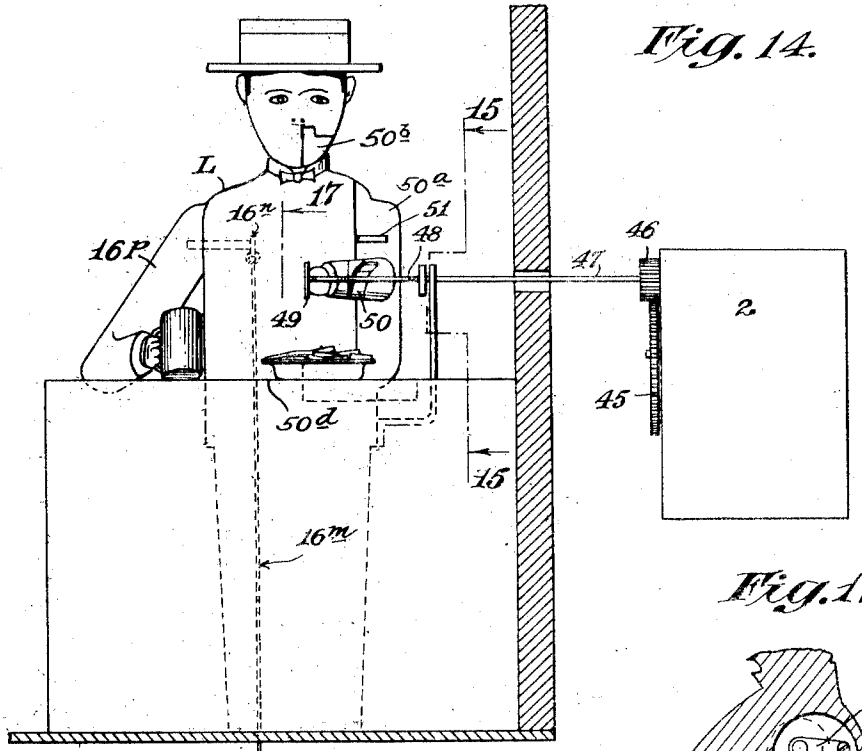


Fig. 17.

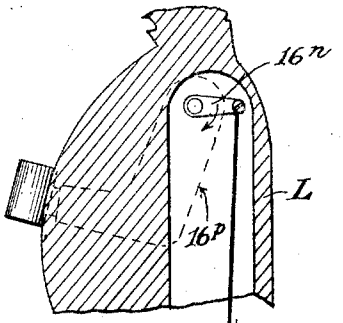


Fig. 15.

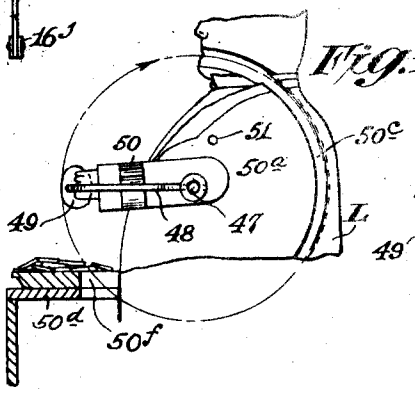
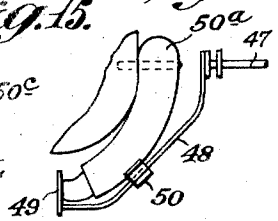


Fig. 16.



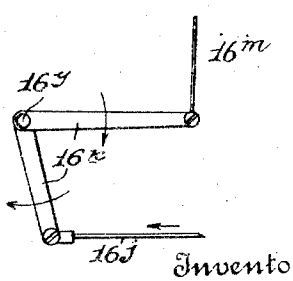


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Fig. 18.

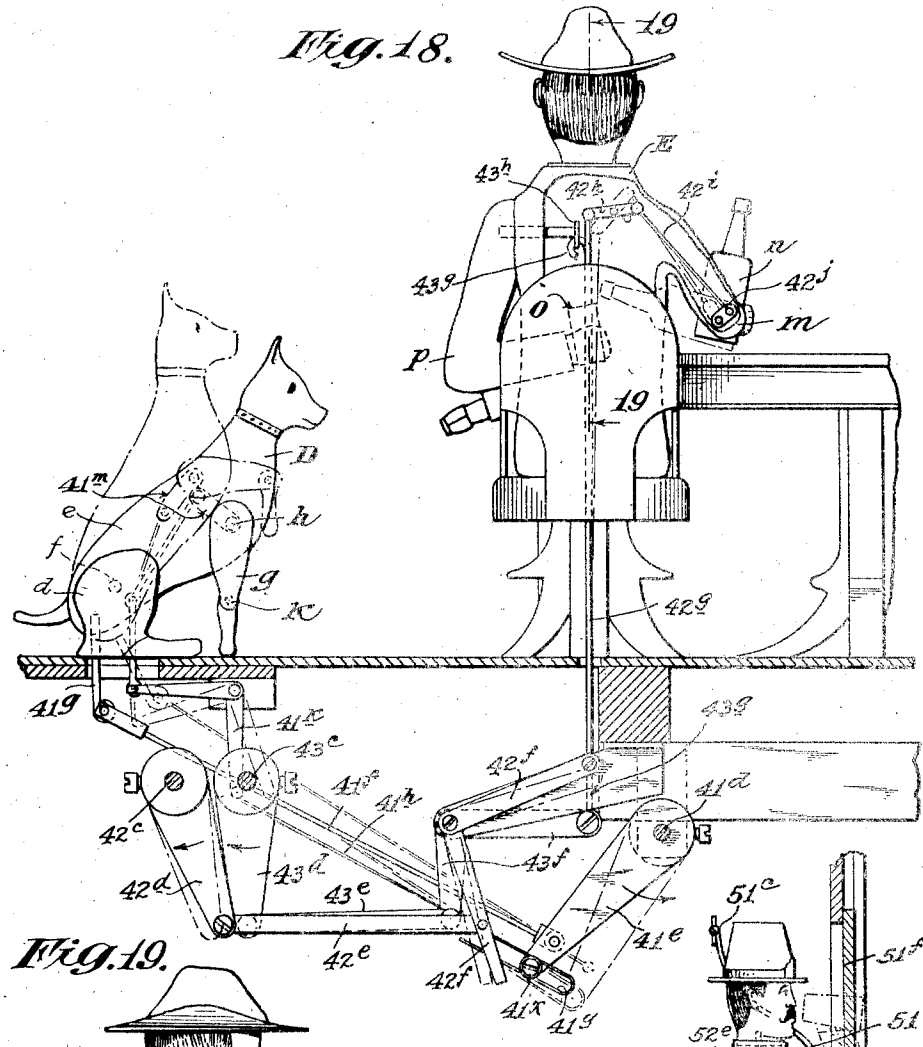


Fig. 19.

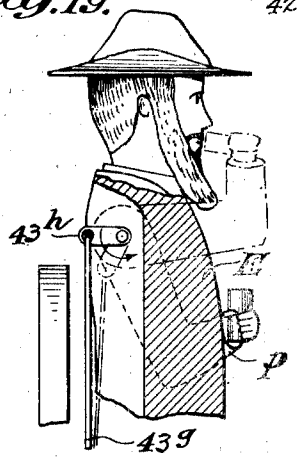
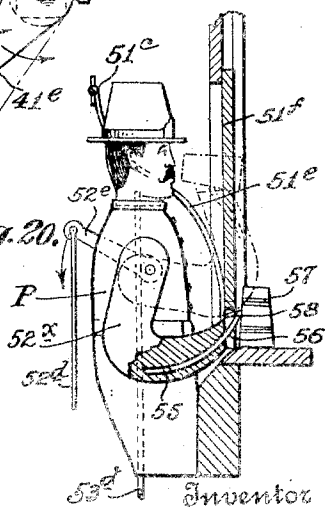


Fig. 20.



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Patented May 10, 1927. 1,628,628

UNITED STATES PATENT OFFICE.

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MECHANICAL MINIATURE THEATRICAL.

Application filed December 13, 1922. Serial No. 606,567.

This invention relates to mechanical miniature theatricals.

The object of the invention is a combination of a miniature theatrical stage with figures disposed thereabout to represent animate beings, and mechanical devices cooperating with special constructions of the individual figures whereby the miniature figures are caused to perform ordinary actions of animate beings in a lifelike manner, the whole being co-ordinated to cause a predetermined relation of the actions of one or more figures to those of other figures, with the result of causing the production on a small scale of a theatrical play or the like, involving actions by a number of individuals.

The invention consists of the arrangement and apparatus herein disclosed.

The several figures may be operated at co-ordinated times either by separate actuating means or by a common actuating means suitably controlled. The figures cooperate with one another to produce a unitary effect or illusion as of a continuous theatrical performance, holding the attention of a number of observers by virtue of the lifelike character of the performance.

The invention is adapted principally for show-window display to attract crowds to which demonstrations can be made, after the performance, of the wares to be sold. The device also is adapted for use as one of the more expensive types of toys. Experience with the invention has demonstrated superior ability to draw crowds at a store window.

Small figures or toys representing animate beings and having movable members have been long known; but this invention differs from those in various respects to be pointed out, all contributing to lifelike motions effected at co-ordinated times for the purpose of sustaining the interest and attention of observers; the figures being operated successively or in co-ordinated time relation so that every movement in its relation to others can be seen without effort and will convey the impression of a logical sequence and a whole performance with related parts.

The mechanism for operating the several figures is so constructed as to properly time the actions of the figures to imitate, on a small scale, the production by living persons, of a play or scene, the several figures seeming to be operatively distinct from each other, and performing their distinctive movements in a lifelike manner without any visible operating mechanisms. An impression created on the mind of an observer of the operation of an embodiment of this invention is that the movements are so realistic and so apparently impossible by mechanical means directly operating the figures, that it seems as if some different force such as electromagnetism must be employed.

While the mechanism for actuating each figure involves individual novel arrangements and produces individual effects, yet the apparatus as a whole with its grouping or succession of individual effects produces a unitary total effect or illusion which would be lessened by the elimination of one or more of the individual figures and effects (see Fig. 1).

Of the drawings,

Figure 1 is a front elevation of the apparatus showing a perspective interior view of a salesroom, store or old-fashioned café or saloon;

Fig. 2 is a rear elevation of the apparatus;

Fig. 3 is a bottom plan view of the apparatus;

Fig. 4 is a detail sectional view on the line 4—4 of Fig. 2, looking in the direction of the arrows and showing the cams of an operating clockwork;

Fig. 5 is a section on the line 5—5 of Fig. 4 looking in the direction of the arrows;

Fig. 6 is a detail sectional view looking from the rear of the apparatus and showing the mechanism for operating the figures of the salesman and customer;

Fig. 7 is a view of the back of the customer, showing its controlling mechanism;

Fig. 8 is a vertical section on the line 8—8 of Fig. 7 looking in the direction of the arrows and showing the mechanism for raising the left arm of the customer;

Fig. 9 is a detail view showing how the customer tilts the bottle;

Fig. 10 is a view looking from the rear of the bar and showing the lower portion of the body of the salesman or drink dispenser, the bottle on the rear shelf, and the mechanism controlling the salesman and the bottle;

Fig. 11 is a detail sectional view on the line 11—11 of Fig. 6, looking in the direction of the arrows, and illustrating the hook which connects the salesman mechanism to the bottle carrier;

Fig. 12 is a detail view of the bottle carrier and connecting hook in a position engaging a releasing mechanism;

Fig. 13 is a detail view similar to Fig. 10, showing the body of the salesman and releasing mechanism for the bottle;

Fig. 14 is an illustration of the front of the figure at the lunch counter and of the mechanism for controlling its arms;

Fig. 15 is a detail sectional view on the line 15—15 of Fig. 14, looking in the direction of the arrows, and showing the mechanism for raising the oyster and arm to the mouth of the figure;

Fig. 16 is a detail view of the left arm and operating mechanism for the figure at the lunch counter;

Fig. 17 is a vertical section on the line 17—17 of Fig. 14, looking in the direction of the arrows and showing the mechanism for raising the lunch-counter figure's right arm;

Fig. 18 is a detail elevation looking at the back of the figure at the table and at the dog, showing the mechanism for operating them;

Fig. 19 is a section on the line 19—19 of Fig. 18, looking in the direction of the arrows; and

Fig. 20 is a section on the line 20—20 of Fig. 2, looking in the direction of the arrows and showing the details of the policeman's right arm and connection to the drinking cup.

The novel features of the invention, among others, include mechanisms and arrangements for producing the following movements or effects, which may be more or less according to the following sequence (see Fig. 1):

(1) A figure, as a salesman or clerk, who may be a drink dispenser, turns toward the wall and apparently grasps an article, such as a bottle, and places it in a different position, letting go of it and later again grasping it and returning it to its original position.

(2) Another figure (as a drinker at the counter) takes the article and tilts it, as if pouring the contents into a glass, the arm of this figure having a compound movement.

(3) A figure (as the one sitting at table, or the one at the counter) tilts an article such as a bottle.

(4) A figure (as at lunch counter) apparently lifts an article of food to its mouth and releases it, the arm returning to lowered position without the article, which disappears, apparently in the mouth of this figure.

(5) The quadruped raises up on its haunches and bends its forepaws, a compound movement taking place.

(6) The raising of an arm of a figure to the mouth, as the lunch counter figure, the seated figure, the figure at the counter, and the policeman (behind the window).

(7) The movement of an arm of a person relative to a movable object, moving the latter to lift it or tilt it (as the policeman, the lunch-counter figure, and the standing customer).

(8) The raising of a window apparently by one of the figures (the policeman behind the window).

(9) The movement of both arms of a figure to perform different functions, as eating with one hand and drinking with the other or pouring with one hand and drinking with the other (as all three customer figures).

(10) The movement of the arm of a figure and the turning of its head (as the policeman).

While the above are a few of the movements or effects produced by the several figures individually, yet these figures cooperate to produce resultant effects and illusions, and are operated in part simultaneously and in part successively and in synchronism and order, in order to produce the effect of a play, scene or act.

Another feature of the invention is that the movements of the figures are controlled by several motors or clock mechanisms, a part of the movements being caused by one mechanism and other movements by another mechanism, the action being successive, one clock mechanism controlling the starting of the movement of another. Means is also provided to cause intervals of time to elapse between successive complete performances. This last means controls the starting of one motor-mechanism, which in turn controls another motor-mechanism. The figures are thus synchronized to perform their movements in proper order. After the play or act is completed, there is an interval of inaction or an intermission, and then a recommencement of the performance; and the interval may be employed to show the wares of the merchant in whose store-window the apparatus is being displayed for advertising purposes. A phonograph may be used not only as an accompaniment to the play, but also during the interval between performances to assist in displaying the advertiser's goods to the crowd collected by the apparatus of the invention.

The object of the invention is to secure the novel effects above described by the mechanism, constructions and arrangements hereinafter described and herein illustrated and as covered in the claims.

The specific embodiment of the invention

illustrated simulates an old-time bar-room or saloon having therein the figures of types of persons frequenting such places, the figures being constructed and arranged to produce the effects, impressions and illusions above referred to, with the purpose and actual result as proved in practice of holding such old customs up to ridicule. Before describing in detail the specific mechanism or mechanisms employed to actuate the several figures, there will be briefly outlined the general arrangement, operation and effects of the device when thus embodied as a bar-room scene.

The apparatus (Fig. 1) comprises a box-like structure open on one side. A view into the box from the open side shows an interior of a saloon. At the left is a bar with the usual furnishings, such as bottles, cash register, etc. A figure representing a bartender is behind the bar and seems (at the commencement of the play) to be just about to take an order from another figure, representing a customer in front of the bar.

At the rear of the room is a closed window with a stein or glass resting on the sill.

At the right center of the scene is the figure of an oldtimer seated at a table; this figure holds, and continues throughout to hold, a bottle in its right hand and a glass in its left.

To the right of the figure at the table there is a figure of a dog, and behind the dog in the rear corner of the room the figure of a man stands before a lunch-counter.

Behind the closed window is the figure of a policeman, which does not come into view of the spectators until the window is raised.

The action of the play takes about one minute, approximately, with an intermission of about two minutes, approximately, between successive plays, a complete cycle (play and intermission) taking about three minutes.

The movements of the several figures are controlled and caused by three clock mechanisms 1, 2 and 3 mounted on the rear of the rear wall of the box, Fig. 2; one of the clocks 1 being controlled by a fourth or master clock 4, also mounted on the rear of the rear wall. Action of clock 1 starts the action of clock 2 at a predetermined time, while the action of clock 2 starts the action of clock 3. Each of these actions slightly overlaps one another, so that there is substantially continuous action during the one minute of the play.

Clocks 1, 2 and 3 having come to rest after the minute interval, await the start of the action again by the master clock 4 which controls clock 1.

The action of the play is as follows. The figure of the bartender turns to the rear of the bar, raises its arm and apparently grasps a bottle which is standing on the rear shelf. It then faces front, bringing the bottle with it, and places it in front of the customer. The bartender's arm now drops away from the bottle. The right arm of the customer's figure now moves forward and its right hand grasps the bottle, tilting it by a rotation of the hand, then apparently pouring a drink from the bottle into the glass held in the left hand. The customer now returns the bottle to an upright position, and his right arm moves back, releasing the bottle. The bartender then again raises his arm and apparently grasps the bottle, and turning places it on the rear shelf. As the bartender turns away from the customer, the customer raises the glass in his left hand to his mouth and apparently drinks; and as the bartender faces front, the customer returns his glass to the bar. The foregoing action of the bartender and the customer is controlled by clock 1. This clock also controls the movement of the right arm of the figure at the lunch counter, the mechanism controlling its arm being connected to the mechanism controlling the bartender's arm, so that each time the bartender figure raises its arm the lunch counter figure raises its arm also and drinks from the glass in its hand.

The action of clock 2 begins as the bartender faces the customer the second time.

Clock 2 actuates the lunch counter figure, which begins to simulate the customer's eating of oysters, raising them to its mouth with its left hand, each oyster apparently disappearing into the mouth as the left hand returns to the plate of oysters on the lunch counter. This action of eating oysters continutes during the entire operation of clock 2, and is extraordinarily realistic.

Clock 2 also controls the actions of the oldtimer's figure seated at the table, and of the dog. The dog first sits up on its hind legs while its front legs bend at the joints so that the figure assumes a "begging" attitude directed toward the oldtimer. The latter now tilts the bottle in its right hand, as if to pour a drink into the glass in its left hand, then returns it to vertical position and raises its left arm and apparently drinks from the glass. The dog and figure at the table then repeat their movements successively.

This completes the action of clock 2. At about the time the oldtimer's figure at the table finishes drinking from the glass, the action of clock 3 begins, which causes the lower sash of the window at the rear to be raised by the figure of the policeman, revealing the latter. Its right arm moves forward, and, apparently, graps the drinking cup on the window sill and raises it to its mouth and drinks from it. It then returns the cup to the sill. The head then turns, apparently for a look of caution up the street or alley. The drinking operation

then is repeated, and the window closed. This completes the performance, which does not begin again until approximately two minutes have elapsed and the masterclock 4 releases the mechanism of clock 1.

The novel actions and illusions caused and depicted by the apparatus are so extremely realistic and independent of operating means as to cause the spectator to wonder how it is accomplished. For instance, the bartender apparently conveys the bottle to the customer and releases it while the customer grasps and tilts it; then the bartender returns the bottle to the rear shelf. The figure at the lunch counter apparently eats oysters which he conveys to his mouth by his left hand, and, as the oyster seems to disappear in its mouth, the arm returns to obtain another oyster. Then the policeman, after the window is raised, apparently takes hold of the glass and raises it to its lips, returning the glass to the sill and leaving it standing there after the window is closed. The mechanism employed causes the several movements of the figures to produce the above-described effects. This mechanism now will be described in detail.

The apparatus comprises (see drawings) a boxlike member A (Fig. 1) open at the front and simulating the interior of a room, in the present case the interior of a saloon.

Back of the rear wall of box A is mounted (Fig. 2) the master clock 4, and clocks 1, 2 and 3. Above the master clock 4 is located a control O by which the operation can be started or stopped. This control comprises a knob 5 fixed to the end of shaft 6 to which is secured a stop pin 7 and a blade 8. When the clock 4 is stopped, the blade 8 is in the path of a wind governor 4^a, which is part of the clock mechanism. When the knob 5 is rotated counter-clockwise and placed in the position shown in Fig. 2 in broken lines, the wind governor is free to turn. One of the wheels of the clock 4 (which runs continuously when released by the knob) has three pins 4^b mounted thereon which successively engage an ear 9 on a lever 9^a pivoted at 9^b and connected by a link 9^c to the detent or release 1^b in the path of the wind governor 1^a of clock 1. Every time a pin 4^b passes the ear 9, the detent 1^b is raised, starting the mechanism of clock 1. This is approximately every three minutes. Clocks 2 and 3 also have wind governors 2^a and 3^a respectively, which are released by raising their levers or detents 2^b and 3^b out of their way. Clock 1 controls clock 2, and the latter controls clock 3. As each detent 1^b, 2^b, 3^b controlling a wind governor is raised, a finger 13 on each is raised out of a notch 14 in a disk 14^a associated with each clock 1, 2, 3 and rotated thereby. When any disk 14^a completes one revolution, the finger 13, which rides on the edge of the disk again, drops into a notch 14, and the detent intercepts the governor and stops the clock. Each of the notched disks 14^a of clocks 1 and 2 carries a finger 15 which releases the detents 2^b, 3^b in sequence, so that after the disk 14^a on clock 1 has made almost a revolution, its finger 15 trips the detent 2^b, releasing clock 2. Similarly, when the notched disk 14^a on clock 2 has made almost one revolution, the finger 15 on this disk trips detent 3^b, which releases clock 3.

The action of the figures of the bartender B and of the customer C at the bar is controlled by clock 1 through the medium of five cams located at the rear of clock 1 (see Figs. 4 and 5). These cams 10, 11, 12, 13, 14 are mounted on a common shaft 10^a rotated by clock 1 and act on levers 15, 16, 17, 19 and 18 respectively, on rock shafts 20, 21, 22, 24 and 23 respectively mounted on the framework. These rock shafts have secured to them depending levers 15^a, 16^a, 17^a, 19^a and 18^a respectively, which are held under tension in one position by springs 15^b, 16^b, 17^b, 19^b and 18^b respectively (see Figs. 2, 3 and 6), which return them to normal position after being actuated by the cams and then released. Cams 10 and 11 are double cams adapted to actuate the levers 15 and 16 twice during a revolution of shaft 10^a.

Lever 15^a (Figs. 3 and 6) is connected by a rod 15^c to a lever 15^d on the end of a shaft 15^e (Fig. 10) which carries a gear 15^f which meshes with a pinion 15^g secured to a hollow shaft 15^h on which the figure of the bartender B is mounted. Actuation of the foregoing train causes bartender B to turn to the rear, rotating 180°. Mounted on the front of the figure of bartender B is a rectangular frame 30 (Figs. 6, 10–13) in which is pivotally mounted a hook 31 which, when the bartender rotates 180°, engages an angular bottle support 32 freely pivoted at its lower end around the shaft 15^h. This support 32 projects upwardly and through a semicircular slot 32^a (Fig. 6) in the rear shelf, and when in the forward position projects through a semicircular slot 32^b in the bar, as illustrated in broken lines Fig. 6. The bottle 33 is pivoted to the upper end of the support 32 above the rear shelf and is held upright by a spring 34.

As bartender B completes its movement to the rear, the hook 31 automatically engages the horizontal portion of bottle support 32. As bartender B returns in the reverse direction (under the influence of spring 15^b, the double cam 10 having released lever 15^a), the carrier 32 and bottle 33 are carried around with him to the front, and placed upon the bar. Before the return movement, the bartender's pivoted right arm 16^x is raised (moving around an axis near the shoulder). By the arm movement, the bartender appears to grasp bottle 33. This

movement is caused by lever 16^a (Figs. 3 and 6) which is connected by a rod 16^c to a bell crank 16^d which actuates rod 16^e extending through shaft 15^h and connected by swivels 16^f to rod 16^g connected in turn to lever 16^h secured to the pivot of the arm 16^x.

The bottle 33 (shown in broken lines, Fig. 6) is now in front of customer C, which moves its right arm 17^g towards it, the arm being pivoted at a point near the shoulder. This brings its hand 18^g up around the bottle, the hand 18^g being in the shape of a fork (see Fig. 9), the prongs of which engage the bottle 33 on opposite sides. The foregoing action is brought about (Figs. 3 and 6) by the lever 17^a, rod 17^c connected to bell crank 17^d which is attached to rod 17^e connected to bell crank 17^f (also Fig. 7), which moves the arm 17^g of customer C around an axis at the shoulder, the bell crank 17^f having a pin and slot connection with the arm. When customer C has grasped the bottle (as illustrated in broken lines, Fig. 6), the pivoted hand piece 18^g is rotated to tilt it towards the left hand 19^g holding a cup, simulating a pouring from the bottle into the glass or cup. This is caused by lever 18^a through rod 18^c, bell crank 18^d, rod 18^e and lever 18^f connected to the pivot of hand piece 18^g. Cam 14 thereafter releases lever 18^a allowing spring 18^b to reverse the movement of hand 18^g and set the bottle upright. Then arm 17^g is moved back, cam 12 allowing spring 17^b to do it.

Bartender B again raises its pivoted right arm 16^x and turns back, bottle 33 returning also, the double cams 10 and 11 causing these movements. Bottle 33 then is automatically disconnected from Figure B and is left on the rear shelf. For this purpose, a releasing device R is raised into the path of hook 31, which is released from bottle support 32 as it passes over device R (Figs. 6, 10, 12 and 13). Release R is actuated simultaneously with the movement of the customer's left arm or hand 19^g to simulate drinking. Arm 19^g (see Figs. 3–8) is swung around an axis near the shoulder from lever 19^a through rod 19^b, bell crank 19^d, rod 19^e and lever 19^f secured to the pivot of arm 19^g.

When bell crank 19^d is rocked, it actuates a slotted link 19^h connected to lever 19^i (Figs. 3, 6 and 10). When lever 19^i is actuated, rod 19^j connected to it and to lever 19^k, raises release R mounted thereon into the path of movement of hook 31. Release R comprises a frame 35 (see also Figs. 12 and 13) having a lug 36 and a hook 37 pivoted in frame 35. When release R is in raised position as shown in Figs. 12 and 13, hook 31 and carrier 32 on their return movement engage release R, hook 31 engaging lug 36 is disconnected from carrier 32, and carrier 32 is caught by hook 37 and held in the rear position, allowing bartender B to return without the bottle. Release R through the action of spring 19^b then lowers, and carrier 32 is held in place by a flat spring 38 bearing against it.

When bartender B raises its arm 16^x, the figure L at the lunch counter also raises its right arm 16^p (Figs. 3, 6, 14 and 17) which is pivoted at the shoulder. Arm 16^p is actuated by lever 16^a through rod 16^j, bell crank 16^k on shaft 16^y and rod 16^m connected to lever 16^n secured to the pivoted right arm 16^p of figure L.

Clock 2 now is in operation. This clock has four cams 41, 42, 43 and 44 (see Fig. 2). The cam 41 actuates the figure of a quadruped or dog D (Fig. 18, also Figs. 2 and 3). For this purpose, cam 41 (Fig. 2) actuates bell crank 41^a connected to lever 41^c on rock shaft 41^d through a rod 41^b. Lever 41^e on shaft 41^d is connected to a rod 41^g secured to the movable body or part e by rods 41^f (Fig. 18). Dog D is sitting on its hind legs d, (Fig. 18) the body part e being pivoted at f thereto. The operation of rods 41^f and 41^g moves body e on pivot f causing the body d to move from the inclined position when in full lines to that shown in dotted lines. The fore legs are double-jointed, the upper parts g being pivoted at h to the body e and to the lower parts at k. The dog's front legs are bent at the joints by the following means. At the end of lever 41^e is a stud 41^x which rides in U-shaped slot 41^y in one end of a rod 41^b which is connected at its opposite end to bell crank 41^k, which pulls down on lever 41^m secured to the pivot h and raises the upper parts of the front legs from the full line position to the dotted line position. The dog's fore paws are freely pivoted at k so that they move to hang downwardly in a "begging" position as soon as upper legs a are moved to the dotted line position. Thus when lever 41^e is actuated, the dog both sits upright and bends its forepaws as shown in broken lines Fig. 18, the slot 41^y providing sufficient lost motion for this purpose; that is, to allow the double movement (sitting upright and bending front legs) through a single actuating means 41^e.

The figure of a man E sitting at the table (Figs. 1, 18 and 19) has a right hand m holding a representation of a bottle n and pivoted to tilt the bottle to simulate a pouring into the glass o held in the hand of arm p which is pivoted at the shoulder to allow movement of arm p towards the mouth. Figure E is actuated as follows. Cam 42 (Fig. 2) rocks bell crank 42^a connected by levers 42^b to rock shaft 42^c (Fig. 18) to which lever 42^d is secured. Lever 42^d is connected by rod 42^e to bell crank 42^f which is connected by link 42^g to lever 42^h on figure E. Lever 42^h is connected by link 42^i to lever 42^j, which rotates hand m to tilt bottle n. Arm p is now raised to simulate

drinking. For this purpose, cam 43 (Figs. 2, 18 and 19) engages bell crank 43^a connected by link 43^b to rock shaft 43^c. On rock shaft 43^c is lever 43^d, which is connected by rod 43^e to bell crank 43^f connected by rod 43^g to lever 43^h connected in turn to pivoted left arm *p*. Cam 44 next engages bell crank 41^a, which causes the dog to repeat its action.

Clock 2 also causes figure L at lunch counter to simulate the eating of food such as oysters as follows (see Figs. 14–16). On the back of clock 2 is a gear 45 which meshes with pinion 46 secured to one end of shaft 47 which rotates as long as clock 2 is going. Shaft 47 carries a bent rod 48, on the outer end of which is a disk representing, say, an oyster 49. Disk 49 moves in a circular orbit, and as it comes up towards the man's mouth, rod 48 engages a spring catch 50 secured to the pivoted left arm 50^a of the figure, raising the arm until the hand and disk 49 are about up to the mouth. Arm 50^a then strikes a stop 51, which allows rod 48 to pass spring catch 50 on the arm and the arm drops back to its first position. The disk 49 continues on around through an opening 50^b through the man's head (so that the oyster apparently passes into his mouth) and through a circular groove 50^c at the rear of the figure, when it picks the arm up again. At the front of figure L is a table 50^d on which is a dish having the representation of a supply of oysters thereon. The dish and table have an opening 50^f through which rod 48 is raised to simulate a picking up of the food 49. The arm 50^a is pivoted at the shoulder on an axis coincident with the axis of shaft 47.

Clock 3 operates the figure of a policeman P (Figs. 2 and 20). This clock carries a series of cams 51, 52, 53 and 54. Window 51^f (Fig. 20) is raised by cam 51, which engages bell crank 51^a connected through rod 51^b to lever 51^c fulcrumed at 51^d and connected through rod 51^e to the window 51^f, the policeman's left arm 51^y being pivoted at the shoulder and connected to the window to move therewith to effect the illusion of the policeman opening the window. Window 51^f is held open by cam 51 during the movements of Figure P and caused by cams 52, 53, 54. The policeman's right arm 52^x, which is pivoted at the shoulder, is raised (to simulate drinking) by cam 52 which engages lever 52^a connected by rod 52^b (also Fig. 3) to bell crank 52^c connected in turn through rod 52^d to lever 52^e connected to the pivot of arm 52^x.

The policeman's pivoted head 53^x is then turned (Figs. 2, 3 and 20) by cam 53, which engages lever 53^a connected through rod 53^b to lever 53^c on rock shaft 53^d (Fig. 20) on the upper end of which the policeman's head 53^x is mounted. This makes it appear as if the policeman is turning his head to look down the back alley. Cam 54 then engages lever 52^a, which repeats the operation of raising arm to drink after the figure's head is returned toward the window. Then cam 51 allows window 51^f to close. This completes the play or performance. Arm 52^x (Fig. 20) has a curved longitudinally extending hole 55 slidably receiving rod 56 which is attached at its opposite end to glass 57 on the window sill on the other side of window 51^f, which is cut away at 58 to allow the rod 56 to pass through when the window is closed. This allows a relative motion or a lost motion of the arm before it picks up the stein and carries out the illusion of the policeman reaching for the stein, raising it and setting it down and releasing it.

In Fig. 2 an auxiliary means is shown for initiating the operation independently of master clock 4. This means comprises a handle 60 connected to release 1^b and which, when pulled down, raises the release 1^b and releases fly 1^a on clock 1 to start the clock.

I claim:

1. The combination with a box constructed to simulate the interior of a room, visible from outside the box like the stage of a theater, and having a sliding window in one side; of a pair of figures of persons located near one another in one part of the room together with a movable representation of an article, one of said figures being rotatably mounted and having a movable arm and the other figure having movable arms one of which arms is provided with a rotatable hand; means for actuating said figures whereby a movement of one figure places said article in front of the second figure and removes it from such position; and for actuating the second figure to simulate a pouring from the article and a drinking by the second figure; other figures of other persons in the room and having movable arms, means actuating said arms to simulate eating and drinking; a mechanically operated figure of a quadruped, and means for actuating it in synchronism with the movements of one of said figures; a figure of a person behind said window, means for actuating said figure and window; and mechanism controlling said several actuating means to cause the actuation of the figures in a predetermined order.

2. The combination with a platform constituting a miniature theatrical stage; of a plurality of mechanically operable figures thereon representing actors having movable members, a plurality of movable articles including drinking vessels for pseudo eating and drinking and respectively associated with the several figures, and means for actuating the movable members of said figures and the movable articles in a predetermined order or sequence to simulate the eating and drinking by the figures of and from the

articles by said figures imparting the impression of a succession of parts of a theatrical performance with succesive actions of the various individual actors.

3. The combination with a box simulating a room and constructed to have its interior visible from outside as a stage of a theater, of a plurality of mechanically operable figures representing actors located near one another in one part of the room, a plurality of mechanically operable figures located near one another in another part of the room, movable articles for pseudo-eating adjacent the figures in front of the room, movable articles for pseudo-drinking adjacent the figures in the other part of the room, said figures in both parts of the room having movable arms arranged to be movable to simulate eating and drinking of said articles and service therefor; and means for actuating said figures in a predetermined order or sequence to effect such simulation imparting the impression of a succession of parts of a theatrical performance with successive actions of the various individual actors.

4. The combination with a box simulating the interior of a room and having a movable window shield, of a movable article simulating a drinking vessel supported apparently on the window-sill inside the room; a figure located on the other side of the window, simulating a person and having movable arms and a pivoted head, one of the movable arms of the figure being operatively connected to the movable window shield; the other movable arm of the figure being operatively connected to the drinking vessel; and mechanism operating the arms and head of the figure, first moving the window shield to reveal the exterior figure from the room interior and apparently permit access of the figure to the drinking vessel, and then alternately to move the drinking cup to simulate drinking and turn the figure's head, and finally to restore the drinking vessel and window shield to their normal positions, leaving the drinking vessel in sight and again concealing the exterior figure.

5. The combination with a scene representing a place of drinking, of a plurality of figures of persons located at different portions of the scene but having no other apparent co-operative relation to one another; said figures having a movable arm; members simulating drinking receptacles and severally located within reach of said movable arms of the several figures; means operating simultaneously toward the mouths of the figures, the arm of each figure and the receptacle within reach of said arm, to simulate drinking; and means causing such operation of the figures and their articles to be successive.

6. The combination with a plurality of mechanically operable figures representing animate beings, of a plurality of clock mechanisms, actuating connections between the respective clocks and respective figures, detents interposed between the clocks to start and stop them successively, and a master clock for controlling the operation of said clock mechanisms to start and stop them successively and operate the figures in a predetermined order, and for causing an interval of time between successive complete actuations of the several figures.

7. The combination with a plurality of mechanically operable figures representing actors, of a plurality of clock mechanisms, actuating connections between the respective clock mechanisms and the respective figures, and means for successively starting the operation of the clocks imparting the impression of a succession of parts of a theatrical performance with successive actions of the various individual actors.

8. The combination with a plurality of mechanically operable figures representing animate beings, of motor mechanisms for actuating said figures in a predetermined order, means controlled by one motor mechanism to control another to cause their successive operation, and a master control for said motor mechanisms for causing an interval of time between successive complete operations of the entire apparatus.

9. The combination with a figure of a person having two arms one of which is bodily movable and the other of which has a hand movably secured to it, of a tiltable bottle and a movable drinking-receptacle, means independent of the figure and supporting the bottle in position engaged by said movable hand; the drinking receptacle being secured to the end of the movable arm; means moving the movable hand to engage the bottle to tilt it toward the receptacle to simulate pouring from the bottle to the receptacle; means moving the movable arm and the receptacle secured to it toward the mouth of the figure to simulate drinking from the receptacle; and means causing such operation of the movable arm and movable hand to be successive in the order specified.

10. The combination with a figure of a person mounted to swing on a vertical axis, of an article mounted for revolutionary swinging movement about the axis of said figure; said figure initially facing away from said article and being movable independently of the article; means swinging the figure independently of movement of the article to face the latter; the figure having a movable arm; means moving the arm toward the article simulating grasping the article by the figure; the article and figure being constructed for co-operative engagement; means co-operatively connecting the figure and article together; means swinging both together to the initial position of the

figure; means disconnecting the figure and article from one another; and means moving the arm from the article.

11. The combination with a plurality of mechanically operable figures representing actors, of motor mechanisms actuating said figures in a predetermined order, and means controlled by one motor mechanism for controlling the operation of the other motor mechanisms imparting the impression of a succession of parts of a theatrical performance with successive actions of the various individual actors.

12. The combination with a figure of a person, an arm and hand of which figure are movable, of an article movably mounted adjacent said figure, a support for said article, means for moving said arm to engage the article, and means for actuating said hand to move the article.

13. The combination with a figure of a person, of a movable article adapted to be apparently grasped by the hand, a movable support for said article independent of said figure, and means for moving an arm of the figure to a position near said article and then changing the position of the article by moving the support and simultaneously moving the figure and simulating movement of the article by the figure.

14. The combination with a figure of a person, of a movable article, a movable support for said article independent of said figure, and means for relatively actuating said figure and article to bring them into juxtaposition to simulate a grasping of the article by a hand of the figure, means for causing a movement of the article and means for causing a movement of the figure, said two means being operable simultaneously to simulate a movement of the article by the hand.

15. The combination with a figure of a person, an arm thereof being mounted for shoulder movement, of a movable article, a movable support for said article independent of said figure, means for relatively actuating said arm and article respectively and simultaneously to bring them into juxtaposition to simulate a grasping of the article by the hand of the figure, and means for causing a subsequent movement of the figure and article respectively and simultaneously to simulate a movement of the article by the hand of the figure.

16. The combination with a figure of a person, of a movable article, a movable support for said article independent of said figure, means for relatively actuating the figure and article respectively to bring them into juxtaposition to simulate a grasping of the article by the hand of the figure, means for causing a subsequent movement of the figure and article respectively and simultaneously to simulate a movement of the article by the hand, and means for causing a subsequent reverse relative movement of the article and figure respectively and simultaneously to simulate a release of the article by the hand of the figure.

17. The combination with a figure of a person, said figure having an arm mounted for shoulder movement, of a movable article, a movable support for said article independent of said figure, means for relatively actuating said arm and article respectively and simultaneously to bring them into juxtaposition to simulate a grasping of the article by the hand of the figure, means for causing subsequent movements of the figure and article respectively and simultaneously to simulate a movement of the article by the arm, and means for subsequently causing a reverse relative movement of the arm and article respectively and simultaneously to simulate a release of the article by the hand of the figure.

18. The combination with a small article, of a support therefor, a figure of a person facing away from said article, said figure being mounted for turning movement and having an arm mounted for shoulder movement, means for turning said figure to face the article, and means for actuating said arm to move the same towards the article to simulate the grasping of the article by the hand of the figure.

19. The combination with a small article, of a support therefor, a figure of a person facing away from said article, said figure being mounted for turning movement, means for turning said figure to face the article and bring the arm of the figure in juxtaposition thereto to simulate a grasping thereof by the hand of the figure, and means for causing thereupon simultaneous movements of the figure and article respectively.

20. The combination with a small article, of a support therefor, a figure of a person facing away from said article, said figure being mounted for turning movement, means for turning said figure to face the article and bring the arm of the figure in juxtaposition thereto to simulate a grasping thereof, means for causing a reverse turning movement of the figure, and means independent of said last-named means for causing a movement of said article simultaneously with the turning movement of the figure.

21. The combination with a movable article, of a support therefor on which it is movable, a figure of a person, said figure being movable independently of said article, and means for connecting and disconnecting said article to and from said figure, whereby a grasping and releasing of said article by the hand of the figure is simulated during movement.

22. The combination with a movable ar-

ticle, of a support therefor on which it is movable, a figure of a person, said figure being rotatable on a vertical axis independently of the article, means for rotating said figure, and means for connecting said article to said figure for movement therewith.

23. The combination with a movable article, of a support therefor on which it is movable, a rotatable figure of a person, said figure having an arm simulating the grasping of said article by the hand of the figure, means for connecting the article to the figure, means for rotating the figure while the article is connected thereto, and means for releasing the article from the figure to allow movement of the figure independent of the article.

24. The combination with a movable article, of a support therefor on which it is movable, a rotatable figure of a person, said figure having an arm mounted for shoulder movement, means for actuating said arm relatively to said article to simulate the grasping of the article by the hand of the figure, means for connecting the article to the figure, means for rotating the article while it is connected to the figure, and means for actuating the arm to simulate the release of the article by the hand of the figure.

25. The combination with a movable article, of a support therefor, a rotatable figure of a person, said figure having an arm mounted for shoulder movement and facing away from said article, means for rotating said figure to face said article, means for actuating said arm to position it to simulate the grasping of the article by the hand of the figure, means for connecting the article to the figure, means for actuating said figure and article simultaneously to change their positions, by rotating the figure to its initial position, means for lowering said arm away from the article and raising it again, means for again rotating said figure to return said article to its original position, means again lowering said arm, means to release said article from said figure, and means returning the figure to its initial position.

26. The combination with a figure representing a person and mounted to swing on a vertical axis; of an article mounted for revolutionary swinging movement about the axis of said figure; said figure being movable independently of the article; said article and figure being constructed for co-operative engagement; means swinging the figure to and fro on its vertical axis; means connecting said article and figure together causing swinging revolutionary movement of the article by the swinging rotary movement of the figure in one direction; and means disconnecting the article and figure from one another permitting swinging rotatory movement of the figure in the other direction unaccompanied by the article.

27. The combination with a figure of a person mounted to swing on a vertical axis, of an article mounted for revolutionary swinging movement about the axis of said figure; said figure having an arm and hand movable toward the article; means moving the arm to simulate grasping of the article by the hand of the figure; the figure and article being constructed for co-operative engagement; means connecting the figure and article together; means swinging figure and article together; means disconnecting the figure and article; and means independent of the figure for moving the article.

28. The combination with a pair of figures representing persons, of a movable bottle and a movable drinking vessel; means connecting one figure to the bottle; means moving said figure and bottle together toward the second figure, the bottle and drinking vessel being then in proximity to one another; means disconnecting said figure from the bottle; means connecting the bottle and second figure together; means moving the second figure and bottle together simulating pouring from the bottle to the drinking vessel; means connecting the second figure and the drinking vessel; and means moving the second figure and drinking vessel together simulating drinking from the vessel by the second figure.

29. The combination with a pair of figures representing persons, of a movable article, each figure being mounted to move with the article and provided with means permitting its co-operative connection with the article; means moving the article together with one of the figures into position permitting co-operative connection of the second figure with the article; means disconnecting the article and first figure; and means effecting such co-operative connection between the article and the second figure and effecting simultaneous movement of the article by movement of the second figure.

30. The combination with a pair of figures representing persons, of a movable bottle, means connecting one of said figures with the bottle; means simulating grasping of the bottle by said figure; means causing simultaneous movement of said figure and bottle, by which the latter is moved to a position within reach of the second figure, the second figure being provided with a movable arm and hand; means moving the arm to cause the hand to engage and simulate grasping of the bottle; and means causing the figure to tilt the bottle simulating pouring therefrom.

31. The combination with a rotatable figure of a person, a second figure having a movable arm and a rotatable hand, a mov-

able article normally located behind said first figure; means for rotating said first figure to cause it to face the article and simulate a grasping of said article by the hand of said figure, means for returning the said first figure carrying with it the article to place the article in front of and adjacent the second figure and between the two figures, means for disengaging the first figure from the bottle, means for actuating the arm of the second figure to engage said article, and means rotating the hand of the second figure to move the article.

32. The combination of a figure of a person having a movable arm and a rotatable hand, an article in front of said figure, means for actuating said arm and hand to grasp and move said article and release it, a second figure of a person which is rotatable; means connecting the article to the second figure, and means for actuating said second figure to remove the article to a different position.

33. The combination with a figure of a person, said figure having arms mounted for shoulder movement, one of said arms having a hand holding a representation of a receptacle and the other arm having a rotatable hand, a second figure of a person, which is rotatable and facing said first figure and having an arm mounted for shoulder movement, an article movably mounted behind said second figure, means for rotating said second figure toward said article and raising its arm to simulate a grasping of the article, means for connecting said second figure and article for simultaneous movement; means for rotating said second figure to its said initial position, placing the article in front of the first figure, and lowering the arm of the second figure; means synchronized to move the arm of the first figure (holding the receptacle) thereafter to position to grasp the article with the rotatable hand of said figure; means rotating said hand, tilting the article toward said receptacle and returning the article to upright position and releasing it; means for again raising the arm of the second figure to grasp the article and returning it to original position; means for lowering the arm of the second figure and releasing the article, returning said second figure to original position; and means for actuating the other arm of the first figure to simulate a drinking from said receptacle.

34. The combination with a pair of movable figures of persons, of a movable bottle and movable drinking vessel; means for moving one of said figures to simulate grasping said bottle; means moving said figure and the bottle simultaneously to move the bottle to a position within reach of the second figure; the second figure having both arms movable; means for causing the first figure to release the bottle; means moving one arm of the second figure to tilt the bottle over the drinking vessel and simulate decanting, and means moving the other arm of said second figure to raise the drinking vessel and simulate drinking therefrom.

35. A figure of a quadruped, having its hind quarters fixed in sitting position, its body pivoted to the hind quarters, the upper ends of its front legs pivoted to the body and its fore-paws loosely pivoted to the lower ends of the front legs, the front legs and fore-paws extending substantially straight down to the level of the hind quarters, the fore-paws supporting the front of the body in normal sitting position; and mechanism moving the body on its pivot with the hind quarters to a more nearly vertical position and substantially simultaneously moving the front legs on their pivots with the body to substantially horizontal positions, the loose pivots of the fore-paws permitting the fore-paws to remain by gravity in vertical altho elevated positions, the whole permitting simulation of a begging attitude of the quadruped.

36. The combination with a figure of a person, said figure having a pivoted arm, of a rotatable member having a representation of an article of food thereon, means for causing a simultaneous movement of said arm and member towards the mouth of the figure, and means for releasing the member and arm when they arrive at a position near the mouth of the figure.

37. The combination with a representation of a receptacle of food having an opening therethrough, of a figure of a person, said figure having an opening through the head at one side of the mouth, and having also a pivoted arm; a member rotatable on an axis coincident with the pivot of the arm of the figure, and having a representation of an article of food at one end, said member being rotatable through said opening in the head of the figure; means for causing said rotatable member to swing the arm of the figure on its pivot toward the mouth of the figure; and means for releasing the arm and allowing its return.

38. The combination with a figure representing a person, and having an arm pivoted at the elbow and having its hand end normally located substantially at table height; of a member simulating an article of food and mounted to make complete revolutions in the plane of the mouth of the figure and the hand end of the pivoted arm thereof; the hand end of the arm being reciprocable between its normal location and the mouth of the figure; means for moving the arm and the food member together from the normal position of the hand end of the arm to the mouth of the figure; and means effectuating the return of the hand end of the arm to

its normal location when the food member has reached the mouth of the figure.

39. The combination with a sliding member representing a window-sash, of a figure on one side of the window and having pivoted arms and head, means for actuating one arm and the window-sash to open the latter to disclose the figure, a representation of a container having a sliding connection with the other arm of the figure to allow relative movement of arm and container; means for actuating said arm and container, and means for actuating the pivoted head of the figure.

40. The combination with a sliding windowlike partition, of a figure of a person, said figure being located at one side of said partition and having a movable arm and movable head, an article at the opposite side of said partition from said figure and having a lost motion connection with the movable arm of the figure; means for opening said partition, and means for alternately actuating the arm and head of said figure.

41. The combination with a plurality of figures of persons and a plurality of articles, said figures having movable arms and the articles being also movable and located within reach of said arms; means simultaneously moving the arms of one figure and an article within reach of said arm; means simultaneously moving the arm of another figure and another article within reach of said arm; and means causing the operation of said respective means at different times.

42. A figure of a quadruped in combination with a support therefor which is perforated beneath the hind quarters of the figures, the body of the figure being movably connected with its hind quarters and forward portions of the figure being movably connected with the body; and operating mechanism located below said support, extending thru the perforated portion of the support and connected with the movable body and the movable forward portions thereof.

CLARENCE T. HUNT.

PATENT SPECIFICATION

Application Date: Oct. 26, 1922. No. 29,147/22. **208,851**

Complete Accepted: Jan. 3, 1924.

COMPLETE SPECIFICATION.

Improvements in Automatons or Display Figures.

(Communicated by HARRY HOOPER HEMING, of 284—28th Street, Milwaukee, Wisconsin, United States of America, a citizen of the United States of America.)

I, WILLIAM PHILLIPS THOMPSON, F.C.S., M.I.M.E., Agent for Foreign Patent Solicitors, of 12, Church Street, Liverpool, in the County of Lancaster, Civil Engineer, British subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to automatons and is particularly directed to an animated display figure.

Objects of this invention are to provide a display figure which will accurately and repeatedly simulate the motions of a person, which has the movement of its members so timed and related in their operation that the two hands will co-operate to perform jointly a given operation, and to provide means for returning all of the parts of the display figure to their initial positions and of returning the material handled by such figure to its initial position or state, so that, at the end of each cycle or operation, the entire system will be in its initial state.

Further objects are to provide an automaton which will simulate a person pouring liquid from a bottle into a glass, drinking the liquid from the glass and returning the bottle and glass to their initial positions, to provide hidden means for returning the liquid from the glass to the bottle so as to permit the continued or repeated use of the same liquid, and to so associate the parts that the liquid will be poured from the bottle into the glass in full view, and will return to the bottle by way of the hidden means.

Further objects are to provide mechanism for operating the various members of the automaton, so arranged as to provide for ready access, individual adjustment and timing; and to provide an automaton which is of unitary design, that is to say, in which all of the mechanism is self contained, so that the automaton may be bodily moved from one place to another without disturbing the various adjustments.

An embodiment of the invention is shown in the accompanying drawing in which:—

Figure 1 is a front elevation of the automaton, with parts removed to more clearly show the construction.

Figure 2 is a side elevation of the structure shown in Figure 1 with some added parts in position.

Figure 3 is a diagrammatic view showing the mechanism upon the left hand side of Figure 1.

Figure 4 is a corresponding view showing the mechanism on the right hand side of Figure 1.

Figure 5 is a fragmentary view of a part of the mechanism for operating the eyes.

In the embodiment of the invention shown for illustration, an animated doll is provided and occupies a seated position. One of the doll's or automaton's hands carries an ordinary drinking glass, while the other carries a bottle partly filled with a liquid. The mechanism is operated to cause the automaton to pour the liquid from the bottle into the glass, thereafter lower the bottle and elevate the glass, simultaneously moving the head forwardly as in drinking. At the same time the eyes are operated to produce a more animated effect. While the glass is elevated and the bottle depressed, the liquid runs to the bottle through hidden means and thereafter the bottle and glass arrive at their initial position and the cycle is again repeated.

The automaton comprises a body 1, form of molded papier mâche and is carried upon a hollow base portion 2. The body portion is provided with a removable back 3 and with removable lower leg portions 4. The interior of the body 1 is hollow and provides a considerable space suitable for the reception of the operating mechanism.

The upper arms 5 and 6 are pivotally joined to the body portion and are provided with pivotally joined forearms 7 and 8 respectively, the forearm 7 having a pivotal motion in a single plane, while the forearm 8 has a rocking or rotary motion so as to cause a tilting of the bottle 9, as may be seen from reference to Figures 1 and 2. The head 10 and neck 11 are formed as a unitary structure and are pivotally carried upon an upper transverse shaft 12. The neck portion 11 projects through an opening 13 formed in the upper portion of the body and has room for a slight motion within this opening without contacting with the sides thereof.

Within the hollow base portion 2, the driving mechanism is positioned. It comprises a motor 14 preferably secured upon the floor 15 of the base portion and provided with a relatively small pulley 16. A jack shaft 17 is carried in hangers 18 from the upper portion 19 of the base, and is provided at one end with a relatively large pulley 20 bolted to the small pulley 16 as shown in Figure 2. At the other end the jack shaft is provided with a relatively small pulley 21 adapted to be bolted to a pulley 22 of the operating mechanism.

The operating mechanism comprises a main transverse shaft 23 upon which is rigidly secured a worm wheel 24, this worm wheel is in mesh with a worm 25 carried upon the shaft 26 of the pulley 22 and therefore receives reduced motion from the motor 14.

The motor 14 and the intermediate mechanism of the shaft 23 is so designed as to cause a relatively slow rotation of the shaft 23. This main transverse shaft 23 extends substantially completely across the interior of the automaton and has a plurality of cams 27 to 32 inclusive, rigidly mounted thereon, and preferably, independently, adjustably held in position by means of set screws, one of which is shown at 33 of Figure 3. Underneath the cams are positioned a plurality of co-operating cam followers or levers 34 to 39 inclusive. These levers may, if desired, be provided with a wear resisting plate beneath the cams, or may be formed of wear resisting material. They are pivotally carried upon a shaft 40 extending transversely of the automaton (see Figures 2 and 1) and located in front of and below the cams. Their rear or free ends are each provided with an adjustably mounted eye 41. From each of these eyes a flexible connector extends upwardly to its appropriate mechanism.

The extreme left hand lever or cam follower 34 is joined by means of a connector 42 with a drum 43 loosely mounted upon the upper shaft 12 and rigidly joined to the pivoted portion 44 of the upper portion of the right hand arm. When the cam follower 34 is depressed by its cam, the connector 42 causes a rotation of the drum 43 and correspondingly lifts the upper arm 44. Thereafter the cam follower 37 is depressed, causing its connector 45, which is partially wrapped around and attached to a drum 46 mounted upon the shaft 12, to rotate. This drum 46 is rigidly attached to the shaft 12 and therefore causes a partial rotation of the shaft. At the same time the cam follower 36 is lifted thereby allowing its connector 47 to be wound upon the drum 48 to which it is attached, such drum being rigidly fastened upon the shaft 12. This causes a controlled and smooth partial rotation of the shaft 12. A drum 49 is rigidly secured upon the shaft 12 adjacent its end, near the right hand arm, and has secured thereto a belt-like connector 50. This connector 50 or belt passes around and is secured to a pulley 51, rigidly attached to the right forearm to rock it about its axes and pour a portion of the liquid contents of the bottle 9 in to the glass 53. Thereafter the cam follower or lever 36 is depressed and the lever 37 is allowed to become elevated, thereby causing the reverse rotation of the forearm in an obvious manner, reversing the bottle to its substantially vertical position. Following this operation the cam follower 34 is allowed to move upwardly, and the right arm, due to its weight, gradually descends until it occupies substantially the position shown in Figure 2. At about this time the cam follower 39 is depressed and retracts its connector 54, such connector passing freely over a pulley 55 loosely mounted upon the upper shaft 12. The other end of the connector 54 is joined to the pivoted forearm 7 of the left hand arm as may be seen in Figures 1 and 3. As this connector is retracted by the cam follower 39, the forearm is rocked about its pivot point, thereby elevating the glass 53. This rocking motion continues until a stop 56, carried either by the forearm 7 or the upper arm 5, pre-

vents further motion of this forearm. Thereafter as the retraction of the connector 54 continues, the forearm 7 and upper arm 5 are, as a unitary structure, elevated until the glass 53 occupies a position substantially at the lips of the automaton as shown in Figure 2.

A flexible tube 57 joins the lower portion of the glass 53 and the lower portion of the bottle 9, and passes in a concealed manner through the arms of the automaton and through a portion of the body. When the parts occupy the position shown in Figure 2, the liquid within the glass will run downwardly through the tube 57 into the bottle 9, the glass and bottle being temporarily retained in this position a sufficient length of time to insure complete return of the liquid.

At the time that the glass is approaching the lips of the automaton, the head is rocked forwardly in a natural manner to accurately simulate the motions of a person drinking from a glass. This rocking motion of the head is secured by the depression of the cam follower 38 which, through its connector 58, imparts partial rotary motion to a jack shaft 59 through the medium of the lever 60, (see Figure 3). A lever 61, rigidly secured to this shaft is connected by means of a link 62 with a point 63 located at the base of the neck and thereby causes a corresponding rocking motion of the head to occur.

If desired, the connector 58 may be made of rigid material and pivotally joined at its upper and lower ends to the levers 60 and 38 respectively. If, however, it is found desirable to provide a flexible connector, a spring, not shown, may be employed to return the head to its initial position.

During the various motions of the arms and head of the automaton, the eyes are rocked back and forth with periods of dwell or cessation. This rocking motion is controlled by means of the cam follower 35, which, when it is depressed, transmits motion to the lever 64 by means of its connector 65, (see Figure 4). The lever 64 is rigidly secured upon a rock shaft 65^1 which in turn carries a lever 66 which tends to move upwardly under the influence of a spring 67^1. The outer end of the lever 66 has secured thereto a flexible connector 67 which passes upwardly through the hollow neck and into the hollow head of the automaton. If desired, mechanism may be employed for transforming the relatively vertical motion of the connector 67 into the relatively horizontal motion necessary for rocking the eyes 68 and 69. This mechanism may take the form shown in Figure 5, in which the eyes 68 and 69 are respectively provided with rearwardly projecting levers 70 and 71, these levers being connected by means of a link 72. The connector 67 may pass over a pulley 73, (see Figure 5), and has its end attached to the inner end of the lever 70. A spring 74 is secured to a stationary point in the head and to the free end of the lever 71. It will be seen that when the connector 67 is drawn downwardly it draws the arm 70 to the left, in Figure 5, and through the medium of the link 72, moves the arm 71 to the left, thereby simultaneously rocking both the eyes. Thereafter, when the connector 67 is allowed to pass upwardly the spring 74 rocks the eyes to their other side position. It is to be noted that the cam for operating the follower 35 for the eyes, has a series of projections as indicated in Figure 4, so as to rock the eyes several times during each complete cycle of operation.

The exact contour of the cams has not been described in detail, as it is obvious that they are so designed as to give the necessary motion and timing to the various parts, and also to allow the desired dwell at the different points in the cycle of operations.

It will thus be seen that an automaton has been provided which may be readily constructed, which has a relatively small number of parts and which has the parts so associated with the operating mechanism that their motions and timing may be accurately and independently adjusted. It will also be seen that hidden means have been provided for returning the liquid from one vessel to another, thereby permitting the repeated pouring of the same liquid from the second vessel into the first vessel.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A display figure in which a receptacle carried by each of two members having relative vertical motion are connected by a hollow member in order to allow fluid to flow from one receptacle to the other when they occupy certain predetermined positions.

2. A display figure as claimed in Claim 1 in which one of said receptacles can be moved between positions respectively higher and lower than the second of said receptacles substantially as described.

3. A display figure as claimed in Claim 1 in which liquid is transferred from one receptacle to the other by the tilting of the first receptacle when the second

receptacle is in its lowest position, and transferred in the opposite direction by gravity when the second receptacle is in its highest position.

4. An automaton as claimed in Claim 1 in which there is provided a figure having a head and arms the latter carrying the receptacles and one of said arms being articulated whereby the receptacle carried by said arm can be raised to the head of the figure and lowered substantially as described.

5. An automaton as claimed in Claim 1, 2 or 4 in which the receptacles are connected by a tubular flexible member hidden within the automaton and the relative vertical positions of the arms and receptacles changed at predetermined moments to allow the flow of liquid therethrough from one vessel to another, substantially as described.

6. An automaton as claimed in Claim 1 in which the position of the movable members is controlled by cam followers and rotating cams, the cam followers being connected with the movable members by independently adjustable connecting means substantially as described.

7. An automaton as claimed in Claim 6 in which a body portion is fixedly mounted on a hollow base and is provided with a removable back to allow free access to the cams and the connecting means substantially as described.

8. A display figure in which two open ended receptacles connected by fluid conducting means are displaced vertically relatively to one another to obtain a uniflow direction of transference of the liquid from one receptacle to the other substantially as described.

9. A display figure having movable members associated therewith constructed and arranged to operate substantially as described with reference to the accompanying drawing.

Dated this 25th day of October, 1922.

W. P. THOMPSON & Co.,
12, Church Street, Liverpool,
Chartered & Registered Patent Agents.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1924.

Fig. 1.

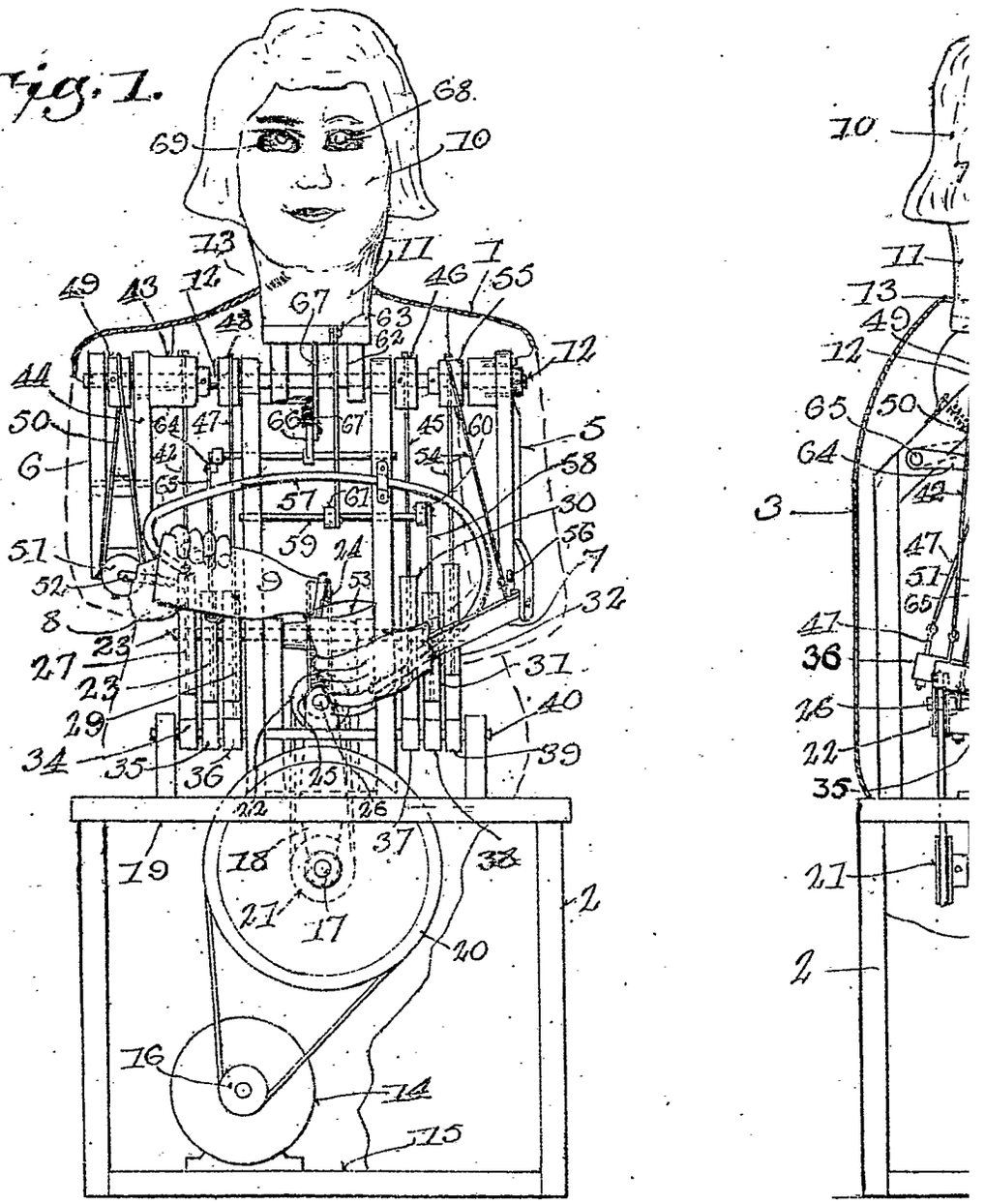
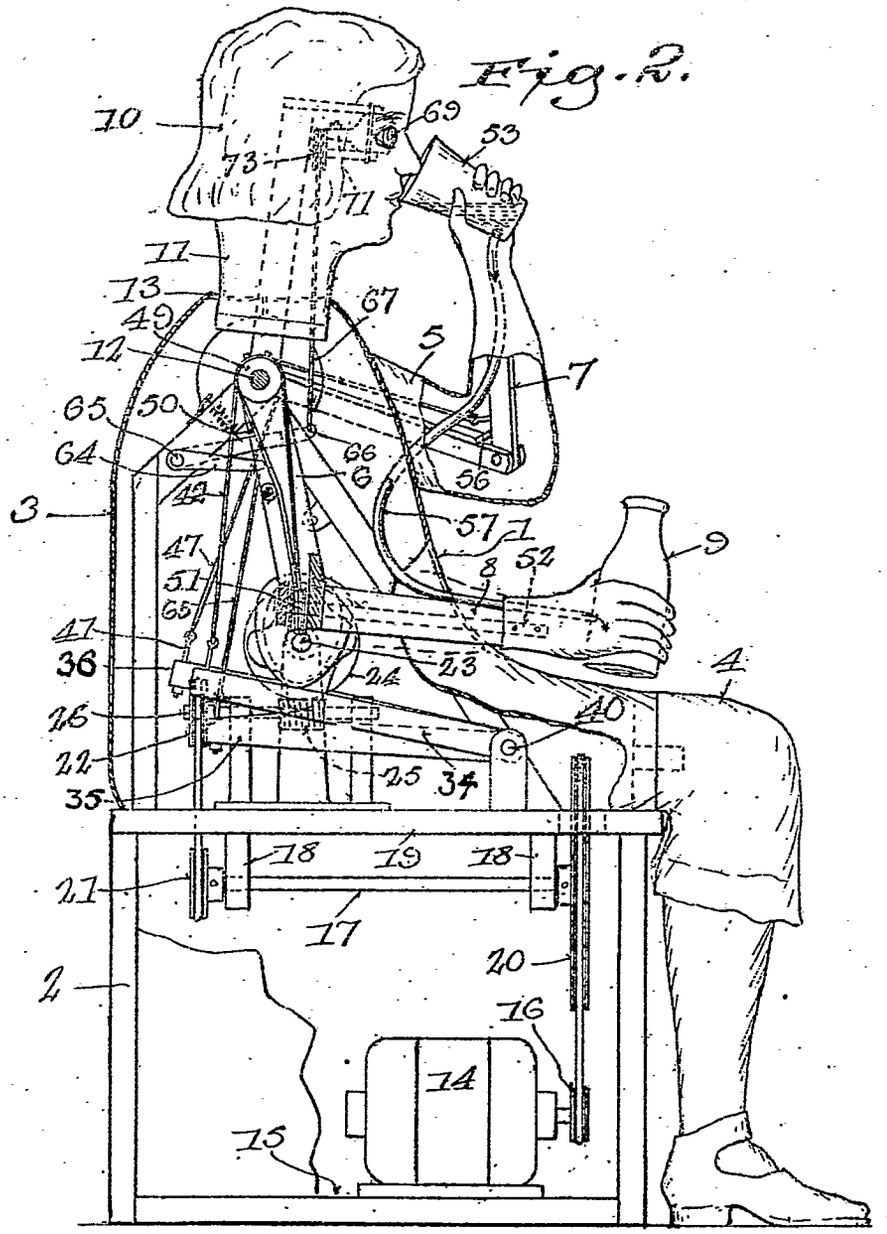


Fig. 2.



Malby & Sons, Photo-Litho

[This Drawing is a full-size reproduction of the Original.]

Fig. 1.

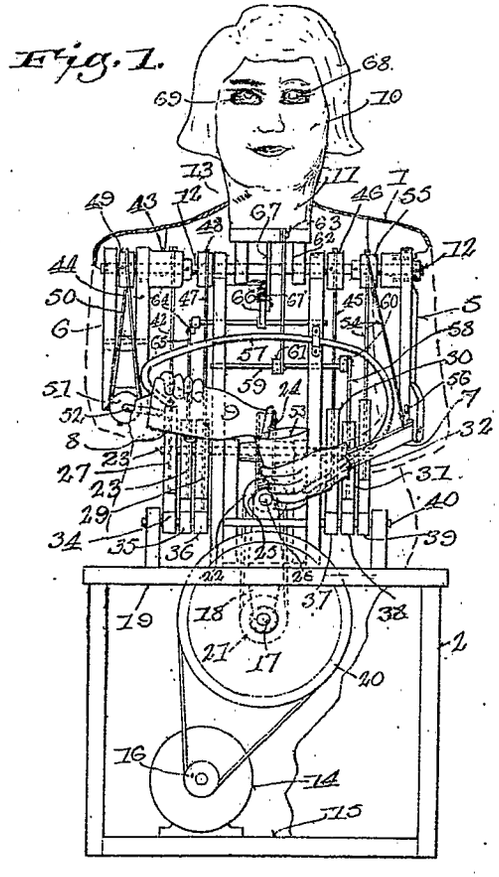
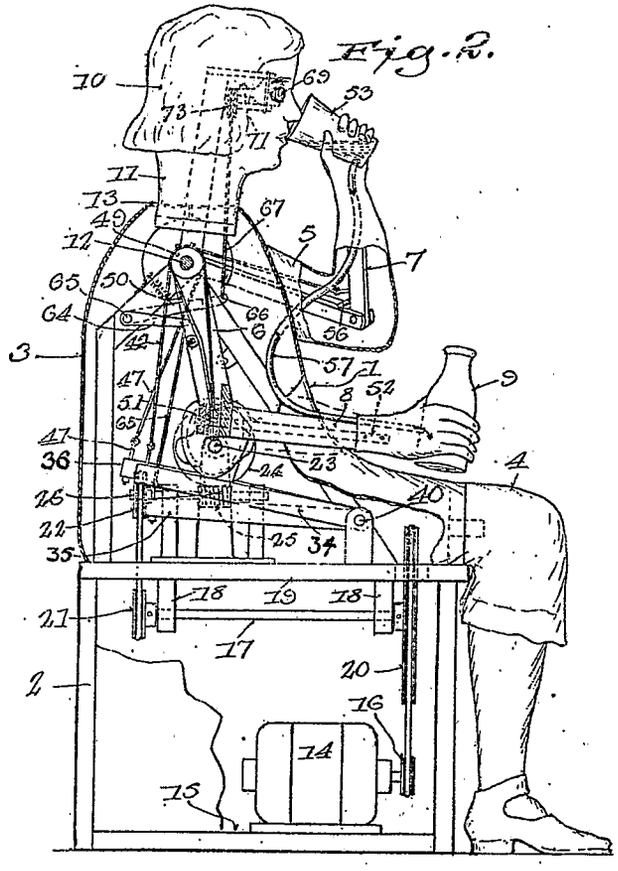


Fig. 2.



Malby & Sons, Photo-Litho

[This Drawing is a reproduction of the Original on a reduced scale]

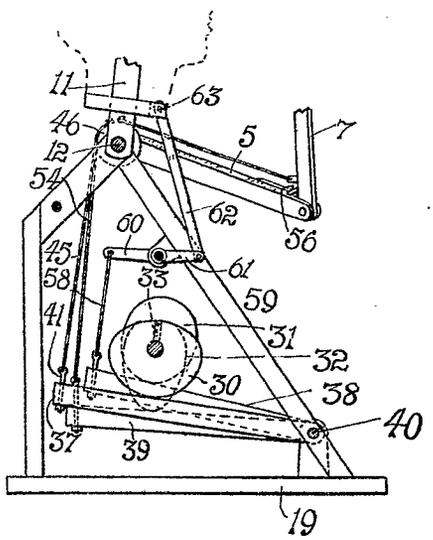
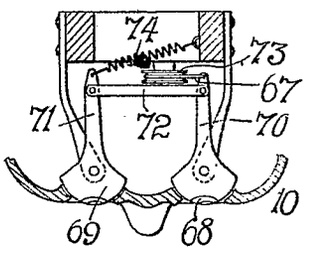


Fig. 3.

Fig. 5.



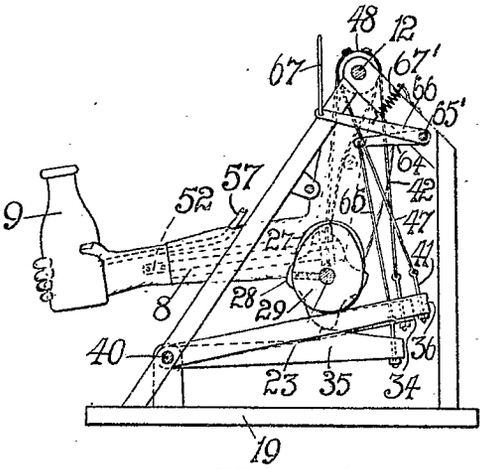


Fig. 4.

Malby&Sons, Photo-Litho

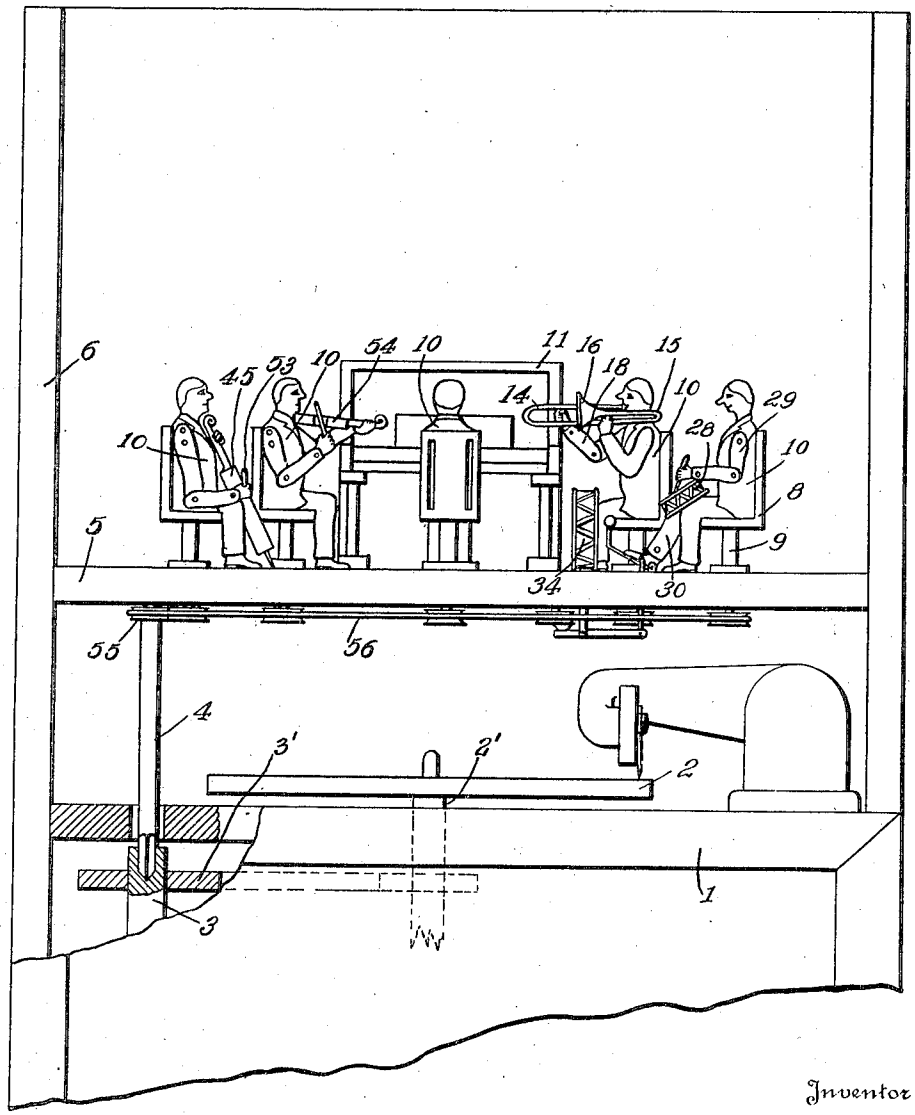
July 17, 1923. 1,462,006

G. W. HALL

MECHANICAL ORCHESTRA

Filed June 18, 1921 2 Sheets-Sheet 1

Fig. 1.



Inventor

G. W. Hall.

By *Cushman & Co.*

Attorneys

July 17, 1923. 1,462,006

G. W. HALL

MECHANICAL ORCHESTRA

Filed June 18, 1921 2 Sheets-Sheet 2

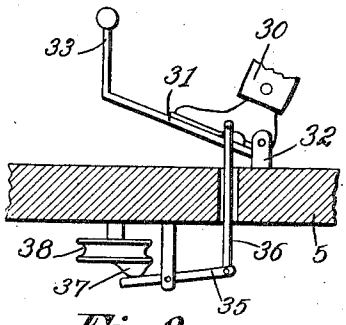


Fig. 3.

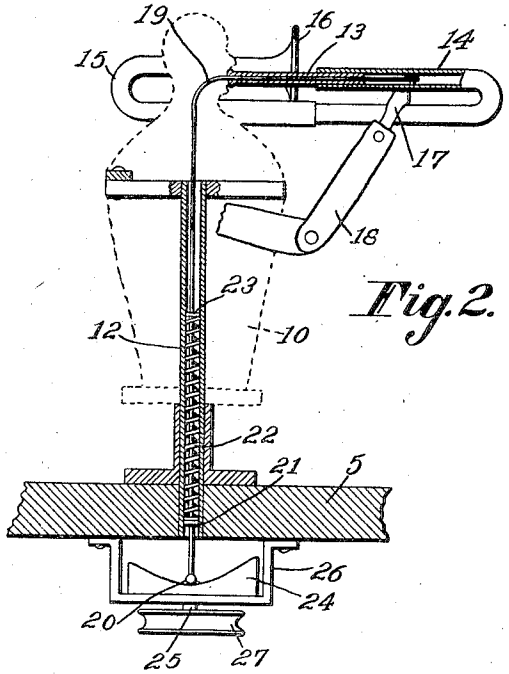
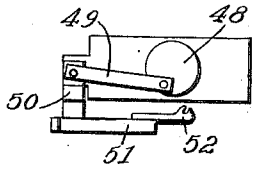


Fig. 2.

Fig. 4.



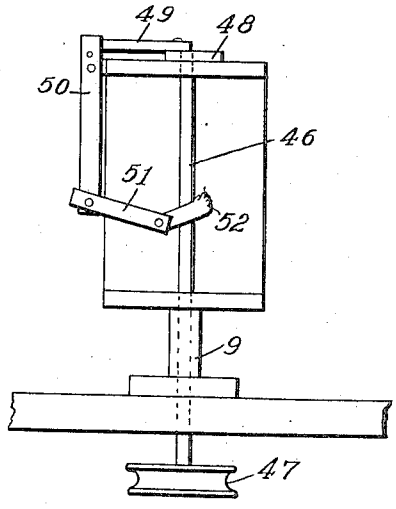


Fig. 5.

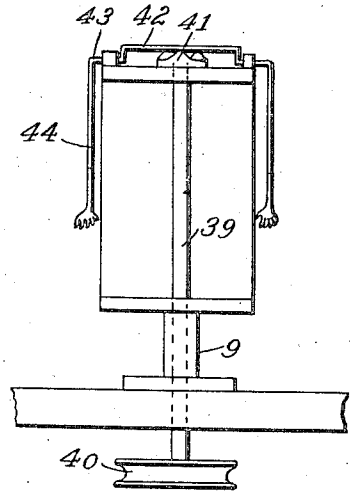


Fig. 6.

Inventor

G. W. Hall.

By Crow & Co.

Attorneys

Patented July 17, 1923. 1,462,006

UNITED STATES PATENT OFFICE.

GEORGE WILLIAM HALL, OF TOPEKA, KANSAS.

MECHANICAL ORCHESTRA.

Application filed June 18, 1921. Serial No. 478,734.

To all whom it may concern:

Be it known that I, GEORGE WILLIAM HALL, a citizen of the United States, residing at Topeka, in the county of Shawnee and State of Kansas, have invented a new and useful Mechanical Orchestra, of which the following is a specification.

This invention relates to a mechanical orchestra for use in connection with phonographs, one of its objects being to provide a series of figures representing instrument players and which figures are provided with means whereby portions of them will be set into motion by the rotation of the record, thus to simulate the playing of the instruments reproduced by the record.

Another object is to provide a structure of this character which can be coupled readily to the mechanism of the phonograph and which, when in operation, will afford considerable amusement.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that, within the scope of what is claimed, changes in the precise embodiment of the invention shown can be made without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings

Figure 1 is an elevation of the complete orchestra, the parts being shown connected to a phonograph.

Figure 2 is a vertical section through the operating parts combined with one of the units.

Figure 3 is a view partly in section and partly in elevation of another unit of the orchestra.

Figure 4 is a plan view of a portion of another unit.

Figure 5 is an elevation of the structure shown in Figure 4.

Figure 6 is an elevation of another unit.

Referring to the figures by characters of reference 1 designates the housing of a phonograph, the same being provided with the usual rotatable table 2 for supporting a record. The phonograph mechanism is formed with a rotating spindle 3 adapted to be driven in any suitable manner, as by means of pulley and belt mechanism 3′ driven by the spindle 2′ of the table of the phonograph. The spindle 3 is detachably engaged by the lower end of the main shaft 4 of the apparatus constituting the present invention. This shaft is journaled in and extends downwardly from a platform 5 adapted to be supported over the table 2 by any suitable means. For example the side and back walls of the case of the phonograph can be extended upwardly as shown at 6 and the platform 5 secured therebetween so as to constitute the floor of an upper compartment 7. Mounted at suitable points on the platform 5 are representations of chairs 8 having tubular supports or pedestals 9. The representation of a piano has been indicated at 11.

Secured on each of the chairs 8 is a figure 10 simulating one of the performers in the mechanical orchestra. In the present instance five of these figures have been used, each figure being mounted on one of the chairs 8. In the structure shown the figures provided represent a pianist, a violinist, a drummer, a trombone player, and a cello player. As shown particularly in Figure 2 a guide tube 12 extends into the figure 10 and through the platform 5 while extending from the mouth of the figure 10 is a stationary tube 13 on which is slidably mounted one arm of a U-shaped tube 14. Another U-shaped tube 15 terminating at one end in a bell or flare 16 is fixedly mounted on the figure 10 and is slidably engaged by one arm of the tube 14. To the other arm of the tube 14 is attached the hand portion 17 of a jointed arm 18 pivotally connected to the figure 10 so that when the tube 14 is reciprocated on the tube 13 the arm 18 will be caused to move back and forth therewith. Slidably mounted within the tube 13 and attached to the inside of the adjacent arm of the tube 14 is a wire 19 which is bent downwardly within the figure 10 and is slidable within the tube 12, there being a roller 20 upon the lower end of the wire while secured to this wire and slidable in the tube 12 is a collar 21 engaged by one end of a coiled spring 22. The other end of this coiled spring bears against a top shoulder 23 provided in the tube 12. Thus it will be seen that the spring 22 will thrust the roller 20 downwardly where it will normally contact with the upper face of a cam 24 secured to a short shaft 25 that is journaled in a bracket 26 carried by the bottom face of the

platform 5. A pulley 27 is secured to the lower end of this shaft 25 and when it is rotated the cam 24 will rotate therewith and will thrust the wire 19 upwardly and then allow the spring 22 to move the wire downwardly. In this way during the rotation of the cam a reciprocation of the wire 19 will be set up and the tube 14 will be reciprocated so as to simulate the action of a trombone while being played.

Another one of the figures 10 simulates a drummer and supports a representation of a snare drum, indicated at 28 about which are supported the jointed arms 29 of the figure. One of the legs of this figure is jointed as shown at 30 and is mounted on and secured to a pedal 31 pivotally mounted on a bracket 32. A beater 33 is extended from the pedal and supported close to the representation of a bass drum 34. A lever 35 is fulcrumed below the platform 5 and has one end connected to the pedal 31 by a link 36 while the other end of the lever extends under a cam 37 rotatable with a pulley 38 journaled under the platform 5 as shown in Figure 3. Thus it will be seen that when the pulley is rotated the lever 35 will be oscillated, causing the pedal 31 to swing upwardly and downwardly and produce an action simulating the beating of the drum 34. The figure 10 simulating a pianist has a vertical shaft 39 journaled therein and in the adjacent pedestal or support 9, there being a pulley 40 at the lower end of this shaft while the upper end has a cam 41 on which rests the intermediate or crank portion 42 of a transverse shaft 43. Jointed arms 44 extend from the ends of the shaft and the free ends of these arms, representing the hand portions, are adapted to rest on the representation of the keyboard of the piano. Thus it will be seen that when the pulley 40 and the shaft 39 are rotated the crank portion 42 will be moved upwardly and downwardly by the cam 41, causing a slight vertical oscillation of the arms 44 simulating the movement of the arms of a piano player.

The figure 10 simulating a cello player has the representation of a cello supported in front thereof, as indicated at 45. A shaft 46 is journaled in this figure and extends through the supporting pedestal 9 thereof, there being a pulley 47 at the lower end of the shaft while the upper end is provided with a crank disk 48. A pitman 49 connects this disk to the upper arm of a lever 50 which lever represents the upper portion of the arm of the performer. A jointed extension 51 is provided on the arm, the hand portion 52 thereof carrying a bow 53 which rests on the cello 45. Thus it will be seen that when the shaft 46 is rotated the lever 50 will be oscillated and cause the bow 53 to reciprocate upon the cello. The figure 10 representing a violinist is similar to the one representing a cello player with the exception of a violin, indicated at 54 is held higher than is the cello 45. The operation of this structure, however, is the same as that described in connection with the cello.

The shaft 4 hereinbefore referred to has a pulley 55 on the upper portion thereof and this pulley drives a belt 56 which extends continuously under the platform 5 and engages all of the pulleys 27, 38, 40 and 47. Thus it will be seen that after a record has been placed on the table 2 and said table set in motion, the movable parts of all of the figures will be operated so as to simulate the motions of an orchestra. It is to be understood that any one of the figures can be removed when desired. For example if the record is a reproduction of a trombone solo all of the figures should be removed except that of the trombone player. If the record is a reproduction of a cello, all of the performers except the cello player are to be removed. This removal is easily effected by slipping the pulley off of the lower end of the shaft belonging to the figure and then lifting the figure from the platform 5.

What is claimed is:—

The combination with a platform and a figure thereon simulating an orchestra performer, of a tube extending from the mouth portion of the figure, a U-shaped tube slidable thereon, a stationary tube slidably engaged by the U-shaped tube, a jointed member upon the figure simulating an arm and connected at one end to the U-shaped tube, a flexible reciprocating element connected to the U-shaped tube and slidable within the tube extending from the mouth portion, a guide tube extending downwardly within the figure and through which the flexible reciprocating element extends, a cam mounted for rotation, means on the flexible element for engaging the cam, and a spring for holding said means pressed against the cam, and means for rotating the cam to reciprocate the flexible element and U-shaped tubular member.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

GEORGE WILLIAM HALL.

Witnesses:

MATILDA M. HALL,

STANLEY MEDIEROTH.

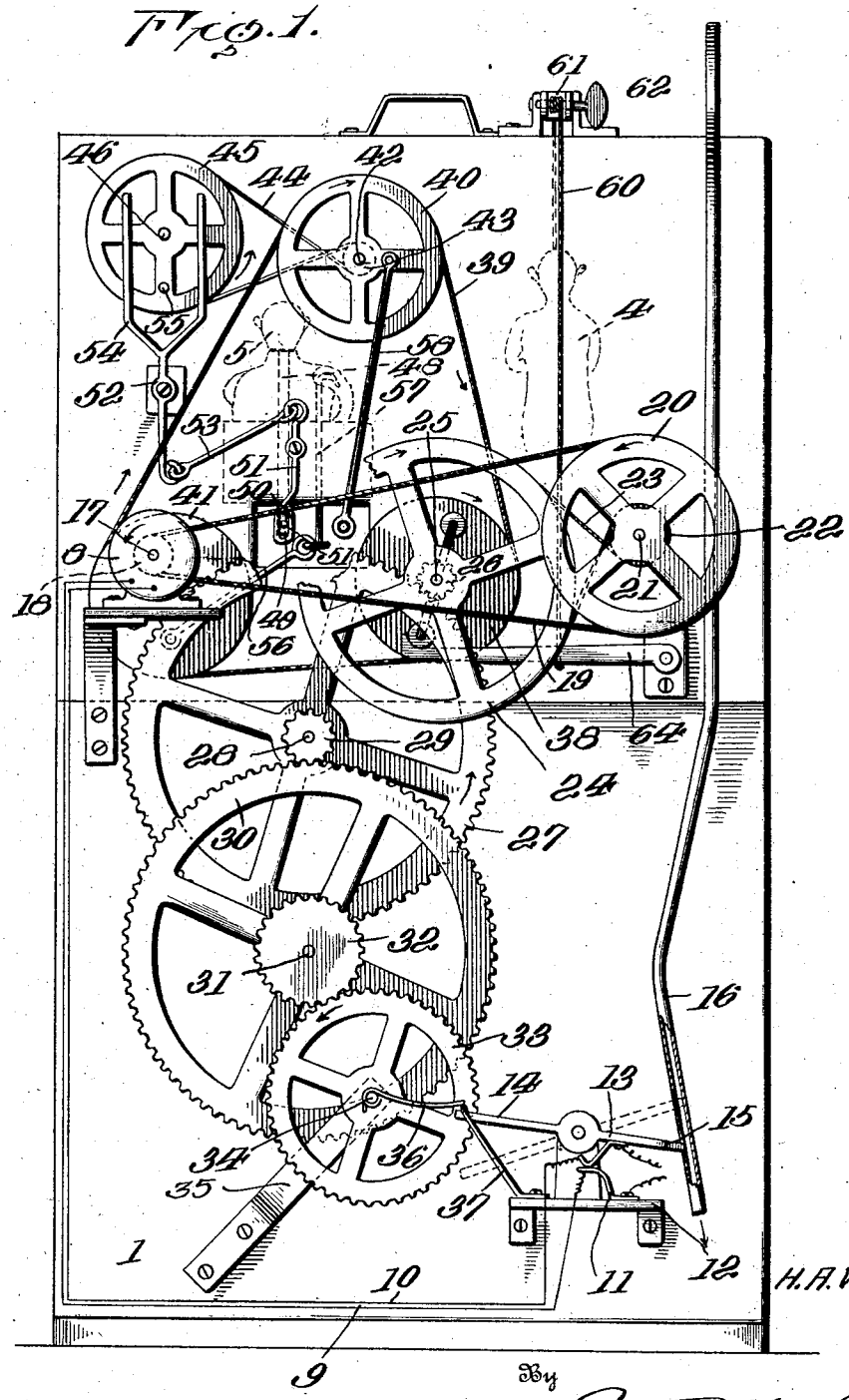
Sept. 6, 1927. 1,641,213

H. A. WILLIAMS

AMUSEMENT DEVICE

Filed March 10, 1921 2 Sheets-Sheet 1

Fig. 1.



Inventor
H. A. WILLIAMS,

By

Attorney

Sept. 6, 1927. 1,641,213

H. A. WILLIAMS

AMUSEMENT DEVICE

Filed March 10, 1921 2 Sheets-Sheet 2

FIG. 2.

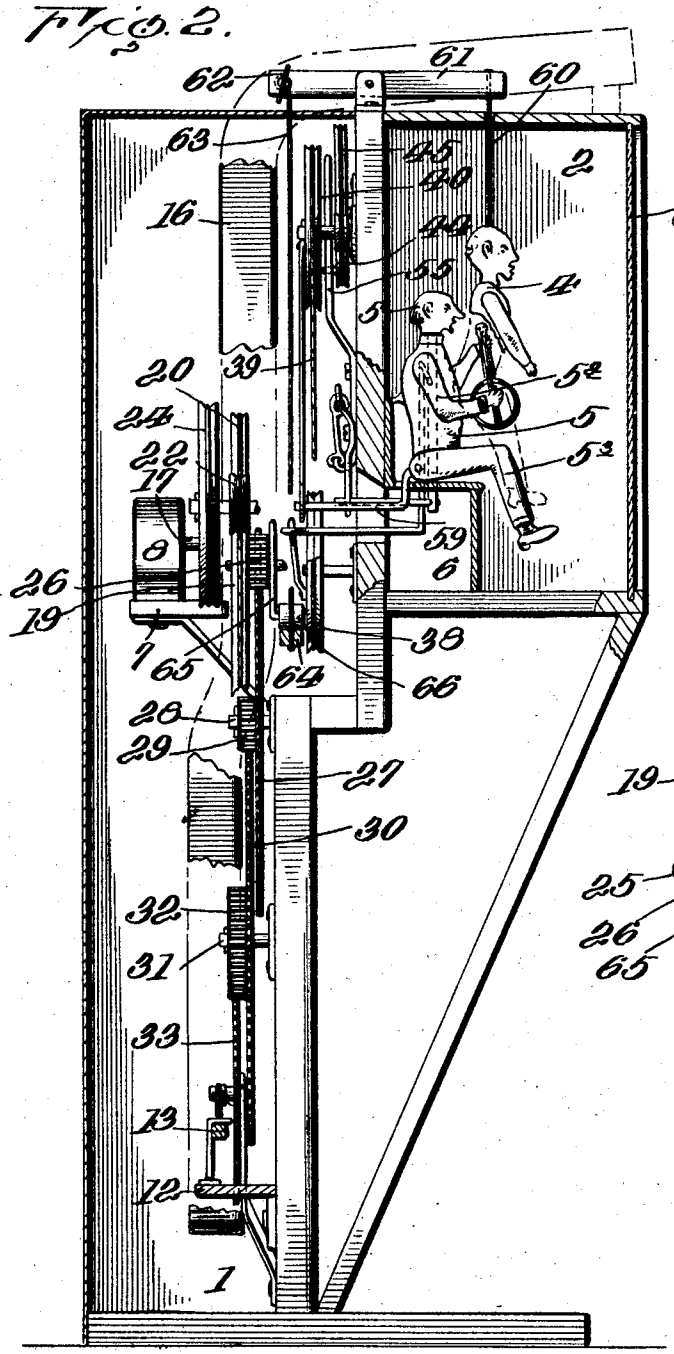
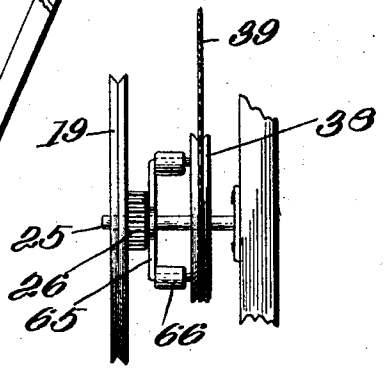


FIG. 3.



Inventor
H. A. WILLIAMS.

By

Attorney

Patented Sept. 6, 1927. 1,641,213

UNITED STATES PATENT OFFICE.

HENRY A. WILLIAMS, OF MURPHYSBORO, ILLINOIS.

AMUSEMENT DEVICE.

Application filed March 10, 1921. Serial No. 451,229.

This invention relates to certain new and useful improvements in amusement devices adapted to be set in motion by the introduction of a coin or token, the object being to provide an amusement device in which what I term a dancing and a musical figure is disposed within a chamber having a glass front and connected to mechanism for causing one of the figures to dance and the other to play an instrument.

Another object of the invention is to provide novel means for operating the figures through the medium of driving mechanism operated by an electric motor which is set in motion by the introduction of a coin which causes a circuit to be closed so as to supply the electrical energy to the motor for operating the figures.

A further object of the invention is to provide novel means for cutting off the supply of electrical energy to the motor after the device has operated a predetermined time by the medium of timing gears.

A still further object of the invention is to provide a construction which is very simple, the parts being so arranged and mounted that they are not likely to get out of order in operation.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings,

Figure 1 is a rear view of my improved device, the back of the case being removed;

Figure 2 is a vertical section through the device; and

Figure 3 is a detail view of the driving means for operating the dancing figure.

In the drawings 1 indicates a case or housing having a chamber 2 provided with a glass front 3 in which is disposed a dancing figure 4 and a musical figure 5, the musical figure 5 being disposed upon a bench 6. The device is capable of being inserted in a large cabinet or can be used as shown but I do not wish to limit myself to the particular construction of case employed.

Mounted on a suitable supporting bracket 7 within the housing 1 is an electrical motor 8 supplied with electrical energy through wires 9 and 10 from a suitable source of supply not shown. The wire 9 is connected to a spring contact 11 fixed on a bracket 12 and the wire 10 is connected to a spring contact 13 carried by a pivoted trip 14 having its end 15 arranged to travel in a slot formed in a coin tube 16 which extends up through the top of the casing and forward as clearly shown so that when a coin is dropped into the coin tube, the weight of the coin will force the contact 13 into engagement with the contact 11 in order to complete the circuit of the motor.

The electrical motor 8 is provided with a shaft 17 carrying a pulley 18 over which passes a belt 19 extending around a pulley 20 carried by shaft 21 which is also provided with a pulley 22. Looped around the pulley 22 is a belt 23 which passes around a pulley 24 fixed on shaft 25 having a pinion 26 fixed thereon which engages a gear 27 fixed on shaft 28. The shaft 28 is provided with a pinion 29 which engages a gear 30 carried by a shaft 31 which is also provided with a pinion 32 meshing with a gear 33 carried by shaft 34 supported in bracket 35 forming a train of timing gears. The shaft 34 carries a spring arm 36 normally supported by an arm 37 and adapted to engage the free end of the trip 14 and move the same downwardly in order to break the contact so as to cut off the motor after the device has been operated a predetermined time.

The shaft 25 carries a pulley 38 around which passes a belt 39 traveling around a pulley 40 and a pulley 41, the pulley 40 being fixed on a shaft 42 and provided with a pulley 43 of a smaller diameter around which passes a belt 44 which extends around a pulley 45 mounted on shaft 46.

The head 5′ of the musical toy 5 is mounted on stem 48 so as to oscillate, said stem being provided with a pin 49 arranged within an eye 50 carried by a lever 51 which is connected to an oscillating lever 52 by a link 53, said oscillating lever being provided with a fork portion 54 adapted to be engaged by a pin 55 carried by the pulley 45, so that as the pulley 45 rotates the lever 52 will be rocked on its pivot and through its connection with the stem 48 through the medium of the link 53 and lever 51 the head of the musical player will be oscillated so as to move from side to side.

The toy 5 is provided with a pivoted arm 5^2 which is adapted to move over the musical instrument carried thereby to imitate the playing of the same, the arm being caused to move by a pitman rod 56 carried by the pulley 41 which is connected to a rod 57 which in turn is connected to the pivoted arm 5^2 of

the musical figure. The musical figure is provided with a pivoted leg 5^3 which is moved up and down by a pitman 58 carried by the pulley 40 which is connected to a rod 58 carried by the pivoted leg so as to cause the figure to keep time with its foot as the device is operated.

The dancing figure 4 is supported by a wire or spring 60 carried by the free end of a rocking beam 61. The other end of the rocking beam carries an adjustable shaft or pin 62 around which is wound a cable 63 which has its lower end connected to a rocking arm 64. The length of the cable 63 can be adjusted by operating the pin 62 so as to adjust the position of the figure in its dancing movement within the chamber 2.

The shaft 25 has fixed thereon a pair of oppositely disposed arms 65 carrying antifriction rollers 66 at their ends which are adapted to intermittently engage the rocking arm 64 so as to force the same downwardly in order to move the dancing figure up and down.

From the foregoing description it will be seen that I have provided an amusement device having a pair of figures arranged to be operated through mechanism operated by an electrical motor which is supplied with electrical energy by the introduction of a coin or token and through suitable timing mechanism the device operates for a predetermined time and then it is automatically cut off.

What I claim is:—

1. An amusement device comprising a figure having a vertical stem carrying the head thereof, said stem being provided with a pin extending laterally therefrom, a lever having an eye to receive said pin, an oscillating lever having a connection with said lever and means for operating said oscillating lever.

2. In an amusement device, the combination with a housing, of a rocking beam carrying a cable, a toy attached to said cable, a rocking arm, a cable carried by said arm adjustably secured to said rocking beam and a pair of arms having antifriction rollers carried by a shaft adapted to be intermittently moved into engagement with said rocking arm for rocking said beam.

In testimony whereof I hereunto affix my signature.

HENRY A. WILLIAMS.

H. A. VAUGHAN.

TOY CIRCUS.

APPLICATION FILED OCT. 19, 1920.

1,429,382.

Patented Sept. 19, 1922.

6 SHEETS—SHEET 1.

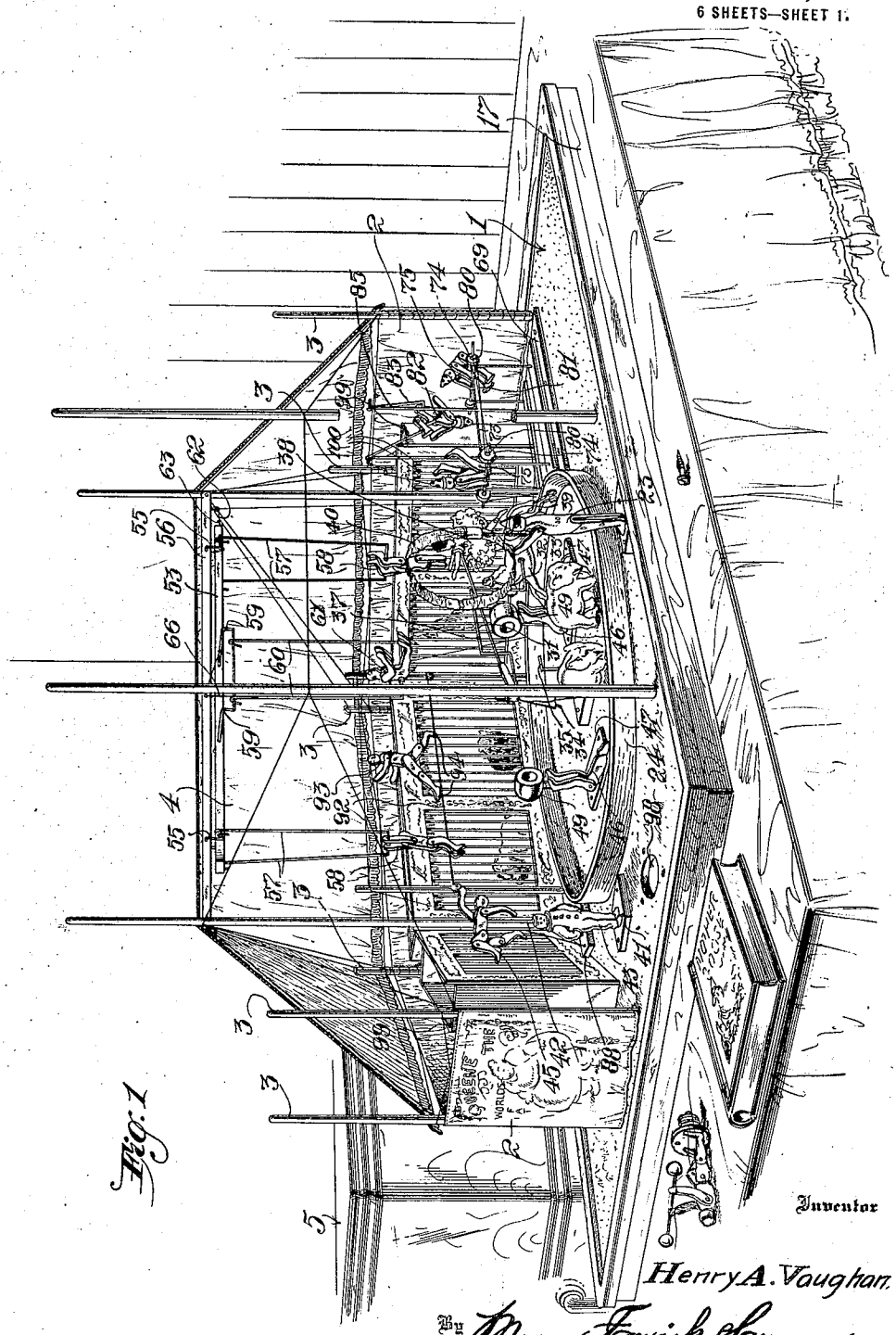


Fig. 1

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APPLICATION FILED OCT. 19, 1920.

1,429,382.

Patented Sept. 19, 1922.

6 SHEETS—SHEET 2.

Fig. 16.

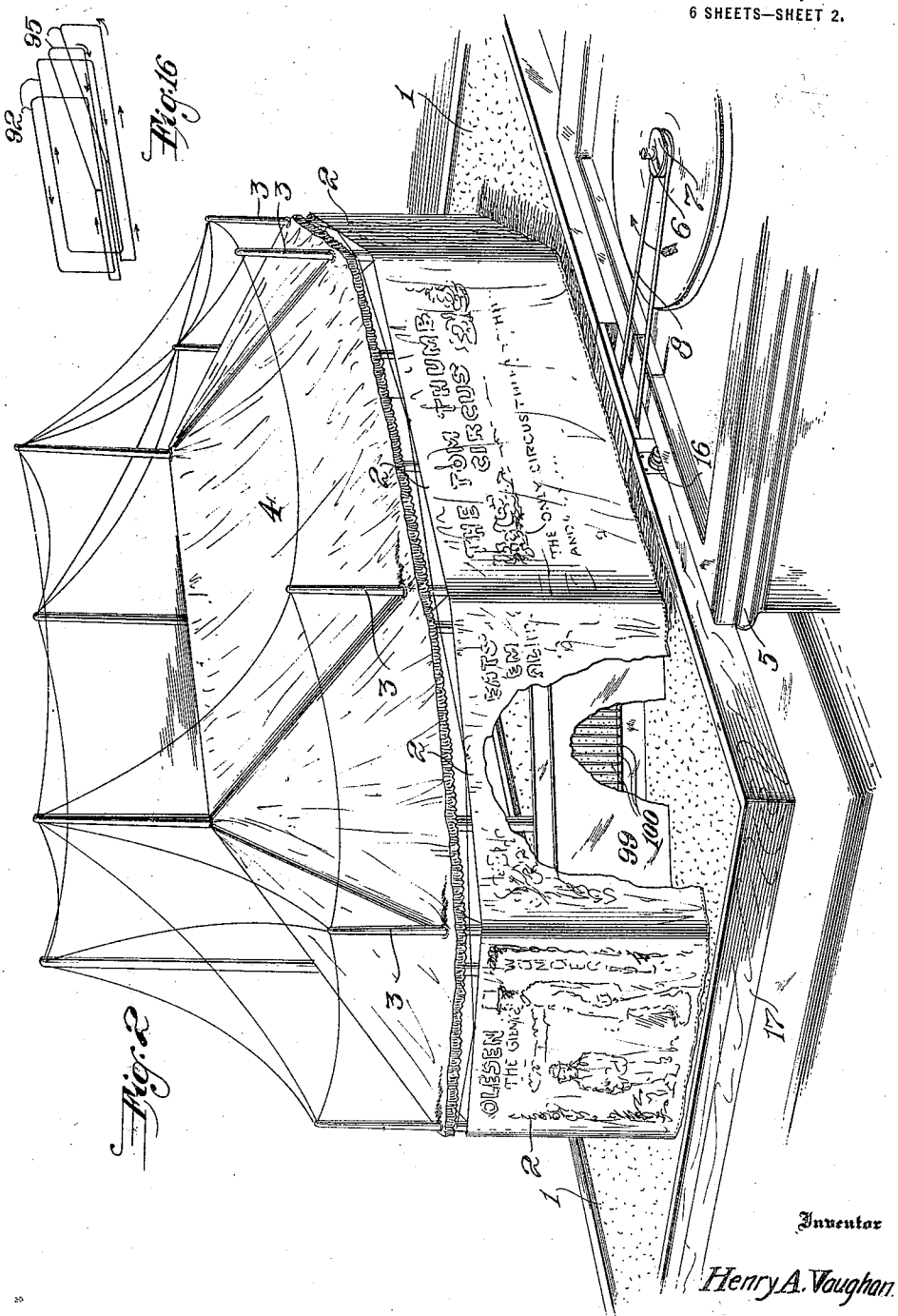

Fig. 2.

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6 SHEETS—SHEET 3.

Fig. 3.

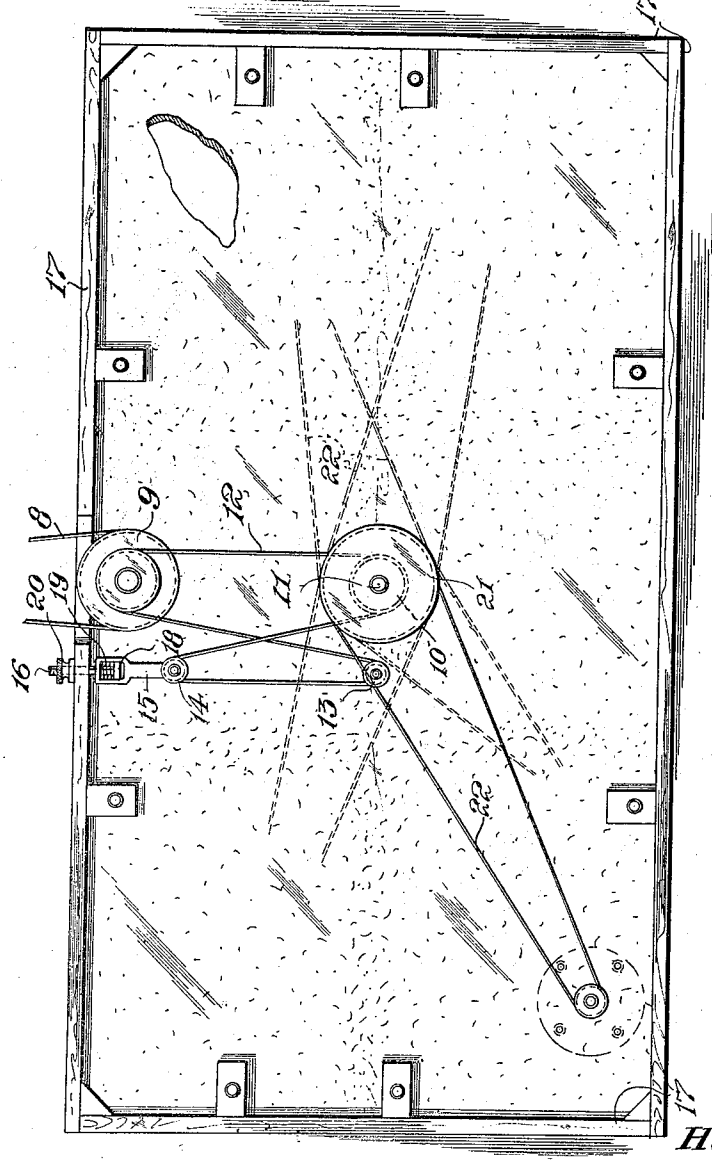

Fig. 10.

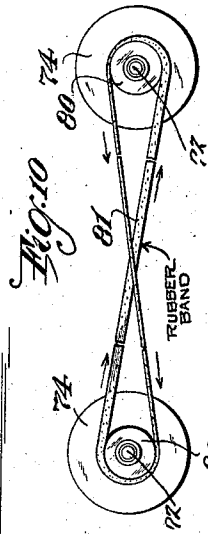

Fig. 11.

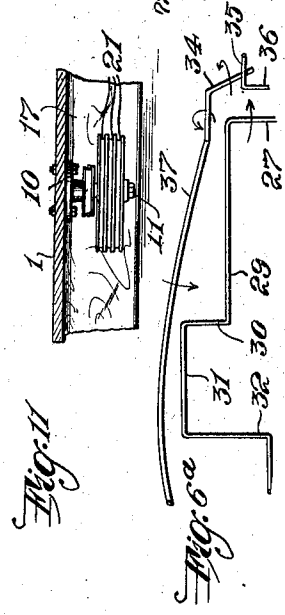

Fig. 6a.

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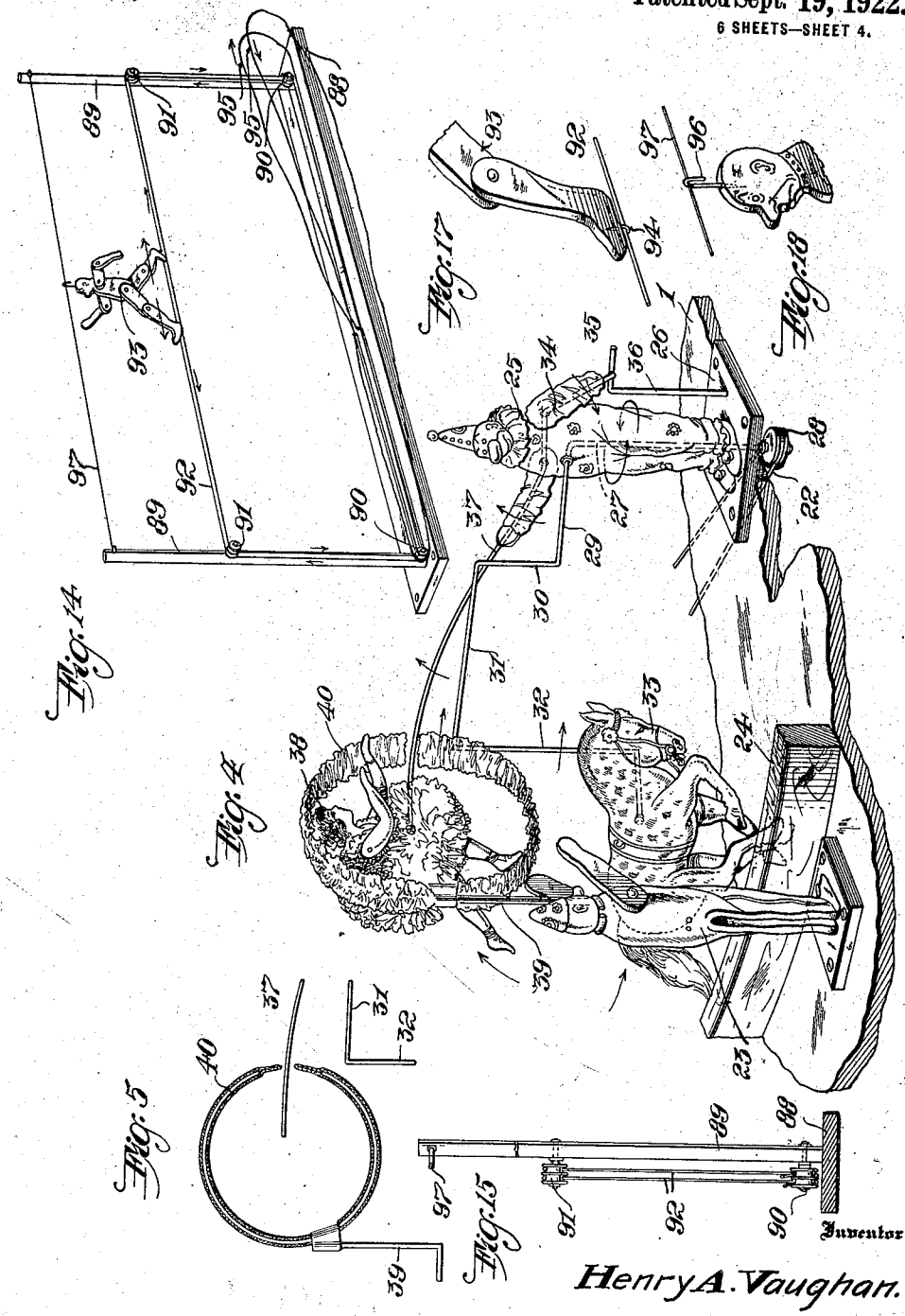
6 SHEETS—SHEET 4.



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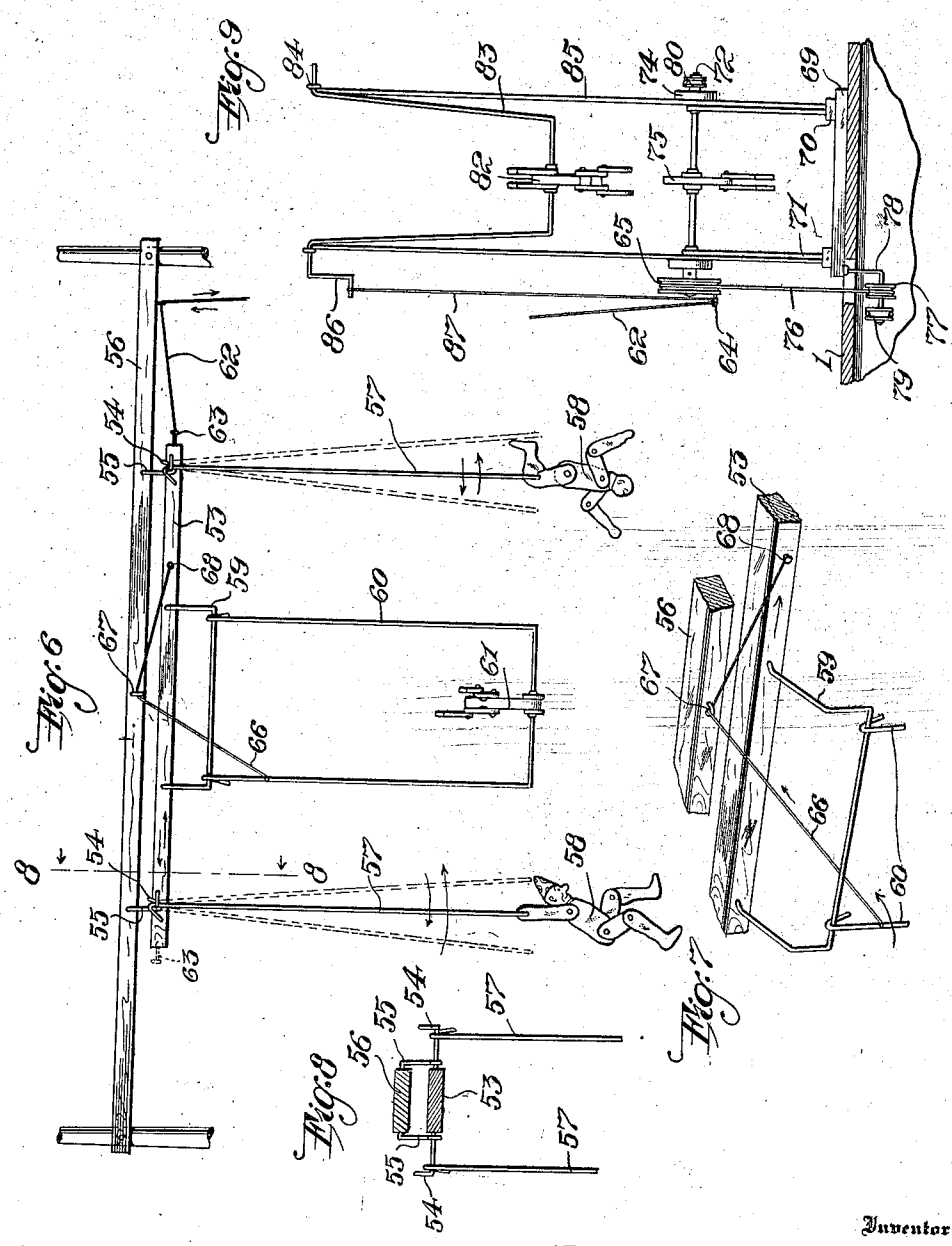

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6 SHEETS—SHEET 6.

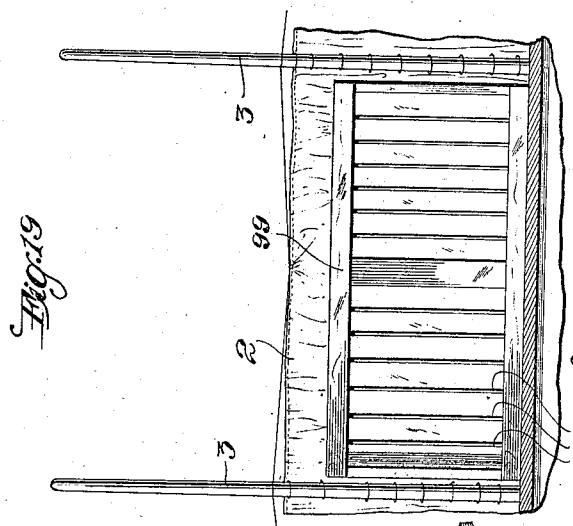

Fig. 19

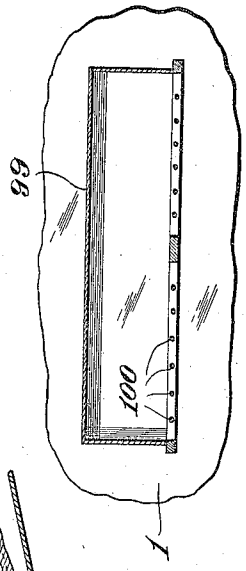

Fig. 20

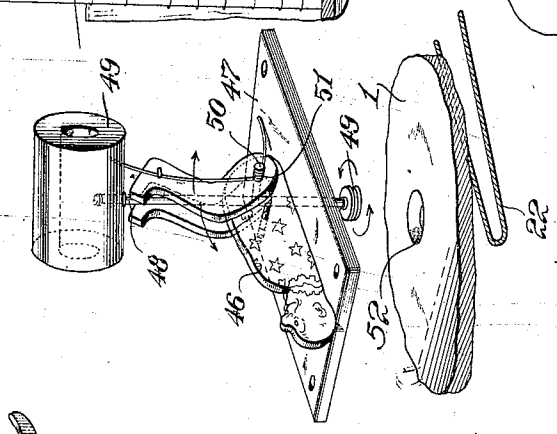

Fig. 13

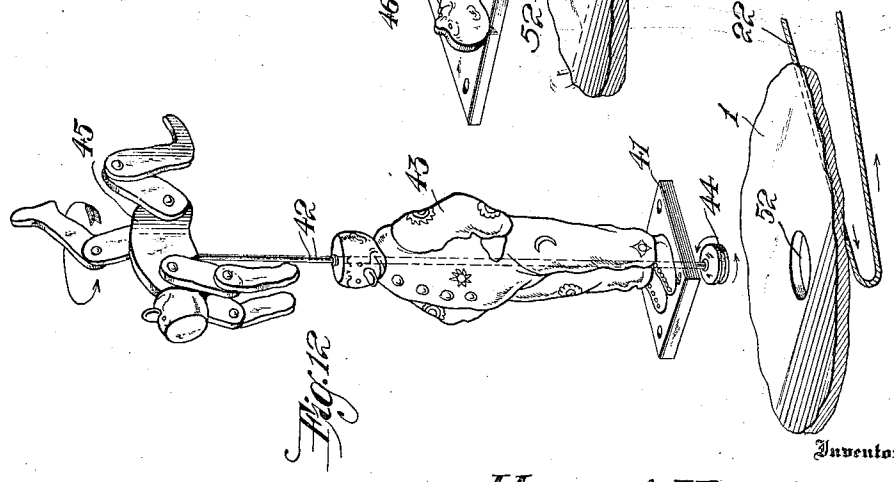

Fig. 12

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Patented Sept. 19, 1922. 1,429,382

UNITED STATES PATENT OFFICE.

HENRY ALBERT VAUGHAN, OF SELMA, ALABAMA, ASSIGNOR OF ONE-HALF TO GEORGE F. COTHRAN, OF SELMA, ALABAMA.

TOY CIRCUS.

Application filed October 19, 1920. Serial No. 417,944.

To all whom it may concern:

Be it known that I, HENRY A. VAUGHAN, citizen of the United States, residing at Selma, in the county of Dallas and State of Alabama, have invented certain new and useful Improvements in Toy Circuses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in amusement devices and more particularly to what will be hereinafter known as a toy circus, the main object of the present invention being the provision of an amusement device wherein a plurality of manikins are operated to carry out a predetermined performance, through the medium of suitable operating mechanism, controlled by the mechanism of a musical instrument, such as a phonograph or the like, the operating mechanism of the toy circus being connected directly to the operating mechanism of the musical instrument.

Another object of the present invention is the provision of a toy circus wherein the several manikins to be operated are suitably connected to a single source of supply, whereby the manikins will be operated simultaneously to carry out a predetermined performance.

A further object of the invention is the provision of a toy circus, wherein the plurality of manikins are so constructed and arranged with respect to the main portion of the device that the arrangement of several of the manikins can be altered, as each individual manikin is mounted on a separate base, detachably connected with the main platform and each manikin is provided with means whereby the same is connected to the main source of power.

A further object of the present invention is the provision of an individual manikin operated in the form of a tight-rope walker, this manikin being operated independent of the simultaneously operated manikins and preferably manually operated in connection with the operation of the mechanically operated manikins.

With the above and other objects in view, the invention consists in the novel features of construction, the combination and arrangement of parts hereinafter more fully set forth, pointed out in the claims and shown in the accompanying drawings, in which—

Figure 1 is a detailed perspective view of a circus constructed in accordance with my invention,

Figure 2 is a perspective of the exterior, showing the arrangement of a musical instrument with respect to the circus and illustrating the connection between the musical instrument and the circus mechanism,

Figure 3 is a bottom plan view of the platform supporting the toy circus,

Figure 4 is a detailed perspective view of a group of manikins, illustrating the action to be performed by this group of manikins,

Figure 5 is a detailed elevation relating to certain parts of the group shown in Figure 4,

Figure 6[a] is a detailed elevation showing the particular operating means for the group illustrated in Figure 4,

Figure 6 is a side elevation, illustrating the relative positions of another group of manikins,

Figure 7 is a detailed perspective, illustrating the manner of operating certain of the manikins illustrated in the group in Figure 6,

Figure 8 is a transverse sectional view, taken on the line 8—8 of Figure 6, looking in the direction of the arrows,

Figure 9 is a detailed end elevation, illustrating another group of manikins and the means for operating the same,

Figure 10 is a detailed side elevation of the connection between certain of the manikins illustrated in Figure 9,

Figure 11 is a detailed elevation of the several pulleys attached to the main operating shaft,

Figure 12 illustrates still another group of manikins, the same being removed from the main base member,

Figure 13 illustrates in perspective one of the individual manikins and the means of operating the same,

Figure 14 illustrates in perspective the individual manikin operated as a tight-rope walker and illustrates the means for operating the same,

Figure 15 is a transverse section, taken through the device illustrated in Figure 14, adjacent one of the end poles,

Figure 16 is a diagrammatic view of the operating mechanism for the device shown in Figure 14,

Figure 17 is a detailed side elevation of one of the supporting limbs, illustrating the manner of attaching the same to the operating wires,

Figure 18 is a detailed side elevation, illustrating the manner of supporting the manikin illustrated in Figure 14,

Figure 19 is a detailed front elevation of one of the animal cages, and

Figure 20 is a horizontal sectional view.

In carrying out my invention, it will be apparent that while I have shown and described the device as arranged for use in connection with the operating mechanism of a musical instrument, it will be understood that any suitable source of power supply may be utilized for operating the several parts of the device. In the accompanying drawings, which clearly illustrate the several features of my invention, the numeral 1 indicates the main platform or base member of my improved toy circus, having arranged upon its upper face a suitable enclosure shown in the form of a miniature circus tent, as indicated at 2, having the usual supporting poles 3 and the canvas 4 mounted upon these poles and so arranged upon the poles that it can be readily removed when desired.

In Figures 1 and 2, I have illustrated in perspective my improved circus suitably connected with a musical instrument in the form of a victrola 5, the operating shaft 6 of the victrola being provided with a pulley 7, which is connected by means of the belt 8 to the drive pulley 9 arranged beneath the base member 1. This drive pulley 9 is connected to a pulley 10 on the main operating shaft 11 by means of a belt 12. This belt 12 is of suitable length whereby it may be extended and passed around the pulley 13 mounted upon one of the reenforcing strips of the base member and thence around the adjustable pulley 14. This pulley 14 is connected to a bracket 15 having a movable rod 16 adjustably connecting the bracket with the side wall 17 of the base 1. The inner end of this rod 16 is provided with a head portion 18 and disposed between the end of the bracket 15 and the head 18 is a coil spring 19, the outer end of said rod having a thumb nut 20 adjustable thereon to adjust the tension of the belt 12 by manipulating this nut. From this, it will be apparent that the tension of the belt 12 can be readily adjusted and by having the spring 19 arranged in the bracket 15, the belt 12 will be yieldably mounted and permitted to give to a certain extent.

The main drive shaft 11 has mounted thereon a plurality of superimposed pulleys, generally indicated by the numeral 21 and adapted to be connected to the several manikins to be operated by means of a plurality of belts 22 extending around the pulleys 21 and connected with the several manikins to be operated.

In mounting the several manikins in the base member it is preferred to have each manikin mounted on an individual base removably attached to the main base member and in carrying out this idea, the group of manikins illustrated in Figure 4 consists of a stationary manikin 23 arranged upon the exterior of a ring 24. A movable manikin 25 is arranged in the center of this ring and mounted upon a removable base member 26 which is attached to the main platform or base 1 in any suitable manner so that the same can be readily detached. Extending up through the center of this base 26, is a shaft 27, on the lower end of which is mounted a pulley 28, having one of the belts 22 passed around the same and extended to one of the superimposed pulleys 21. This shaft 27 extends upwardly centrally of the manikin 25 and is then bent at right angles to provide a horizontal portion 29 and thence extended upwardly to provide a vertical portion 30. The upper end of the vertical portion 30 is extended toward the ring 24, forming a horizontal portion 31. A crank 32 is formed upon the outer end of the horizontal portion 31 and connected to a miniature horse 33.

Extending transversely through the manikins 25 is the horizontal portion of a crank 34, the vertical portion of said crank being adapted to engage the horizontal portion 35 of the post 36 which is stationed in the base 26 and arranged in such a position that the lower end of the crank 34 will engage the horizontal portion 35 upon each revolution of the manikin 25. Connected with the crank 34, is a supporting rod 37 which extends out through the rod of the manikin and supports at its outer end a manikin 38, which is normally positioned upon the back of the miniature horse 33. The manikin 23 is provided with a supporting rod 39 upon the upper end of which is mounted a split ring 40, the ends of said ring being disposed a suitable distance apart at the inner side thereof whereby the rod 37 may readily pass the ring and the manikin 38 pass through the ring. From the above description, it will be readily apparent that the rod 37 may readily pass the ring and the manikin 38 pass through the ring. From

the above description, it will be readily apparent that upon rotation of the shaft 27, the miniature horse 33 and the manikins 25 and 38 will be rotated about the ring 24 and upon each revolution of the manikin 25, the crank 34 will engage the horizontal portion 35 of the crank 36 and actuate the rod 37 to raise the manikin 38 so that it will pass through the ring 40, thus carrying out a distinct imitation of a bareback rider. In Figure 12, I have illustrated one of the individual manikins, showing the same in its detached position and provided with the removable base member 41, having extended up through the center thereof a shaft 42 which also extends up through the manikin 43. The lower end of this shaft is provided with a pulley 44 adapted to be connected by means of one of the belts 22 to one of the pulleys in the series 21. The manikin 43 is stationary, while the manikin 45, secured to the upper end of the shaft 42 rotates with the shaft and provides an imitation of a person balancing himself upon a suitable supporting member arranged a suitable distance above the surface of the main platform 1.

In Figure 13, I have illustrated another individual manikin 46, mounted upon a suitable base member 47, said manikin being arranged in a position upon its back and extending up through the base 47 and the manikin is a shaft 48, upon the lower end of which is mounted a pulley 49 connected by means of one of the belts 22 to one of the pulleys in the series 21 to impart movement to the shaft 48. Mounted upon the upper end of the shaft 48 is a roll member 49', preferably resembling a barrel or other article and adapted to rotate with the shaft 48. The limbs of the manikin are mounted upon a transverse shaft 50 and mounted upon the shaft is a coil spring 51, one end of which bears against the base member 47, while the other end thereof is connected with one of the limbs of the manikin and extended out beyond the foot of the manikin and adapted to be engaged by the roll 49 upon the rotation of the same, so as to actuate the limbs of the manikin to imitate the juggling of the roll 49 by the feet of the manikin.

In each case of the individual manikins illustrated in Figures 12 and 13, the base or platform 1 is provided with a suitable opening 52, whereby the pulleys may be passed through the base member 1 and the individual bases of the manikins be arranged upon the upper surface of the base or platform 1 and detachably secured thereto in any suitable manner.

In Figure 6, I have illustrated a plurality of manikins mounted upon swinging supports and preferably adapted to produce in miniature the imitation of a number of trapeze performers. In carrying out this particular arrangement, I provide a longitudinally movable bar 53 mounted for swinging movement and having the rods 54 extended through the bar and supported within the loops 55 upon opposite sides of the bar. The loops 55 are formed upon the outer ends of a transverse shaft which extends through the supporting bar 56. These shafts which extend through the bar 56 are mounted for rotation whereby to impart a swinging movement to the loops 55 upon longitudinal movement of the bar 53. Suspended from the outer ends of the rods 54 are the U-shaped trapeze members 57, having mounted upon their horizontal portions the manikins 58, said manikins being mounted for swinging movement whereby the movement of the members 57 will impart movement to the manikins 58, in view of the fact that the manikins are loosely mounted upon the horizontal portions of the members 57. From this, it will be apparent that upon longitudinal movement of the bar 53, movement will be imparted to the members 57 which, in turn, will impart a swinging movement to the manikins 58.

A substantially U-shaped supporting bracket 59 is disposed at right angles to the bar 53, the ends of said bracket being secured to the bar while the intermediate portion supports a swinging trapeze member 60 having mounted upon its horizontal portion a swinging manikin 61.

In order to impart movement to the members 57 and 60 through the medium of the bar 53, a cord 62 is connected to the end of the bar 53 by means of a pin 63, the other end of said cord being connected to a crank 64 on a pulley 65. From this, it will be apparent that upon rotation of the pulley 65, a swinging longitudinal movement will be imparted to the bar 53 to thus actuate the members 57 and the manikins 58. In order to impart movement to the members 60 and 61, a cord 56 is connected to one of the side portions of the member 60 and extended up through a loop 67 on the support 66 and thence downwardly at an angle of 45° and attached to a pin 68 on the movable bar 53. From this, it will be apparent that as the movable bar 53 moves longitudinally, the cord 66 will be drawn through the loop 67 and impart a swinging movement to the trapeze member 60. This particular feature of the invention is clearly illustrated in Figure 7, where it is shown in detail in a perspective view.

In Figure 9, I have illustrated an end elevation of a group of manikins and in carrying out the particular performance for these manikins, I construct a base member 69 upon which are mounted the longitudinal members 70 and extending up from

these members 70 are the supports 71 connected at their upper ends by means of the transverse shafts 72 and the longitudinal rods 73 which form a substantially rigid frame member and in order to retain the transverse shafts 72 in position within the bearings at the upper ends of the standards 71, discs are mounted upon the shafts 72 and arranged adjacent the upper ends of the standards 71, to thus prevent any lateral movement on the part of the shafts 72.

Connected to the central portion of the shafts 72 and arranged between the standards 71 are the manikins 75 which are adapted to rotate with the shafts 72. Suitable balance or stop wheels are mounted upon the ends of the shafts 72 whereby to prevent lateral movement of the shafts when mounted within the standard 71. It will be noted that one of the shafts 72 has mounted upon its outer end the pulley 65, which is connected by means of a belt 76 to a pulley 77, supported upon the horizontal portion of a bracket 78. Mounted upon the horizontal portion of the bracket 78 is a second pulley 79 which is connected by means of one of the belts 22 to one of the series of the pulleys 21. From this, it will be apparent that movement will be readily imparted to one of the shafts 72 and in order to impart movement to the other shaft, each of the shafts is provided upon one of its ends with a pulley 80, said pulleys being connected by means of a belt 81, preferably of yieldable material such as a rubber band or the like. It will be noted that when the belt 81 is mounted upon the pulleys 80, the belt is twisted so that by the rotation of the pulleys, they will be rotated in opposite directions. From this, it will be apparent that upon rotating movement of the pulley 65, both of the shafts 72 will be rotated in opposite directions.

An additional manikin 82 is supported above the frame-work which supports and operates the manikins 75. This manikin 82 is mounted upon the horizontal portion of a U-shaped trapeze member 83, the upper ends of which are loosely mounted within the loops 84 formed at the upper ends of the spaced standards 85, said standards having their lower ends mounted in the longitudinal members 70 on the base 69 and disposed midway between the two sets of standards 71 which support the two manikins 75 so that through the swinging movement of the several manikins, they will not interfere with the operation of each other.

In order to impart movement to the trapeze member 83, one of the ends of the trapeze member is extended beyond the loop 84 and provided with a crank 86 which is connected, by means of a cord 87, to the pin 64 on the pulley 65, whereby upon rotation of the pullley 65, movement will be imparted to the trapeze member 83 through the operation of the crank 86. From this, it will be apparent that when the pulley 65 is rotated through the medium of the belt 76, the manikins 75 will be rotated with the shafts 72 and movement will be imparted to the manikin 82, so that the several manikins in this group will be operated simultaneously with the same motive power.

In Figure 14, I have illustrated in perspective the miniature of a tight-rope walker which includes in its construction a base member 88 having the post members 89 extending upwardly from each end thereof, each of said posts being provided with a pair of pulleys 90 at its lower end and with a second pair of pulleys 91 arranged in spaced relation with the pulleys 90 and preferably at a point above the center of the post over which the cords 92 are movable. A manikin 93 is mounted upon the cords 92 between the two posts 89, each foot of the manikin being secured to one of the cords so that the feet are operated independent of each other. In order to connect the cords 92 with the feet of the manikin, staples 94 are used and driven into the feet of the manikin, engaging the cord 92 to retain the same in connection with the feet of the manikin.

From the above, it will be apparent that by operating the cords 92 over the pulleys 90 and 91, the manikin 93 will be moved between the two posts 89. In order to operate the cords 92 so that first one of the cords and then the other can be moved, the operating cords 95 are connected to the cords 92 at a point between the posts 89 and at a point on the cords 92 where they operate along the base member 88. From this, it will be apparent that by pulling first upon one cord and then upon the other of the cords 95, the cords 92 will be operated intermittently to move the feet of the manikin to represent an imitation of walking so that the manikin will be moved the distance between the two posts 89 in one direction and by pulling upon the cords 95 in the other direction, the manikin will be moved in the opposite direction by pulling first one cord and then the other.

In order to support the manikin 93 in an upright position, a loop 96 is attached to the head of the manikin and engaged with the supporting rod 97, said loop 96 being loosely engaged with the cord 97 so that it can readily move along the same as the manikin 93 is moved from one post to the other.

In Figure 1, I have illustrated one of the manikins removed from the base platform 1, illustrating the manner in which the manikins are mounted upon this base or platform 1. It will be noted in this construction that a suitable opening 98 is provided for the reception of a pulley attached to the mani-

kin to operate the same, said opening being closed by means of the base upon which the manikin is supported, this base member being detachably connected to the main base or platform 1 in any suitable manner.

In Figures 19 and 20 I have illustrated the relative positions and construction of a plurality of miniature animal cages, these cages being disposed around the side wall of the tent and arranged between the side supporting posts and in their construction include a substantially rectangular body member 99, the front portion of which is provided with a plurality of spaced bars 100, giving in miniature an animal cage and it will be apparent that several types of animals in miniature can be displayed within these cages to present a realistic appearance to the circus.

From the above description, taken in connection with the accompanying drawings, it will be readily apparent that I have provided a miniature toy circus, depicting the original well-known circus in miniature in a very realistic manner and wherein the several features of the circus are operated simultaneously with the exception of the miniature tight-rope walker, which is operated independent of the remaining parts of the circus.

What I claim is:

1. A device of the class described including a stationary bar, a reciprocating bar disposed beneath the stationary bar, a movable figure suspended at each end of the movable bar, an additional figure supported intermediate the ends of said movable bar and disposed at right angles to the figures at the ends of the bar, means for imparting reciprocating movement to the movable bar for moving the figures at the ends thereof in the same general direction and means dependent upon the reciprocating movement of the movable bar for imparting movement to the central figure.

2. A device of the class described including a stationary bar, a reciprocating bar disposed beneath the stationary bar, a plurality of figures suspended for swinging movement from said bars and disposed at different angles with respect to each other, means for imparting reciprocating movement to the movable bar for actuating certain of said figures and means for forming connection between the movable bar and the other figure and dependent upon the relatively stationary position of the stationary bar for imparting movement to said other figure.

3. A device of the class described, including a platform, a base member thereon, spaced standards mounted in the base, transverse shafts at the upper end of the standards, movable figures supported upon the central portion of the shafts, means for imparting movement to the shafts for actuating the figures, spaced uprights disposed midway between the two sets of standards, a movable figure supported between said uprights and means for imparting movement to said figure simultaneously with the movement of the first mentioned figures.

4. A device of the class described, including a platform, a ring mounted upon the platform, a movable figure arranged centrally of the ring, supporting members carried by said figure, additional figures arranged upon the outer ends of the supporting members, means for imparting movement to the first figure for rotating the same, whereby the figures on the supports will be moved in a circle concentric with the ring and means engaged by the inner end of one of said supports upon each revolution of the figure for actuating said support to raise and lower the figure upon the outer end thereof.

5. A toy circus comprising a platform having openings therein, a plurality of movable figures, a base member attached to each of said figures and removably secured to the platform above the opening, each of said figures having an operating shaft extending through the base and through the openings in the platform, a pulley upon the lower end of said shaft, a main shaft arranged beneath the platform, means for connecting said pulley with the main shaft and means for connecting said main shaft with a source of power whereby to impart movement to the figures.

6. A toy circus including a platform, having openings therein, a base member arranged above one of the openings and removably secured to the platform, a manikin mounted upon the base member, a shaft extending upwardly through the base member and manikin, said shaft projecting beyond the upper end of the manikin, said shaft being rotatable within the base and manikin and a second manikin secured to the upper end of the shaft and adapted to rotate therewith, an operating shaft and means connecting the first mentioned shaft with the operating shaft to impart movement to the manikin upon the outer end of the first shaft.

7. A toy circus including a platform, a movable figure mounted for rotation thereon, supporting members carried by said figure, additional figures arranged upon the outer ends of the supporting members, means for imparting movement to the first figure for rotating the same and means actuated through the rotation of the additional figures for raising and lowering one of said figures with respect to the others.

8. A toy circus of the class described in-

cluding a platform, a movable figure arranged upon the platform, supporting members carried by said figure, additional figures arranged upon the outer ends of the supporting members, means for imparting movement to the first figure for rotating the same whereby the figures on the support will be moved around the first figure and means engaged by the inner end of one of said supports upon each revolution of the first figure for actuating said support to raise and lower the figure upon the outer end thereof.

In testimony whereof I affix my signature.

HENRY ALBERT VAUGHAN.

P. WRONOWSKI.

MECHANICAL TOY.

APPLICATION FILED FEB. 17, 1920.

1,348,386. Patented Aug. 3, 1920.

3 SHEETS—SHEET 1.

Fig. 5.

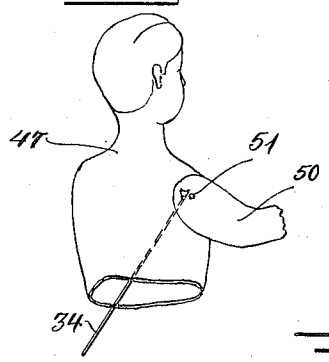


Fig. 6.

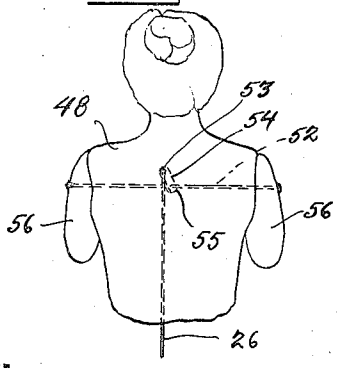
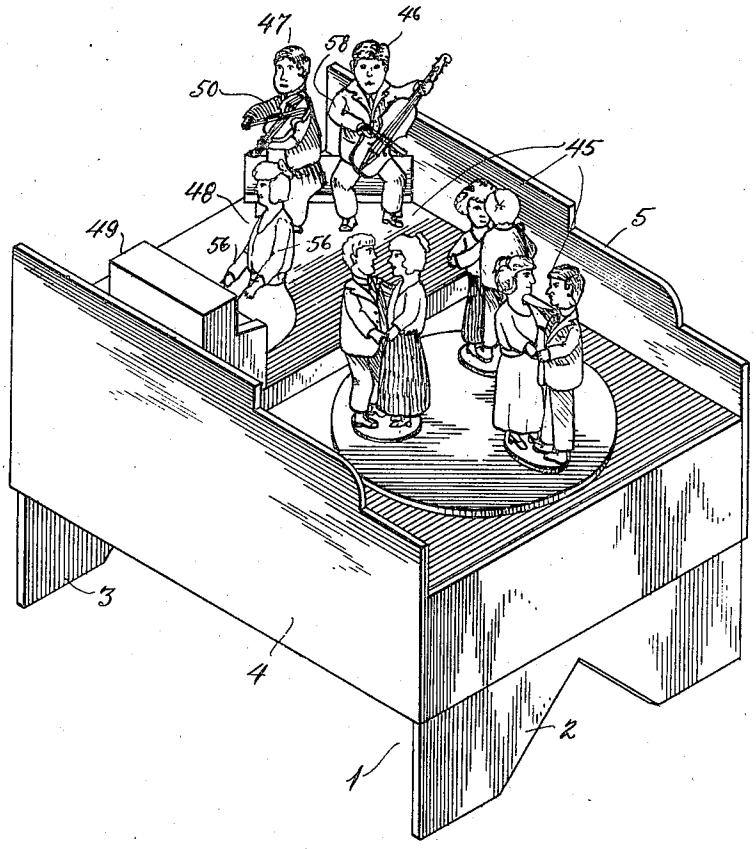


Fig. 1.



Inventor
P. Wronowski

By his Attorney
Marion Talbot

P. WRONOWSKI.

MECHANICAL TOY.

APPLICATION FILED FEB. 17, 1920.

1,348,386.

Patented Aug. 3, 1920.

3 SHEETS—SHEET 2.

Fig. 2.

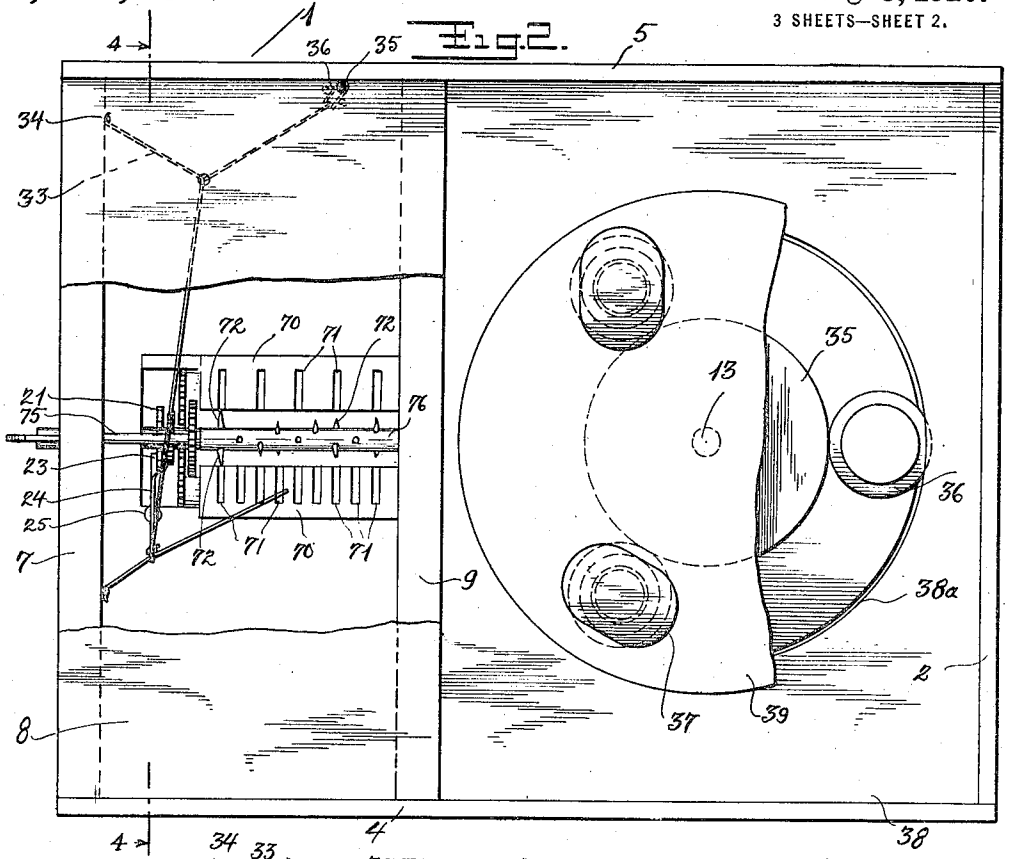
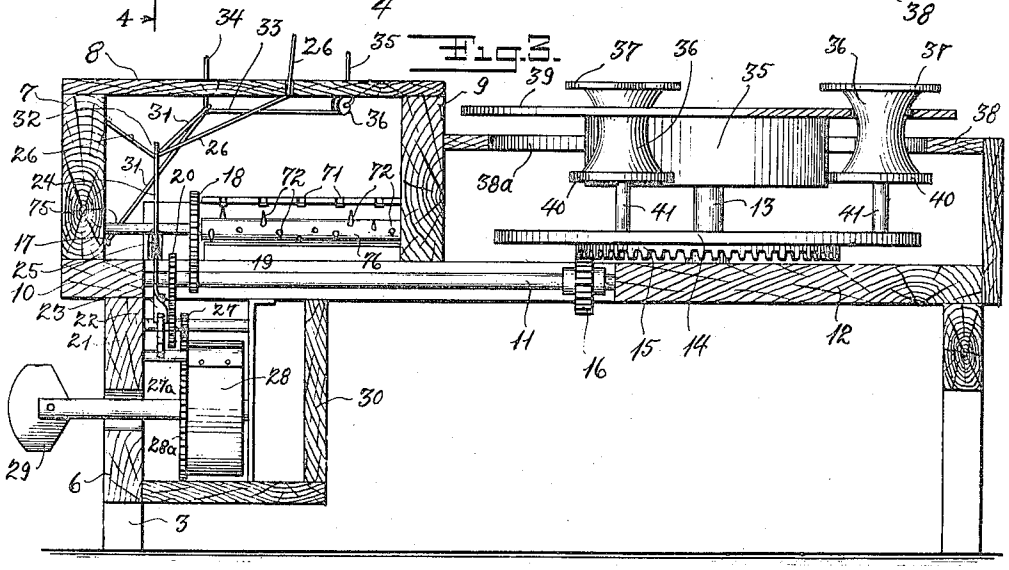


Fig. 3.



Inventor

P. Wronowski

By his Attorney

Marcus Galip

P. WRONOWSKI.

MECHANICAL TOY.

APPLICATION FILED FEB. 17, 1920.

1,348,386. Patented Aug. 3, 1920.

3 SHEETS—SHEET 3.

Fig. 4.

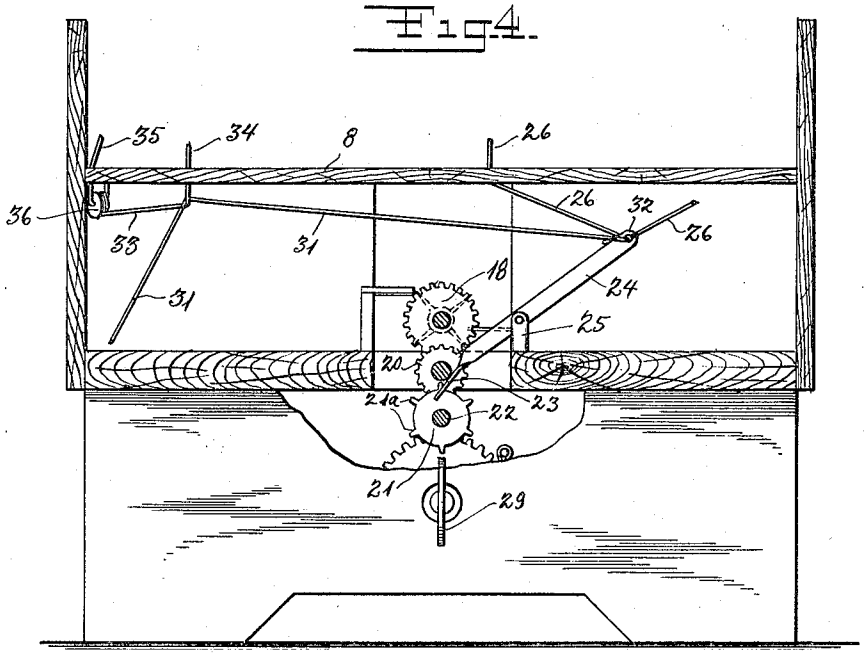
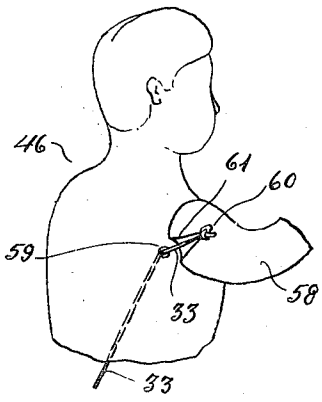


Fig. 7.



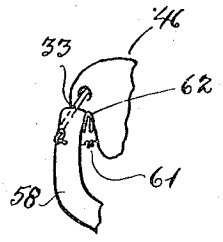


Fig. 8.

Inventor

P. Wronowski

By his Attorney

Marcus Allen

UNITED STATES PATENT OFFICE.

PIOTR WRONOWSKI, OF YOUNGSTOWN, OHIO.

MECHANICAL TOY.

1,348,386. Specification of Letters Patent. Patented Aug. 3, 1920.

Application filed February 17, 1920. Serial No. 359,298.

To all whom it may concern:

Be it known that I, PIOTR WRONOWSKI, citizen of Poland, and resident of Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Mechanical Toys, of which the following is a specification.

This invention relates to mechanical toys, and has for its main object to provide a novel and entertaining, easily operated, mechanical toy, which is simple in construction and inexpensive in cost of manufacture.

The above and other objects will become apparent in the description below, in which characters of reference refer to like-named parts in the drawings.

Referring briefly to the drawings, Figure 1 represents my device in perspective projection.

Fig. 2 is a partial plan view of the same with parts removed to expose the interior.

Fig. 3 is a side elevational view of the same with the side panel of the frame removed to expose the interior.

Fig. 4 is a cross-sectional view substantially on the line 4—4 of Fig. 2.

Fig. 5 is a diagrammatic view of one of the mechanical figures illustrative of its operation.

Fig. 6 is a diagrammatic view of another of said figures illustrative of its operation.

Fig. 7 is a diagrammatic view of still another of the mechanical figures, illustrative of its operation.

Fig. 8 is a partial plan view of the figure illustrated in Fig. 7.

Referring now in detail to the drawings, the numeral 1 represents the frame of my device supported on pedestals 2 and 3. Side frame members 4 and 5, which may be of ornamental design, surround the mechanical figures so as to give the appearance of a stage or the like to the platforms upon which the mechanical figures perform. The pedestal 3 is extended upward as a frame member 6 having a hole therein for the insertion of a key 29 which serves to wind up the spring motor represented generally by 28. Since the latter may be of any desirable and common type, it will not be described in detail, as its specific structure forms no part of my invention. A box-like frame 30 supports and incloses said motor.

Said motor rotates a large gear 28^a, which meshes with a small gear 27 which is mounted on a shaft 22. A second gear 27^a is mounted on said shaft 22, and is in mesh with a gear 20 mounted on the long shaft 11 supported as shown. A third gear, or preferably a pin-wheel, 21, is mounted on the shaft 22, having pins or rather widely separated gear teeth 21^a, as shown in Fig. 4. A simple lever 24 is pivotally mounted upon a support 25, and the lower end of said lever is forked and the crutch of said fork lies in the path of the teeth 21^a of said gear 21. Thus it is apparent that rotation of said gear 21 will cause intermittent reciprocation of said lever.

A cord 31 is attached to the side frame 7 and extends over a loop in another cord 33 and thence to the upper end of said lever, where it is attached at 32. The cord 33 extends upward through the platform 8 through two holes in the latter, and for the sake of simplicity both ends of the cord 33 above said platform are separately numbered, the one being indicated at 34, and the other at 35. If desired, the ends of said cord 33 may be passed about rollers such as that at 36 in passing upward through said platform. Another cord 26 is attached at one end to the interior of the wall 7, and passes through the eyelet 32 and thence upward through the platform 8.

In Fig. 1 I have shown three figures, one that of a pianiste 48 and two those of violinists 46 and 47. When the toy is in operation, as will presently be seen, both arms of the pianiste will alternately rise and fall rapidly before the toy piano 49 in imitation of one playing the piano, and at the same time the arm of the figure 46 will reciprocate horizontally in imitation of one playing a violin; and still at the same time the arm of the violinist 46 will reciprocate vertically also in imitation of one playing a bass violin. The manner of attaining these motions is as follows: It is apparent that, as the gear 21 rotates in a clockwise direction, intermittent or rocking motion will be given the lever 24. As, then, the upper end of said lever so rocks, it will alternately pull and release the cords 31 and 26, thus similarly and synchronously pulling and stretching the strings or cords 26, 34, and 35. Now, referring first to the figure 47 (Fig. 5), the arm 50 thereof, which carries the bow of the violin, is pivotally attached to the body at 51, and the cord 34 is attached to the shoulder-end of the arm as shown; therefore, as said cord 34 is alternately pulled and re-

leased (by the cord 31), it is apparent that the arm 50 will rise and fall in unison with the rocking of the lever 24. Referring now to the figure 48 (Fig. 6), a horizontal shaft 52 is pivotally mounted in the shoulders of said figure, and a rod 54 is rigid to said shaft at 55. The free end of said rod is provided with an eyelet 53 to which the end of the cord 26 is attached. It is again apparent that alternate pulling and releasing of the cord 26 will cause synchronous rising and falling of the arms 56 of this figure 48. Referring finally to the figure 46, the cord 33 passes through the body thereof and out through a hole 59, and is attached to the arm 58 at 60, said arm being provided with a groove 61 in which the end of said cord lies. Said arm is pivotally attached to the body by a hinge 62, and a spring or elastic band 61 serves to urge said arm against the body. Again, it is apparent that alternate pulling and releasing of the cord 33 will cause synchronous horizontal motion of the arm 58 which carries the bow.

As aforementioned, the gear 20 is rigid to the long shaft 11, the former turning the latter by virtue of its engagement with the spring motor through the gear 27^a, shaft 22, gears 27 and 28^a. A small pinion or gear 16 is rigid to the end of said long shaft, and lies in engagement with a horizontal face gear or circular rack 15. The latter is secured to a circular plate 14 which is provided with a central hole for the passage therethrough of a short vertical shaft 13 supported in the floor board 12. A drum 35 is secured to the upper end of the shaft 13. An upper floor board 38 rests upon a level slightly lower than that of the platform 8, and for the rotation of parts about to be described, a circular recess or hole 38^a is cut in said floor board 38. At three equidistant points near the periphery of the plate 14 stand upright posts 41, and upon each is pivotally mounted a symmetrical drum 36. Each of these drums has an upper flange 37 which provides a platform upon which stands a dancing couple 45. These couples are figures in various dancing poses, and they are secured by glue or other means to the top of said flange 37. Each of said drums has also a lower flange 40 of rubber or other material, the periphery thereof being roughened; and the drum 35 is also of rubber or other material, and its periphery is also roughened. The flanges 40 are in contact with the drum 35, so that when said drums 36 revolve about said drum 35, the former are also made to rotate about their own axes; thereby the couples are made to turn in imitation of actual dancing couples. As is apparent from the previous description, the drum 35 is stationary, and the platform 39 rests lightly thereon, the latter being rotated by the rotating drums 37. The function of the platform 39 is simply to cover the hole 38^a and to conceal the mechanism otherwise visible therethrough.

A horizontal shaft 75 is pivotally mounted in the walls 7 and 9 directly above the shaft 11, and a gear 19 rigid to the latter engages and drives a gear 18 rigid to the former, thereby causing rotation of the shaft 75. Said shaft 75 is enlarged in diameter through the greater part of its length, as at 76, and pointed fingers 72 stand radially thereon. On either side of said enlarged portion 76 of the shaft 75 is a plate 70 having vibrating reeds 71 cut out therefrom, and said fingers are adapted to engage the tips of said reeds during the rotation of the shaft 75, thus causing the issuance of musical notes from said reeds. By a proper design and arrangement of said reeds and spacing of said rods on said shaft, any desired tune may be caused to issue from said reeds to accompany the dancing of the couples and the imitation playing of the pianiste and violinists.

Now the complete operation of the toy is apparent. After the motor 28 is wound up by the key 29, and allowed then to unwind, the gear 28^a turns the gear 27, and hence the gear 27^a turns the gear 20 and the shaft 11, the latter causing the couples to revolve and at the same time to rotate about their own axes. The gear 21, which is turned by the shaft 22, causes rocking of the lever 24 and hence causes sideward reciprocating motion of the arm 58 of the violinist 46, vertical reciprocating motion of the arm 50 of the violinist 47, and vertical reciprocating motion of the arms 56 of the pianiste 48; at the same time the musical notes issue from the reeds 71 as above described.

Thus it is seen that I have invented a useful and entertaining toy, which is a close and natural imitation of a dancing party and an orchestra in accompaniment with the dancers. My toy is simple in construction, and the whole occupies only a small amount of space and is all supported upon legs or pedestals so that it may be conveniently carried about even by a child.

I claim:

A device of the class described comprising a frame, a spring motor mounted therein, a gear driven by said motor, a relatively long shaft having a gear at each end, one of said last-named gears being in mesh with said first-named gear, a disk pivotally mounted in horizontal position and having an annular rack on the bottom thereof, the other gear on said long shaft lying in mesh with said rack, a plurality of drums pivotally mounted upon said disk, an upright extending rigidly from the center of said disk, a circular platform mounted rigidly in horizontal position upon said upright, a cylindrical member on the underside of said plat-

form concentric therewith, said drums having pivotal contact with said member, openings in said platform, said drums extending upward through said openings, figures mounted upon the tops of said drums, a plurality of figures representing musicians mounted upon said frame, each of said musicians having one arm pivotally attached to the body, cords attached to said arms, a lever pivotally mounted in said frame adjacent said shaft, one end of said lever being forked, said cords connected to the other end of said lever, a wheel pivotally mounted in said frame and rotatable by said motor, spaced apart projections on the periphery of said wheel, said forked end of said lever lying in the path of said projections, resilient means urging said forked end against said wheel, and means for turning said motor.

Signed at N. S. Pittsburgh, in the county of Allegheny and State of Pennsylvania this 7th day of February, A. D. 1920.

PIOTR WRONOWSKI.

F. GORGELLINO.

MOTION DEVICE FOR AUTOMATONS.

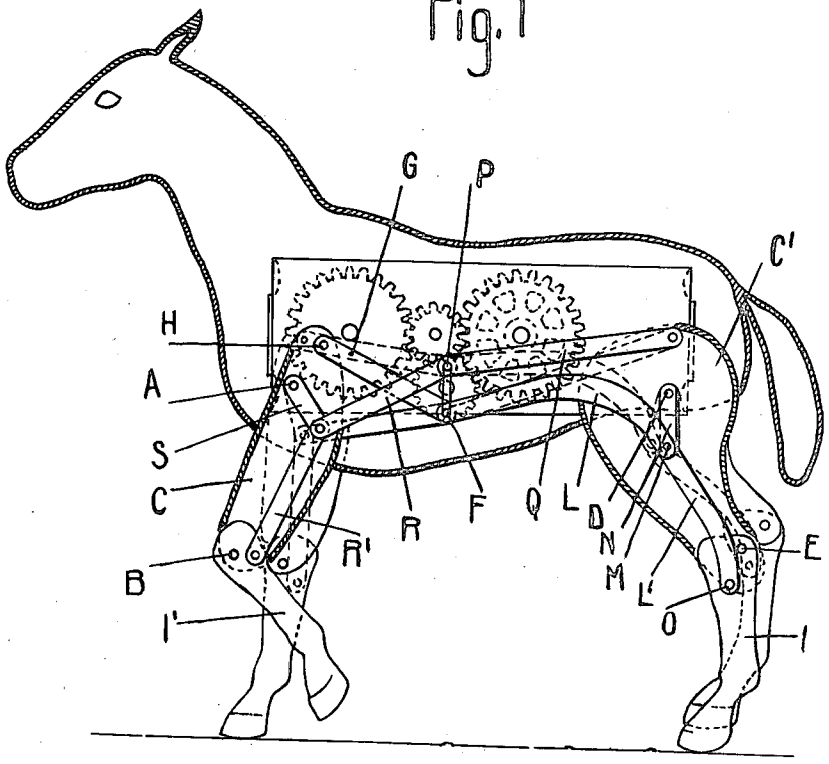
APPLICATION FILED NOV. 20, 1919.

1,422,436.

Patented July 11, 1922.

2 SHEETS—SHEET 1.

Fig. 1



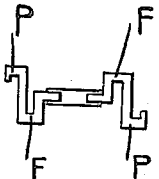


Fig. 1a

Fig. 2

Fig. 3

INVENTOR:

Francesco Gorgellino

By Hyde

Fraser, Dunlop & Myers

F. GORGELLINO.

MOTION DEVICE FOR AUTOMATONS.

APPLICATION FILED NOV. 20, 1919.

1,422,436.

Patented July 11, 1922.

2 SHEETS—SHEET 2.

Fig. 4

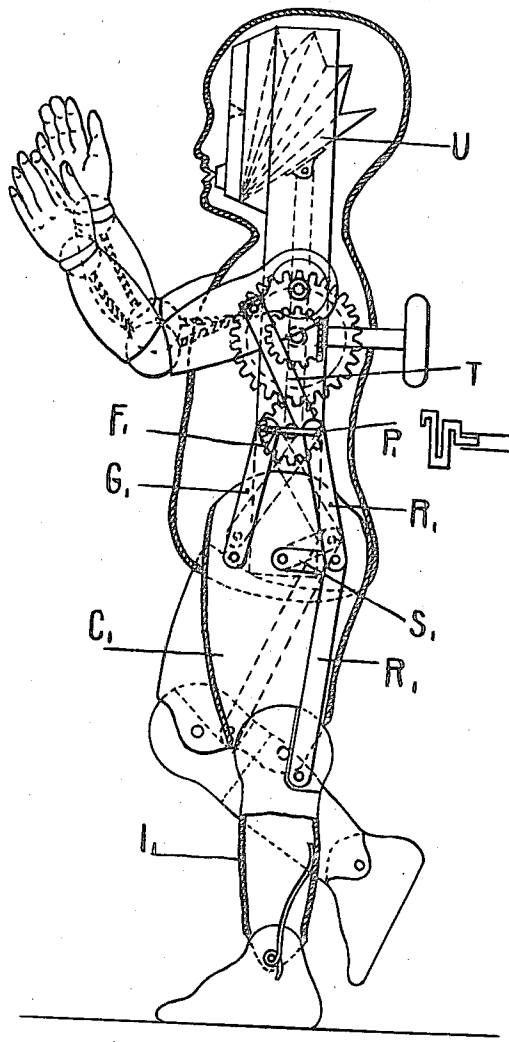
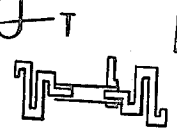


Fig. 4a



INVENTOR:

Francesco Gorgellino

By Attys

Fraser, Dunlop & Myers

UNITED STATES PATENT OFFICE.

FRANCESCO GORGELLINO, OF TURIN, ITALY.

MOTION DEVICE FOR AUTOMATONS.

1,422,436. Specification of Letters Patent. Patented July 11, 1922.

Application filed November 20, 1919. Serial No. 339,412.

To all whom it may concern:

Be it known that I, FRANCESCO GORGELLINO, a subject of the King of Italy, residing in the city of Turin, Kingdom of Italy, have invented certain new and useful Improvements in Motion Devices for Automatons, of which the following is a specification.

This invention relates to mechanism for giving life-like motion to the legs or arms of mechanical toys.

In the accompanying drawings, illustrating two embodiments thereof, one as applied to a horse and the other to a doll.

Fig. 1 is a longitudinal section, partly fragmentary, showing the mechanism applied to a toy horse.

Fig. 1ª is a detached view of one form of crank shaft therefor.

Figs. 2 and 3 are detached views of crankshafts of modified form adapted for use in the mechanism of Fig. 1.

Fig. 4 shows the invention as applied to a mechanical doll.

Fig 4ª is a detached view of one form of a crank shaft therefor.

Having reference more particularly to the toy animal illustrated in Fig. 1, a crank P—F is preferably located between each front and rear leg and may be rotated by any suitable means, as, for example, a spring motor of any appropriate type, indicated conventionally in broken lines.

The upper or thigh portions C, C′, of the animal's legs may be pivotally secured to its body portion at points A, D, and the lower or fetlock portions of the legs may be pivotally connected to the thigh portions at points B, E.

A forwardly extending connecting link G, pivotally connects arm F of the rotating crank P—F with the upper leg portion C, at H, while a rearwardly extending link L connects the same arm of the crank P—F, at M, with one end of a second link L′, the other end of which is pivotally connected at O with the lower portion I of the rear leg. A depending link N, having its upper end pivotally secured at D, is connected at its lower end with the junction M of the links L, L′.

Arm P of the rotating crank P—F is connected, by a link R, to one end of a link R′, connected at its other end to the lower portion I′ of the front leg at a point near the pivotal point B. A link S, corresponding to link N of the rear leg, is connected at one end to the pivotal point A of the upper leg portion C, and at its other end to the point of pivotal connection between links R and R′. The arm P of the rotating crank P—F is also connected by a link Q with the upper portion C′ of the rear leg.

The front and rear legs on the other side of the toy may likewise be provided with crank arms and driving connections forming part of the same operating mechanism, as indicated in broken lines, so that all of the various leg portions will be co-ordinated for relative movement in a predetermined order.

A very important feature of the invention thus far described, which materially adds to the lifelike simulation of the leg movement of a living animal, is the specific form of mechanism herein disclosed as a means for operating the lower leg portion, whereby the common piviotal connection, between two of the three links emloyed, is caused to move in a circular arc about the pivotal connection between the third link and its pivotal connection with said body portion.

It will be obvious that, by varying the connections between the different cranks and leg portions, the movements of the legs may be caused to conform with those of an animal when trotting, cantering, galloping, etc., and, if desired, a separate crank arm may be provided for each leg portion, as indicated in Fig. 2, and these arms may be bent to different positions, as indicated in Fig. 3, whereby an ambling or stepping motion may be attained.

In Fig. 4 is illustrated a modification of the invention, as applied to a mechanical doll.

In this figure, the legs may be operated in a manner analogous to those of one pair of the legs of the toy illustrated in Fig. 1. The crank arms and operating links are, therefore, designated by reference characters corresponding with those of the forelegs of Fig. 1, but with subscripts added. If desired, each arm of the doll may be provided with a crank arm which may be connected by a bar T with an arm of the crankshaft, and the bellows U in the head of the doll may be similarly connected for operation.

What I claim is:—

1. In a device for producing life-like relative movement between the parts of mechanical toys, the combination with a body

portion, of an articulated leg, comprising an upper portion jointed to the body portion and a lower portion jointed to the upper portion, and an operating mechanism comprising a separate crank arm for each of said leg portions, a separate operating connection from each of said crank arms to its respective leg portion, and means for causing said crank arms to rotate in a predetermined relation.

2. In a device for producing life-like relative movement between the parts of mechanical toys, the combination with a body portion, of an articulated leg, comprising an upper portion jointed to the body portion and a lower portion jointed to the upper portion, and an operating mechanism comprising a double arm crank, and a separate connection from each arm of said crank to one of said leg portions.

3. In a device for producing life-like movement in mechanical toys, in combination, a body portion, a plurality of members jointed thereto, comprising articulated legs, each having an upper member jointed to said body portion and a lower member jointed to the upper portion, and an operating mechanism for said members comprising a plurality of crank arms, a separate operating connection from each member to the crank arm by which it is to be operated, and means for causing said crank arms to rotate in a predetermined relation.

4. A device, as specified in claim 1, in which the operating connection for the lower leg portion comprises a link pivotally connected at one end to said body portion, a second link pivotally connected at one end to the lower leg portion at a slight distance from its pivotal connection with the upper leg portion, and a third link pivotally connected at one end to the operating crank arm for the lower leg portion, the opposite ends of said three links being pivotally connected together, whereby the common pivotal connection between the three links forms a floating connection between the second and third mentioned links movable in a circular arc about the point of pivotal connection between the first mentioned link and said body portion.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

FRANCESCO GORGELLINO.

Witnesses:

FELIX BAZETTO,

FUGANT VINCA.

C. H. LEGGETT.

ADVERTISING DEVICE.

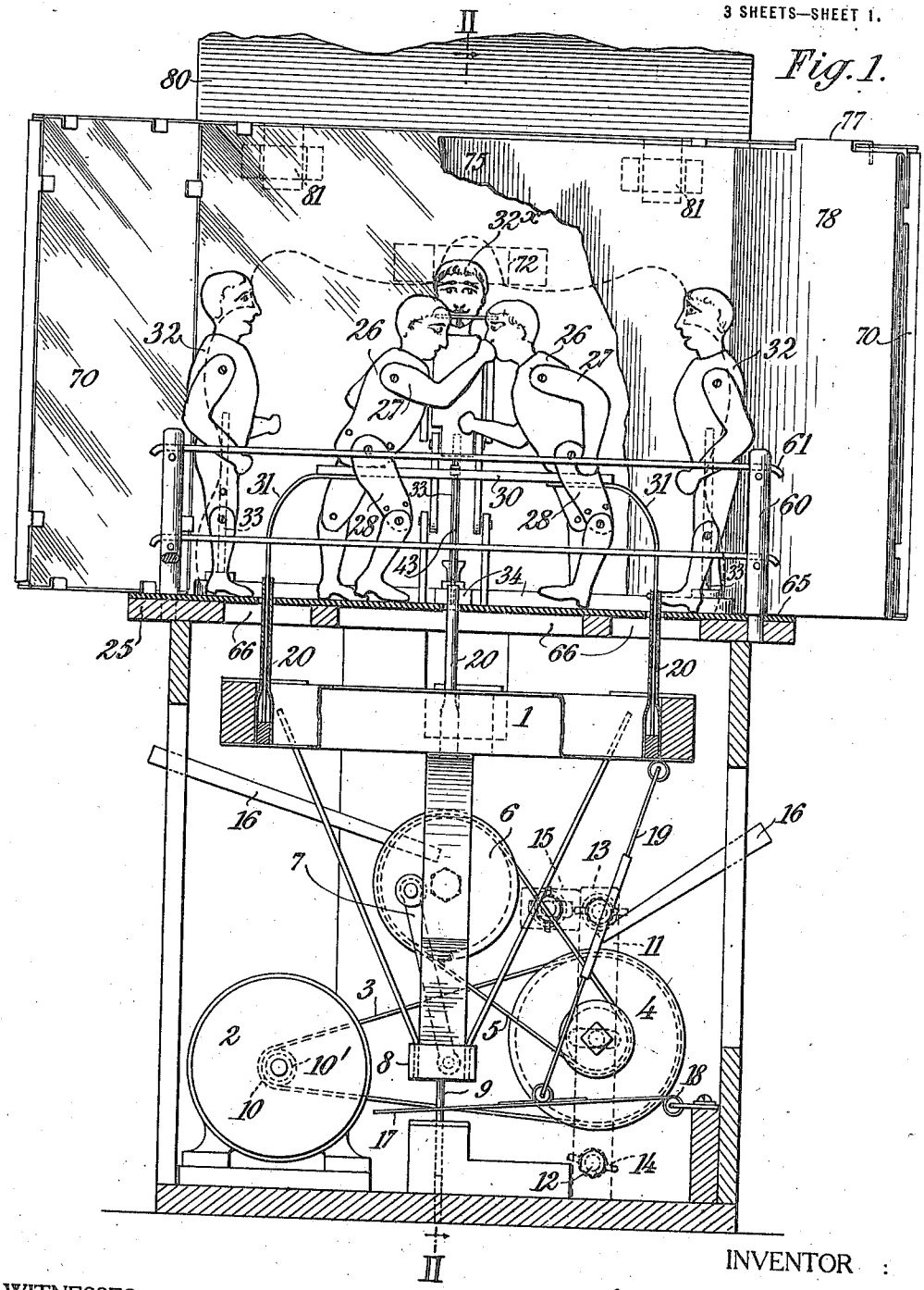
APPLICATION FILED APR. 7, 1917.

1,264,947.

Patented May 7, 1918.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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Clinton H. Leggett

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Fraser, Turk & Myers

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APPLICATION FILED APR. 7, 1917.

1,264,947.

Patented May 7, 1918.

3 SHEETS—SHEET 2.

Fig. 2.

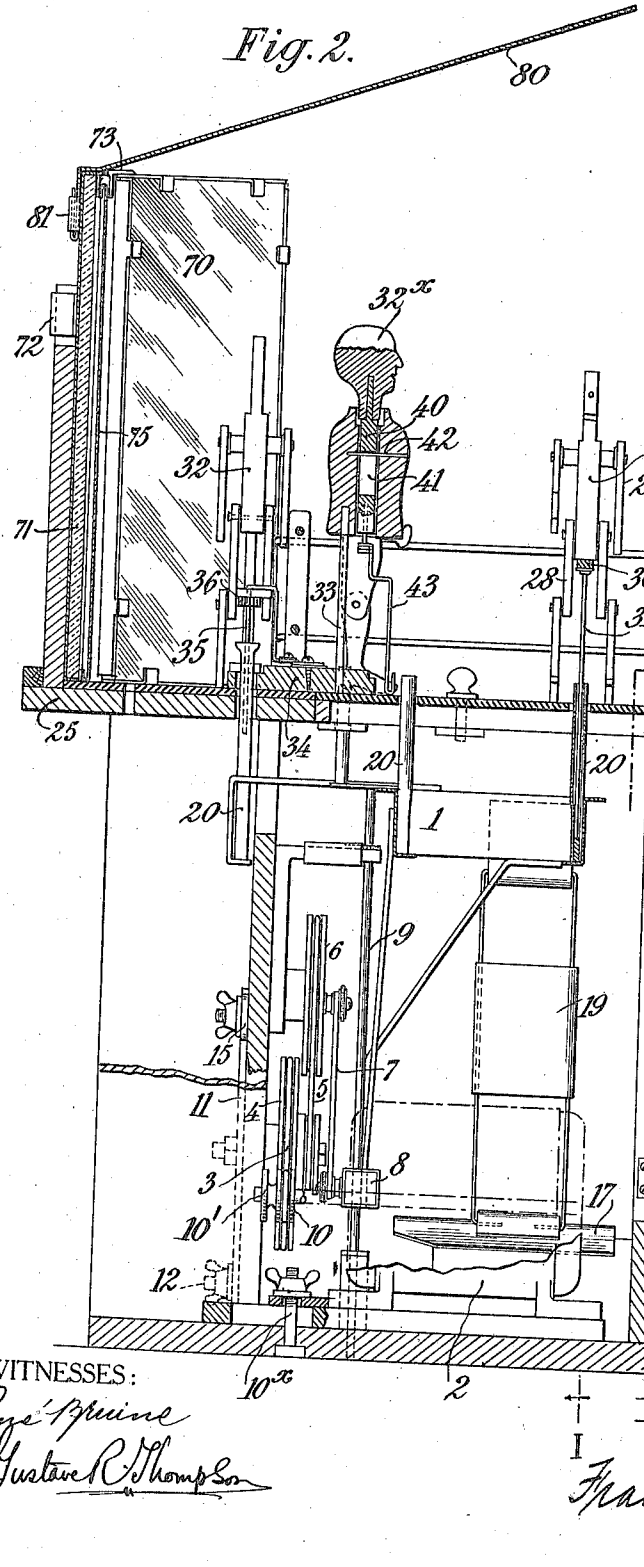


Fig. 4.

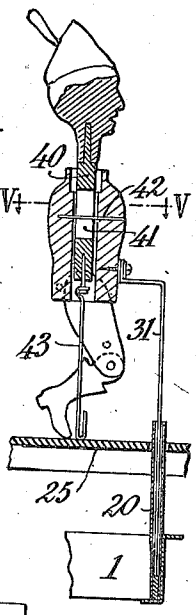
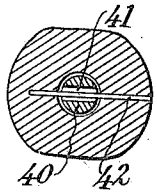


Fig. 5.



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ADVERTISING DEVICE.

APPLICATION FILED APR. 7, 1917.

1,264,947.

Patented May 7, 1918.

3 SHEETS—SHEET 3.

Fig. 3.

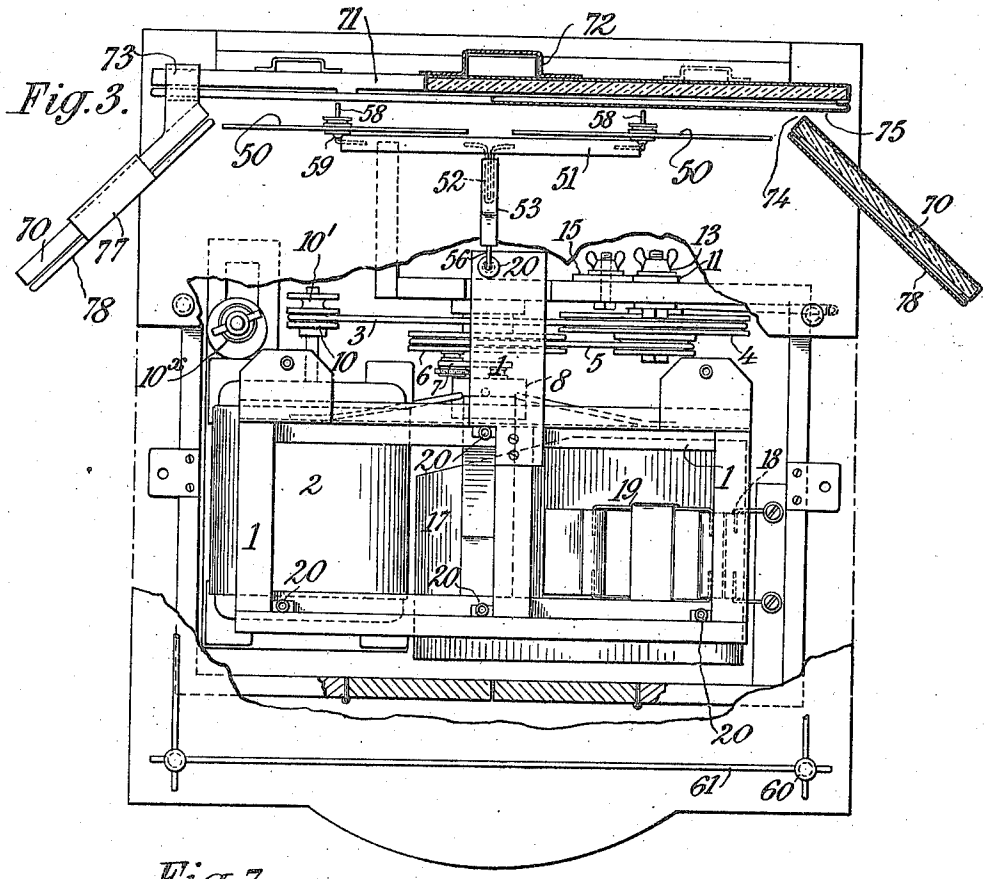


Fig. 7.

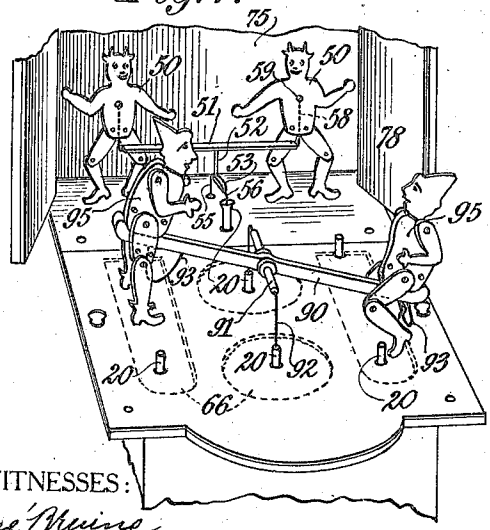
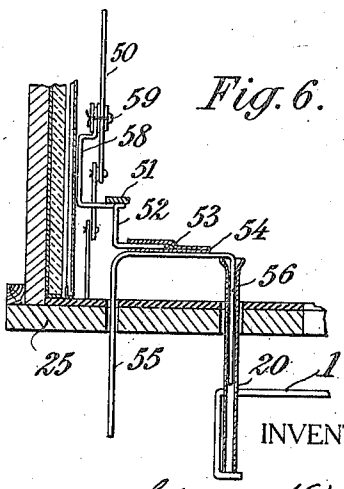


Fig. 6.



WITNESSES:

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Gustave R. Thompson

INVENTOR:

Clinton H. Leggett

By Attorneys,

Fraser, Sinkler & Rogers

UNITED STATES PATENT OFFICE.

CLINTON H. LEGGETT, OF NEW YORK, N. Y.

ADVERTISING DEVICE.

1,264,947. Specification of Letters Patent. Patented May 7, 1918.

Application filed April 7, 1917. Serial No. 160,358.

To all whom it may concern:

Be it known that I, CLINTON H. LEGGETT, a citizen of the United States of America, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Advertising Devices, of which the following is a specification.

The present invention provides a device, preferably motor actuated, adapted to put various objects in motion, such as figures or toys, etc., for the purpose of attracting the attention of persons. The device is primarily intended to be placed in show windows to attract the attention of passersby. The actuating device is one which is capable of having the animated objects substituted, so that different figures or objects may be put in motion.

The invention further embodies a number of figures and groups which may be made to perform novel movements.

Other features of invention will be hereinafter referred to.

Embodiments of the invention are illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical sectional view of the invention, the figures upon the platform representing a prize fight, the section being approximately on the line I—I in Fig. 2;

Fig. 2 is a vertical sectional view of the construction shown in Fig. 1, the section being approximately on the line II—II in Fig. 1;

Fig. 3 is a top plan view with parts omitted, parts broken away, and parts in section;

Fig. 4 is a detail view of one of the figures, the view being in vertical section. The form of the figure is slightly different from that of the figure numbered 42 in Fig. 2.

Fig. 5 is a transverse view on the line V—V in Fig. 4;

Fig. 6 is a detail view in section of the connections of one of the groups of animated figures;

Fig. 7 is a perspective view of the construction, illustrating a different arrangement and subject of the figures than that shown in Fig. 1.

In said drawings, the numeral 1 designates a vibrating frame, the vibratory motion being communicated thereto preferably by an electric motor 2, a transmitting mechanism comprising a belt 3, pulley 4, belt 5, pulley 6, a connecting rod 7 and cross-head 8, and a connecting piece 9.

The motor is preferably provided with several pulleys 10, 10′ of different diameters. In order to bring these pulleys into line with the pulley 4, the motor is displaceably mounted, and suitable clamping means 10× provided for fixing it in its adjusted positions.

In order to tighten the belts in a simple and convenient manner, the pulley 4 is carried by a bar 11, which bar is pivoted at 12 and which has a clamp 13 at its opposite end. By turning the bar 11 upon the pivot 12 the belts 3 and 5 may be simultaneously tightened. When the belts are tight the clamp 13 may be tightened and the bar 11 held in position. The pivot pin upon which the bar 11 turns may also be provided with a clamping nut 14, which may be tightened when the bar 11 is in position.

15 is an abutment which may be adjusted to contact with the bar 11 to hold it in place. 16, 16 are oil conduits.

In order to keep the motor cool, it is desirable to have a simple and convenient means for ventilating same. These means preferably comprise a fan 17, pivoted at 18 and connected to the vibrating frame 1 by a tie piece 19.

20, 20 designate a plurality of sockets or the like, which may be attached to the vibrating frame 1.

The socket pieces 20 preferably project through openings in the platform 25.

On the platform 25 is arranged one or more objects, such as toys, adapted to be actuated by the vibrating frame 1.

In Fig. 1 the objects represent a prize fight. On the fore part of the platform 25 are the two principals. These two principals 26, 26 have body portions and hinged arms 27 and hinged legs 28. The two figures 26 are connected by a bar 30, and this bar 30 has projections or wires 31 which fit within the sockets 20. When the vibrating frame is in motion the figures are vibrated, the arms swing in a circle, giving the impression of feints and blows, and the legs go through various motions simulating the fighter's foot-work.

At the rear of the platform are arranged the figures 32, 32, designating the seconds, and 32× designating the referee. As the movements of the referee and seconds are

not supposed to be quite as animated as those of the principals, these figures 32, 32 and 32× are arranged to have a less motion. Preferably these figures are carried upon standards 33, which standards 33 are fixed to a plate 34. The plate 34 has a projecting piece or wire 35, the end of which projects into one of the sockets 20 of the frame 1. A stop 36, preferably in the form of a buffer, is arranged upon the projection 35, in such manner that the stop 36 is only brought into contact with the socket piece 20 when the socket piece 20 is near the limit of its upward vibration. The effect of the contact of the socket piece 20 upon the stop 36 upon the projection 35 is to slightly lift the plate 34. This causes the figures to move up and down slightly, giving the figures 32 and 32× a slight jerky motion simulating nervous movements.

Figures 32, 32 and 32× also preferably have jointed legs and arms which move slightly as the plate 34 is moved.

It is desired to give the figure 32×, representing the referee, an alert and important mien. This is effected by mounting his head upon a slide 40 which may work up and down in a bore through the body. The slide 40 has a slot 41 therein through which passes a pin 42, the pin and slot limiting the up and down movements of the slide. At the base of the slide is arranged a projection or wire 43. This wire 43 is of such length that when it and the plate 34 rest upon the platform 25 at the same time, the slide 40 and head thereon is slightly lifted. When the plate 34 is lifted consequently, the body is lifted, but not the head. A succession of rising and falling movements of the plate 34 gives the impression of the stretching of the neck of the referee. Moreover, the pin 42 fits somewhat loosely in the slot 41, so that the slide 40 may wabble and consequently the head may wabble. The head consequently has a combined wabbling and turning movement, giving the impression of a manifestation by the referee of close attention to the action of the principals 26, 26.

The neck action of the figure 32× may be accentuated as in the figure shown in Fig. 4.

In Fig. 4 the body portion of the toy may have a projection or wire 31 which fits within the socket piece 20 upon the vibrating frame 1. The slide 40 which carries the head has a projection or wire 43, which projection rests upon the platform 25. The body portion of the toy moves relatively to the slide 40 carrying the head. There is therefore an accentuation of the head movement, resulting in a strange or grotesque effect.

In order to give the figures a setting or background and to enhance the effect, at the rear portion of the platform may be provided a group of animated devils 50, 50 (Figs. 3 and 6). These figures 50, 50 may have hinged limbs and are joined to a bar 51 which may be actuated by the vibrating frame 1. Preferably, as indicated in Fig. 6, the bar 51 has a tongue 52 thereon which fits in a socket piece 53 upon a connecting piece 54. The connecting piece 54 has preferably two projecting portions 55 and 56. One of these projecting portions 55 and 56 fits within the socket piece 20 upon the vibrating frame 1, and the other may project through a slot in the platform 25, for the purpose of preventing the connecting piece 54 from turning. By removing the tongue 52 from the socket piece 53, various groups of figures may be substituted.

The bar 51 preferably has projections 58 thereon, the bodies of the devils being pivotally mounted thereon as indicated in 59. By such an arrangement the bodies of the devils may sway as they dance.

Around the fighting figures is preferably arranged a "ring" or fence. This fence is preferably composed of removable posts 60 and removable wires 61 simulating ropes.

It is preferable to cover the platform 25 with a rubber mat 65, and it is further preferable to cut out the platform 25, as indicated at 66, 66, beneath the portions of the rubber mat, upon which the figures dance. This arrangement not only deadens the sound, but the slight curvature of the rubber mat over the cut out portions facilitates the action of the figures. It avoids a straight line reaction being imparted to the figures through the lines of their joints.

It is desirable to heighten the effect of movement by arranging behind the scene a plurality of mirrors 70, 70 and 71. The mirror 71 is provided at its back with a socket piece 72, by which means it may be removably fixed to a projection at the back of the platform 25. The mirror 71 is also provided with brackets 73 which slide over the ends of the mirror 71. The mirrors 70 are thereby detachable from the mirror 71. Between the mirrors 70 and 71 a space 74 is left through which may be passed a slide or blind 75. The mirrors 70 are also provided with brackets 77 in which may be slid slides or blinds 78 for covering the mirrors. It is sometimes desirable to have a dark non-reflecting background, and sometimes to have a back-ground full of light. The blinds and mirrors provide for obtaining such different back-grounds.

With the mirrors it is found that the effect is sometimes improved by providing an overhanging plate or canopy 80. This is preferably arranged to be detached from the mirror, as indicated at 81.

In Fig. 7 there is shown a group of figures somewhat different from that shown in Figs. 1 *et seq.* In said figure numerals 95, 95 designate a pair of figures, shown in the

dress of clowns. The bodies of these figures are mounted upon a beam 90, which beam is pivoted midway thereof, as indicated at 91 upon a U-shaped bar 92, the ends of which project into two of the socket pieces 20 of the vibrating frame 1. The figures 95, 95 preferably have hinged legs and arms. 93, 93 are stops upon the bar 90 for limiting the movement of said bar toward the platform. When the vibrating frame 1 is set in motion, the socket pieces 20, 20 and consequently the U-shaped bar 92 is vibrated. This vibrates the bar 90, and the bar 90 at the same time begins to swing or see-saw upon its pivot 91. The figures 95, 95 are given a combined jumping and see-sawing effect.

The inventive ideas herein illustrated and described are capable of receiving a variety of mechanical expressions.

What is claimed is:—

1. A device of the character described comprising a vibratory frame, a platform, figures, and connections between said frame and figures, whereby said figures are actuated by said frame, said figures having parts adapted to come into contact with said platform, said platform being covered with a light covering and being cut out at points beneath said figures.

2. A device of the character described comprising a vibratory frame, a motor for actuating said frame, a fan for cooling said motor, said fan being operatively connected to said frame.

3. A device of the character described comprising a vibratory frame, a motor for actuating said frame, a plurality of pulleys and belts between said motor and frame, one of said pulleys being mounted upon a shiftable part, said part being adjustable in such manner as to cause said pulley simultaneously tighten the belts passing over two adjacent pulleys.

4. A device of the character described comprising a vibratory frame, socket-pieces therein, a platform, and figures adapted to be actuated by said frame, a bar and a plurality of figures mounted on said bar, said bar having means for engaging said socket pieces.

5. A device according to claim 4, the platform being cut out under the figures and covered with a light covering.

6. A device according to claim 4, the bar being pivoted in such manner as to see-saw.

7. A device according to claim 4 including a figure adapted to be actuated by said frame in conjunction with said figures on said bar.

8. A device according to claim 4 including a figure adapted to be actuated by said frame in conjunction with said figures on said bar, a connection between said frame and platform whereby said frame is only given a minor movement.

9. A device according to claim 4, including a figure adapted to be actuated by said frame in conjunction with said figures on said bar, said figures having a head movable with relation to the body and means for supporting said head from the platform, whereby relative movement of the head and body gives the effect af neck-stretching.

10. A device according to claim 4 including a plate on said platform behind said first figures, a connection between said frame and plate whereby said plate is only given a minor movement, and figures on said plate adapted to be rendered active by movement of said plate.

11. A device according to claim 4, the figures being pivoted with respect to said bar, whereby the bodies may sway.

12. A device according to claim 4, said bar being detachably connected to said means for engaging the socket-piece.

13. A device of the character described, comprising a figure, means for vibrating said figure up and down, said figure comprising a body and a slide in said body, a head on said slide, and a support for said slide adapted to bear on a platform or the like.

14. A device according to claim 13, the slide having a movement around its axis whereby the head can turn as the body moves up and down.

15. A device of the character described comprising a figure, means for actuating said figure, and reflecting means behind said figure, said reflecting means comprising a mirror at the rear and mirrors at the side, a slide adapted to cover said rear mirror, said mirrors having a space between one another through which said slide may pass.

16. A device of the character described comprising a figure, means for actuating said figure, and reflecting means behind said figure, said reflecting means comprising a mirror at the rear and mirrors at the side, a slide adapted to cover said rear mirror, said mirrors having a space between one another through which said slide may pass, and slides for covering the said mirrors, said side mirrors having means for holding said slides.

17. A device according to claim 3, the motor having a plurality of pulleys of different diameters, and means for shifting said motor to bring the driving pulley into line with the driven pulley.

In witness whereof, I have hereunto signed my name.

CLINTON H. LEGGETT.

C. H. LEGGETT.

ADVERTISING DEVICE.

APPLICATION FILED AUG. 1, 1916.

1,264,946.

Patented May 7, 1918.

2 SHEETS—SHEET 1.

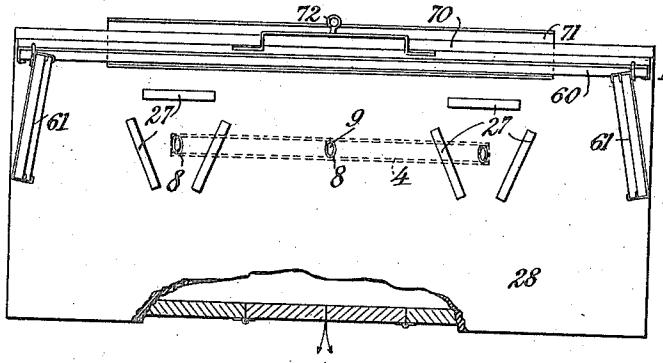


Fig. 3.

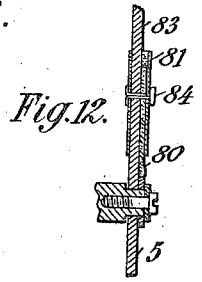
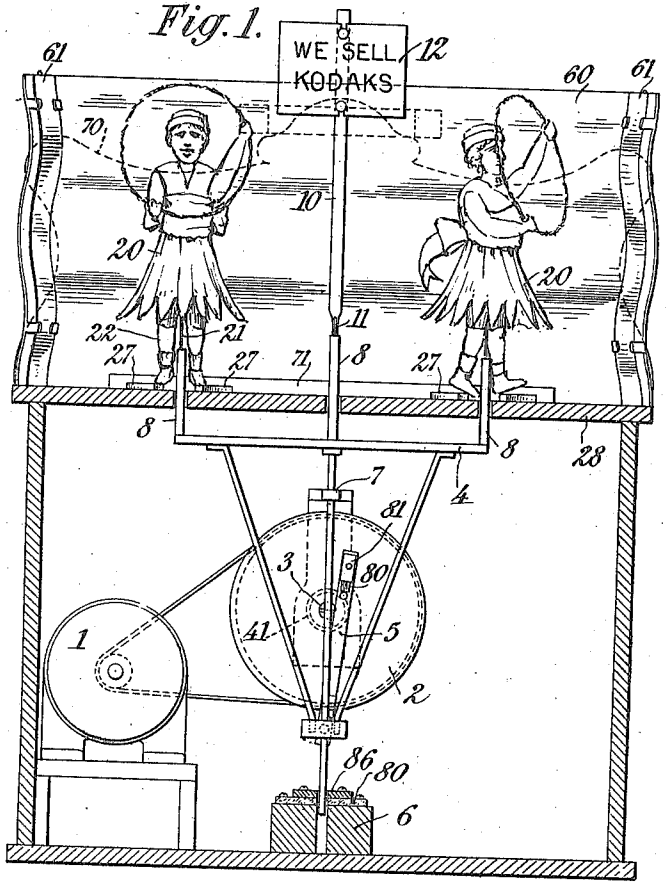


Fig. 12.

Fig. 1.



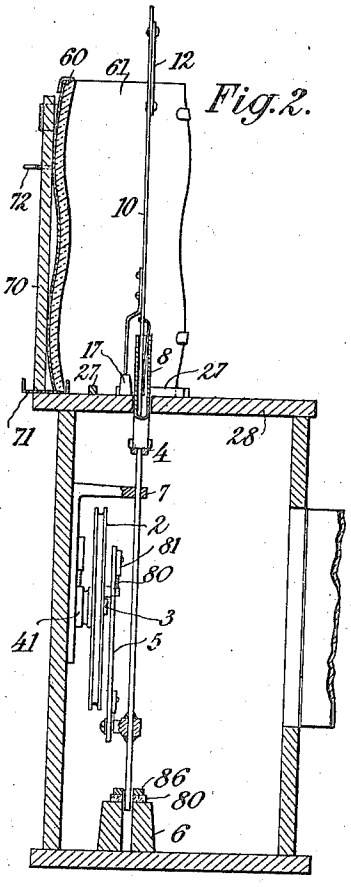


Fig. 2.

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ADVERTISING DEVICE.

APPLICATION FILED AUG. 1, 1916.

1,264,946.

Patented May 7, 1918.

2 SHEETS—SHEET 2.

Fig. 4.

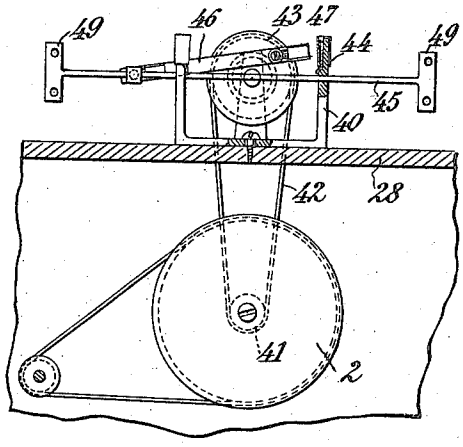


Fig. 5.

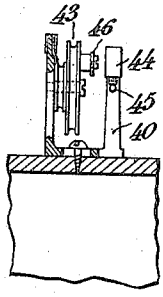


Fig. 9.

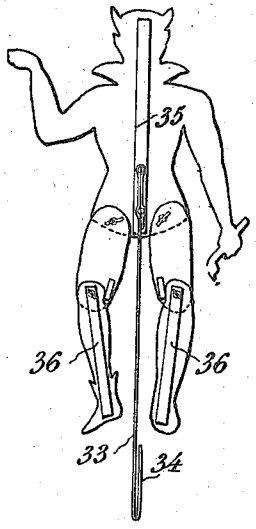


Fig. 8.

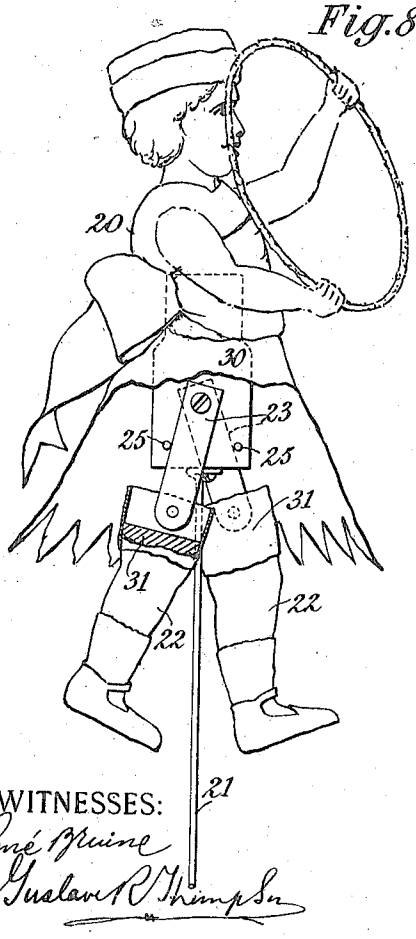


Fig. 7.

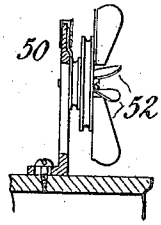


Fig. 6.

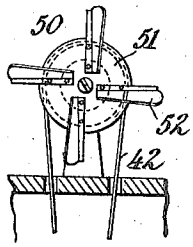


Fig. 10.

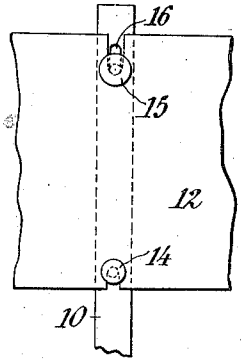
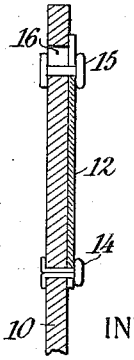


Fig. 11.



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UNITED STATES PATENT OFFICE.

CLINTON H. LEGGETT, OF NEW YORK, N. Y.

ADVERTISING DEVICE.

1,264,946. Specification of Letters Patent. Patented May 7, 1918.

Application filed August 1, 1916. Serial No. 112,494.

To all whom it may concern:

Be it known that I, CLINTON H. LEGGETT, a citizen of the United States of America, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Advertising Devices, of which the following is a specification.

The present invention provides a motor-actuated device, adapted to put various devices in motion, such as signs, banners, dancing and jigging figures or the like, etc., for the purpose of attracting the attention of persons. The device is primarily intended to be placed in show windows, to attract the attention of passers-by.

The device is one capable of having the figures substituted, so that different figures can be put in motion, and is also one which is capable of having certain parts of the actuating mechanism substituted, by means of which different kinds of motion may be imparted to the figures.

The invention further embodies a number of improvements in the dancing or jigging figures, and in other parts of the mechanism, which will be hereinafter pointed out.

An improved form of oiler is also comprehended in the invention.

An embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a front elevation of an embodiment of the invention (parts being shown in section);

Fig. 2 is a transverse vertical section of the embodiment shown in Fig. 1;

Fig. 3 is a top plan view of the construction shown in Fig. 1, parts being omitted;

Fig. 4 is an elevation (parts being shown in section) of a part of an actuating mechanism which may be substituted for that shown in Fig. 1, and for producing a different sort of motion;

Fig. 5 is a vertical transverse section of the construction shown in Fig. 4;

Fig. 6 is a front elevation of another part of the actuating mechanism which may be substituted for the actuating mechanism shown in Fig. 1;

Fig. 7 is a transverse section of the construction shown in Fig. 6;

Fig. 8 is a view (parts being shown in section) of one of the dancing figures;

Fig. 9 is a rear view of one of the dancing or jigging figures;

Figs. 10 and 11 illustrate details of construction of a movable standard adapted to carry substitutable signs;

Fig. 12 is a detail view of a device for supplying oil to the moving parts.

In said drawings, numeral 1 designates a motor, preferably an electric motor, which drives a pulley 2 turning on shaft 3. 4 designates a frame or actuator adapted to be moved up and down by the pulley 2, through the intermediary, for example, of a connecting rod 5. Guides or bearings 6 and 7 are provided for the frame or actuator 4. The actuator 4 is provided with one or more uprights 8, preferably in the form of socket pieces, the sockets of which are oval, as indicated by the numeral 9 in Fig. 3.

Various figures or signs are adapted to be put in motion by the upright pieces 8. For example, the center socketed upright 8 may actuate a standard 10, the standard 10 having an oval tang 11 adapted to fit in the oval socket in the piece 8, and thereby prevent the standard 10 from turning. The standard 10 may carry a sign 12, which is preferably adapted to be detached and substituted by others. Means, such as buttons 14 and 15 (Figs. 10 and 11), one of which, as the button 15, may be slidable in a slot 16 to permit of a sign being displaced and substituted by another. The standard 10 may carry a cushioned stop or buffer 17. This stop or buffer 17 has the function of stopping the standard 10 in its downward movement, prior to the completion of the downward movement of the actuator 4. By this means the standard 10 has a less extensive up and down movement than the actuator 4.

On each side of the standard 10 there is preferably a pair of dancing figures. A dancing figure, designated by numeral 20, is illustrated in detail in Fig. 8. The dancing figure 20 has a rod or wire 21 therein, preferably round in contour and adapted to fit in the sockets in the socketed uprights 8, 8, the fit between the wire 21 and the sockets being such that the figures may turn, and

also wabble a bit. The legs 22 upon the figures are preferably attached to the bodies by means of links 23, by means of which the legs may bend. The links 23 are limited in their movement by pins or stops 25. These pins or stops 25 coact with strips or cleats 27 (best seen in Figs. 1 and 2) upon a platform 28, to produce a dancing motion of the figures, now to be described.

As the actuator moves up and down the figures or dancers 20 also move up and down. On the down motion the legs strike against the floor, causing them to bend, and to swing, as the dancer is carried up by the actuator 4 upon a succeeding upward movement. As the dancer comes down again one of the legs is perchance in a position to strike against one of the strips or cleats 27. The leg 22 and the link 23 being very nearly in line at this moment, and further movement of the link 23 being prevented by the stop 25, the leg 22 hits stiffly against the strip or cleat 27, producing a reaction upon the figure, which turns or spins it around. The wire or rod 21, fitting loosely and rotatably in the socket piece 8, permits the figure to turn, and also to wabble or lunge to an extent, the effect of the figure, as it turns, first one way and then another, dips, bends, and goes up and down, producing very much the semblance of an animated dancer.

The dancing figures may be conveniently made up from ordinary celluloid dolls. The body may be cut, and a wooden plug 30 inserted in the hollow thereof. Wooden plugs 31 may be inserted in the hollows of the legs. The links 23 are attached to the plugs 30 and 31 and connect the body and links.

Instead of a turning figure, a figure which does not turn in jigging may be substituted for one of the dancers 20. Such a figure is shown in Fig. 9. It is connected to the socket upright 8 by means of a rod or wire 33 which is preferably bent up at the end, as at 34, this bend fitting in the oval socket, preventing turning of the figure. The prevention of turning is desirable where the figure is made of cardboard and where the working parts in the figure are disclosed in the rear. A stiffening rib 35 may be applied to a cardboard body, and stiffening strips 36, 36 may be applied to the legs.

Where it is desirable to impart a different primary motion to the figures, than an up and down motion, as that of the actuator 4 in Figs. 1 and 2, an actuator 40, as illustrated in Figs. 4 and 5, may be substituted. The pulley 2 preferably has at the rear thereof a small pulley 41 around which passes a belt 42, which actuates a pulley 43 carried in a suitable frame 44, which frame is preferably detachably connected to the platform 28.

In the frame 44 there is mounted a reciprocatory rod 45, the reciprocatory movement being imparted thereto by a connecting rod 46 connected to the rod 45, and to a crank pin 47 upon the pulley 43. Suitable figures may be attached to the attachment pieces 49 upon the ends of the rod 45, and be actuated by the rod 45.

Instead of the actuators 4 and 40 shown in Figs. 1 and 2 and 4 and 5, an actuator 50, as illustrated in Figs. 6 and 7, may be used. The actuator 50 comprises the pulley or hub 51 carrying blades 52 which, when in motion, are adapted to set up a breeze to float a flag or banner. The pulley or hub 51 may be driven by a belt 42, passing over the small pulley 41 on the large pulley 2, as in Figs. 1 and 2 and 4 and 5.

At the rear of the platform 28 there is preferably arranged a plurality of mirrors 60 and 61. These mirrors behind the moving parts add to the impression created by the color and movement of the animated figures. The mirrors are preferably detachable from the platform, and preferably have curved surfaces whereby the effect may be rendered more noticeable. At the rear of the platform there is preferably a back 70, which may serve as a support for the mirrors. Upon the back 70 there is preferably a flanged support 71, adapted to hold the lower edge of a sign or placard which is adapted to be attached to the back 70 and project into view above the back 70. A suitable device, as a screw 72, may be provided for fastening the card or placard to the back 70.

The sliding parts of the device are conveniently lubricated by means of strips of fabric, preferably felt 80, which are saturated with oil, and which are retained in holders 81, preferably of sheet metal bent to tubular form, and attached to one of the parts. The lubricator is shown in detail in Fig. 12. The sheet metal tubular part may be slipped over a prolonged part 83 of one of the parts, and held thereon by suitable means, as, for example, a pin 84.

The bearing 6 may be lubricated by a piece of felt 80, saturated with oil, and held in place by a suitable plate 86.

The inventive ideas may receive other mechanical expressions than those herein specifically illustrated and described.

What I claim is:—

1. An advertising device, comprising a reciprocatory actuator, a figure rotatably mounted on said actuator, and a platform having means thereon adapted to coöperate with said figure to turn it as it moves up and down.

2. An advertising device, comprising a reciprocatory actuator, a figure rotatably and loosely mounted on said actuator, said figure being adapted to wabble somewhat with relation to said actuator.

3. An advertising device, comprising a re-

ciprocatory actuator, a figure rotatably mounted on said actuator, said figure having hinged legs, and a platform having means thereon adapted to coöperate with said figure to turn it as it moves up and down.

4. An advertising device, comprising a reciprocatory actuator, a figure rotatably mounted on said actuator, a platform having means thereon adapted to coöperate with said figure to turn it as it moves up and down, and stops adapted to limit the bending of the legs, whereby said legs when they strike said means on the platform are prevented from bending.

5. An advertising device, comprising a reciprocatory actuator, a figure rotatably and loosely mounted on said actuator, said figure being adapted to wabble somewhat with relation to said actuator, said figure having hinged legs, and a platform having means thereon adapted to coöperate with said figure to turn it as it moves up and down, and stops adapted to limit the bending of the legs, whereby said legs when they strike said means on the platform are prevented from bending.

6. An advertising device, comprising an actuator, a figure to be set in motion, an oval socket in said actuator, and a part on said figure adapted to set in said oval socket.

7. An advertising device, comprising an actuator, a figure to be set in motion, an oval socket in said actuator, a part on said figure adapted to set in said oval socket, and a stop on said figure adapted to limit its motion to less than that of the actuator.

8. An advertising device, comprising a reciprocatory actuator, a plurality of connections therein for devices to be set in motion by said actuator, a sign adapted to be connected to one of said actuator connections, a connection between said actuator and sign and adapted to prevent turning of the sign and a device adapted to be set in motion by said actuator, and a connection between said device and actuator permitting turning of said figure.

9. An advertising device, comprising a reciprocatory actuator, a plurality of connections therein for devices to be set in motion by said actuator, a sign adapted to be connected to one of said actuator connections, a connection between said actuator and sign and adapted to prevent turning of the sign, and a plurality of dancing figures on each side of said sign, and connections between said figures and actuator.

10. An advertising device, comprising a device or figure to be set in motion, and a mirror having curved surfaces behind said device.

11. An advertising device, comprising an actuator, a device or figure adapted to be set in motion by said actuator, and a mirror behind said device, said figure and the reflections thereof being directly observable.

12. An advertising device, comprising an actuator, a dancing device or figure adapted to be set in motion by said actuator, and a mirror behind said device, said figure and the reflections thereof being directly observable.

13. An advertising device, comprising a cabinet, a motor in said cabinet, a platform or top on said cabinet, an actuator, devices on said platform adapted to be set in motion by said actuator, a back behind said platform, and a mirror detachably connected to said back.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

CLINTON H. LEGGETT.

Witnesses:
OLIVER T. ROGERS,
IRMA SILVERSTEIN.

W. J. HERBST.

FIGURE TOY.

APPLICATION FILED MAY 29, 1911.

1,001,395.

Patented Aug. 22, 1911.

2 SHEETS—SHEET 1.

Fig1.

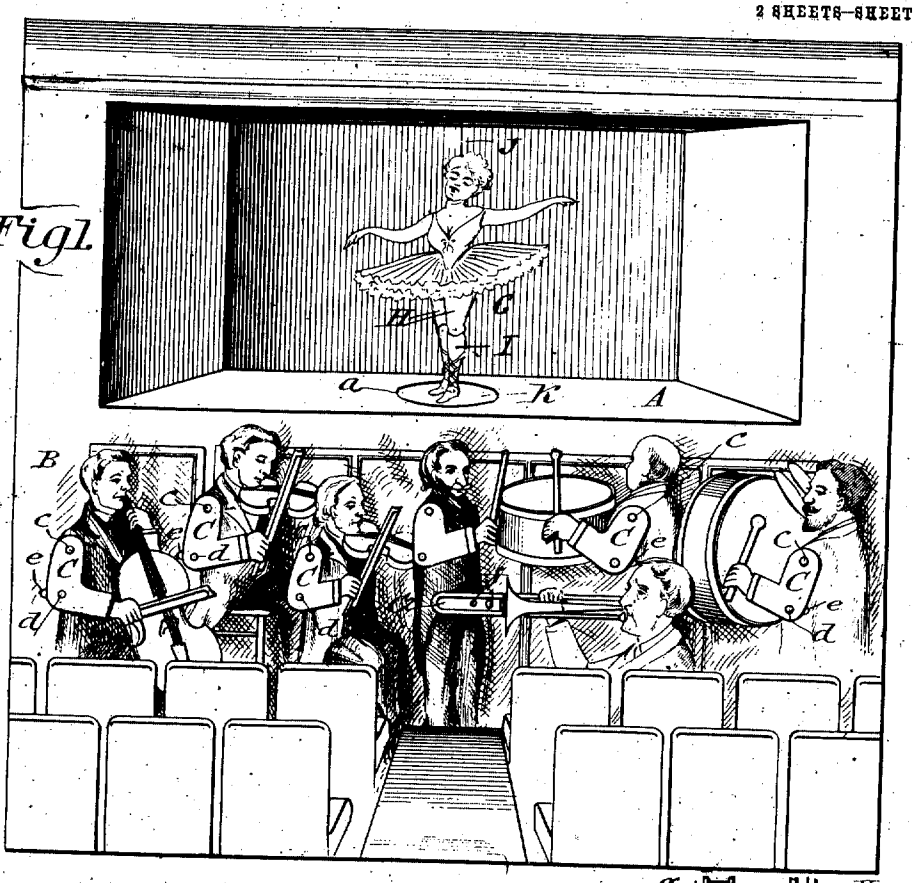


Fig3.

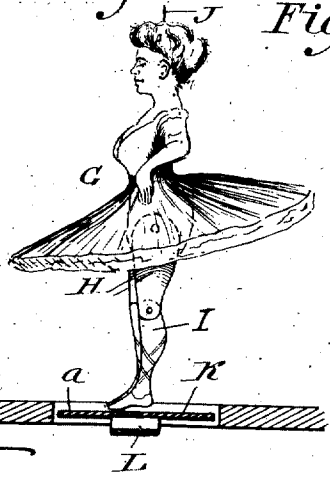


Fig8.

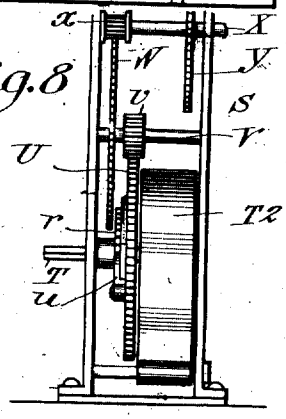
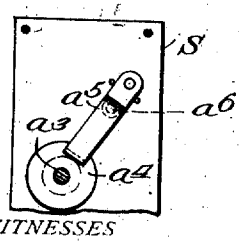


Fig7.



WITNESSES

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N. C. Healy

INVENTOR

W. J. Herbst

By James J. Healy & Co

W. J. HERBST.

FIGURE TOY.

APPLICATION FILED MAY 29, 1911.

1,001,395.

Patented Aug. 22, 1911.

2 SHEETS—SHEET 2.

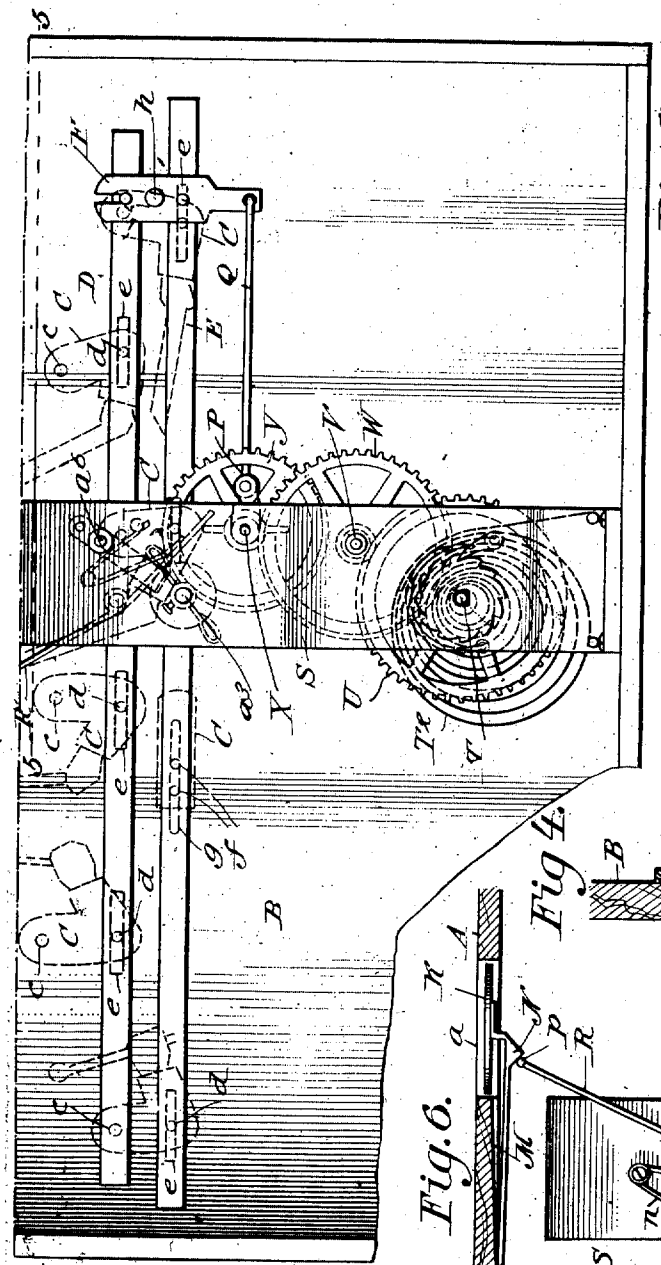


Fig. 2.

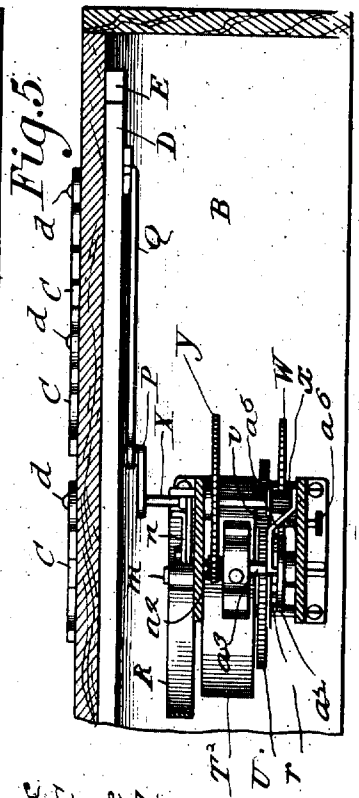


Fig. 5.

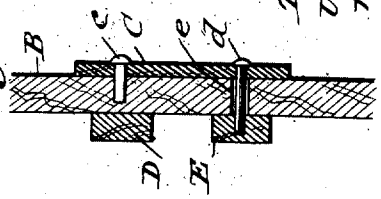


Fig. 4.

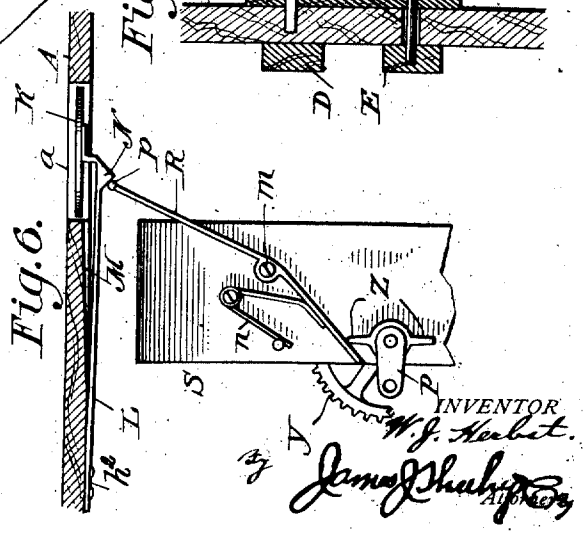


Fig. 6.

WITNESSES

Philip E. Barnes

W. C. Healy

INVENTOR

W. J. Herbst.

By James J. Shakley

Atty.

UNITED STATES PATENT OFFICE.

WILLIAM J. HERBST, OF NEW ORLEANS, LOUISIANA.

FIGURE TOY.

1,001,395. Specification of Letters Patent. Patented Aug. 22, 1911.

Application filed May 29, 1911. Serial No. 630,051.

To all whom it may concern:

Be it known that I, WILLIAM J. HERBST, citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented new and useful Improvements in Figure Toys, of which the following is a specification.

My present invention relates to figure toys; and it has for its general object to provide a toy constituting a miniature theater and comprising figures and means for actuating the figures, whereby one of the figures is made to simulate a dancer in action on the stage and the others the members of a playing orchestra.

Other objects and advantageous features of the invention will be fully understood from the following description and claims when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a perspective of my novel toy as the same appears from the point of view of a person in the audience. Fig. 2 is a detail elevation illustrating a part of the toy as viewed from the back thereof. Fig. 3 is a detail view illustrative of the construction of the dancing figure and the means for imparting motion thereto. Fig. 4 is a detail view illustrating the manner in which the longitudinally-movable bars shown complete in Fig. 2 are connected with the movable members of the figures that simulate the orchestra players. Fig. 5 is a detail horizontal section illustrating the spring motor in plan and also illustrating the manner in which said spring motor is connected with the before-mentioned longitudinally-movable bars; said section being taken in the line 5—5 of Fig. 2. Fig. 6 is a detail view illustrative of the manner in which the tappet comprised in the spring motor is arranged relative to the vibratory bar on which is mounted the platform for imparting motion to the dancing figure. Fig. 7 is a detail view of a part of the motor, hereinafter specifically referred to. Fig. 8 is a detail of the spring motor.

Similar letters of reference designate corresponding parts in all of the views of the drawings.

By comparison of the figures, it will be understood that A is a stage in which is a vertically disposed opening *a*. The said stage may be provided with suitable scenery (not shown), and with representations of private boxes (also not shown).

On the face of the wall B that extends downward from the stage A, I prefer to place a picture showing orchestra chairs, occupied or unoccupied, and the members of an orchestra; all but one of the latter figures respectively comprising a swinging arm C, pivoted at *c* and having on the said arm a pin *d* that extends rearward through a slot *e* in the wall for a purpose hereinafter set forth. It will also be noted that the picture of one member of the orchestra comprises instead of a swinging arm, a slide piece C^2, which slide piece is made to simulate a trombone slide and is provided with a rearwardly extending pin *f*, disposed in a slot *g* in wall B. The pins *d* on the upper of the swinging arms C are connected to the upper longitudinally-movable bar D, while the pins of the lower arms C, as well as the pin *f* of the slide piece C^2, are connected to the lower longitudinally-movable bar E. A vertically swinging lever F, Fig. 2, is fulcrumed at *h* on the back of the wall B, and the upper arm of said lever is connected to the upper bar D, while the lower arm thereof is connected to the lower bar E. Hence when the lever is rocked by means hereinafter described, the bars D and E will be reciprocated and the arms C will be swung to and fro and at the same time the slide piece C^2 will be reciprocated, with the result that the pictures representing an orchestra will appear in action; the conductor wielding his baton, the violinists their bows, the drummers their sticks, and the trombone player the slide of his instrument.

The dancing figure comprises a body G on which is a head, arms and skirt, and to the lower portion of the said body G are loosely hinged the upper sections H of legs which also comprise lower sections I loosely hinged to the said sections H. The body G of the dancing figure is suspended through a cable J from the top of the stage in such manner as to enable the feet of the figure to rest lightly on a platform K disposed in the before-mentioned opening *a* in the stage A. Connected at h^2 to the underside of the stage A is a vibratory bar L, preferably of metal, which bar is connected at its free end to the underside of the platform K. It will also be noted by reference to the draw-

ings, that a recess M is provided in the underside of the stage A and in communication with the opening *a* in order to permit of movement of the vibratory bar upward beyond the plane of the underside of the stage A. On the underside of the bar L is provided a pad N for the engagement of the tappet, hereinafter described, for vibrating or actuating the bar up and down, and here it will be understood that when the bar L is vibrated or rapidly actuated up and down, the platform K will be moved with the bar L and will cause the dancing figure to dance, jump, and turn around after the manner of a ballet performer.

P, Figs. 5 and 6, is a crank connected through a rod Q to the lower end of the lever F, and R is a swinging tappet pivoted at *m* on a suitable support and backed by a spring *n*, and having a head *p* arranged to act against the pad N on the vibratory bar L with a view to vibrating or rapidly moving said bar up and down. Any suitable means may be employed for rapidly rotating the crank P and moving the tappet R against the action of the spring *n* without involving departure from the scope of my invention as claimed. I prefer, however, to employ for the purpose of rotating the crank P and actuating tappet R, the spring motor illustrated. The said spring motor in addition to a suitable frame S, comprises a shaft T bearing a ratchet disk *r*, a spring T^2 connected at one end to the frame S, and wound about the shaft T and connected at its opposite end thereto, a spur gear U loosely mounted on the shaft T and having a pawl *u* in engagement with the ratchet disk *r*, a second shaft V bearing a pinion *v* intermeshed with the spur gear U and also bearing a spur gear W, and a third shaft X having a pinion *w* and also having a spur gear Y for a purpose hereinafter set forth. The said shaft X carries the crank P and also carries oppositely directed arms Z for striking the tappet R and moving the same against the action of the spring *n*. By reason of the construction described it will be manifest that when the shaft T is rotated by the expansion of the spring S, the shaft X will be rapidly rotated to rotate the crank P and actuate the tappet R in the manner and for the purposes before described.

The spur gear Y on the third shaft X of the spring motor is intermeshed with a pinion a^2 on a shaft a^3, and on the said shaft a^3 is also fixed a disk a^4. This disk a^4 is normally engaged and held against rotation by a spring strip a^5 fixedly connected to one side plate of the motor frame S. A screw a^6 bears in the said frame plate and is adapted at its inner end to engage the said spring strip a^5. From this it follows that when the spring T^2 is contracted or wound up by a suitable key (not shown) applied to the shaft T, and the spring strip a^5 is held by the screw a^6 out of engagement with the disk a^4, the crank P and the swinging tappet R will be actuated by the expanding of the spring T^2, while when the screw a^6 is moved outward to permit the spring strip a^5 to bear strongly against the disk a^4, the motor will be stopped as will also the movement of the crank P and the tappet R. It will also be understood that through the medium of the screw a^6 and the spring strip a^5, the operation of the motor can be regulated, it being simply necessary when it is desired to operate the crank P and tappet R slowly, to move the screw a^6 outward so as to permit the spring strip a^5 to bear against the disk a^4 to a greater or less extent after the manner of a brake shoe.

It will be gathered from the foregoing that my novel toy is reliable in operation, and is calculated to afford considerable amusement to children.

While I have entered into a detailed description of the construction and relative arrangement of the parts comprised in the present and preferred embodiment of my invention, it is to be understood that in the future practice of the invention such changes or modifications may be made as do not involve departure from the scope of my invention as defined in the claims appended.

Having described my invention, what I claim and desire to secure by Letters-Patent, is:

1. In a figure toy, the combination of a stage having a vertically-disposed opening, a support disposed above the stage, a jointed figure loosely suspended from said support, a vertically-movable platform disposed in said opening of the stage and adapted to actuate the jointed figure, a vibratory bar fixed at one end to the underside of the stage and carrying on its free portion the platform, a swinging tappet supported below and adapted to strike against the underside of the bar to vibrate the same, a wall depending from the front of the stage and having slots; said wall bearing on its face simulations of orchestra players, movable pieces forming parts of the simulations and having pins extending rearward through the slots in the wall, longitudinally-movable bars disposed back of the wall and connected to said pins, a lever fulcrumed at an intermediate point of its length and having its arms connected to said bars, and means for actuating said tappet and lever.

2. In a figure toy, the combination of a wall having slots and bearing on its face simulations of figures, movable pieces forming parts of the simulations and having

pins extending rearward through the slots in the wall, longitudinally-movable bars disposed back of the wall and connected to said pins, a lever fulcrumed at an intermediate point of its length and having its arms connected to said bars, and means for actuating said lever.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM J. HERBST.

Witnesses:
EARL A. DANKINS,
ANATOLE PUICCU.

F. JACKSON.

AMUSEMENT DEVICE.

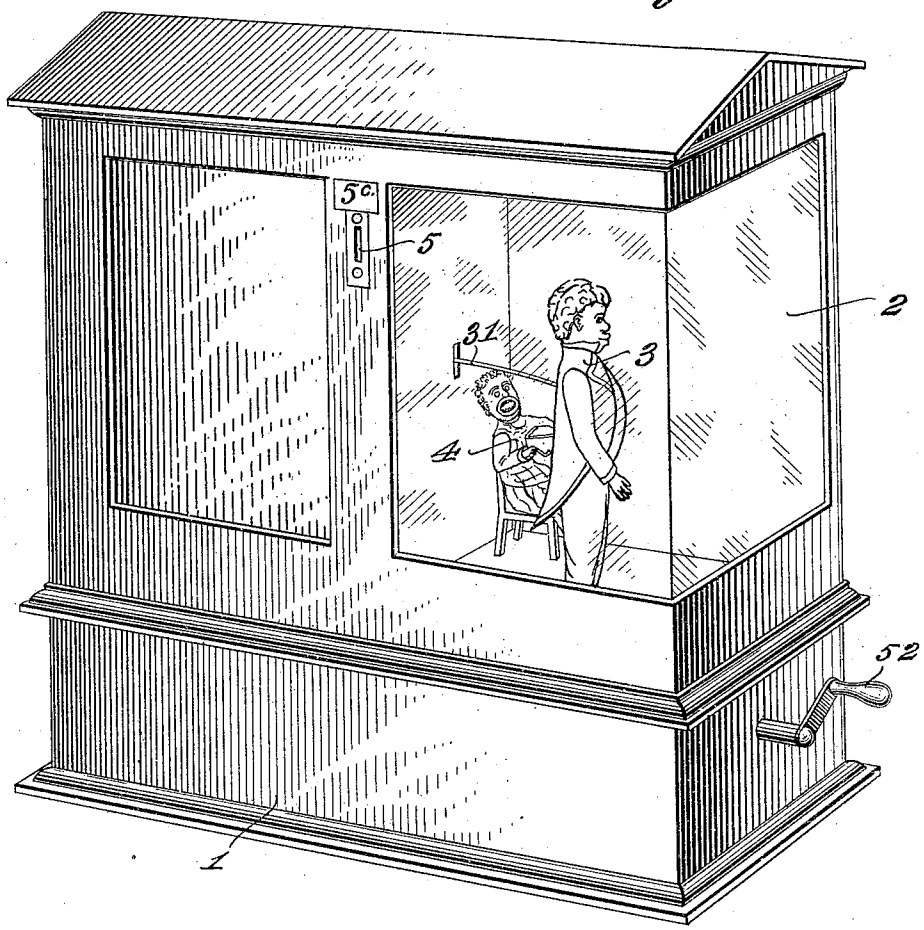
APPLICATION FILED JULY 6, 1909.

955,407.

Patented Apr. 19, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



Inventor

F. Jackson

Witnesses

E. Larson

S. E. Dodge

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AMUSEMENT DEVICE.

APPLICATION FILED JULY 6, 1909.

955,407.

Patented Apr. 19, 1910.

3 SHEETS—SHEET 2.

Fig. 2.

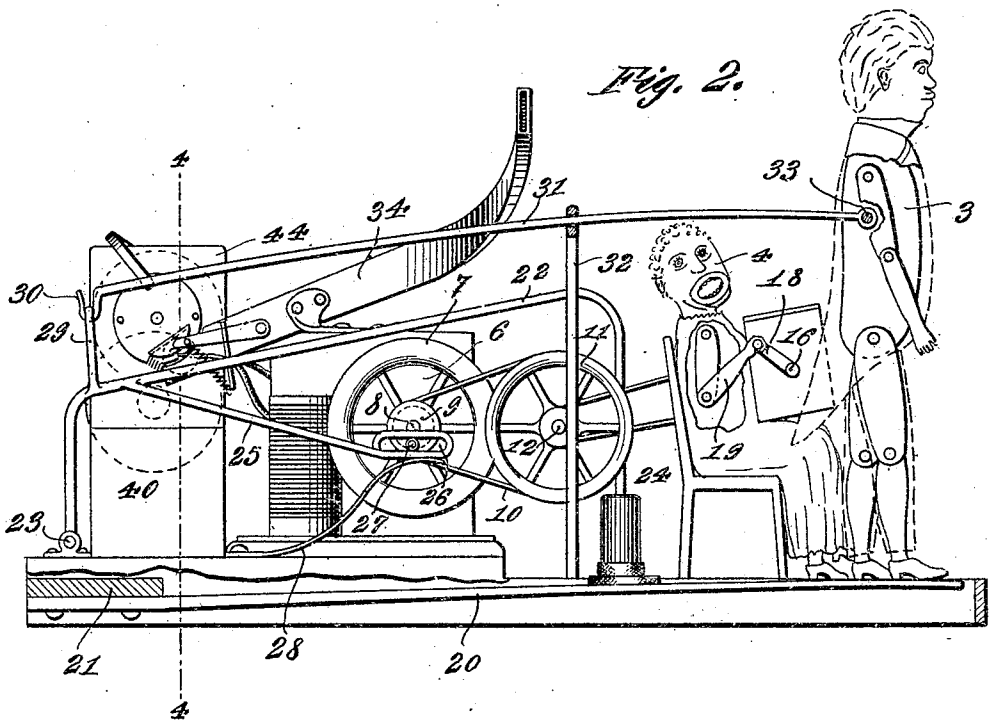
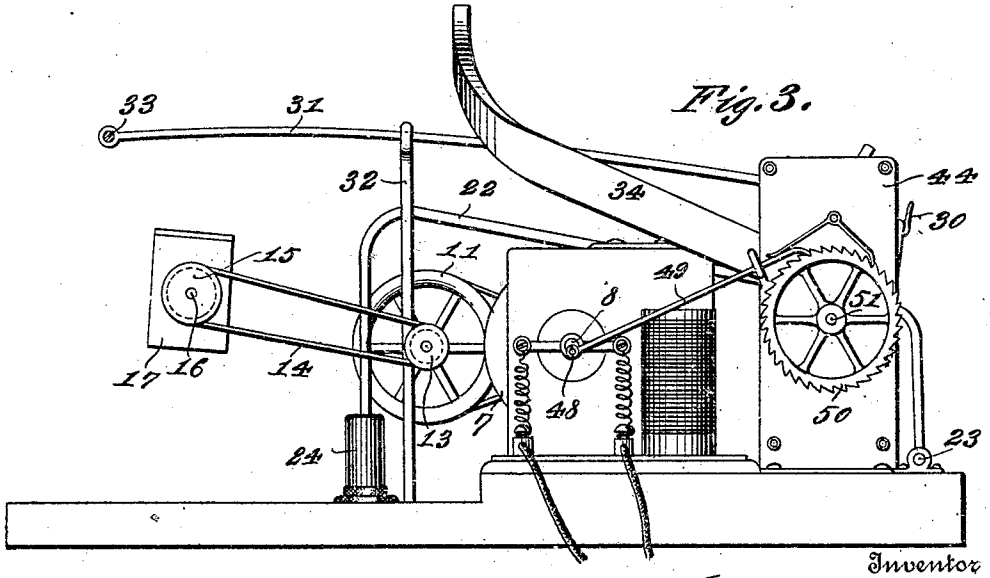


Fig. 3.



Witnesses

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AMUSEMENT DEVICE.

APPLICATION FILED JULY 6, 1909.

955,407.

Patented Apr. 19, 1910.

3 SHEETS—SHEET 3.

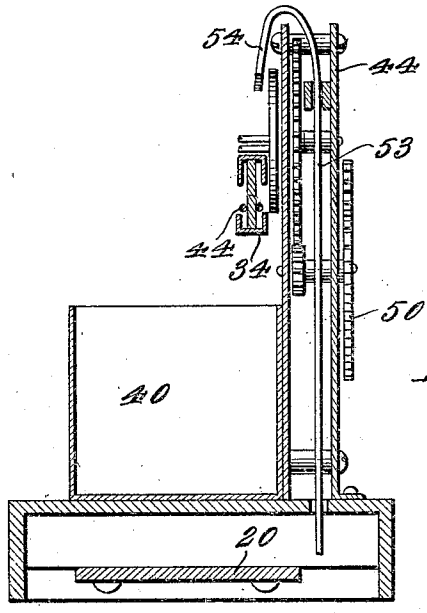


Fig. 4.

Witnesses

E. Larson

S. E. Dodge

Inventor

F. Jackson,

By Beeler & Cobb

Attorneys

UNITED STATES PATENT OFFICE.

FRANK JACKSON, OF MOUNTAIN HOME, IDAHO.

AMUSEMENT DEVICE.

955,407. Specification of Letters Patent. **Patented Apr. 19, 1910.**

Application filed July 6, 1909. Serial No. 506,096.

To all whom it may concern:

Be it known that I, FRANK JACKSON, a citizen of the United States, residing at Mountain Home, in the county of Elmore and State of Idaho, have invented certain new and useful Improvements in Amusement Devices, of which the following is a specification.

This invention relates to game or amusement apparatus in the form of a machine adapted for operation by coin controlled means, or the like, and which embodies an inclosed figure or figures intended to be operated in an amusing manner by the special means comprising the invention.

The invention resides particularly in the arrangement of the toy figures forming a part of the amusement machine, and the peculiar actuating devices for imparting movement to said figures.

For a full understanding of the invention, reference is to be had to the following detail description and to the accompanying drawings, in which—

Figure 1 is a perspective view of a machine embodying the essential features of the invention; Fig. 2 is a side elevation of the general mechanism inclosed in the casing of the machine, portions being broken away to bring out the mounting of the spring board coöperating with the jointed figures; Fig. 3 is a view somewhat similar to Fig. 2 looking at the parts from the opposite side and some of the parts shown in Fig. 2 being omitted; and Fig. 4 is a section taken about on the line 4—4 of Fig. 2.

Throughout the following detail description and on the several figures of the drawings similar parts are referred to by like reference characters.

Referring to Fig. 1 of the drawings it will be observed that a machine embodying the essential features of the invention consists of a suitable inclosing casing 1, an upper end portion of which is provided with a compartment 2 in which are arranged a dancing figure 3 and sitting figure 4, said figures being exposed to view by reason of the provision of transparent sides for the said compartment 2. In the upper central portion of the casing 1 at one side is provided a coin-entrance opening 5 permitting the introduction of a coin into the machine and for a purpose to be later described.

Passing now to the other figures of the drawings, the mechanism inclosed in the casing 1 comprises an electric motor preferably, indicated at 6, said motor having a fly wheel 7 on its drive shaft 8, and being mounted in any suitable manner in the casing 1. A belt pulley 9 on one end of the shaft 8, and adjacent to the fly wheel 7, is connected by a belt 10 to a pulley wheel 11 supported on a suitable shaft 12, and another pulley 13 on the said shaft 12 is connected by a belt 14 with a pulley 15 carried by a shaft 16. The shaft 16 is mounted in a box 17, which box is an imitation of a small hand organ, and on the end of the shaft 16 opposite that carrying the pulley 15 is provided a crank arm 18 which is connected with the jointed arm 19 of the sitting figure 4.

The figures 3 and 4 are preferably made to represent darky minstrels, or the like, and it will be apparent that when the motor is operated the rotation of the shaft 16 will actuate the arm 19 of the figure 4 so that said figure will imitate the operation of turning a hand organ.

The standing figure 3 has jointed legs and arms and the feet of said figure rest upon a spring board 20 secured at 21 by suitable fastenings to the frame-work of the casing 1. A lever 22 is pivoted at one end, as shown at 23 to the frame-work of the casing 1, and the opposite end of the lever 22 has a hammer 24 arranged to strike the upper side of the spring board 20 at a point intermediate of the ends of the latter, and intermittently. For actuation of the lever 22, said lever is provided with an arm 25 the outer end of which has a slot 26 therein and the said slot receives a crank or eccentric pin 27 on the pulley 9. As the pulley 9 is rotated by the motor 6 the arm 25 is given an up and down movement imparting similar movement to the lever 22 and causing the hammer 24 to strike the spring board 20 intermittently. If desired, the lower end of the hammer 24 may be padded, and the portion of the board 20 struck by the hammer also padded so that the striking of the hammer against the spring board will not be audible. A spring 28 bears upwardly against the slotted portion of the arm 25 and tends to raise the hammer 24 so as to reduce the load on the motor. A vertical arm 29 extends upwardly from the outer end of the lever 22 and is connected with a hook 30 on the end of an auxiliary lever 31 which passes through an eye or opening in the upper end of a standard 32. The standard 32 is arranged inter-

mediate of the ends of the auxiliary lever 31, and the said lever 31 is connected at its end remote from the hook 30 with the body of the standing figure 3, and in a pivotal manner as shown at 33. The up and down movement of the lever 22 vibrates the lever 31 and imparts slight up and down movement to the dancing figure 3, thereby tending to give a very life-like movement to said figure in coöperation with the spring board 20 which operates in contact with the feet of said figure.

The operation of the above described mechanism is preferably controlled by coin actuated devices including the coin chute 34 leading downwardly from the coin entrance opening 5, and of course within the casing 1. The coins drop into the box 40 and the coin controlling means comprises any suitable mechanism. The motor not only operates the toy figures 3 and 4 in the manner before described, but the motor has on its shaft 8 a disk eccentrically connected at 48 with a pawl 49 arranged to engage a ratchet wheel 50 on the frame work 44. The ratchet wheel 50 is mounted on a suitable shaft and is connected by a train of gearing shown in Fig. 4 with the shaft on which the disk 43 is carried. As the drive shaft 8 turns, therefore, the pawl 49 will rotate the shaft 51 of the wheel 50 and actuate the train of gearing which operates the disk 43, whereby the pins 45 of the disk may in proper turn be caused to engage the coins 36 dropped into the chute 34 and eject said coins from the chute in a positive manner so that they may drop to the box 40.

At the lower portion of the casing 1, and at one end, is an operating handle 52 which may be turned so as to operate musical devices in the base of the casing. The operation of the handle 52 is controlled by a lever 53 pivoted on the frame-work 44, said lever having an arm 54 which curves outwardly and downwardly at its upper ends so that it will be within the path of movement of the pins 45 on the disk 43. The turning of the disk 43 will actuate the arm 54 of the lever 53 and permit operation of the musical device by the handle 52.

Having thus described the invention, what is claimed as new is:

1. In an amusement machine, the combination of a movable figure, a spring board in contact with the lower end of the figure, a motor, means operated from the motor for vibrating the spring board, and auxiliary means connected with the body of the figure and operable by said motor to move the body simultaneously with the actuation of the spring board.

2. In an amusement device, the combination of a movable figure of jointed construction, a spring board in contact with the lower portion of the figure, a hammer for vibrating the spring board, a lever connected with the body of the figure to move the same, and means for operating the hammer and the lever.

3. In an amusement machine, the combination of a movable jointed figure, a pivoted hammer, a spring board arranged in contact with jointed portions of the figure and adapted to be struck by the hammer, a standard, a lever supported intermediate of its ends by said standard, a connection between one end of the lever and the body of the figure, and a motor operably connected with the hammer and said lever for operation thereof to impart movement to the figure.

4. In an amusement machine, the combination of a movable jointed figure, a pivoted hammer, a spring board arranged in contact with jointed portions of the figure and adapted to be struck by the hammer, a standard, a lever supported intermediate of its ends by said standard, a connection between one end of the lever and the body of the figure, a connection between the pivoted hammer and the lever for actuation of the latter, and a motor connected for operation of the hammer.

5. In an amusement machine, the combination of a movable jointed figure, a pivoted hammer, a spring board arranged in contact with jointed portions of the figure and adapted to be struck by the hammer, a standard, a lever supported intermediate of its ends by said standard, a connection between one end of the lever and the body of the figure, a connection between the pivoted hammer and the lever for actuation of the latter, an arm projecting from the pivoted hammer, a motor and a pin and slot connection between the motor and said arm for intermittently actuating the hammer and the lever to impart movement to the figure and its jointed parts.

6. In an amusement machine, the combination of a movable figure, a spring board in contact with the lower end of the figure, a motor, means operated from the motor for vibrating the spring board, auxiliary means connected with the body of the figure and operable by said motor to move the body simultaneously with the actuation of the spring board, a second figure adjacent to that above mentioned and embodying a jointed arm, a shaft adjacent to the second figure and having a crank arm connected with the jointed arm thereof, and connections between the said shaft and the motor for rotating the crank arm and operating the jointed arm of the figure.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK JACKSON.

Witnesses:

H. E. Beckmeyer,

Arthur Robersen.

No. 895,312. PATENTED AUG. 4, 1908.

H. STUBERT.

TOY.

APPLICATION FILED MAY 17, 1907.

Fig. 1.

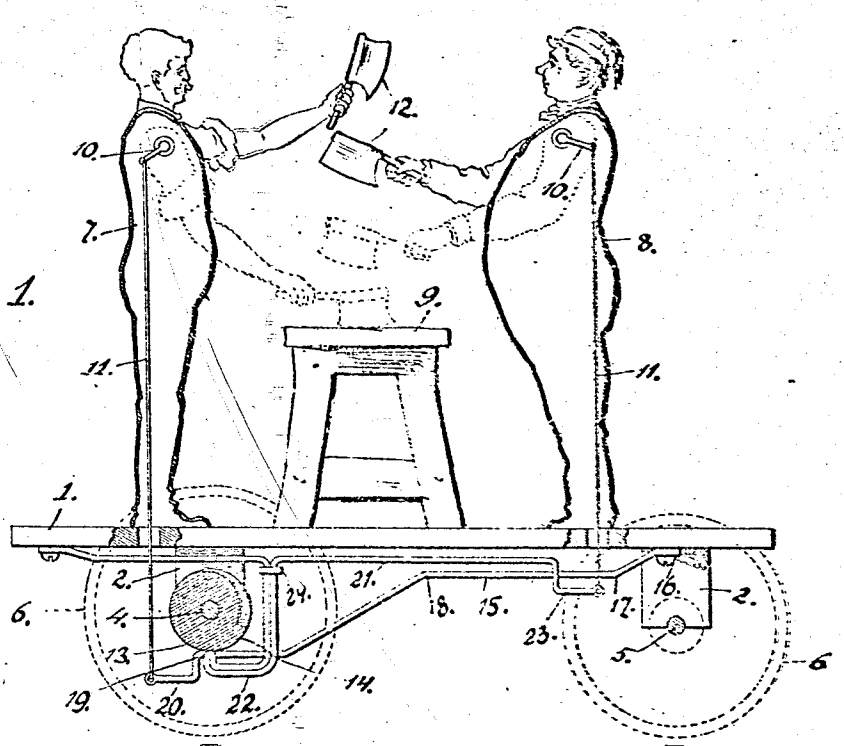
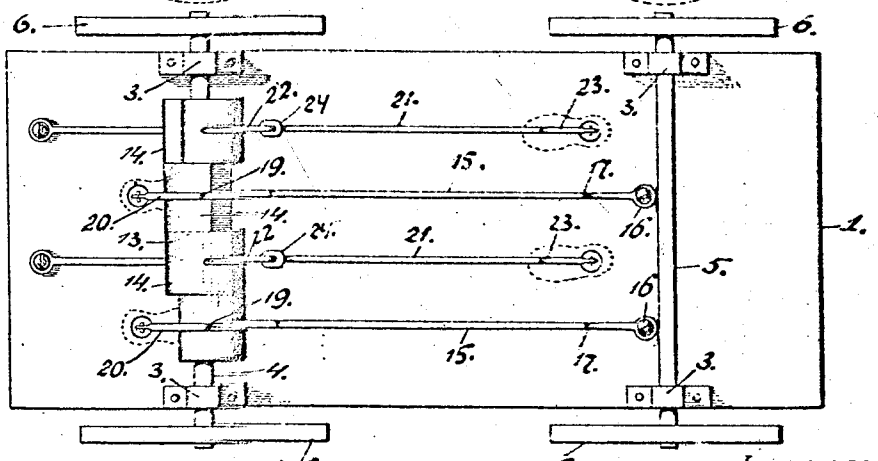


Fig. 2.



WITNESSES:

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R. N. Butler

INVENTOR

Henry Stubert,

BY H. C. Evert & Co.

Attorneys

UNITED STATES PATENT OFFICE.

HENRY STUBERT, OF NEW KENSINGTON, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO DAVID THOMAS, OF NEW KENSINGTON, PENNSYLVANIA.

TOY.

No. 895,312. Specification of Letters Patent. Patented Aug. 4, 1908.

Application filed May 17, 1907. Serial No. 374,238.

To all whom it may concern:

Be it known that I, HENRY STUBERT, a citizen of the United States of America, residing at New Kensington, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Toys, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to toys of the class known as trundling toys, in which the revolution of an axle operates movable parts of a figure supported above the axle.

The primary object of the invention is to provide a trundling toy vehicle of simple and inexpensive construction, comprising a platform or vehicle body supported upon axles, wheels mounted on said axles, one or more figures or automatons supported upon the platform, and mechanism of novel construction for operating the movable parts of said figure or figures.

A further object of the invention is to provide a wheeled toy having a platform or body, in combination with two figures or automatons supported upon said platform and facing each other, a chopping table or block supported upon the platform between the two figures, and mechanism operated by the revolution of one of the axles of the toy, to cause the arms of the figures to move alternately.

The construction of the improvement will be fully described hereinafter in connection with the accompanying drawing, which forms a part of this specification, and its novel features will be defined in the appended claims.

In the drawing, Figure 1 is a side elevation partly in vertical section, of a toy vehicle embodying the invention, and Fig. 2 is a reverse or bottom plan view of the same.

The reference numeral 1 designates a platform constituting the vehicle body from opposite sides of which depend brackets 2, provided with suitable bearings 3 for the axles 4 and 5, upon which are mounted wheels 6.

Upon the platform 1 are supported two hollow figures 7 and 8 made in imitation of the human body, and arranged facing each other. Between the figures a chopping table or block 9 is supported upon the platform.

The arms of each of the figures are pivotally secured by bell-crank levers, the horizontal arms of which extend through openings formed in opposite sides of the bodies of the figures, while the inner arms 10 of said levers extend within the hollow bodies and are loosely connected to the upper ends of rods or wires 11. The lower ends of the rods or wires extend through openings in the platform and are connected to tripping levers located below the platform, as will be described hereinafter.

To each hand of each of the two figures is secured a cleaver 12, or like chopping implement. Upon the axle 4 is secured a drum 13 recessed at equi-distant peripheral points to provide a plurality of cams 14, the number of said cams corresponding to the number of rods 11 employed, four being here shown. These cams are arranged in staggered relation to one another, so that each will be at a distance equal to one fourth the circumference of the drum from the next adjacent cam, to insure the desired alternate and successive movement of the arms of the two figures.

To operate the arms of the figure designated by the numeral 7, two tripping levers 15 are employed, each consisting of a resilient wire secured at one end to the under surface of the platform by screws 16 or like securing means. These wires are bent downward at the points 17 to deflect them from the under surface of the platform, and again at the point 18 to project them below the drum 13. From the bends 18 the wires incline downward to points adjacent to the drum and then extend horizontally below the drum, and are finally bent downward and outward to provide shoulders 19 and horizontal arms 20, to which latter are loosely connected the lower ends of the rods 11 of the figure designated as 7. The arms of the other figure are operated by trip-levers differing in construction from those just described, each comprising a resilient wire 21 secured at one end to the under surface of the platform adjacent to the end of the latter opposite to that to which the wires 15 are secured. These wires 21 are also bent downward adjacent to their fixed ends to deflect them below the under surface of the platform, and are then bent upon themselves to provide hook-shaped dogs 22 to engage the cams on the drum which aline therewith. The wires 21 then extend horizontally below the platform, and are bent to provide arms 23 which are loosely secured to the lower ends of the proximate connecting rods 11.

I preferably employ keepers 24 to reinforce the dogs 22.

The resilient tripping levers 15 alternate with the levers 21, and as illustrated by dotted lines in Fig. 2 the feet of the two figures or automatons alternate or are out of horizontal alinement.

The operation of the device will be readily understood. The revolution of the axle 4 and drum 13 fixed thereon brings the cams 14 successively into engagement with the shoulders 19 and dogs 22 of the tripping levers to operate the arms of the two figures, the relative arrangement of the cams and tripping levers being such that one arm of one of the figures is first moved, then one arm of the other figure, then the other arm of the first figure and then the remaining arm of the other figure, this succession and alternate movement of the arms being continuous as long as the toy is trundled or propelled.

While the primary purpose of the construction, is to produce the alternate movement of the arms of the two figures to simulate the action of two persons chopping, the invention is not restricted to the construction and details shown, but includes all such modifications and variations as may fall within the terms and scope of the following claims.

What I claim and desire to secure by Letters Patent, is:—

1. A trundling toy, comprising a platform, axles supporting said platform, wheels mounted on said axles, a drum fixed upon one of said axles, and recessed to provide peripheral cams equidistant from each other, a hollow figure or automaton supported upon the platform, and provided with movable arms, bell-crank levers, upon which said arms are mounted, connecting rods or wires extending within said figure and connected to said bell-crank levers, and means for operating said rods and bell crank levers comprising resilient tripping levers, each secured at one end to said platform, and adapted to engage said cams, said tripping levers being loosely secured to said connecting rods.

2. A trundling toy, comprising a wheeled vehicle having a platform, two hollow automaton figures supported on said platform facing each other and each having movable arms, bell-crank levers upon which said arms are mounted, implements attached to the hands of the figures, a table supported upon the platform between the two figures, and means operated from one of the axles of the vehicle for moving the arms of said figures alternately, comprising a drum fixed upon said axle and formed with equidistant peripheral cams, tripping levers secured below said platform and bent to engage said cams, and connections between said tripping levers and said bell-crank levers.

3. A trundling toy, comprising a wheeled vehicle having a platform, two hollow automaton figures supported on said platform facing each other and each having movable arms, bell-crank levers upon which said arms are mounted, implements attached to the hands of the figures, a table supported upon the platform between the two figures, and means operated from one of the axles of the vehicle for moving the arms of said figures alternately, comprising a drum fixed upon said axle, and formed with equidistant peripheral cams, rods or wires loosely connected at their upper ends to said bell-crank levers, a pair of resilient tripping levers secured below said platform, projected below said drum, and connected to the rods or wires of one of said figures, and a pair of resilient tripping levers secured below the platform and extending above said drum and provided with dogs extending below the drum, and arms loosely connected to the rods or wires of the other figure.

4. In a trundling toy, the combination with a wheeled vehicle having a platform body, of two hollow automaton figures each having movable arms, bell-crank levers upon which said arms are mounted, rods depending from said bell crank levers and extending through said platform, a drum fixed upon one of the axles of the vehicle and recessed to provide equidistant peripheral cams, a pair of tripping levers for each of said figures adapted to engage said cams, and loosely connected to the lower ends of said depending rods, the members of each pair of tripping levers alternating with those of the other pair, and the feet of one of said figures being arranged out of horizontal alinement with those of the other figure.

In testimony whereof I affix my signature in the presence of two witnesses.

HENRY STUBERT.

Witnesses:

ULYSSES S. ARMSTRONG,

JOSEPH S. STUBERT.

No. 711,511. Patented Oct. 21, 1902.

R. H. LITTLE.

AUTOMATON FIGURE.

(Application filed Apr. 26, 1902.)

(No Model.) 3 Sheets—Sheet 1.

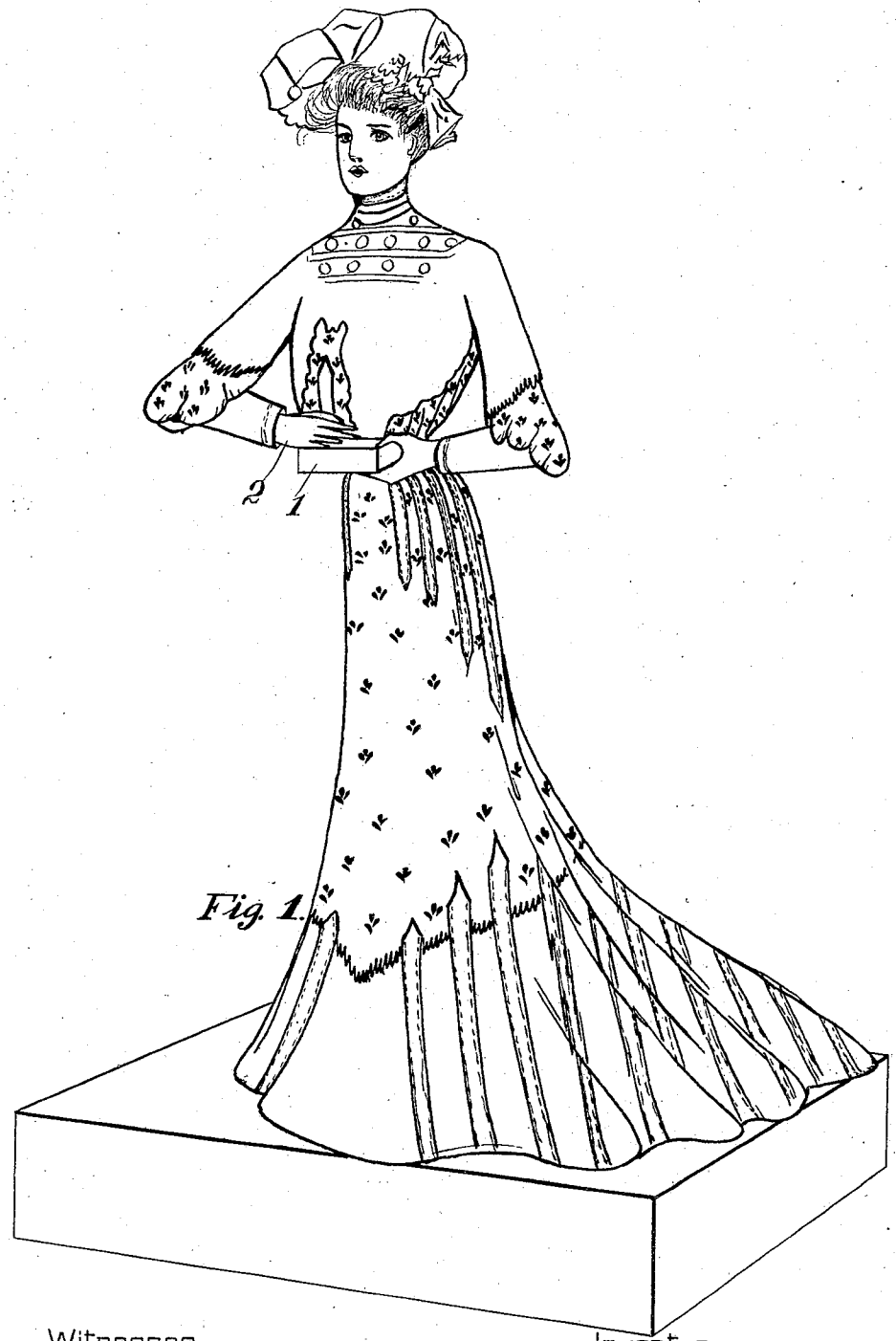

Fig. 1.

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Harvey L. Hanson.

Inventor:
Robert H. Little,
By Charles A. Brown & Cragg
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No. 711,511. Patented Oct. 21, 1902.

R. H. LITTLE.

AUTOMATON FIGURE.

(Application filed Apr. 26, 1902.)

(No Model.) 3 Sheets—Sheet 2.

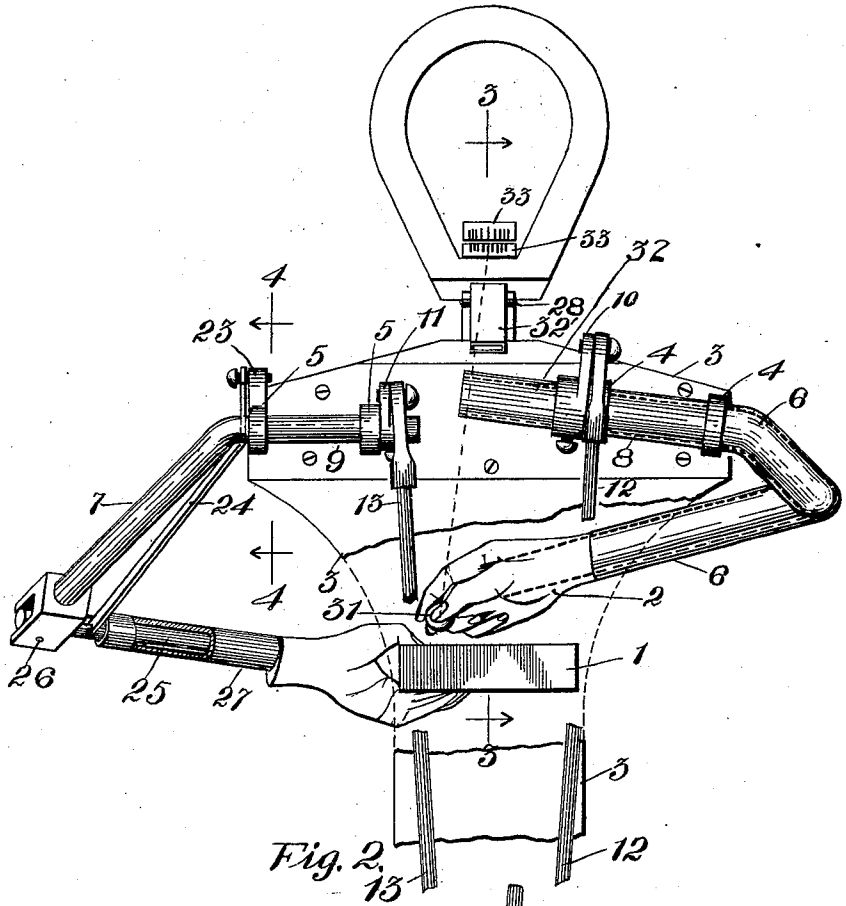
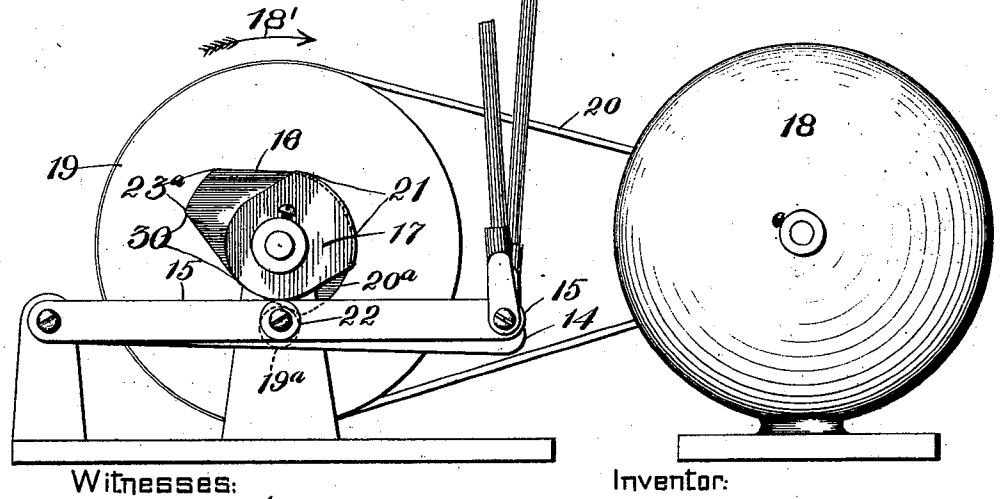


Fig. 2.



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No. 711,511. Patented Oct. 21, 1902.

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AUTOMATON FIGURE.

(Application filed Apr. 26, 1902.)

(No Model.) 3 Sheets—Sheet 3.

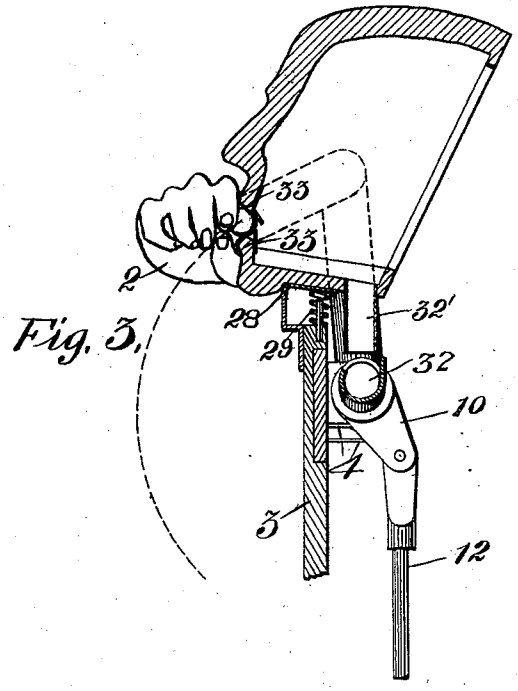

Fig. 3.

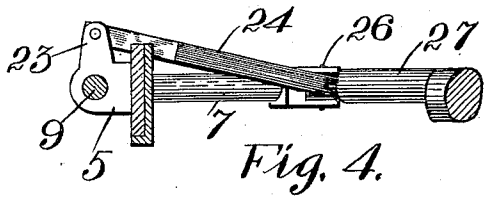

Fig. 4.

Witnesses:
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UNITED STATES PATENT OFFICE.

ROBERT H. LITTLE, OF CHICAGO, ILLINOIS, ASSIGNOR TO MAURICE H. MANDELBAUM, OF CHICAGO, ILLINOIS.

AUTOMATON FIGURE.

SPECIFICATION forming part of Letters Patent No. 711,511, dated October 21, 1902.

Application filed April 26, 1902. Serial No. 104,888. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. LITTLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Automaton Figures, (Case No. 2,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to automaton figures, and has for its object the provision of a figure of this class which will first move a hand from a receptacle to the mouth of the figure; second, extend the receptacle forward from the figure as in the act of offering a portion of its contents for another to partake of, and, third, to permit the material that may be discharged from the hand into the mouth of the figure to return to this same hand.

I will explain my invention more fully by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a figure that may embody my invention. Fig. 2 is a rear view of the mechanism of the figure, including a prime mover for operating it. Fig. 3 is a central vertical sectional view showing the manner of the application of the hand to the mouth of the figure, and Fig. 4 is a detail view of the mechanism of the arm that carries a receptacle that is to be extended as in the act of offering the contents thereof to another.

Like parts are indicated by similar characters of reference throughout the different figures.

The invention may be adapted to any form of automaton.

In Fig. 1 the figure of a lady is illustrated, holding in her left hand a box 1, which may be supposed to contain candy, for example, while the other hand, 2, is adapted for placement in the box, as in the act of removing a portion of its contents therefrom. Mechanism is provided whereby the right hand 2 is applied to the mouth of the figure in order that the mouth may receive this material, which may, for example, represent a chocolate drop. Mechanism is also preferably provided whereby after the right hand of the figure has been partially raised from the receptacle the left hand is moved forward, as in the act of presenting the box 1 to another to partake of its contents. Mechanism is further preferably provided whereby the substance that is transferred to the mouth may find its way through the arm back to the hand, to be thereafter again returned to the mouth. To these various ends I preferably employ the mechanism illustrated in Figs. 2, 3, and 4, wherein I have disclosed a body-frame 3, carrying journals 4 4 and 5 5, in which bearings are respectively journaled the right arm 6 and the left arm 7, these arms having substantially horizontal continuations 8 and 9 at the shoulders of the figure to afford the journal-mountings therefor. Crank connections 10 and 11 are provided upon these horizontal extensions of the arms, which cranks are united by means of pitmen 12 and 13 with swinging arms 14 and 15, which latter arms are operated by cams 16 and 17, respectively, which cams in turn are operated by any suitable form of a prime mover, as an electric motor 18, which motor may, if desired, drive a pulley 19 by means of a belt 20, though I do not wish to be limited to the means by which the arms 14 and 15 are actuated. It will be observed that the cams 16 and 17 are angularly displaced, so that the arms are not similarly operated at the same time. The cams are caused to travel in the direction of the arrow 18′, the cam 16 being the first to depress or otherwise operate the arm 14 to cause a slight elevation of the hand 2, a cam-roller 19^a engaging a peripheral portion 20^a of the cam 16 that is concentric with relation to the axis of rotation of the cams. When the cam-roller 19^a is in engagement with this cam portion 20^a, the hand will be retained in its slightly-elevated position, as it would naturally be after one has abstracted a portion of the contents of the box, preparing to extend the box to another. Shortly after the hand 2 has been thus slightly raised the portion 21 of the cam 17 which is concentric with relation to the axis of rotation of the cams is brought into engagement with the cam-roller 22, and as the portion 21 is further removed from the axis of rotation than any other portion of the cam 17 the arm

15 is depressed, causing a rotation of the left arm and a slight elevation thereof. As the left arm is thus rotated and elevated the left hand, containing the receptacle 1, is extended forwardly, preferably by means of the mechanism illustrated in Figs. 2 and 4, wherein I have disclosed a lug 23 somewhat in the nature of a crank, from which projects a link 24 somewhat in the nature of a pitman, which link has pivotal connection at its lower end with the forearm 25, which forearm is pivoted at 26 to the elbow. It will be apparent that as the left arm is raised, owing to the displacement between the center of rotation of the arm at its shoulder and the connection of the pitman with the crank 23, the arm will be thrust outwardly, moving the box or receptacle forward. The left hand is preferably weighted, being preferably a solid casting, whose center of gravity is below the forearm, and in order that the box may occupy a horizontal position as it is extended this hand is preferably rotatably mounted upon the forearm by being secured to a sleeve 27, which is rotatably supported upon the forearm. The box is elevated during the engagement of the cam portion 21 with the corresponding cam-roller, whereafter it is lowered, the right hand being at the same time started on its further movement toward the mouth. Just before the cam portion 23^a is engaged with the cam-roller 19^a the right hand has been engaged with the mouth of the figure to thrust the head thereof back upon its hinged mounting 28 and against the force of a spring 29. After the head has been completely thrust back the portion 23^a of the cam is engaged with the cam-roller 19^a, so that the hand may rest for a slight period at the mouth, whereafter the portion 30 of the cam 16 is brought into engagement with the cam-roller 19 to permit the head to resume its normal vertical position and to permit the hand 2 to resume its lower position by the action of gravity.

I have indicated a ball 31 in the right hand of the figure, as this may very readily be discharged into the mouth and may readily find its passage back to the hand through a duct 32, preferably formed for the greater part as indicated by dotted lines in Fig. 2 in the arm. A portion 32′ of the duct between the mouth and hand is carried by the head of the figure, being separated therefrom slightly. Communication is established between the duct portions 32 and 32′, as indicated most clearly in Fig. 3. After the ball has been discharged into the mouth and upon a lowering of the right hand it will return to the hand the fingers of which are so shaped and relatively disposed as to prevent the ball from falling out as it is being conveyed toward the mouth. The mouth is preferably provided with two flaps 33, cut to represent teeth, between which the ball may readily be passed and which will close after the ball has been passed between the same.

It is obvious that many changes may readily be made in the device of my invention shown, without departing from the spirit of the invention, and I do not, therefore, wish to be limited to the precise embodiment of the invention set forth; but,

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an automaton figure, the combination with the head and hand portions thereof, the hand being adapted to hold material to be conveyed to the mouth, of means whereby the hand may be applied to the mouth and removed therefrom, and a duct communicating between the mouth and the hand, whereby the substance that is passed to the mouth may be directly returned to the hand, substantially as described.

2. In an automaton figure, the combination with the head and hand portions thereof, the hand being adapted to hold material to be conveyed to the mouth, of means whereby the hand may be applied to the mouth and removed therefrom, a duct communicating between the mouth and the hand, whereby the substance that is passed to the mouth may be directly returned to the hand, the head portion of the figure having a swinging connection, and a spring for supporting the head in its upright position, whereby upon the application of the hand to the mouth the head may be thrust backwardly to resume its normal position through the action of the spring when the hand is removed from the mouth, substantially as described.

3. In an automaton figure, the combination with the arm and hand portions thereof, of means whereby one of the arms may be moved forward and restored to its initial position, whereby the hand upon this arm may be extended as in the act of making an offer and restored, and means whereby the remaining hand of the figure may move from and toward the aforesaid hand as in the act of taking contents therefrom, substantially as described.

4. In an automaton figure, the combination with the arm and hand portions thereof, of means whereby one of the arms may be moved forward and restored to its initial position, whereby the hand upon this arm may be extended as in the act of making an offer and restored, means whereby the remaining hand of the figure may move from and toward the aforesaid hand as in the act of taking contents therefrom, and means whereby the said remaining hand may be brought to the mouth of the figure, substantially as described.

5. In an automaton figure, the combination with the arm and hand portions thereof, of means whereby one of the arms may be moved forward and restored to its initial position, whereby the hand upon this arm may be extended as in the act of making an offer and restored, means whereby the remaining hand of the figure may move from and toward the aforesaid hand as in the act of taking con-

tents therefrom, and means whereby the said remaining hand may be brought to the mouth of the figure, a duct being provided between the head of the figure and the said remaining hand, whereby the substance transferred to the mouth of the figure may be returned to the said remaining hand, substantially as described.

6. In an automaton figure, the combination with the arm and hand portions thereof, of means whereby one of the arms may be moved forward and restored to its initial position, whereby the hand upon this arm may be extended as in the act of making an offer and restored, and means whereby the remaining hand of the figure may move from and toward the aforesaid hand as in the act of taking contents therefrom, a receptacle or box being carried in the first aforesaid hand, from which contents may be seemingly directly taken.

7. In an automaton figure, the combination with the arm and hand portions thereof, of means whereby one of the arms may be moved forward and restored to its initial position, whereby the hand upon this arm may be extended as in the act of making an offer and restored, means whereby the remaining hand of the figure may be moved from and toward the aforesaid hand as in the act of taking contents therefrom, and means whereby the said remaining hand may be brought to the mouth of the figure, a receptacle or box being carried in the first aforesaid hand from which contents may be seemingly directly taken, substantially as described.

8. In an automaton figure, the combination with the arm and hand portions thereof, of means whereby one of the arms may be moved forward and restored to its initial position, whereby the hand upon this arm may be extended as in the act of making an offer and restored, means whereby the remaining hand of the figure may move from and toward the aforesaid hand as in the act of taking contents therefrom, and means whereby the said remaining hand may be brought to the mouth of the figure, a duct being provided between the head of the figure and the said remaining hand, whereby the substance transferred to the mouth of the figure may be returned to the said remaining hand, and a receptacle or box being carried in the first aforesaid hand from which contents may be seemingly directly taken, substantially as described.

In witness whereof I hereunto subscribe my name this 24th day of April, A. D. 1902.

ROBERT H. LITTLE.

Witnesses:
GEORGE L. CRAGG,
JOHN STAHR.

No. 711,510. Patented Oct. 21, 1902.

R. H. LITTLE.

AUTOMATON FIGURE.

(Application filed Apr. 5, 1902.)

(No Model.) 3 Sheets—Sheet 1.

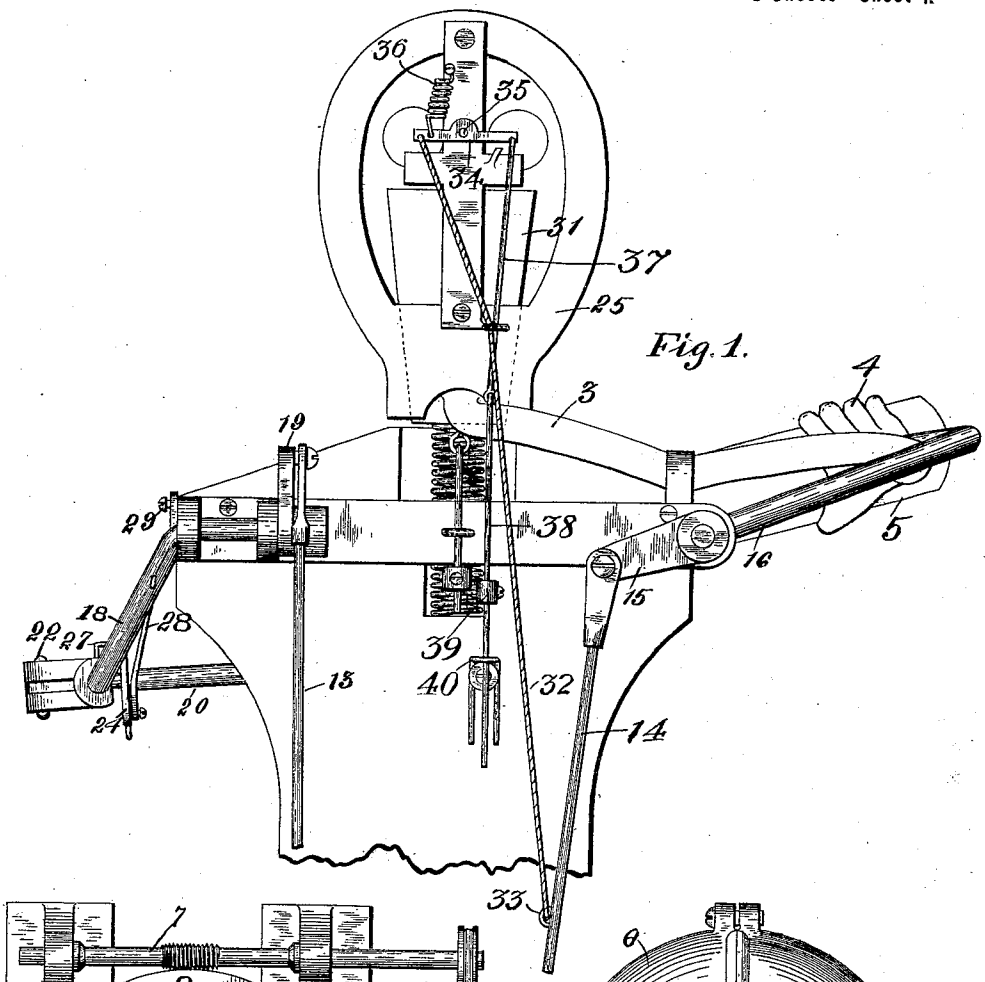

Fig. 1.

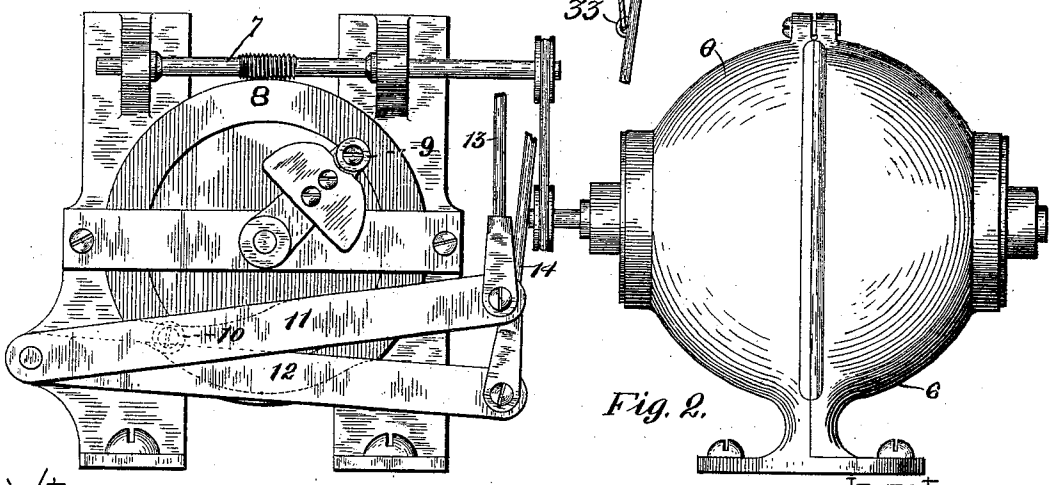

Fig. 2.

Witnesses
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No. 711,510. Patented Oct. 21, 1902.

R. H. LITTLE.

AUTOMATON FIGURE.

(Application filed Apr. 5, 1902.)

(No Model.) 3 Sheets—Sheet 2.

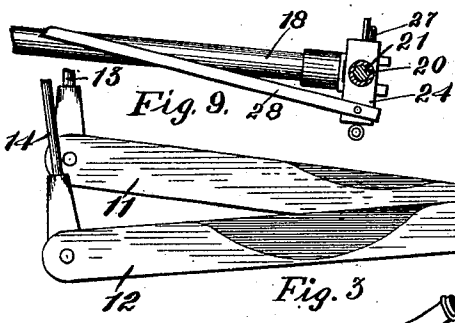

Fig. 9.

Fig. 3

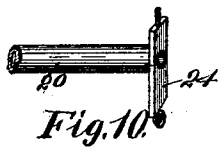

Fig. 10.

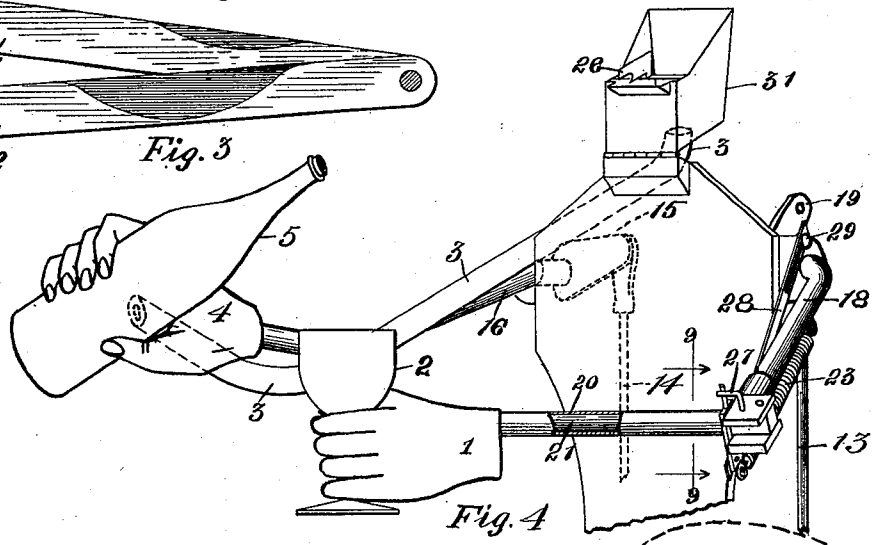

Fig. 4

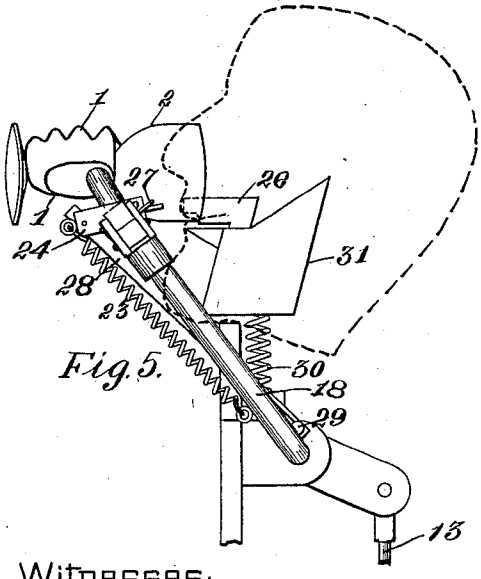

Fig. 5.

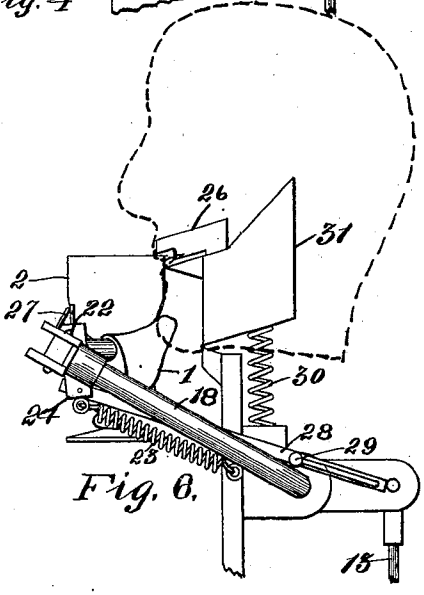

Fig. 6.

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No. 711,510. Patented Oct. 21, 1902.

R. H. LITTLE.

AUTOMATON FIGURE.

(Application filed Apr. 5, 1902.)

(No Model.) 3 Sheets—Sheet 3.

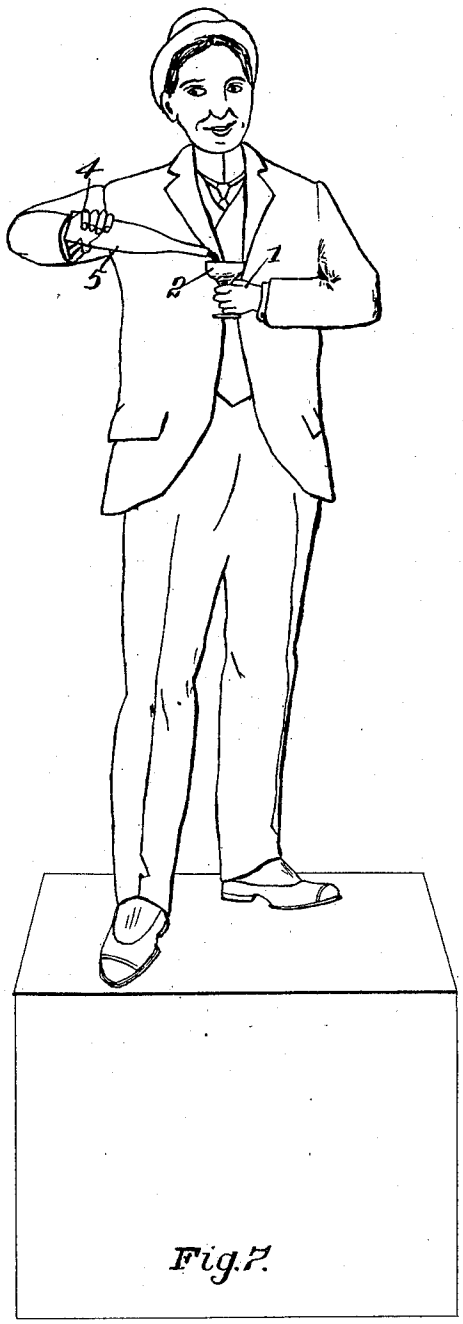

Fig. 7.

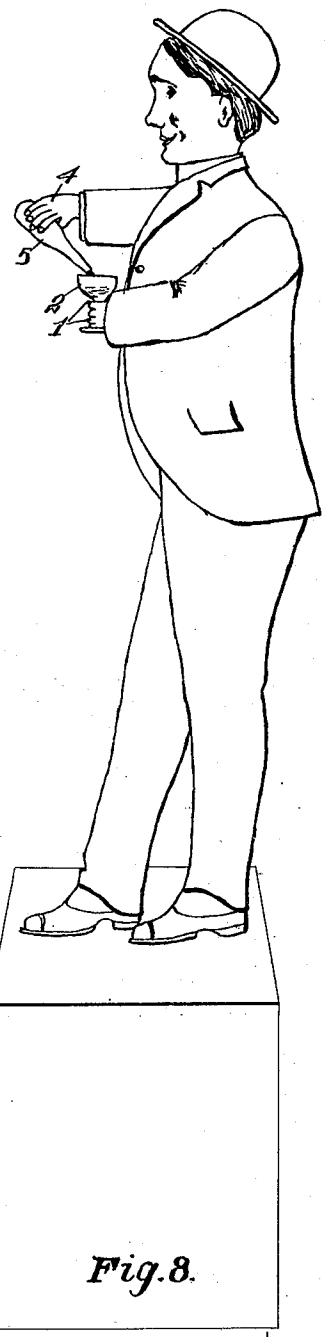

Fig. 8.

Witnesses
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Inventor
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UNITED STATES PATENT OFFICE.

ROBERT H. LITTLE, OF CHICAGO, ILLINOIS, ASSIGNOR TO MAURICE H. MANDELBAUM, OF CHICAGO, ILLINOIS.

AUTOMATON FIGURE.

SPECIFICATION forming part of Letters Patent No. 711,510, dated October 21, 1902.

Application filed April 5, 1902. Serial No. 101,506. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. LITTLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Automaton Figures, (Case No. 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to automaton figures, and has for its object the provision of a figure of this class which is adapted to move a member, as a hand, toward and from the mouth, and has for its further object the provision of such a figure which is adapted to hold in its hand substances designed for entry within the mouth, the figure being so constructed that when the hand is brought to the mouth the substance will be transferred from the hand to the mouth.

A further object of the invention is to provide mechanism whereby the figure in its operation may transfer the substance that is to be taken within the mouth from one hand to that hand which is to be raised to the mouth.

In accordance with my invention I may also provide a receptacle, as a glass, in that hand which is to be brought to the mouth that may contain liquid, which is poured from the glass into the mouth of the figure in the operation thereof. Means are provided whereby the liquid may be returned to the glass, preferably after it has been removed from the mouth, so that the glass may be again brought to the mouth and reëmptied. There is thus provided a continuous circulation for the liquid from the glass through a duct communicating with the figure's mouth back to the glass. This circulating path preferably includes another receptacle, as a glass bottle, carried in the other hand of the figure, mechanism being preferably employed for tilting the bottle after the glass has been removed from the mouth to pour the liquid that has in the meantime been returned to the bottle into the glass. The mechanism employed for operating the figure may continuously be employed for emptying and refilling the glass, making the operation of the figure a continuous one, which is thus particularly adapted for advertising purposes, though its use is not to be thus restricted.

I will explain my invention more fully by reference to the accompanying drawings, in which—

Figure 1 is a rear view of the figure sufficiently uncovered to reveal the essential parts of the operating mechanism. Fig. 2 is a view of the motor mechanism for operating the moving parts of the figure. Fig. 3 is a detail of certain of the lever mechanism shown in Fig. 2. Fig. 4 is a front view of the mechanism of the figure. Fig. 5 is a side view of the mechanism shown in Fig. 4 in another position. Fig. 6 is a side view of the mechanism in still another position. Fig. 7 is a front view of the complete apparatus suitably draped that may constitute one embodiment of my invention. Fig. 8 is a side view thereof, and Figs. 9 and 10 are detailed views of the elbow mechanism.

Like parts are indicated by similar characters of reference throughout the different figures.

One of the figure's hands 1—as, for example, the left hand—is designed to be moved toward and from the mouth of the figure, so that substance held by the hand may pass to the mouth and, if desirable, be removed from the hand at the mouth, whereafter the hand may be lowered to receive additional substance, which may in like manner be brought to the mouth of the figure. I prefer to provide in this hand a receptacle, such as a glass 2, so that the figure may be caused to swallow liquid conveyed to its mouth. In order that the substance swallowed or passed through the mouth of the figure may be returned to the hand, I preferably provide a duct or passage, such as a rubber hose 3, which returns the substance to the hand, preferably through the action of gravity. This duct or passage in the preferred embodiment of the invention extends to the other hand 4 of the figure—in this instance the right hand—from which hand the substance is passed to the left. When the figure is designed to receive liquids, the hand 4 preferably contains a second receptacle, as a glass bottle 5, the

duct terminating in the bottle having communication with its interior. Mechanism is provided whereby the bottle may be tilted, as shown in Figs. 7 and 8, so that liquid may pass from same into the glass when the hand holding the glass is lowered and whereby the bottle may be inclined upwardly, as indicated in Fig. 4, after the glass has been filled and during the time the glass is being brought to the mouth and again lowered to be refilled.

It is obvious that a variety of mechanical means may be employed for accomplishing the several functions above generally outlined, among which is the mechanism I have herein illustrated. For the purpose of accomplishing the various movements by the figure in orderly sequence I prefer to employ a unitary motor mechanism, which may have as a prime mover a small electric motor 6, which is designed to effect the rotation of a worm-jack shaft 7, that engages a worm-wheel 8, carrying cam mechanism 9 and 10. These cam devices are designed to be engaged with the pivoted arms 11 and 12 to effect their successive actuation as the worm-wheel 8 is revolved. Links 13 and 14 are united with the free ends of the arms and terminate at their upper ends in mechanical connections for operating the left and right arms of the figure, respectively. The link 14 engages a crank-arm 15, which is fastened to the end of a rod 16, constituting the right arm, this rod 16 terminating in a hand 4, which holds the bottle 5. As the worm-wheel 8 is rotated the cam 10 is brought into and out of engagement with the cam-groove provided in the arm 12, whereby this arm is depressed to swing the arm 16, so that it may tilt the bottle downwardly, as indicated in Figs. 1, 7, and 8, to empty liquid from the bottle into the glass 2. After the predetermined quantity of liquid has been poured into the glass the cam-roller 10 in disengaging itself from the arm 12 permits the arm 16 to descend through the weight of the hand 4, which is preferably solid metal, the arm in thus descending also rotating, whereby the bottle in lowering is placed in the position indicated in Fig. 4. Other mechanism obviously might be employed for effecting the desired movement without departing from my invention. After the liquid has been poured from the bottle into the glass the cam mechanism 9 is brought into engagement with the cam-groove in the arm 11, effecting its depression, thereby causing a swinging movement of the arm 18 upwardly to force the application of the glass to the mouth of the figure, the crank 19 preferably intervening between the link 13 and the arm 18 for the purpose of accomplishing this movement. It will be observed that the application of the cams 9 and 10 to the arms 11 and 12 is dissimultaneous and that as the worm-wheel 8 moves in a clockwise direction the link 14, with the arm 16, is moved first to cause the liquid to run from the bottle to the glass and to effect removal of the bottle from the glass, whereafter the glass may be applied to the mouth of the figure by the subsequent operation of the link 13 and the arm 18.

In order to secure a life-like motion of the arm 18, particularly the forearm and hand, I preferably mount the hand 1 on a sleeve 20 and journal this sleeve upon a rod 21, that is provided with a pivotal connection at 22 with the humerus portion of the arm 18. It will be observed that the sleeve 20 is so united with the hand that the major portion of the hand will lie below the sleeve, so that as the arm 18 is elevated the sleeve 20 is rotated upon its journal through the action of gravity, preserving the glass in substantially a vertical position until it is brought close to the mouth of the figure. To aid the action of gravity, I may employ a spring 23, united at one end to the humerus portion of the arm and at the other end to a lug 24, secured to and projecting below the arm 20, whereby rotating tendency is exerted upon the sleeve. It is desirable to have the head portion 25 of the figure tilted backwardly when the glass is applied to the mouth and to effect a tilting of the glass to drain its contents into the mouth. To this end there is provided, preferably upon the upper lip, a guiding-lug 26, which engages the glass and as the arm is continued in its elevation tilts the glass and by the same movement forces the head backward. The tilting movement of the glass is opposed by the spring 23, which largely effects the restoration of the glass to a vertical position after it is removed from the mouth when the arm is lowered. To prevent the spring from swinging the forearm—for instance, sleeve 20—so as to tilt the glass in an opposite direction, lug 24 is preferably extended also above the sleeve 20 to engage pin 27, carried by the elbow of the arm 18. Spring 23 instead of being attached directly to the lug 24 may be secured to an arm 28, which is connected at one end of the lug 24 and has slotted connection with the shoulder of the figure, a screw 29 passing through the slot into the shoulder. By means of the screw and the slot the glass when in its lower position is prevented from tilting inwardly, and when in its upper position is forced to engage lug 26. The link 28 is not absolutely essential to the construction, but is desirable in case the weight of the glass, with its contents and the hand, is not properly balanced to secure the desired effectiveness in operation. The head portion is preferably only provided with permissive means, whereby it may be tilted backwardly, which comprises, preferably, a spring 30, which is interposed between the fixed portion of the form of the figure and the base of the head, this base portion of the head preferably comprising a box 31, into which the contents of the glass are poured. When the glass is removed from the mouth, the spring effects the restoration of the head to its normal position. The bottom of the box 31 communicates with a suitable duct or pas-

sage, preferably a rubber hose 3, so that the material that leaves the hand and is passed into the mouth finds its return.

A cord or other flexible connecting means 32 is attached to the connecting-rod 14 at 33. The other end of this cord is attached to a lever 34, having pivotal connection with the frame of the head through the agency of the shaft 35, a spring 36 serving normally to maintain this lever in the position shown in Fig. 1. Suitable connecting means are provided to communicate the turning motion of the shaft 35 to the eyeballs, it being clear that each time the connecting-rod 14 is drawn downward by its associated cam a motion will be imparted to the eye-shifting mechanism. A depending link 37 and rod 38, having an adjustable bob 39, which engages the stop 40, serve to limit and partially control the movement of the eyeballs.

The operation of the figure will now be readily understood, as it is apparent by the mechanism illustrated that the liquid is first poured from the bottle into the glass, whereafter the bottle is inclined upwardly, the glass raised to the lips, fluid poured from the glass into the mouth to find its way back to the bottle, and finally the glass depressed to permit the same to be again filled.

It is obvious that the device of my invention may have wide and varied uses and that it need not be limited to the precise functions herein disclosed, and I do not, therefore, wish to be limited to the disclosure of the invention illustrated; but,

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an automaton figure, the combination with the head and hand portion thereof, the latter being designed to hold a substance, of means whereby the hand may be moved to the mouth of the figure and cause the discharge of substance into the mouth, and means whereby the substance may be returned to the hand, substantially as described.

2. In an automaton figure, the combination with the head and hand portion thereof, the latter serving to carry substance, of means whereby the hand may be moved to the mouth and be caused to discharge substance into the mouth, and means for transferring the substance from mouth to hand, substantially as described.

3. In an automaton figure, the combination with the head and hand portion thereof, of a receptacle carried by the hand portion, and means whereby the receptacle may be carried to the mouth of the figure and contents thereof discharged into the mouth, and means whereby the substance may be transferred from the mouth to the receptacle, substantially as described.

4. In an automaton figure, the combination with the head and hand portion thereof, of a receptacle carried by the hand portion, means whereby the receptacle may be carried to the mouth of the figure and contents thereof discharged into mouth, and means whereby the contents of the receptacle may be returned thereto after having been received into the mouth of the figure, substantially as described.

5. In an automaton figure, the combination with the head and hand portions thereof, of means for effecting the movement of one of the hands to the mouth, discharging substance carried by this hand into the mouth, and means whereby this substance may be brought to the other hand, substantially as described.

6. In an automaton figure, the combination with the head and hand portions thereof, of means for effecting the movement of one of the hands to the mouth, discharging substance carried by this hand into the mouth, means whereby this substance may be brought to the other hand, and means whereby the substance may be returned by the latter hand to the first hand, substantially as described.

7. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle carried by one of the hands, means for effecting the application of this receptacle to the mouth of the figure and to cause the discharge of the substance into the mouth of the figure, and means for returning the substance to the other hand of the figure, substantially as described.

8. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle carried by one of the hands, means for effecting the application of this receptacle to the mouth of the figure and to cause the discharge of the substance into the mouth of the figure, means for returning the substance to the other hand of the figure, and means for effecting return of the substance from the latter hand of the figure to the aforesaid receptacle, substantially as described.

9. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle in each hand, means for effecting the application of one receptacle to the mouth of the figure and discharging the contents thereof into the mouth, and means for effecting the passage of this substance to the other receptacle in the other hand after its reception in the mouth, substantially as described.

10. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle in each hand, means for effecting the application of one receptacle to the mouth of the figure and discharging the contents thereof into the mouth, means for effecting the passage of this substance to the other receptacle in the other hand after its reception in the mouth, and means whereby this substance may be returned from the latter receptacle to the former receptacle, substantially as described.

11. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle carried by one of the hands, means for effecting the movement of this hand to cause the transfer of substance carried by this receptacle to the other hand, and means whereby the latter hand may be carried to the mouth of the figure, substantially as described.

12. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle carried by one of the hands, means for effecting the movement of this hand to cause the transfer of substance carried by this receptacle to the other hand, means whereby the latter hand may be carried to the mouth of the figure, and means whereby the substance may be discharged from the hand that is applied to the mouth into the mouth, substantially as described.

13. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle carried by one of the hands, means for effecting the movement of this hand to cause the transfer of substance carried by this receptacle to the other hand, means whereby the latter hand may be carried to the mouth of the figure, means whereby a substance may be discharged from the hand that is applied to the mouth into the mouth, and means whereby the substance may be returned to the said receptacle, substantially as described.

14. In an automaton figure, the combination with the head and a hand portion thereof, of a receptacle carried by the hand portion, means whereby this receptacle may be carried to the mouth of the figure, and means whereby the hand portion carrying the receptacle may be turned to tip the receptacle (when applied to the mouth) as in the act of drinking, substantially as described.

15. In an automaton figure, the combination with the head and a hand portion thereof, of a receptacle carried by the hand portion, means whereby this receptacle may be carried to the mouth of the figure, means whereby the hand portion carrying the receptacle may be turned to tip the receptacle (when applied to the mouth) as in the act of drinking, and means whereby the head portion may be inclined backwardly when the receptacle is thus applied to the mouth, substantially as described.

16. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle in each hand, means whereby the receptacle in one hand may be turned to have its contents poured into the receptacle in the other hand, and means whereby the receptacle in the other hand may be carried to the mouth of the figure, substantially as described.

17. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle in each hand, means whereby the receptacle in one hand may be turned to have its contents poured into the receptacle in the other hand, means whereby the receptacle in the other hand may be carried to the mouth of the figure, and means whereby the receptacle that is carried to the mouth may be tilted when applied to the mouth as in the act of drinking, substantially as described.

18. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle in each hand, means whereby the receptacle in one hand may be turned to have its contents poured into the receptacle in the other hand, means whereby the receptacle in the other hand may be carried to the mouth of the figure, means whereby the receptacle that is carried to the mouth may be tilted when applied to the mouth as in the act of drinking, and means whereby the head portion may be tilted backwardly upon the said application of the receptacle to the mouth of the figure, substantially as described.

19. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle in each hand, means whereby the receptacle in one hand may be turned to have its contents poured into the receptacle in the other hand, means whereby the receptacle in the other hand may be carried to the mouth of the figure, means whereby the receptacle that is carried to the mouth may be tilted when applied to the mouth as in the act of drinking, means whereby the head portion may be tilted backwardly upon the said application of the receptacle to the mouth of the figure, and a duct communicating between the head portion and the receptacle from which the contents are initially poured, whereby the receptacle that is to be carried to the mouth may again be filled, substantially as described.

20. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle in each hand, means whereby the receptacle in one hand may be moved as in the act of transferring substance from this receptacle to the receptacle in the other hand, and means whereby the latter hand may be moved to the mouth, substantially as described.

21. In an automaton figure, the combination with the head and hand portions thereof, of a receptacle in one hand, means whereby the receptacle in this hand may be moved as in the act of transferring substance in this receptacle to the other hand, and means whereby the latter hand may be moved to the mouth, substantially as described.

In witness whereof I hereunto subscribe my name this 31st day of March, A. D. 1902.

ROBERT H. LITTLE.

Witnesses:
GEORGE L. CRAGG,
JOHN STAHR.

No. 638,793. Patented Dec. 12, 1899.

S. ANSON.

MECHANICAL TOY.

(Application filed June 19, 1899.)

(No Model.) 2 Sheets—Sheet 1.

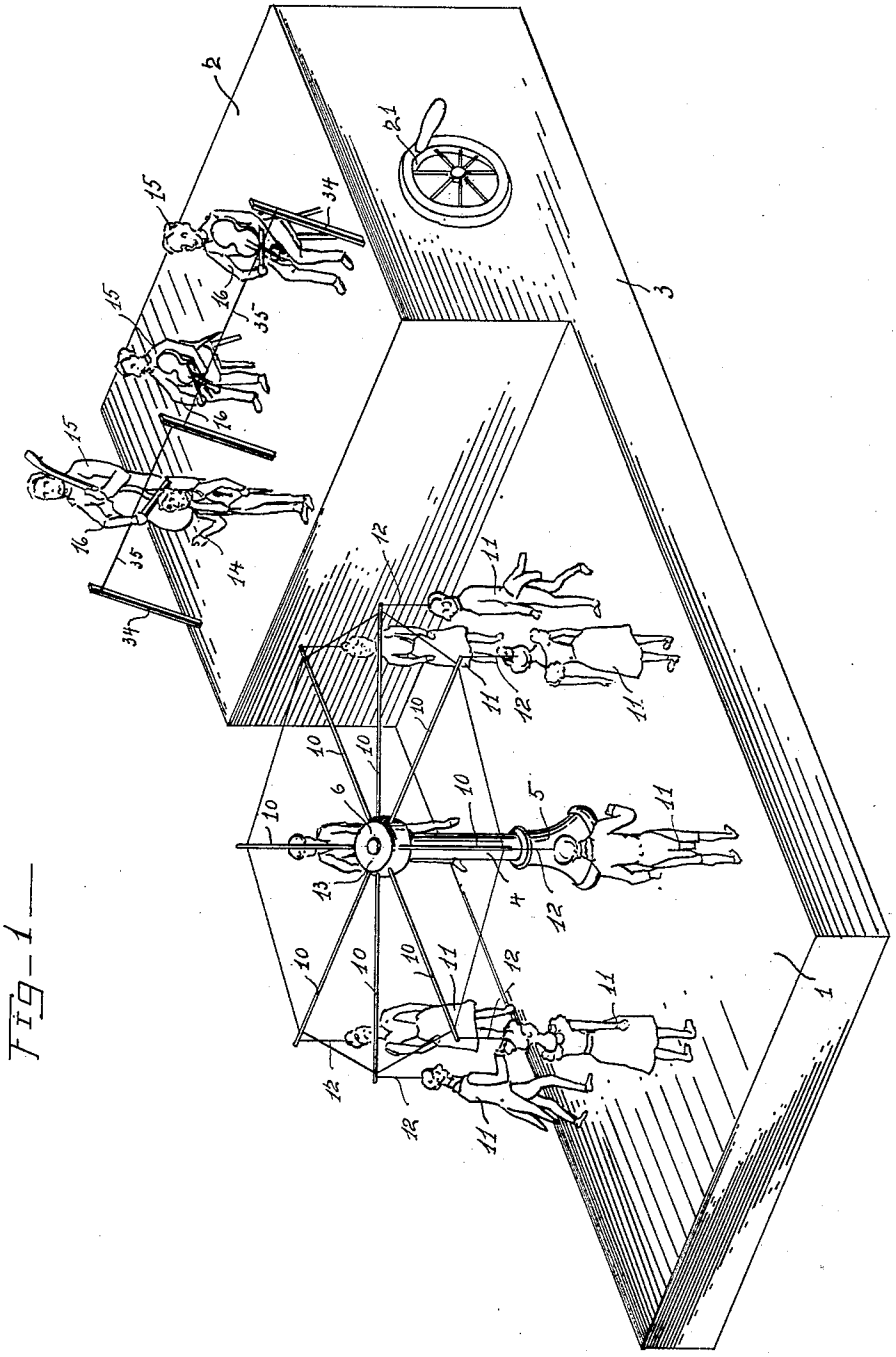


FIG. 1.

Witnesses—
Herman A. Martin
Chas. A. Boake

Inventor—
Sidney Anson,
By Robt. B. Wilson
his attorney

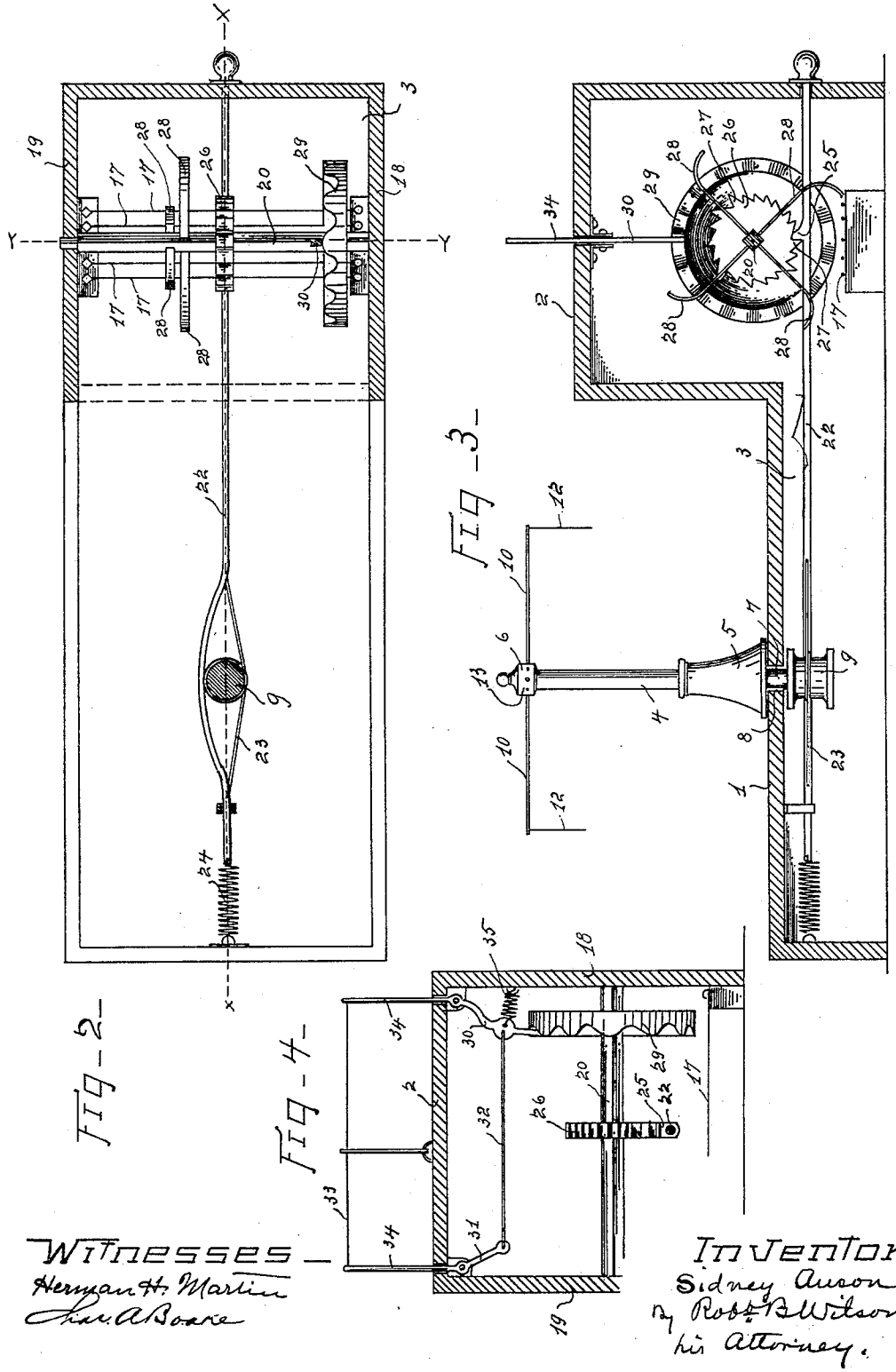
No. 638,793. Patented Dec. 12, 1899.

S. ANSON.

MECHANICAL TOY.

(Application filed June 19, 1899.)

(No Model.) 2 Sheets—Sheet 2.



Witnesses—
Herman H. Martin
Chas. A. Boarc

Inventor—
Sidney Anson,
by Robt. B. Wilson
his Attorney.

UNITED STATES PATENT OFFICE.

SIDNEY ANSON, OF TOLEDO, OHIO.

MECHANICAL TOY.

SPECIFICATION forming part of Letters Patent No. 638,793, dated December 12, 1899.

Application filed June 19, 1899. Serial No. 721,016. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY ANSON, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in Mechanical Toys, of which the following is a specification.

My invention relates to a mechanical toy, and has for its object to simulate the dance of a cotillion and music therefor.

My invention consists of articulated automaton figures representing musicians, a leader, and dancers in which the movements of the dancers are simulated by mechanical vibrations and intermittent semirevolution of the circle of dancing figures produced simultaneously with coincident movement of the bow-arm of musician figures and accompanied by harmonic sounds from strings, which are also vibrated by mechanical means.

In the drawings, Figure 1 is an isometric view of my invention, displaying the automatons in position. Fig. 2 is a plan view of the actuating mechanism. Fig. 3 is a longitudinal vertical section on the line *x x* of Fig. 2, and Fig. 4 is a cross-section on the line *x x* of Fig. 2.

In the drawings, in which similar reference-numerals represent similar parts, 1 represents the dancing-floor, and 2 the orchestra-platform, preferably elevated to some extent above the dancing-floor, and both are supported on walls to form a housing 3 for the actuating mechanism. From the center of the dancing-floor rises a rotatable vertical column 4, which is provided with an enlarged base 5 at the floor and a cap 6 some distance above. The reduced portion 7 of the column also projects downward through a slightly-enlarged aperture 8, located in the floor, and the column is held in position by means of a flanged pulley 9, secured to the pendent reduced portion 7. To the cap 6 of the column are secured a plurality of flexible radial arms 10, and from each of the aforesaid arms a dancing figure 11 is pendently supported by means of a flexible cord 12. The arms and limbs of the figures are articulated at the trunk and joints, and the figures representing the dancers are suspended from the arms of the spider 13 at a height to allow the feet of the dancers to rest lightly upon the floor during the vibrating movement of their supporting-arms 10 and offer a minimum of resistance to the column during its intermittent semirotation.

14 designates the leader, (not articulated,) and 15 designates the musicians, the bow-arms 16 of which are articulated to allow the movement of the bows across their instruments. The simulated musical sounds are produced by a plurality of metallic strings 17, suitably secured and located in the housing under the orchestra-platform and are attuned to any pleasing harmonic chord.

In the opposite side walls 18 and 19 there is journaled an arbor 20, having one end projecting beyond one of the side walls and a crank-wheel 21 secured thereto for rotating the arbor and its several attachments. A vibratory and intermittent semirotative movement is transmitted from the arbor to the column supporting the dancers by means of a flexible rod 22, curving at flanged pulley 9 into a bow and transmitting motion to it by means of a cord 23 roved around the pulley, the ends of the cord being secured to the rod.

At one end of rod 22 is a spring 24, and at the opposite end thereof there is secured a shoulder 25, adapted to engage a toothed wheel 26, mounted upon the arbor and having one or more teeth 27 projecting beyond other peripheral teeth, whereby upon rotating the arbor the differential teeth of the wheel 26 will successively engage the shoulder 25 upon the rod, and thereby, together with spring 24, produce a reciprocation of varying stroke which vibrates the column and intermittently semirotates the same as the projecting teeth 27 engage the shoulder upon the rod, thereby causing the articulated limbs of the dancing figures to simulate the movements of dancing.

The musical strings 17 are vibrated by means of radial flexible arms 28, which are secured to the arbor, and each arm is adapted to successively engage each string as the arbor is rotated.

The movements of the bow-arms of the musician figures are produced by means of a crown-wheel 29, also secured to the arbor, and in constant engagement therewith is a lever 30, pivotally secured to the under side of the top of the musicians' platform and is

rigidly connected to a similar lever 31, located opposite, by means of a rod 32. Each of the articulated bow-arms is connected to a cord 33, which is secured to upwardly-projecting ends 34 of levers 30 and 31. The lever 30 is held in constant contact with the curvilinear teeth of the crown-wheel by means of spring 35, whereby as the crown-wheel is rotated with the arbor levers 30 and 31 are vibrated together to produce the stroke of the bows. The teeth of crown-wheel 29 are also of different lengths, whereby different lengths of vibration of the levers and different lengths of stroke of the bows are produced simulating the short quick vibrations of the bow interspersed with occasional longer sweeps thereof ordinarily employed in violin-playing.

Having thus fully described my invention, what I claim to be new, and desire to secure by Letters Patent, is—

1. In a mechanical toy, the combination of a vertical rotating column having a cap or top provided with a plurality of elastic radial arms, with articulated automaton figures flexibly suspended from their outer ends, and a flanged pulley at its lower end, a housing adapted to support the column, an elastic bow provided with a cord adapted to engage the pulley and rotate it, and means to vibrate the bow with short and intermittent longer strokes, and thereby vibrate the column and cause intermittent semirotations thereof, substantially as and for the purpose set forth and described.

2. In a mechanical toy, the combination of a vertical rotating column having a cap provided with a plurality of elastic radial arms with articulated automaton figures suspended flexibly from their outer ends, and a flanged pulley at its lower end, a housing adapted to support the column, an elastic bow provided with a cord roved around the pulley and adapted to rotate it and therewith the column, provided with a spring at one end attached to the housing, and having the other end prolonged and provided with a shoulder, an arbor journaled in the housing and provided with a wheel having differential peripheral teeth adapted to engage the shoulder of the bow, and move it horizontally against the pull of the spring to allow the teeth to pass successively, and thereby vibrate the bow with both short and longer strokes, and means to rotate the arbor, substantially as and for the purpose described.

In witness whereof I have hereunto set my hand this 15th day of June, 1899.

SIDNEY ANSON.

Witnesses:
THAD S. POWELL,
JAMES RAYMOND.

(No Model.)

H. D. PURSELL & E. F. PRICE.

COIN CONTROLLED AUTOMATON.

No. 496,324. Patented Apr. 25, 1893.

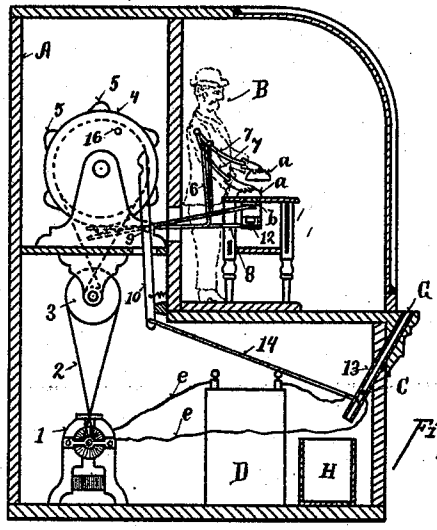


Fig. 1.

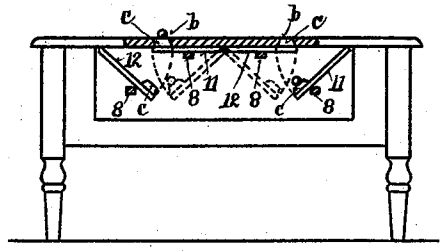


Fig. 2.

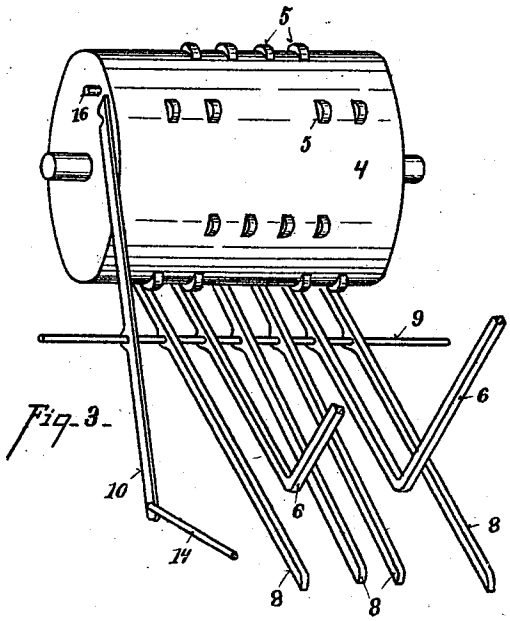


Fig. 3.

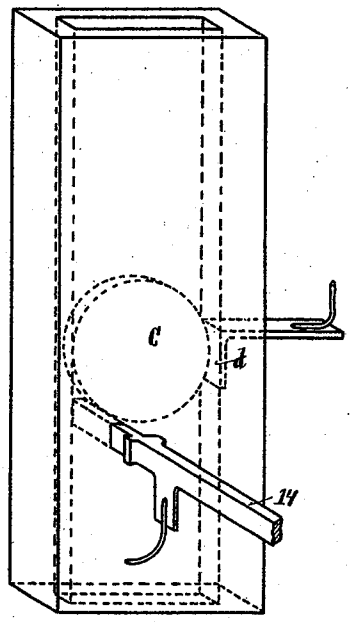


Fig. 4.

Witnesses
C. W. Miles
T. Simmonds

Inventors
Harry D. Pursell
Edwin F. Price
By Wood & Bond
Attorneys

UNITED STATES PATENT OFFICE.

HARRY D. PURSELL AND EDWIN F. PRICE, OF WASHINGTON COURT-HOUSE, OHIO.

COIN-CONTROLLED AUTOMATON.

SPECIFICATION forming part of Letters Patent No. 496,324, dated April 25, 1893.

Application filed February 14, 1893. Serial No. 462,249. (No model.)

To all whom it may concern:

Be it known that we, HARRY D. PURSELL and EDWIN F. PRICE, citizens of the United States, residing at Washington Court-House, in the county of Fayette and State of Ohio, have invented certain new and useful Improvements in Coin-Controlled Automatons, of which the following is a specification.

The object of our invention is to provide a new and improved automaton set in action by a coin which acts upon two electric terminals or contact pieces in a coin chute, and completes and forms part of an electric circuit including a motor which operates the swinging or movable arms or members of the automaton figure.

To accomplish this object our invention consists in the features of construction and the combination or arrangement of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a central vertical section of our improvement in position for use. Fig. 2 is a rear elevation of the table in front of the automaton. Fig. 3 is a perspective view of the drum operating mechanism. Fig. 4 is a detail view of the coin circuit closing mechanism.

A represents the case preferably L-shaped, in which the working apparatus is placed and concealed from view.

B represents the automaton figure having swinging or movable arms or members provided with hands which carry bowls or cups hereinafter referred to.

1 represents an electrical motor; 2 a belt driven by said motor; 3 a pulley over which said belt works and transmits motion to the drum 4.

5 represents lugs or protuberances upon the periphery of said drum.

6 represents bellcrank levers hinged to levers 7 concealed within the arms of the automaton.

8 represents a series of straight levers; the levers 6 and 8 are supported upon a common axis 9.

10 represents a shipping lever likewise hinged upon said axis. The hands of the automaton are provided with small bowls or cups *a* secured thereto, bottom side up.

b represents orifices pierced through the table directly under the bowls *a*.

11 represents levers hinged to the under side of the table each carrying an orifice closer *c* adapted to fit and close the orifice *b*, preferably made to represent the surface of the table, and upon which is mounted a ball. 11 represents similar levers, hinged in like manner but not provided with a ball.

D represents an electrical generator; *e*, *e*, the wires forming a circuit to the motor 1; these wires are normally broken at the point 13, and the circuit is closed by the coin C dropped into the chute G and lodges upon the electrical terminals or contact pieces *d* and 14, the latter being composod of an arm or rod hinged to a trip-lever 10.

In the practical operation of the apparatus the coin C is introduced into the coin-chute G, and is stopped by the arm 14, so that the coin bears against the latter, and also against the terminal or contact-piece *d*. By this means the coin completes and constitutes a part of the electrical circuit *e* to set the motor in motion, and the drum makes one revolution; as soon as the revolution is complete the trip pin 16 engages the lever 10 and pulls the arm or rod 14 out of the path of the coin which drops down into the receptacle H thereby breaking the circuit, when the rod returns to engage the succeeding coin. By the revolution of the drum one set of the lugs 5 engage with the bent levers 6, and lift the arms of the automaton up; another set of lugs operate the arms 8, which operate in turn the arms 11 and 12; these lugs 5 may be arranged in various ways, but the preferred form is to have the levers 11 lifted up exposing the ball 12 in the orifice *b* when the arms of the automaton are raised; but to operate alternately with each lifting of the arms so that at one time the ball is exposed and at another time the orifice closer conceals the orifice. These operations take place rapidly and the disposition of the ball forms a puzzle; but the automaton may be operated in various similar ways by the lugs on the drum engaging the operative levers 6 and 8.

Having described our invention, what we claim is—

1. The combination in an automaton, of a figure having movable arms or members, le-

vers connected with said arms or members for moving the same, a rotary drum for actuating the levers, an electric motor for rotating the drum, a coin-chute, an electric circuit connected with the motor, a pair of terminals or contact pieces included in the circuit and against which the coin introduced into the coin-chute bears to make and form part of the electric circuit for setting the motor in action, and devices for moving one of the terminals or contact pieces to release the coin and thereby break the circuit, substantially as described.

2. The combination in an automaton, of a figure having swinging arms or members, levers connected with said arms or members for swinging the same, a rotary drum for actuating the levers, an electric motor for rotating the drum, a coin-chute, an electric circuit connected with the motor, devices for retaining the coin in the coin-chute and completing the circuit to start the motor, and tripping mechanism operated by the rotary drum for releasing the coin from the coin-chute, substantially as described.

3. The combination in an automaton, of a table having orifices, a figure having movable arms or members located above the table, levers arranged under the table, orifice-closers, levers connected with the movable arms or members, a drum having lugs for actuating all of said levers, and an electric motor for operating the drum, and thereby causing the several levers to move the arms or members of the figure and the orifice-closer, substantially as described.

In testimony whereof we have hereunto set our hands.

HARRY D. PURSELL.
EDWIN F. PRICE.

Witnesses:
FRANK M. BATEMAN,
GEORGE W. ALLEN.

(No Model.) 3 Sheets—Sheet 1.

E. T. BIRDSALL.

COIN CONTROLLED THEATRICAL SHOW.

No. 487,510. Patented Dec. 6, 1892.

Fig. 3.

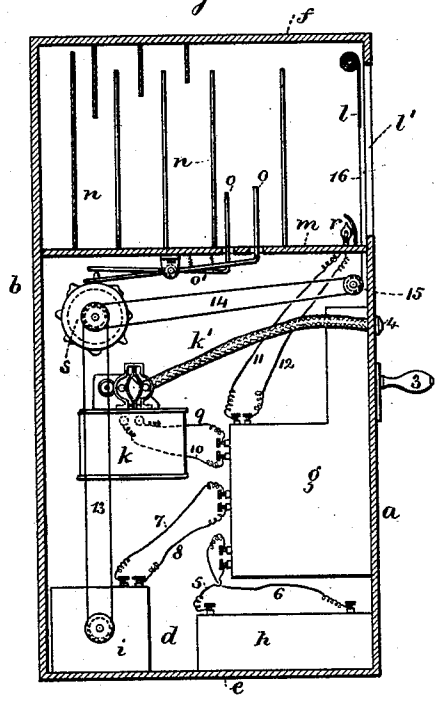


Fig. 2.

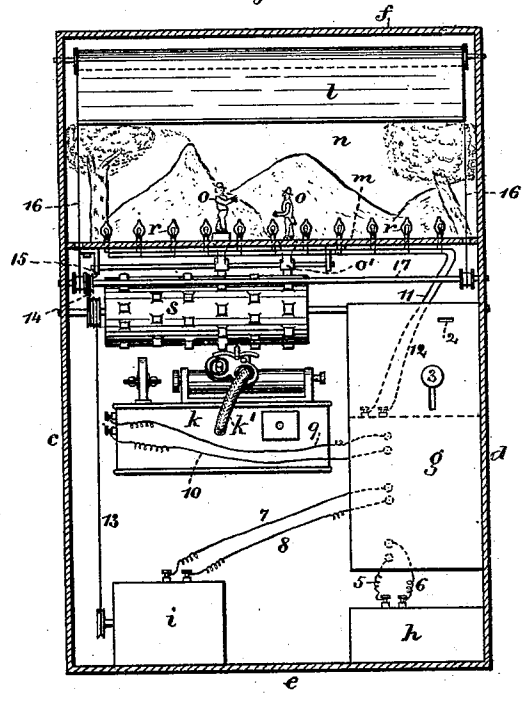
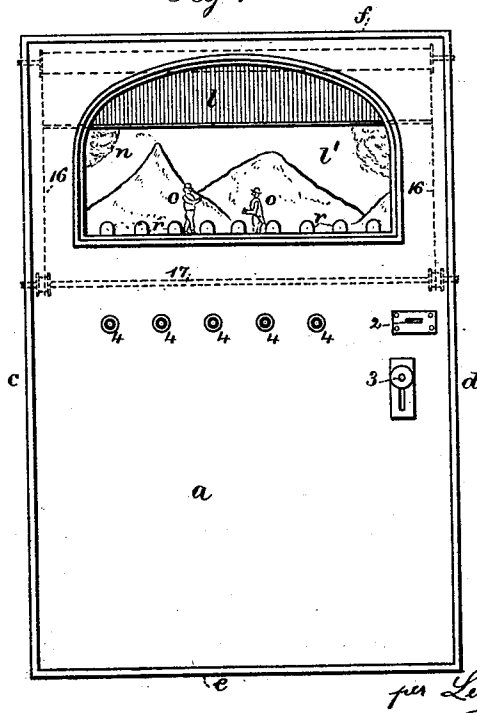


Fig. 1.



Witnesses:
J. Stail
Chas. H. Smith

Inventor:
Edward T. Birdsall
per Lemuel W. Serrell atty.

(No Model.) 3 Sheets—Sheet 2.

E. T. BIRDSALL.

COIN CONTROLLED THEATRICAL SHOW.

No. 487,510. Patented Dec. 6, 1892.

Fig. 5.

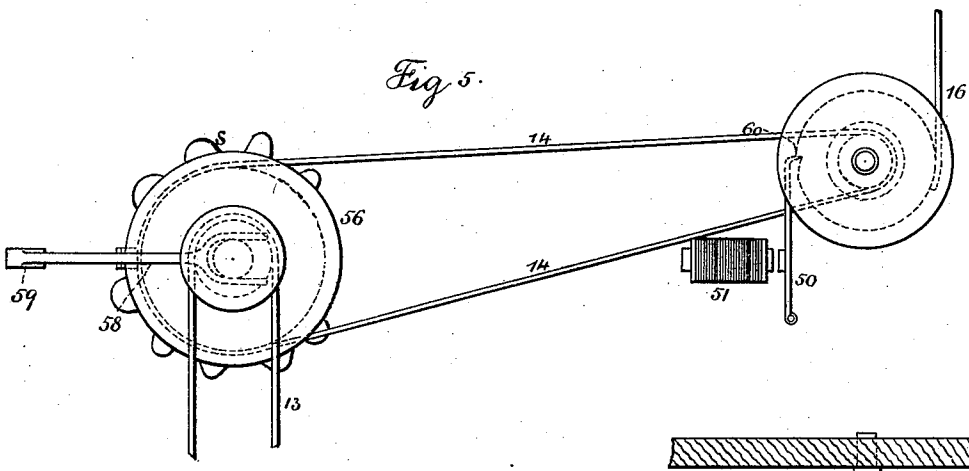
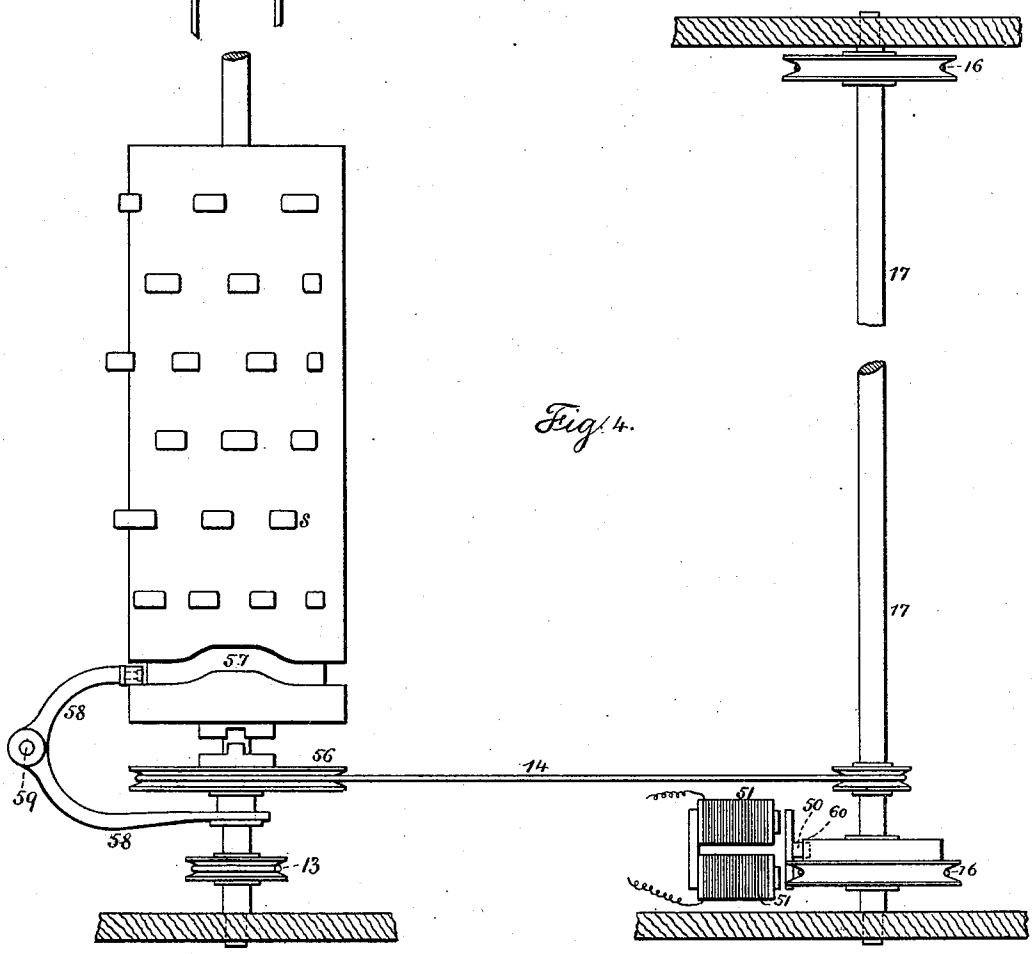


Fig. 4.



Witnesses:
J. Stahl
Chas. H. Smith

Inventor:
Edward T. Birdsall
per Lemuel W. Serrell Atty.

(No Model.) 3 Sheets—Sheet 3.

E. T. BIRDSALL.

COIN CONTROLLED THEATRICAL SHOW.

No. 487,510. Patented Dec. 6, 1892.

Fig. 7.

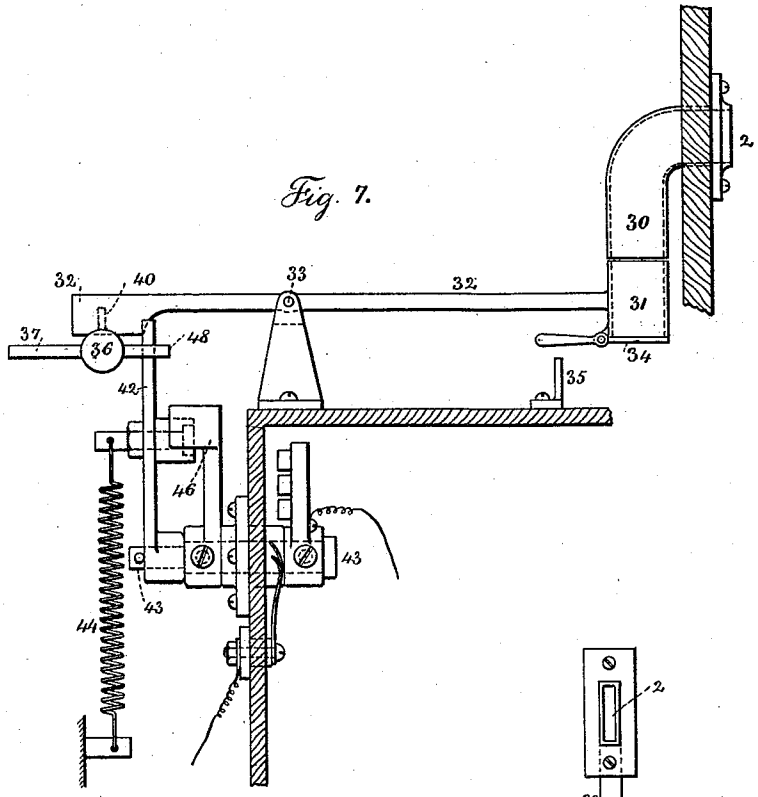
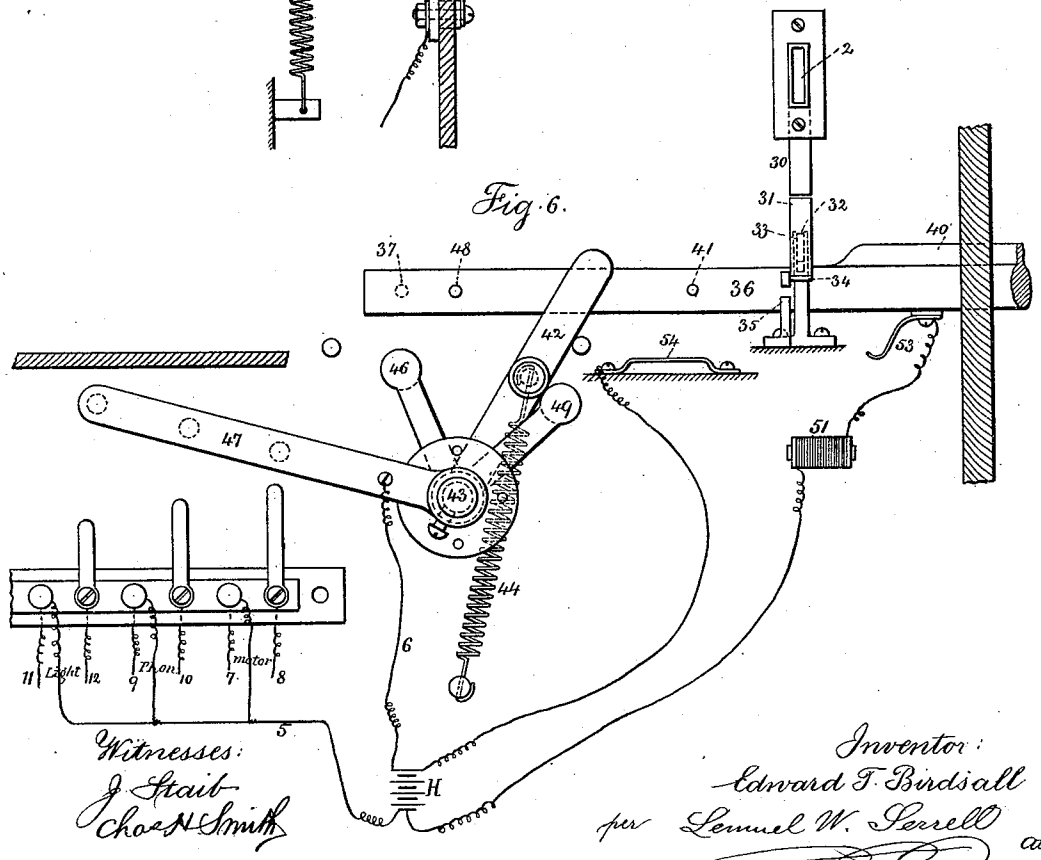


Fig. 6.



Witnesses:
J. Stait
Chas. H. Smith

Inventor:
Edward T. Birdsall
per Samuel W. Serrell
atty

UNITED STATES PATENT OFFICE.

EDWARD T. BIRDSALL, OF NEW YORK, N. Y.

COIN-CONTROLLED THEATRICAL SHOW.

SPECIFICATION forming part of Letters Patent No. 487,510, dated December 6, 1892.

Application filed August 8, 1890. Renewed November 5, 1892. Serial No. 451,031. (No model.)

To all whom it may concern:

Be it known that I, EDWARD T. BIRDSALL, a citizen of the United States, residing at the city, county, and State of New York, have invented a new and useful Improvement in Coin-Controlled Theatrical Shows or Exhibitions, of which the following is a specification.

Coin-actuated devices of various forms have heretofore been employed. Among these may be mentioned toy racing-horses, phonographs, and toy money-boxes having a clockwork mechanism operated by a coin to liberate the clockwork and set moving figures in action.

My invention relates to the combination, with a coin-actuated mechanism, of moving or performing figures and a curtain and scenery to represent a theatrical show or other exhibition, and a phonograph in connection with said moving figures and the other parts that go to make up a theatrical show or other exhibition, and these are all to be contained in a suitable case of such a nature that the contents cannot be tampered with.

In the drawings, Figure 1 represents an elevation of my improved device. Fig. 2 is an elevation of the contents of the case with the front part of the case removed; and Fig. 3 is a side elevation of the contents of the inclosure, the case being in section. Fig. 4 is a diagrammatic plan, and Fig. 5 is a similar elevation, of the curtain-actuating device. Fig. 6 is a diagrammatic elevation of a coin-actuated device and the parts therewith connected, and Fig. 7 is a similar view at right angles to Fig. 6.

The inclosure or case is composed of the front *a*, back *b*, sides *c d*, bottom *e*, and top *f*.

g represents the box or case containing the coin-actuated mechanism, the coin being inserted therein by the slot at 2, and the mechanism being started by a movement of the handle 3. This mechanism may be of any well-known form.

h represents a storage or other battery; *i*, an electric motor.

k represents a phonograph, from which a tube *k'* may pass to the openings 4 in the front *a*, where the listening-tubes are to be inserted. I have shown circuit-wires 5 6 from the battery *h* to the electric coin mechanism *g* and circuit-wires 7 8 from said coin mechanism to the electric motor *i*, and circuit-wires 9 10 from said coin mechanism to the phonograph *k*, whereby the insertion of the coin and the movements of the parts in any well-known form of electric coin mechanism is adapted to complete the circuit, so that the current can pass from the battery to operate the motor or the phonograph.

l represents the curtain, *m* the stage, *n* the scenery, *o* the movable figures, *o'* pivoted arms to which said figures are connected, and *r* represents small incandescent lamps arranged as foot-lights across the front of the stage, and to these are connected circuit-wires 11 12, which pass to the case of the electric coin mechanism.

s represents the rotative cylinder, upon the surface of which at various intervals are projections, and the pivoted arms *o'* at their back ends rest upon the cylinder *s* and are moved up and down by the projections upon the surface of said cylinder to cause the figures *o*, seen from the front of the theatrical show, to move up and down or in other directions. These arms *o'* may be returned to a normal position by small springs or in any other desired manner.

The cylinder *s* is to be mounted in bearings in the case, and I employ a belt 13 from a pulley upon the shaft of the electric motor *i* to a pulley upon the shaft of the cylinder *s*, by which means the cylinder is rotated.

The curtain *l* is to be moved in any desired manner. I have represented a spring-roller at the top, by which the curtain may be drawn up when liberated by automatically releasing a latch or otherwise and cords 16 to spools on the shaft 17, by which the curtain can be drawn at the end of the performance. The belt 14 or any other suitable device may be used to rotate the shaft 17 and draw down the curtain.

I remark that electrically-actuated and coin-controlled devices, having heretofore been made, I have only represented a box *g* as containing any such device and a slot at 2 for the coin and a handle or lever at 3. I am also aware that a phonograph has been driven by an electric motor and brought into action by a coin-actuated device. Hence I have only illustrated such device.

The phonograph and the electrically-actuated and coin-controlled devices may be of

any desired character and the theatrical or scenic representation can be varied; but it is preferable to adapt the scene to the phonograph—for instance, imitation soldiers can be moved in harmony with marching tunes reproduced by the phonograph, the figure of a speaker or singer can be moved in harmony with the phonographic reproductions, or two or more figures can be moved as the parts of a scene or play are reproduced by the phonograph, or figures may be used representing a band of musicians playing the tune that is reproduced by the phonograph, and I remark that a coin-actuated mechanism is not always necessary, as the automatic theatrical or scenic representation may be used simply with the phonograph to furnish a pleasing visual accompaniment to the audible reproductions by the phonograph.

In order to illustrate an apparatus that may be made use of for carrying out the aforesaid operations, I will describe convenient appliances that may be added to the phonograph and coin-actuated mechanism. The coin-slot 2 is represented in Figs. 6 and 7 as in a case 30, with a coin-holder 31 upon the end of the lever 32, pivoted at 33, and the holder 31 has a valve 34 to close the bottom, and the inner end of the lever 32 passes into a notch in the sliding bar 36. This sliding bar 36 is usual in coin-actuated phonographs, and it has a pin 37, by which the diaphragm is moved from one end of the cylinder to the other before the phonograph commences operation, and during the progress of the phonographic cylinder this slide-bar 36 is moved by the pin 37 outwardly. This slide-bar 36 is movable in any desired direction; but I have represented it in Figs. 6 and 7 as occupying a position at right angles to the coin-slot and the lever 32, and hence it will be in line with the cylinder of the phonograph. When the coin is inserted through the slot 2, it falls into the receptacle 31, and its weight is sufficient to lift the back end of the lever 32 out of a notch in the slide-bar 36. Hence such slide-bar can be pushed in, as usual in phonographs, and in so doing the cam 40 on the slide-bar 36 runs under the lever 32, depressing the coin-holder 31, and by the stationary finger 35 tripping the valve 34, allowing the coin to drop out of the holder 31. As the slide-bar 36 is pushed in, the pin 41 comes in contact with an arm 42, swinging loosely upon the shaft 43 and moving the arm against the action of the spring 44, and as soon as the spring and arm pass beyond a straight line the spring 44 causes the arm 42 to act suddenly upon the arm 46 and turn the shaft 43 and the switch 47. This switch brings the electrical devices into action. As the slide-bar 36 is moved outwardly by the action of the phonograph during the reproduction of the sounds the pin 48 acts against the arm 42, and as soon as the same passes beyond a straight line with the spring 44 such spring 44, contracting, causes the arm 42 to act upon the the arm 49 and raises the switch 47, breaking the electrical contacts and stopping the apparatus.

In the diagram Fig. 6 a battery is indicated at H, and the wires 5 and 6 are represented as connected in such a manner that when the switch 47 is moved downwardly it first closes the circuit by the wires 7 to the motor *i*, (see Fig. 2,) the return-circuit being by the wire 8 and spring-contact to the arm 47, and thence by the wire 6 to the battery, and almost simultaneously therewith an electric circuit from the wire 5 is closed through the wire 9 to the motor of the phonograph and the return-circuit through the wire 10 and spring contact to the arm 47 and wire 6, and the lights *r* are rendered incandescent by the electric circuit being closed from the wire 5 through the wire 11 to the electric lights and by the return-wire 12, contact and switch 47, and return-wire 6 to the battery. This serves to illustrate electric connections that may be made use of; but where the apparatus is driven by a branch circuit to an electric-light wire a battery will be dispensed with and the circuit connections may either be in multiple arc or series, or separate cells of battery may be made use of to the respective circuits before mentioned.

As before described, the curtain *l* is preferably wound up by a spring-roller at the top and drawn down by cords 16 to pulleys upon a cross-shaft 17, as indicated in the diagram, Figs. 4 and 5.

In order to allow the curtain to be drawn up suddenly, the pawl 50 may be withdrawn from a tooth or ratchet 60 upon one of the pulleys for the cord 16 by an electro-magnet 51, the circuit connections to which are illustrated in Fig. 6, and as soon as the slide-bar 36 is moved inwardly the spring 53 makes contact with 54 and closes the circuit to the electro-magnet 51 to draw back the pawl 50 and allow the spring to pull up the curtain *l* instantly.

In order to bring the curtain down, the bands 13 and 14 may be made use of, as before mentioned, the latter being driven by the motor at *i*, and the band 13 also drives the cylinder *s*, containing the pins that act upon the figures or other devices of the show.

A convenient way of drawing down the curtain by the band 14 is to provide a loose pulley 56 upon the shaft of the cylinder *s*, which loose pulley 56 is coupled with the cylinder by the action of a cam 57 upon said cylinder *s* and a clutch-lever 58, pivoted at 59 and acting to couple or uncouple the pulley 56, and the parts are to be constructed and timed in such a manner that the pulley 56 is coupled with the cylinder *s* after the toy figures cease to be moved, but the motor must continue to revolve a sufficient time for drawing down the curtain and latching the same by the pawl 50, and at the moment this is done the arm 42 has been moved beyond a straight line with the spring 44, and such spring 44 moves the switch 47, disconnecting the elec-

tric devices, and at this time the phonograph in giving motion to the pin 37 and slide-bar 36 has moved the latter so that the end of the lever 32 has fallen into the notch of said slide-bar 36, so that said bar 36 cannot be pushed in for bringing the phonograph into action again until the coin has been introduced through the slot 2 to raise the lever 32, as before described.

In Figs. 1, 2, and 3 the handle 3 to start the apparatus is represeted as in the front of the case, as in some phonograph-machines; but with the arrangement of parts illustrated in Figs. 6 and 7 this handle will come at one side of the machine and be upon the outer end of the bar 36.

I claim as my invention—

1. The combination, with an inclosure and a coin-actuated mechanism, of a motor, a curtain operated from the same, and mechanism for replacing or drawing down the curtain before the coin-actuated mechanism stops, substantially as set forth.

2. The combination, with an inclosure or case and an electrically coin-actuated mechanism, of a motor, a phonograph, performing figures, connections from the electric coin-actuated mechanism to the motor, the phonograph, and the figures, whereby the phonograph is brought into action simultaneously with the performing figures, substantially as set forth.

3. The combination, with a motor and a phonograph, of performing figures and connections from the motor to the phonograph and to the performing figures, whereby the performing figures are brought into action simultaneously with the phonograph, substantially as set forth.

4. The combination, with a motor and a phonograph, of performing figures, connections from the motor to the phonograph and to the performing figures, whereby the performing figures are brought into action simultaneously with the phonograph, and an electric coin-actuated mechanism for bringing the motor into operation, substantially as set forth.

Signed by me this 4th day of August, 1890.

E. T. BIRDSALL.

Witnesses:
HAROLD SERRELL,
WILLIAM G. MOTT.

(No Model.) 3 Sheets—Sheet 1.

G. MUSIC.

ADVERTISING AUTOMATON FOR STORE WINDOWS.

No. 420,351. Patented Jan. 28, 1890.

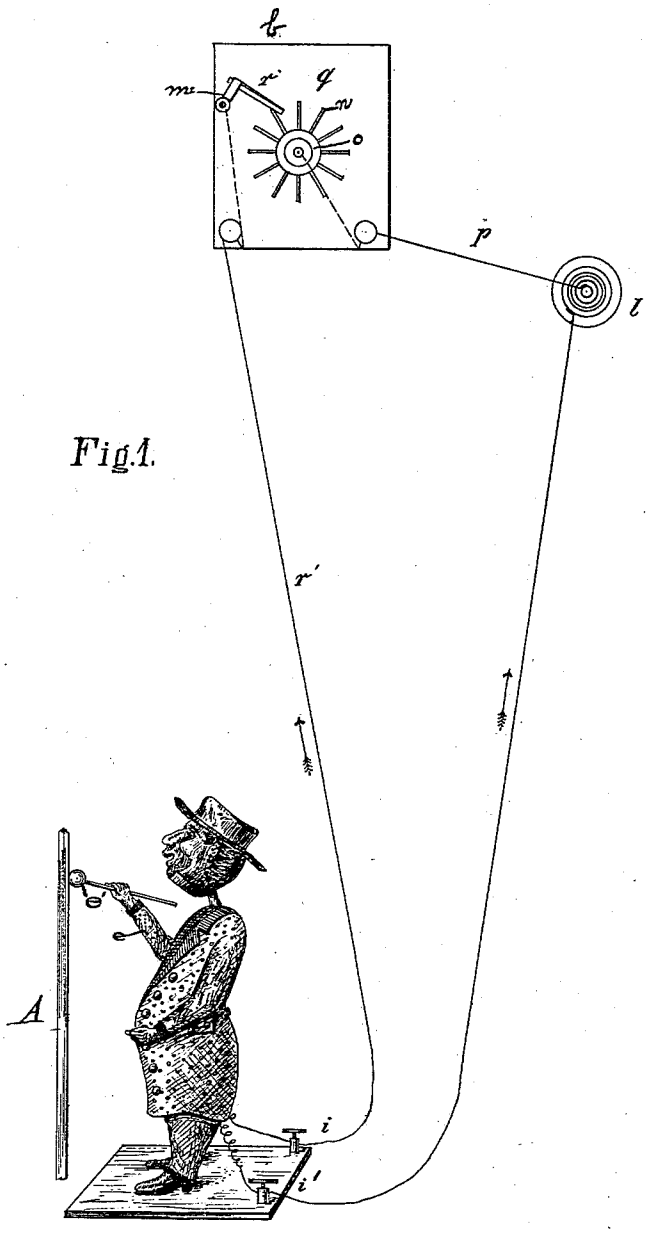


Fig. 1.

Witnesses:
E. C. Duffy
H. E. Peck.

Inventor
Georg Music
per
E. C. Duffy
Attorney

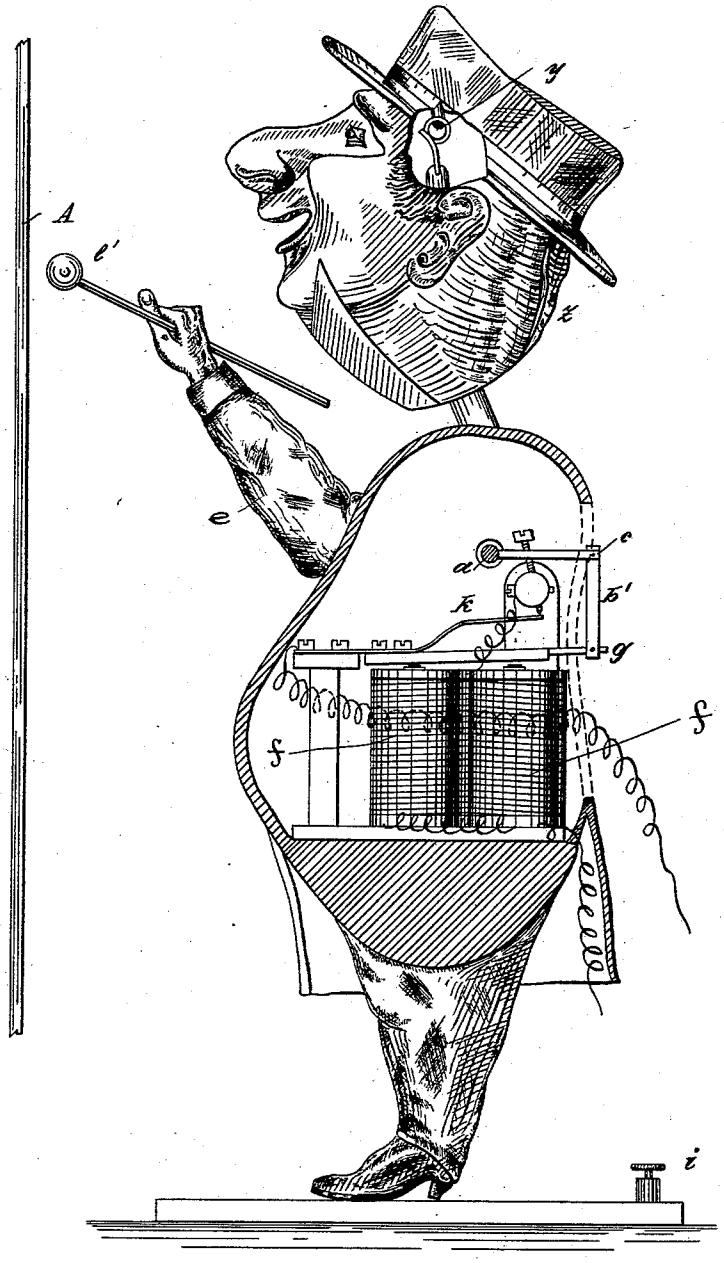
(No Model.) 3 Sheets—Sheet 2.

G. MUSIC.

ADVERTISING AUTOMATON FOR STORE WINDOWS.

No. 420,351. Patented Jan. 28, 1890.

Fig. 2.



Witnesses:
E. C. Duffy
Chas. M. Cook

per

Inventor
Georg Music
A. Holmes

(No Model.) 3 Sheets—Sheet 3.

G. MUSIC.

ADVERTISING AUTOMATON FOR STORE WINDOWS.

No. 420,351. Patented Jan. 28, 1890.

Fig. 4.

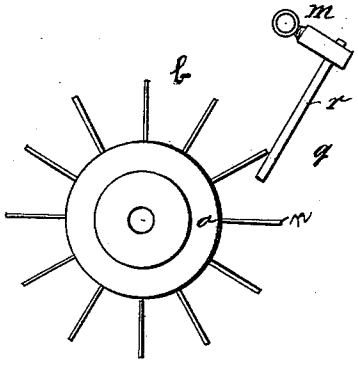


Fig. 3.

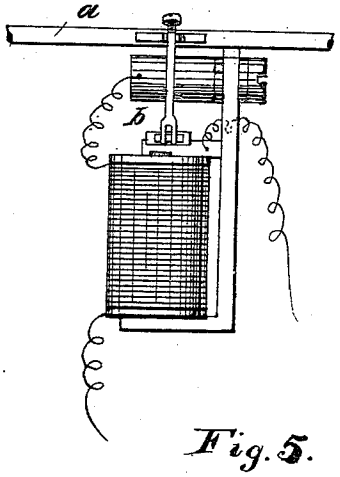
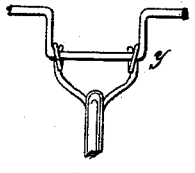


Fig. 5.



Witnesses:
E. C. Duffy
Chas. M. Wertle

Inventor:
Georg Music
per
E. C. Duffy
Attorney

UNITED STATES PATENT OFFICE.

GEORG MUSIC, OF BERLIN, GERMANY.

ADVERTISING-AUTOMATON FOR STORE-WINDOWS.

SPECIFICATION forming part of Letters Patent No. 420,351, dated January 28, 1890.

Application filed July 29, 1889. Serial No. 319,045. (No model.)

To all whom it may concern:

Be it known that I, GEORG MUSIC, manufacturer, of Berlin, in the Kingdom of Prussia, German Empire, have invented a new and useful Advertising-Automaton for the Windows of Stores and the Like, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention hereinafter described relates to an advertising-figure for shop-windows which will attract the attention of passers-by to the shop by reason of the figure striking the window with a small metal or other stick or member or members, and thus producing at certain intervals of time a knocking noise.

The advertising-figure is further distinguished by the fact that it is partly set in motion by clock-work and partly by a source of electricity, inasmuch as the clock-work in the spaces sets to work the electrical connection of the electromotor of the advertising-figure with the battery, while by the source of electricity the induction of the electro-magnet and the movement of the figure are produced. By this means the advantage is obtained that with the assistance of clock-work going for a suitable time the frequent winding up thereof is avoided, while the source of electricity requisite for working the figure—as, for instance, when a Leclanché element is used—lasts several years without regeneration.

The figure mechanism and apparatus constituting this invention is represented in the accompanying drawings.

Figure 1 shows the arrangement and disposition of the apparatus. Fig. 2 shows the advertising-figure in longitudinal section with the electro-magnets. Fig. 3 is a front view of the latter. Fig. 4 shows the arrangement of the contact-closure of the clock-work. Fig. 5 shows the revolving suspension of the head of the advertising-figure.

The invention is arranged as follows: The advertising-figure is placed close before the inside of the shop-window A. The clock-work *b* is constructed like an alarm-clock. The shaft of the center wheel is prolonged through one of the cheeks *q* of the clock-case, and is provided on the outer side with a spur-wheel *o*, which is connected in a suitable manner with one pole *p* of a Leclanché element or a Leclanché battery. On the hard india-rubber plate *q* an insulated pin *m* is fixed, on which a spring *r* or a lever is fixed and can revolve. The spring *r* or the lever is connected through the conductor *r'* with the binding-screw *i* on the advertising-figure. When the wheel *o* is set in rotation by the clock-work, the flies *n* of the spur-wheel *o* come from time to time in contact with the spring *r*, and the electric current coming from the pole *p* is connected to the advertising-figure through *p*, *o*, *r*, *r'*, and *i*.

The advertising-figure, Fig. 2, represents the figure of a man, or it may be an animal or any other figure or body-section, &c., and has in the interior or at the back the electro-magnets *f f*, (*f* is not shown in the drawings,) over the iron core of which the armature *g* plays. The armature *g* is connected by a lever *b'* with a second lever *c*, and the latter is firmly fixed on the shaft *a*. In the accompanying figure the shaft *a* has at one end the arm *e*, which carries the stick with its knob *e'*. The electro-magnets *f f* are connected with the contact *i* and the spring-connector *k* with the contact *i'*, which leads back to the battery.

If an electric current goes to the advertising-figure during the time that the current is closed, the armature *g* will be rapidly pulled and pushed, and will accordingly set the arm *e* in rapid oscillation. The knob *e'* strikes against the window-pane A, and then makes a quick knocking noise. As soon as the fly *n* has left the spring *r* the contact is interrupted and the advertising-figure ceases acting.

In the advertising-figure shown in Fig. 2 the head *z* is suspended so as to oscillate from *y*, so that with the vibrations to which the figure is exposed in knocking the knob *e'* against the window A the head performs a nodding motion.

The electro-magnet and its oscillating lever may be of any construction, suspended so as to revolve either horizontally or vertically with spring action, &c.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. A figure having a movable member adapted to be rapidly oscillated, for the purpose set forth, and an electric motor in the figure connected to oscillate said member, in

combination with a source of electricity connected with said motor and an automatic circuit maker and breaker in the circuit, substantially as described.

2. The combination, with a figure having a vibratory member, an electro-magnetic motor in the figure, and a rock-shaft connecting said motor and member to vibrate the same, of a circuit including said motor and a source of electricity and an automatic circuit maker and breaker in said circuit, substantially as described.

3. An automaton having its head balanced on the body so as to vibrate independent of other parts, an oscillating member for said figure adapted to rapidly rap against a window-glass and thereby jar and vibrate the head, and an electro-magnetic motor in the figure to oscillate said member, substantially as described.

4. The combination, with a figure having a movable member and an electric motor therein, of a circuit including said motor and a source of electricity, and a circuit maker and breaker in the circuit comprising a stationary spring-contact and a wheel having projecting flies to engage said spring-contact and mounted on the shaft of a clock-work, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

GEORG MUSIC.

Witnesses:
B. ROI,
PAUL FISCHER.

(No Model.) 2 Sheets—Sheet 1.

R. G. SHUTE.

ANDROIDES OR AUTOMATON SHOE FACTORY.

No. 284,338. Patented Sept. 4, 1883.

Fig. 1.

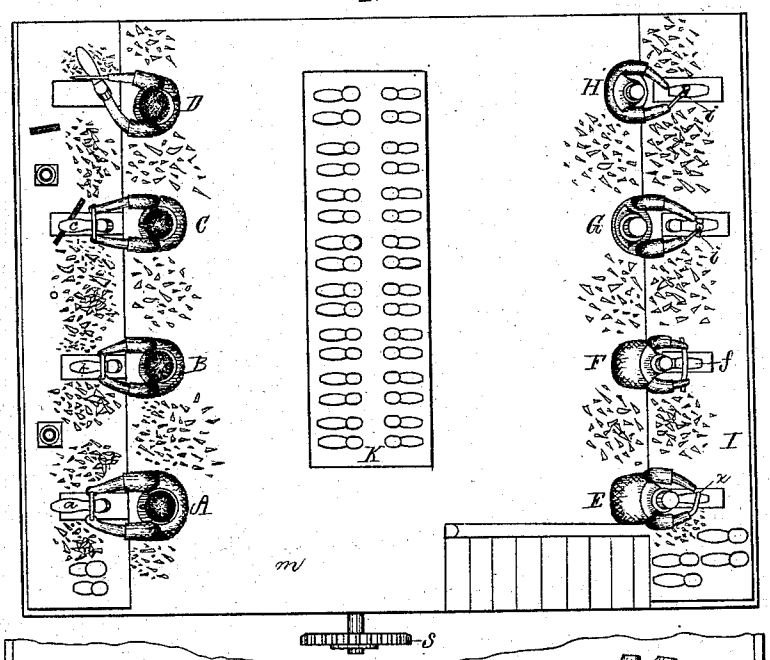


Fig. 2.

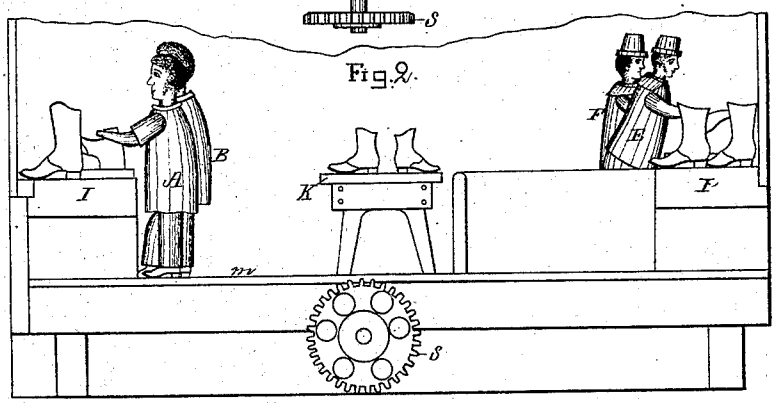
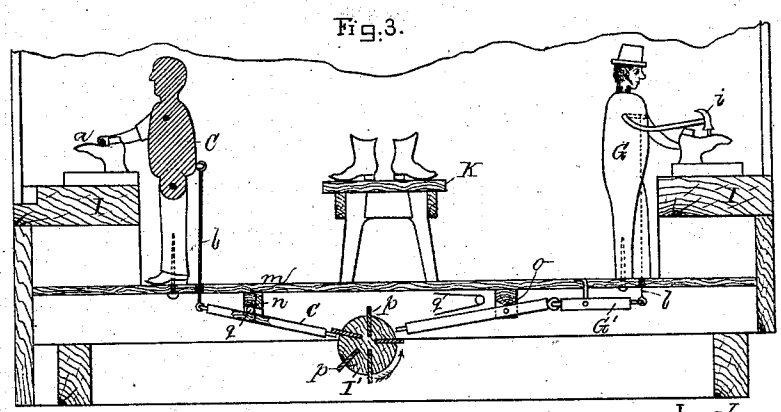


Fig. 3.



Witnesses.
S. N. Piper
E. G. Pratt

Inventor.
Richard Gardner Shute
by R. H. Eddy atty.

(No Model.) 2 Sheets—Sheet 2.

R. G. SHUTE.

ANDROIDES OR AUTOMATON SHOE FACTORY.

No. 284,338. Patented Sept. 4, 1883.

Fig. 4

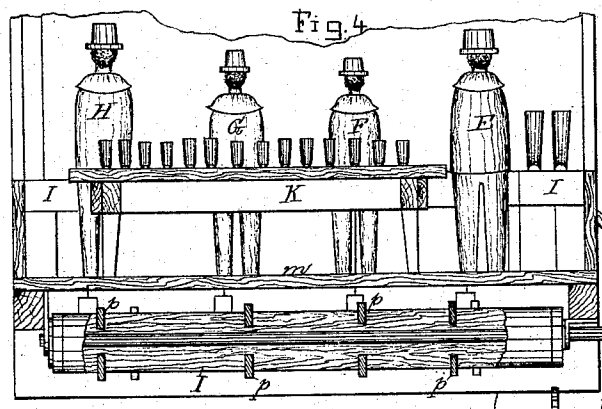
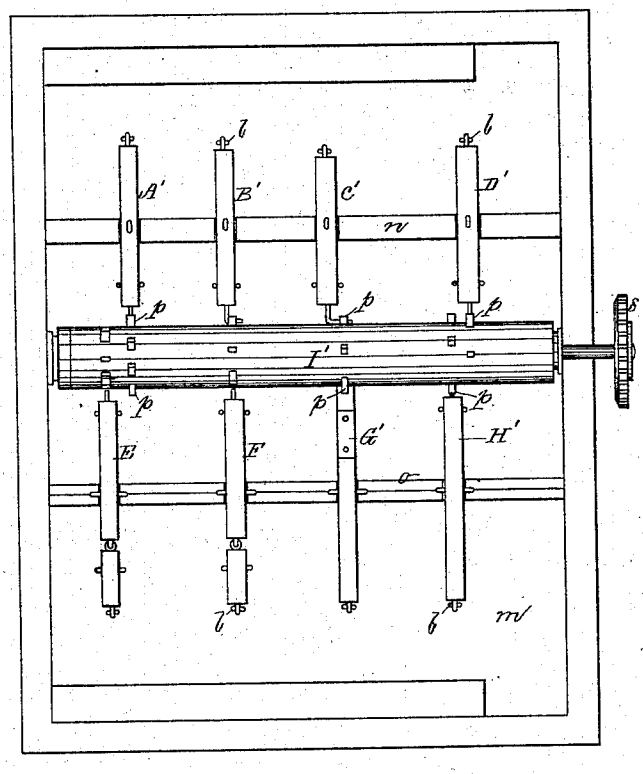


Fig. 5.



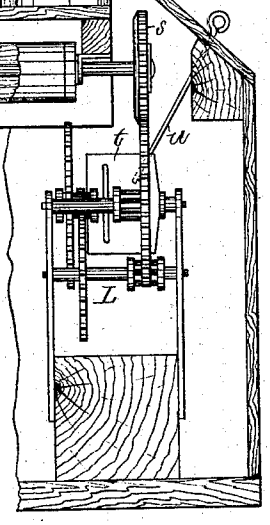


Fig. 7.

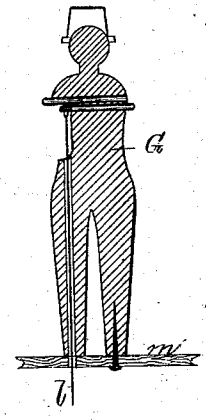
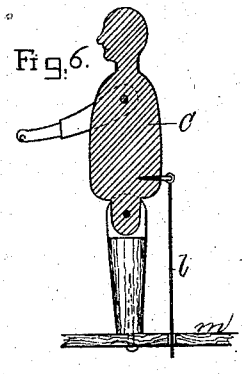


Fig. 6.



Witnesses.

S. N. Piper.

E. B. Pratt

Inventor.

Richard Gardner Shute.

by R. H. Eddy atty.

UNITED STATES PATENT OFFICE.

RICHARD GARDNER SHUTE, OF EDGARTOWN, MASSACHUSETTS.

ANDROIDES OR AUTOMATON SHOE-FACTORY.

SPECIFICATION forming part of Letters Patent No. 284,338, dated September 4, 1883.

Application filed August 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, RICHARD GARDNER SHUTE, of Edgartown, in the county of Dukes, of the Commonwealth of Massachusetts, have invented a new and useful Improvement in Androides or Automaton Shoe-Factories; and I do hereby declare the same to be described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a top view; Fig. 2, a rear elevation; Figs. 3 and 4 transverse sections of two views of androides, and their operative mechism constituting my invention, such androides representing the shoe-factory operatives at work at their benches. Fig. 5 is an under side view of the toothed shaft and the levers for operating the androides. Fig. 6 is a vertical section of one of the body-moving androides, and the mechanism connecting its body with its working-lever. Fig. 7 is a vertical section of one of the arm-moving androides, and the mechanism connecting its arm with its operative lever.

There are four of the androides in each series, those of one series being marked A, B, C, and D, and those of the other E, F, G, and H. The three, A, B, and C, of the first series, and one, F, of the second are represented as engaged in buffing the soles *a*, *b*, *c*, and *f*, their arms being simply pivoted to their bodies, which are pivoted to their legs, so as to be capable of vibrating toward and from the shoes. Each of the remaining androides—viz., those marked E, G, and H—has one arm pivoted to the body at the shoulder, so as to be movable up and down, such arm being represented as holding a hammer, *i*, or a file or other tool, *x*, over a shoe. Each series of the androides has a bench, I, in front of it, and between them is a table, K, having shoes upon it. The invention is not limited to the exact number mentioned of androides to each series, as it may be composed of a greater or less number of them. From the movable part of each android a rod, *z*, is jointed and extends down through the floor or base *m*, on which the two series are arranged. At its lesser end the said rod is jointed to the outer arm of one of a set of levers. Beneath the floor or base, and fulcrumed to bars *n o* extending across it, are two sets of levers, A′ B′ C′ D′, and E′ F′ G′ H′, between which is a shaft or barrel, I′, provided with teeth *p* to act against and move such levers at proper times, while such shaft or barrel may be revolved. Each lever is furnished with a spring, *q*, to move it in the direction opposite to that in which it may be moved by the toothed shaft. To some of the androides there may be two working-levers to each, the levers of the pair having their lesser arms jointed together. On one end of the rotary shaft or barrel is the gear *s* of a clock-movement or train, L, whose retarding-fly is shown at *t*. A rod to slide into and out of the path of the fly is shown at *u*. By moving or sliding the said rod down into such path the fly by it may be stopped from revolving, it being caused to revolve by the power of the actuating-spring of the train, when such spring is wound up or contracted. The train on being set in movement, will cause the toothed barrel or shaft to revolve and put in motion in the order required, the movable part of each figure or android. The sets of automata will thus be made to appear to be at work, like the operatives of a shoe-factory.

I claim—

1. The combination of the toothed barrel or shaft, the two sets of levers, their operative springs, and the two series of androides, as described, having a part of each android movable and connected with one of the levers, so as to be movable thereby, as explained.

2. The combination of the clock-movement and its stopping-slide, with the toothed shaft or barrel, the two series of levers, their operative springs, and the two series of androides having a part of each android movable and connected with one of the levers, so as to be movable thereby, as set forth.

RICHARD GARDNER SHUTE.

Witnesses:

R. H. EDDY,

E. B. PRATT.