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ELECTRICALLY OPERATED COIN CONTROLLED MECHANISM

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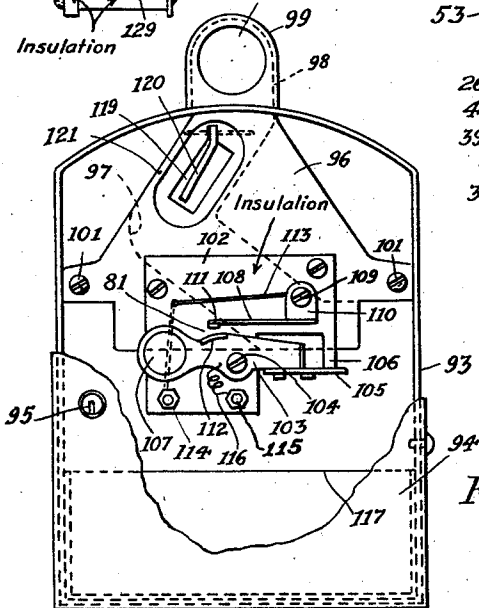
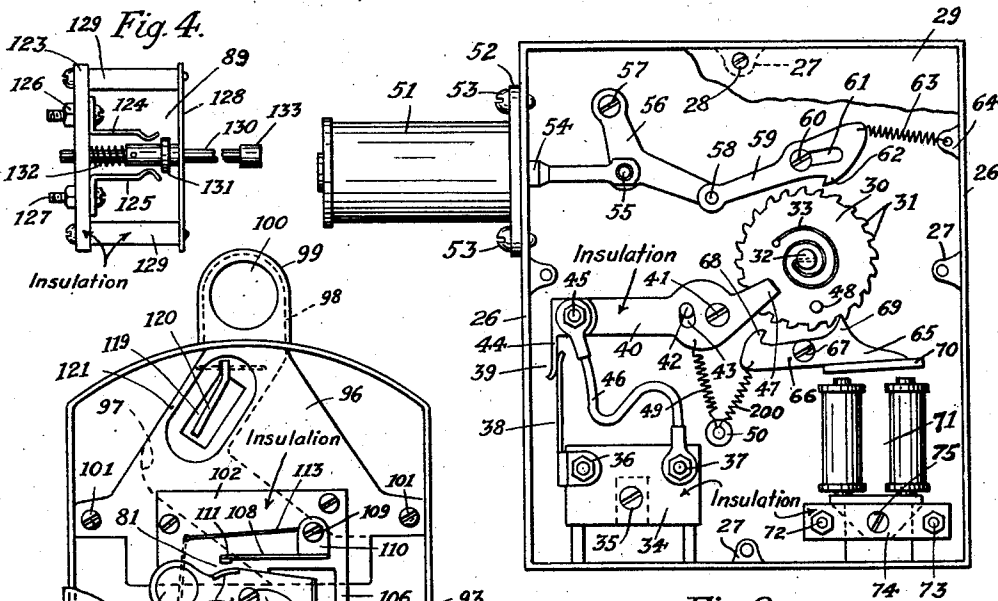
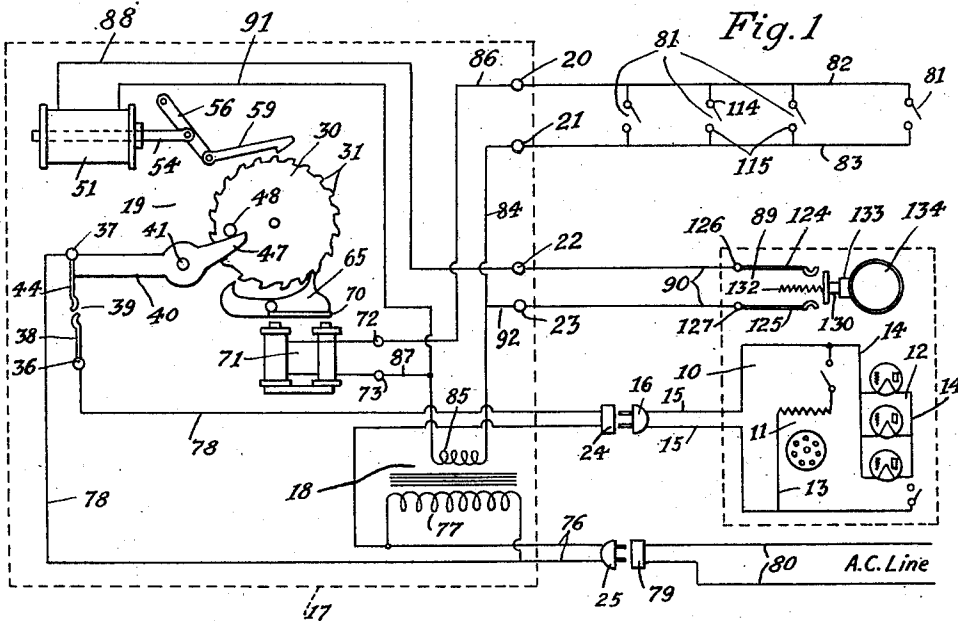


Fig. 2

Fig. 3

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ELECTRICALLY OPERATED COIN CONTROLLED MECHANISM

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My invention relates to electrically operated coin controlled mechanisms and has for its object to provide a device whereby a musical instrument may be played upon the insertion of a coin into the coin controlled apparatus thereof.

Another object of the invention resides in providing means whereby an electrically operated musical instrument may be played a number of times corresponding to the number of coins inserted into the coin controlled apparatus.

A still further object of the invention resides in providing a device which may be attached to any existing electrically operated musical instrument as a separate unit and without requiring the alteration or reconstruction of the musical instrument or the wiring thereof.

Another object of the invention resides in providing a device whereby the musical instrument may be readily disconnected and used in the ordinary manner whenever desired.

An object of the invention resides in providing a unit containing the operating mechanism of my invention, said unit having a line issuing therefrom adapted to be connected to a suitable electric power outlet, another line issuing outwardly therefrom and adapted to be connected to a suitable cut off switch, and outlets for connection for the musical instrument operating line and the coin controlled apparatus line.

Another object of the invention resides in providing a toothed revoluble member and in connecting therewith an operating switch adapted to be opened and closed upon movement of said member in opposite directions.

A still further object of the invention resides in providing electromagnets and members operated thereby adapted to engage the teeth of said revoluble member to give the same a step by step movement in opposite directions.

An object of the invention resides in providing a circuit connected to one of said magnets and including a coin controlled switch for operating the same.

A still further object of the invention re-

sides in providing a circuit for the other of said magnets and in including in said circuit a cut off switch adapted to be operated by a movable part of the musical instrument to open said operating switch upon the playing of a number of records corresponding to the number of coins inserted into the coin controlled apparatus.

Other objects of the invention reside in the details of construction thereof, and in the novel combination and arrangement of parts hereinafter illustrated or described.

In the drawings:

Fig. 1 is a wiring diagram illustrating an embodiment of my invention.

Fig. 2 is a side elevational view of the operating switch and operating mechanism therefor.

Fig. 3 is a view similar to Fig. 2 of the coin operated switch used with my invention.

Fig. 4 is a side elevational view of the cut off switch used with my invention.

In Fig. 1 of the drawings, I have diagrammatically indicated at 10 an electrically operated musical instrument which, for the purpose of illustration, may be considered as an electrically operated phonograph, though it can readily be comprehended that any other electrically operated musical instrument or similar device may be equally as well substituted in place thereof. This device includes an electrical motor 11 and a number of audio amplifying tubes 12 which are connected in the usual manner by means of lines 13 and 14 to an input line 15 leading from the case in which the musical instrument is installed. The line 15 terminates in a plug 16 which, in the ordinary use of the phonograph, is adapted to be inserted into any light socket whereby the phonograph or other musical instrument may be energized. This construction being well known in the art and forming no particular feature of my invention has not been described in detail further than to state that the line 15—15 serves as the input line through which the phonograph is supplied with electrical energy for the operation thereof.

The invention proper consists of a number of devices which are all mounted within a

single case, which case has been diagrammatically indicated by dotted lines at 17 in Fig. 1. Within this case are positioned a step down transformer 18 adapted to be utilized when alternating current is employed and an operating switch together with the operating mechanism therefor, indicated in its entirety at 19. Said case is further provided with terminals 20, 21, 22 and 23 and with a receptacle 24 and an outlet plug 25 by means of which the various mechanisms may be electrically connected to one another. It can be readily comprehended that binding posts, plugs or sockets may be interchangeably used in these particular instances, the said construction being chosen merely for the purpose of giving greatest flexibility to the device.

The structure indicated at 19 is shown in detail in Fig. 2. This device comprises a case 26 which is formed with a number of lugs 27 threaded to receive machine screws 28 by means of which a cover 29 may be secured to the same to enclose the interior of the case. Within this case is mounted for rotation a wheel 30 which is formed along the outer periphery thereof with a number of spaced teeth 31. The wheel 30 is journaled upon a stud 32 and is adapted to rotate in either direction. A spiral spring 33 encircles the axis of stud 32 and is secured at one end to the said stud and at its other end to the wheel 30 and serves to give the wheel 30 a clockwise rotation when the said wheel has been previously turned in a counter-clockwise direction.

Within the case 26 is mounted a switch for operating the musical instrument which switch I have termed an operating switch and which is indicated in its entirety at 39. This switch includes an insulating block 34 which is attached to said case by means of a screw 35. This block has mounted on it two binding posts 36 and 37, binding post 36 having attached to it a leaf spring 38 serving as one of the contacts of said operating switch. Immediately above the block 34 is pivoted to the case 26 a lever 40 constructed of insulating material which is mounted for oscillation upon a pivot 41 secured to said case. A pin 42, operating through a hole 43 in said lever, limits the movement of the same. At the extreme end of lever 40 is attached to it by means of a bolt 45, a second leaf spring 44 which serves as the other contact of the switch 39. This leaf spring is connected by means of a flexible conductor 46 to the binding post 37 to which the conductors in the circuit controlled by the said switch are connected. The lever 40 is constructed with an outwardly extending arm 47 which is adapted to be engaged by a pin 48 secured to the face of the wheel 30. As the said wheel rotates in a counter-clockwise direction, the pin 48 engages the upper surface of the arm

47, swinging lever 40 in a manner to separate the leaf springs 44 and 38 from one another so as to open the switch 39. A tension coil spring 49 secured to a lug 50 on the case 26 and to the lever 40 serves to hold the switch 39 in closed position. As soon as the wheel 30 travels in a clockwise direction, pin 48 leaves the arm 47 which causes the said switch 39 to close through the action of spring 49.

For causing the rotation of the wheel 30 in a counter-clockwise direction, I employ an electromagnet 51 which may be of ordinary construction. This electromagnet is provided with a base 52 and is attached to the side of the case 26 through screws 53. The electromagnet 51 is preferably of the plunger type and is provided with a plunger 54 adapted to be moved longitudinally along said electromagnet upon energizing the same. This plunger is pivotally connected by means of a pin 55 to a lever 56 which in turn is pivoted at one end thereof through a pivot 57 to the case 26. The other end of the said lever is pivoted through a rivet 58 to the end of a link 59 which extends immediately above the toothed wheel 30. This link is slidably mounted at the free end thereof through a screw 60 screwed into the case 26, which screw is received within a slot 61 formed in the free end of the said link. As the plunger 54 is drawn into the magnet 51 upon the energizing of the same, the free end of the link 59 is given a combined radial and tangential movement with respect to the wheel 30 which causes a hook 62 formed thereon to engage with one of the teeth 31 of the said wheel and move the same tangentially a distance equal to or greater than the pitch of the said teeth. A tension coil spring 63 secured to the free end of the link 59 and to a lug 64 on case 26 serves to withdraw the link 59 from operative engagement with the wheel 30 and to bring the plunger 54 back to its normal position from which it may again be attracted by the magnet 51 when the same is energized.

For causing the movement of the wheel 30 in a clockwise direction, an escapement 65 is employed which consists of an arm 66 pivoted on a screw 67 attached to the case proper. This arm has formed on it two pallets 68 and 69 which are adapted to alternately engage the teeth 31 of wheel 30 to procure a tooth by tooth movement of said wheel through the action of spring 33 as the said arm 66 is oscillated. Arm 66 has attached to it the armature 70 of an electromagnet 71 which is mounted in the lower portion of the case 26. This electromagnet is connected to two binding posts 72 and 73 on an insulating block 74 which is attached to the case 26 by a screw 75. When the electromagnet 71 is energized, the armature 70 is attracted, which causes the wheel 30 to move a distance equal to the pitch between the teeth thereof in a clockwise di-

rection. Arm 66 is returned to normal position through a spring 200 connected to it and to the lug 50.

The system of wiring used with my invention is shown in Fig. 1. The leads 76 from the plug 25 on the case 17 are directly connected to the primary 77 of the transformer 18. A circuit 78 is also connected to the leads 76, which circuit includes the socket 24 and the switch 39. The plug 16 of the phonograph 10 is adapted to be inserted into the socket 24. In a similar manner, the plug 25 is adapted to be inserted into a socket 79, which socket may be connected to any suitable alternating current line 80. When the switch 39 is closed, the current from the line 80 is transferred to the circuit 78 through the socket 24 whereby the same is brought into the phonograph to operate the same through the input line 15 thereof.

For actuating the circuit 78, a plurality of coin controlled switches 81 are employed which are connected in parallel across two leads 82 and 83 connected to the terminals 20 and 21 on the case 17. A lead 84 runs from the terminal 21 to one side of the secondary 85 of transformer 18, while another lead 86 runs from the other terminal 20 directly to the terminal 72 of the magnet 71. A lead 87 is connected to the terminal 73 of said electromagnet and to the other side of the secondary 85 of transformer 18 so that, upon closing any of the switches 81, magnet 71 is operated to cause the oscillation of the escapement 65 and the corresponding clockwise movement of the wheel 30 tooth by tooth.

For rotating the wheel 30 in a counter-clockwise direction, I employ a switch indicated in its entirety at 89 and which is adapted to be positioned in a manner to be operated by a movable part of the phonograph for closure thereof. This switch is directly connected by means of a line 90 with terminals 22 and 23 of case 17. One of the leads 88 of electromagnet 51 is connected to the terminal 22 while the other lead 91 of said electromagnet is connected to one terminal of the secondary 85 of the transformer 18. The other side of the secondary 85 of transformer 18 is directly connected to the terminal 23 through a lead 92. It will now become apparent that on closing the switch 89, the circuit 88—91 is energized, causing the electromagnet 51 to operate the link 59 and give the wheel 30 a step by step counter-clockwise movement against the action of spring 33.

The coin controlled device of which the switch 81 forms a part is shown in detail in Fig. 3. This device comprises a case 93 adapted to be closed by means of a cover 94 having a lock 95 thereon. Within the upper portion of the case 93 is disposed a support 96 in which is formed a zig-zag coin passageway 97. This passageway communicates with a coin slot 98 formed in a member 99

into which the coins may be inserted through an opening 100 therein. The support 96 is attached to the case 93 through screws 101. At the lower portion of the support 96 is attached an insulating block 102 which has pivoted to it a swinging lever 103 mounted on a pivot 104. This lever is provided at one end with a shelf-like member 105 which is adapted to engage a stop 106 on the insulating block 102 and which is retained in engagement therewith through a weight 107 attached to the other end of said lever. A leaf spring 108 is attached to the insulating block 102 through a screw 109 which screw passes through an ear 110 on said leaf spring. This leaf spring is formed on one end thereof with a contact 111 adapted to contact with a corresponding contact 112 formed on the lever 103 when said lever is oscillated by depressing the shelf-like member 105. These contacts form the contacts of the manually controlled coin operated switches 81 previously referred to which are connected across the line 82—83 as shown in Fig. 1. The leaf spring 108 is connected through a conductor 113 with a binding post 114 secured to the lower end of the insulating block 102. This conductor is secured beneath the screw 109 holding the said contact member in place. In a similar manner, the lever 103 is connected by a flexible conductor 116 secured thereto to another binding post 115 attached to said insulating block.

In the operation of the coin controlled device, a coin of proper denomination inserted in the opening 100 of member 99 passes through the slot 98 therein and along the passageway 97. Upon leaving said passageway, the same drops on the shelf-like member 105 of lever 103 and depresses said lever causing the contacts 111 and 112 to contact and close the switch 81. As the said lever swings upon the pivot 104, the coin rolls off the shelf-like member 105 and into a suitable receptacle 117 disposed in the bottom of the case 93 and from which the same may be removed by the attendant by unlocking the cover 94.

The coin controlled mechanism may be constructed to eject coins of smaller size than those of the proper denomination if desired. For this purpose, the mounting 96 is constructed with an opening 119 in which is pivotally mounted a movable kicker 120 normally extending across the passageway 97. When a coin of proper size passes through said passageway, the same is retained within said slot through a portion 121 of the support 96, thereby forcing the kicker 120 out of the said passageway as the coin continues in its passage therethrough. When a coin of smaller size is passed through the passageway 97, the same falls short of the portion 121 and the said coin is ejected by the kicker 120 out of the passageway 97 without actuating

the lever 103 and hence does not close the switch 81.

A form of switch capable of use as switch 89 is shown in detail in Fig. 4. This switch comprises a base of insulating material 123 which carries two contacts 124 and 125 insulated from one another. These contacts are held in place on the base 123 by means of binding posts 126 and 127. Mounted in spaced relation with respect to the base 123 is a plate 128 which is attached thereto by means of posts of insulation 129. In this plate and the base 123 is mounted for reciprocable movement a plunger 130 which is formed with a disc 131 adapted to simultaneously contact with the contacts 124 and 125 and to close the switch 89. A spring 132, positioned upon the plunger 130 and seated at one end against the base 123 and at the other end against the disc member 131, serves to hold said disc out of engagement with the contacts 124 and 125. Upon the end of the plunger 130 is attached a button 133 which is adapted to be engaged by a movable part of the phonograph or other electrically operated musical instrument with which the device is to be used. Where the invention is used in conjunction with a phonograph, the button 133 is so disposed as to be engaged by the tone arm of the phonograph when the same reaches the end of its path of movement after having finished the playing of a record mounted upon the turn table of the phonograph proper.

The operation of my invention is as follows: When the mechanism is in normally inoperative position, the parts are arranged as shown in Fig. 1 with the pin 48 engaging the arm 47 of lever 48 and holding the switch 39 open. Upon inserting the plug 16 into the socket 24 and the plug 25 into the socket 79, the primary 77 of transformer 18 is energized. As soon as a proper coin is inserted into the coin mechanism, one of the switches 81 is closed and a circuit completed through the leads 83 and 84, the secondary 85 of transformer 18, the electromagnet 71, and the leads 86 and 82. This energizes the said electromagnet which draws the armature 70 downwardly and permits of the escapement of one tooth of the wheel 30 through the action of spring 33. This causes the closing of the switch 39 through movement of the lever 40 due to the withdrawal of the pin 48 from engagement with the arm 47. Upon the closing of switch 39, the circuit 78 is completed, which energizes the line 15 and sets the phonograph in operation. As soon as the record on the phonograph has been played, and the tone arm, which I have indicated at 134 in Fig. 1, engages the button 133 on the plunger 130, the said plunger moves against the action of spring 132 to bring the disc 131 into contact with the contacts 124 and 125 and to close the switch 89. This completes the circuit

comprising the secondary 85 of transformer 18, magnet 51, and leads 88, 90, 92, 87 and 91, which results in energizing the electromagnet 51. The link 59 is then actuated by the electromagnet and the wheel 30 rotated in a counter-clockwise direction to cause the pin 48 to engage arm 47 and open the switch 39. This deenergizes the line 15 which cuts off the phonograph causing the apparatus to be reset in its normally inoperative position.

In the installation of the switch 89 with respect to the tone arm, the same is installed to engage with the tone arm at the end of its path of movement. The momentum of the parts operating the phonograph is usually sufficient to cause the tone arm to move away from the button 133 before all of the energy of the moving parts of the phonograph have been expended so as to leave the switch 89 normally open when the parts of the phonograph finally come to rest.

When a number of coins are successively inserted in the various coin actuated mechanisms and the switches 81 repeatedly operated, the wheel 30 is given a step by step movement corresponding to the number of coins inserted. The closing of switch 89 merely causes the link 59 to move the wheel 30 in a counter-clockwise direction one step at a time. It will hence be readily comprehended that the device serves to operate the phonograph so as to play a number of records corresponding to the number of coins inserted into the coin controlled mechanism. In this manner, one record may be played for each coin inserted, and when the last record is played, the phonograph or other musical instrument is automatically cut off.

My invention is highly advantageous in that a simple and positive device is provided where an electrically operated musical instrument may be operated by coin controlled mechanism without interfering with or without changing the structure of the phonograph or the wiring thereof. The input line for the phonograph is directly plugged into the proper socket of the device and a simple switch installed within the phonograph adapted to be engaged by the tone arm of the phonograph. The various coin controlled devices may be distributed wherever desired and connected to the line controlling the actuation of the device so that remote control may be had for the operation of the phonograph. The device is particularly adaptable for use with phonographs and similar musical instruments previously installed where reconstruction or alteration of the same would be highly impractical.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I

claim as new and desire to protect by Letters Patent is:

1. In combination with the input line of an electrically controlled musical instrument, a unit remotely disposed therefrom, an operating switch within said unit, a power line connected to said unit, a service line issuing from said unit and connected to said switch and power line, said service line being adapted to be connected to the input line of said musical instrument for actuating the same, a manually controlled switch connected to said unit, means for closing said operating switch upon closure of said manually operated switch, and a cut off switch connected with a moving part of the musical instrument for disconnecting said operating switch upon the playing of a record on said musical instrument.
2. An actuating mechanism for musical instruments comprising a movable member, an operating switch adapted to be opened and closed through the movement of said member, means for giving said member a step by step movement in one direction, said switch being adapted to be closed upon the first step by step movement of said member and to remain closed for each succeeding step by step movement of said member, means for giving said member a corresponding step by step movement in the other direction, a manually controlled device for actuating said first named means, said second named means becoming operable upon the passing of the device operated by said operating circuit through one of the cycles of operation thereof, and said switch being adapted to be opened upon the second named means being operated the same number of times as the first named means.
3. An actuating mechanism for musical instruments comprising a movable member, an operating switch adapted to be opened and closed by the movement of said member, an electromagnet, means operated thereby for giving said member a step by step movement in one direction, a second electromagnet, means operated thereby for controlling the movement of said member in the opposite direction, manually controlled means for energizing one of said electromagnets, a circuit connected to said other electromagnet, and a switch therein for closing said circuit.
4. An actuating mechanism for musical instruments comprising a revoluble member, teeth formed on said member, an electromagnet, a member operated by said electromagnet for moving said revoluble member tooth by tooth, an operating switch adapted to be closed by said revoluble member, a second electromagnet, means actuated thereby for causing the movement of said revoluble member tooth by tooth in the opposite direction, a manually closed circuit for operating one of said electromagnets, and a mechanically

closed circuit for operating the other of said electromagnets.

5. In combination with the input line of an electrically operated musical instrument, an operating switch, an operating line connected therewith and adapted to be connected to said input line, a power line adapted to be connected to said operating line, a pair of electromagnets, means operated by one of said electromagnets for closing said operating switch, a line connected to said electromagnet, a manually controlled switch in said line for energizing said electromagnet, means operated by the other of said electromagnets for opening said operating switch, a line connected to said other electromagnet, and a switch adapted to be closed through engagement with a moving part of said musical instrument for energizing said second electromagnet to open said operating switch.
6. In combination with the input line of an electrically operated musical instrument, a toothed revoluble member, an operating switch adapted to be opened and closed by said revoluble member, a circuit including said operating switch, a power line connected in said circuit, said input line of said musical instrument being adapted to be connected in said circuit, an electromagnet, means operated thereby for giving said revoluble member a tooth by tooth movement in one direction to close said switch, a circuit connected to said electromagnet, a manually controlled switch in said circuit, a second electromagnet, means operated thereby for giving said revoluble member a tooth by tooth movement in the opposite direction, to open said switch, a circuit connected to said last named electromagnet, and a switch in said circuit adapted to be operated through a moving part of said musical instrument.
7. In combination with an electrically operated musical instrument having an input line, a movable member, movable during a portion of the cycle of operation of said instrument, manually controlled means for energizing said line, and a momentarily closed switch operated by said movable member during its movement for deenergizing said line upon the completion of the cycle of movement of said movable member.
8. In combination with the operating circuit and a movable part of a phonograph, a circuit, a switch in said circuit, means operated by said circuit for energizing said phonograph circuit, a third circuit for de-energizing said operating circuit, and a switch in said last named circuit adapted to be engaged by the moving part of said phonograph for rendering the phonograph inoperative when said part reaches a predetermined position.
9. In combination, three normally open circuits, one of said circuits including the motor of a phonograph, a manually controlled switch in one of the other of said circuits,

means in said same circuit for energizing the phonograph circuit upon closure of said switch, a switch in said third circuit adapted to be closed by a moving part of the phonograph, and means in said last named circuit for de-energizing the phonograph circuit upon closure of said last named switch.

10. In combination with the operating circuit of a phonograph, means for energizing said circuit, a normally open circuit, a switch in said circuit adapted to be operated by a moving part of the phonograph, and means in said normally open circuit for energizing the phonograph circuit upon closure of said switch.

11. In combination with the operating circuit and a part of a phonograph movable toward and from a given position, a normally open circuit, a switch in said circuit adapted to be first opened and then closed by movement of said movable part of the phonograph at such position, and means in said circuit operable upon closing of said switch for de-energizing the phonograph circuit.

In testimony whereof I have affixed my signature to this specification.

OSCAR A. BRONSON.

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