

Feb. 25, 1941.

L. P. MOCK ET AL
SELECTOR FOR PHONOGRAPHS

Filed July 22, 1939

2,233,026

4 Sheets-Sheet 1

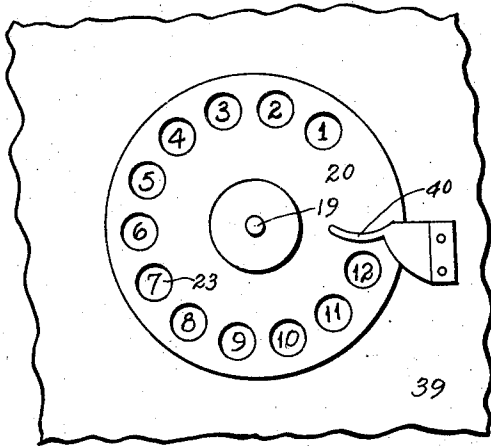


Fig. 1

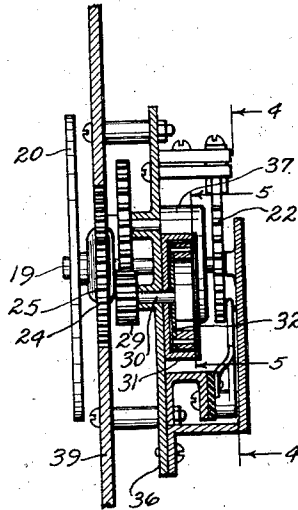


Fig. 2

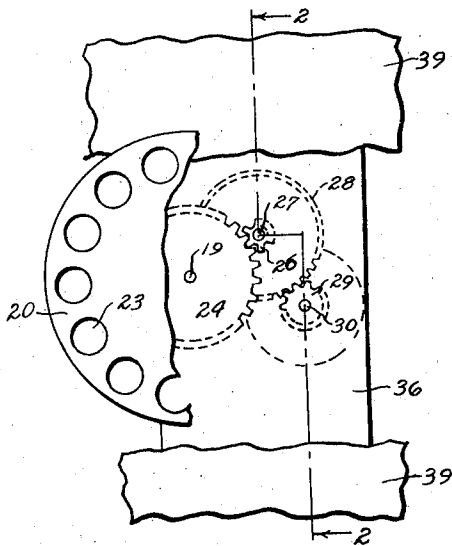


Fig. 3

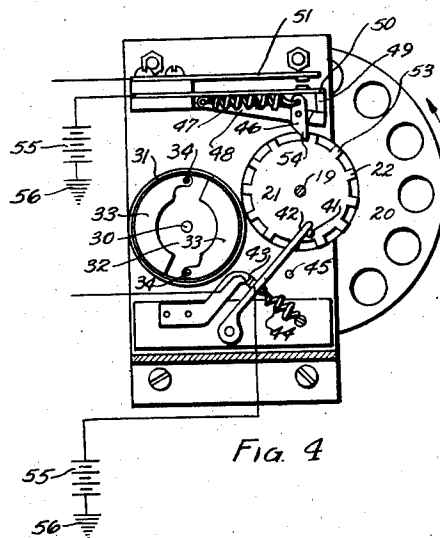


Fig. 4

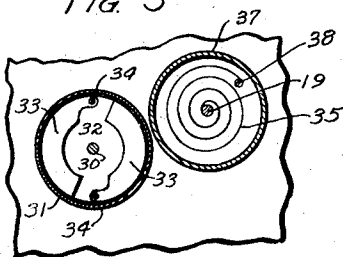


Fig. 5

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4 Sheets-Sheet 2

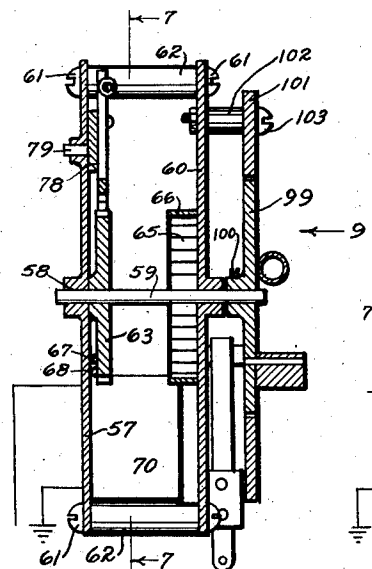


Fig. 6

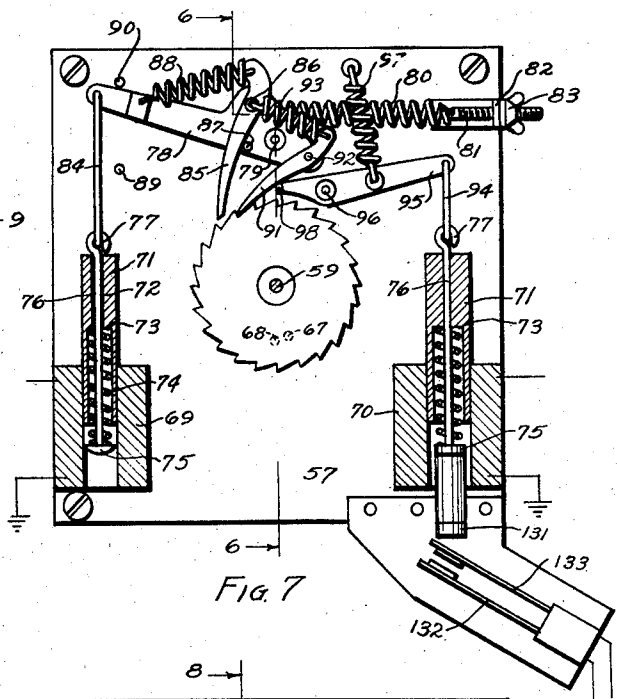


Fig. 7

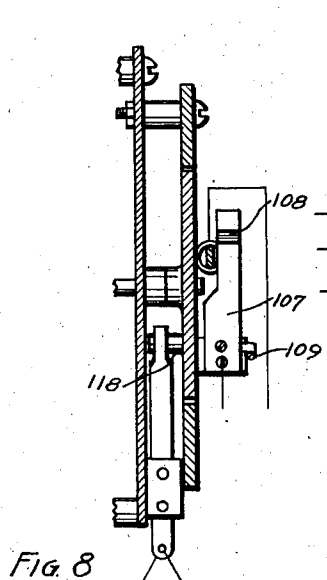


Fig. 8

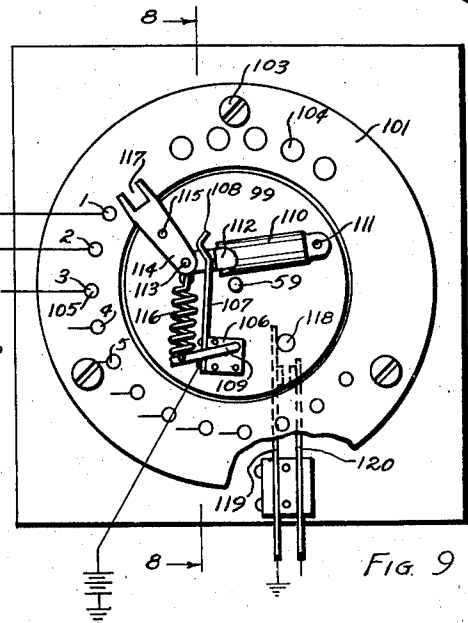


Fig. 9

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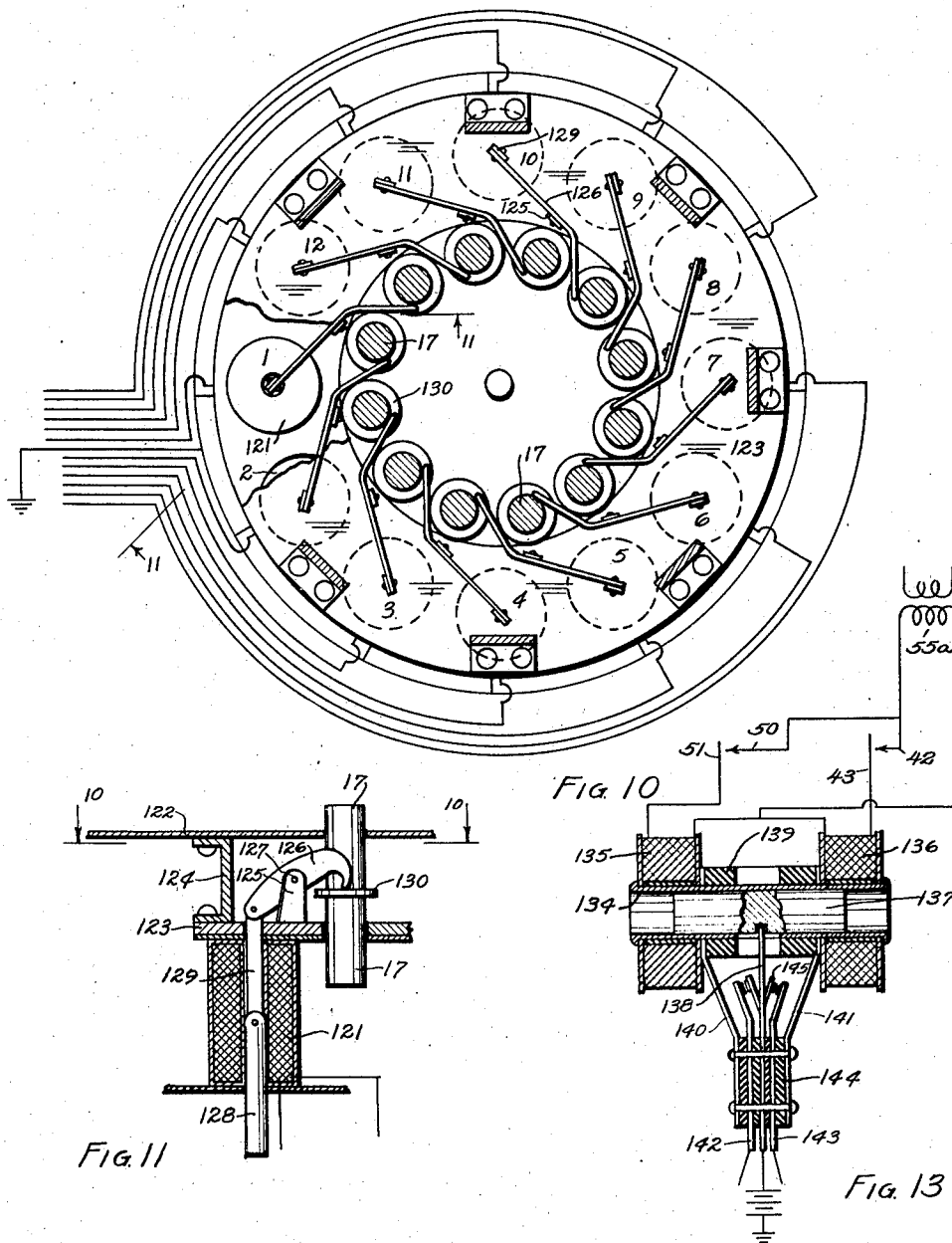
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SELECTOR FOR PHONOGRAPHS

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4 Sheets-Sheet 3



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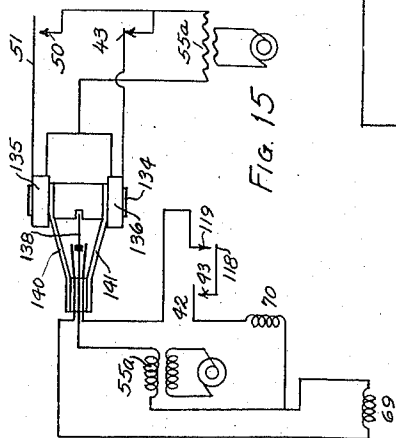
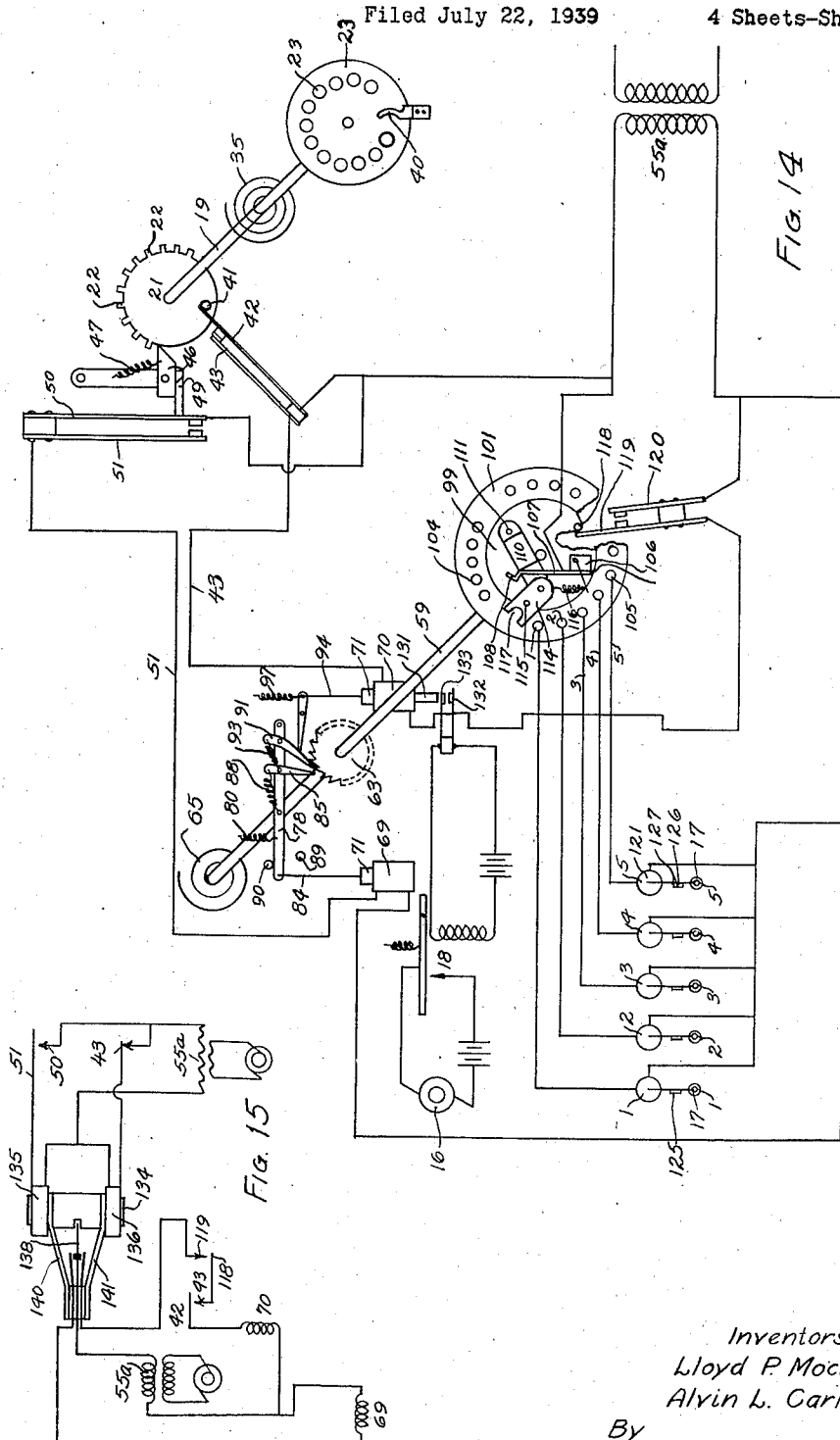
L. P. MOCK ET AL.

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SELECTOR FOR PHONOGRAPHS

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,233,026

SELECTOR FOR PHONOGRAPHS

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Application July 22, 1939, Serial No. 285,874

3 Claims. (Cl. 177-353)

This invention relates to improvements in program selectors for phonographs and similar musical devices.

Automatic phonographs and other musical instruments are quite popular in cafes and other places, but in most cases the starting of the machine and the selection of the program must take place at the instrument itself which greatly reduces the value of the instrument, from the point of view of a revenue producer.

In cafes and other places where such instruments are employed, the patrons are usually seated at tables or in booths far removed from the instrument and the instrument would therefore be employed to a greater extent if it could be started and the program selected from any place where the patrons are seated.

It is an object of this invention to produce a mechanism or a system of control by means of which automatic phonographs and other musical instruments can be started and their programs selected from a plurality of different points removed as far as necessary from the instrument.

Another object of this invention is to produce a control system of the type mentioned which shall require the minimum number of conductors from the various stations to the machine.

Another object of the invention is to produce a system which is operable on a low voltage circuit, as, for example, a twelve volt alternating current circuit and in which the current for operating the selector does not have to travel to the different stations and which therefore will not be subject to the resistance losses that would otherwise occur.

The above and other objects that may become apparent as this description proceeds are attained by means of a construction and an arrangement of parts that will now be described in detail, and for this purpose reference will be had to the accompanying drawings in which the several parts that cooperate to form the system, as well as the relationship of these parts to each other has been shown.

In the drawings:

Figure 1 represents a front elevation of a selector switch which is positioned at a station from which the instrument is to be controlled;

Figure 2 is a section taken on line 2-2, Figure 3;

Figure 3 is a front elevation, with parts broken away, showing in a more or less diagrammatic manner the arrangement of the gear train by means of which the speed of operation of the switch is controlled;

Figure 4 is a section taken on line 4-4, Figure 2, and shows the impulse switch mechanism, the friction brake and the normally open switch employed for returning the selector switch to inoperative position;

Figure 5 is a section taken on line 5-5, Figure 2, and shows the relative positions of the friction brake and the spring by means of which the parts are returned to normal position;

Figure 6 is a section taken on line 6-6, Figure 10 7, and shows a portion of the step by step mechanism and selector switch;

Figure 7 is a section taken on line 7-7, Figure 6;

Figure 8 is a section taken on line 8-8, Figure 9;

Figure 9 is a plan view looking in the direction of arrow 9, in Figure 6;

Figure 10 is a view partly in plan and partly in section, taken along line 10-10, Figure 11, and shows the arrangement of the mechanism for operating the program selector keys;

Figure 11 is a section taken on line 11-11, Figure 10;

Figure 12 is a diagrammatic view showing a 25 rectilinear arrangement of magnets and program selector buttons;

Figure 13 is a sectional view through a relay which is employed in the system;

Figure 14 is a circuit diagram showing the 30 various elements interconnected to perform the desired operations; and

Figure 15 is a diagram showing the manner in which the relay is connected in the circuit so as to maintain the highest possible voltage at the 35 instrument.

Automatic phonographs and other musical instruments, as well as different types of automatic vending machines are electrically operated and in Figure 14, the motor which operates the instrument has been diagrammatically shown and designated by reference numeral 16. Such instruments are provided with means for selecting any one of a group of records or musical compositions or of any one of a group of articles to be 45 dispensed which means includes pushbuttons 17. As an example of such instruments attention is directed to U. S. Letters Patent No. 2,002,236, of May 21, 1935, and to U. S. Letters Patent No. 1,595,241 of August 10, 1926. It is not the purpose of this specification to describe the mechanism of the automatic phonographs or of any other automatic vending machine as such mechanisms are well known and understood but only such portions of the mechanism will be indicated 55

on the drawings and referred to in this specification as may be necessary to properly describe the invention which forms the subject of this application.

5 Machines of the type to which this invention relates are usually coin controlled, but in the present description this feature has not been shown as it does not form part of the present invention, but can be added by any one skilled in
10 this art without the exercise of a degree of skill greater than that of an ordinary mechanic.

This machine will be described in connection with an automatic phonograph, although as above intimated, it is suitable for a variety of
15 other uses. Automatic phonographs of the type usually employed consists of a machine having a turn table, a reproducer arm either of the electric or mechanical type. Mechanism is provided
20 for selecting any one of a number of records and this mechanism includes a plurality of selector keys or buttons which have been designated by reference numeral 17 in the drawings. After the
25 selection has been made, a switch corresponding to the one designated by reference numeral 18 is closed by means of a coin, whereupon the instrument starts operating and after the record has been played, the parts automatically return to inoperative position in readiness for another selection and operation.

30 The instrument that forms the subject of this invention comprises an impulse producing switch constructed as shown in Figures 1 to 5, which is positioned in booths and at tables in different parts of the room. This impulse producing mechanism
35 is connected by electric wires to a selector switch constructed in the manner shown in Figures 6 to 9, inclusive, and this switch mechanism is in turn connected with a plurality of magnets arranged to operate the selector keys of the
40 phonograph in the manner indicated in Figures 10, 11 and 12.

The impulse producing mechanism by means of which the occupant of a booth or table may select a program and put the machine into operation
45 comprises a shaft 19 to the front end of which a perforated disk 20 is attached. An impulse switch operating disk 21 is nonrotatably secured to the other end of shaft 19 and is provided with a plurality of teeth 22, whose function and operation will appear as the description proceeds. Disk 20 is provided with a plurality
50 of openings 23 of which twelve have been shown in the example illustrated. Disk 20 is rigidly connected to the shaft. A gear wheel 24 is rotatably connected with shaft 19 and is frictionally engaged with the latter by means of a spring washer
55 25. The friction clutch arrangement thus produced assures that the parts will not be subjected to any breaking strains when the disk 20 is moved to selecting position and that the return movement of disk 20 and the toothed wheel 22 will be retarded to the proper extent by the brake mechanism which will now be described. Gear
60 24 meshes with a pinion 26 on a shaft 27 which also carries a large gear 28 that is in mesh with a pinion 29 on the end of shaft 30. Shaft 30 extends into a brake housing 31, where it is nonrotatably connected with a disk 32 to which the arcuate brake members 33 are pivotally attached
70 as indicated by numeral 34. When shaft 30 turns, the brake shoes 33 are moved outwardly by centrifugal force and engage the inner surface of the cylindrical wall of the brake housing 31, thereby producing a retarding action which limits
75 the speed at which disk 20 can be returned by

the action of the spring 35. Attached to the supporting plate 36 that supports the brake housing 31 is a cylindrical spring housing 37 in which the helical spring 35 is located. One end of this spring is held stationary by a pin 38 and the other one is attached to the shaft 19, the parts being so
5 arranged that the spring tends to move the selector disk 20 counterclockwise when viewed as in Figure 1. Numbers from one to twelve are painted on the surface of the supporting plate
10 39 in such positions as to be visible through openings 23 in a manner similar to that employed with the ordinary dial telephones. A program is arranged adjacent this switch, on which the various selections that can be played
15 by the machine are listed and given a number and if the patron desires to select the record designated by number 4, he inserts his finger in opening 23 through which number 4 is visible and turns the disk clockwise until his finger engages the stop 40 whereupon the disk is released and is returned to normal position by the spring 35. Disk 21 is provided with twelve spaced teeth which have been designated by reference numeral
20 22. Disk 21 is also provided with a pin 41 which engages a spring arm 42 when the dial or disk 20 returns to normal position. Arm 42 is part of a switch comprising a cooperating switch member 43 and is urged to switch open position by the action of spring 44 which normally holds it
25 in engagement with pin 45. When disk 20 is rotated clockwise when viewed as in Figure 1, or counterclockwise when viewed as in Figure 4, the teeth 22 engage the pivot detent 46 from the right (Fig. 4) and turn it about its pivot in opposition to the action of spring 47, which spring is weak, although it has been indicated on the drawings as being made of heavy material. Detent 46 is carried by a pivot arm 48 whose end has an upwardly extending insulating member 49
30 that engages the under surface of a spring switch element 50 that cooperates with the correspondingly shaped switch element 51 to close an electric circuit to the step by step magnet 52 which forms a part of the selector switch. After the dial 20 has been released, the action of spring
35 35 tends to turn the parts clockwise when viewed as in Figure 4, and since the detent 46 is prevented from turning counterclockwise about its pivot due to stop 53 and since the teeth engage the inclined surface 54 of the detent, the latter, including the arm 48, will move upwardly and establish an electric connection between switch members 50 and 51, whereby an electric current will flow through the magnet 52 and operate the
40 selector switch in a manner which will become more apparent when the mechanism of the selector switch is described.

In Figure 4 a battery 55 has been shown in two of the circuits and one pole of this battery has been shown as grounded at 56. These two batteries, as well as the current supply for the entire mechanism is obtained from a transformer 55a which has been shown in Figure 14 and the battery and ground symbols have merely been
45 used for the purpose of more clearly explaining the invention.

Referring now to Figures 6 to 9, inclusive, which illustrate the construction of the step by step mechanism and the selector switch, reference numeral 57 represents a plate or base member on which the parts are supported. This plate has a central bearing 58 in which shaft 59 is rotatably mounted. Another plate 60 is attached to plate 57 by means of screw 61 and suitable spacers
50 75

62. Attached to shaft 59 by means which prevents it from rotating relative thereto is a ratchet wheel 63 whose periphery is provided with ratchet teeth 64. A clock spring 65 is positioned in a housing 66 and has its ends attached to the housing and to the shaft 59 in such a way that it tends to turn the ratchet disk 63 in clockwise direction when viewed as in Figure 7. Cooperating stops 67 and 68 are attached respectively to the ratchet disk and to the stationary plate 57 limiting the clockwise rotation due to the action of the spring.

Referring now more particularly to Figure 7, it will be seen that two magnet coils 69 and 70 are attached to the plate 57. Iron cores 71 are mounted for reciprocation in the openings in magnets 69 and 70. The cores 71 have axial openings 72 of different diameters so as to form a shoulder 73 in each core. A spring 74 is positioned in the larger axial opening and has one end abutting the shoulder 73 and the other end abutting the head 75 on the end of a wire link 76, whose upper end is provided with an eye 77. The springs 74 are comparatively weak, but are strong enough to hold the cores against the lower ends of the eye 77 when the magnets are deenergized. As soon as either magnet is energized, the core moves downwardly compressing the spring 74 and then strikes the head 75 imparting to the latter a sudden impact which assists in moving the step by step mechanism or the release in a manner which will now be described. From Figure 7 it will be noticed that a lever 78 is pivotally attached to plate 57 by means of a pivot pin 79. A spring 80 has one end attached to the lever 78 at a point above the pivot 79 and the other end attached to an adjustable anchor 81, which comprises a threaded member that passes through an opening in a bracket 82 and is provided with a winged nut 83 which can be rotated for the purpose of adjusting the tension of this spring. Attention is called to the fact that although the spring 80 has been shown as made from heavy spring wire, this is done merely for convenience in showing the spring as the strength of this spring is sufficient merely to move the lever 78 with its attached core 71 upwardly when the magnet is deenergized.

A link 84 connects the eye 77 of the core which is associated with magnet 69 to the movable end of link 78 and therefore when this magnet is energized, lever 78 will move counterclockwise about its pivot. A pawl 85 is pivotally attached to lever 78 at 86 and is normally held against a stop 87 by the action of a comparatively weak spring 88. This pawl is so positioned that when lever 78 moves downwardly it will engage one of the ratchet teeth 64 and move the ratchet disk 63 through an angle corresponding to the angular distance between the ratchet teeth. Stops 89 and 90 serve to limit the movement of lever 78 so that each operation will rotate disk 63 through a predetermined angle. A second pawl which has been designated by reference numeral 91 is pivoted to the lever 78 at the right of pivot 79, the pivotal connection being designated by reference numeral 92. A weak spring 93 tends to hold this pawl in engagement with the surface of the ratchet wheel at all times, whereas, the pawl 85 is limited by the stop 87 in such a way that when lever 78 is at its uppermost position, the end of pawl 85 will not interfere with the rotation of disk 63. The magnet 69 is connected in series with the impulse switch

comprising members 50 and 51 and in series with a source of current in the manner which will be explained by reference to Figure 14 and therefore whenever switch member 50 is moved an electric impulse is produced which energizes magnet 61 and moves the lever 78 downwardly, thereby turning disk 63 a distance of one ratchet tooth and when this lever is released and moves upwardly in response to the action of spring 80, pawl 91 will rotate the disk 63 a similar distance so that for every complete oscillation of lever 78, the ratchet wheel moves an angular distance equal to two ratchet teeth. When the disk 63 is ratcheted in response to the impulses produced by the operation of switch members 50 and 51, spring 65 is tensioned and this spring is of sufficient strength to return the parts to normal when pawl 91 is moved to inoperative position. For the purpose of releasing the ratchet disk, magnet 70 with its cooperating core 71 is provided. A link 94 connects the outer end of lever 95 with the eye 77 at the upper end of link 76. Lever 95 is pivoted at 96 and is urged upwardly by a spring 97. The free end of lever 96 is bent upwardly when viewed as in Figure 7 so as to provide a projection 98 that engages underneath the pawl 91. When magnet 70 is energized, it will turn lever 95 clockwise about its pivot, thereby moving the pawl 91 out of engagement with the ratchet teeth and permit the disk 63 to return to normal position by the action of spring 76. Magnet 70 is connected in series with switch members 42 and 43 and can therefore not be energized until these two switch members are brought into circuit closing engagement, which occurs only after the impulse wheel 21 has been returned to normal position by the action of spring 35. Another switch is also connected in series with magnet 70 as will appear as the description proceeds.

Referring now more particularly to Figures 6, 8 and 9, it will be seen that a disk 99 is attached to the end of shaft 59, preferably by means of a set screw 100, the purpose of the set screw being to permit convenient adjustment of the disk. A ring 101 encircles the disk 99 and is secured to and spaced from plate 60 by means of spacers 102 and bolts 103. Ring 101 is provided with a number of terminals 104 which serve to effect electrical connections with the parts of the mechanism, but which, in the present illustration, have not been shown as involved in the circuit connections. Ring 101 also carries twelve contacts 105, each of which corresponds to one of the numbers on plate 39 that are visible through the openings 23 and which are connected to selector magnets in a manner which will hereinafter appear. Attached to the disk 99 by means of an insulating block 106 is a spring contact 107. The end of this contact has a sharp angular portion 108. An anchor 109 extends through an opening in block 106 and serves to hold one end of a spring in a manner which will presently appear. A dashpot cylinder 110 is attached to the disk 99 at one end by means of a pivot 111. Slidably mounted in the dashpot is a piston or plunger 112 whose outer end is connected by means of a pivot pin 113 to a switch arm 114 that is attached to the disk 99 by means of a pivot 115. A spring 116 connects the pivot 113 with the anchor 109 and this spring is so tensioned that it will normally hold the parts in the position shown in Figure 9. The free end of switch member 114 is provided with a notch 117 of a size that will receive one of the circular

contacts 105. A pin 118 is attached to the under surface of disk 99 and serves to move a switch member 119 to switch opening position when the step by step mechanism is released and returns to normal. Switch member 119 cooperates with a similar switch member 120 and these two switch members are connected in series with switch contacts 42 and 43 and also in series with the release magnet 70 in a manner which will hereinafter more clearly appear.

As has already been intimated, the ordinary automatic phonographs are provided with selector buttons 17 that are pushed inwardly by the operator for the purpose of selecting any one of the records with which the machine is equipped. The outer ends of these buttons are numbered and these numbers correspond to the numbers on the program in the same manner as the numbers visible through openings 23 correspond with the program numbers. For the purpose of operating the selector buttons from a distance, magnets 121 have been provided, there being one magnet for each selector button. In the embodiment illustrated, the selector buttons 17 have been shown as arranged in a circle and magnets 121 have been arranged in a circle which surrounds the buttons. This arrangement can be varied to suit the particular instrument, as some instruments have the selector keys or buttons arranged in a straight line, in which case the magnets 121 are also arranged in a straight line as shown in Figure 12. The metal plate 122 shown in Figure 11 can be assumed as being part of the phonograph housing. The annular disk 123 to which the magnets 121 are attached is connected with the part 122 by a number of brackets 124. Associated with each magnet is an arm 125 to which a lever 126 is attached by means of a pivot 127. Each magnet 121 has a core 128, whose upper end is connected with one end of lever 126 by means of a link 129. The free ends of levers 126 rest on the upper surface of circular flanges 130 carried by the pins 17. Whenever any one of the magnets 121 is energized the corresponding core 128 will move upwardly, thereby forcing the corresponding pin 17 inwardly, whereupon certain circuit connections are made that move the selected record into operating position.

We will now consider that the switch contacts 105 are numbered successively from 1 to 12 in a counter-clockwise direction, when viewed as in Figure 9, and that this numbering corresponds to numbers visible through the openings 23 in Figure 1. Let us also assume that magnets 121 are numbered consecutively in a counterclockwise direction from 1 to 12. If, for example, the patron desires to select the record indicated by number 3 on his program, he will insert his finger in the hole 23, through which number 3 is visible and move the dial clockwise until his finger engages stop 40, whereupon the dial is released. When the dial is released, the impulse wheel 21 will start moving in a clockwise direction when viewed as in Figure 4, and before it comes to rest it will establish circuit connections between switch members 50 and 51 three times, whereupon switch member 114 will move the distance between its neutral position and a position in which the contact 105, which has been designated also by numeral 3, is opposite the opening 117. When disk 21 reaches its normal position, it closes the switch comprising members 42 and 43, thereby establishing a circuit connection with the release magnet 70, where-

upon the step by step mechanism is released permitting spring 65 to return the parts to normal position. When disk 99 begins its return rotation, the pin 105 which corresponds to the number selected, will enter the notch 117 and this makes it necessary for the switch contact 114 to turn counterclockwise about its pivot 115 which movement forces plunger 112 into the cylinder 110 and during this motion the end of switch contact 114 comes into engagement with the switch member 107, thereby establishing an electric connection which sends a current through the conductor which connects contact 3 with magnet 3, whereupon the magnet is energized and operates the lever 26 to push the selector button 17 inwardly. Since the contact 105 enters a considerable distance into notch 117, switch member 114 must continue to rotate counterclockwise until pivot 113 has passed to the other side of a line joining pivots 111 and 115 and shortly after this position is reached contact is broken between 114 and 107 and therefore no current will pass when switch member 114 engages contacts 2 and 1. The function of the dash pot is to slow up the return movement of disk 99. The detent release magnet 70 is in series with the switch comprising contacts 43 and 43 which is open when disk 21 is moved away from normal or inoperative position (see Fig. 4) and when the impulse device is operating, and in series with switch comprising contacts 119 and 120 which closes when disk 99 moves away from inoperative position. It will therefore be seen that the detent is released as soon as disk 21 returns to the position shown in Fig. 13. When the selector switch returns to the position shown in Figure 9, the switch formed by contacts 119 and 120 is moved to open position, which makes it impossible to operate the release mechanism unless the step by step mechanism has already operated since this switch is in series with the release magnet 70. When the release mechanism operates, the downwardly extending projection 131 engages and momentarily closes the switch whose two contacts have been designated by reference numerals 132 and 133. This switch corresponds to the coin controlled switch in the usual mechanism and starts the operation of the electric motor 16 by momentarily closing switch 18. The exact mechanism within the apparatus itself has not been shown as it seems to have no direct bearing on the improved construction that forms the subject matter of this invention.

In Figure 13 a relay mechanism has been illustrated, the parts of which have been shown in section. This relay consists of a tube 134 to the ends of which magnet coils 135 and 136 are attached. A soft iron core 137 is slidably mounted in tube 134 and the latter is provided with an opening through one side for the reception of a spring tongue 138 which forms part of a switch mechanism that will presently be described. A spacer 139 of insulating material surrounds the tube 134 and is positioned between the magnet coils. Metal strips 140 and 141 have openings through which the tube 134 extends and these strips are positioned between the magnet coils and the spacer 139 and clamped in position by the crimping of the outer ends of tube 134. Supported by the members 140 and 141 is a switch mechanism comprising the central spring contact member 138 and two switch members 142 and 143, one of which is located on either side of member 138, the several contact members being

separated by insulating members 144. Member 138 is provided on opposite sides with spring contacts 145 that are positioned to engage the ends of switch members 143 when the core moves in response to the energization of either one of the magnets. The parts are so positioned that when neither of the magnets are energized, both switches will remain open.

The relay described above is connected in the circuit between switches 50, 51; 42, 43 and magnets 69 and 70 in the manner shown in Figure 15. A separate circuit is run from the power line or the transformer 55a to contact 138 in the manner shown. The relay serves as a booster in the usual way and is useful particularly when the impulse device is positioned a considerable distance from the selector switch because it obviates the excessive voltage drop that otherwise takes place due to the fact that all of the current for operating the mechanism must flow through the two switches on the impulse device. With the arrangement shown in Figure 15, the current controlled by switches (50, 51) and (42, 43) is small compared to the current necessary to operate the selector switch and key operating magnets and since the relay can be located in close proximity to the latter devices, the voltage drop can be maintained small.

From the above description, when taken in connection with the drawings, it will be apparent that the mechanism and the system here described is especially well adapted for use in connection with automatic phonographs and other musical instruments which, by the application of this mechanism, can readily be controlled from a distance and in this way have their usefulness greatly improved.

In the foregoing part of this specification, attention has been called to the fact that the use of an automatic phonograph is merely for the purpose of convenience, as this mechanism is equally well adapted for other purposes and can readily be employed in connection with vending machines by means of which an attendant can deliver to a customer any one of a group of articles, as, for example, cigars or cigarettes, or any other vendable merchandise.

In an automatic phonograph of the type referred to in the specification, means is provided for selecting a record and for placing the same on a turn table, and it is evident that the same, or similar means, can be employed for delivering an article so selected to a chute or other discharge opening, thereby performing the function of an automatically controlled vending machine.

It is evident that various modifications can be made in the apparatus illustrated and described and this invention is intended to cover any apparatus shown and described and also any colorable variations thereof.

Having described the invention what is claimed as new is:

1. In a selectively operated device having a plurality of selector keys, and an operating motor, means for effecting a selection and for starting the operation from a distance, comprising in combination, a device for producing a predetermined number of electrical impulses, a selector switch device, spring means for urging the selector switch to normal position, means for operating the selector switch in opposition to the action of the spring comprising a step by step mechanism, means for operating the step by step mechanism comprising an electromagnet

connected in series with the electric impulse device, a key setting electromagnet operatively associated with each selector key, means comprising the selector switch for energizing any one of the selector magnets, means comprising a switch operated by the return of the impulse device to normal and an electromagnet energized by said last named switch and operatively connected with the step by step mechanism for returning the step by step mechanism and the selector switch to normal position, and means for starting the operating motor immediately after the selector key has been actuated.

2. In a selectively operated device having a plurality of selector keys, means for effecting a selection and for starting the mechanism from a distance, comprising in combination, an electromagnet associated with each selector key, means operated by the energization of the electromagnet for actuating the corresponding selector key, a selector switch having terminals in electrical connection with the electromagnets, means comprising an electromagnetically operated step by step mechanism and the selector switch for effecting an electrical connection between a source of electric current and any one of the electromagnets, resilient means for urging the step by step mechanism and the selector switch to inoperative position, a detent associated with the step by step mechanism for resisting the force tending to move it to inoperative position, means comprising an electromagnet for releasing the detent, a device for producing a predetermined number of electrical impulses comprising a normally open switch in series with the operating magnet of the step by step mechanism, a movable operating member urged in one direction by a spring, and means for successively closing and opening the last named switch when the operating member moves in response to the action of the spring, a normally closed switch connected in series with the detent release magnet, said switch being biased to open position, and means operated by the return of the movable operating member to normal position for closing the last named switch and thereby releasing the detent.

3. In a selectively operated device having a plurality of selector keys and an operating motor, means for effecting a selection and for starting the mechanism from a distance, comprising in combination, a device for producing a predetermined number of electrical impulses, a selector switch mechanism comprising an electromagnet in series with the impulse device, a step by step mechanism responsive to the energization of said electromagnet for operating the selector switch, means for yieldingly resisting the movement of the selector switch away from inoperative position and for returning it to inoperative position, a detent mechanism associated with the step by step mechanism for resisting return movement of the selector switch, electromagnetic means for releasing the detent, a normally closed switch associated with the impulse producing device, said last named switch being biased to open position, means for closing the last mentioned switch when the impulse device has functioned, said switch being in series with the electromagnetic detent release of the selector switch, an electromagnet associated with each selector key, the selector switch mechanism having a contact corresponding to each selector key operating magnet, means for connecting each contact with one of the last named electromagnets, means

responsive to the energization of any of the last mentioned electromagnets for moving the corresponding selector key to operative position, and means operated by the return of the selector switch mechanism to inoperative position for initiating the operation of the motor.

4. In a selectively operated device having a plurality of selector keys and an operating motor, means for effecting a selection and for starting the motor from a distance, comprising in combination, a device for producing a predetermined number of electrical impulses, a selector switch device, spring means for urging the selector switch to normal position, means for operating the selector switch in opposition to the action of the spring comprising a step by step mechanism, means for operating the step by step mechanism comprising an electromagnet connected in series with the electric impulse device, a key setting electromagnet operatively associated with each selector key, a detent for holding the selector switch in opposition to the spring action, means comprising an electromagnet for releasing the detent, a normally closed switch associated with the impulse mechanism, a normally open switch associated with the selector switch, the normally closed and the normally open switches being biased to closed and open positions, respectively, and connected in series with the detent release magnet whereby the latter will be energized only when both of the switches are closed, means for closing the normally open switch when the impulse device returns to normal, means for opening the normally closed switch when the selector switch returns to normal position, the selector switch having a contact corresponding to each key operating electromagnet, a conductor connecting each contact with one of the last mentioned electromagnets and means for initiating the operation of the motor when the release magnet has functioned.

5. In a selectively operated mechanism having a plurality of selector keys and an operating motor, means for effecting a selection and for starting the motor comprising, an electromagnet associated with each key for moving the latter when the electromagnet is energized, a mechanism for selectively energizing one of said magnets comprising, a selector switch having a plurality of spaced contacts, means for connecting each contact in series with one of said electromagnets, a selector switch element mounted for movement along the contacts, spring means for urging said element to inoperative position, means comprising a step by step mechanism operatively associated with the selector switch for moving the switch element into electrical engagement with a selected contact, a detent for holding the switch element in opposition to the action of the spring, means comprising an electromagnet for actuating the step by step mechanism, an electric impulse producing device having a normally open switch in series with the last named electromagnet, means comprising an electromagnet operatively associated with the detent for releasing the same, a normally closed switch associated with the impulse device, means for opening said last named switch when the impulse device is moved from normal position and for closing it when the impulse producing mechanism returns to normal position, a normally open switch associated with the selector switch, said last named switches being biased to closed and open position respectively, means for moving the last mentioned switch to open position when

the selector switch returns to normal position, the last two named switches being in series with the detent release magnet, and means comprising a normally open switch associated with the detent release device for starting the motor when the detent is released.

6. In a selectively operated device having a plurality of selector keys and a motor, means for starting and controlling the operation from a distance comprising in combination, a manually controlled device for producing a predetermined number of electrical impulses, a selector switch comprising an electromagnet connected in series with the impulse device, a step by step selector switch operated by the electromagnet, said switch having a plurality of contacts, an electromagnet operatively associated with each selector key, means comprising a conductor for connecting each contact with one of the last mentioned electromagnets for energizing the same to operate the corresponding selector key, means comprising an electromagnet controlled by the operation of the impulse device for releasing the selector switch device, and means comprising the release mechanism for initiating the operation of the motor.

7. In a selectively operated mechanism having a plurality of selector keys and a motor, means for operating any one of the selector keys and for starting the motor from a distance, comprising in combination, an electromagnet associated with each selector key, means for operating the corresponding key whenever an electromagnet is energized, a selector switch having separate contacts, each connected to a selector magnet, and a movable switch member for effecting an electrical connection with any one of the contacts, means for moving the switch member into operative position relative to a selected contact, said means comprising a step by step mechanism including an electromagnet, means for returning the mechanism to inoperative position comprising a spring, means comprising a pawl detent for holding the parts against the action of the spring, means comprising an electromagnet operatively associated with the pawl detent for releasing it to permit the selector switch to return to normal position, means comprising a dashpot for retarding the return movement of the selector switch after its release, means for producing a predetermined number of electric impulses comprising a normally open switch connected in series with the electromagnet that operates the step by step mechanism, means for closing said last named switch a predetermined number of times, a normally closed switch associated with the impulse device, a normally open switch associated with the selector switch, the last two named switches being biased to closed and open position respectively and connected in series with the pawl detent release magnet, means for closing the normally closed switch when the impulse mechanism has functioned, means for opening the normally open switch when the selector switch has functioned, whereby the release magnet can operate only after the desired number of impulses have been sent to the step by step mechanism, and means operated by the pawl release magnet and after it has functioned for starting the motor.

8. In a selectively operated mechanism having a plurality of selector keys and a motor, means for effecting a selection, and means comprising a normally open switch for starting the motor after a selection has been effected, comprising in

combination, a device for producing a predetermined number of electrical impulses, an electromagnet operatively associated with each selector key, means operatively connected with the magnets and the impulse device for selectively energizing any one of the selector magnets, said means comprising, a support, a shaft rotatably mounted thereon, a ratchet wheel attached to the shaft, a lever pivoted to the support, pawl mechanism carried by the lever for rotating the shaft when the lever oscillates, means comprising a spring operatively associated with the lever for holding it in a predetermined normal position, means comprising an electromagnet and a movable armature operatively associated with the lever for moving the lever in opposition to the action of the spring, one of the pawls carried by the lever serving as a detent, means comprising a release magnet for moving the detent to inoperative position, means comprising a spring

connected with the shaft for urging it to rotate in a direction opposed to the action of the detent and for returning it to normal position when released by the detent, a disk carried by the shaft, a ring surrounding the disk, a plurality of switch contacts on the ring, a pivoted switch element carried by the disk, a switch contact also carried by the disk and normally disconnected from the switch element, spring means connected with the switch element for urging it in one direction, and a retarder means connected with the switch element for retarding its movement in opposition to the spring, said switch element serving as means to establish electrical connection between a selected contact on the ring and the switch contact carried by the disk when the latter rotates in response to the spring carried by the shaft.

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