

Nov. 29, 1949

H. G. JENSEN

2,489,782

SELECTOR FOR AUTOMATIC PHONOGRAPHS

Filed Nov. 4, 1944

5 Sheets-Sheet 1

Fig. 1

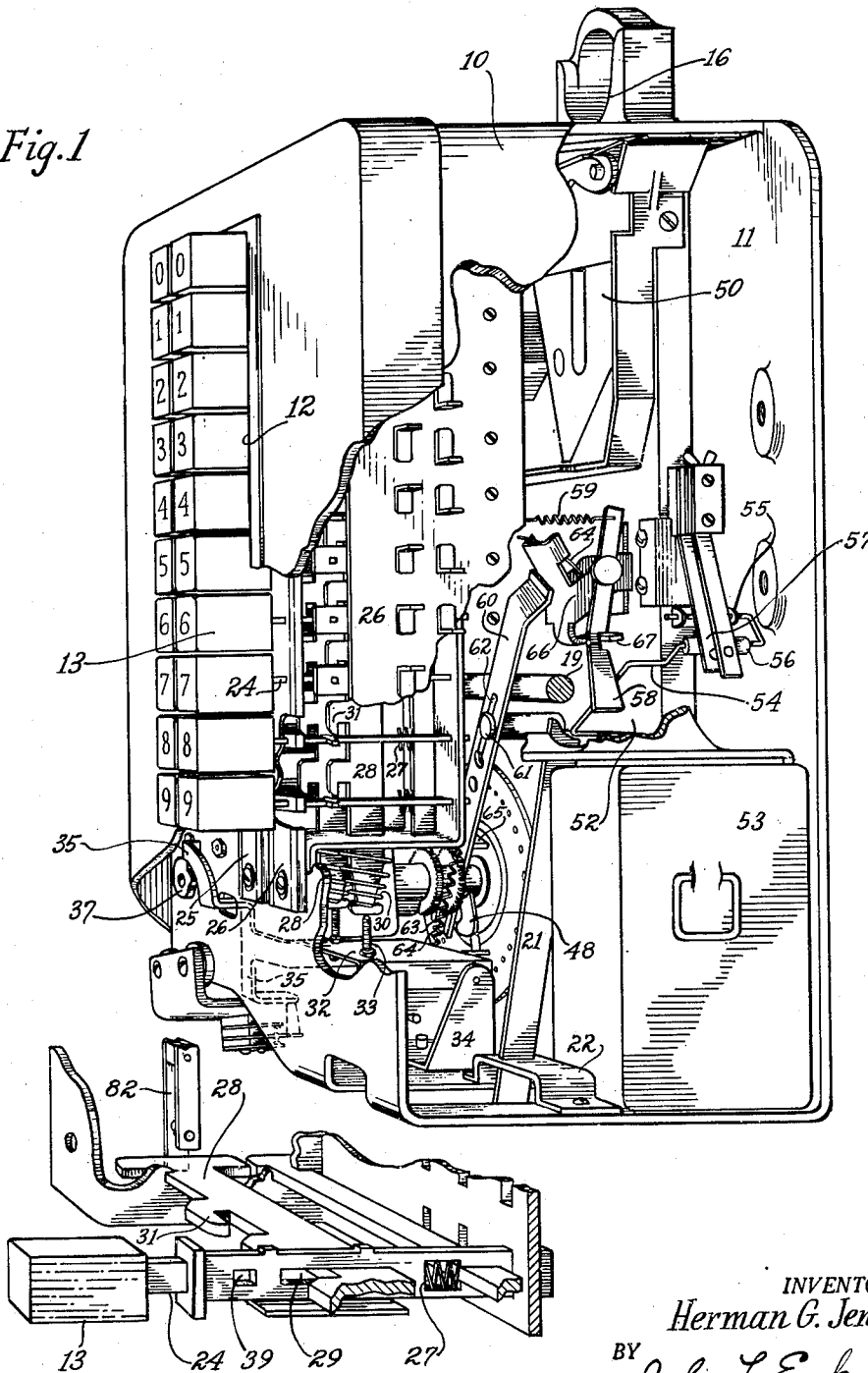


Fig. 3

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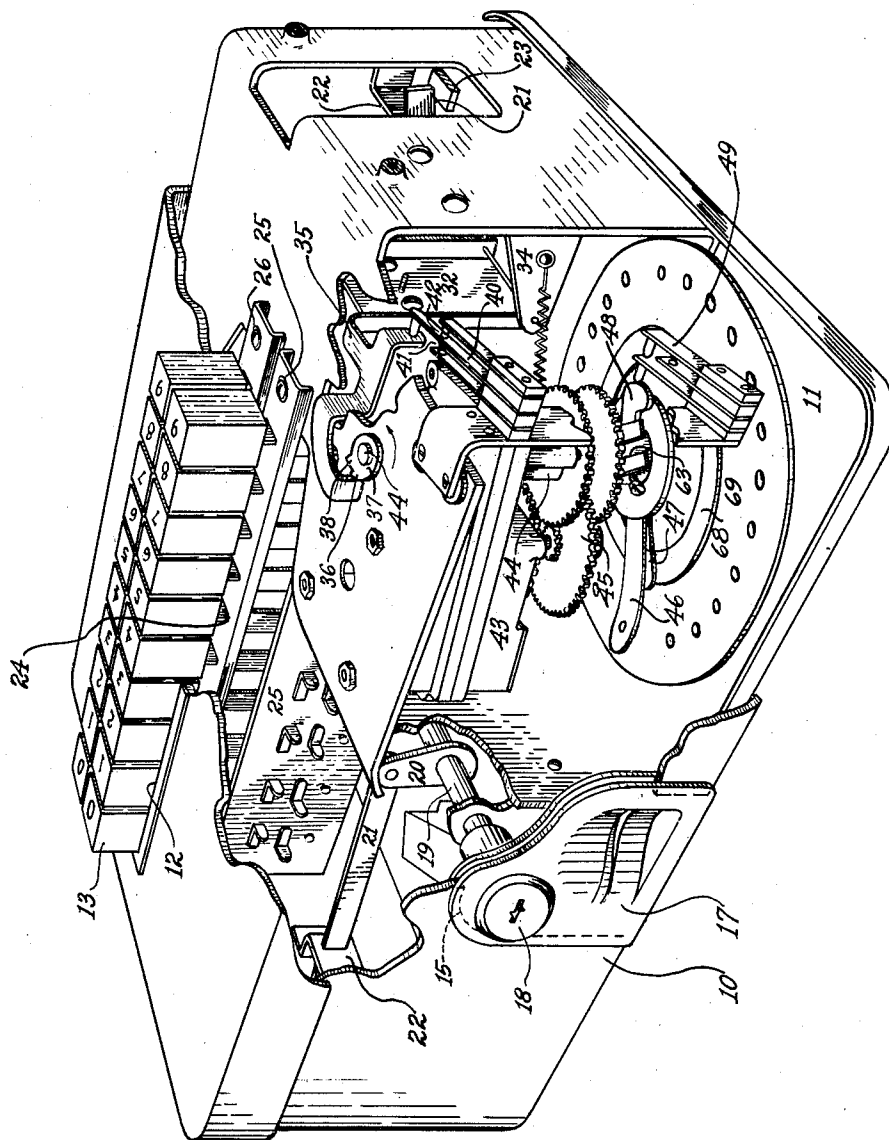


Fig. 2

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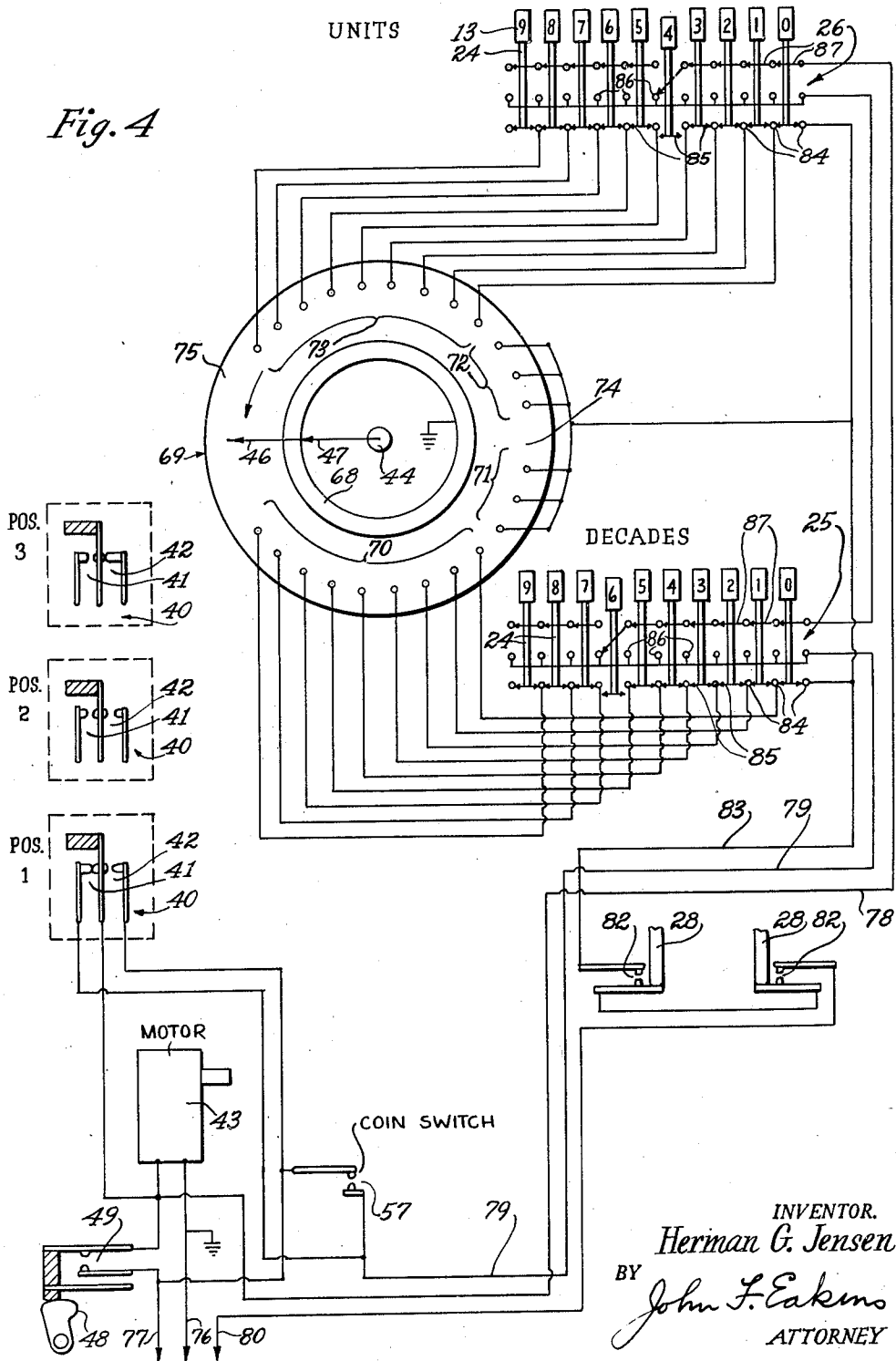
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Fig. 4



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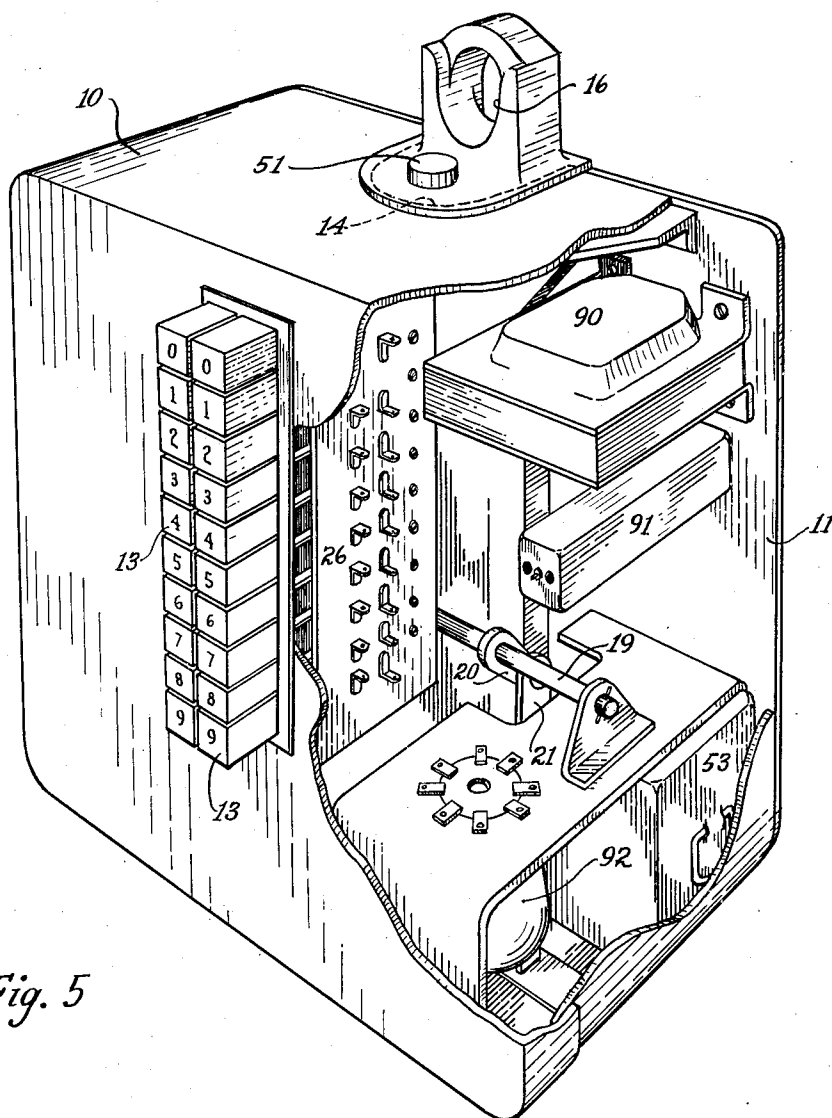


Fig. 5

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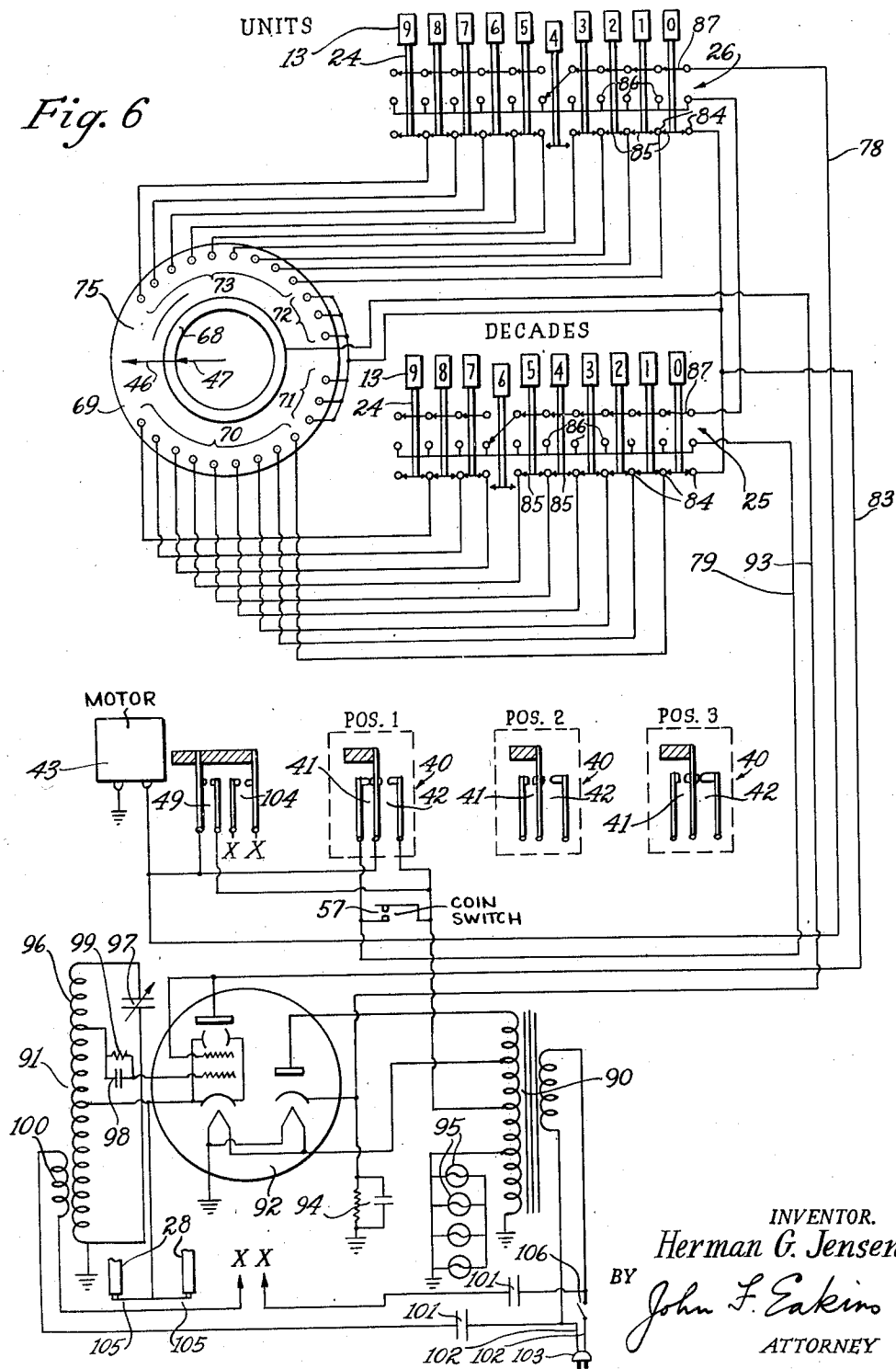
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Fig. 6



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UNITED STATES PATENT OFFICE

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SELECTOR FOR AUTOMATIC PHONOGRAPHS

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Application November 4, 1944, Serial No. 561,984

9 Claims. (Cl. 177—380)

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This invention relates to selectors for automatic phonographs and particularly to selectors in which the individual recordings are selected by a plurality of trains of impulses, the number of impulses in each train determining the recording which is selected.

In the co-pending Patents Nos. 2,382,487 and 2,382,488, issued August 14, 1945, to Mahlon W. Kenney and Herman G. Jensen, and in co-pending Patent No. 2,416,445, issued February 25, 1947, to Herman G. Jensen, there are described automatic phonographs in which selections are made by two trains of impulses.

One of the objects of the invention is to provide an improved selector adapted to control phonographs of this type.

A further object of the invention is to provide an impulse transmitter in which the operator determines the number of impulses for each train and the two trains are then automatically transmitted by the transmitter in sequence.

A further object of the invention is to provide an improved transmitter of this type which is rendered operative by the insertion of a coin.

A further object of the invention is to provide an improved transmitter of this type which can be located in remote relation to the phonograph.

Other objects, advantages, and capabilities of the invention will appear from the following description of the preferred embodiments thereof, taken in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective view of a remote control box embodying the invention and adapted to be connected to the phonograph by wires, part of the box being broken away to disclose the interior thereof;

Fig. 2 is an inverted perspective view of the box similarly broken away;

Fig. 3 is a perspective detail view showing the manner in which the switch bars are locked in;

Fig. 4 is a wiring diagram;

Fig. 5 is a modification adapted for the transmission of radio frequency impulses, and

Fig. 6 is a wiring diagram thereof.

Referring to Figs. 1 to 4 of the drawings, the reference numeral 10 indicates a cover of box-like form which is adapted to be applied to the base 11 which carries the mechanism. The cover 10 is provided with an elongated opening 12 in its front panel through which project two vertical series of buttons 13. These buttons are preferably substantially square so that the opening 12 is substantially filled by the two vertical rows of buttons. The box 10 has a cutout 14 at the top of a cutout 15 in a side. When the box is applied to the base the marginal portions of the cutouts 14 and 15 extend into grooves in the base of the coin slot 16 and around the rejected coin cup 17. The elements 16 and 17 are mounted on the base

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11. The element 17 carries an actuated lock 18 which controls a locking shaft 19 which extends transversely across the box and is supported in suitable bearings mounted on the base 11. The shaft 19 rigidly carries two arms 20 which are pivotally connected to two locking bars 21, one of which extends downwardly and the other upwardly. The outer ends of the bars 21 are guided in members 22 carried by the chassis. These ends are adapted to be projected by the lock 18 so as to engage lugs 23 carried by the box 10. It will readily be understood that when the box 10 is applied over the mechanism on to the base and the lock 18 is actuated by its key, the box is secured in position against unauthorized removal.

The buttons 13 are mounted individually on switch bars 24 of two switch assemblies 25 and 26. The left hand row of buttons 13 controls the decade selection while the right hand row of buttons controls the unit selection. Each row of buttons is numbered consecutively from 0 to 9. When a selection is made one button of each row is pressed inwardly. Thus 100 selections from 00 to 99 may be made by pressing one button of each row inwardly. As will hereinafter appear the buttons marked 0 control three impulses, the buttons 1 control four impulses and so on so that each of the 100 selections corresponds to two trains of impulses each of individual number.

Each switch bar 24 is mounted for longitudinal movement in its switch assembly as shown in Fig. 3 and each bar is biased outwardly by a spring 27. A locking bar 28 extends through openings 29. The bars 28 are biased downwardly by springs 30. Each bar 28 is provided along its outer side with undercut projections 31, each one of these projections being directed towards one of the bars 24. In normal condition the bars 28 are held with their projections 31 clear of the bars 24 by means of a generally horizontal table 32, which carries two adjustable set screws 33 which engage the lower ends of the bars 28. In normal condition any button 13 which is pressed inwardly is immediately returned to normal position by its associated spring 27. The table 32 is pivotally mounted on brackets 34 carried by the chassis. The table 32 carries a forwardly and upwardly projecting arm 35 which normally rests on the high spot 36 of a cam 37. When the cam 37 rotates in the counterclockwise direction as indicated by the arrow in Fig. 2 the arm 35 drops on to the step 38 of the cam 37 so that the table 32 and the bars 28 move downwardly bringing the lower cam shaped ends of the projections 31 into the openings 29 of the bars 24. If a button 13 is now pressed inwardly the bar 28 is cammed upwardly and when the button 13 is pushed into its full extent its projection 31 enters an opening 39 in the bar 24 thus locking the bar 24 in. Continued rotation of the cam 37 clears the step 38

from the end of the arm 35 so that the springs 30 move the bars 28 and the table 32 a further step downwardly. This further movement of the bars 28 brings the projections 31 fully into the openings 29 of the unactuated bars 24 and fully into the opening 39 of the actuated bar 24. In this condition the cam shaped ends of the projections 31 are beyond the associated bars 24 and consequently the actuated bars 24 are locked in and the unactuated bars 24 are locked against actuation until the cam 37 has completed a single revolution.

The arm 35 cooperates with a switch assembly 40 which comprises a normally closed switch 41 and a normally open switch 42. When the arm 35 engages the high spot 38 of the cam 37 the switch assembly is in the condition shown at Pos. 1 on Fig. 4. When the arm 35 engages the step 38 on the cam 37 both switches 41 and 42 are open as shown at Pos. 2 on Fig. 4. When the projection 38 moves away from the arm 35 the switch 42 closes and the switch 41 is open as shown at Pos. 3 on Fig. 4.

A motor 43 mounted on the chassis drives the shaft 44 on which the cam 37 is mounted at a slow speed through a speed reducing train of gearing 45. Two contact arms 46 and 47 are rigidly mounted on the shaft 44 and are insulated therefrom. The two contact arms 46 and 47 are in conductive contact. The shaft 44 carries a cam arm 48 which is arranged to cooperate with the switch 49. At the end of a rotation of the shaft 44 the cam 48 opens the switch 49. When the cam 48 clears the switch 49 this switch closes.

A coin inserted by the coin slot 16 passes into a slug rejector 50 which retains a slug or spurious coin. A retained slug can be retrieved by pressing the button 51 mounted on the base of the coin slot 16, whereupon the released slug returns to the cup 17. An accepted coin drops automatically through a coin chute 52 into a coin box 53. In dropping through the chute the coin engages the end of a bent lever 54, which is pivotally mounted at 55, and swings this lever in the counterclockwise direction. When the lever 54 is thus swung an insulating member 56 carried by the lever closes the normally open switch 57. The coin carries the lever 54 below the end of a pivoted lever 58 which is normally biased against the lever by a light spring 59. Consequently, the lever 54 is locked down and the switch 57 is held closed. A bar 60 is slidably mounted by means of a pin 61 and slot 62 and by engagement of the shaft 44 by its slotted end 63. The bar 60 is biased downwardly by means of a spring 64. This bar carries a projection 65 which is adapted to be engaged by the cam 48 after it has made a substantial part of a single revolution from its initial position. The cam 48 thus moves the bar 60 upwardly. Its upper end is adapted to engage operatively one arm of a bell crank lever 66, the other end of which has a projection 67 adapted to engage the lever 58. The arrangement is such that the upward movement of the bar 60 swings the lever 66 which in turn swings the lever 58 clear of the lever 54. Thereupon the resilient leaf of the switch 57 swings the lever 54 back to its normal position and the switch 57 opens.

The arm 47 engages a grounded conductive ring 68 mounted on a stationary disc 69 of insulating material. The arm 46 is arranged to engage four series of contacts 70, 71, 72 and 73

arranged on a circle on the disc 69. The contacts 70 and 71 are equally spaced, likewise the contacts 72 and 73. A larger space 74 is provided between the two groups of contacts 71 and 72 for the purpose of separating the two trains of impulses. A still larger space 75 is provided between the two groups 70 and 73.

One terminal of the motor 43 is grounded to the ground line 76. A power line, suitably a 25 volt line 77 is connected to one side of the switch 49, to one side of the switch 42 and to one side of the switch 57. The ungrounded terminal of the motor is connected to the other side of the switch 49, to the common pole of the switches 41 and 42 and to a line 78. The other side of the switch 57 is connected to a line 79 and to the other side of the switch 41. A third line 80, the impulse line is connected through two series switches 82 to a line 83. The switches 82 are located at the upper ends of the locking bars 28, which bars normally hold the switches open. The switches 82 are arranged to close when the bars 28 move into locking position, that is when the arm 35 moves off the step 38. Consequently the line 83 is connected to the impulse line 80 only when the selecting bars 24 defining the selection are locked in.

Each switch assembly 25 and 26 comprises a series of stationary contacts 84 which are normally connected in series by movable contacts 85 carried by the bars 24. The first contact 84 of each series is connected to the line 83. The contacts of groups 71 and 72 are also connected to the line 83. The second contact 84 of the decade switch assembly 25 is connected to the contact of group 70 which is adjacent the group 71. The third contact 84 is connected to the next contact of group 70 and so forth. When one of the buttons 13, for example No. 6 of the switch assembly is displaced inwardly, the first six contacts of group 70 are connected to the line 83 and the last three contacts of the group 70 are disconnected from the line 83. The connections of the contacts 85 and the contacts 84 of the unit switch assembly 26 are similarly connected to the group of contacts 73. Thus if the button 13 No. 4 of the switch assembly 26 is displaced inwardly only the first four contacts of the group 73 adjacent of the group 72 are connected to the line 83.

The arm 46 is initially in the space 75 and during each selection the arm makes a complete revolution. It will readily be understood that with the button settings just mentioned the line 83 will be grounded nine times and seven times to create two spaced trains of impulses of these numbers corresponding to selection No. 64. If the two buttons 13 No. 0 and No. 0 are displaced only the groups 71 and 72 are connected to the line 83 so that two trains each of three impulses will be created corresponding to the selection No. 00. If the two buttons 13 No. 9 and No. 9 are displaced the two trains each of 12 impulses will be created corresponding to the selection No. 99. When the arm 46 moves over the contacts of the four groups 70, 71, 72 and 73 the bars 28 are in their locking position and the impulses created are transmitted through the line 80, the switches 81 and 82 being closed. The cam 37 is configured so that the bars 28 are maintained in locking position until after the arm 46 clears the contacts of the group 73.

The line 79 is connected to a series of stationary contacts 86 in one of the switch assemblies, for

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example switch assembly 25. Each switch assembly comprises a plurality of movable contacts 87 which are normally connected in series. When one of the buttons is pressed inwardly the series 87 is broken and the movable contact 87 connects the right hand end (Fig. 4) of the contacts 87 to one of the contacts 86. The right hand end of the series 87 of the decade switch assembly 25 is connected to the contacts 86 of the other switch assembly 26. The right hand end of the series 87 of the switch assembly 26 is connected to the line 78.

The operation is as follows:

A coin of appropriate value is inserted in the coin slot 16 locking the switch 57 closed. The circuit of the motor 43 is thus completed through the normally closed switch 41 and the shaft 44 begins to move in the counterclockwise direction. The high spot 36 on the cam 37 clears the end of the arm 35 so that the switch 41 is opened, the switch assembly 40 changing to the condition shown at Pos. 2 in Fig. 4 and the motor stops. The bars 28 have moved to bring the cam shaped ends of the projections 31 into the openings 29 of the bars 24. The patron can now make his selection by pressing one button 13 of the decade series and one button 13 of the unit series. These two buttons are held in, by their projections 31 in their openings 39. The actuation of one bar 24 in each of the switch assemblies 25 and 26 connects the line 79 to the line 78 so that the circuit of the motor 43 is again completed and the operation of the shaft 44 is resumed. The circuit of the motor now is line 77, switch 57, line 79, two switches 87, line 78, motor 43 and grounded line 76. The movement of the shaft 44 moves the step 38 of the cam 37 away from the end of the arm 35 so that the bars 28 move into locking position. The two actuated buttons 13 are now held in and actuation of any of the other buttons is prevented. When the step 38 of the cam 37 clears the arm 35 the switch 42 is closed as shown in Pos. 3 on Fig. 4 so that the circuit of the motor is completed independently of the switch 57. This circuit is line 77, switch 42, motor 43 and grounded line 76. Thereafter the cam 48 clears the switch 49 which provides an additional circuit for the motor 43. This circuit is line 77, switch 49, motor 43 and grounded line 76.

After the bars 28 are moved into locking position the arm 46 travels over the contacts of groups 70, 71, 72 and 73. As the arm moves over the contacts of group 70 which remain connected to the line 83, for example the right hand six of these nine contacts and over the contacts of group 71, the impulse line 80 is grounded nine times thus creating a regular series of nine impulses. The impulse circuit is grounded ring 68, arm 47, arm 46, an included contact 70 for example, line 83, closed switches 82 and line 80. As the arm 46 travels over the group 72 and the contacts of group 73 which remain connected to the line 83, for example the right hand 4 of these contacts, a regular series of seven impulses is created by the grounding of the line 80 seven times.

During the rotation of the shaft 44 the cam 48 actuates the bar 60 returning the coin lever 54 to its initial position and opening the switch 57. The motor continues to operate because switches 42 and 49 are closed. After the arm 46 clears the group of contacts 73 the cam 37 unlocks the bars 28 and returns the switch assembly 40 to the condition shown at Pos. 1 on Fig. 4. The switch 49 maintains the circuit of the motor until the cam 48 opens the switch 49 which terminates the op-

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eration of the motor with the arm 46 in the space 75.

The three lines 77, 76 and 80 are preferably assembled in a single cable which is connected to the phonograph cabinet. The line 80 may be connected to the grid of a tube in the main unit to increase the bias of the tube to effect the creation of an electrical impulse as fully described in the two applications referred to. It will of course be understood that the line 80 may be connected to a source of voltage so that a relay is operated by each impulse.

The embodiment of the invention illustrated in Figs. 5 and 6 is adapted for transmission of radio frequency impulses. The mechanical parts of this embodiment are substantially similar to those of the first described embodiment and are identified by the same reference numerals. The description of this embodiment will be restricted to the electrical system and to the minor mechanical changes which differentiate it from the first described embodiment. It is to be noted that in Fig. 5 mechanical details, primarily those associated with the coin lever 54 are omitted. These mechanical features are arranged in this embodiment in the same manner as illustrated in Figs. 1 and 2. The box 10 is made somewhat wider in this embodiment to accommodate the transformer 90, the coil assembly 91 and the tube 92. In this embodiment the ring 68 is not grounded but is connected by line 93 to the B+ supply provided by the cathode of the diode section of the tube 92. This tube may suitably be a 70L7-GT tube. A filter 94 is provided for the B+ supply. The line 83 is connected to the plate and screen of the amplifier section of the tube 92. It will thus be seen that the circuit completed by the arm 46 and the contacts on the disc 69 controls the supply of B+ voltage to the amplifying section of the tube 92.

The secondary of the transformer 90 supplies A. C. voltage to the anode of the diode section. A tap on the secondary supplies voltage to the heaters of the tube 92. Another tap on the secondary is connected to the switches 49, 42, and 57 to supply current to the motor 43. Another tap on the secondary provides current for illuminating lamps 95 in the box which indicate that the box is energized.

The oscillator coil assembly 91 includes the oscillator coil 96 which is tuned to a suitable radio frequency, for example 250 kc. by means of a variable condenser 97. One end of the coil 96 is grounded. A tap on the coil 96 is connected to the cathode of the amplifying section of the tube 92 and another tap is connected through a condenser 98 and a parallel grid leak resistor 99 to the grid of the amplifying section. A coil 100 is coupled to the coil 96 and is connected through condensers 101 to the power lines 102 which supply alternating current to the primary of the transformer 90. The lines 102 may be connected to a plug 103 which can be plugged into any suitable receptacle of the power supply to which the phonograph is connected. A switch 104 in series with the coil 100 is preferably provided to prevent any possibility of transmission of impulses at any time that the motor 43 is not driving the arm 46 over the contacts on the discs 69. The switch 104 is normally open and it may be associated with the switch 49 so that it closes when the cam 48 clears the switch 49. As hereinbefore pointed out the cam 48 clears the switch 49 before the arm 46 engages any of the contacts of the group 70.

In this embodiment of the invention switches 82 are omitted. The upper ends of the bars 28 normally engage two insulated contacts 105 which normally render the oscillator inoperative. The contacts 105 may suitably be connected to the cathode of the amplifying section of the tube 92. Thus the cathode is normally grounded and the oscillator is inoperative until both the bars 28 move into their locking positions. A key operated switch 106 in one of the power lines 102 is provided to control the supply of energy to the box.

In this embodiment of the invention the box is energized by closing the switch 106. The diode section of the tube 92 supplies B+ voltage to the ring 68. The selection is made by the patron in precisely the same manner as in the preceding embodiment. Before the arm 46 engages any of the contacts on the disc 69 the bars 28 are moved into locking position breaking the grounding circuit of the cathode of the amplifying section of the tube 92. As the arm 46 moves over the contacts on the disc 69 two trains of impulses of B+ voltage are supplied to the plate of the amplifying section, the number of impulses in each train being determined by the selection made by the buttons 13. The supply of B+ voltage to the oscillator puts it into oscillation to supply a corresponding number of impulses of radio frequency to the coil 100 and to the power lines 102. These radio frequency impulses are picked up at the phonograph and are amplified and supplied, for example to the radio frequency transformer 181 of Patent No. 2,382,488 referred to above.

It is to be noted that in both embodiments of the invention the operator may lock in more than one button 13 either or both series. In this event the selection made will be determined by the actuated buttons bearing the lower numbers.

Although the invention has been described in connection with specific details of a preferred embodiment thereof, it must be understood that such details are not intended to be limitative of the invention except in so far as set forth in the accompanying claims.

I claim:

1. A selector for automatic phonographs adapted to transmit a plurality of trains of impulses seriatim comprising a plurality of series of manually actuable members corresponding to each train, means controlled by each member of a series for determining the number of impulses in its train, normally ineffective means for holding said members in actuated condition, coin-controlled means for rendering said holding means effective, and means controlled by actuation of a member of all of the series into held position for creating the corresponding trains of impulses seriatim.

2. A selector for automatic phonographs adapted to transmit a plurality of trains of impulses comprising a plurality of series of manually actuable members, means controlled by each member of each series for determining the number of impulses in its train, said members being normally free, normally ineffective means for holding said members in actuated position, coin-controlled means for rendering said holding means effective, a motor for creating the trains of impulses seriatim, a switch associated with said coin-controlled means adapted to condition the motor for operation, and switches associated with said members cooperating with said coin-controlled switch to energize said motor when a member of all of the series is in held actuated position, to effect creation of said plurality of

trains seriatim, and means controlled by said motor for returning said holding means to normal ineffective position after the creation of said trains of impulses.

3. A selector for automatic phonographs adapted to transmit a plurality of trains of impulses comprising an impulser circuit including a plurality of series of contacts and a contact movable thereover, a motor for driving said movable contact, a coin-controlled switch adapted to energize said motor, means controlled by the motor to break its circuit before the movable contact has moved over any of the contacts of said series, a plurality of series of manually operable selector members, each series of members corresponding to a series of contacts, a switch associated with each member for controlling the number of contacts of the corresponding series included in said circuit, said members being normally free, normally ineffective holding means for maintaining said members in actuated position, means controlled by the initial operation of said motor to move said holding means to effective position, switch means operably associated with each member, the switch means of the series of members being in series with each other and with said coin-controlled switch, said coin-controlled switch and said switch means establishing an independent circuit for the motor whereby the operation of the motor is resumed by the actuation of a member of all of the series, and means controlled by the motor for terminating its resumed operation after the movable contact has moved over all the contacts of the series, and means controlled by the motor for returning said holding means to normal ineffective position.

4. A selector for automatic phonographs adapted to transmit a plurality of trains of impulses comprising an impulser circuit including a plurality of series of contacts and a contact movable thereover, a motor for driving said movable contact, a coin-controlled switch adapted to energize said motor, means controlled by the motor to break its circuit before the movable contact has moved over any of the contacts of said series, a plurality of series of manually operable selector members, each series of members corresponding to a series of contacts, a switch associated with each member for controlling the number of contacts of the corresponding series included in said circuit, said members being normally free, normally ineffective holding means for maintaining said members in actuated position, means controlled by the initial operation of said motor to move said holding means to effective position, switch means operably associated with each member, the switch means of the series of members being in series with each other and with coin-controlled switch, said coin-controlled switch and said switch means establishing an independent circuit for the motor whereby the operation of the motor is resumed by the actuation of a member of all of the series, means controlled by the motor in its resumed operation for locking all said members against displacement while the movable contact is moving over said series of contacts, and means controlled by the motor for terminating its resumed operation after the movable contact has moved over all the contacts of the series, and means controlled by the motor for returning said holding means to normal ineffective position.

5. A selector for automatic phonographs adapted to transmit a plurality of trains of impulses comprising an impulser circuit including a plurality of series of contacts and a contact movable

thereover, a motor for driving said movable contact, a coin-controlled switch adapted to energize said motor, means controlled by the motor to break its circuit before the movable contact has moved over any of the contacts of said series, a plurality of series of manually operable selector members, each series of members corresponding to a series of contacts, a switch associated with each member for controlling the number of contacts of the corresponding series included in said circuit, switch means operably associated with each member, the switch means of the series of members being in series with each other and with said coin-controlled switch, said coin-controlled switch and said switch means establishing an independent circuit for the motor whereby the operation of the motor is resumed by the actuation of a member of all of the series, means controlled by the motor in its resumed operation for completing a circuit for the motor independent of the coin-controlled switch, means controlled by the motor after the completion of the last mentioned circuit for opening said coin-controlled switch, and means controlled by the motor for opening last mentioned circuit after the movable contact has moved over all the contacts of the series.

6. A selector for automatic phonographs adapted to transmit two trains of impulses corresponding to a single selection comprising an impulser circuit including two spaced series of contacts and a contact movable thereover, a motor for driving said movable contact, a switch assembly associated with each series of contacts, each assembly comprising a plurality of manually actuatable members, switch means operated by each member for disconnecting variable numbers of contacts of the associated series from said circuit, and switch means operated by each member, the switch means of said series being in series and in the circuit of the motor whereby the motor is caused to move the movable contact over both series of contacts when a member of both assemblies is actuated.

7. A selector for automatic phonographs adapted to transmit two trains of impulses seriatim corresponding to a selected recording comprising an impulser circuit including two spaced series of regularly spaced contacts and a contact movable thereover, a motor for driving said movable contact, two series of buttons each corresponding to a series of contacts, switch means associated with each button for eliminating a definite number of contacts of the corresponding series from the circuit, a switch adapted to be closed by a coin to put the motor into operation, means associated with the motor for stopping the motor before the movable contact engages any of the contacts of the series, locking bars adapted in one position to permit actuation of said buttons and to hold said buttons in actuated position and in another position to lock all said buttons against actuation, means associated with the motor for moving said bars from inoperative position into the first mentioned position during the aforesaid operation of the motor, switch means operated by each member arranged to cooperate with the coin-controlled switch to resume the operation of the motor when a button of both series is actuated, means associated with the motor for controlling the movement of the bars to the second mentioned position when the operation of the motor is thus

resumed, and means for terminating the operation of the motor after the movable contact has moved over both series of contacts.

8. A selector for automatic phonographs adapted to transmit two trains of impulses seriatim corresponding to a selected recording comprising an impulser circuit including two spaced series of regularly spaced contacts and a contact movable thereover, a motor for driving said movable contact, two series of buttons each corresponding to a series of contacts, switch means associated with each button for eliminating a definite number of contacts of the corresponding series from the circuit, a switch adapted to be closed by a coin to put the motor into operation, means associated with the motor for stopping the motor before the movable contact engages any of the contacts of the series, locking bars adapted in one position to permit actuation of said buttons and to hold said buttons in actuated position and in another position to lock all said buttons against actuation, means associated with the motor for moving said bars from inoperative position into the first mentioned position during the aforesaid operation of the motor, switch means operated by each member arranged to cooperate with the coin-controlled switch to resume the operation of the motor when a button of both series is actuated, means associated with the motor for controlling the movement of the bars to the second mentioned position when the operation of the motor is thus resumed, means associated with the motor for completing an independent circuit for the motor after its operation is resumed, means associated with the motor for thereafter opening said coin-controlled switch, and means for terminating the operation of the motor after the movable contact has moved over both series of contacts.

9. In a selector for automatic phonographs, in combination, a plurality of manually operable selector buttons, means normally biasing said buttons to non-actuating position, a member normally out of engagement with said buttons and adapted to be moved into two operative positions with respect to said buttons, said member having cam surfaces to permit a button to be actuated and to be retained in actuated position when the member is in one of said operative positions, said member having locking surfaces to prevent the actuation or release of an inactuated or actuated button respectively when the member is in its other operative position, coin controlled means for moving said member into the first mentioned operative position, means controlled by said buttons for moving said member into the second mentioned operative position, and means for returning said member to normal position.

HERMAN G. JENSEN.

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