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SELECTOR MECHANISM

Filed June 15, 1939

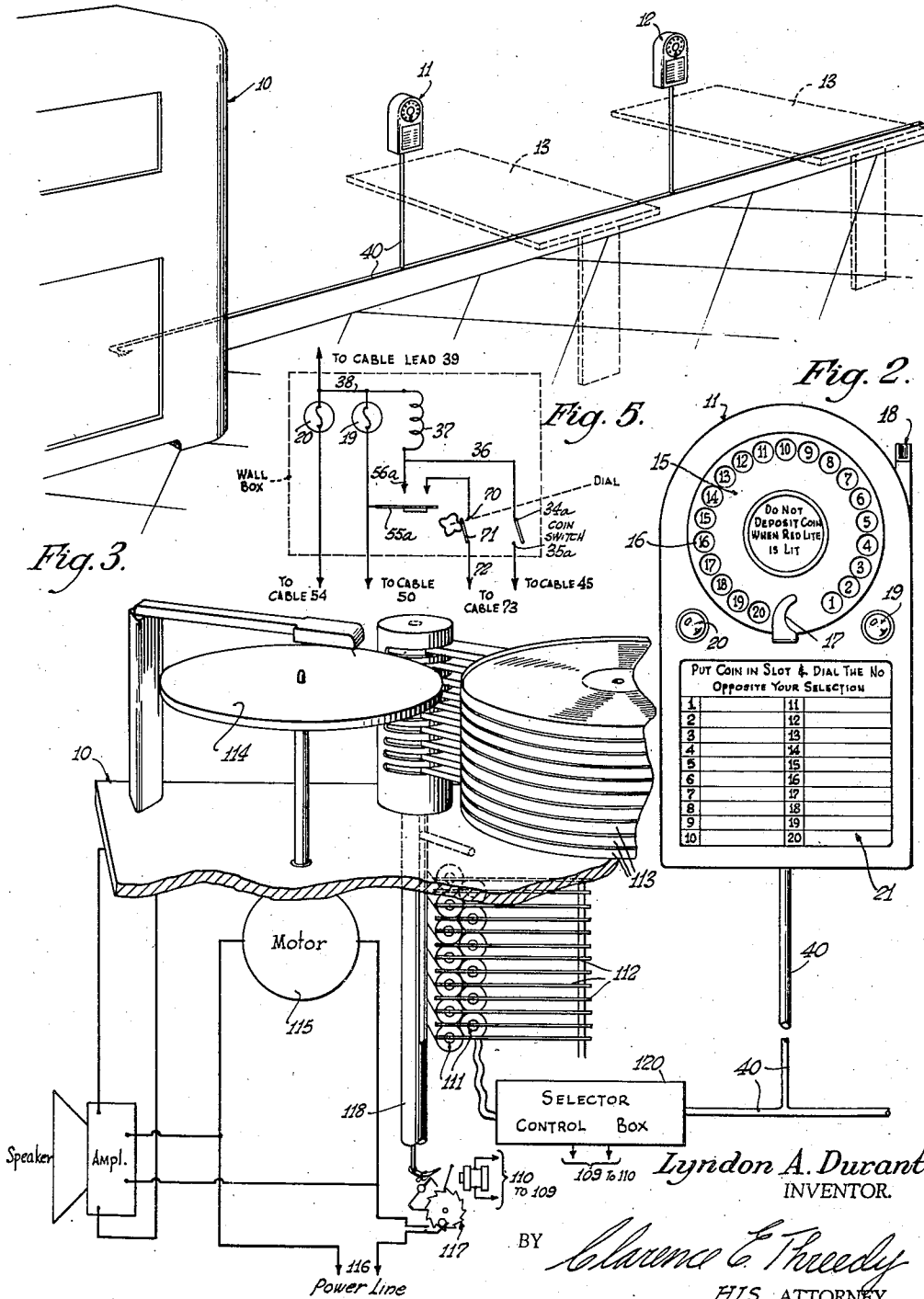
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Fig. 1.

Fig. 2.

Fig. 5.

Fig. 3.



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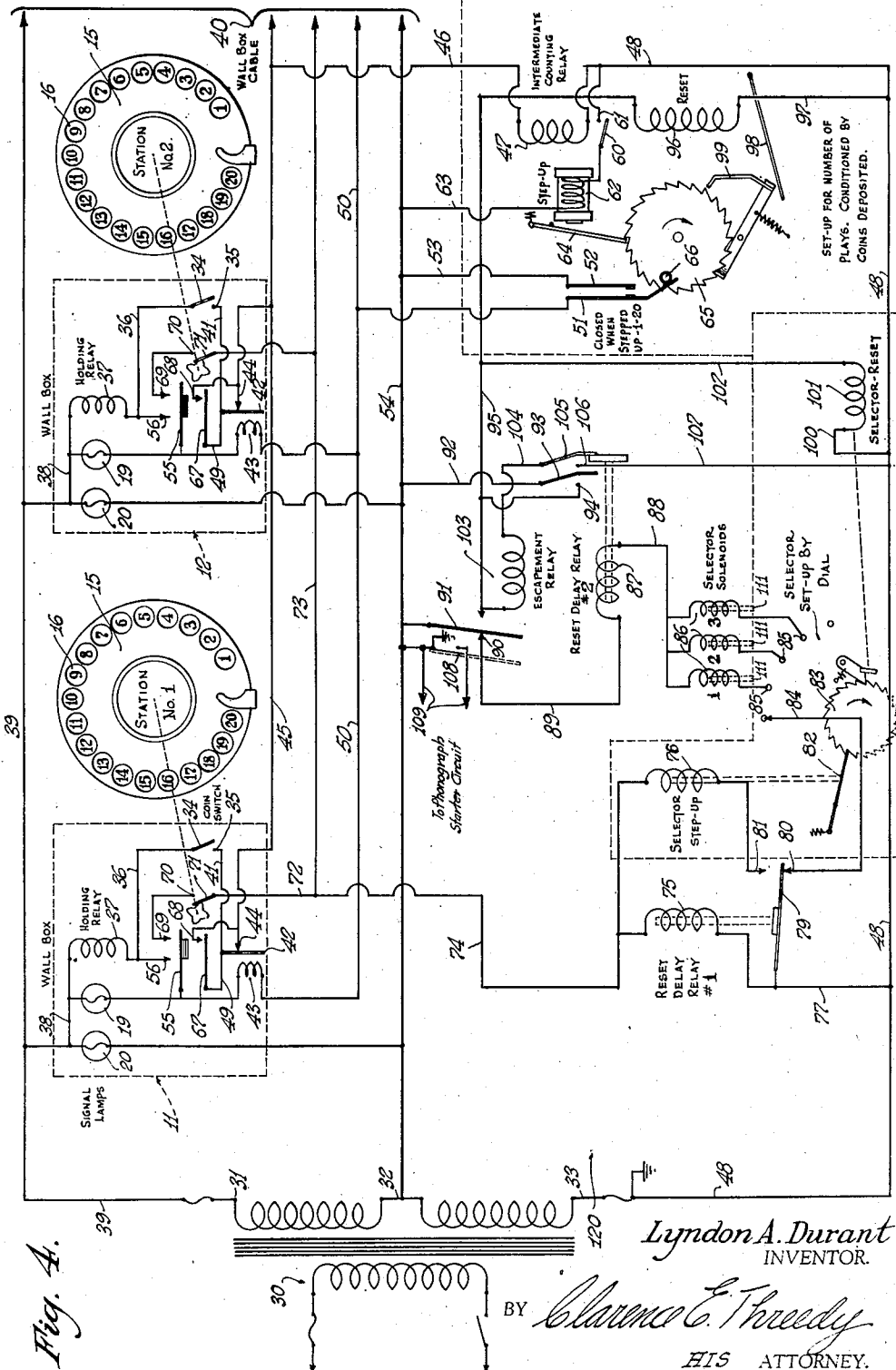
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UNITED STATES PATENT OFFICE

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SELECTOR MECHANISM

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9 Claims. (Cl. 194—15)

This invention relates to remote control means for use with amusement apparatus, such, for example, as automatic phonographs and the like.

A principal object of the invention is the provision of selecting mechanism adapted to be operated by any of a plurality of coin box controls set up in restaurants or other places frequented by the public, with selecting mechanism at the several coin box controls, whereby the patron may dial his selection after depositing a proper coin for actuation of the centrally located selecting mechanism and phonograph or other instrumentality controlled thereby.

Another object of the invention is the provision of a simplified remote control system in which there may be a plurality of individual signal or control stations, arranged for coin operation or not, as desired, and from which selecting signals may be transmitted by operation of a dial, to a central selecting device which employs only one selecting switch for all of the remote dialing or control stations.

Another object is the provision of a remote control selecting system employing a plurality of coin boxes at various stations and a simplified signaling mechanism at each station and which may be connected to the central selecting mechanism through a simple four-wire cable.

A further object is the provision of automatic cut-off means for preventing dialing at the remaining stations when a coin has been deposited preparatory to making a selection at any given station.

Other objects and novel aspects of the invention relate to certain details of the circuit connections and simplified arrangement of signaling and selecting devices to be described hereinafter in the specification of a preferred embodiment, all of which will be best understood in conjunction with the annexed drawings, in which:

Fig. 1 is a perspective layout of the system installed for use;

Fig. 2 is an enlarged front elevation of one of the coin control units or dialing stations;

Fig. 3 is a perspective schema of an automatic phonograph controlled by the selecting system;

Fig. 4 is a circuit diagram;

Fig. 5 is a modified circuit arrangement of the dialing circuit connections at the control boxes.

In Fig. 1, the illustrative installation includes a selectively controlled instrumentality, such as the phonograph 10, which is adapted to be operated from a plurality of dialing or signaling stations 11 and 12 situated at remote points in the room and adjoining booths or tables 13 for operation by the patrons at such tables.

The individual control units 11 and 12, as shown in Fig. 2, include a suitable box or housing adapted for mounting on the wall or table and each including a selecting device in the form

of a dial type of signal or impulse transmitter 15, similar to the usual telephone dial except that the numbering is increased to a suitable figure, say 20, beyond the usual digits applied on the ordinary telephone dial. In other respects, the dial 15 is operated by placing the finger in one of the openings 16 and turning the dial clockwise until the finger engages a stop 17, whereupon the dial is released and returned automatically by self-contained spring motor means to its normal position, such operation in the instance suggested being effective to transmit sixteen impulses to the selecting mechanism. Each control unit is adapted to be freed for operation by deposit of a coin in an opening 18. Signal lamps 19 and 20 are provided on the face of the box, one of the lamps 19 signaling that the system is in use, and such lamp being preferably colored red, while the remaining lamp 20 may be differently colored, for example, blue, to attract attention and indicate that the system as a whole is in service for operation at the pleasure of the patron. Indicia means in the form of a card 21, is provided on the face of the box to designate the selections corresponding to the various numbers on the selecting dial.

Brief statement of operation

The deposit of a coin at a given station, effects operation of a holding relay at that station and cut-out relays at that station and all others. The holding relay establishes a dialing circuit and also establishes a shunt circuit for the corresponding coin switch, but the cut-out relays at all other stations open the corresponding coin switch circuits to render the other stations momentarily inoperable. Red signal lamps indicating that the system is temporarily busy are illuminated in conjunction with the operation of the several cut-out relays.

The coin switch is operated once for each coin deposited, which results in the operation of a counting switch adapted to permit a number of dial selections corresponding to the number of coins deposited. Each time a selection is dialed, a reset coil restores the counting switch one step toward its initial condition until the last selection is made.

The number dialed sends a corresponding number of impulses over the dialing circuit established through the associated holding relay contacts and operates a selecting switch which moves a corresponding number of steps from an initial position. As the last impulse is completed from the dial, certain slow-releasing relays connect a power circuit to a selector solenoid or other selectively operable device for which a circuit has been established by the selecting switch, and as soon as the selector solenoid or other device has been thus operated the selector switch

is restored to its initial position by certain interlocking relays. The selecting switch is thus restored immediately following the dialing of any and every number, thus making it possible to employ a single selector switch for a large number of selecting stations or coin boxes. When the counting switch is restored to its initial or zero position following the last dial operation to which the patron is entitled, the main power circuit is broken so that the holding relay and all of the cut-out relays are restored to initial condition.

Detailed circuit connections

The selecting mechanism and circuit connections shown in Fig. 4 include the provision of a power source such as a transformer 30 having its primary connected to the line at all times when the system is in use, and having a split secondary including terminals 31, 32 and 33. The coin control means includes the provision of a coin switch at each of the wall boxes or stations 11, 12, etc., such switches each having a movable contact 34 adapted to be operated by the coin deposited in opening 18 of the box for momentary engagement with a companion contact 35 to close a locking circuit and condition the corresponding selecting mechanism or station for operation by the patron. The contact 34 is connected by a conductor 36 to one terminal of the winding of a holding relay 37, the remaining terminal of which is connected by a conductor 38 to one of the power conductors 39 included in a four-wire cable 40 by which several coin boxes are connected with the central selecting mechanism which is disposed as a unit in a housing, as illustrated at 120 in Fig. 2, this conductor 39 being connected to one of the terminals 31 of the transformer secondary. The remaining contact 35 of the coin switch is connected by a conductor 41 to the movable contact 42 of a cut-out relay having a winding 43. The cut-out contact 42 is normally in closed circuit engagement with its contact 44 which is connected to another conductor 45 in the cable 40.

The cable conductor 45 is connected by a conductor 46 to one terminal of an intermediate counting relay having a winding 47, the opposite terminal of which is connected by a conductor 48 to one of the outer terminals 33 of the transformer secondary.

Thus, when the switch contacts 34—35 are closed by a coin, the power circuit is closed from the outer terminals of the transformer secondary through the holding relay winding 37 and the intermediate counting relay winding 47, causing both of the same to pull up.

The patron having deposited one coin and the holding relay 37 at his station being pulled up, a locking circuit is established through the holding relay by virtue of connection of battery from conductor 50 through the cut-off winding 43 and holding relay contacts 55 and 56, cable conductor 50 being connected through counting switch contacts 51 and 52 via conductor 53 to the central tap conductor 54 from the center transformer terminal 32, which energizes the winding 43 of the cut-off relay and places battery on one of the holding relay movable contacts 55, this battery being connected through the stationary contact 56 to the same terminal of the holding relay winding to which the contact 34 of the coin switch is connected. Thus, whereas the coin switch closed the power circuit for the holding relay momentarily through the

conductor 45 and the intermediate counting relay winding 47, the locking power circuit for the holding relay is established through its own contacts 55 and 56 and the cut-off relay winding 43. The red lamp 19 at this station will be, and remain, illuminated since it is in series with the winding 43 of the cut-off relay, to indicate that a coin has been deposited and that the system is in use.

Deposit of the coin momentarily closed a circuit through the winding 47 of the intermediate counting relay, causing the movable contact 60 to pull up and engage the companion stationary contact 61 which is connected to the power conductor 48, thus placing battery on one terminal of the counting switch magnet winding 62, the remaining terminal of which is connected by conductor 63 to the center tap transformer conductor 54, thus impulsing the counting switch magnet once (since the coin transiently engages and closes the contacts 34—35) and pulling up its armature 64 to move a counting ratchet 65 one step from its initial position (in which initial position an insulated stud 66 bears against an extension on the counting switch contact 51 to move the latter out of closed circuit engagement with its companion contact 52) so that when the ratchet steps from initial position contacts 51 and 52 may engage to close the power circuit from the center tap conductor through the cut-out relay and holding relay.

It is important to observe that more than one coin may be deposited at any one station, and for each coin deposited, the switch contacts 34 and 35 will be actuated once, thus impulsing the intermediate counting relay once for each coin deposited and thus impulsing the counting switch magnet a corresponding number of times so that the stud 66 will be moved by the ratchet away from its normal position a number of steps corresponding to the number of coins deposited.

Means for cutting off other stations when a coin has been deposited at any given station involves the several cut-off relays 43 at each station. It is to be remembered that whenever one or more coins is deposited at any box, the counting ratchet 65 will be stepped a corresponding number of times, thus connecting battery for the time being, to the cable conductor 50, and since one terminal of each of the cut-off relays 43 is connected to this conductor 50 (the other terminal being connected through the corresponding red lamp to the power cable conductor 39), all cut-off relays at the several stations will instantly pull up as soon as the first coin is deposited at any station, and all red lamps will be illuminated. It will be recalled that each of the coin switch contacts 35 is normally connected in its power circuit through the closed contacts 42 and 44 of the corresponding cut-out relay, but as soon as the first coin is deposited the corresponding cut-off relay and all of the others pull up, thus opening, for the time being, the normal circuit through the coin switches at each station. However, the coin switch at the particular station at which the coin was deposited will instantly be returned in circuit due to the operation of the corresponding holding relay which again connects the coin switch contact 35 with the cable conductor 45 through the second movable contact 67 of the holding relay and the companion stationary contact 68 strapped with the contact 44 to conductor 45. Since the holding relays at the other stations do not pull up, the corresponding coin switches are out of cir-

cuit and deposit of coins at the other stations will be of no avail, the red lamps warning the patrons that such deposits should not be made.

The dialing or signal circuit is established for the station at which the coin was deposited by operation of the corresponding holding relay, the relay contact 55 engaging a stationary contact 69 which connects power from the center tap conductor 54 to one terminal 70 of the dial switch, the movable contact 71 of which is connected by a conductor 72 with a signaling conductor 73 in the cable and which is connected by conductor 74 to one terminal of a first slow-release reset relay 75.

When the patron dials, a corresponding dial switch 70-71 will be closed a number of times corresponding to the number dialed, thus impulsing the winding of the first or reset delay relay 75 via conductor 74 and conductor 77, which is connected to the power lead 48.

The armature of the relay 75 is so constructed that it will not fall back to normal position in the short interval between successive signal impulses, but will remain engaged with its companion open contact 81 while the dial impulses are traversing the conductor 74.

As a result of the hold-up of contact 79, the dial impulses are transmitted through winding 75 and the winding 76 of the stepping magnet for a selecting switch, the return circuit for winding 76 being completed through contacts 79 and 81.

The impulses transmitted from the dial switch through winding 76 of the selector switch, pull up a ratchet armature 82 a corresponding number of times, thus stepping a ratchet 83 and its wiping contact 84 away from an initial position in which it is normally disposed by suitable spring means.

Thus, the selecting switch wiper 84 will be stepped away from its initial position, a number of steps corresponding to the number dialed, to bring its wiping contact 84 to rest on one of the selector solenoid contacts 85, thus conditioning a particular one of the latter for ultimate operation to actuate the selecting mechanism in the phonograph or other instrumentality, (which corresponds to the number dialed) when the last dialing signal is completed.

The means for finally connecting the selectively operated devices, that is, the selector solenoids 86, in the power circuit, includes a second slow-releasing or delayed-action reset relay 87 which has one terminal connected by a conductor 88 in common with one terminal of each of the selector solenoids 86, the remaining terminal of the second reset relay being connected by a conductor 89 to one normal terminal 90 of an escapement relay and thence through the movable contact 91 of the latter to the center tap transformer conductor 54. As soon as the wiper 84 has come to rest on one of the contacts 85 and the last dial impulse has been received, the movable contact 79 of the first slow-acting relay falls back and connects power from conductor 77 through contact 80 to the wiper and hence to the selected solenoid, with the result that the second slow-acting relay 87 pulls up and the selected solenoid is energized. Operation of the second reset relay 87 closes circuits for two resetting magnets respectively associated with the selector switch and the counting switch.

For the resetting circuits, power is derived from the center tap conductor 54 via conductor 92 and the second reset relay contact 93, stationary con-

tact 94, and conductor 95 to one terminal of the reset coil 96, the remaining terminal of which is connected by conductor 97 to the power lead 48. Each time coil 96 is impulsed, armature 98 thereof operates an escapement 99 for the counting switch ratchet 65. The circuit for the selector switch reset is established from the power conductor 48 via conductor 100 to one terminal of the selector reset coil 101, the other terminal of which is connected by conductor 102 to the conductor 95 which is also connected with one terminal of the escapement relay winding 103, the remaining terminal of which is connected by conductor 104 with another movable contact 105 on the second reset relay, this contact 105 engaging its companion contact 106 when the relay pulls up for connection with the power contact 48 via conductor 107. When the escapement relay 103 operates, the circuit for the second reset relay and the selected solenoid is broken by movement of the armature contact 91 of the escapement relay. When the escapement relay 103 is energized, the second gang contact 108 is operated to close a starting circuit 109 for the usual phonograph control circuit. Circuit 109 connects with the starter switch circuit 110 shown at the bottom of Fig. 3.

In the event that only one or two control stations or boxes 11 and 12 are to be used in the installation, a simplified dialing circuit may be provided as shown in Fig. 5, in which the cut-out relay 43 is omitted and the coin switch contact 35a is connected directly to cable 45 and the holding relay armature 55a connects directly to cable lead 50, the dial lead 72 connecting as before to the cable lead 73. In this circuit, as soon as the coin switch is operated, the holding relay locks by engagement of its armature 55a with the stationary contact 56a, as in the case of the arrangement of Fig. 4. In accordance with the circuit arrangement of Fig. 5, there is no cutting off of the other coin boxes, but in smaller installations this would not give rise to any inconvenience.

The foregoing description will make it apparent that I have devised a remote control selecting system which includes a plurality of selectively operable devices such as the selector solenoids 86 which are operated by the impulse transmitter or dials 15, the circuit arrangements being such that the patron is entitled to dial as many numbers as there are coins deposited, each deposit of a coin operating a coin switch once to step the counting switch ratchet away from its initial position, while each number dialed restores the counting switch one step toward normal position. The invention further provides for a single selecting switch which is operated one step away from an initial position for each selecting impulse transmitted, and certain delay and interlocking relays are actuated to connect power through the selector switch after the latter has made a selection, but only after the last selecting impulse has been received at the selecting switch. The interlocking relay connections are such that the selecting switch will automatically be restored to its initial position ready for the next selection immediately following operation of any previously selected solenoid or other selectively operable device 86.

It is to be understood that the novel selecting circuit is not restricted to use with a phonograph, since the selector solenoids 86 may obviously be replaced by any electrically operated or controlled mechanism. However, for purposes of illustra-

tion, in Fig. 3 I have shown plungers 111 which are to be operated by the several selector solenoids 88 to move record selector bars 112 into position in the well known manner to effect movement of one of the record carriers 113 into position for disposition of a record on the turntable 114.

The illustrative phonograph apparatus of Fig. 3 is driven by a motor 115 included in a power circuit 116 controlled by a counting switch 117 which is arranged for coaction with the record carrier shaft 118. The arrangement is such that the operation of the starting switch 108 by the escapement relay 103 in the circuit of Fig. 4 will start the phonograph selecting mechanism, and if more than one of the selector bars 112 have been operated by the solenoid means 88—111, the phonograph will continue to play each of the selected numbers as a result of the automatic operation of the counting switch means 117. This latter arrangement does not constitute a part of the invention except in so far as it coacts with the starting switch 108 and associated selecting means 88, etc., and a detailed description of the phonograph repeating control means is therefore not entered into.

It is also contemplated and expressly provided that the armature of cut-off magnet 43 may be employed to operate known mechanical means for blocking the coin openings 18 when one station is in operation, the holding relay armature means 55—57 coacting with such blocking mechanism to prevent operation of the same when both the holding relay and corresponding cut-out relay are operated together at one station. This same arrangement is also optionally used to operate a coin return lever in known coin return systems to be used in the control boxes 11, 12.

Summary of operation

Assuming the circuit to be in the condition of Fig. 4 with the power source or transformer energized, the lamps 20 will be energized at each selecting station to indicate that the system as a whole is in service. A patron may deposit one or more coins to operate the coin switch 34, causing holding relay 37 to pull up and thus connect the impulse switch 71 in a power circuit to operate the selector. As another incident of the operation of the coin switch, all cut-off relays 43 and the counting relay 47 will be operated. If more than one coin has been deposited the counting relay 47 will be operated a number of times corresponding to the number of coins deposited, the counting ratchet 65 stepping a like number of times. The function of the cut-off relays 43 is to disable all of the coin switches at the several stations excepting the one at which the coins have been deposited, the power circuit for the latter coin switch being maintained by the corresponding holding relay, lamps 19 lighting at all stations to indicate that the system is in service for selecting operation and giving warning that coins are not to be deposited until lamps 19 are extinguished.

Having deposited one or more coins as aforesaid, the patron dials his selection, for example, selection #10, in consequence of which the impulse switch means 70—71 transmits ten impulses via conductor 74 through delay relay #1 (solenoid 75) and the selector coil 76, thus causing the selector ratchet 83 to step ten times, delay relay armature 79 being of the slow-to-release type so that it holds up during the transmission of all ten impulses. By the time the selector wiper 84 comes to rest on the tenth one

of the contacts 85, the delay relay armature 79 will fall back and put battery on conductor 89 connected with the wiper and impulse the tenth selector solenoid (not shown), which will cause the corresponding record selector bar 112 (Fig. 3) to be actuated and condition the proper record selection to be played in the phonograph apparatus.

Simultaneously with the energization of the selector solenoid corresponding to record #10, the #2 delay relay 87 and the escapement relay 103 will also be energized, with a consequent impulsing of reset relay 98 to operate the escapement 99 of the counting relay ratchet to permit the latter to move one step back toward initial position. If only one coin has been deposited, the latter movement of the counting ratchet will open switch 51—52 to release the holding relay and the cut-off relay of the station which has been operated. If more than one coin has been deposited, for example, three coins, then the patron may make two more selections in the manner aforesaid before the switch 51—52 will open.

The operation of the escapement relay 103 following closely upon operation of the appropriate selector solenoid as aforesaid, closes the starting contacts 108 for the phonograph, which contacts are connected to conductors 109 leading in turn to contacts 110 on the phonograph counting switch 117 to step the latter a number of times depending upon the number of coins deposited. The operation of the counting switch 117 is known in the art and is such that each time the selector arm 118 of the phonograph makes a complete oscillation corresponding to the playing of a selection, the ratchet of the counting switch 117 will be stepped once back toward initial condition, in which initial condition the associated switch for motor 115 and the amplifier is opened.

Thus, each time the escapement relay 103 is operated to restore the selector switch to initial condition, the phonograph counting switch 117 is stepped once. If three coins have been deposited, switch 117 will be stepped three times, closing the associated switch to operate the phonograph, and it will require three steps of the counting switch ratchet 117 by the phonograph selector arm 118 to restore the ratchet to initial condition with the phonograph control switch again opened.

The invention is susceptible of variations in the circuit connections and arrangement of apparatus described in conjunction with the illustrative embodiment, and is therefore to be accorded the broadest possible interpretation consistent with the appended claims.

I claim:

1. In a remote control selecting system, a plurality of centrally located selectively operable devices, a plurality of remotely situated impulse transmitters, centrally located impulse-operated selecting switch means for selectively connecting any of said devices in a power circuit, switching means coacting with said transmitters and selecting switch means to close said power circuits and energize a selected one of said devices following a predetermined time after the transmission of an impulse or impulses by one of said transmitters.

2. In a remote control selecting system including a plurality of centrally located selectively operable devices and a plurality of remotely situated control units each including an impulse

transmitter for selective operation to actuate a desired one of said devices, the combination with said selectively operable devices of switching means and circuit connections including a selecting switch operable in steps from an initial position by impulses from any of said transmitters to connect one of said selectively operable devices in a power circuit, a coin switch associated with each of said units, a centrally located counting switch operated by any of said coin switches in steps from an initial position depending upon the number of coins deposited, and switching means coacting with said transmitters and selecting switch to close a power circuit established by the selecting switch as aforesaid to energize the selected device at a predetermined time following connection of said device in said power circuit by the selecting switch, means for effecting restoration of said selecting switch to said initial position after each selecting operation thereof, and means for restoring said counting switch one step toward said initial position for each selecting operation of said selecting switch.

3. A control system in accordance with claim 2 and further characterized by the provision of means operatively associated with each of said coin-operated switches for rendering inoperative all coin switches of units save the one first operated by a coin.

4. In a system of the class described including a plurality of centrally situated selectively operable devices and a plurality of de-centralized selecting units each provided with a dial impulse transmitter for selective operation of a desired one of said devices, switching mechanism including a step by step selecting switch movable from an initial position to establish an operating circuit for any of said devices, coin-controlled switch mechanism at each of said units and counting switch means co-operable therewith for connecting the corresponding dial transmitter for operation of said selecting switch a number of times corresponding to the number of coins deposited, and switching mechanism cooperating with said selecting switch to complete a power circuit and actuate any of said devices selectively connected as aforesaid by the selecting switch, and means for automatically restoring said selecting switch to said initial position after each selecting operation thereof.

5. In a system of the class described including a plurality of centrally situated selectively operable devices and a plurality of de-centralized selecting units each provided with a dial impulse transmitter for selective operation of a desired one of said devices, switching mechanism including a step by step selecting switch movable from an initial position to establish an operating circuit for any of said devices, coin-controlled switch mechanism at each of said units and counting switch means co-operable therewith for connecting the corresponding dial transmitter for operation of said selecting switch a number of times corresponding to the number of coins deposited, and switching mechanism cooperating with said selecting switch to complete a power circuit and actuate any of said devices selectively connected as aforesaid by the selecting switch, means for automatically restoring said selecting switch to said initial position after each selecting operation thereof, and switching means at

each of said units operable to render the coin switch means thereof ineffective while said counting switch is in condition to permit one or more selecting operations of the dial transmitter at any other unit.

6. In an electrical selecting system of the class described, a plurality of selectively operable devices, an electrically operated connecting switch operable by impulses to effect operation of a desired one of said devices, means for transmitting impulses to operate said connecting switch, a coin-controlled switch operable to establish circuit connections to render said impulse transmitting means effective for the purpose aforesaid, and switching mechanism operably controlled by said coin-controlled switch to condition said system so that said impulse transmitting means may be operated once for each coin deposited.

7. In a selecting system, a selecting dial switch for transmitting selecting signals consisting of one or more impulses in succession, selectively operable devices, and switch means controlled by impulses from said dial switch for connecting a desired one of said devices in an actuating circuit, and means including a relay operably controlled by said impulses for connecting power to said actuating circuit to actuate the selected device following transmission of a selecting signal as aforesaid.

8. An electrical selecting system having in combination, a plurality of selectively operable impulse transmitters, a plurality of selecting magnets, an impulse-operated selecting switch movable from a starting position to successively connect each of said magnets in a power circuit, a counting switch operable in steps from a normal ineffective position to connect operating power to the system, a coin switch associated with each impulse transmitter, and connected to step said counting switch away from normal position once for each coin deposited, and relay means arranged to automatically close said power circuit to actuate a magnet connected therein by selecting action of the selecting switch as aforesaid following each selecting operation of an impulse transmitter, means cooperating with said relay means for effecting restoration of said selecting switch to starting position after actuation as aforesaid of a magnet selected thereby, and means for automatically restoring said counting switch in steps back to said normal position following each selecting operation of said transmitter.

9. In an electrical selecting system for phonographs including a central selecting unit and a plurality of selecting stations each including means for dialing a selecting signal consisting of a group of one or more impulses, the combination with said system of a coin switch at each station and arranged to be operated once for each coin deposited, a central counting switch operated one step at a time by each operation of a coin switch so as to be stepped away from a normal open-circuit condition and close an operating circuit for said unit, and means coacting with said dialing means for restoring said counting switch in steps toward normal position one step at a time for each selecting signal transmitted, whereby to effect a number of selections corresponding to the number of coins deposited.

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