

Nov. 29, 1949

E. G. HENRY

2,489,576

MULTIPLE PLUNGER SELECTOR SYSTEM

Filed May 4, 1945

2 Sheets-Sheet 1

FIG. 1.

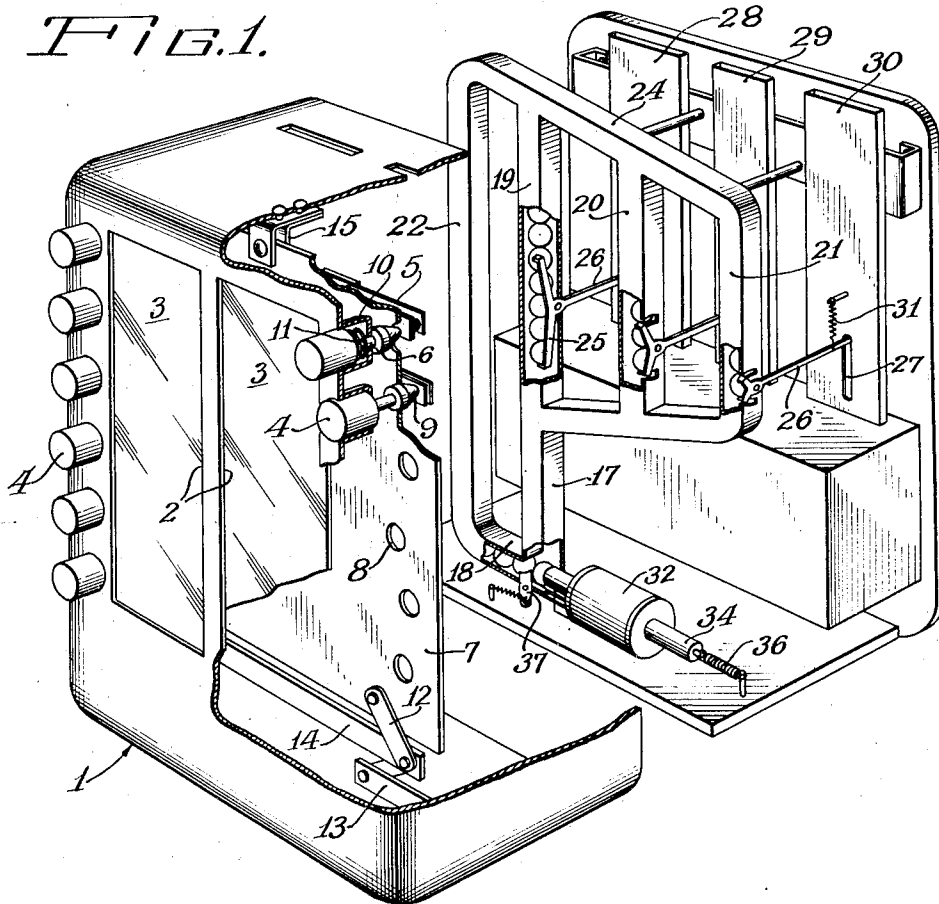
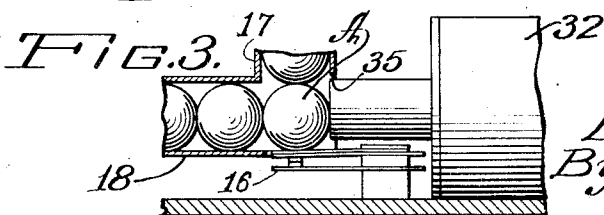
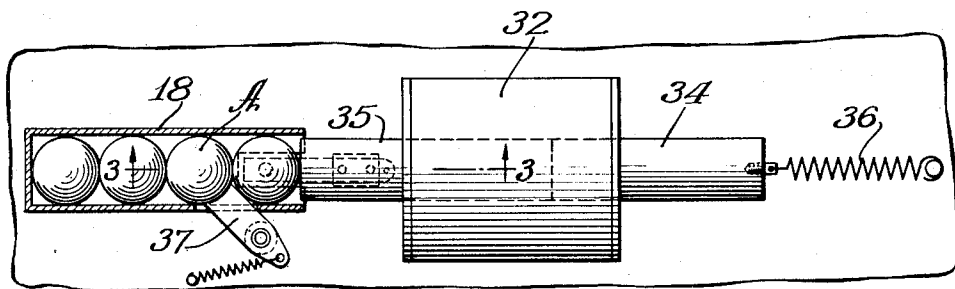


FIG. 2.



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FIG. 4.

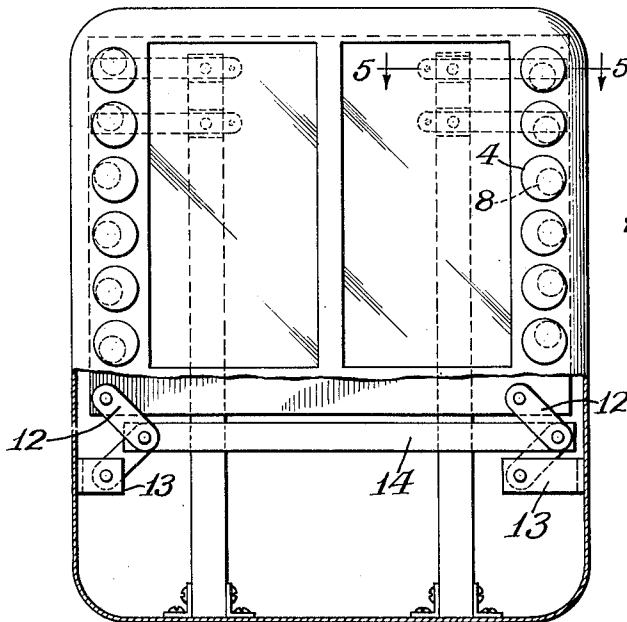


FIG. 5.

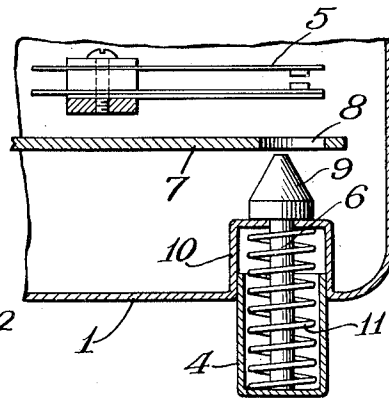


FIG. 6.

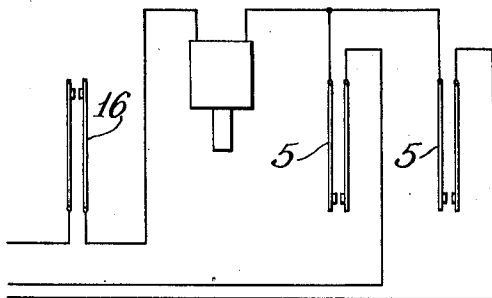
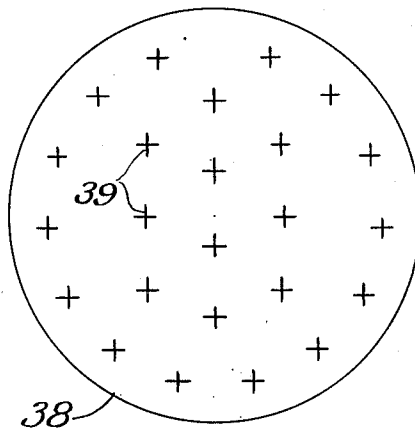


FIG. 7.



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UNITED STATES PATENT OFFICE

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MULTIPLE PLUNGER SELECTOR SYSTEM

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Application May 4, 1945, Serial No. 592,038

2 Claims. (Cl. 200—5)

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In my prior Patents 2,219,257 and 2,222,564, I have disclosed a coin controlled apparatus with which selections may be made, of musical records to be played or goods to be vended, from a list, by dialling numbers corresponding to the names in the list. The present invention has for its object to permit such selections to be made, successfully, by simply pressing push buttons or the like located alongside the names listed.

In the use of push buttons or other elements in making selections, each operable individually, the customer may receive more than he pays for, in musical selections or goods, if he is able to operate a plurality of such elements at the same time. Viewed in one of its aspects, the present invention may be said to have for its object to make it impossible for two selections in a selective system, to be operated simultaneously.

In the preferred form of my invention there is a mechanical interlock between the push button elements and, therefore, in one aspect of the present invention it may be said to have for its object to produce a simple, novel and reliable interlock between push buttons or other devices having similar movements, regardless of nature of the system in which those devices are used.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of the invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is a perspective view of a box, separated into two sections and parts thereof being broken away, containing my novel control mechanism in a highly developed form; Fig. 2 is a horizontal section on an enlarged scale, through the credit cancelling means within the box and a fragment of the immediate support therefor; Fig. 3 is a section on line 3—3 of Fig. 2; Fig. 4 is a front view of the box, with a part of the front wall broken away; Fig. 5 is a section on a still larger scale on line 5—5 of Fig. 4; Fig. 6 is a wiring diagram; and Fig. 7 is a diagram showing the displacement, each relative to the center of its co-operating plunger, of the centers of holes in an interlock plate through which plunger elements on twenty-four push buttons must pass during effective operation of the push buttons, in a modified construction.

In the construction shown in Figs. 1-5 of the drawings, 1 is a box or casing having two windows 2 in the front wall or panel. Visible through

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these windows are sheets 3 that are adapted to carry lists of names; spaces being provided for six names behind each window. Alongside each window is a row of six push buttons 4, one beside each name. Mounted within the box and set well back from the front wall or panel are twelve normally open switches 5, each directly behind one of the push buttons and the plunger 6 attached to and actuated by the latter. Between the rear ends of the plungers and the switches is a floating vertical plate 7 that contains holes 8 through which the inner or rear ends of the plungers must pass to reach the switches. Each plunger has at its inner end a head 9 which may comprise a short cylindrical section having a diameter that is very slightly smaller than the diameter of one of the holes and terminating in a conical portion. With this construction, upon pressing a push button home, the cylindrical part of the head enters the corresponding hole in the interlock plate before the switch closes; thereby insuring that the interlock plate is locked in such position that no other switch can be closed at the time of closing any selected switch. The push buttons are normally held retracted by suitable springs. In the construction shown, each button comprises a deep cylindrical cup slidable in an oppositely disposed cup-shaped boss 10 on the inner side of the front wall of the box. Within these two telescoped cuplike elements of each unit, and bearing at its ends against the bottoms of the cups, is a compression spring 11 which surrounds the plunger. When the button is pressed in, the spring, which is under some initial compression, is further compressed and therefore returns the push button to its idle position as soon as it is released. The centers of the holes in the plate are not at the axes of the push button devices but are displaced a little in one direction or another. In fact, the displacement is in twelve different directions as there are twelve of the push buttons. From this it follows that since each push button must shift the floating plate, in order to register exactly with the corresponding hole, in a different direction than is needed to enable any other push button to register with the hole that it must enter, no two push buttons can pass far enough through the interlock plates to close their switches at the same time.

In order that the interlock plate may move in any direction in its own plane, it may be pivotally connected to the upper ends of a pair of parallel toggles 12, below the plate and pivoted or hinged at their lower ends, in turn, to stationary supports 13 in the bottom of the box. A bar or rod 14 con-

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nects the two toggles together at the hinge joints therein. Suitable guides, such as the guides 15 in the top of the box, serve to hold the plate upright and against movements except in its own plane.

The closing of one of the switches 5, alone, is not all that the operator must do, for he must also cause a coin-controlled switch to close by inserting a coin in a slot in the box. This additional switch is indicated at 16 in Fig. 6 which also includes two of the switches 5. It will be seen that switches 5 are connected in parallel with each other and in series with switch 16 and that normally all of them are open. Thus while each of the switches 5 controls the circuit for causing a particular record to be played, in the case of a record playing system this is conditioned on first having necessary credit established as evidenced by the closing of switch 16, which is coin-controlled.

While the coin-controlled switch may be closed in any suitable manner, I have illustrated the same credit establishing and cancelling apparatus as that disclosed and claimed in my companion application on a coin-controlled system, Ser. No. 592,039, filed May 4, 1945, modified slightly to adapt it to a selective control system. As in the aforesaid application, there is a group of connected chutes in which many small metal balls are housed and through which they may circulate. A movable element for closing the switch 16, which may be a movable member of the switch itself, is placed at the juncture of a chute section 17, down which balls A drop or roll and come to rest on such element, and a horizontal chute section 18 into which balls are pushed from the switch-closing position to start on their return journey. If provision is to be made for depositing nickels, dimes and quarters, for example, chute section 17 is fed balls from three chute sections, 19, 20 and 21, arranged above the same and connected to the upper end thereof. Section 18 merges in a gradual curve into a long section 22 that rises above the upper ends of sections 19 to 21 and is connected with such ends by a laterally extending section 24 joined to section 22 on a gradual curve.

Associated with each of sections 19-21 of the chute system is an escapement adapted to release, say, one, two or five balls, depending on whether the escapement is actuated by a nickel, dime or quarter. Each escapement comprises a body member 25 mounted on one side of its chute section for rocking movements, and a long, slender radial arm or stem 26. These arms or stems extend at their free ends through elongated, vertical slots 27 in coin chutes 28, 29 and 30 positioned behind the ball chute sections 19, 20 and 21, respectively. The parts are so proportioned that the escapements rock about their centers of gravity and thus cannot be caused to rock and release balls by jarring the box. Springs 31 yieldingly hold the escapement stems raised within the upper ends of the slots. Whenever a coin is inserted in any coin chute, it drops upon the escapement stem in that chute and forces it down to rock the escapement in the direction to release one or more balls, as the case may be, for delivery to ball chutes section 17.

If one ball is released by an escapement at a time when chute section 17 is empty, that ball drops down on the switch and closes it. If a plurality of balls are released or if there are already one or more balls in that chute section, the balls simply pile on top of one another above the

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switch. The ball that rests on the switch may be pushed off the same and into the return chute section 18 in any suitable way. In the arrangement shown, an electromagnet is used for this purpose, the same comprising a coil 32 and a plunger 34 aligned with chute section 18 and adapted to enter into the chute system through an opening 35 in the wall at the lower end of section 17. Normally a spring 36 holds the plunger retracted as shown in the drawings, so as not to interfere with the descent of balls in chute section 17 to the switch 16. When the electromagnet is energized, the plunger travels to the left, as viewed in Figs. 2 and 3, driving before it such balls as are in advance of it if there be a ball resting on the switch. Associated with chute sections 17 and 18 is a spring pressed pawl 37 to prevent balls from rolling back upon the switch after having been pushed off the same.

The coil of the electromagnet is shown as being connected in series with switch 16 and, therefore, in series with each of the selective switches 5. Consequently, whenever the switch 16 is in its closed state, so that the pressing of one of the push buttons 4 starts the playing of a selected record, conditions are such that the electromagnet is automatically energized simultaneously with the selecting of a record; whereby credit, to the extent of one record to be played, is immediately cancelled.

Fig. 7 shows how little movement of the interlock plate is required even though a large number of push buttons are involved. Thus the circle 38 represents on a greatly enlarged scale all of the push buttons to be interlocked and each cross, 39 indicates the center of a hole to receive a particular push button plunger. Twenty-four crosses are shown, each spaced apart from the center of the circle in a different direction than are the others. Since the circle is the same size as the cross section of a plunger or, at least that part thereof that fills a hole in the plate when in switch-closing position, it is evident that the capacity for movement of the plate in any direction need not be greater than the diameter of one of the holes.

While I have illustrated and described with particularity only a single preferred form of my invention, I do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements which come within the definitions of my invention constituting the appended claims.

I claim:

1. A selective apparatus comprising a panel, actuators of the push button type mounted on and extending through said panel, switches mounted behind the panel and at some distance therefrom, each switch being aligned with one of the actuators and being adapted to be operated by that actuator when the latter is pushed in a predetermined distance, a pair of parallel links whose lower ends are hinged to a part fixed to the panel, an interlock plate, parallel to the panel and hinged to the upper ends of said links so as to be movable in all directions in its own plane, located between the panel and the switches, said plate containing holes through which the actuators must pass in order to engage the corresponding switches, and said holes being so distributed that only one of them can at any time be so closely aligned with the corresponding actuator as to allow the latter to pass through the same in a switch-operating direction.

2. A selective apparatus comprising a panel, ac-

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tuators of the push button type mounted on and extending through said panel, switches mounted behind the panel and at some distance therefrom, each switch being aligned with one of the actuators and being adapted to be operated by that actuator when the latter is pushed in a predetermined distance, an interlock plate, parallel with the panel, between the panel and the switches, a pair of spaced toggles hinged to the lower end of said plate at their upper ends and to a part fixed to the panel, a spacer bar connecting the toggles together at their middles, whereby said plate is movable in all directions in its own plane, said plate containing holes through which the actuators must pass in order to engage the corresponding switches, and said holes being so distributed that only one of them can at any time be so closely aligned with the corresponding actuator as to allow the latter to pass through the same in a switch operating direction.

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