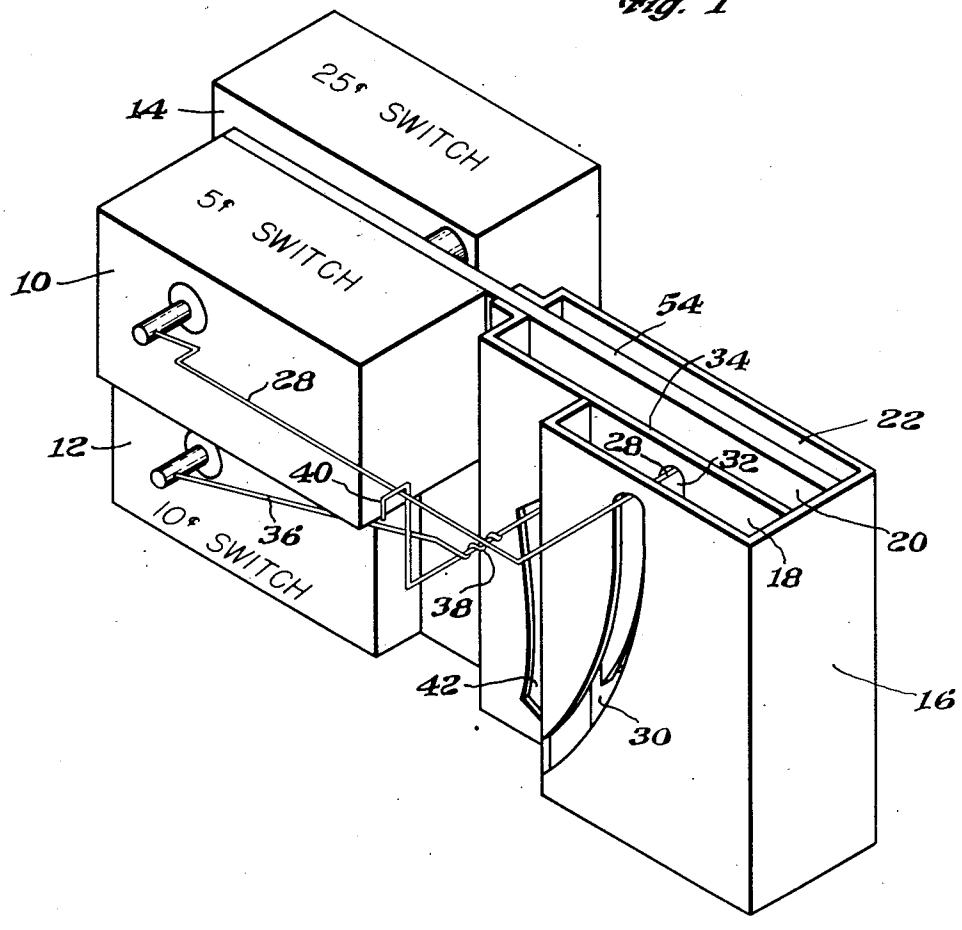
May 19, 1953 E. E. YORK 2,639,016

CONTROL ASSEMBLY FOR COIN OR TOKEN OPERATED VENDING MACHINES

Filed May 18, 1950 3 Sheets-Sheet 1

Fig. 1



Ernest E. York
Inventor
by Bryce Beach
Attorney

May 19, 1953 E. E. YORK 2,639,016

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Filed May 18, 1950 3 Sheets-Sheet 2

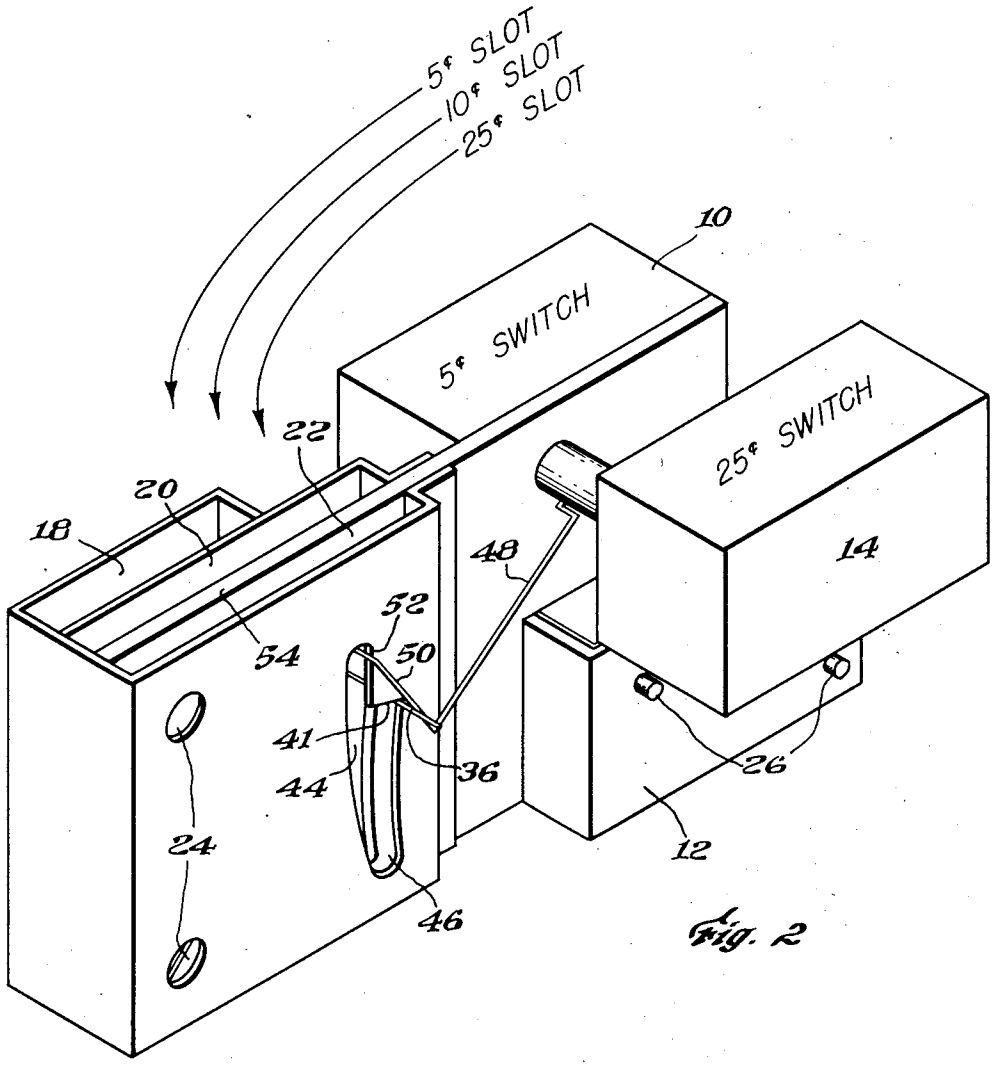


Fig. 2

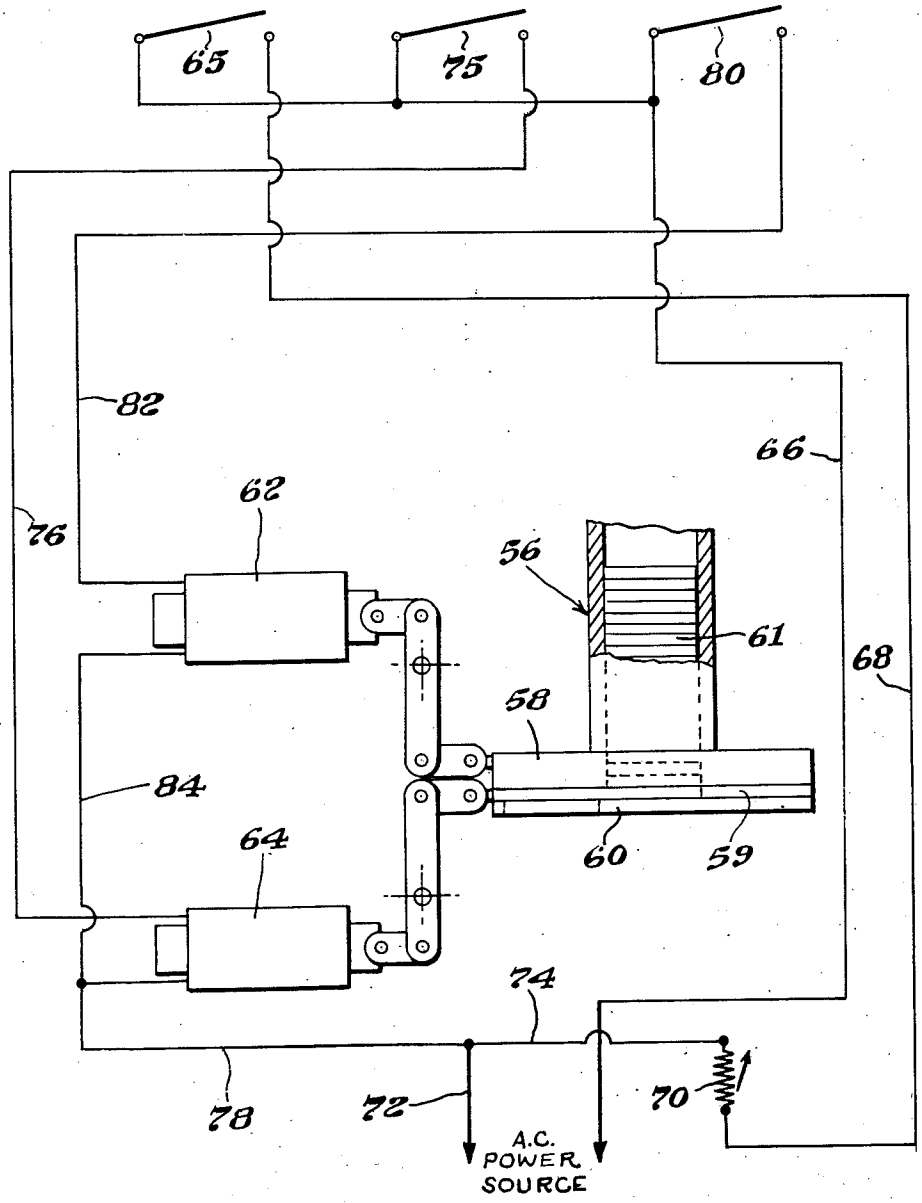
Ernest E. York
Inventor
by
Attorney

May 19, 1953 E. E. YORK 2,639,016

CONTROL ASSEMBLY FOR COIN OR TOKEN OPERATED VENDING MACHINES

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Fig. 3



Ernest E. York
Inventor

by Roger Becker
Attorney

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CONTROL ASSEMBLY FOR COIN OR TOKEN OPERATED VENDING MACHINES

Ernest E. York, Falmouth Corner, Maine, assignor to American Coin Changer Corp., Boston, Mass., a corporation of Maine

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3 Claims. (Cl. 194—10)

1

My invention relates to a control assembly especially adapted for use in coin or token operated vending machines. In its most particular aspect the invention concerns a switch assembly for vending machines which are capable of making change, e. g., a machine utilized in the dispensing of a 5-cent article which is operable by a 10- or 25-cent piece as well as by a 5-cent piece and which when operated with one of the coins of higher denomination delivers with the merchandise one or four 5-cent pieces, as the case may be.

Machines of the class indicated conventionally include a control switch for each value of coin to be handled, each switch being biased in open position by yieldable means, as a spring, for example, and being momentarily closable through a coin actuable switch arm extending into a coin track through which coins of the denomination corresponding to the switch are directed. These machines further include a vertically disposed tubular coin magazine superposed over a plurality of slides, each of the slides being of predetermined thickness and having a circular aperture therein of a diameter corresponding to the diameter of the denomination of coin which the magazine is adapted to receive, the aperture in the normal position of the slide registering with the aperture in the other slide or slides and with the chamber of the magazine. The slides are movable over a base plate having a coin aperture which opens to a coin delivery chute and which stands in offset relation with respect to the apertures in the slides in the normal position of the slides. In machines of the type referred to above by way of example the magazine, as indicated, is charged with 5-cent pieces and there are two such slides; one having a thickness approximating that of a single 5-cent piece, the other a thickness approximating that of three 5-cent pieces. When a 10-cent piece is used to operate the machine, the thinner slide, which lies below the thicker slide, is caused to be actuated to drop a single 5-cent piece through the aperture in the base plate into the change delivery chute. On the other hand, when a 25-cent piece is used, both slides are actuated to drop four 5-cent pieces.

The electrical system in such machines as conventionally assembled comprises a relay in circuit with each of the switches corresponding to the coins having values exceeding the price of the merchandise. Thus, in the machine comprising the slides just described there are two such relays, a "10-cent" relay and a "25-cent" relay. On the momentary closing of the 10-cent switch,

2

the 10-cent relay is energized and remains energized until tripped by delivery of the merchandise. The closing of the relay completes the vending circuit and also a circuit including a solenoid controlling the 10-cent slide. Similarly, closing of the 25-cent switch energizes the 25-cent relay, resulting in completion of the vending circuit and actuation of a second solenoid connected to move both of the changer slides. In some cases, to assure more positive slide action, the arrangement is slightly modified so that in quarter operation both solenoids are actuated.

My invention has as its principal object to eliminate the above-mentioned relays, thereby to materially reduce equipment costs. I accomplish this and other objects, which will become apparent from the description which follows, by duplicating the function of the relays mechanically in the switch assembly.

In the accompanying drawings:

Fig. 1 is an isometric front view of a switch assembly embodying the invention;

Fig. 2 is an isometric back view of the assembly; and

Fig. 3 is a diagram of a typical circuit arrangement, including the assembly.

Referring first to Figs. 1 and 2, the switches included in the assembly are confined within individual switch boxes **10**, **12** and **14**. These switches are of the conventional spring- or weight-loaded type. Fixed to the switch boxes is a coin track unit **16** providing coin tracks **18**, **20** and **22**, track **18** being the 5-cent track, tracks **20** and **22** being the dime and quarter tracks, respectively. Apertures **24** and studs **26** (Fig. 2) find their complements in a support piece, not shown, on which the assembly is mounted in use.

A wire switch arm **28** extends from the 5-cent switch through an arcuate slot **30** into the track **18**, terminating at a point within a second arcuate slot **32** cut in the partition **34**. Switch arm **36**, which controls the 10-cent switch, is shown as formed of two lengths of wire joined at **38**. The portion including the hook **40** overlying the 5-cent switch arm **28** extends rearwardly through all of the coin tracks to terminate at a point external of the coin track unit. Upward arcuate movement of the switch arm **36** in the slots **42**, **44** and **46** is limited by the shoulder **41** in the latter slot.

The 25-cent switch arm **48** (Fig. 2) includes a portion **50** overlying the switch arm **36** in position to depress such arm when the arm **48** is

depressed and a portion 52 which terminates just short of the partition 54.

With the arrangement as described, it will be readily understood that when a 5-cent coin is introduced into the track 18 it forces the arm 28 downwardly to close the 5-cent switch; also, that as soon as the coin loses contact with the arm the switch opens by virtue of its spring or weight loading, this action being accompanied by return of the switch arm to its normal position. Due to the hook 40, the depression of the arm 36 by a 10-cent piece introduced into the track 20 results not only in closing of the 10-cent switch but also in depression of the arm 28 and closing of the 5-cent switch. The 25-cent switch arm 48 is not affected on 10-cent operation since it overlies the arm 36. On quarter operation, i. e., when a 25-cent piece is introduced into the track 22, all three of the arms are carried downwardly to close all three of the switches, arm 48 being depressed directly by the coin, arm 36 by the arm 48 and arm 28 just as in 10-cent operation by the hook 40.

The reason for the above arrangement will be better appreciated through reference to Fig. 3 which represents part of the inner workings of a vending machine to which the assembly is applicable. In such figure, the numeral 56 denotes a coin changer of the type hereinbefore generally described. The changer includes a pair of apertured slides 58, 59 which are movable to the left in a guideway, not shown, over an apertured base plate 60. Slide 58, which has a thickness corresponding to that of three of the 5-cent coins 61, is actuated by a solenoid 62, the armature of which is linked to the slide. Similarly, slide 59 is under the control of a second solenoid 64. The thickness of this slide corresponds to that of one of the coins.

One of the contacts forming part of the 5-cent switch 65 is connected to a common power lead 66, while its companion contact is connected via conductor 68 to one terminal of the winding of a holding relay 70, the opposite terminal of which is connected to the second power lead 72 through a conductor 74. In the case of the particular machine contemplated by the diagram, closing of relay 70 results in energization of the vending circuit, not shown. This circuit remains energized until the relay is tripped by delivery of the merchandise.

The 10-cent circuit includes the switch 75, the power lead 66, the conductor 76, extending to the winding of the solenoid 64, and the conductor 78 through which such winding is connected to the power lead 72, while the circuit including the 25-cent switch 80 comprises power lead 66, the winding of the solenoid 62 and conductors 84 and 78.

Considering Figs. 1 and 2 in conjunction with Fig. 3 it should be clear that in the operation of the machine represented by the latter figure, the circuit including the relay 70, which controls the vending circuit, is energized regardless of the denomination of the coin employed. It should be equally clear that in 10-cent operation only the lower slide 59 is actuated, whereas in 25-cent operation both slides are moved over the base plate so that the apertures therein register with the aperture in the plate. The slides may be considered as returned by spring action.

The various advantages and objects of the invention may be accomplished by modifications of the particular embodiment described herein, and it is intended that the appended claims shall include all equivalent arrangements fairly coming within their scope.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a switch assembly for a coin or token operated vending machine or the like, three switches spring biased in open position, an equal number of coin tracks, each adapted for the reception of coins of a particular value, the track into which the coins of intermediate value are introduced being positioned mediate the other two tracks, a first coin actuable switch arm extending from one of said switches into the coin track adapted for the reception of the coins of lowest value, a second coin actuable switch arm extending from another of said switches into the coin track adapted for the reception of the coins of highest value, and a third coin actuable switch arm extending from the remaining switch into the coin track adapted for the reception of the coins of intermediate value, said third mentioned switch arm having a hook extension overlying said first mentioned switch arm at a point external of said tracks and a portion extending through the coin track receiving the coins of highest value to underlie said second mentioned switch arm external of the coin tracks, whereby said first mentioned switch arm is actuated simultaneously with said third mentioned switch arm whenever the latter is actuated and the actuation of said second mentioned switch arm results in simultaneous actuation of said other switch arms.

2. In a control assembly for a coin or token operated vending machine or the like having an article-delivering mechanism, a single relay actuating said mechanism, three coin tracks, each adapted for the reception of coins of a particular value, a switch biased in open position in the circuit with said relay, a first coin actuable switch arm extending from said switch into the coin track adapted for the reception of the coins of lowest value, a second switch biased in open position having a coin actuable switch arm extending therefrom into the coin track adapted for the reception of the coins of highest value, and a third switch biased in open position having a coin actuable switch arm extending into the coin track adapted for the reception of the coins of intermediate value, said third mentioned switch arm overlying said first mentioned switch arm and underlying said second mentioned switch arm so that said second-mentioned switch arm is actuated only by a coin passing through its corresponding track, said third-mentioned switch arm is actuated both by a coin passing through its corresponding track and by actuation of said second-mentioned switch arm, and said first-mentioned switch arm is actuated both by a coin passing through its corresponding track and by actuation of said third-mentioned switch arm.

3. In a switch assembly for a coin or token operated vending machine or the like, a single relay actuating said machine, three coin tracks, each adapted for the reception of coins of a particular value, the track for reception of coins of intermediate value being positioned between the other two tracks, a switch biased in open position in the circuit with said relay, a first coin actuable switch arm extending from said switch into the coin track adapted for the reception of the coins of lowest value, a second switch biased in open

position having a coin actuable switch arm extending therefrom into the coin track adapted for the reception of the coins of highest value, and a third switch biased in open position having a coin actuable switch arm extending into the coin track adapted for the reception of the coins of intermediate value, said third mentioned switch arm having a hook extension overlying said first mentioned switch arm at a point external of said tracks and a portion extending through the coin track receiving the coins of highest value to underlie said second mentioned switch arm external of the coin tracks, whereby said first mentioned switch arm is actuated simultaneously with said third mentioned switch arm whenever the latter is actuated and the actuation of said second mentioned switch arm results in simultaneous actuation of said other switch arms.

ERNEST E. YORK.

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