Sept. 13, 1960 R. D. STAYTON 2,952,385

VENDING MACHINE

Filed Dec. 23, 1955 3 Sheets-Sheet 1

FIG. 1.

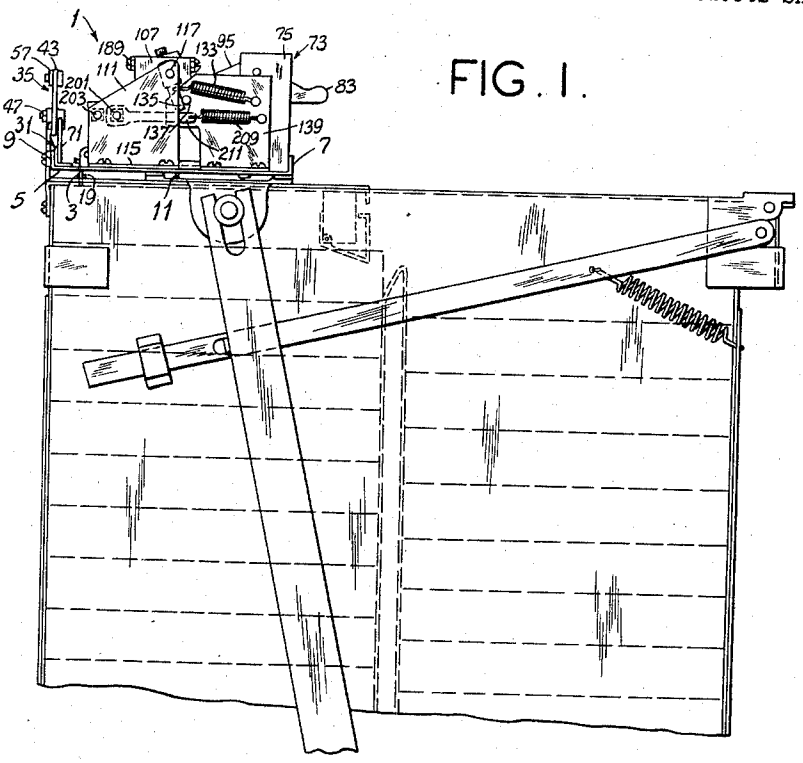
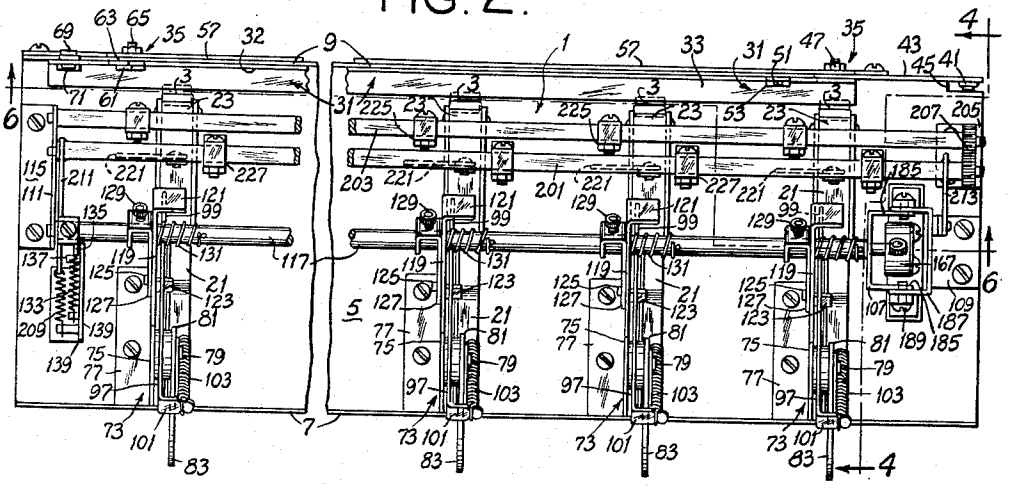


FIG. 2.



Robert D. Stayton,
Inventor.
Koenig and Pope,
Attorneys.

Sept. 13, 1960 R. D. STAYTON 2,952,385

VENDING MACHINE

Filed Dec. 23, 1955 3 Sheets-Sheet 2

FIG. 3.

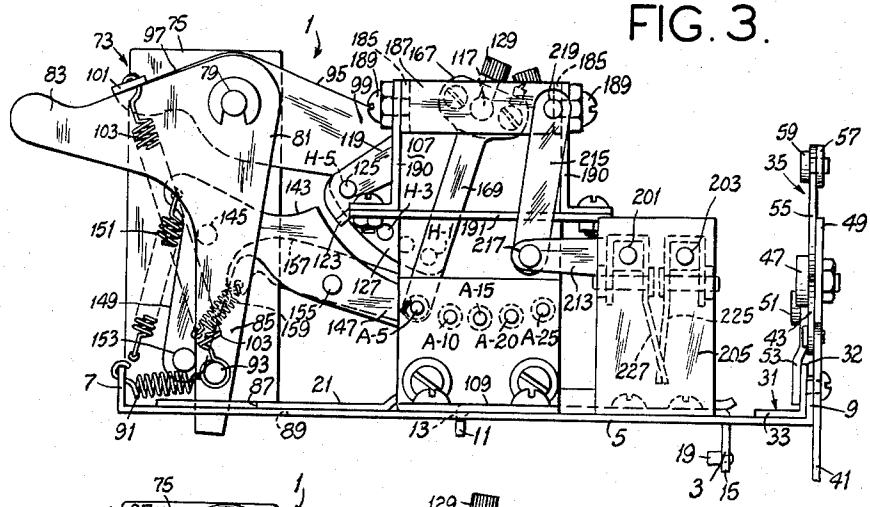



FIG. 4.

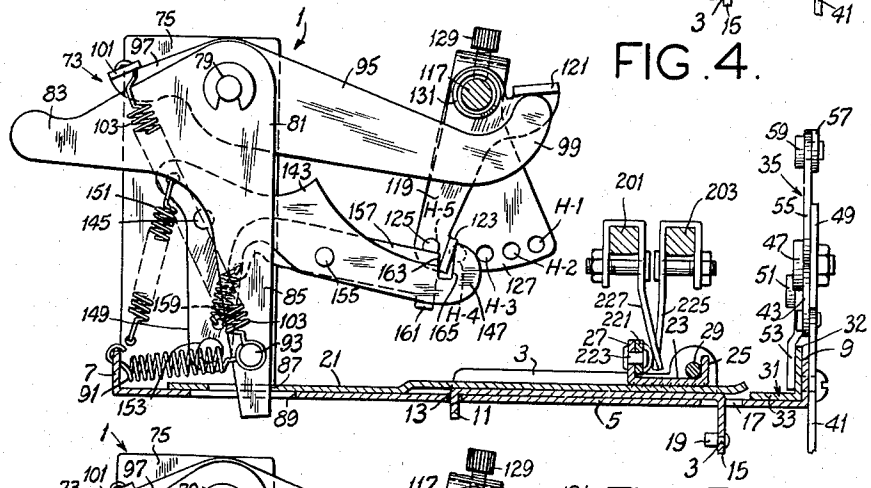
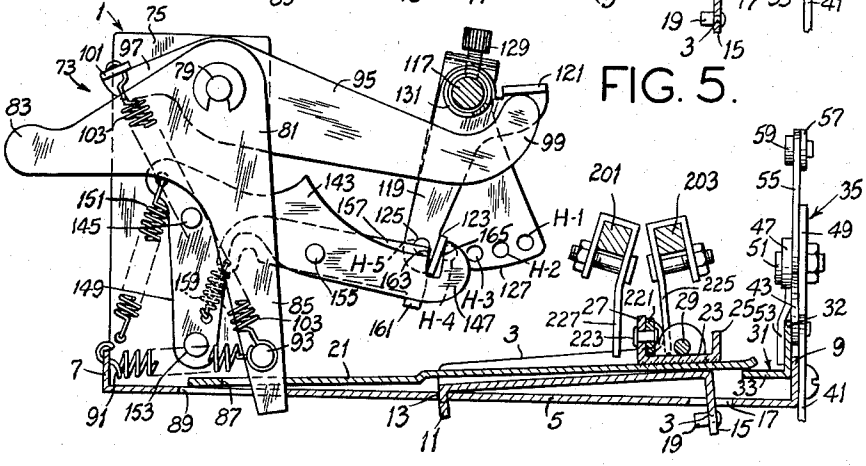



FIG. 5.




Robert D. Stayton,
Inventor.
Koenig and Pope,
attorneys.

Sept. 13, 1960 R. D. STAYTON 2,952,385

VENDING MACHINE

Filed Dec. 23, 1955

3 Sheets-Sheet 3

FIG. 6.

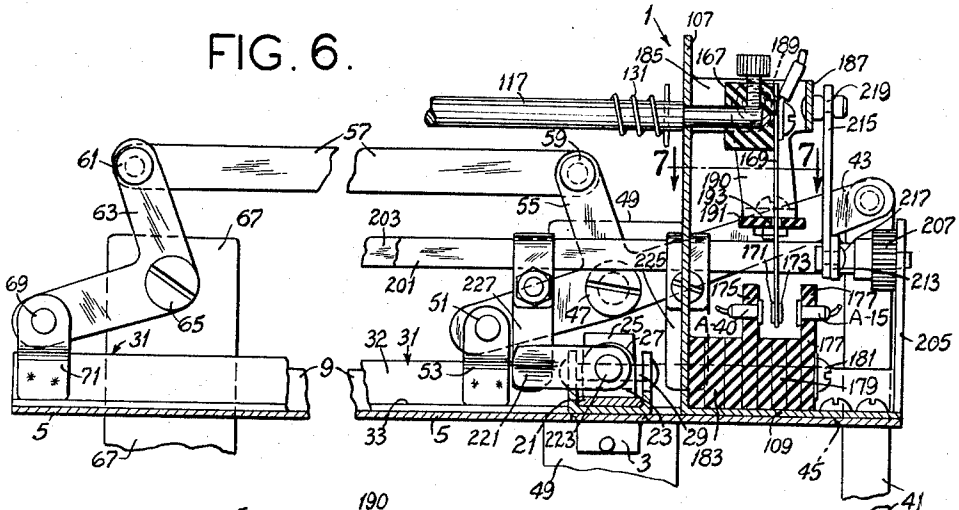



FIG. 7.

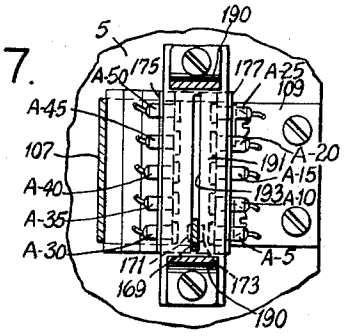
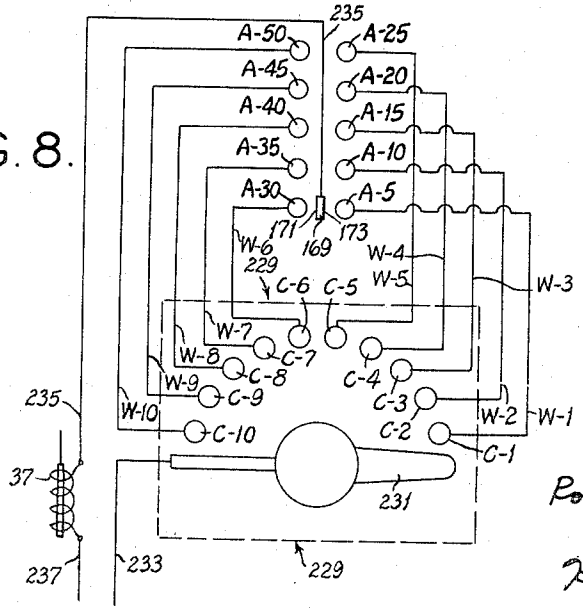



FIG. 8.




Robert D. Stayton,
Inventor.
Koenig and Pope,
Attorneys.

United States Patent Office

2,952,385

Patented Sept. 13, 1960



2,952,385

# VENDING MACHINE

Robert D. Stayton, St. Louis, Mo., assignor, by mesne assignments, to National Vendors, Inc., a corporation of Missouri

Filed Dec. 23, 1955, Ser. No. 555,075

16 Claims. (Cl. 221—129)

This invention relates to vending machines, and more particularly to control apparatus for vending machines of a type having a plurality of magazines for articles to be vended, a dispensing mechanism associated with each magazine, a latch for each dispensing mechanism, and a plurality of purchaser-operable controls, one for each latch, for releasing the latches.

The invention specifically is an improvement upon the apparatus disclosed in Fry Patent 2,468,819, patented May 3, 1949. In the apparatus shown in this patent, each purchaser-operable control comprises a switch and a solenoid controlled by the switch. Thus, the apparatus includes as many switches and as many solenoids as there are magazines. This necessitates relatively complex wiring, particularly in the case where each control is to be capable of being set for vending articles of one of several different prices from the respective magazine. Since it may be desired to provide for setting each control so that the respective magazine may be adapted for vending articles of ten different prices ranging, for example, from five cents to fifty cents in five-cent steps, the wiring problem may become acute.

Among the several objects of this invention may be noted the provision of an improved latch control apparatus which requires only one solenoid and one switch for all the latches, thereby simplifying the wiring; the provision of a control apparatus as described wherein the said one switch is a price selector switch and provision is made for a relatively large number of different price settings for each magazine; the provision of a control apparatus in which the prior purchaser-operated switches and the individual solenoids are replaced by economical mechanisms; the provision of a control apparatus having the stated characteristics which is compact so that no increase in the size of the cabinet of the vending machine is required; and the provision of a control apparatus of the class described which is reliable in operation and jar-proof to prevent dispensing of articles without insertion of coins by shaking the machine. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which one of various embodiments of the invention is illustrated,

Fig. 1 is a view in elevation of the upper portion of one side of an article-dispensing apparatus in which the control apparatus of this invention is incorporated;

Fig. 2 is a plan of the control apparatus per se, with parts broken away;

Fig. 3 is an enlarged view in elevation of the right side of Fig. 2, illustrating parts in a retracted position;

Fig. 4 is a vertical section taken on line 4—4 of Fig. 2, on the same scale as Fig. 3, illustrating parts in an intermediate position;

Fig. 5 is a view similar to Fig. 4 illustrating parts in a final position;



Fig. 6 is an enlarged vertical section taken on line 6—6 of Fig. 2, parts being broken away;

Fig. 7 is a horizontal section taken on line 7—7 of Fig. 6; and,

Fig. 8 is a wiring diagram.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings, a control apparatus of this invention is generally designated 1. This is shown to include a plurality of latches 3 arranged side-by-side in a row. These correspond to and have the same function as the latches indicated at 199 in Fry Patent 2,468,819. Each latch controls the dispensing mechanism for a respective magazine of the type shown in the Fry patent. In a typical vending machine, there may be seven magazines, for example, and hence seven latches 3. Fig. 1 shows the upper portion of the left side of the apparatus shown in the Fry patent (corresponding to the upper portion of Fig. 1 of the patent), and shows the location of the control apparatus 1 in respect to the Fry apparatus. Fig. 2 is broken away in view of space requirements, hence shows only four latches.

The control apparatus 1 comprises a horizontal plate 5 which is mounted on the top of the magazines of the apparatus shown in the Fry patent, and toward the rear of the apparatus, extending from one side of the apparatus to the other. This plate 5 has an upwardly directed front flange 7 and an upwardly directed rear flange 9. In their latching position, the latches 3 lie on top of the plate 5 extending in front-to-rear direction. Each latch 3 comprises a member of channel shape in cross section having a downturned ear 11 (which may be T-shaped) at its forward end retained in a slot 13 in the plate 5, and a downturned ear 15 at its rearward end movable in a slot 17 in the plate 5. The latch is adapted to pivot about its forward end. The ear 15 has a stud 19 engageable with the bottom of plate 5 for limiting the upward pivotal movement of the latch.

Associated with each latch 3 is a coupling member constituted by a slide 21. This extends from near the front flange 7 of plate 5 over the latch 3 between the side flanges of the latch. Fixed on the top of the slide toward its rearward end is a U-shaped member 23 providing rearward and forward fingers 25 and 27. A pin 29 extending between the side flanges of the latch backs the finger 25 and holds the slide in position between the flanges of the latch.

Each slide 21 is movable from the retracted position illustrated in Fig. 3 in rearward direction to an operative position in which it is coupled at its rearward end to a latch release member 31. This member 31 is constituted by a bar which extends from near one side of the plate 5 to the other in front of the rear flange 9 of the plate. The member or bar 31 is of angle section, having a vertical flange 32 and a horizontal flange 33 which extends forward from the lower edge of the vertical flange. In the operative position of each slide, its rearward end overlies the horizontal flange 33 of the bar.

The bar 31 is adapted to be raised from the lowered retracted position illustrated in Figs. 3, 4 and 6 by means generally designated 35. This is particularly illustrated in Fig. 6 and is shown to include a solenoid 37 (which may be mounted on the right side wall of the apparatus shown in the Fry patent). The plunger 39 of the solenoid is connected by a link 41 to one end (the outer end) of a lever 43. The link 41 extends through a slot 45 in the plate 5 (see Fig. 2). The lever 43 is pivoted intermediate its ends at 47 on a bracket 49 secured to the rear flange 9 of the plate 5. The inner end of the lever 43 is connected at 51 to a lug 53 which extends upward from the release bar 31. The lever 43 has an upwardly

extending arm 55. A link 57 is connected at 59 to the upper end of the arm 55 and extends above the rear flange 9 of the plate 5 to a connection at 61 with one arm of a bell crank lever 63. This bell crank lever 63 is pivoted at 65 on a bracket 67 fastened to the rear flange 9 of plate 5 near the left side of the plate 5. The other arm of the bell crank lever is connected at 69 to a lug 71 which extends upward from the release bar 31. The arrangement is such that when the solenoid is energized, the link 41 is pulled downward to rock the lever 43 clockwise as viewed in Fig. 6, thereby raising the right end of the bar 31. The rocking of the lever 43 effects movement of the link 57 to the right via arm 55, thereby rocking the bell crank lever 63 clockwise and raising the left end of the bar simultaneously and equally with the right end of the bar. Upon deenergization of the solenoid, the bar returns to its retracted position.

Associated with each of the latches 3 and the slides 21 is a purchaser-operable control means generally designated 73 for moving the slides rearward to their operative position in which their rearward ends overlie the horizontal flange 33 of the release bar 31. Each control 73 comprises a bracket 75 consisting of a vertical plate having a horizontal bottom flange 77 by means of which it is secured on top of the plate 5. Pivoted at 79 on the plate 75 is a lever 81 having a forwardly extending arm 83 and a downwardly extending arm 85. The arm 85 extends down through a slot 87 in the slide 21 and a slot 89 in the plate 5. The lever 81 is biased to rotate clockwise as viewed in Figs. 3–5 by a spring 91 having one end connected to the front flange 7 of the plate 5 and its other end connected to a stud 93 on the lever arm 85 adjacent its lower end. The spring 91 biases the lever to the retracted position shown in Fig. 3 determined by the engagement of the lower end portion of the arm 85 with the forward end of the slot 89 in plate 5. The slot 87 in the slide is longer than the width of the lower end portion of the arm 85 so that there is some lost motion between the arm 85 and the slide 21. The forwardly extending arms 83 of the levers 81 are adapted to be pushed down by push buttons (not shown) located at the top of a cabinet (not shown) housing the apparatus.

A lever 95 is pivoted on the pivot 79 along with the lever 81. Lever 95 has a forwardly extending arm 97 and a rearwardly extending arm 99. The arm 97 has a lateral ear 101 extending over the upper edge of the forwardly extending arm 83 of the lever 81. A spring 103 connected at one end to the stud 93 and at its other end to the ear 101 biases the lever 95 to rotate counterclockwise as viewed in Figs. 3–5.

Mounted on the plate 5 adjacent its right side is a vertical bearing plate 107 having a horizontal bottom flange 109 by means of which it is secured on top of the plate 5. A vertical bearing plate 111 is mounted on the plate 5 adjacent its left side, having a horizontal flange 115 by means of which it is secured on top of the plate 5. A shaft 117 is journalled in the bearing plates 107 and 111 extending above the plate 5 from near one side thereof to near the other side. Associated with each one of the levers 95 is an arm 119 mounted on the shaft 117. Each arm 119 has an upper lateral finger 121 extending over the rearward end of the rearwardly extending arm 99 of the lever 95. At its lower end, the arm 119 has a finger 123 projecting laterally toward the right and a pin 125 projecting laterally toward the left.

The pin 125 is received in one of a series of holes in a sector plate 127 locked on the shaft 117 by means of a set screw 129. Five holes are shown in the sector plate, spaced at equal intervals on an arc having its center in the axis of shaft 117 and drawn on the radius of the pin 125. These holes are designated H–1, H–2, H–3, H–4 and H–5, in order from rear to front. The arm 119 is axially slidable on the shaft 117 and rotary relative to the shaft 117 when moved axially to the right to disengage the pin 125 from whatever hole it may be in. A spring 131 biases the arm 119 toward the sector plate. With the arm 119 moved axially along the shaft 117 to disengage the pin 125 from the sector plate, the arm may be rotated on the shaft to locate the pin for reception in any one of the five holes in the sector plate. The shaft 117 is biased to rotate clockwise as viewed in Figs. 3–5 (counterclockwise as viewed in Fig. 1) by a spring 133 to a retracted position determined by engagement of an arm 135 on the shaft with a stop pin 137 fixed on a vertical plate 139. The plate 139 is mounted on the plate 5 adjacent its left side. The spring 133 has one end connected to the plate 139 and its other end connected to the arm 135 on the shaft 117.

A stop lever 143 is pivoted at 145 on each plate 75. This stop lever has a rearwardly extending arm 147 and a downwardly extending arm 149. It is biased to rotate counterclockwise as viewed in Figs. 3–5 by a spring 151. A stud 153 extends laterally from the downwardly extending arm 149 in front of the downwardly extending arm 85 of the lever 81. Pivoted at 155 on the rearwardly extending arm 147 of the lever 143 is a latch lever 157. This is biased to rotate counterclockwise as viewed in Figs. 3–5 by a spring 159 connected at one end to the arm 149 and at its other end to the forward end of the latch lever 157. Counterclockwise movement of lever 157 is limited by engagement of a laterally extending ear 161 on the rearward end of lever 157 with the lower edge of the arm 147. When the lever 157 is in the retracted position determined by engagement of the ear 161 with the lower edge of arm 147, its rearward end edge 163 projects above the upper edge of the arm 147 and is spaced forward of a forwardly facing shoulder 165 at the rearward end of arm 147.

The shaft 117 extends through the plate 107 and has a block of insulation 167 fixed on its right end (see Fig. 6). A switch blade 169 is fixed to block 167 and extends downward therefrom. At its lower end, the switch blade has a contact 171 on its left side and a contact 173 on its right side. The switch blade is made of a flexible conductive metal strip so that it may bend out of its normal plane. Its lower end extends between a pair of insulation switch plates 175 and 177, plate 175 being on the left side of the switch blade and plate 177 being on the right side. These insulation plates are held in spaced apart relation by insulation spacers indicated at 179. The plates 175 and 177 and spacers 179 are fastened to the plate 107 as by screws 181 with insulation spacers indicated at 183 between the plates 175 and 107.

The plate 107 is formed with arms 185 projecting laterally toward the right at its upper end. These arms straddle the block 167. A U-shaped member 187 has its sides pivoted on arms 185 as indicated at 189. The U-shaped member 187 has arms 190 extending downward from its sides. Extending between the lower end of the arms 190 and fastened thereto is a plate 191 of insulation having a slot 193 receiving the switch blade 169. The assembly of 187 and 191 constitutes a pivoted yoke for bending the switch blade out of its normal plane to one side or the other. The left hand switch plate 175 has a series of contacts fixed therein adapted for engagement by the left hand contact 171 on the switch blade. The right hand switch plate 177 has a series of contacts fixed therein paired with the contacts in plate 175 and adapted for engagement by the right hand contact 173 on the switch blade. Five contacts are shown in the right hand switch plate 177, these being designated A–5, A–10, A–15, A–20 and A–25, in order from front to rear. Five contacts are shown in the left hand switch plate 175 these being designated A–30, A–35, A–40, A–45, A–50, in order from front to rear. The contacts are paired as follows: A–5 and A–30, A–10 and A–35, A–15 and A–40, A–20 and A–45, A–25 and A–50 (see Fig. 7).

The switch blade 169 normally occupies the retracted position shown in Fig. 3 wherein its lower end carrying contacts 171 and 173 is located between but out of engagement with the forward paired contacts A–5 and A–30. This retracted position of the switch blade is determined by the engagement of the arm 135 on the shaft 117 with the stop pin 137 on the plate 139. As will be made clear, the blade 169 is adapted to swing rearward from its retracted position (counterclockwise as viewed in Fig. 3) upon counterclockwise movement of the lever 81, dependent upon the positioning of the pin 125 in the holes in the sector plate 127, to a position wherein its lower end is between contacts A–10 and A–35, or to a position between A–15 and A–40, or to a position between A–20 and A–45, or to a position between A–25 and A–50, without engaging any of the contacts, and then to be swung by the yoke 187—191 to the right or to the left for engagement with one of the contacts.

Mechanism for swinging the yoke 187—191 is shown to comprise a pair of shafts 201 and 203 journalled at their right ends in a vertical plate 205 mounted on the plate 5 and journalled at their left ends in the plate 111. The shafts 201 and 203 are geared together at their right ends as indicated at 207. The shafts 201 and 203 are biased to a normal position by means of an overcentering spring mechanism comprising a spring 209 fastened at one end to the plate 139 and at its other end to an arm 211 fixed to the shaft 201 adjacent its left end. A crank arm 213 is fixed to the shaft 201 at its right end. A link 215 is connected at 217 to the crank arm and at 219 to the U-shaped member 187. The connections at 217 and 219 are sufficiently loose to permit the swinging of the member 187. When the crank arm 213 swings clockwise from its normal position shown in Fig. 3 it rocks the member 187 counterclockwise from the position shown in Fig. 6 thereby swinging the switch blade 169 to the right. When the crank arm swings counterclockwise from its normal position shown in Fig. 3, it rocks the member 187 clockwise from the position shown in Fig. 6, thereby swinging the switch blade to the left.

A pusher 221 is pivoted at 223 on the finger 27 on each slide 21. This pusher is adjustable by swinging it to extend either toward the left or toward the right. When it is positioned to extend toward the left, it is engageable with an arm 225 which extends downward from the shaft 203. When positioned to extend to the right it is engageable with an arm 227 which extends down from the shaft 201. When the pusher is positioned extending to the left, and is moved rearward along with the slide 21, the pusher engages arm 225 to rotate the shaft 203 counterclockwise as viewed in Figs. 3–5. This rotates the shaft 201 clockwise via gearing 207 to swing the switch blade 169 to the right. When the pusher is positioned extending to the right, and is moved rearward with the slide, the pusher engages arm 227 to rotate the shaft 201 counterclockwise to swing the switch blade 169 to the left.

Contacts A–5, A–10, A–15, A–20, A–25, A–30, A–35, A–40, A–45 and A–50 are hereinafter referred to as price contacts, representing 5¢, 10¢, 15¢, 20¢, 25¢, 30¢, 35¢, 40¢, 45¢ and 50¢ prices, respectively. These contacts are wired to a coin mechanism indicated at 229 in Fig. 8, which may be of a type such as shown in the copending coassigned application of Benjamin W. Fry, Serial No. 433,400, filed June 1, 1954, issued as Patent No. 2,779,449 January 29, 1957. This coin mechanism includes a selector switch having a series of ten price contacts designated C1 to C–10 (corresponding to the contacts designated C–1 to C–10 in said application) representing prices ranging from 5¢ to 50¢ in five-cent increments, and a switch blade 231 (corresponding to the blade designated 165 in said application) movable into engagement with any one of the contacts depending upon the total amount of coins entering the coin mechanism. As shown in Fig. 8, one wire 233 of a two-wire power supply line is connected to the switch blade 231. Contacts C–1 to C–10 are connected to contacts A–5 to A–50 by wires W–1 to W–10, respectively. The switch blade 169 is connected by a wire 235 to one terminal of the solenoid 37. The other wire 237 of the supply line is connected to the other terminal of the solenoid. The arrangement is such that upon closure of the switch blade 231 with one of the contacts C–1 to C–10 and closure of the switch blade 169 with the related one of contacts A–5 to A–50, the solenoid is energized. For example, when a nickel is inserted in the coin mechanism 229, blade 231 closes on contact C–1 and a circuit is completed from wire 233 to the contact A–5, and then when blade 169 closes on contact A–5, the solenoid is energized. Upon the insertion of two nickels or a dime (a total of ten cents) in the coin mechanism, blade 231 closes on contact C–2 and a circuit is completed from wire 233 to the contact A–10, and then when blade 169 closes on contact A–10, the solenoid is energized. When a total of fifteen cents is inserted in the coin mechanism, blade 231 closes on contact C–3 and a circuit is completed from the wire 233 to the contact A–15, and then when blade 169 closes on contact A–15, the solenoid is energized. The operation for other amounts of coin will be apparent.

Operation is as follows:

Assuming, for example, that the items stocked in a particular magazine of the dispensing apparatus with which the control of this invention is used are to be vended for twenty-five cents, the purchaser-operable control 73 for that particular magazine has its arm 119 positioned with the pin 125 received in the hole H–5 of its sector plate 127, and its pusher 221 positioned to extend to the left, as illustrated in Figs. 2 and 6. Assuming that the purchaser has deposited twenty-five cents in the vending machine, the blade 231 of the coin mechanism 229 is closed on contact C–5 and a circuit is completed from wire 233 to the twenty-five cent price contact A–25. When the customer operates the push button for the stated magazine, the forwardly extending arm 83 of the lever 81 is pushed down by the push button to rock the lever 81 counterclockwise from its initial position shown in Fig. 3. As the lever 81 rocks counterclockwise, the lever 95 follows it, also rocking counterclockwise, under the bias of the spring 103. The rearward end of the rearwardly extending arm 99 of the lever 95 engages the finger 121 of the arm 119 and rotates the arm 119 and the shaft 117 in counterclockwise direction as viewed in Figs. 3–5 via the sector plate 127.

Also, upon the stated counterclockwise movement of the lever 81, the stop lever 143 is rocked counterclockwise on its pivot 145 under the bias of the spring 151, the downwardly extending arm 85 of the lever 81 being followed by the stud 153 on the downwardly extending arm 149 of the lever 143. This elevates the rearward end of the rearwardly extending arm 147 of the stop lever 143 into position for engagement of the shoulder 165 on lever 143 by the finger 123 at the lower end of the arm 119. As the arm 119 swings rearward from its retracted position shown in Fig. 3, the finger 123 pushes down on the latch lever 157. When the finger 123 engages the shoulder 165, the latch lever 157 is returned by the spring 159 to the position shown in Fig. 4 to latch the arm 119 in the position shown in Fig. 4. With the pin 125 on the arm 119 set in the hole H–5 in the sector plate 127, the arc of movement of the arm 119 and the corresponding arc of rotation of the shaft 117 are such that the switch blade 169 is swung (without engaging any of contacts A–5 to A–50) from its retracted position between contacts A–5 and A–30 to a position wherein its lower end is between contacts A–25 and A–50.

The above-stated movements occur substantially during the lost-motion interval in which the lower end of the downwardly extending arm 85 of the lever 81 is moving rearward in the slot 87 in the slide 21. After the finger 123 on the arm 119 has become locked between

the shoulder 165 and the forward end 163 of the latching lever 157 (with resultant locking of the switch blade 169 with its lower end between contacts A–25 and A–50), continued counterclockwise movement of the lever 81 effects rearward movement of the slide 21 to a position in which the rearward end of the slide is located above the horizontal flange 33 of the release bar 31. Upon such movement of the slide, the pusher 221 (positioned as above stated to extend toward the left) engages the arm 225 on the shaft 203, which results in operation of the member 187 to swing the switch blade 169 to the right. The contact 173 at the lower end of the switch blade thereupon engages the twenty-five cent price contact A–25. This completes the circuit for the solenoid 37 and results in raising of the release bar 31 to the position shown in Fig. 5 to lift the latch 3 for the particular magazine and thereby release the associated dispensing mechanism to dispense an article from the magazine. Upon release of the push button by the purchaser, the parts return to their original positions.

For vending five cent items from the magazine, the pusher 221 is set in position extending to the left, and the arm 119 is set to have its pin 125 extend into the hole H–1 in the sector plate 127. With this setting, no movement of arm 119 and shaft 117 occurs upon operation of the lever 81, and the blade 169 remains in its retracted position of Fig. 4 wherein its lower end is between contacts A–5 and A–30, being ultimately swung to the right for engagement of contact 173 with contact A–5.

For vending ten cent items from the magazine, the pusher 221 is set in position extending to the left, and the arm 119 is set to have its pin 125 extend into the hole H–2 in the sector plate 127. With this setting the arm 119 and shaft 117 are rotated through such an arc upon operation of the lever 181 as to rotate the blade 169 to a position wherein its lower end is between contacts A–10 and A–35, the blade being ultimately swung to the right for engagement of contact 173 with contact A–10.

For vending fifteen cent items from the magazine, the pusher 221 is set in position extending to the left, and the arm 119 is set to have its pin 125 extend into the hole H–3 in the sector plate 127. With this setting, the arm 119 and shaft 117 are rotated through such an arc upon operation of the lever 181 as to rotate the blade 169 to a position wherein its lower end is between contacts A–15 and A–40, the blade being ultimately swung to the right for engagement of contact 173 with contact A–15.

For vending twenty cent items from the magazine, the pusher 221 is set in position extending to the left, and the arm 119 is set to have its pin 125 extend into the hole H–4 in the sector plate 127. With this setting, the arm 119 and shaft 117 rotate through such an arc upon operation of the lever 181 as to rotate the blade 169 to a position wherein its lower end is between contacts A–20 and A–45, the blade being ultimately swung to the right for engagement of contact 173 with contact A–20.

For vending thirty cent items from the magazine, the pusher 221 is set in position extending to the right, and the arm 119 is positioned to have its pin 125 extend into the hole H–1 in the sector plate 127. With this setting, no movement of arm 119 and shaft 117 occurs upon operation of the lever 181, and the blade 169 remains in its retracted position of Fig. 4 wherein its lower end is between contacts A–5 and A–30, being ultimately swung to the left for engagement of contact 171 with contact A–30. Swinging of the blade 169 to the left occurs by reason of engagement of the pusher 221 with the arm 227 on the shaft 201.

For vending thirty-five cent items from the magazine the pusher 221 is set in position extending to the right, and the arm 119 is set to have its pin 125 extend into the hole H–2 in the sector plate 127. With this setting, the arm 119 and shaft 117 are rotated upon operation of the lever 181 to rotate the blade 169 to the position wherein its lower end is between contacts A–10 and A–35, the blade being ultimately swung to the left for engagement of contact 171 with contact A–35.

For vending forty cent items from the magazine, the pusher 221 is set in position extending to the right, and the arm 119 is set to have its pin 125 extend into the hole H–3 in the sector plate 127. With this setting, the arm 119 and shaft 117 are rotated upon operation of the lever 181 to rotate the blade 169 to the position wherein its lower end is between contacts A–15 and A–40, the blade being ultimately swung to the left for engagement of contact 171 with contact A–40.

For vending forty-five cent items from the magazine, the pusher 221 is set in position extending to the right, and the arm 119 is set to have its pin 125 extend into the hole H–4 in the sector plate 127. With this setting, the arm 119 and shaft 117 are rotated upon operation of the lever 181 to rotate the blade 169 to the position wherein its lower end is between contacts A–20 and A–45, the blade being ultimately swung to the left for engagement of contact 171 with contact A–45.

For vending fifty cent items from the magazine, the pusher 221 is set in position extending to the right, and the arm 119 is set to have its pin 125 extend into the hole H–5 in the sector plate 127. With this setting, the arm 119 and shaft 117 are rotated upon operation of the lever 181 to rotate the blade 169 to the position wherein its lower end is between contacts A–25 and A–50, the blade being ultimately swung to the left for engagement of contact 171 with contact A–50.

It will be observed that if a purchaser attempts to obtain an item of a higher price than the total amount of coins deposited, the circuit to the solenoid 37 will not be completed. Similarly if the purchaser attempts to obtain an item of lower price than the total amount of coins deposited, the circuit to the solenoid will not be completed. It will be understood that the coin mechanism includes a coin return mechanism to allow the purchaser to obtain the return of the deposited coins under these circumstances. It will also be observed that once the purchaser has pushed down a push button, the arm 119 becomes locked between the forward end edge 163 of the latching lever 157 and the shoulder 165, and this eliminates the possibility of obtaining additional items by shaking the machine without the deposit of additional coins. It will be apparent that the wiring is simple, and that the construction of the selector switch constituted by blade 169 and the price contacts is compact.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a vending machine having a plurality of dispensing mechanisms, a mechanism comprising a plurality of latches, one for each dispensing mechanism, each latch being movable between a latching position in which it holds the respective dispensing mechanism out of operation and a released position, a single latch release bar movable in a direction transverse to its length away from a retracted position, a slide associated with each latch, each of said slides being movable relative to the respective latch from a retracted position wherein it is disengaged from the bar to an operative position wherein it is engageable by the bar, a plurality of purchaser-operable means, one for each slide, each adapted to move the respective slide to operative position, and means for mov-

ing the bar away from its retracted position in response to movement of any slide to operative position.

2. In a vending machine having a plurality of dispensing mechanisms, a mechanism comprising a plurality of latches, one for each dispensing mechanism, each latch being movable between a latching position in which it holds the respective dispensing mechanism out of operation and a released position, a single latch release bar movable in a direction transverse to its length away from a retracted position, a slide associated with each latch, each of said slides being movable relative to the respective latch from a retracted position wherein it is disengaged from the bar to an operative position wherein it is engageable by the bar, a plurality of purchaser-operable means, one for each slide, each adapted to move the respective slide to operative position, electrically controlled means for moving the bar away from its retracted position, and means for operating said electrically controlled means in response to movement of any slide to operative position.

3. In a vending machine having a plurality of dispensing mechanisms, a mechanism comprising a plurality of latches, one for each dispensing mechanism, each latch being movable between a latching position in which it holds the respective dispensing mechanism out of operation and a released position, a single latch release bar movable in a direction transverse to its length away from a retracted position, a slide associated with each latch, each of said slides being movable relative to the respective latch from a retracted position wherein it is disengaged from the bar to an operative position wherein it is engageable by the bar, a plurality of purchaser-operable means, one for each slide, each adapted to move the respective slide to operative position, means including a solenoid for moving the bar away from its retracted position, means for energizing the solenoid including a switch, and means for closing the switch in response to movement of any slide to operative position.

4. In a vending machine, a mechanism comprising a plurality of latches, a single latch release member, all of the latches normally being uncoupled from the release member, a plurality of purchaser-operable controls, one for each latch, each adapted to couple the respective latch to the release member upon operation by a purchaser, said latch release member being movable away from a retracted position for releasing any one of the latches which may be coupled thereto, electrically controlled means for moving the release member away from retracted position, and a control circuit for said electrically controlled means including a selector switch having fixed and movable elements, each of said purchaser-operable controls being adapted to move said movable element of said selector switch and each including means for varying the extent of movement imparted thereby to said movable element.

5. In a vending machine, a mechanism comprising a plurality of latches, a single latch release member, all of the latches normally being uncoupled from the release member, a plurality of purchaser-operable controls, one for each latch, each adapted to couple the respective latch to the release member upon operation by a purchaser, said latch release member being movable away from a retracted position for releasing any one of the latches which may be coupled thereto electrically controlled means for moving the release member away from retracted position, and a control circuit for said electrically controlled means including a selector switch having a rotatable blade and a series of fixed contacts for engagement by the blade, each of said purchaser-operable controls being adapted to rotate said blade and each including means for varying the extent of rotation imparted thereby to said blade.

6. In a vending machine, a mechanism comprising a plurality of latches, a single latch release member, all of the latches normally being uncoupled from the release



member, a plurality of purchaser-operable controls, one for each latch, each adapted to couple the respective latch to the release member upon operation by a purchaser, said latch release member being movable away from a retracted position for releasing any one of the latches which may be coupled thereto, electrically controlled means for moving the release member away from retracted position, and a control circuit for said electrically controlled means including a selector switch having a contact member and a series of contacts for engagement by the contact member, said contact member and series of contacts being relatively movable through a first phase without engagement therebetween for positioning the contact member opposite one of the contacts and then through a second phase for effecting engagement of the contact member and said one contact, each of said purchaser-operable controls being adapted upon operation by a purchaser successively to effect said phases of movement, each of said controls including means for varying the extent of movement through said first phase imparted thereby to said selector switch.

7. In a vending machine, a mechanism comprising a plurality of latches, a single latch release member, all of the latches normally being uncoupled from the release member, a plurality of purchaser-operable controls, one for each latch, each adapted to couple the respective latch to the release member upon operation by a purchaser, said latch release member being movable away from a retracted position for releasing any one of the latches which may be coupled thereto, electrically controlled means for moving the release member away from retracted position, and a control circuit for said electrically controlled means including a selector switch comprising a shaft, a switch blade fixed to the shaft, a series of fixed contacts for engagement by the blade, said blade being rotary in a plane without engagement with any of the contacts for positioning it opposite one of the contacts, means for shifting the blade laterally out of said plane into engagement with one of the contacts, each of said purchaser-operable controls being adapted upon operation by a purchaser to effect rotation of the shaft and the blade and then to effect operation of said blade-shifting means, each of said controls including means for varying the extent of rotation imparted thereby to the shaft and hence the extent of rotation imparted thereby to the blade.

8. In a vending machine, a mechanism comprising a plurality of latches, a single latch release member, all of the latches normally being uncoupled from the release member, a plurality of purchaser-operable controls, one for each latch, each adapted to couple the respective latch to the release member upon operation by a purchaser, said latch release member being movable away from a retracted position for releasing any one of the latches which may be coupled thereto, electrically controlled means for moving the release member away from retracted position, and a control circuit for said electrically controlled means including a selector switch comprising a shaft, a switch blade fixed to the shaft for swinging movement in a plane at right angles to the shaft, a series of fixed contacts on one side of said plane and a paired series of fixed contacts on the other side of said plane, said blade being adapted to be moved in one direction out of said plane into engagement with a contact of one series and to be moved out of said plane in the opposite direction into engagement with a contact of the other series, each of said purchaser-operable controls being adapted to rotate the shaft to rotate the blade away from a retracted position without engaging any of said contacts, each of said controls including means for varying the extent of rotation imparted thereby to the shaft and hence varying the extent of rotation imparted thereby to the blade, and means for moving the blade out of said plane toward one or the other series of fixed contacts including an adjustable member associated with each

purchaser-operated control adapted to be set in one position for moving the blade toward one series of contacts and adapted to be set in another position for moving the blade toward the other series of contacts.

9. In a vending machine, a mechanism comprising a latch release bar movable in a direction transverse to its length away from a retracted position, a plurality of latches arranged in a row on one side of said bar, a slide associated with each latch, each of said slides being movable relative to the respective latch from a retracted position wherein it is disengaged from the bar to an operative position wherein it is engageable by the bar, a shaft parallel to the bar and a switch blade fixed to the shaft biased to rotate to a retracted position, a series of fixed contacts for engagement by the blade, a pluraltiy of purchaser-operable controls, one for each slide, each of said controls comprising a first member movable away from a retracted position for moving the respective slide to operative position, each of said controls further comprising a second member adapted to follow said first member for rotating the shaft and the blade away from retracted position, each of said controls further comprising means for arresting the rotation of the shaft and the movement of the second member adjustable to vary the extent of rotation of the shaft and blade, said first member being adapted for continued movement after rotation of the shaft and blade and movement of the second member are arrested, electrically controlled means for moving the bar away from retracted position, and a control circuit for said electrically controlled means including said blade and contacts.

10. In a vending machine as set forth in claim 9, the arresting means of each of said controls comprising an arm rotary on the shaft, means for locking the arm in any one of a plurality of different angular positions on the shaft, and a stop engageable by the arm.

11. In a vending machine as set forth in claim 10, said stop being movable into and out of the path of said arm, and means operable upon movement of said first member away from retracted position for moving the stop into the path of said arm.

12. In a vending machine as set forth in claim 11, said stop carrying a latch for locking the arm to the stop upon arrest of the arm by the stop.

13. In a vending machine, a mechanism comprising a latch release bar movable in a direction transverse to its length away from a retracted position, a plurality of latches arranged in a row on one side of said bar, a slide associated with each latch, each of said slides being movable relative to the respective latch from a retracted position wherein it is disengaged from the bar to an operative position wherein it is engageable by the bar, a shaft parallel to the bar, a switch blade fixed to the shaft for swinging movement in a plane at right angles to the shaft, means biasing the shaft and blade to rotate to a retracted position, a series of fixed contacts on one side of said plane and a paired series of fixed contacts on the other side of said plane, said blade being adapted to be moved in one direction out of said plane into engagement with a contact of one series and to be moved out of said plane in the opposite direction into engagement with a contact of the other series, a plurality of purchaser-operable controls, one for each slide, each of said controls comprising a first member movable away from a retracted position for moving the respective slide to operative position, each of said controls further comprising a second member adapted to follow said first member for rotating the shaft and the blade away from retracted position, each of said controls further comprising means for arresting the rotation of the shaft and the movement of the second member adjustable to vary the extent of rotation of the shaft and blade, said first member being adapted for continued movement after rotation of the shaft and blade and movement of the second member are arrested, means for moving the blade out of said plane toward one or the other series of fixed contacts including an adjustable member associated with each slide adapted to be set in one position for moving the blade toward one series of contacts and adapted to be set in another position for moving the blade toward the other series of contacts, electrically controlled means for moving the bar away from retracted position, and a control circuit for said electrically controlled means including said blade and contacts.

14. In a vending machine as set forth in claim 13, said means for moving the blade out of said plane comprising a pivoted yoke engageable with the blade, a first control shaft extending transverse to the slides, means connecting said first control shaft and the yoke for swinging the yoke in one direction on rotation of the first control shaft in one direction and for swinging the yoke in the opposite direction on rotation of the first control shaft in the opposite direction, a second control shaft parallel to the first control shaft and connected thereto for rotation in opposite direction, each of said control shafts having a series of arms thereon, one for each slide, and each slide having a pusher mounted thereon for adjustment between a position for engagement with the respective arm on the first control shaft and a position for engagement with the respective arm on the second control shaft.

15. In a vending machine as set forth in claim 13, the arresting means of each of said controls comprising an arm rotary on the shaft, means for locking the arm in any one of a plurality of different angular positions on the shaft comprising a pin on the arm and a plate fixed on the shaft having a series of holes for receiving the pin, a stop engageable by the arm movable into and out of the path of the arm, and means operable upon movement of said first member away from retracted position for moving the stop into the path of said arm.

16. In a vending machine as set forth in claim 15, said stop having a latch lever pivoted thereon for locking the arm to the stop upon arrest of the arm by the stop.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 2,323,981 | Du Grenier et al. | July 13, 1943 |
| 2,455,976 | Caruso | Dec. 14, 1948 |
| 2,476,877 | Knott et al. | July 19, 1949 |
| 2,521,489 | Sorensen | Sept. 5, 1950 |
| 2,843,242 | Gabrielsen | July 15, 1958 |