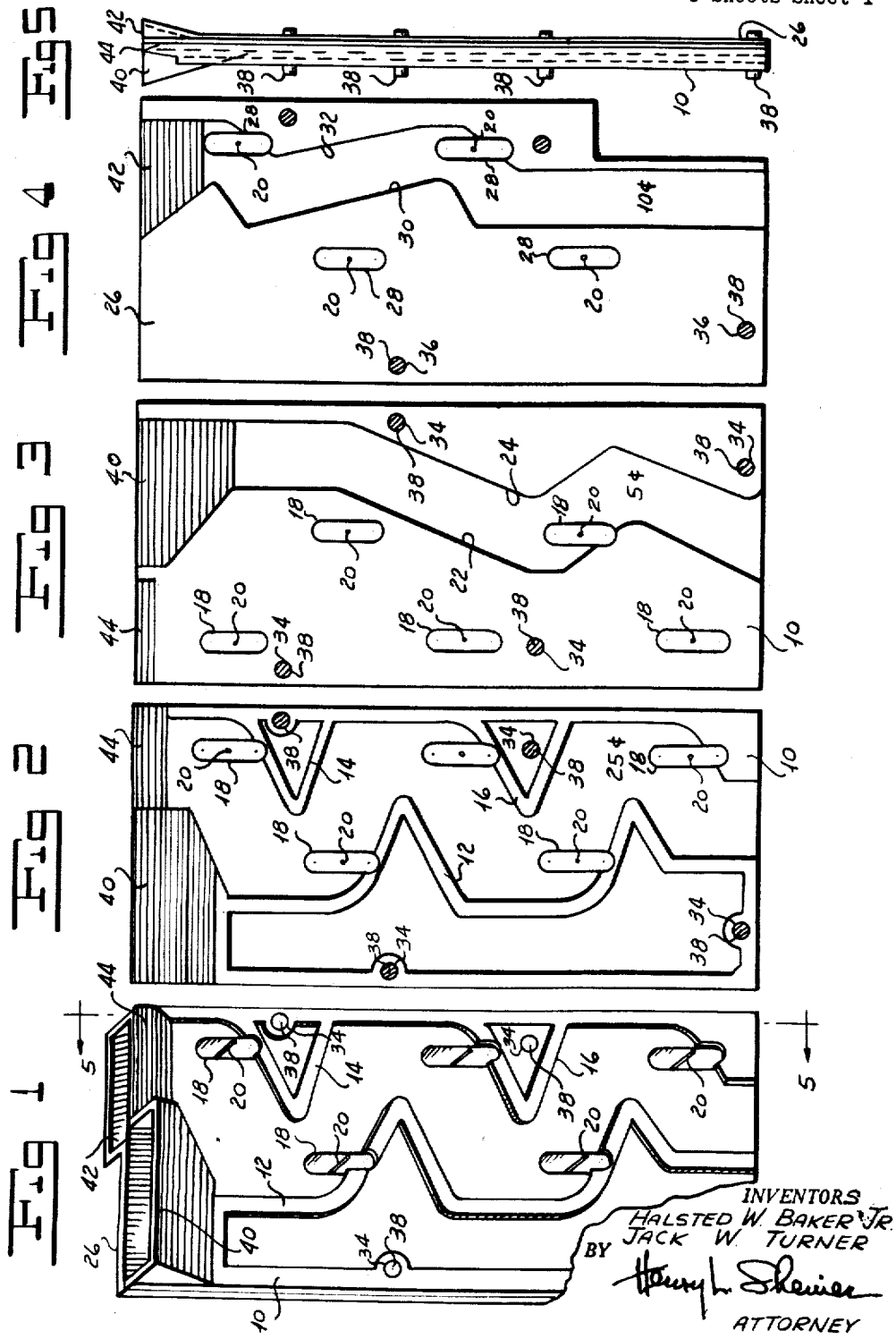
March 10, 1959 H. W. BAKER, JR., ET AL 2,876,883

MERCHANDISING MACHINE CONTROL CIRCUIT

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MERCHANDISING MACHINE CONTROL CIRCUIT

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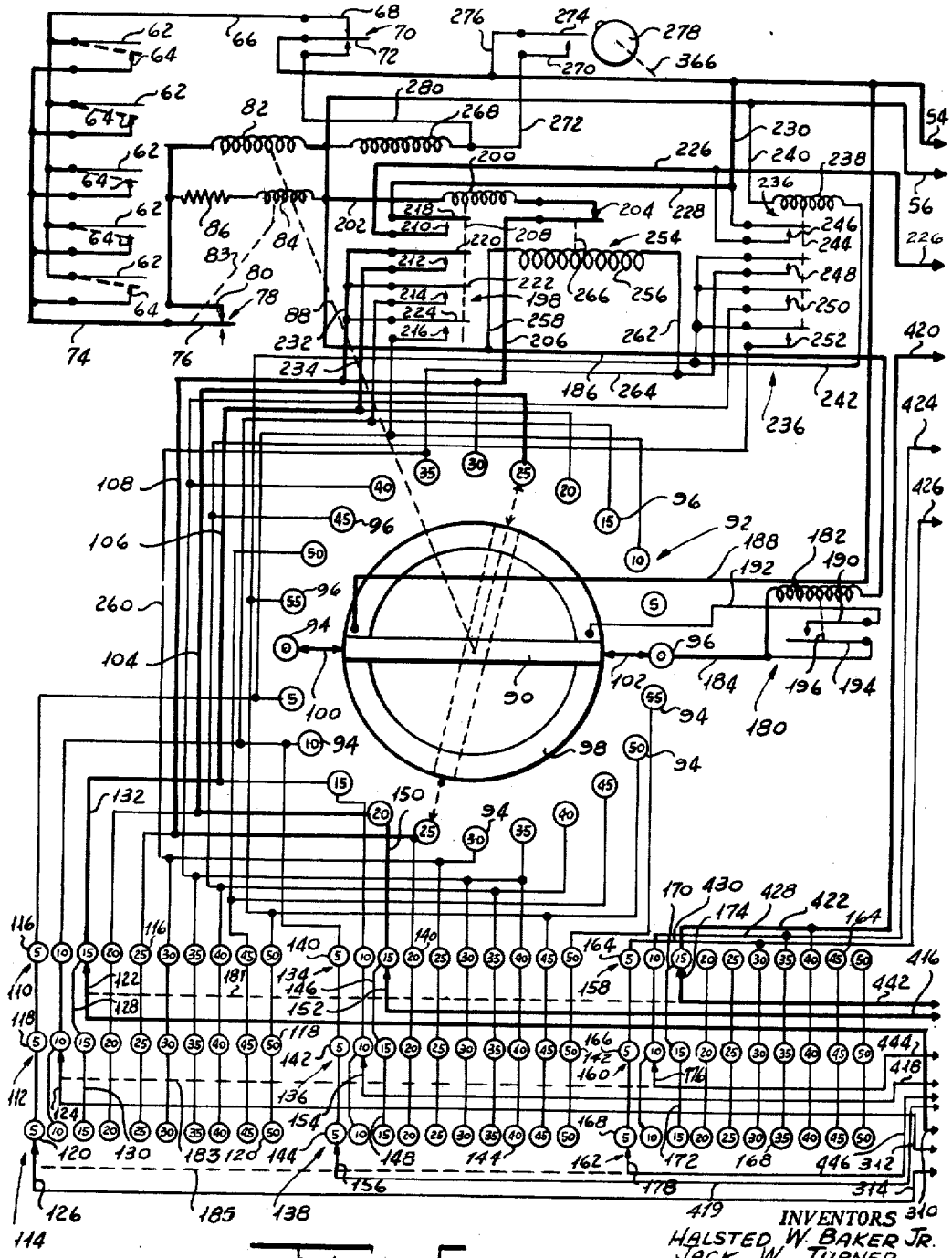


Fig 6

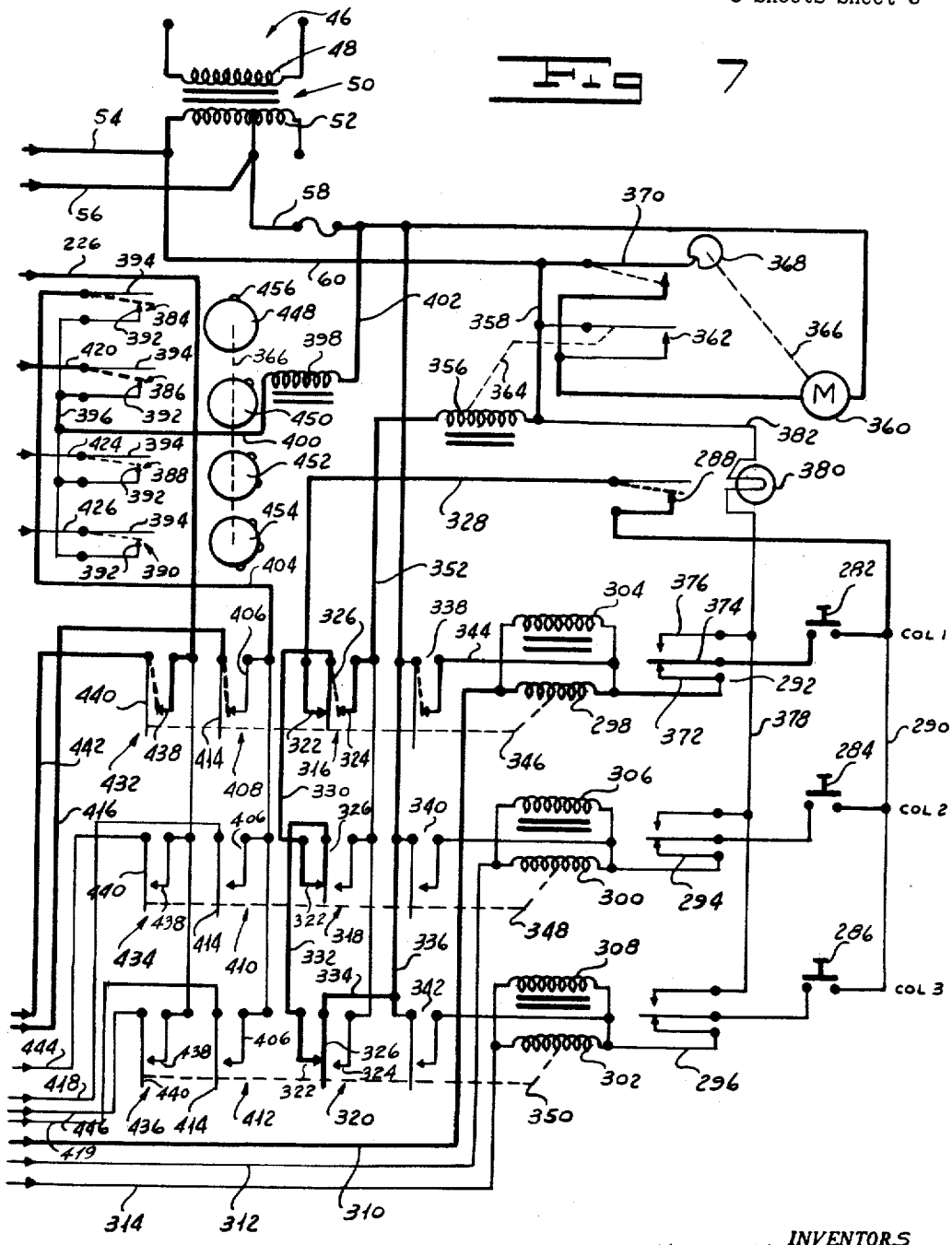
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Fig 7



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United States Patent Office 2,876,883 Patented Mar. 10, 1959

2,876,883

MERCHANDISING MACHINE CONTROL CIRCUIT

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Application February 3, 1954, Serial No. 407,852

8 Claims. (Cl. 194—10)

Our invention relates to a merchandising machine control circuit and more particularly to an improved control circuit for merchandising machines which is flexible in application, simple in construction, certain in operation, and inexpensive to manufacture.

Merchandising machines of the prior art employ control circuits which are adapted to initiate a dispensing operation upon the deposit of a predetermined sum in coins in the coin register of the machine. These control circuits are complicated and expensive. They are provided in some cases with means for making change when an amount in excess of the price of the article selected is deposited in the coin register of the machine. This change making mechanism includes a number of relays and complicated circuitry which is subject to the development of a number of different troubles. Moreover, the design of control circuits of the prior art is relatively inflexible, since it is responsive to only a certain number of combinations of coins and is adapted to give only a limited sum in change. Such control circuits are generally limited in application to a machine which dispenses only a single type of merchandise at a single fixed price. In the event the machine is to merchandise more than a single variety of articles from a plurality of magazines, a separate control circuit or change maker must be provided for each magazine. If the price of a particular article in a magazine is changed, the control circuit must be replaced or modified to dispense a different sum in change.

We have developed a control circuit for merchandising machines which may be utilized on a machine for dispensing a large variety of merchandise selling at various prices. Our machine gives change in sums ranging from five cents to twenty cents. Any magazine containing a particular type of merchandise may be set to any price from five cents to fifty cents in five-cent increments. Provision is made in our machine for setting the various magazines, columns, or dispensing levels carrying different kinds of merchandise at different respective prices. The price of any particular column may be adjusted to any other price within the range so that the proper sum in change is given to a purchaser.

One object of our invention is to provide an improved control circuit for merchandising machines which may be employed on a machine for dispensing a large variety of merchandise selling at various prices.

Another object of our invention is to provide an improved control circuit for merchandising machines which is adapted to sell merchandise ranging in price from five cents to fifty cents in five-cent increments.

A further object of our invention is to provide an improved control circuit for merchandising machines which is adapted to make change up to twenty cents in nickels.

Yet another object of our invention is to provide an improved control circuit for merchandising machines in which provision is made for adjustment of the price at which a particular item of merchandise is sold so that the proper amount in change for the coins deposited is returned to the customer.

A still further object of our invention is the provision of an improved control circuit for merchandising machines which is flexible in application, simple in construction, certain in operation, and inexpensive to manufacture.

Other and further objects of our invention will appear from the following description.

In general, our invention contemplates the provision of a merchandising machine control circuit associated with a coin register having a number of coin tracks. Each of the coin tracks is adapted to receive coins of a particular denomination. For example, we may conveniently provide three tracks adapted to receive, respectively, nickels, dimes, and quarters. A number of switch actuating arms are arranged in the paths formed by the coin tracks so that certain of the switches are actuated by coins passing along the respective tracks. That is, the nickel track is so arranged that a nickel passing therethrough actuates one switch, the dime track is arranged so that a dime actuates two switches, and the quarter track so that a quarter actuates five switches. Each of the switches, when actuated, energizes the coil of a stepping relay associated with a coin totalizer switch to step the switch arm through a movement corresponding to the deposit of one nickel, as is well known in the art. A quarter would step the switch arm five times, a dime twice, and a nickel once.

The merchandising machine with which our control circuit is associated may be provided with any number of dispensing magazines, columns, or levels, each of which has an individual selecting means including a button and a solenoid adapted to be energized thereby. The arrangement is such that when coins in an amount at least equal to the price of the item selected have been deposited in the coin register, coins falling through the coin tracks operate the totalizer relay to step its switch arm to a position where the circuit of a column selector solenoid may be completed when the associated selecting button is actuated. The energized solenoid closes a coin accept switch to energize the coin accept solenoid which completes the circuit to a drive motor which operates the delivery mechanism of the machine. The delivery motor is provided with a camshaft carrying a cam which maintains the motor circuit after the selecting button has been released. When the motor starts, the merchandise is delivered to the customer in any appropriate manner known to the art.

If a sum more than the price of the article has been deposited in the machine, change must be returned to the customer. We provide a change making device which is operated by a solenoid adapted to be energized by a number of change making switches. When the circuit of a change making switch is in a condition where it may energize the solenoid upon operation of the switch, a cam on the delivery motor camshaft closes the switch to energize the solenoid and make change. In order that the proper amount of change be returned to the customer, we provide means for conditioning the circuits of the proper change making switches. This last-mentioned means includes a bank of price selection switches, a bank of nickel change switches, and a bank of extra nickel change switches. One switch of each of the banks is associated with a respective column of merchandise. The bank of nickel change switches is arranged to complete a portion of the circuit of one of the change making switches and the extra nickel switches are adapted to complete the circuit of one of the remaining change making switches so that the proper sum in change is returned to the customer. The remaining portions of the respective change making switch circuits are completed by switches associated with the column selecting solenoids and ganged with the coin accept and

motor start switches. Thereby, when the change making switches whose circuits are conditioned are closed by the change making cams, the change solenoid is energized to return the proper sum in change to the customer.

Our improved control circuit is also provided with a coin return switch whereby coins deposited in the coin register may be returned in the event the machine is empty. In addition our control circuit includes an anti-cheat relay and means for automatically resetting the coin totalizer switch.

In the accompanying drawings which form part of the instant specification and which are to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views:

Figure 1 is a perspective view of the coin track assembly of a register for use with our improved merchandising machine control circuit, removed from the merchandising machine.

Figure 2 is a front elevation of one panel showing the twenty-five-cent coin track of the coin track assembly shown in Figure 1.

Figure 3 is a rear elevation of the panel shown in Figure 2 showing the five-cent coin track.

Figure 4 is a front elevation of another panel showing the ten-cent coin track of the coin track assembly shown in Figure 1.

Figure 5 is a side elevation of the coin track assembly taken along the line 5—5 of Figure 1.

Figure 6 is a schematic view of a portion of our improved merchandising machine control circuit.

Figure 7 is a schematic view of the remaining portion of our improved merchandising machine control circuit.

More particularly referring now to the drawings, Figures 1 to 3, the coin track assembly of the coin register for use with our improved merchandising machine control circuit includes a first panel member **10**. As can be seen by reference to Figure 2, one side of the panel **10** is formed with a raised track **12** adapted to guide a quarter along a confined path from the top to the bottom of the panel. A pair of triangular bosses **14** and **16** complete this path. It is to be noted that the panel **10** is formed with a plurality of holes **18** into each of which the actuating arm **20** of a suitable switch (not shown) extends. The disposition of the holes **18** and arms **20** is such that a quarter passing along the path defined by track **12** and projections **14** and **16** will engage all the arms **20**.

The reverse side of the panel **10** is illustrated in Figure 3. This side of the panel is provided with a depressed track defined by shoulders **22** and **24**. It can readily be seen from an examination of this figure that a nickel passing downwardly along the path defined by shoulders **22** and **24** will engage and actuate only one of the arms **20**.

The coin track assembly is completed by a second panel **26** provided with a plurality of holes **28** and having a depressed track formed by shoulders **30** and **32**, as can be seen by reference to Figure 4. The holes **28** in panel **26** are so disposed that when panels **26** and **10** are assembled, the holes **18** register with the holes **28** so that arms **20** extend into holes **28**. It is to be noted also that the track defined by shoulders **30** and **32** is such that two of the arms **20** will be engaged and actuated by a dime passing along the track. In order to assemble panels **10** and **26**, we provide panel **10** with suitably located holes **34** and panel **26** with corresponding holes **36**. As can be seen by reference to Figure 1, the panels may be joined by any suitable means such as screws **38** passing through holes **34** and **36**. Panel **10** is provided at its upper end as viewed in Figure 1 with an outwardly extending lip **40** forming a funnel by means of which nickels may readily be guided into the nickel coin track. Similarly, panel **26** is provided with a lip **42** forming a

funnel by means of which dimes may readily be guided into the dime track. When in the assembled position in the machine, the quarter track formed by track **12** and bosses **14** and **16** will be enclosed by a part of the machine (not shown) so that quarters deposited therein will be confined to the track. It is to be noted that for convenience we form the portion **44** of the top panel **10** adjacent lip **40** with a tapered cross section so that entrance to the dime track is more accurately separated from the entrance to the quarter track. While we have shown this particular construction of coin track assembly, any type assembly or coin register adapted to actuate switches by coins in the manner shown may be employed.

The electrical connections of our improved merchandising machine control circuit are shown in Figures 6 and 7 and include a source of alternating current indicated generally by the reference numeral **46** feeding the primary winding **48** of a transformer, indicated generally by the reference character **50**. The secondary winding **52** of transformer **50** is adapted to feed supply lines **54** and **56** and lines **58** and **60**. Each of the actuating arms **20** actuate a switch including a contactor **64** and a contact arm **62** shown in Figure 6. Arms **62** are connected by a common line **66** to the contact **68** of a normally closed coin return switch, indicated generally by reference character **70**. The arm **72** of switch **70** is joined to the supply line **54**. A conductor **74** common to the contacts **64** of the coin track switches connects contacts **64** to the contact arm **76** of a thermal relay switch, indicated generally by the reference numeral **78**. The contact **80** of switch **78** is connected to a stepping coil **82** which, in turn, is connected to supply line **56**. A thermal relay including a coil **84** and a resistor **86** is in parallel with stepping coil **82**. Coil **84** is adapted, when energized, to actuate switch **78** through linkage **83**. From the circuitry described so far it will be appreciated that each time an arm **20** is actuated by a coin passing along one of the coin tracks stepping coil **82** will be energized. For example, if a dime passes down the dime track, two of the arms **20** will be actuated so that stepping coil **82** will be energized twice. In a similar manner, a quarter will close five switches in succession, and a nickel will close one switch.

Stepping coil **82** is connected by mechanical means, indicated by the reference character **88**, to the contact arm **90** of the coin totalizer switch, indicated generally by reference character **92**. Totalizer switch **92** includes a lower group of contacts **94** and an upper group of contacts **96** arranged around its periphery and an annular conducting element **98**. Contact arm **90**, which is formed of suitable insulating material, carries a pair of contactors **100** and **102** at its respective ends. Each of the contactors **100** and **102** is formed of conducting material and is adapted to connect, respectively, one of the contacts **94** or **96** with the conducting ring **98**. It will be appreciated that in this arrangement, as arm **90** is stepped around by coil **82**, a pair of oppositely disposed contacts **94** and **96** are interconnected. From an examination of Figure 6 it will be apparent that contacts **94** of switch **92** have been marked in five-cent intervals from zero to fifty-five cents in a counterclockwise direction, and contacts **96** are similarly marked. Thereby, contactors **100** and **102** engage correspondingly marked contacts **94** and **96** at opposite points on the circle described by the contacts **94** and **96**. For example, if contactor **100** engages the ten-cent contact **94**, contactor **102** engages the ten-cent contact **96**. Each of the contacts **94** making up half the circle of contacts is cross connected to a contact **96** of the group forming the remaining half of the contact circle. The arrangement is such that a contact **94** corresponding to a particular price is cross connected with a contact **96** corresponding to a price which is five cents higher. For example, the twenty-cent contact **94** is cross connected with the twenty-five-cent contact **96** by

a line 104. Similarly, the fifteen-cent contact 94 is connected with the twenty-cent contact 96 by a line 106, and the twenty-five-cent contact 94 is connected with the thirty-cent contact 96 by a conductor 108. It is to be understood that, for the most part, the remaining contacts 94 and 96 are cross connected in like manner. The fifty-five-cent contact 94 is not cross connected with any contact 96 and the five-cent contact 96 is not connected with any contact 94.

In order to provide a means for setting up the respective prices for the various kinds of merchandise to be dispensed by the machine, we provide a plurality of price selection switches, indicated generally, respectively, by the reference characters 110, 112, and 114. Switch 110 includes ten contacts 116 corresponding, respectively, to prices ranging from five cents to fifty cents in five-cent intervals and is associated with a first dispensing level assembly or column of the machine. Switches 112 and 114 include, respectively, contacts 118 and 120, similarly marked to contacts 116 and corresponding, respectively, to a second and third dispensing level assembly or column of the machine. While we have shown only three price selection switches, it is to be understood that we employ as many switches as there are dispensing level assemblies or columns in the machine. For simplicity we have shown a machine including only three columns. Brushes 122, 124, and 126 are associated, respectively, with the switches 110, 112, and 114 and may be moved along the contacts to engage a contact corresponding to the price of the article of merchandise in a particular column. As will be explained in detail hereinafter, the price selection switches are adapted to complete the circuits of the selecting means associated with the various columns. Corresponding contacts 116, 118, and 120 of the price selection switches are connected. For example, the fifteen-cent contact 116 is connected to the fifteen-cent contact 118 by a conductor 128, and the fifteen-cent contact 118 is connected to the fifteen-cent contact 120 by a conductor 130. Other corresponding contacts are similarly connected. Each of the five-cent to fifty-cent contacts 116 is connected to the corresponding contact 94 of the coin totalizer switch 92. For example, the fifteen-cent contact 116 is connected to the fifteen-cent contact 94 by a conductor 132.

In order to make change, we first provide banks of change selecting switches. Single nickel change selecting switches, indicated generally, respectively, by the reference characters 134, 136, and 138, are adapted to be set up, in a manner which will be described in detail hereinafter, to give a single nickel in change when the amount deposited in the machine exceeds the price of the article selected by five cents. Switches 134, 136, and 138 include respective groups of contacts 140, 142, and 144. Each group corresponds to prices from five cents to fifty cents in five-cent intervals. Corresponding contacts 140, 142, and 144 are connected. For example, fifteen-cent contact 140 is connected with fifteen-cent contacts 142 and 144 by lines 146 and 148. Each of the contacts 140 is connected to a contact 94 corresponding to a price which is five cents higher than the price to which the contact 140 corresponds. For example, the fifteen-cent contact 140 is connected to the twenty-cent contact 94 by a line 150 and the remaining contacts 140 are similarly connected with the contacts 94. Switches 134, 136, and 138 are provided with respective brushes 152, 154, and 156, each adapted to engage a respective contact 140, 142, and 144 corresponding to the price of an article of merchandise in the column with which the switch is associated. Switches 134, 136, and 138 are associated, respectively, with the first, second, and third columns of the machine.

In the event that the sum deposited in the coin register of the machine exceeds the price of the article of merchandise by more than one nickel, some means must be provided for dispensing additional change. To accomplish this, we provide extra nickel change selection switches, indicated generally, respectively, by reference characters 158, 160, and 162 and corresponding to the respective first, second, and third columns of the machine. Switches 158, 160, and 162 include respective groups of contacts 164, 166, and 168. Each group corresponds to prices from five cents to fifty cents in five-cent intervals. As was the case with the price selection switches and the single nickel change selection switches, corresponding contacts of switches 158, 160, and 162 are connected. For example, the fifteen-cent contact 164 is connected with the fifteen-cent contacts 166 and 168 by conductors 170 and 172. Switches 158, 160, and 162 are provided with respective brushes 174, 176, and 178, each adapted to be moved along its associated row of contacts to engage a contact corresponding to the price of an article of merchandise in the column with which the switch is associated. Contacts 164 are connected in the circuits of extra nickel change making switches in a manner which will be described hereinafter.

A suitable mechanical means 181 gangs brushes 122, 152, and 174, corresponding to the first column of the machine, so that they may be moved along their associated rows of contacts to engage a contact corresponding to the price of an item of merchandise in the first column. As can readily be seen by reference to Figure 6, the price selection and change selection switches corresponding to the first column have been set up to dispense an article of merchandise from the first column in response to the deposit of at least fifteen cents in the machine. That is, brushes 122, 152, and 174 engage the respective fifteen-cent contacts 116, 140, and 164. Similar mechanical means 183 gangs brushes 124, 154, and 176 corresponding to the second column of merchandise and means 185 gangs brushes 126, 156, and 178 corresponding to the third column of merchandise. The price selection and change selecting switches corresponding to the second and third columns have been set up to dispense merchandise from the respective columns in response to the deposit of at least ten cents and five cents in the coin register. Brushes 152, 154, and 156 of the single nickel change selection switches and brushes 174, 176, and 178 of the extra nickel change switches are connected in a manner to be described hereinafter to respective switches associated with the merchandise selecting mechanism to complete the circuits of appropriate change making switches so that when the change making switches are actuated, the proper amount in change will be returned to the customer.

We provide an anticheat relay, indicated generally by reference character 180, which includes a coil 182 connected at one end to the zero contact 96 by a conductor 184 and at the other end by line 186 to the line 56. A conductor 188 connects ring 98 with supply line 54 to complete the circuit of coil 182 when arm 90 is in the position shown in solid lines in Figure 6. The coil circuit is completed from line 56 through line 186, the coil 182, conductor 184, zero contact 96, contactor 102, ring 98, and line 188 to line 54 so that the anticheat relay is normally energized. It will be appreciated that when arm 90 is stepped so that contactor 102 moves from the zero contact 96 to the five-cent contact 96, this circuit will be broken. In order to maintain the anticheat relay energized, we provide a contact 190 connected to ring 98 by a line 192 and a contact arm 194 connected to line 184. Suitable mechanical means 196 engages arm 194 with contact 190 when the coil 182 is energized. Thereby, when contactor 102 moves away from the zero contact 96, the circuit of coil 182 remains complete and may then be traced through line 186, the coil 182, arm 194, contact 190, line 192, ring 98, and line 188. This prevents obtaining merchandise by interrupting power, operating the coin return and then re-establishing power.

The only occasion on which more than a single nickel need be given in change is the insertion of one or two quarters into the machine and the selection of an item

which sells for ten or more cents less than the sum deposited. That is, if the customer has a sufficient number of nickels, no change need be given no matter what the price of the selected item, since the exact price in coins may be deposited in the machine. If he has only dimes, he may purchase any item and a single nickel will be the maximum amount necessary to be returned in change. The single nickel change selecting switches provide for this return. If however, the customer has only quarters, up to four nickels in change may have to be returned depending upon the price of the item selected. In this last instance the extra nickel change selecting switches must be connected into the circuit. A twenty-five-cent holding relay, indicated generally by reference character **198**, provides a means for connecting the extra nickel change switches in the circuit when a quarter has been deposited. If the customer desires to purchase an item costing more than twenty-five cents and he is supplied with nickels or dimes, no change or only a single nickel change need be given in return so that the extra nickel change selecting switches are not necessary. We provide a change protection relay, indicated generally by reference character **254**, to interrupt the circuit to the twenty-five-cent holding relay when more than a quarter has been inserted in the machine. If the customer has only quarters and wishes to purchase an item costing more than twenty-five cents, the extra nickel change selecting switches may again become necessary. We provide a fifty-cent hold relay, indicated generally by reference character **236**, to connect the extra nickel change selecting switches into the circuit when two quarters have been deposited in the machine.

In order to complete the proper circuits so that the correct change making mechanism may be actuated when a quarter has been inserted in the coin register, we provide a twenty-five-cent holding relay, indicated generally by reference character **198**, which includes a coil **200** connected at one end to the line **56** by a lead **202** and at the other end to a normally closed switch **204**. Switch **204** is connected to line **108** by a conductor **206**. As will be explained hereinafter, when a quarter has been deposited in the coin register, arm **90** is stepped to a position where the circuit of coil **200** is completed and the coil actuates a linkage **208** to close its associated normally open switches **210**, **212**, **214**, and **216** including respective contact arms **218**, **220**, **222**, and **224**. The contact of switch **210** is connected to the selecting mechanism associated with the first column of merchandise by a line **226**. The arm **218** of switch **210** is connected to supply line **54** by conductors **228** and **230**. The remaining switches **212**, **214**, and **216** are connected across selected pairs of the lines connecting contacts **94** with contacts **96**. For example, arm **220** of switch **212** is connected to line **108** by a conductor **232** and its contact is connected to line **106** by a conductor **234**. Swtiches **214** and **216** are connected between appropriate cross connecting lines as shown so that the proper amount in change is returned to the customer in response to the deposit of coins and the selection of merchandise. These connections complete the price selection circuits in the event that a quarter is deposited in the machine and the price of the article is such that more than a single nickel must be returned in change, as will be described hereinafter.

A change protection relay, indicated generally by reference character **254**, includes a coil **256** which is connected at one end to line **186** by a lead **258** and at the other end to a cross connecting conductor **264** between the thirty-five-cent contact **96** and the thirty-cent contact **94** by leads **262** and **264**. It will be appreciated that when coins in excess of twenty-five cents are deposited in the coin register, arm **90** will be stepped to a position where the change protection relay coil **256** will be energized. When energized, coil **256** actuates a linkage **266** which opens switch **204**, thereby preventing the twenty-five-cent hold relay from being energized to bring the extra nickel change switches into play.

In order that proper change be returned when two quarters have been deposited in the coin track assembly, we provide a fifty-cent hold relay, indicated generally by the reference character **236** and including a coil **238**, one end of which is connected to line **56** by a conductor **240** and the other end of which is connected to the fifty-five-cent contact **96** by line **242**. The coil **238** will be energized, in a manner similar to that in which coil **200** was energized, when two quarters have been deposited in the coin register. When energized, coil **238** actuates linkage **244** to close switches **246**, **248**, **250**, and **252** to set up the extra nickel change circuits so that the proper amount in change will be returned to the customer. From the foregoing it will be seen that the twenty-five-cent hold relay is energized only when twenty-five cents has been deposited and the fifty-cent relay only when fifty cents has been deposited.

We provide a reset coil **268** connected at one end to line **56** and at the other end to the contact **270** of the reset switch by a lead **272**. The contact arm **274** of the reset switch is connected to supply line **54** by a lead **276**. A cam **278** mounted on the dispensing motor shaft, to be described hereinafter, engages arm **274** to close switch **270** when the dispensing operation is completed. This operation completes the circuit of coil **268** so that the latter is energized and resets arm **90** through suitable mechanical linkage (not shown). The circuit of coil **268** may be traced, when the reset switch is closed, from line **54** through line **276**, arm **274**, contact **270**, line **272**, and through the coil **268** to line **56**. A line **280** connects line **272** to a contact of coin return switch **70** so that when the coin return switch is actuated, the circuit of the reset coil **268** will be completed to line **54** and arm **90** will be reset. It is to be understood that the coin return system per se is a mechanical system of any suitable type known to the art. Operation of the coin return actuates switch **70** to complete the circuit of the reset winding **268**.

The dispensing level assemblies or columns of our merchandising machine include respective push button selecting switches **282**, **284**, and **286**, one side of each of which is connected to a normally open switch **288** on the anticheat relay by a common line **290**. The other side of each of the switches **282** to **286** is connected to respective normally closed empty switches **292**, **294**, and **296**. Each of the empty switches **292** to **296** is connected in series with a respective column selector relay coil **298**, **300**, and **302**. Respective holding solenoids **304**, **306**, and **308** are connected in parallel with the coils **298** to **302**. The coil **298** is connected to brush **122** of the price selection switch **110** corresponding to the first column by a line **310**. Similarly, coils **300** and **302** are connected, respectively, to the brushes **124** and **126** of switches **112** and **114** corresponding to the second and third columns by leads **312** and **314**.

Associated with each of the selecting mechanisms we provide respective coin accept and motor start switches, indicated generally, respectively, by the reference characters **316**, **318**, and **320**. Each of these switches includes contacts **322** and **324** and an arm **326**. The contact **322** of switch **316** is connected to the switch **288** on the anticheat relay by a conductor **328**. Arm **326** of switch **316** is connected with the contact **322** of switch **318** by conductor **330** and the arm **326** of switch **318** similarly connected with the contact **322** of switch **320** by lead **332**. The arm **326** of switch **320** is connected by a lead **334** to a line **336** connected to the supply line **58**. As can readily be seen by reference to Figure 7, the arm **326** of each of the switches **316** to **320** normally engages its respective contact **322**. A circuit is thereby completed through line **328**, switch **316**, conductor **330**, switch **318**, conductor **332**, switch **320**, conductor **334**, and line **336** to supply line **58**. Since coil **182** is maintained energized in the manner described hereinbefore,

switch 288, actuated by this coil through means (not shown), will be maintained closed so that a circuit is completed from supply line 58 to one side of each of the selecting buttons 282, 284, and 286. When the proper sum has been deposited in the coin register and one of the selecting buttons is actuated, the circuit of the solenoid associated with the actuated selecting button will be completed through the coin totalizer switch 92 to energize the solenoid in a manner to be described hereinafter.

If, after the arm 90 has been stepped in response to the deposit of coins, power to the system is interrupted as by a dishonest customer pulling the plug, then the anticheat relay winding 182 is de-energized. If the coin return is then actuated, the deposited coins will be returned, but the reset winding 268 cannot be energized by operation of the switch 70 owing to the fact that the power has been cut off. Upon re-establishment of power, the anti-cheat winding 188 will not be re-energized, since arm 90 has not been reset. Thus switch 288 is open, and no merchandise can be obtained. Another operation of the coin return to close switch 70 to reset arm 90 is required before merchandise can be obtained upon the deposit of coins.

Each of the selecting coils 298, 300, and 302 is adapted to actuate a respective holding switch 338, 340, or 342 to maintain the column selector solenoid energized after the associated selecting button has been released. For example, swtich 338 associated with the first column is connected on one side to line 336 and on the other side to one end of the solenoid 304 by a conductor 344. When the coil 298 is energized upon actuation of a selecting button, switch 338 is closed by a linkage 346 to complete the circuit of solenoid 304 from line 58 through line 336, switch 338, conductor 344, the solenoid 304, line 310, and the price selection and totalizer switches to line 60 in a manner to be described more fully hereinafter. Switches 340 and 342 are actuated in a similar manner by linkages 348 and 350.

As will be apparent from an examination of Figure 7, the linkages 346 to 350 also actuate switches 316, 318, and 320 to move their respective arms 326 to positions where they engage contacts 324. Contacts 324 are connected by a common conductor 352 to a coin accept solenoid 356. A conductor 358 connects the coin accept solenoid 356 with supply line 60. If one of the coin accept switches, for example 316, has been actuated so that its arm 326 engages contact 324, the coin accept solenoid circuit will be completed from line 60 through line 358, the solenoid 356, line 352, contact 324, arm 326, conductor 330, switch 318, conductor 332, switch 320, conductor 334, and line 336 to supply line 58. A delivery motor 360 is connected at one end to supply line 58 and at the other end to a motor start swtich 362 adapted to be actuated by a linkage 364 operated by coin accept solenoid 356. When solenoid 356 is energized, switch 362 closes and the motor circuit is completed from line 58 through the motor, the switch 362, and conductor 358 to line 60. In order that a complete revolution of motor 360 be ensured, I provide the shaft, indicated schematically at 366, with a cam 268 adapted to actuate a follow-through switch arm 370 and maintain the switch closed for the period of one revolution. When switch arm 370 is closed, the motor circuit is complete from line 58 through the motor and through switch arm 370 directly to line 60.

Each of the empty switches 292 to 296 includes a contact 372 normally engaged by the switch arm 374 and a second contact 376. The contacts 376 are connected by a common conductor 378 to an appropriate signal device such as a lamp 380 which is connected to supply line 60 by a lead 382 and line 358. When one of the respective columns is empty, the associated empty switch is actuated by means (not shown) so that contact arm 374 is engaged with contact 376. When this condition occurs and the associated selecting buton is pressed, the circuit to the signal device 380 will be completed from line 60 through lines 358 and 382, the signal device 380, line 378, contact 376, arm 374, the associated selecting button, the switch 288, line 328, switches 316 to 320, and line 336 to line 58. Thereby, when the selecting button corresponding to an empty column is pressed, the customer will be informed that the column is empty.

In order to provide a means for delivering the change, we arrange change making switches, indicated generally, respectively, by the reference characters 384, 386, 388, and 390, each including a contact 392 and a contact arm 394. Contacts 392 are joined by a common conductor 396 which is connected to one side of a change solenoid 398 by a lead 400. A conductor 402 connects the other end of solenoid 398 to supply line 58. The switch 384 is adapted to give a single nickel in change whenever change is to be given by operating a change making device, not shown since it is known to the art. Its arm 394 is connected to a line 404 which connects the respective contacts 406 of single nickel conditioning switches, indicated generally, respectively, by the reference characters 408, 410, and 412. Each of the switches 408, 410, and 412 is associated with a respective column and adapted to be actuated by one of the linkages 346 to 350. The contact arm 414 of switch 408 is connected to the brush 152 of the single nickel change selection switch 134 corresponding to the first column by a line 416, the contact arm 414 of the switch 410 is connected to the brush 154 of the single nickel change selection switch 136 associated with the second column by a line 418, and the arm 414 of switch 412 is connected to brush 156 of the single nickel change selection switch by a line 419.

Switches 386, 388, and 390 are extra nickel change making switches and are adapted, respectively, to effect the giving of one nickel, two nickels, and three nickels in change and are associated with the extra nickel change selection switches 158 to 162. Arm 394 of switch 386 is connected by a line 420 to a conductor 422 joining the fifteen-cent and forty-cent contacts 164 of the extra nickel change selection switches 158 to 162. Similarly, brushes 394 of switches 388 and 390 are connected, respectively, by lines 424 and 426 to lines 428 and 430 connecting the ten-cent and thirty-five-cent and five-cent and thirty-cent contacts of switches 158 to 162.

To complete the circuits for dispensing extra nickels in change, we provide extra nickel change conditioning switches, indicated generally by reference characters 432, 434, and 436, associated with the respective machine columns and each including a contact 438 and an arm 440. The arm 440 of switch 432 is connected to the brush 174 of the switch 158 corresponding to the first column by a line 442. Similarly, the arms 440 of switches 434 and 436 are connected, respectively, to the brushes 176 and 178 of the switches 160 and 162 corresponding to the second and third columns by conductors 444 and 446. As will be explained in detail hereinafter, the extra nickel change circuit conditioning switches 432 to 436 are interconnected with the extra nickel change selection switches 158 to 162, to condition the circuit of a proper one of the extra nickel change making swicthes 386, 388, and 390 to dispense the proper amount in change when extra nickels must be returned. Circuits are thus set up which enable the change making switches to actuate the change solenoid to return the proper amount in coins when they are closed. In order to provide a means for closing the change making switches, we arrange a plurality of cams 448, 450, 452, and 454 on the shaft 366 of the delivery motor 360, each adapted to actuate a respective switch 384, 386, 388, and 390. Each of the cams 448, 450, 452, and 454 has at least one projection 456 thereon for engaging a contact arm 394 of one of the switches. For example, cam 448 associated with the single nickel change making switch 384 has one projection 356 there-

on so that switch 384 is actuated only once during a single revolution of delivery motor 360. Whenever change is to be made, the circuit of switch 384 is conditioned so that closure of the switch will energize solenoid 398. If extra nickels are necessary to make up the required amount in change, the circuit of one of the other switches 386, 388, or 390 must be conditioned so that operation of the switch will actuate solenoid 398. If only ten cent's change or two nickels is required, the circuit of switch 386 will be conditioned to operate the solenoid. Cam 450 associated with this switch has a single projection 456 thereon spaced radially relative to the projection on cam 448 so that switch 386 is closed at a slightly later time than is switch 384. Thereby, if two nickels are to be delivered, the circuits of both switches 384 and 386 are conditioned and the switches successively closed so that solenoid 398 is energized twice during a revolution of the delivery motor to give two nickels in change through the change dispensing device. If three nickels are to be given in change, the circuits of switches 384 and 388 are conditioned. Cam 452 associated with switch 388 has two radially spaced projections 456 thereon so that after switch 384 has been operated once to deliver one nickel, switch 388 will be actuated twice to deliver two more nickels. In a similar manner if four nickels are to be returned, the circuits of switches 384 and 390 are conditioned. Switch 384 is actuated once to deliver one nickel and cam 454, which has three radially spaced projections thereon, actuates switch 390 three times more so that a total of four nickels are delivered to the customer. It will be appreciated that when more than one nickel in change is to be given, switch 384 is always conditioned to operate while only one of the switches 386, 388, or 390 is conditioned to operate.

The operation of our control circuit is best understood by assuming a particular condition of operation of the machine. The machine may be set up, for example, as shown in Figure 6 so that an item of merchandise in column one is sold for fifteen cents, an item in column two sold for ten cents, and an item in column three sold for five cents. The prices shown are illustrative only and any item in any column may be sold for a price ranging from five cents to fifty cents. When our circuit is energized and arm 90 is in the zero position shown in solid lines in Figure 6, the anticheat relay coil 182 is energized. The circuit to this relay is completed from supply line 56 through line 186, through the coil 182, conductor 184, zero contact 96, contactor 102, ring 98, and line 188 to line 54. We will assume that a quarter is inserted in the coin register and that the customer desires to purchase an item of merchandise from column one which is priced at fifteen cents as shown. As can be seen by reference to Figure 2, if a quarter is inserted in the path formed by track 12 and projections 14 and 16, five switch actuating arms 20 will be engaged by the coin in its passage along the path. Referring now to Figure 6, when a coin switch is actuated so that arm 64 engages contact 62, the circuit to the stepping coil 82 is completed from line 56 through the coil, through thermal relay switch 78, conductor 74, through the actuated coin switch, through conductor 66, and finally through the coin return switch 70 to line 54. It will be appreciated that each time one of the switches 20 is actuated, stepping relay coil 82 is energized to move arm 90 one step in a counterclockwise direction as viewed in Figure 6 through linkage 88. When the arm 90 is stepped out of engagement with the zero contact 96, the circuit to the anticheat relay coil 182 is maintained by the switch including arm 194 and contact 190 which was closed when the relay was initially energized. When a quarter has been deposited, arm 90 and contactors 100 and 102 will be stepped around so that the twenty-five-cent contact 94 is cross connected with the twenty-five-cent contact 96 through the medium of ring 98. The arrangement is such that at this time the machine is in a condition to be operated. For purposes of convenience, the circuits energized under the assumed condition have been illustrated in heavier lines.

When arm 90 and contactors 100 and 102 have been stepped around in response to a deposit of a quarter, they will be in the positions shown in broken lines in Figure 6. In this position of the arm 90, the twenty-five-cent hold relay coil is energized to close its associated bank of switches through the linkage 208. The circuit to coil 200 is completed from line 56 through conductor 202, coil 200, switch 204, line 206, line 108, twenty-five-cent contact 94, contactor 100, ring 98, and line 188 to supply line 54.

Since the customer desires an article of merchandise in column one, he actuates the push button 282 corresponding to column one to energize relay coil 298 and close the associated switches through linkage 346. It will be understood that since the anticheat relay coil 182 is energized, the switch 288 is closed to the broken line position shown in Figure 7. The circuit to coil 298 is completed from supply line 58 through line 336, lead 334, switch 320, conductor 332, switch 318, conductor 330, switch 322, line 328, switch 288, line 290, push button switch 282, empty switch 372, the coil 298, line 310, brush 122, the fifteen-cent contact 116, conductor 132, line 106, conductor 234, contact 212, contact arm 220, conductor 232, line 108, the twenty-five-cent contact 94, contactor 100, ring 98, line 188, and line 54 to line 60. When coil 298 is thus energized, it actuates switches 338, 316, 408, and 432 through the common linkage 346. Switch 338 maintains the selecting relay energized by completing the circuit of solenoid 304. This circuit may be traced from line 58 to line 336, switch 338, solenoid 304, to line 310 and through stepping switch 92 and the twenty-five-cent hold relay to line 54.

When linkage 346 is actuated, the arm 326 of switch 316 is moved from contact 322 to engage contact 324 to complete the circuit of the coin accept solenoid 356. This circuit is completed from line 60 through conductor 358, solenoid 356, line 352, switch 316, conductor 330, switch 318, conductor 332, switch 320, conductor 334, and line 336 to line 58. When the coin accept solenoid is energized, its linkage 364 closes the delivery motor start switch 362 to complete the circuit of motor 360 from line 58 through motor 360, through switch 362, and conductor 358 to line 60. When operation of the motor has thus been initiated, the cam 368 on the motor shaft closes follow-through switch 370 to maintain the motor circuit complete during one revolution of the delivery motor. When the delivery motor thus rotates, it actuates the dispensing mechanism (not shown) in a manner well known in the art.

It is to be understood, of course, that in the event a particular selected column is empty, one of the switches 372 will be actuated so that the column selector relay cannot be energized and the signal light 380 will light when the selecting button is pressed. In this event the customer may press the coin return switch 70 to return his coins or he may make another selection.

Since twenty-five cents has been deposited in the coin register and only a fifteen-cent item selected, it is necessary that ten cents in change or two nickels be given to the customer. In order to give the change, the circuits of the change making switch 384 and 386 should be conditioned so that solenoid 398 will be energized when the switches are actuated by their respective cams 448 and 450. It can be seen from an examination of Figure 7 that this is the condition which exists when the control circuit has been actuated in the manner described. For example, the circuit of switch 384 may be traced from line 58 through solenoid 398 through line 400, conductor 396, across switch 384 to line 404, through switch 408 to line 416, to brush 152, across fifteen-cent contact 140 to line 150, through twenty-cent contact 94 to line 104,

to twenty-five-cent contact **96**, through contactor **102** to ring **98**, and through line **188** and to the line **54** connected to line **60**. From the foregoing it will be appreciated that when the projection **456** on cam **448** closes switch **384**, solenoid **398** is energized to give one nickel in change to the customer. The circuit associated with the single extra nickel switch **386** is likewise conditioned and may be traced from line **58** through conductor **402**, through solenoid **398**, through line **400** to conductor **396**, across switch **386**, through line **420** to conductor **422**, through the fifteen-cent contact **164** to line **442**, through switch **432** to line **226**, through the switch including contact **210** and arm **218** to line **228**, and through conductor **230** to line **54** and thence to line **60**. It can thus be seen that this circuit is also conditioned so that when the projection **456** on cam **450** closes switch **386**, a second nickel will be dispensed through the action of solenoid **398**. In this case, the circuits associated with switches **388** and **390** will not be completed when the projections on the respective cams **452** and **454** close the switches so that their operation does not energize change making solenoid **298** and only two nickels in change are obtained. It is to be understood that the foregoing example of twenty-five cents inserted and a fifteen-cent item selected was given by way of illustration only and that our control circuit is adapted to give change up to four nickels and to sell merchandise at any price from five cents to fifty cents in five-cent increments.

When the merchandise has been dispensed and change has been made by appropriate mechanism in the manner described, a cam **278** on shaft **366** of motor **360** actuates reset switch arm **274** to engage its contact **270** to complete the circuit of reset coil **268** to reset arm **90** for the succeeding dispensing operation through appropriate mechanism (not shown, since it is well known in the art). The circuit to coil **268** may be traced from line **54** through conductor **276**, arm **274**, contact **270**, line **272**, and through the coil **268** to line **56**. It is to be noted that the reset coil is also energized through the medium of the connection **280** when the coin return switch **70** is operated. The machine is ready for the succeeding dispensing operation after switch **92** has been reset.

Thus it will be seen that we have accomplished the objects of our invention. We have provided an improved control circuit for merchandising machines which may be used with a machine having a plurality of dispensing level assemblies or columns containing various kinds of merchandise to be sold at different prices. Our control circuit is extremely flexible in application, since it may be employed in a machine adapted to sell merchandise, with any combination of coins, at prices ranging from five cents to fifty cents. Moreover, our control circuit is capable of giving change up to an amount of four nickels. It is simple in construction, certain in operation, and economical to manufacture. Our control circuit is not limited in use to a single kind of merchandise but may operate on a machine dispensing various kinds of merchandise. Moreover, our circuit may be adjusted to accommodate changes in price of the various kinds of merchandise so that the circuit need not be altered each time different priced merchandise is put in a particular column. Our column circuit is provided with means by which it may automatically be reset after each dispensing operation.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of our claims. It is further obvious that various changes may be made in details within the scope of our claims without departing from the spirit of our invention. It is therefore to be understood that our invention is not to be limited to the specific details shown and described.

Having thus described our invention, what we claim is:

1. A control circuit for a coin operated merchandising machine having a coin register and a number of dispensing magazines including in combination a source of electrical energy, a coin totalizer switch connected to said source of energy, a plurality of selecting means corresponding respectively to said magazines, a dispensing actuating means responsive to the operation of any one of said selecting means, a plurality of price selection switches connected in series between said coin totalizer switch and a respective one of said selecting means, means responsive to the deposit of at least a first predetermined sum in coins in said coin register for actuating said coin totalizer switch to energize a selected one of said selecting means, a single nickel change-making switch, change maker actuating means connected in series between said source of energy and said single nickel change-making switch, a plurality of single nickel change selection switches connected to said coin totalizer switch, a plurality of single nickel change conditioning switches each adapted to be acutated by a respective one of said selecting means and connected in series between said single nickel change-making switch and a respective one of said single nickel change selection switches, the arrangement being such that when at least a second predetermined sum in coins is deposited in the coin register the single nickel change-making switch is conditioned to operate, a holding relay connected to said source of energy, a plurality of extra nickel change conditioning switches connected to said relay and each adapted to be actuated by a respective one of said selecting means, a plurality of extra nickel change-making switches connected to said source of energy, a plurality of extra nickel change selection switches connected respectively in series between said extra nickel change-making switches and respective ones of said extra nickel change conditioning switches, the arrangement being such that said coin totalizer switch energizes said relay to condition a predetermined one of said extra nickel change-making switches when coins in excess of said second predetermined sum are deposited in the coin register, said change maker actuating means being connected in series between said extra nickel change-making switches and said source of energy and means operated by said dispensing actuating means for closing said single nickel and said extra nickel change-making switches.

2. A control circuit for a mechandising machine having a coin register including in combination a coin totalizer switch having a first and a second series of contacts comprising a pair of series of contacts corresponding respectively to coin deposits in five-cent increments up to a predetermined amount, means for connecting contacts of the first of said series which first series contacts correspond to deposits of respective certain amounts in five-cent increments respectively to contacts of the second series which second series contacts correspond to deposits of amounts which are five cents higher than said certain amounts, first switch means including a series of contacts corresponding respectively to the prices at which merchandise may be sold, said prices at which mechandise may be sold corresponding to coin deposits in five-cent increments up to a given amount, means for connecting contacts of said first switch means to corresponding contacts of said first series of contacts, second switch means including a series of contacts corresponding respectively to the prices at which merchandise may be sold, means for connecting the contacts of said second switch means to respective contacts of said first series corresponding to a price which is five cents higher than the price at which mechandise is to be sold, a coin totalizer switch contact arm adapted to be stepped to cross-connect a pair of contacts of said first and second series of contacts, means responsive to the deposit of coins in the register for stepping said contact arm, change-making means, a change-making circuit including said second switch means and a contact of said first series of

contacts for energizing said change-making means when said circuit is complete, a selecting circuit including said first switch means and said means for connecting the contacts of said first and second series and a contact of said second series, said selecting circuit adapted to be completed when said totalizer switch arm engages said selecting circuit contact, means responsive to the completion of said selecting circuit for completing said change-making circuit, said second switch means adapted to complete said change-making circuit when said coin totalizer switch arm is stepped to a position corresponding to a coin deposit which is greater than the price at which a selected article is sold.

3. A control circuit for a coin operated merchandising machine having a coin register including in combination a source of electrical energy, a coin totalizer switch having a plurality of contacts corresponding to deposits in the register of respective sums in coins in five-cent increments and movable contact means adapted to be stepped to engage said contacts, means connecting said movable contact means to said source, means responsive to the deposit of coins in the register for stepping said movable contact means, dispensing actuating means, selecting means adapted to be actuated to energize said dispensing actuating means, a price selection switch, means connecting said price selection switch to a contact of said coin totalizer switch corresponding to the price at which an article is to be sold and to a contact of the coin totalizer which is five cents higher than said price, means connecting said selecting means and said dispensing actuating means in series between said price selection switch and said source to cause a series circuit to be complete across said source through said coin totalizer switch and said price selection switch and said dispensing actuating means and said selecting means upon actuation of sad selecting means when a sum in coins aggregating the purchase price is deposited in the register and when a sum aggregating five cents greater than the purchase price is deposited in the register, a single nickel change-conditioning switch adapted to be operated by said selecting means, a single nickel change-making switch connected to said source of energy, a single nickel change-selection switch, means connecting said single nickel change-conditioning switch and said single nickel change-making switch in series with said single nickel change-selection switch, means connecting said single nickel change-selection switch to said means connecting said price selection switch to said coin totalizer switch contacts, the arrangement being such that upon the deposit in the register of said sum aggregating five cents greater than the purchase price and upon energization of said selecting means said single nickel change-making switch is conditioned to operate, a relay connected in series between the coin totalizer switch and said source of energy and adapted to be energized through said totalizer switch upon the deposit of a given sum in coins in the register, a plurality of extra nickel change-making switches, an extra nickel change-conditioning switch operated by said selecting means, an extra nickel change-selection switch, means connecting said extra nickel change-selection switch and said extra nickel change-conditioning switch in series between said extra nickel change-making switches and said relay, means including said price selection switch and said relay for conditioning said selecting means to operate when the difference between the sum deposited and the purchase price is greater than a single nickel, means operated by said dispensing actuating means for closing said single nickel and said extra nickel change-making switches and change dispenser actuating means connected in series between said source of energy and said single nickel and extra nickel change-making switches.

4. A control circuit as in claim 3 in which said relay is a first relay and in which said control circuit includes a change protection relay adapted to be energized to render said first relay inoperative, means including said totalizer switch for energizing said change protection relay when a sum in coins in excess of said given sum is deposited in said coin register, a second relay connected in series between said coin totalizer switch and said source of energy and adapted to be energized upon the deposit of a second given sum in coins in the coin register, means including said price selection switch and said second relay for conditioning said selecting means to operate when the difference between the sum deposited and the purchase price is greater than a single nickel, and means connecting said extra nickel change-conditioning switch and said extra nickel change-selection switch between said second relay and said change-making switches to cause one of said extra nickel change-conditioning switches to be connected in a circuit with said change dispenser actuating means when a sum in excess of said second given sum is deposited in the register and the difference between said last named sum and the purchase price is greater than a single nickel.

5. A control circuit for a coin operated merchandising machine having a coin register including in combination a source of electrical energy, a coin totalizer switch having a plurality of contacts corresponding to deposits in the register of respective sums in coins in five-cent increments and movable contact means adapted to be stepped to engage said contacts, means connecting said movable contact means to said source, means responsive to the deposit of coins in the register for stepping said movable contact means, dispensing actuating means, selecting means adapted to be actuated to energize said dispensing actuating means, a price selection switch, means connecting said price selection switch, means connecting said price selection switch to a contact of said coin totalizer switch corresponding to the price at which an article is to be sold and to a contact of the coin totalizer which is five cents higher than said price, means connecting said selecting means and said dispensing actuating means in series between said price selection switch and said source to cause a series circuit to be complete across said source through said coin totalizer switch and said price selection switch and said dispensing actuating means and said selecting means upon actuation of said selecting means when a sum in coins aggregating the purchase price is deposited in the register and when a sum aggregating five cents greater than the purchase price is deposited in the register, a single nickel change-conditioning switch adapted to be operated by said selecting means, a single nickel change-making switch connected to said source of energy, a single nickel change-selection switch, means connecting said single nickel change-conditioning switch and said single nickel change-making switch in series with said nickel change-selection switch, means connecting said single nickel change-selection switch to said means connecting said price selection switch to said coin totalizer switch contacts, the arrangement being such that upon the deposit in the register of said sum aggregating five cents greater than the purchase price and upon energization of said selecting means said single nickle change-making switch is conditioned to operate, a plurality of extra nickel change-making switches, an extra nickel change-selecting switch connected in series between said extra nickel change-conditioning switch and said extra nickel change-making switches, means responsive to the position of said coin totalizer switch for conditioning one of said extra nickel change-making switches when more than a single nickel in change is to be given, nickel dispenser actuating means connected in series between said single nickel and said extra nickel change-making switches and said source of energy and means operable by said dispensing actuating means to sequentially operate said single nickel and said extra nickel change-making switches whereby said nickel dispensing means is energized when the single nickel and extra nickel change-making switches which have been conditioned are operated by said change-making switch actuating means.

6. A control circuit as in claim 5 wherein said price selection switch, said single nickel change selection switch and said extra nickel change selection switch each includes a group of contacts, the contacts of each group corresponding to the various prices at which merchandise is to be sold and brushes associated with the respective switches and adapted to be moved to engage a contact of their respective groups corresponding to the price at which merchandise is to be sold.

7. A control circuit for a coin operated mechandising machine having a coin register and a number of magazines including in combination a source of electrical energy, a coin totalizer switch having a plurality of contacts corresponding to deposits in the register of respective sums in coins in five-cent increments and movable contact means adapted to be stepped to engage said contacts, means connecting said movable contact means to said source, means responsive to the deposit of coins in the register for stepping said movable contact means, dispensing actuating means associated with said magazines, a plurality of selecting means corresponding to the respective magazines and each adapted to be actuated to energize its associated dispensing actuating means, a plurality of price selection switches, means connecting each price selection switch to a contact of said coin totalizer switch corresponding to the price at which the article in the magazine with which the price selection switch is associated is to be sold and to a contact of the coin totalizer switch which is five cents higher than said price, means connecting each of said selecting means and its associated dispensing actuating means in series between the corresponding price selection switch and said source through said coin totalizer switch and said price selection switch and said dispensing actuating means and said selecting means upon actuation of said selecting means when a sum in coins aggregating the purchase price of an article in the particular magazine is deposited in the register and when a sum aggregating five cents greater than the purchase price of an article in the particular magazine is deposited in the register, a plurality of single nickel change-conditioning switches adapted to be operated by the respective selecting means, a single nickel change-making switch connected to said source of energy, a plurality of single nickel change-selection switches, means connecting the single nickel change-conditioning switch associated with a particular selecting means and said single nickel change-making switch in series with the corresponding single nickel change-selecting switch, means connecting the single nickel change-selecting switch associated with a particular selecting means to the means connecting the corresponding price selection switch, the arrangement being such that upon the deposit in the register of a sum aggregating five cents greater than the purchase price of an article carried in a particular magazine and upon the energization of the associated selecting means the corresponding single nickel change-making switch is conditioned to operate, a first relay connected in series between the coin totalizer switch and said source of energy and adapted to be energized through said totalizer switch upon the deposit of a given sum in coins in the register, a plurality of extra nickel change-making switches, a plurality of extra nickel change-conditioning switches operated by the respective selecting means, a plurality of extra nickel change-selection switches, means connecting the extra nickel change selection switch associated with a particular selecting means and the corresponding extra nickel change-conditioning switch in series between said extra nickel change-making switches and said relay, means including the price selection switch corresponding to a particular selecting means and said relay for conditioning the particular selecting means to operate when the difference between the sum deposited and the purchase price of the article corresponding to the particular selecting means is greater than a single nickel, means operated by said dispensing actuating means for closing said single nickel and said extra nickel change-making switches and change dispenser actuating means connected in series between said source of energy and said single nickel and extra nickel change-making switches.

8. A control circuit for coin operated merchandising machines as in claim 7 including means for rendering said first relay inoperative, means including said coin totalizer switch for energizing said means for rendering the first relay inoperative upon the deposit in the register of a sum in coins exceeding said given sum and a second relay connected between said extra nickel change conditioning switches and said source, said second relay being adapted to be energized upon the deposit of a second given sum in coins in the coin register, said second relay being connected between said coin totalizer switch and said source.

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