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COIN CONTROLLED DISPENSING MACHINE

Filed March 22, 1947

3 Sheets-Sheet 1

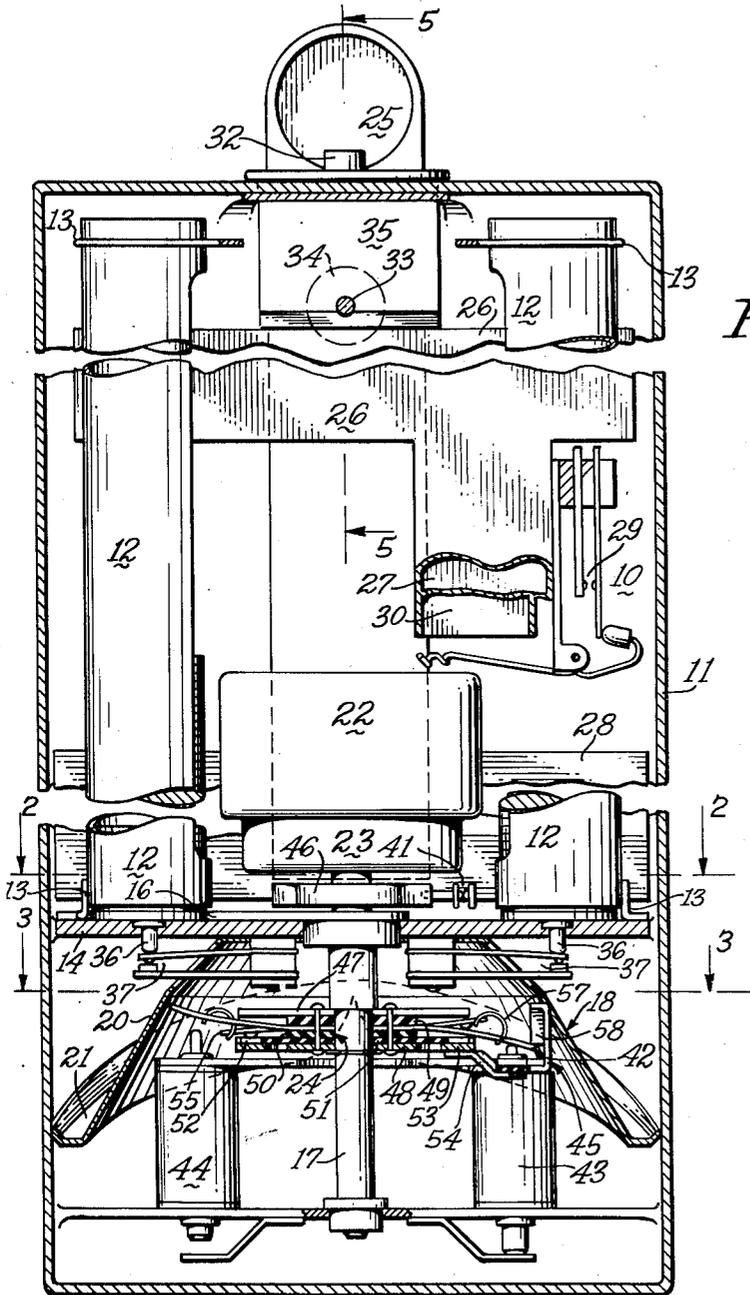


Fig. 1

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3 Sheets-Sheet 2

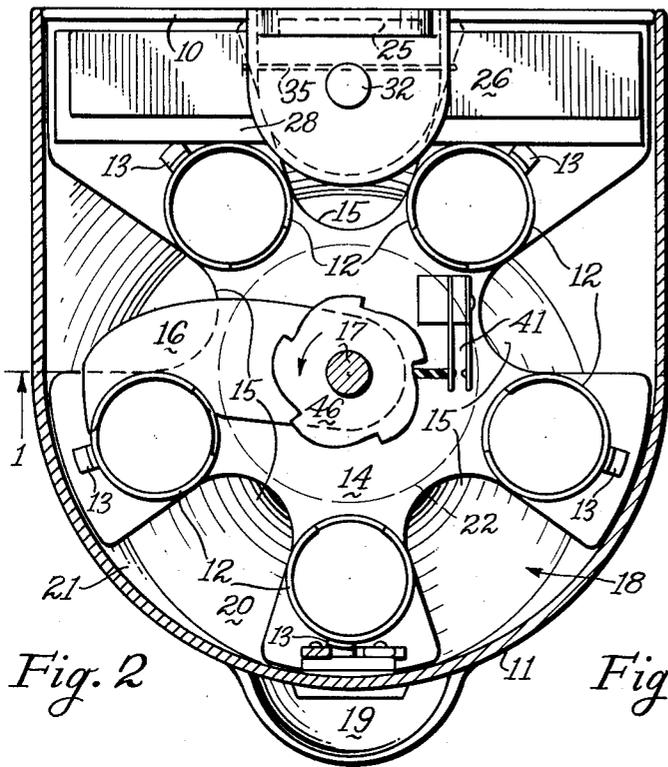


Fig. 2

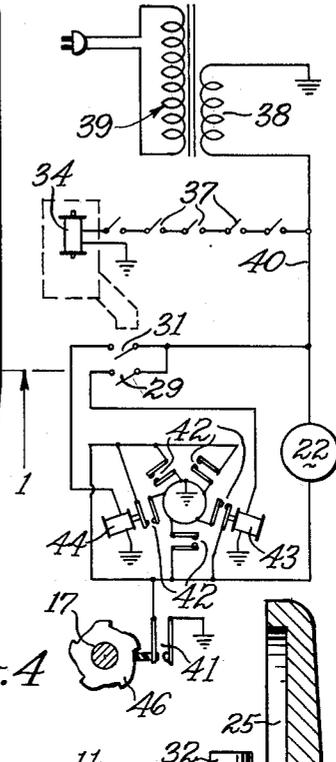


Fig. 4

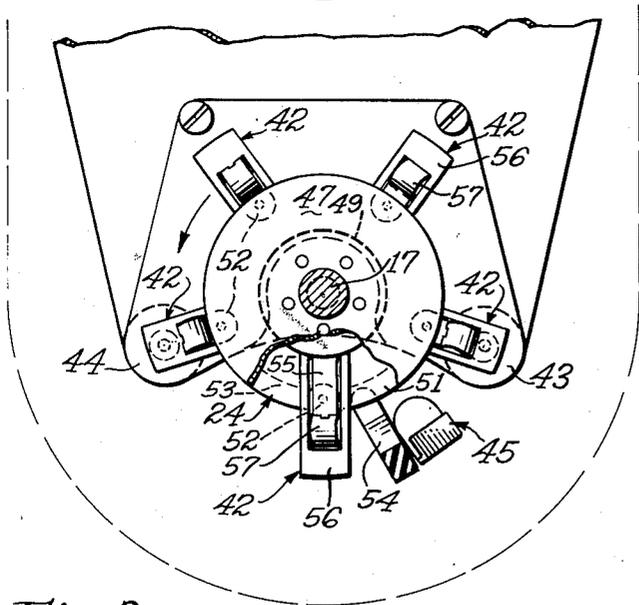


Fig. 3

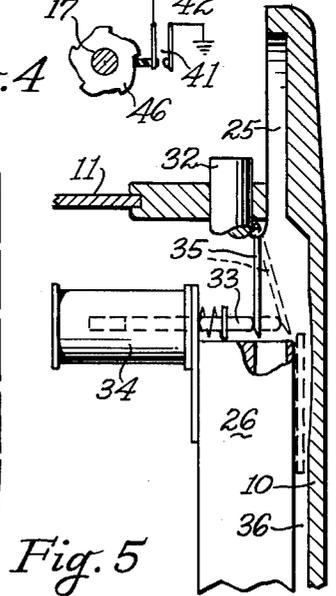


Fig. 5

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# UNITED STATES PATENT OFFICE

2,621,771

## COIN CONTROLLED DISPENSING MACHINE

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Application March 22, 1947, Serial No. 736,501

13 Claims. (Cl. 194—10)

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This invention relates to a coin controlled dispensing machine which is adapted to be put into operation by the insertion of a coin to dispense a corresponding number of articles. The machine may be constructed to accept coins of a plurality of denominations and to dispense a number of articles depending upon the value of the coin inserted.

The invention may readily be applied to change making machines which are a form of coin actuated dispensing machines which dispense a plurality of smaller coins corresponding in value to a larger coin inserted. The invention is, however, applicable to all kinds of coin controlled dispensing machines.

The principal object of the present invention is to provide an improved coin controlled dispensing machine.

In one embodiment of the present invention I provide a motor driven means for dispensing articles, and a switch assembly. This assembly carries a plurality of motor controlling snap switches and is driven by the motor in synchronism with the dispensing mechanism. I provide stationary means for opening the switches of the switch assembly and I provide means controlled by the insertion of a coin for closing one of the switches. The switch closed by the insertion of a particular coin is displaced from the switch opening means by a distance corresponding to the value of the coin which controls it so that the appropriate number of articles is dispensed before the motor is stopped as a result of the opening of the switch by the switch opening means.

In another embodiment of my invention, I provide a motor driven means for dispensing and an assembly carrying a series of members which can be snapped from one position to another. I provide a relay which is energized when a coin is inserted and at the same time, one of the snap members is snapped out of normal position. The relay controls the motor switch and a switch which completes a holding circuit for the relay. The assembly is driven by the motor in synchronism with the dispensing mechanism. The holding circuit includes a normally closed switch which is out of the path of an undisplaced member and is opened by a displaced member. Means associated with this switch snaps the displaced member back to normal position. I provide a member displacing means for each coin denomination. These displacing means are located from the normally closed switch by a distance correspond-

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ing to the number of articles to be dispensed in exchange for the coins inserted.

In both cases, I prefer to provide a carry-over switch for the motor so that the motor stops leaving snap members or switches in alignment with the displacing means.

I describe and illustrate machines which are intended to accept a quarter or a dime and dispense five or two nickels, respectively. It must be understood, however, that the invention is not intended to be limited to these particular coins since the machine may readily be designed to accept any number of coins and to provide change in smaller coins in appropriate amounts.

The invention will readily be understood from the following description of this preferred embodiment taken in conjunction with the accompanying drawings in which:

Figure 1 is a sectional elevation through a change maker embodying my invention, the section being taken on the line 1—1 of Fig. 2;

Fig. 2 is a sectional plan view, the section being taken on the line 2—2 of Figure 1;

Fig. 3 is a sectional plan view showing the switch assembly, the section being taken on the line 3—3 of Fig. 1;

Fig. 4 is a wiring diagram;

Fig. 5 is a sectional detail view taken on the line 5—5 of Figure 1; and

Fig. 6 is a diagrammatic view and wiring diagram of another embodiment of my invention.

Referring to the drawings, the improved change maker comprises a base 10, whereby it may be mounted on a wall or other suitable support, and a cover 11 which is removable and may be secured to the base by suitable locks (not shown). The coins to be discharged, in the embodiment shown, nickels, are stacked in tubes 12, of which five are shown. The tubes are supported by suitable brackets 13, mounted on the base 10, so that their lower ends are spaced above a shelf 14 by a distance slightly greater than the thickness of a nickel. Between the tubes 12, the shelf 14 is provided with cutouts 15. An arm 16 is carried by a shaft 17 and is located so as to ride on the shelf 14 below the tubes 12. It will readily be understood from Fig. 2 that as the arm 16 is rotated by the shaft 17, a nickel is transferred from below each tube it passes and is caused to drop through the cutout 15.

Below the shelf 14 is provided a discharged coin receiver 18 which carries the coins downwardly into a cup 19 which projects forwardly

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through the cover 11 so that the user may pick up his change. The coin receiver 18 is preferably of hat shape having a central dome 20 and an upturned rim 21. The preferred arrangement is that the discharged coins hit the dome and slide down into edge engagement with the rim 21. They roll down the rim, leaning against the dome into the cup 19, the rim being sloped downwardly from back to front.

The shaft 17 is driven by a motor 22 through a suitable gear reduction 23. Also driven by the motor in synchronism with the shaft 17 is a switch assembly 24. In the preferred form of the invention the switch assembly 24 is carried by the shaft 17.

At the upper end of the base 10 is provided a coin chute 25 into which the user inserts the coin for which he desires change. The inserted coin drops into a slug rejector 26. An accepted quarter drops through a chute 27 into a cash box 28, momentarily closing a switch 29. An accepted dime drops through a chute 30 into the cash box, momentarily closing a similar switch 31. A rejected slug drops to the coin receiver 18 into the cup 19. A scavenger button 32 may be actuated in known manner to discharge a slug of magnetic material.

A spring pressed armature 33 of a solenoid 34 tends to move a gate 35 into the path of an incoming coin as shown in dotted lines in Fig. 5 diverting the coin into a chute 36 which leads to the diverted coin receiver 18 and into the cup 19. When the solenoid 34 is energized, the armature 33 and gate 35 move into the full line position in Fig. 5 so that the inserted coin drops into the slug rejector 26.

Beneath each tube 12, I provide in the shelf a button 36 of insulating material which engages a leaf switch 37. When one or more coins is in a tube 12, its button 36 is depressed and its switch 37 is closed. When the last coin is dispensed from a tube 12 its switch 37 opens.

The machine is energized by the secondary 39 of a transformer 39. One side of the secondary is grounded. The hot line 40 is connected through the switches 37, which are in series, to the solenoid 34. The other side of the solenoid is grounded. It will thus be seen that when any tube lacks a coin or when the power fails, the solenoid 34 is de-energized and the gate 35 moves into coin returning position.

The hot line 40 is connected to one side of the motor 22, the other side of which is connected to one side of a carry-over switch 41 and one side of five snap switches 42 carried by the switch assembly 24. The other sides of the switches 41 and 42 are grounded.

It will thus be seen that the motor 22 operates as long as any of the switches 41 or 42 is closed.

The snap switches 42 are arranged to be closed by the solenoids 43 and 44, and are adapted to be opened by the cam member 45. The carry-over switch 41 is actuated by a cam wheel 46 carried by the shaft 17. This wheel has the same number of cams as there are tubes 12. The motor 22 is stopped by the opening of the carry-over switch 41 leaving the arm 16 in its position of Fig. 2. When the arm is moved by the motor to discharge a coin, the carry-over switch 41 is closed and before a second coin is dispensed, the carry-over switch opens as shown in Fig. 2.

The dime switch 31 is connected to the hot line 40 and to one side of the solenoid 44, the other side of which is grounded. The quarter switch 29 is connected to the hot line 40 and to one

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side of the solenoid 43, the other side of which is grounded. When the machine stops in its normal condition, as shown in Fig. 2, two of the switches 42 register with the solenoids 43 and 44 as shown in Fig. 3. When a dime is accepted it closes a switch 31 energizing the solenoid 44. The armature of this solenoid moves upwardly actuating the registering switch 42. The motor 22 is put into operation so that the arm 16 is driven dispensing coins from the tubes 12. The closed switch 42 is carried around in the counterclockwise direction as viewed in Fig. 3 in synchronism with the arm 16. During or after the dispensing of the second nickel and before the arm 16 engages a third nickel, the closed switch 42 is engaged by the switch opening cam member 45 so that all the switches 42 are opened. At this time the carry-over switch 41 is closed and the motor 22 continues to operate until the switch 41 is opened stopping the machine with two of the switches 42 aligned with the solenoids 43 and 44 and leaving the arm 16 in a position displaced 144° in the counterclockwise direction from its position in Fig. 2.

When a quarter is accepted, it closes the switch 29 energizing the solenoid 43 so that the switch 42 registering with this solenoid is closed and the machine dispenses five nickels, the solenoid 43 being displaced from the switch opening cam 45 by somewhat more than four times the spacing of the switches 42, in the direction of movement of the switch assembly 24. In the embodiment illustrated, where five tubes are provided, actuation of the machine by the acceptance of a quarter brings the arm 16 into its initial position.

It must be understood that any number of tubes 12 may be provided and likewise any number of switches 42. There must be as many switches 42 as the highest number of coins which are to be dispensed. The switch assembly must move one spacing of the switches 42 for each coin dispensing operation and the switch closing solenoid must be located relative to the switch opening member 45 so that the correct number of coins are dispensed. Furthermore, the invention is not limited to two coins since the machine may readily be adapted to accept any number of coins, duplicating the coins switches and the switch closing solenoids actuated thereby.

The switches 42 may be any desired type of snap switches. I prefer, however, to employ the switch assembly 24 which is illustrated. This switch assembly comprises upper and lower plates 47 and 48 and three discs 49, 50 and 51 of insulating material, all the elements 47 to 51 being secured together by rivets. The assembly is provided with an opening whereby it is mounted rigidly on the shaft 17. The lower disc 51 carries the contacts 52 of the switches 42, these contacts being connected to a slip ring 53 which is engaged by a brush 54 connected to the motor 22 and the ungrounded side of the switch 41. The movable poles of the switches 42 are provided by leaf arms 55 which are anchored between the members 49 and 50 so as to project radially therefrom. The leaves 55 are grounded to the shaft 17. The members 49 and 50 also serve to support a spider which includes projecting arms 56 in alignment with the switch leaves 55. Each arm 56 is provided with a slot to provide room for the switch leaves 55. Each switch leaf 55 is connected to its arm 56 by means of a horseshoe spring 57. The arrangement is such

that when an arm 56 is in its normal position the spring 57 holds the leaf 55 upwardly away from its contact 52 as shown on the right hand side of Figure 1. When one of the solenoids, for example 44, is energized, its armature moves upwardly displacing the registering arm 56 upwardly so that it snaps into the position shown on the left hand side of Figure 1, the switch leaf 55 being snapped downwardly into engagement with its contact 52. The switch opening member 45 provides a sloping surface 58 which engages the upwardly deflected arm 56 so that this arm is moved downwardly with the result that the arms 55 and 56 snap into the position shown on the right hand of Fig. 1 opening the switch.

In the embodiment of the invention illustrated diagrammatically in Fig. 6, the assembly 24' merely provides displaceable members which may be the arms 56 of the previously described embodiment, although they may be any other kind of arm which is snapped from one position to the other by the solenoids 43 and 44 and are returned to their initial position by the cam member 45. The switches 42 of the previously described embodiment are replaced by a normally open switch 42' which, together with a normally open switch 60, are arranged to be closed by a relay 61. One side of the relay 61 is connected to the power line 40. Its other side is connected to one side of the switches 31, 29 and 60. The other sides of the coin switches 31 and 29 are connected to the ungrounded sides of the solenoids 44 and 43. The other side of the switch 60 is connected to the ungrounded side of a normally closed switch 62. The switch 62 is located immediately ahead of the cam member 45 and is out of the path of undisplaced members 56. The switch 62 is in the path of a displaced member 56, and is arranged so that it is opened by a displaced member 56 immediately before that displaced member is returned to normal position by the cam member 45. The power line 40 is connected to one side of the motor 22, the other side of the motor being connected to the ungrounded side of the switch 42' and the ungrounded side of the carryover switch 41.

When a quarter is inserted the switch 29 is closed energizing the relay 61. The relay 61 is held in energized condition by the holding circuit, line 40, relay 61, closed switch 60, resistor 63 and closed switch 62. The motor 22 is put into operation by the closing of the switch 42' and five coins are dispensed. During the dispensing of the fifth coin the switch 62 is opened by the displaced member 56 and relay 61 is deenergized opening the switches 42' and 60. The displaced member 56 is returned to its initial position by the cam member 45. When the switch 62 is opened, the carryover switch 41 is maintained closed by the cam wheel 46 so that the motor 22 continues to operate to complete the dispensing of the fifth coin and to bring the arms 56 into their normal position.

When a dime is inserted the switch 31 is closed, energizing the solenoid 44 so that the motor 22 is put into operation to dispense two coins.

The coin control, herein described, is described and claimed in my co-pending application Serial No. 736,446, filed of even date herewith, without relation to a dispensing machine.

Although the invention has been described in connection with the specific details of a preferred embodiment thereof, it must be understood that such details are not intended to be

limitative of the invention except in so far as set forth in the accompanying claims.

Having thus described my invention I declare that what I claim is:

1. A coin controlled dispensing machine comprising a mechanism for dispensing articles, electromagnetic means for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said electromagnetic means, a series of displaceable members on said assembly, switch means controlling said electromagnetic means, means at a definite position arranged to be engaged by a displaced member to expect the opening of said switch means, a plurality of means, each arranged to displace a corresponding displaceable member, a plurality of coin actuated means, each arranged to control the actuation of the corresponding displacing means and the closing of said switch means, said displacing means being displaced from said definite position by distances which ensure the dispensation of a definite number of articles for each displacing means.

2. A coin controlled dispensing machine comprising a mechanism for dispensing articles, electromagnetic means for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said electromagnetic means, a series of displaceable members on said assembly, switch means controlling said electromagnetic means, means at a definite position arranged to be engaged by a displaced member to effect the opening of said switch means, means for returning said displaced member to normal position, a plurality of means, each arranged to displace a corresponding displaceable member, a plurality of coin actuated means, each arranged to control the actuation of the corresponding displacing means and the closing of said switch means, said displacing means being displaced from said definite position by distances which ensure the dispensation of a definite number of articles for each displacing means.

3. A coin controlled dispensing machine comprising a mechanism for dispensing articles, a motor for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said motor, a series of displaceable members on said assembly, switch means controlling said motor, means at a definite position arranged to be engaged by a displaced member to effect the opening of said switch means, a plurality of electromagnetic means, each arranged to displace a corresponding displaceable member, a plurality of coin actuated means, each arranged to control the energization of the corresponding electromagnetic means and the closing of said switch means, said electromagnetic means being displaced from said definite position by various distances which ensure the dispensation of a definite number of articles for each electromagnetic means and its coin actuated means.

4. A coin controlled dispensing machine comprising a mechanism for dispensing articles, a motor for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said motor, a series of displaceable members on said assembly, switch means controlling said motor, means at a definite position arranged to be engaged by a displaced member to effect the opening of said switch means, means for returning said displaced member to normal position, a plurality of electromagnetic means, each arranged to displace a corresponding displaceable member, a plurality of coin actuated means,

each arranged to control the energization of the corresponding electromagnetic means and the closing of said switch means, said electromagnetic means being displaced from said definite position by various distances which ensure the dispensation of a definite number of articles for each electromagnetic means and its coin actuated means.

5. A coin controlled dispensing machine comprising a mechanism for dispensing articles, electromagnetic means for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said electromagnetic means, a series of snap switches on said assembly, each controlling the operation of the electromagnetic means, a plurality of coin controlled means for actuating said snap switches, and means for opening said switches, said switch actuating means being located at a plurality of distances from said switch opening means, whereby a definite number of dispensing operations is initiated by actuating any of said switch actuating means.

6. A coin controlled dispensing machine comprising a mechanism for dispensing articles, electromagnetic means for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said electromagnetic means, a series of snap switches on said assembly, each controlling the operation of the electromagnetic means, a plurality of coin controlled means for actuating said snap switches, means for opening said switches, said switch actuating means being located at a plurality of distances from said switch opening means, whereby a definite number of dispensing operations is initiated by actuating any of said switch actuating means, and a limit switch in the motor circuit, controlled by said motor and arranged to open to stop the motor after a snap switch is opened to locate a snap switch in register with each switch actuating means.

7. A coin controlled dispensing machine comprising a mechanism for dispensing articles, a motor for actuating said mechanism to dispense articles repeatedly, a rotatable assembly, a series of evenly spaced snap switches on said assembly, each controlling the operation of the motor, means operatively connecting said assembly to the motor whereby the assembly is driven one switch spacing for each dispensing operation, a plurality of coin controlled means, each arranged to actuate one of said switches, means for opening said switches, each of said actuating means being displaced from the switch opening means by an individual distance to effect a definite number of dispensing operations for each actuation of said switch actuating means.

8. A coin controlled dispensing machine comprising a mechanism for dispensing articles, electromagnetic means for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said electromagnetic means, a series of displaceable members on said assembly, electromagnetic means for displacing one of said members from its normal position, a relay for closing the circuit of the first mentioned electromagnetic means, coin controlled means for energizing said relay and energizing the second mentioned electromagnetic means, and a switch actuable by a displaced member for de-energizing said relay, said switch being displaced from the second mentioned electromagnetic means by a distance which ensures a definite number of dispensing operations.

9. A coin controlled dispensing machine comprising a mechanism for dispensing articles, electromagnetic means for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said electromagnetic means, a series of displaceable members on said assembly, a plurality of electromagnetic means, each arranged to displace one of said members from its normal position, a relay for closing the circuit of the first mentioned electromagnetic means, a plurality of coin controlled means for energizing said relay and energizing one of the plurality of electromagnetic means, and a switch actuable by a displaced member for de-energizing said relay, said switch being displaced from each of the second mentioned electromagnetic means by distances which ensure a definite number of dispensing operations for each of the second mentioned electromagnetic means.

10. A coin controlled dispensing machine comprising a mechanism for dispensing articles, a motor for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said motor, a series of displaceable members on said assembly, electromagnetic means for displacing one of said members from its normal position, a relay for closing the circuit of the motor, coin controlled means for energizing said relay and energizing the electromagnetic means, a switch actuable by a displaced member for de-energizing said relay, said switch being displaced from the electromagnetic means by a distance which ensures a definite number of dispensing operations, means for returning the displaced member to normal position, and a limit switch in the motor circuit controlled by said motor and arranged to open to stop said motor after said relay has been deenergized, to locate a displaceable member in register with the electromagnetic means.

11. A coin controlled dispensing machine comprising a mechanism for dispensing articles, a motor for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said electromagnetic means, a series of displaceable members on said assembly, a plurality of electromagnetic means, each arranged to displace one of said members from its normal position, a relay for closing the circuit of the motor, a plurality of coin controlled means, each arranged to energize said relay and energize one of said electromagnetic means, a switch actuable by a displaced member for de-energizing said relay, said switch being displaced from each of the electromagnetic means by a distance which ensures a definite number of dispensing operations for each of the electromagnetic means, means for returning the displaced member to normal position, and a limit switch in the motor circuit controlled by said motor and arranged to open to stop said motor after said relay has been deenergized to locate a displaceable member in register with each electromagnetic means.

12. A coin controlled dispensing machine comprising a mechanism for dispensing articles, a motor for actuating said mechanism to dispense articles repeatedly, a rotatable assembly driven by said motor, a series of evenly spaced displaceable members on said assembly, electromagnetic means for displacing one of said members from its normal position, a relay having a pair of normally open switches, one of said switches being in the motor circuit, coin controlled means for energizing said electromagnetic means and said relay, and a normally closed switch arranged

to be opened by a displaced member, said normally closed switch cooperating with the other relay switch to establish a holding circuit for said relay, said normally closed switch being displaced from the electromagnetic means by a distance which ensures a definite number of dispensing operations.

13. A coin controlled dispensing machine comprising a mechanism for dispensing articles, a motor for actuating said mechanism to dispense articles repeatedly, a rotatable assembly carrying a series of evenly spaced displaceable members, means operatively connecting said motor to said assembly whereby the assembly is driven one member spacing for each dispensing operation, a plurality of electromagnetic means, each arranged to displace one of said members from its normal position, a relay having a pair of normally open switches, one of said switches being in the motor circuit, a plurality of coin controlled means, each arranged to energize said relay and one of said electromagnetic means, a normally closed switch arranged to be opened by a displaced member, means for returning the displaced member to its normal position, said normally closed switch cooperating with the other

relay switch to establish a holding circuit for said relay, said normally closed switch being displaced from each of the electromagnetic means by a distance which ensures a definite number of dispensing operations for each electromagnetic means, and a limit switch in the motor circuit controlled by said motor and arranged to open to stop the motor after the relay is de-energized to locate displaceable members in register with each electromagnetic means.

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