

United States Patent

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 3,430,746 3/1969 Bolen 194/63

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[54] **MERCHANDISE-VENDING MACHINE**
2 Claims, 9 Drawing Figs.

[52] U.S. Cl. 194/2,
 194/63
 [51] Int. Cl. G07f 11/00
 [50] Field of Search 194/1, .04,
 63, 93, 2

[56] **References Cited**

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ABSTRACT: A bulk merchandise-vending machine with a base supporting a merchandise storage member, a mechanism plate positioned to form a closure member for at least a part of the base and removable therefrom by a pivotal movement without removing the storage member, a slug rejector mechanism on the base for distinguishing between coins and slugs, a coin wheel on the base and rotatable to operate a merchandise-dispensing mechanism when a coin is deposited in the machine and passes through the slug rejector mechanism, a slug chute on the plate for carrying slugs from the slug rejector mechanism out of the merchandise-vending machine, a latch to prevent rotation of the coin wheel when a coin has not been deposited in the coin wheel, and means defining a compartment for housing the latch to prevent access thereto via the slug chute.

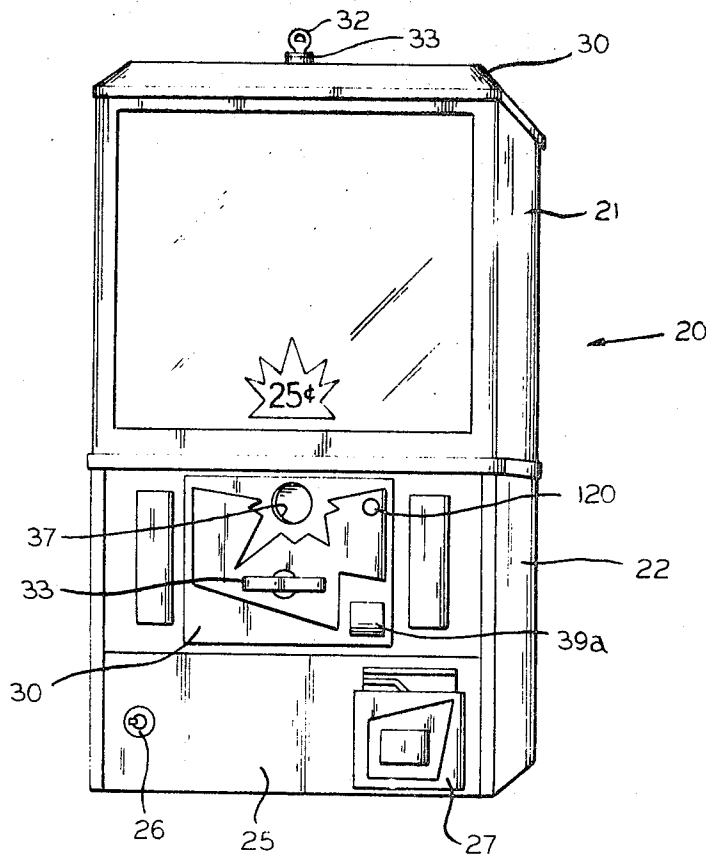


FIG. 1

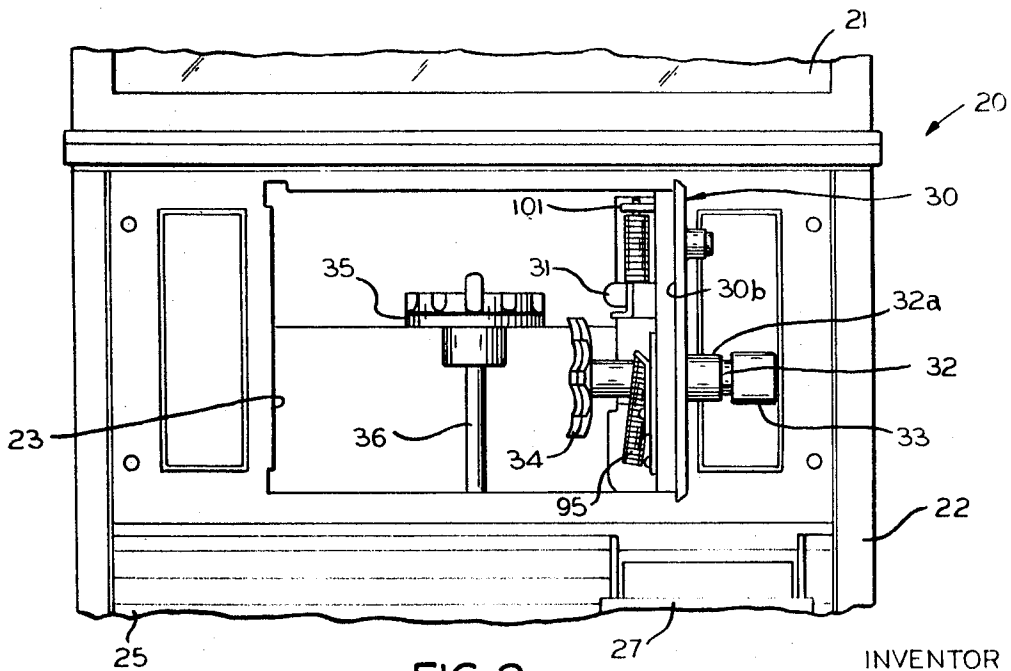
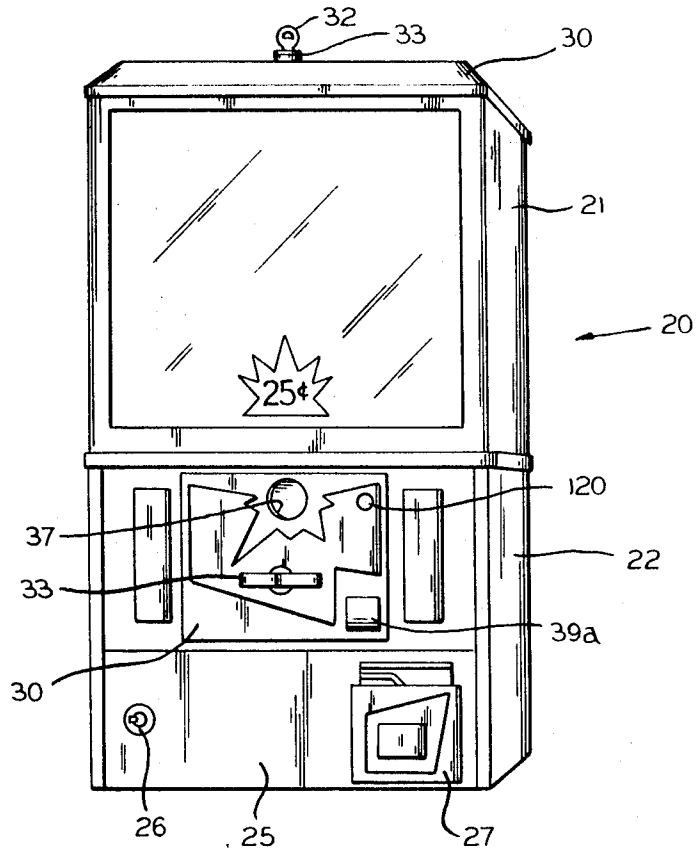


FIG. 2

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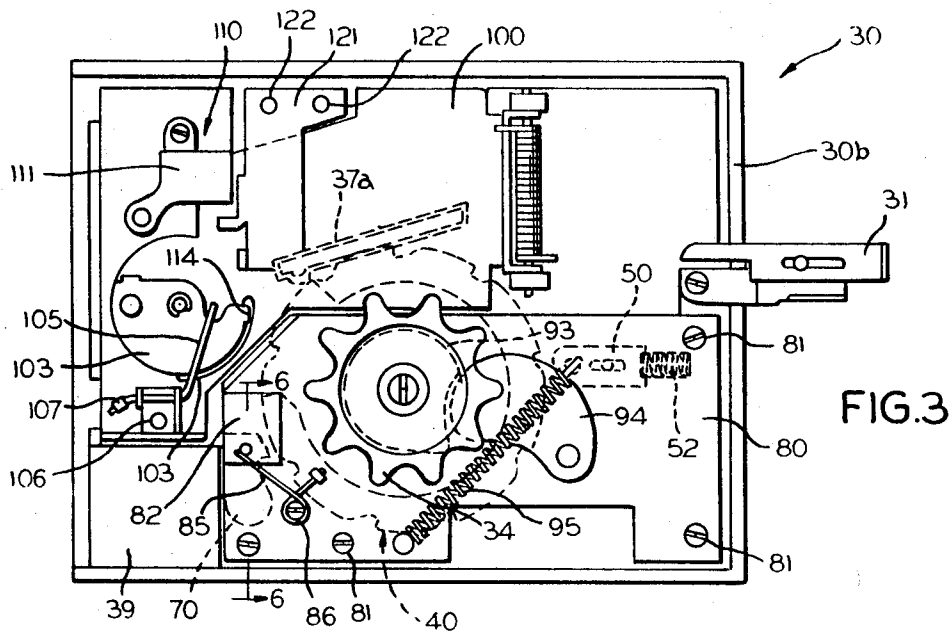


FIG. 3

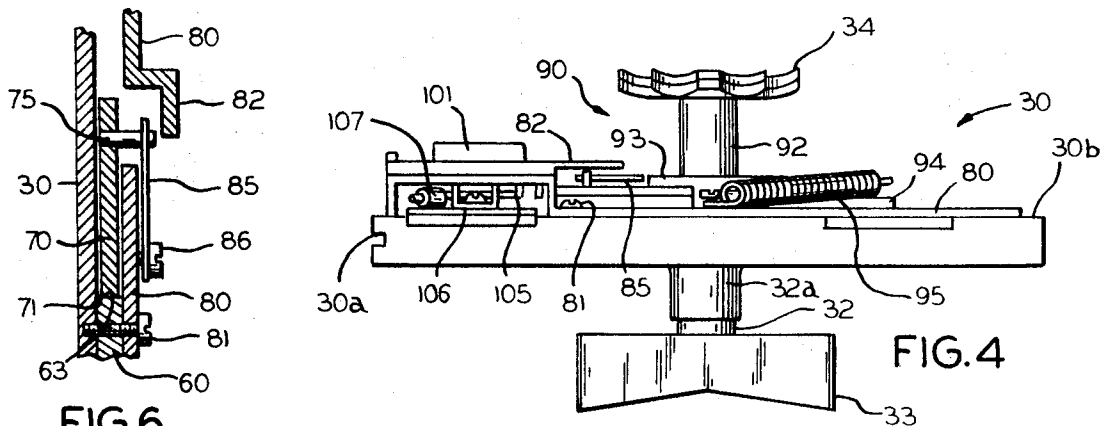


FIG. 4

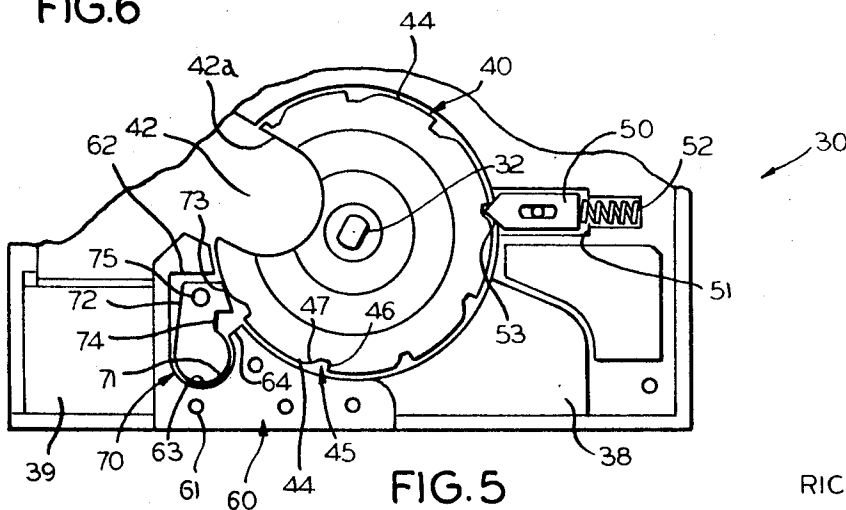


FIG. 5

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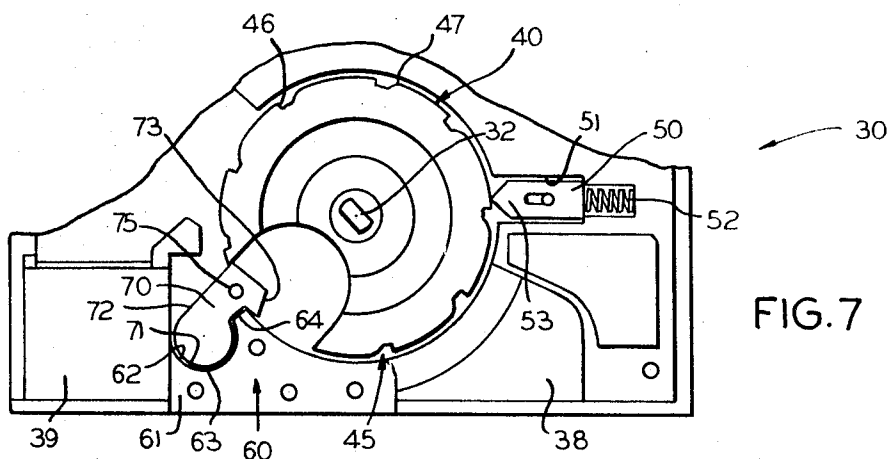


FIG. 7

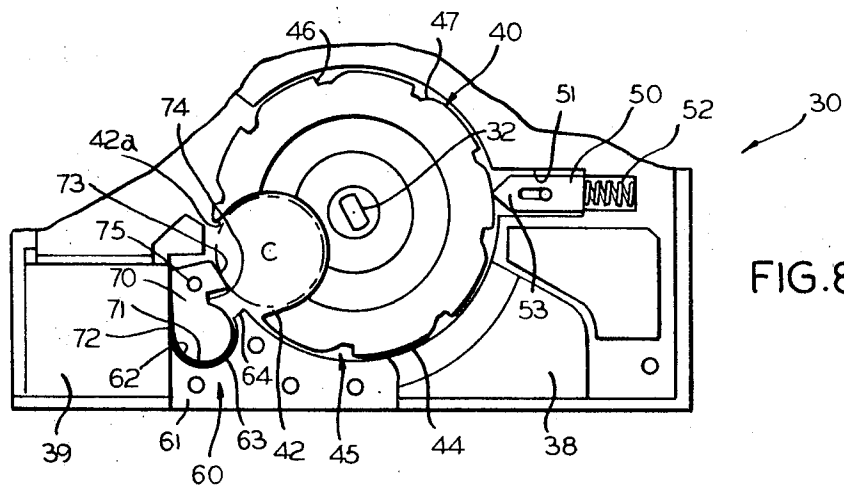


FIG. 8

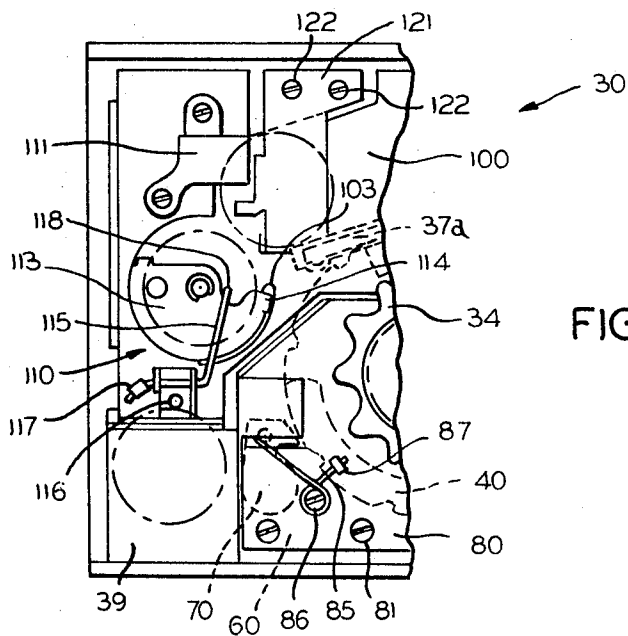


FIG. 9

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MERCHANDISE-VENDING MACHINE

BACKGROUND OF THE INVENTION

This invention relates to improvements in merchandise-vending machines in which the cash box is mounted in the base of the machine and a plate carrying a rotary coin mechanism and a slug rejector mechanism is removably positioned to close a portion of the base. More particularly, the machine described and claimed herein is a specific improvement over that disclosed in U.S. Pat. No. 3,430,746 issued to the inventor of the instant improvement, assigned to the same assignee, and entitled "Merchandise Vending Machine with Combination Rotary Coin Mechanism and Slug Rejector."

One of the basic objectives of the machine described in said patent was to prevent dispensing of merchandise from the machine when a slug had been deposited therein. This had become particularly important since so many new machines accommodated coins of greater denominations than those heretofore used, in which case there was a greater inducement to use slugs. The patent, therefore, disclosed a machine having a plate forming a closure member for the base that supported the merchandise storage member, the plate carrying a slug rejector mechanism. The coins and slugs passed into such mechanism, with the coins going on to the coin wheel and the slugs being carried out of the machine through a slug chute. There was also provided a latch which would allow rotation of the coin wheel, which in turn operated a merchandise-dispensing mechanism, only when a coin of the proper denomination was deposited therein. The latch was located close to the slug chute so that an individual could insert through the slug chute a hanger or paper clip bent into the desired shape, grasping the latch and moving same out of engagement with the coin wheel, thus to allow the individual to rotate the coin wheel and dispense merchandise without depositing a coin. Again, it is because the merchandise-vending machine accepts coins of substantially greater denominations that this type of practice is particularly undesirable.

Also, it became apparent that it would be most desirable to provide a mechanism plate that was completely self contained, that is, a mechanism plate that supports the entire coin mechanism and the slug rejector apparatus for the purpose of facilitating replacement, ease in servicing, etc.

One further aspect that took shape with additional developmental work was the desirability to separate, as much as possible, the merchandise dispensing portion of the merchandise-vending machine from the coin mechanism and the slug rejector apparatus. To this end, the mechanism plate which carried the coin mechanism and the slug rejector apparatus was constructed to be removable without first removing the merchandise storage member, should servicing or replacement become necessary.

SUMMARY OF THE INVENTION

It is therefore an important object of the present invention to provide an improved merchandise-vending machine that is more impervious to schemes for obtaining merchandise without depositing coins.

Another object, in connection with the foregoing object, is to minimize access to the latch that controls whether the merchandise-dispensing mechanism can or cannot dispense merchandise.

Still another object of the invention is to provide a mechanism plate that contains the entire coin mechanism and slug rejector.

A still further object, in connection with the foregoing object, is to place the outlet, through which slugs are rejected, on the mechanism plate.

A yet further object of the present invention is to provide a merchandise-vending machine having a merchandise storage member and a mechanism plate supporting the coin mechanism and slug rejector apparatus, and constructed such that the merchandise plate can be removed without first unlocking the storage member and removing it.

In summary, there is provided a coin controlled merchandise-vending machine comprising a merchandise storage member, a base having a plate-receiving opening therein and operative to support the storage member, a merchandise dispensing mechanism and a cashbox all positioned in the base, a mechanism plate positioned to form a closure member for the plate-receiving opening and having a coin-receiving slot, the plate being pivotally mounted adjacent to an edge thereof in the plate-receiving opening, with the plate being removable from the opening by outward pivotal movement thereof, a fastener on the plate and on the housing and having a fastened condition for preventing pivotal movement of the plate to prevent removal thereof and a release condition permitting the plate to be pivoted outwardly, a slug rejector mechanism on the plate and operative to distinguish coins from slugs, a coin-runway strip on the plate for transporting the coins and slugs from the slot to the slug rejector mechanism, a rotary coin wheel mounted on the plate and having a coin pocket for receiving coins that pass through the slug rejector mechanism, a merchandise dispensing mechanism being coupled to the coin wheel with a handle projecting from the plate to operate the merchandise-dispensing mechanism, a coin chute on the plate for transferring coins from the coin wheel to the cash box, a slug chute wholly on the plate and extending from the slug rejector mechanism to an outlet in the front of the plate for carrying slugs from the slug rejector mechanism out of the merchandise-vending machine, a latch mounted on the plate adjacent to the slug chute and to the coin wheel for selective engagement and release thereof, the latch in its engaged position preventing rotation of the coin wheel and in its released position allowing the wheel to be rotated to accommodate operation of the merchandise-dispensing mechanism by rotation of the handle, and means on the plate defining a compartment for housing the latch and constructed substantially to prevent access to the latch via the slug chute.

BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of facilitating an understanding of the invention, there is illustrated in the accompanying drawings a preferred embodiment thereof, from an inspection of which, when considered in connection with the following description, the invention, its mode of construction, assembly and operation, and many of its advantages should be readily understood and appreciated.

Referring to the drawings in which the same characters of reference are employed to indicate corresponding or similar parts throughout several figures of the drawings:

FIG. 1 is a front elevational view of a vending machine embodying the principles of the present invention;

FIG. 2 is a fragmentary view on an enlarged scale of the mechanism plate pivoted outwardly to expose the interior of the base that supports the merchandise storage member;

FIG. 3 is a rear elevational view of the merchandise plate;

FIG. 4 is a bottom plan view of the merchandise plate;

FIG. 5 illustrates the coin wheel mounted on the mechanism plate in position to receive a coin;

FIG. 6 is a view in vertical cross section of the mechanism plate of FIG. 3, taken along the lines 6-6 thereof, and showing detail of the latch;

FIG. 7 illustrates the latch in its engaged position when no coin has been deposited in the coin pocket, thereby preventing rotation of the coin wheel;

FIG. 8 is a view similar to FIG. 7, but with a coin in the coin pocket, thus preventing engagement of the latch; and

FIG. 9 is a fragmentary view of the back of the mechanism plate, showing the path of a slug inserted into the machine.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, and more particularly to FIG. 1 thereof, there is shown a bulk merchandise vending machine 20 comprising a merchandise storage member or

globe 21 supported by a base 22. A cashbox 25 is slidably positioned in the bottom portion of the base 22 and carries a lock 26 which in its locked position prevents removal of the cashbox. There is provided a merchandise chute (not shown) positioned in alignment with the merchandise ejecting portion of the dispensing mechanism. Merchandise in the globe 21 will drop into the merchandise chute and is withdrawn by raising the cover 27. The front of the upper part of the base 22 has a plate-receiving opening 23 therein for receiving a mechanism plate 30.

The mechanism plate 30 is formed, in the right side thereof as viewed in FIG. 2, with a vertically disposed groove 30a, the left side of the plate 30 providing a skirt 30b. The adjacent marginal edge of the plate-receiving opening 23 is disposed in the groove 30a, whereupon the plate 30 may be pivoted from the position shown in FIG. 2 toward the base 22 until the skirt 30b abuts the opposite side of the opening 23. The side of the plate 30 nearest the skirt 30b carries a fastener 31 which holds a swingable finger. After the plate 30 has been pivoted to its closed position, one reaches under the base 22 and swings the finger on the fastener 31 into its extended position so that it engages the adjacent portion of the base 22 to prevent unauthorized removal of the mechanism plate 30. The cashbox 25 is then inserted and locked. The only way, therefore, to gain access to the mechanism plate 30, is first to unlock the cashbox 25 and remove it, whereupon one can reach under the base 22 to release the fastener 31. It should be particularly pointed out that in order to remove the mechanism plate 30, one need not unlock the merchandise storage globe 21 and remove it first. One lock, the top one, is provided for the globe, and another lock, the bottom one, is provided for the cashbox and for gaining access to the mechanism plate 30.

Protruding from the front of the mechanism plate 30 is a centrally apertured boss 32a and through said boss and plate is journaled a shaft 32. To the outer end of the shaft is affixed an actuating handle 33 and affixed to the inner end thereof is a sprocket wheel 34. The sprocket wheel 34 is adapted to mesh with a complementary member 35. The member 35 is connected via a shaft 36 to means for dispensing the merchandise from the globe 21. As is best seen in FIG. 1, there is formed in the mechanism plate 30 a coin-receiving slot 37. Extending inwardly from the plate 30 is a strip 37a which is inclined so that a coin dropped in the slot 37 rolls down the strip 37a toward the slug rejector mechanism 110.

Also formed in the mechanism plate is a coin chute 38 leading from the coin wheel 40 into the cashbox 25; and a slug chute 39 leading from the slug rejector mechanism 110 to an outlet 39a in the plate 30. The merchandise is dispensed by twisting the handle 33 provided the shaft 32 is free to rotate. This occurs when the proper coin is inserted in the slot 37 to release the rotary mechanism, which structure will be disclosed as the description proceeds.

Attention is now directed to FIGS. 3 and 4, which show a coin wheel 40 mounted on the shaft 32 and positioned in a recess formed in the rear surface of the mechanism plate 30. A coin pocket 42 is formed in the wheel 40, opening to the periphery thereof and sized to receive a predetermined coin such as a nickel, dime, or quarter. The periphery of the coin wheel 40 has long arcuate portions 44 terminating in shorter notches 45, each defined by a straight side 46 and an inclined side 47.

There is provided a pawl 50 slidably positioned in a recess 51 and urged by a spring 52 toward the coin wheel 40, the pawl 50 having a pointed end 53. When the coin wheel 40 is rotated in the counterclockwise direction, the pointed end 53 of the pawl 50 rides up the inclined side 47 of a notch 45 onto the adjacent arcuate portion 44 along which it moves until it reaches the next notch 45, whereupon the spring 52 urges it thereinto. Any attempt at that point to rotate the coin wheel 40 in the clockwise direction is resisted by the engagement of one side of the pointed end 53 with the straight side 46 of the notch 45.

To accommodate dispensing of merchandise only when a coin (or coins) of the proper denomination is inserted, there is provided a latching mechanism 60, including a member 61 having a compartment 62 formed therein, the walls of the compartment 62 defining an arcuate guide surface 63 and a projection 64. The latching mechanism 60 also includes a pawl 70 having an arcuate bearing surface 71, a straight surface 72, and inclined or cammed surface 73 and a notch 74. The pawl 70 carries on the end thereof disposed away from the bearing surface 71, a laterally extending pin 75. The pawl 70 is positioned in the compartment 62 of the member 61 such that the bearing surface 71 is adjacent to the guide surface 63 and can rotate with respect thereto. The pawl 70 is rotatable between a position wherein its straight surface 72 is adjacent to the complementary part of the wall of the compartment 62, and a position wherein the projection 64 is disposed in the notch 74. As shown in FIG. 3, there is also provided a cover plate 80 secured, by screws 81 or the like, to the mechanism plate 30 and to the member 61. Struck from the plate 80 is an offset portion 82, spaced outwardly with respect to the rest of the plate 80. There is provided a wire spring 85 wrapped around a screw 86 and having one end thereof secured to an ear 87 struck from the cover plate 80 and having the other end between the offset portion 82 and the plate 80 and abutting against the outside of the pin 75. The wire spring 85 urges the pawl 70 to rotate clockwise and out of the compartment 62.

Referring now to FIG. 5, the coin pocket 42 is in position to receive a coin. In this condition, the inclined surface 73 of the pawl 70 is abutting against an arcuate portion 44 of the coin wheel 40. If the coin wheel 40 is rotated in the counterclockwise direction (which is the only direction permitted by the pawl 50, as previously explained), when no coin is in the coin pocket 42, then the wire spring 85 will cause the pawl 70 to rotate clockwise to the position illustrated in FIG. 7 with the projection 64 disposed within the notch 74. It can be seen that attempted continued counterclockwise rotation of the coin wheel 40 will cause the surface 42a of the coin pocket to abut against the straight surface 72 of the pawl 70, thereby to prevent continued rotation of the coin wheel 40. On the other hand, if a coin of the right denomination has been inserted and has dropped into the coin pocket 42, then the counterclockwise rotation of the coin wheel 40 will be able to continue since, as shown in FIG. 8, the inclined surface 73 of the pawl 70 will abut against the edge of the coin C which is shown in phantom. Now the handle 33 can be rotated to rotate the sprocket wheel 34, which, in turn, rotates the member 35 to dispense a predetermined quantity of merchandise.

The depth of the pocket 42 is such that when a coin of the proper denomination is positioned therein, the outside edge thereof lies on the imaginary circle defined by the arcuate portions 44. Therefore, when the coin wheel 40 is rotated counterclockwise in the merchandise dispensing operation the pawl 70 moves toward the coin pocket 42, but the edge of the coin in the pocket 42 filling the same prevents or blocks the pawl 70 from entry.

To insure positive action and prevent rocking or excessive play of the machine, a subassembly 90 is provided, which comprises a cylindrical sleeve portion 92 carrying an irregularly shaped integrally formed cam portion 93, the sleeve and cam portions being mounted on the shaft 32. A pawl 94 is mounted on the cover plate 80 and is urged by a strongly rated coil spring 95 into a firm engagement with the cam portion 93.

The merchandise-vending machine 20 also includes a mounting plate 100 carrying a slug rejector mechanism 110 which is essentially the same as that shown and described in the aforesaid patent, but, in the interest of completeness, certain aspects of the mechanism will be described herein. The plate 100 is mounted at one edge thereof to the mechanism plate 30 by a hinge 101 which is spring biased to urge the mounting mounting plate 100 toward the mechanism plate 30. Formed in the plate 100 is an arcuate slot 103.

The slug rejector mechanism includes a first slug rejector element or magnet 111. If the coin is a magnetic slug rather

than a nonmagnetic coin, it will be attracted to and withheld from passage to the coin wheel 40 by the magnet 111. The next slug rejector element comprises a pivotally mounted, counterweighted balance wheel 113 formed with an inwardly bent finger 114 protruding inwardly through the arcuate slot 103 in the mounting plate 100. In operation, when a coin of insufficient weight, such as, for example, a plastic disc, is inserted into the coin-receiving slot 37, it rolls down the coin strip 37a, passes by the magnet 111 and drops onto the balance wheel 113. Finger 114 blocks further passage of the slug and prevents it from dropping into the coin pocket 42. However, if the coin is of sufficient weight, it causes the balance wheel 113 to pivot about its axis in a clockwise direction, thereby moving the finger 114 down through the arcuate slot 103 thereby unblocking the passageway and permitting the coin to drop into the coin pocket 42.

The slug rejector mechanism 110 finally includes a portion to reject coins formed with holes therein. There is provided a wire member 115 mounted by means of a bracket 116 to the mounting plate 100. The bottom end of the wire member 115 has a counterweight 117 affixed thereto and the upper end is bent inwardly to form a pawl finger 108 directed forwardly. The pawl finger 108 is positioned in the path of the coin, so that, if it is formed with holes or apertures, it engages therein and prevents the passage of the coin into the coin pocket 42.

If the coin is of the proper size and value, it will, of course, pass all the slug-rejecting elements in the slug rejector mechanism 110, enter the coin pocket 42 and be rotated about 150°, whereupon the coin drops out of the pocket 42 and into the coin chute 38 formed in the inner surface of the mechanism plate 30. From there, of course, the coin drops into the cashbox 25. However, if the coin is an improper one or actually comprises a slug or similar device, same will be caught and held from further passage by one or the other of the above-described slug-rejecting elements in the slug rejector mechanism 110.

To discharge the slugs through the slug chute 39, there is provided a plunger 120, which, when pushed, pivots the mounting plate 100 inwardly or away from the mechanism plate 30 to clear the slugs held by any of the elements of the slug rejector mechanism 110. There is provided a limit bracket 121 which is spaced from the mechanism plate 30 and is secured thereto by the screws 122. The bracket 121 may be removed simply by removing the screws, enabling the mounting plate 100 to be swung further outward, in the event that it is necessary to clear the mechanism of extraneous materials and to accommodate other necessary servicing.

It should be noted that the slug chute 39 is positioned directly adjacent to the latching mechanism 60. With the construction of the latching mechanism described in the aforementioned patent, it was possible for an individual to shape a hanger or a paper clip and fit it up through the slug chute 39 in such a manner as to be able to disengage the latching mechanism and thereby permit operation of the coin wheel 40 without depositing the requisite coin. On the other hand, with the construction just described, the latching mechanism, particularly the pawl 70 itself, is housed in the compartment 62 which is defined by the mechanism plate 30 and the cover plate 80. The pawl 70 is disposed between those two plates to

minimize access thereto. In addition, compartment 62 is further defined by the member 61 which almost completely encircles the pawl 70, except for a small opening to permit a portion of the pawl 70 to leave the compartment 62 and enter the coin pocket 42. However, on the side adjacent to the pocket, the member 61 prevents any access. Thus, the mechanism plate 30, the cover plate 80, and the member 61 define a virtually all-encompassing compartment 62 to prevent access to the pawl 70 via the slug chute 39.

One further advantage of the construction just described is that the entire coin-discriminating mechanism and the entire control for the merchandise-dispensing mechanism are carried by the mechanism plate 30. Attention is particularly directed to the slug chute 39 which terminates in an outlet 39a on the mechanism plate 30 itself. Accordingly, there is no need, in mounting the mechanism plate 30, to provide a conduit between the slug rejector mechanism and a remotely located outlet.

It is believed that the invention, its mode of construction and assembly, and many of its advantages should be readily understood from the foregoing without further description, and it should also be manifest that while the preferred embodiment of the invention has been shown and described for illustrative purposes, the structural details are nevertheless capable of wide variation within the purview of the invention as defined in the appended claims.

1. A coin controlled merchandise-vending machine comprising a merchandise storage member, a base having a plate-receiving opening therein and operative to support said storage member, a merchandise-dispensing mechanism, a mechanism plate positioned to form a closure member for said plate-receiving opening and having a coin-receiving slot, means pivotally mounting said plate adjacent to an edge thereof in said plate-receiving opening, said plate being removable from the opening by outward pivotal movement thereof, fastening means on the inside of said plate and on said housing and having a fastened condition for precluding pivotal movement of said plate to prevent removal thereof and a release condition permitting said plate to be pivoted outwardly, a slug rejector mechanism on said plate and operative to distinguish coins from slugs, a coin-runway strip on said plate for transporting the coins and the slugs from said slot to said slug rejector mechanism, a rotary coin wheel mounted on said plate and having a coin pocket for receiving coins that pass through said slug rejector mechanism, means connecting the merchandise-dispensing mechanism to said coin wheel and carrying a handle projecting from the front of said plate, a cashbox positioned in said base and beneath said mechanism plate and having a lock to prevent unauthorized removal of said cashbox, whereby said lock must be unlocked and said cashbox removed to gain access to said fastening means, a coin chute on said plate for transferring coins from said coin wheel to the cashbox, and a slug chute on said plate for carrying slugs from the slug rejector mechanism out of said merchandise-vending machine.

2. The coin controlled merchandise-vending machine set forth in claim 1, wherein said merchandise storage member carries a lock to prevent unauthorized removal of said storage member.