Nov. 25, 1930. F. J. ROWSE 1,782,768

COIN OPERATED VENDING MACHINE

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Fig. 1.

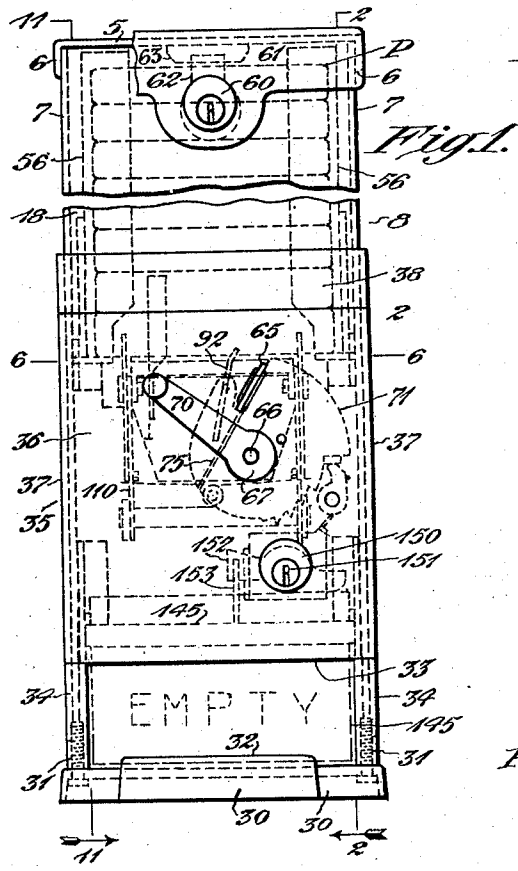

Fig. 2.

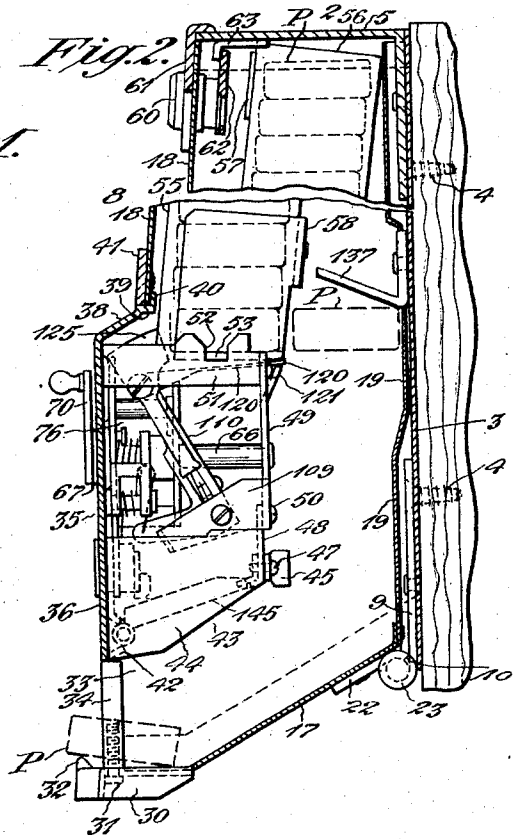

Fig. 3.

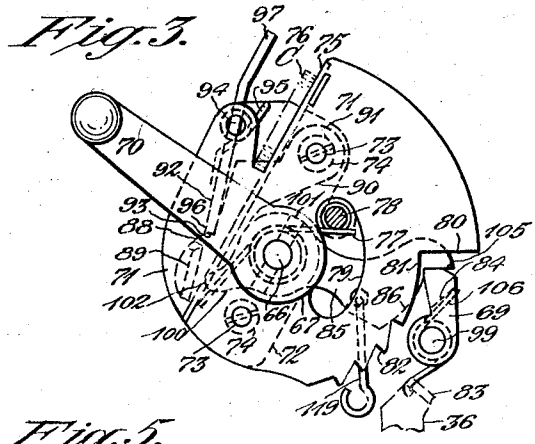

Fig. 4.

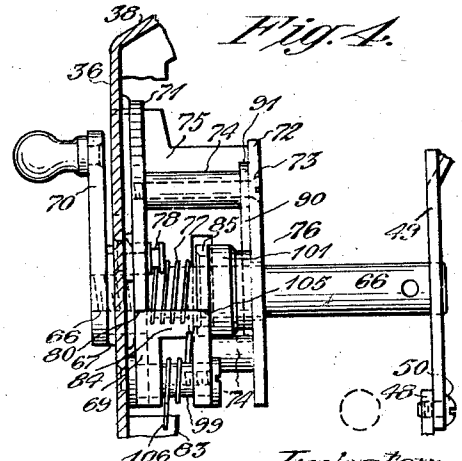

Fig. 5.

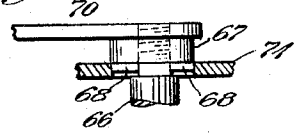

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Fig. 6.

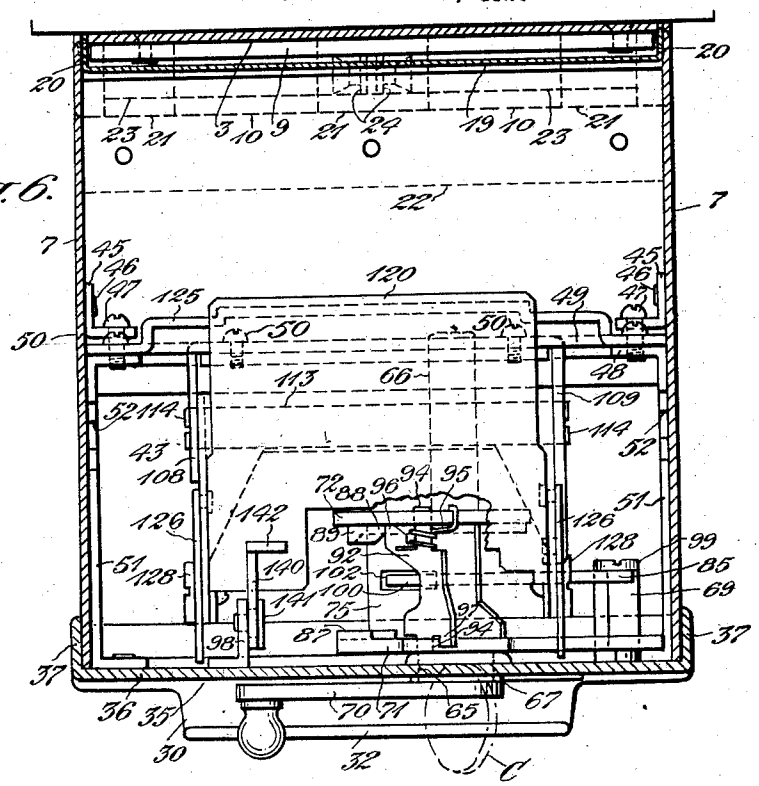

Fig. 7.

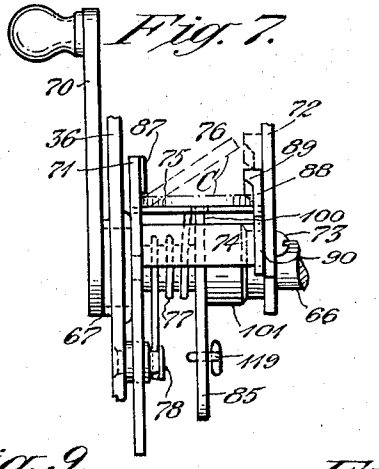

Fig. 10.

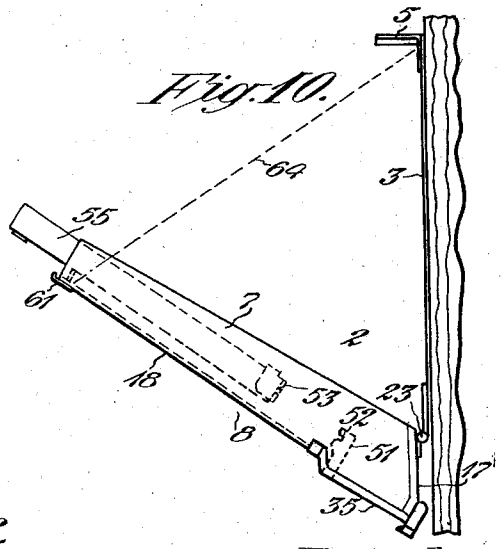

Fig. 9.

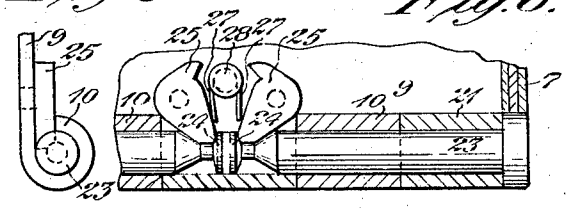

Fig. 8.

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Fig. 12.

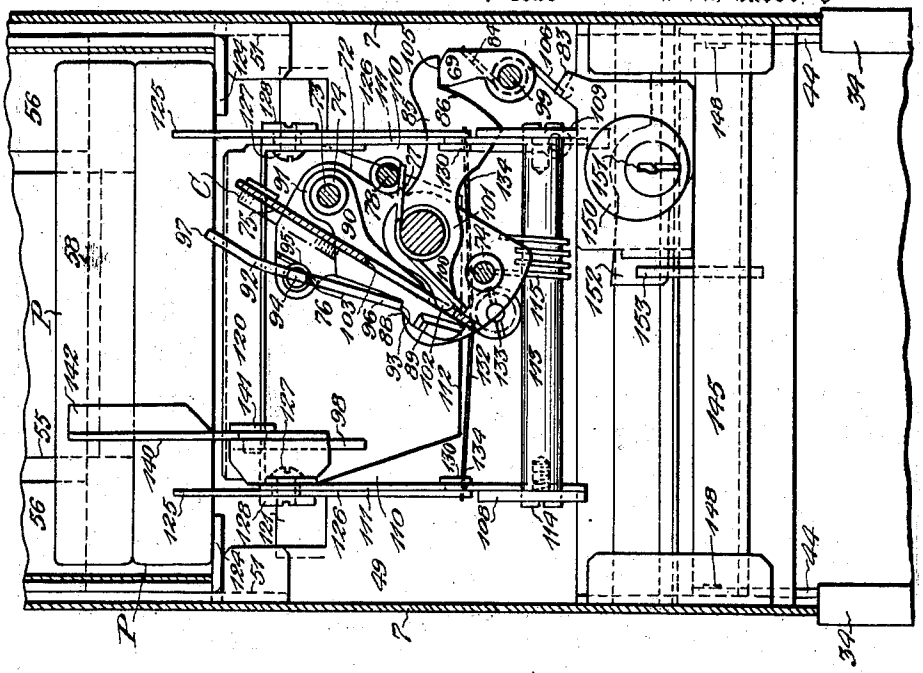
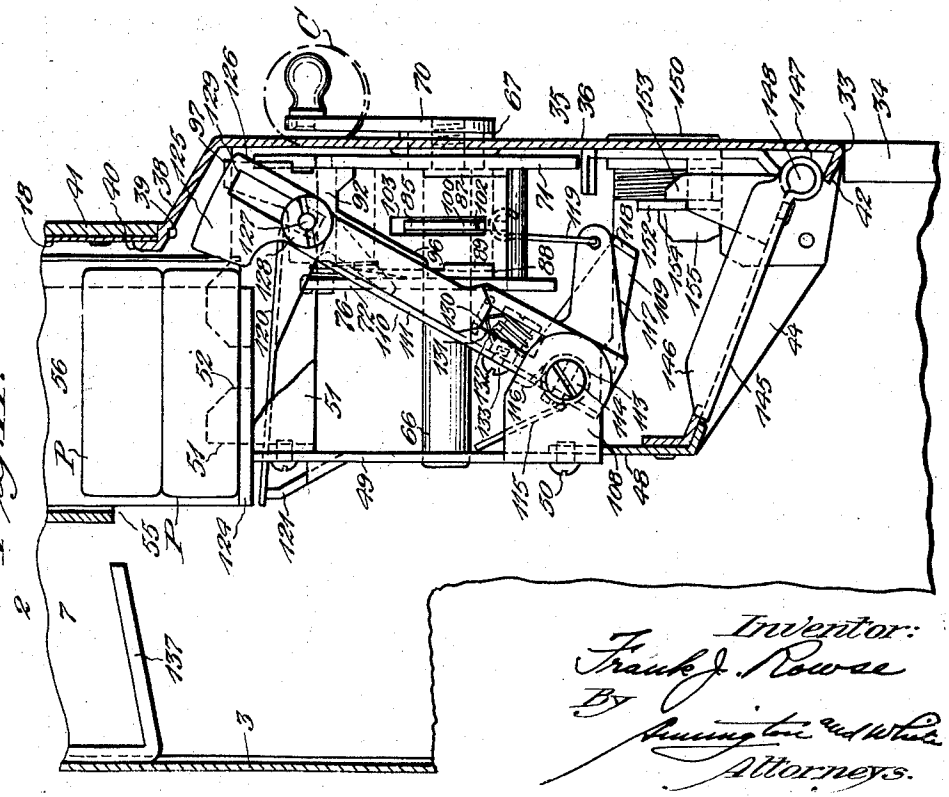


Fig. 11.



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COIN OPERATED VENDING MACHINE

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Fig. 14.

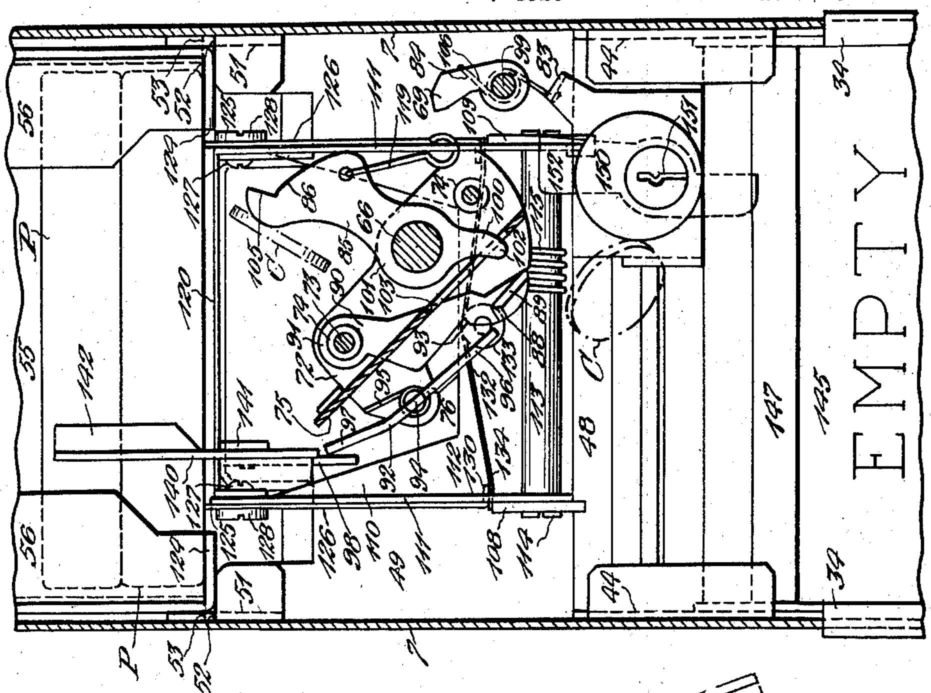
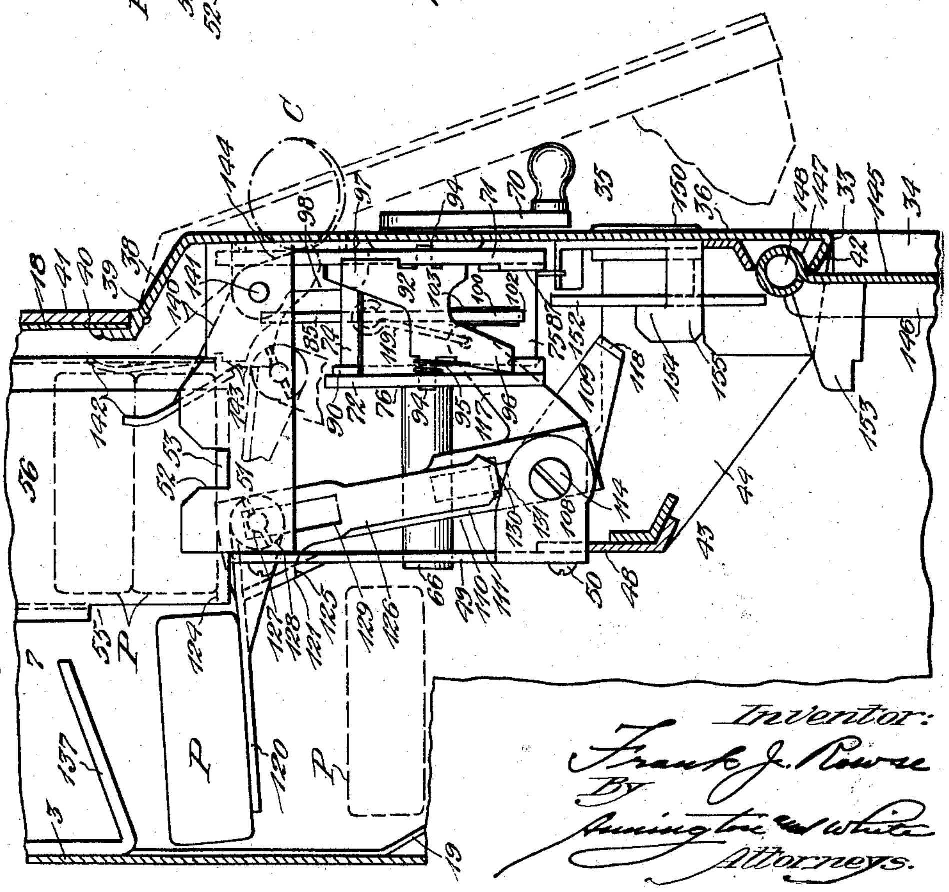


Fig. 13.



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Patented Nov. 25, 1930 1,782,768

UNITED STATES PATENT OFFICE

FRANK J. ROWSE, OF PAWTUCKET, RHODE ISLAND

COIN-OPERATED VENDING MACHINE

Application filed November 23, 1926. Serial No. 150,360.

This invention relates to coin-controlled vending machines and consists of improvements in the construction and method of operation of the same.

A principal object of the invention is to provide a machine having coin-operated mechanism for vending packages containing toilet accessories such as towels and soap or various other small articles and commodities.

Another object of the invention is to provide a machine of the type specified in which the coin-operated mechanism is simple in construction and proof against derangement or getting out of order.

Another object of the invention is to provide a machine which is proof against unauthorized tampering or pilfering of its contents and the coins collected therein.

Another object of the invention is to provide a machine of the type specified having means for preventing the insertion of the coins when the supply of articles is exhausted.

Another object of the invention is to provide a machine of the type specified which while secure against unauthorized opening has its interior readily accessible under lock control for inspection, filling and removal of the coins.

Another object of the invention is to provide a machine having delivery-mechanism for the articles to be vended which acts positively after the insertion of the proper coin, but only when the coin has passed through the mechanism into the cash-drawer or till.

Another object of the invention is to provide a machine in which the coin-operated mechanism is assembled with the casing to adapt it to be removed therefrom as a unit for repair or replacement and also to permit removal of the delivery-mechanism as a unit.

Further objects of the invention are set forth in the following specification which describes a preferred embodiment thereof as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a front view of the improved vending machine showing its main casing partly broken away and illustrating the general arrangement of the coin-controlled operating-mechanism in dotted lines;

Fig. 2 is a side view of the machine showing its casing in section on line 2—2 of Fig. 1;

Fig. 3 is an enlarged front view of the coin-controlled operating-mechanism of the machine;

Fig. 4 is an enlarged part sectional side view of the coin-controlled operating-mechanism of the machine showing the front of the casing in section;

Fig. 5 is a detailed view of the operating-crank for the coin-controlled mechanism;

Fig. 6 is an enlarged plan view of the coin-controlled mechanism, showing the casing of the machine in section on the line 6—6 of Fig. 1;

Fig. 7 is an enlarged detailed view of the coin-carrier and coin-ejecting mechanism showing the method of ejection of the coin;

Fig. 8 is an enlarged detailed view showing the locking mechanism for the hinge-pins which connect the main casing with its back-plate;

Fig. 9 is an end view of the same;

Fig. 10 is a view in reduced scale showing the manner in which the casing swings away from its back-plate and the wall to which the latter is attached;

Fig. 11 is an enlarged side view of the coin-controlled mechanism showing the casing of the machine in section on line 11—11 of Fig. 1, and illustrating the coin-controlled mechanism with the parts in normal position prior to the insertion of the coin;

Fig. 12 is a front elevation of the same showing the parts in the same relation;

Fig. 13 is a view similar to Fig. 11 showing the coin-carrier in position after having been operated to actuate the delivery-mechanism and after the coin has been ejected; and

Fig. 14 is a front view of the same with the parts in the same relation.

In its present embodiment the invention is applied to a machine for vending hand towels, rolled or folded into small oblong packages containing a piece of soap, and for convenience of description the articles to be vended will hereinafter be referred to as packages; although it is to be understood

that the machine may be adapted for vending any other kind of article or commodity.

The coin-controlled mechanism of the machine is of that type in which the coin is inserted through a slot in the front of the case and received in a coin-carrier, so-called, where it becomes the active element for effecting the operation of the delivery- or vending-mechanism. That is to say, with the proper coin in position in the coin-carrier suitable means are operated manually to cause the coin to function to positively actuate the delivery-mechanism, whereby when the coin is finally ejected from the carrier into the cash-box the delivery-mechanism will be again actuated to release the package to cause it to fall into position to be accessible for removal from the machine through an opening in the casing thereof.

The present invention embodies certain elements of coin-controlled mechanism such as shown and described in my earlier patents hereinafter specifically referred to. In the present invention, however, these elements are constructed and arranged to provide improvements as will be hereinafter particularly pointed out.

Referring first to Figs. 1 and 2 of the drawings, the improved machine comprises a main cabinet or casing 2 which contains the supply of articles to be vended and the coin-controlled delivery-mechanism. As shown more particularly in Fig. 2 the casing 2 is preferably constructed of sheet-metal and comprises a back-plate 3 adapted to be permanently attached to a wall or other support by means of screws 4 concealed within the sides of the casing. Projecting forwardly from the back-plate 3 is a horizontal top-plate 5 which is provided with bent over flanges 6 to overlap the sides 7 of the front or main portion 8 of the casing which is hinged to the bottom of the back-plate 3. As illustrated most clearly in Figs. 2 and 6 the back-plate 3 is constructed of relatively thin sheet-metal and forms the tie or connection between the top-plate 5 and a bottom hinge-plate 9, these latter plates being suitably riveted or welded to the back-plate 3 to render them unitary therewith. The top-plate 5 is bent into angular shape with its vertical portion secured to the front of the back-plate 3 in the manner as previously described; while the bottom-plate 9 is of flat construction with a pair of hinge-ears 10 bent up from its lower edge, see Figs. 8 and 9.

The front or main portion 8 of the casing 2 takes the form of a rectangular box constructed with the sheet-metal sides 7, a sloping bottom 17 and a slightly inclined upper front wall 18; the upper tapering portion of the casing being considerably longer than the lower compartment which contains the operating-mechanism of the machine as indicated in Fig. 10; Figs. 1 and 2 illustrating this part of the casing as broken away to condense the drawings. Preferably, the sides 7 of the casing are connected at the rear by a false-back 19 shown in detail in Fig. 6. The false-back 19 is flanged over along its lateral edges, the flanges 20 being spot-welded or otherwise suitably secured to the sides 7 of the casing. The false-back 19 may be constructed of relatively thin sheet-metal and cut away with openings if desired to save weight while also giving access to the mechanism in the casing.

The sloping bottom 17 of the casing is provided with hinge-ears 21 either formed integral therewith or on a strip 22 welded or riveted to its under side as shown in Fig. 2. The hinge-ears 21 aline with the ears 10 on the bottom-plate 9 to adapt them to receive a pair of hinge-pins 23 inserted from the sides of the casing, see Fig. 8. The hinge-pins 23 are turned down at their inner ends to provide flanges or buttons 24 adapted to be engaged by a pair of pawls 25 pivoted to the bottom-plate 9. The pawls 25 are maintained in engagement with the sides of the buttons 24 by means of a hairpin spring 27 coiled around a stud 28 as shown in Fig. 8. In this manner the pins 23 are locked in position against removal from the outside of the casing, it being necessary to individually release the pawls 25 from the inside before the pins can be withdrawn to disconnect the main part of the casing from its back-plate 3.

At the forward end of the sloping bottom 17 is a horizontal shelf 30 adapted to receive the packages P as they drop down and slide forward after being discharged by the delivery-mechanism to be later described, see Fig. 2. Preferably the shelf 30 is constructed as a casting and is secured to the sides of the main casing 2 by means of screws 31 reaching up from the bottom. The screws 31 engage suitable tapped holes in the sides 7, the walls of which are thickened at the front by folding over the metal to form flanges 34 as shown in Figs. 1 and 2. Above the shelf 30 is a rectangular opening 33 in the front of the casing through which the packages P are delivered, the forward part of the shelf 30 being provided with an upstanding inclined lip 32 against which the package brings up to prevent it from sliding off from the shelf.

The front part of the casing 2 is cut away below the sloping wall 18 clear to the top of the package opening or exit 33 to provide for the insertion of a supplementary framework or casing which carries the complete operating-mechanism of the machine embodied in a unitary structure. This supplementary casing 35 comprises a vertical front wall 36 having lateral flanges 37 which overlap the sides 7 of the main casing 8. At its top is a rearwardly inclined wall 38 which is bent around at 39 to form a lip 40 which hooks in back

of the bottom edge of the front-plate 18. As shown in Figs. 2 and 11, this lower edge of the front-plate 18 may be reenforced by an overlying strip or plate 41 of heavier metal. The lower edge of the front wall 36 of the supplementary casing 35 is bent inwardly at 42 to provide a smooth edge, see Fig. 11, and the sides thereof rest on the upper edges of the bent over flanges 34 of the sides 7 of the main casing, see Figs. 2 and 12, to support the weight of the casing 35. Referring to Figs. 2 and 6, a box-like framework 43 comprising lateral arms 44 is riveted or otherwise secured to the inside of the front wall 36 of the casing 35 with the arms adapted to slide into place abutting the side walls 7 of the main casing 8. Angular pieces 45 riveted to the sides 7 at 46 are punched with holes for receiving suitable screws 47 screwed into the back-strip 48 of the casing 35.

Projecting upwardly from the back-strip 48 is a vertical extension 49 held by screws 50. The vertical plate or extension 49 has horizontal arms 51 at the top, see Figs. 2 and 13, which reach forwardly and are suitably secured to the front wall 36 of the casing 35. The arms 51 have sockets 52 for receiving lugs 53 projecting outwardly from the sides of a chute or magazine 55 which extends upwardly in the main casing 8 and is removable therefrom to adapt it to be conveniently filled or loaded with the packages P. The magazine 55 is thus supported from the casing 35 and leans rearwardly toward the back-wall of the casing 8. As shown more particularly in Figs. 2 and 12 the magazine 55 comprises opposite U-shaped sheet-metal sides 56 held in spaced relation at top and bottom by cross strips 57 and 58. Normally, the casing 2 has its front portion 18 closed against the back-plate 3 and secured thereto by a suitable lock 60 held in a reenforcing strip 61 which overlaps the forward edge of the top-plate 5. The lock 60 may be of cylindrical type operated by a suitable key to engage its bolt 62 with a keeper 63 fastened to the under side of the top-plate 5. When unlocked the main casing 8 may be tilted forward on its hinges as illustrated in Fig. 10, so that the magazine or chute 55 may be conveniently slid out at the top thereof. Preferably, a cord or chain 64, indicated by a dash-line in Fig. 10, connects the top of the casing 8 with the back-plate 3 to suspend the front part of the casing in open position as shown.

The front wall 36 of the casing 35 is provided with a coin-slot 65, preferably inclined to the vertical as illustrated in Fig. 1. A main operating shaft 66 journalled at its rearward end in the back-strip 49 projects forwardly through the front wall 36 of the casing 35 and is threaded to screw into the hub 67 of a crank-handle 70 which serves as the manual means for operating the coin-controlled mechanism of the machine. As shown in Fig. 5 the hub 67 carries a key 68 adapted to engage suitable slots in a ratchet-plate 71 carried by the shaft 66 at the rear of the front wall 36. The ratchet-plate 71 is connected with an opposite plate 72 by means of screws 73, see Figs. 3 and 4, passing through tubular hubs 74 which form the separating medium between the plates 71 and 72. Extending between the plates 71 and 72 is an inclined coin-rest 75, these last named parts forming the main elements of the coin-carrier, hereinafter designated in general by the reference character 76. It will thus be seen that the coin-carrier 76 is mounted fast on the shaft 66 to be rocked about the axis thereof by means of the crank 70. A spring 77 coiled around the shaft 66 bears with one end against the under side of the coin-rest 75 while its opposite end is held by a stud 78 projecting from the rearward face of the front wall 36, see Figs. 3 and 4. The stud 78 projects through an arcuate slot 79 in the ratchet-plate 71 and serves as a stop to limit the movement of the coin-carrier 76 rotatively on its axis, the spring 77 tending to normally maintain the coin-carrier in the position illustrated in Figs. 1 and 3 with the coin-rest 75 in line with the inclined coin-slot 65 whereby to receive the coin represented at C as inserted through the slot. It will be apparent also that the spring 77 will act to return the coin-carrier to initial position after it has been rotated to its full extent.

It will be noted from Fig. 3 of the drawings that the edge of the ratchet-plate 71 is cut back at 80 and formed with a portion 81 of less radius terminating in a series of ratchet-teeth 82. Opposite this edge of the ratchet-plate 71 is a pawl 69 pivoted on a stud 99 and adapted to be operated by a spring 106 to engage its toe with the teeth 82. The spring 106 is coiled around the stud 99 with one end bearing against an inclined portion 84 of the pawl 69 and its other end anchored to a lug 83 projecting rearwardly from the front-plate 36. It will be noted from Fig. 4 that the pawl 69 is of yoke-shape having two arms mounted on the stud 99 and connected by the inclined cross-piece 84. The pawl 69 is adapted to be tripped by a rockable arm 85 which has a cam face 86 for engaging its toe whereby to release it from the teeth 82 and maintain it in the position shown in Fig. 3. The cam-arm 85 forms a part of the main operating element or presser-lever 100, to be later described, through which the coin acts to energize the delivery-mechanism of the machine.

The coin-rest 75 has means at its lower end for engaging the rim of the coin C to hold it in place thereon after it has slid down beyond the coin slot 65. At one side of the coin-rest 75 is a ledge or abutment 87 projecting from the rearward face of the ratchet-plate 71 with its lower edge extending paral-

lel with and spaced above the face of the coin-rest, see Figs. 7 and 13. As shown particularly in Fig. 7, the ledge 87 is spaced away from the coin-rest 75 a sufficient distance to permit the coin to slide freely thereinunder and also to allow the coin to tilt or rock, as indicated by the dotted lines in Fig. 7, when it is ejected from the coin-carrier in the manner as later explained. On the opposite side of the coin-rest is a metal strip 88 which abuts the side of the plate 72 and is formed with an overhanging beveled shoulder 89 which is inclined upwardly toward the top of the coin-plate as shown more particularly in Figs. 3 and 12. The present construction of the coin-holding means provides an improvement over the similar instrumentalities in my prior United States Patents Nos. 992,258, May 16, 1911; and 1,568,792, January 5, 1926.

In the present construction the shouldered abutment or coin-holder 89 is an independently movable element, forming a part of an arm or lever 90 which is pivoted at 91 on one of the hubs 74 separating the two plates 71 and 72, see Fig. 12. The coin-holder 89 is held in operative relation with respect to the coin-rest 75 by means of a latch or detent 92 which engages a shoulder 93 cut into the edge of the lever 90. The latch 92 is of bifurcated construction in plan view, as shown more particularly in Fig. 13, and overlies the face of the coin-rest 75 in inclined relation thereto whereby to provide a guard for guiding the coin into place beneath the coin-holder 89 and ledge 87, see Fig. 12, to insure that the coin will lie flat against the rest. The detent-latch 92 is provided with projecting pintles 94 on its opposite sides which are received in suitable holes in the plates 71 and 72 to pivotally mount the latch above the coin-rest 75. A spring 95 is coiled around one of the pintles 94 with one end bearing on the top of the latch and its opposite end anchored to the plate 72, see Figs. 12 and 13, thus tending to rock the latch to engage its finger 96 with the shoulder 93 in the edge of the lever 90. Extending in the opposite direction from its finger 96 the latch 92 has a tail-piece 97 adapted to be engaged by a strip or plate 98 which projects at right-angles from the front wall 36 of the casing 35, see Fig. 14. Through this engagement the latch 92 is rocked to release its finger 96 from the shoulder 93 of the lever 90. The release of the detent-latch 92 allows the lever 90 to rock on its pivot 91 to release the coin-holder 89 from the edge of the coin, whereby the latter is ejected from the coin-carrier in the manner as later more fully explained.

As before indicated the presser-lever 100 constitutes the means for energizing the delivery-mechanism of the machine, the lever being moved by and with the coin-carrier through the action of the coin thereagainst. The presser-lever 100 is provided with a hub 101 which is free to rotate on the main operating shaft 66 so that the coin-carrier is movable independently thereof when no coin is in place on the carrier. The presser-lever 100 has a curved finger 102 adapted to project through a longitudinal slot or opening 103 in the coin-rest 75. When a coin C is in place on the coin-rest 75 and held by the coin-holder 89 the end of the finger 102 will bear against its under side so that the coin will act to rock the presser-lever under the movement of the coin-carrier 76. The rearwardly extending arm 85 of the presser-lever 100 is formed with a cam-face 86 which, as before indicated, is adapted to slide under the toe of the pawl 69 to rock the latter to release it from the ratchet-teeth 82. At the end of its cam-face 86 the arm 85 is provided with a shoulder 105 which strikes against the end of the pawl 69 to limit the return movement of the presser-lever 100 after it has been operated from the coin-carrier. The presser-lever 100 is connected to operate the delivery-mechanism of the machine through instrumentalities as next described.

Extending forwardly from the vertical plate 49 on the casing 35 are two arms 108 and 109 to which is pivoted a swinging delivery-frame or package-carrier 110. The frame 110 comprises two upright arms 111 joined by a web 112, see Figs. 11 to 14, and also having a tubular sleeve or bearing 113 extending horizontally at the bottom. Suitable studs 114 are screwed into the ends of the bearing or sleeve 113 with their heads journalled in holes in the arms 108 and 109, as clearly shown in Fig. 12. The frame or package-carrier 110 is thus adapted to rock on an axis at right-angles to the axis of the coin-carrier and is controlled by a helical spring 115 coiled around the sleeve 113. One end of the spring bears against the vertical plate 49 of the casing 35 and its opposite end is bent around the web 112 of the frame 110 as shown at 116 in Fig. 11. The tension of the spring 115 thus tends to rock the upper part of the frame 110 towards the front of the casing 35, its movement in this direction being limited by the engagement of an arm 117 at its lower end with a detent lug 118 on the arm 109, see Fig. 11. The arm 117 is provided at its end with a hole into which is hooked the end of a link 119 which connects the frame or package-carrier 110 with the presser-lever 100, see Figs. 11, 13 and 14. It will thus be seen that the rocking movement of the presser-lever 100 in a contra-clockwise direction will cause the package-carrier 110 to be swung away from the front of the casing into the position shown in Fig. 13.

Pivoted between the upper ends of the arms

111 of the frame 110 is a shelf or rest 120, the rearward free end of which is supported on the upper edge of an offset portion 121 of the vertical plate 49, see Fig. 11. The rest or shelf 120 normally stands in position beneath the magazine 55 as shown in the figure last referred to; but the packages are supported slightly above the shelf by means of rests or ledges 124, shown in Figs. 11 and 12 as projecting inwardly from the sides of the chute. The packages are slid off from the rests or ledges 124 by means of pusher-fingers 125 projecting rearwardly from the upper ends of the arms 111 of the frame 110. These pusher-fingers 125 are formed on slides 126 which are mounted to move up and down on the sides of the frame 110. As shown in Figs. 11 and 12 screws 127 which form the pivots for the sliding shelf 120 are screwed into hollow studs 128 set against the outer faces of the arms 111. The slides 126 have elongated slots 129 engaged by the body of the studs 128 whereby they may slide thereon; the lower ends of the slides 126 being guided by offset lugs 130 projecting through slots 131 at the bottom of the arms 111. The slides 126 are thus supported to move vertically on the arms 111 of the frame 110, being normally maintained in their uppermost position by the ends of a wire spring 132 which is coiled around a screw 133 secured in the web 112 of the frame and having extensions 134 reaching outwardly through the slots 131 to bear against the lower ends of the slides as clearly shown in Figs. 11 and 12. Besides serving as pushers to slide the packages off from the ledges 124 the slides 126 also function to engage beneath the stack of packages remaining in the chute after one has been discharged therefrom whereby to take the weight of the same during the return movement of the package-carrier to prevent undue friction or retardation of its action, all as more fully explained hereinafter.

Referring Figs. 2, 11 and 13, an inclined plate or guard 137 projects forwardly from the back-plate 3 of the casing 2 in position slightly above the shelf or rest 120 whereby to prevent the packages from tilting or overturning on the package-carrier 110.

The package-carrier or frame 110 is adapted to be engaged by a trip-lever or pawl 140 to prevent it from returning to normal position after the last package has been dropped into position to be delivered from the machine, see Figs. 6, 13 and 14. The trip-lever 140 is pivoted on a stud 141 screwed into the plate 98, previously referred to as projecting rearwardly from the front of the casing 35, and is formed with a forwardly projecting bent finger 142 which is normally adapted to be engaged by the sides of the packages P as they slide down in the chute 55, see dotted lines in Fig. 13. Below the finger 142 the trip-lever is formed with a detent-shoulder 143 which, when the lever is rocked forward into the position indicated by full lines in Fig. 13, will engage in back of the shelf 120 to prevent the package-carrier from completing its return movement toward the front of the casing. The trip-lever 140 is operated by gravity to tilt downwardly when the last package has been delivered from the chute 55 and is held in this position by a toe 144 which strikes against the front wall 36 of the casing 35, see Fig. 13.

Referring to Figs. 11, 13 and 14, a coin receptacle or till 145, constructed as an inclined shelf having side flanges 146, is pivoted between the rearwardly extending arms 44 of the framework 43. Preferably the shelf or till 145 has a rolled edge 147 for receiving the ends of suitable studs or pins 148 projecting from the inner faces of the arms 44, see Fig. 12. The till 145 is locked in position to close the bottom of the casing 35, as shown in Fig. 11, by means of a suitable cylinder lock 150, see also Figs. 12, 13 and 14. The lock 150 is controlled from a key adapted to be inserted through the key-hole 151 on the front of the casing 35 to be turned to rotate an arm or bolt 152 which engages against a shouldered keeper 153 projecting upwardly from the till 145. The bolt 152 when in locked position also engages with an abutment 154 on a member 155 projecting from the front wall 36, whereby to take the strain from the lock itself to provide for greater security. When the bolt 152 is released the till 145 will drop down into the position shown in Figs. 13 and 14 to discharge the coins into the bottom of the casing 2 where they may be collected by the attendant. As shown in Figs. 1 and 14 the bottom of the till 145 bears the word "Empty" or other similar indicia stamped or lettered thereon. When the coins have been removed from the machine the till drops down into position to display the indicia above the delivery shelf 30. If the machine is left standing without a supply of articles the till is dropped to this position to indicate that it contains no coins, so as to dissuade anyone from breaking the casing or tampering with the mechanism in an effort to pilfer the coins.

Having now described the construction and arrangement of the complete machine its method of operation will next be explained. To prepare the machine for operation the front section 8 of the casing 2 is unlocked at the top and tilted forward into the position shown in Fig. 10. The chute 55 is then removed and filled with the articles to be vended or, if preferred, the empty chute is removed and replaced with another loaded magazine. The chute or magazine 55 is slid down into the front section of the casing 2 until its lugs 53 engage with the sockets 52 in the arms 51 of the casing 35. The chute is thus supported from the supplementary

casing 35 to maintain the packages in a substantially vertical stack above the delivery-shelf 120. The front section of the casing is closed against the back-plate 3 and secured thereto by means of the lock 60. It will be understood, of course, that either before or after the casing is closed the till 145 is reset in position as shown in Figs. 2 and 11 and locked in place to receive the coins as they are ejected from the coin-carrier.

Normally, with the machine loaded, the operating crank-handle 70 may be turned in a contra-clockwise direction within certain limits as defined by the stop-pin 78 engaging the end of the slot 79 in the ratchet-plate 71. Unless there is a coin in the coin-carrier, however, such movement of the crank 70 will fail to operate any part of the mechanism, it being necessary that a coin be in position in the carrier to serve as the active element for actuating the presser-lever 100. To operate the machine to vend a package or other article the coin C is inserted through the coin-slot 65, whereupon it will slide down on the coin-rest 75 to lodge its rim beneath the ledge 87 and coin-holder 89. The operator then turns the crank 70 to rotate the coin-carrier 76 on its axis whereby the coin C will impinge against the end of the finger 102 of the presser-lever 100 to rock the latter with the carrier. The movement of the presser-lever 100 is communicated through its link 119 to the delivery-frame or package-carrier 110 to rock the latter toward the rear of the casing.

As the package-carrier 110 is rocked in this direction the pusher-fingers 125 on the slides 126 will come against the lowermost package P in the chute 55, see Fig. 11, and as the movement of the carrier is continued will slide this package out from under the stack in the chute. As the frame of the package-carrier 110 swings rearwardly the shelf or rest 120 carried thereby is slid out to receive the package P pushed out from under the stack in the manner as clearly illustrated in Fig. 13. This view illustrates the crank-handle 70 at the limit of its stroke at which point the coin-carrier 76 has been rocked to the position shown in Fig. 14, the package-carrier 110 being then at the end of its throw with the package completely ejected from the chute 55 and resting on the shelf 120, see Fig. 13. As the coin-carrier is rocked or rotated in this manner the pawl 69 rides across the ratchet-teeth 82, engaging successively therewith to prevent retrogressive movement of the carrier; it being noted that the pawl is released from the high point of the cam 86 on the presser-lever 100 immediately said lever is rocked with the coin-carrier. It will be apparent therefore that the package-carrier is prevented from swinging back after its presser-fingers have once engaged with a package P so that it cannot partly eject a package and then return to first position. That is to say, if the pressure on the crank-handle 70 is released through accident or mistake it will not prevent the proper functioning of the delivery-mechanism, the operator being only required to continue the movement of the crank-handle to its full extent to effect the delivery of the package. As the coin-carrier 76 is rocked to its full extent the tail-piece 97 of the detent-latch 92 is brought into engagement with the side of the plate 98, as shown in Fig. 14. That is to say, at the last end of the stroke of the coin-carrier the tail 97 of the latch-lever 92 strikes against the plate 98 to release the toe of said latch from the notch or shoulder 93 in the lever 90 carrying the coin-holder 89. Immediately the detent-latch is released the pressure of the presser-lever 100 on the under side of the coin C will cause the latter to raise the coin-holder 89 away from the coin-rest 75 as indicated by the dash lines in Fig. 7. The lifting of the coin-holder 89 will thus release one edge of the coin C to allow it to rock or cant away from the coin-rest 75 under the pressure of the lever 100 whereby it will slide freely out from under the ledge 87 and drop down into the till 145 as indicated by the dot-and-dash lines in Fig. 14. In this way the coin is positively ejected from the operating mechanism without chance of its binding or sticking in the coin-carrier. After the coin has been discharged from the coin-carrier 76 the lever 90 returns the coin-holder 89 to normal position under the action of the spring 95 and as the detent-latch 92 is released from engagement with the plate 98 upon the return of the coin-carrier 76 the latch will again lock the coin-holder in operative relation with respect to the coin-rest 75.

Immediately the presser-lever 100 is released by the discharge of the coin C from the coin-carrier 76 the spring 115 will act on the package-carrier 110 to swing the latter back to first position as illustrated in Fig. 11. This movement of the carrier 110 rocks the presser-lever 100 on its axis to return it to first position, as shown in Fig. 12, with its shoulder 105 engaging against the end of the pawl 69 to prevent further movement thereof. The return movement of the lever 100 also acts through the engagement of its cam-face 86 with the toe of the pawl 69 to release the latter from the ratchet-teeth 82 whereby, when the crank-handle 70 is released, the coin-carrier 76 will be returned to first position under the action of its spring 77. In this way the parts of the mechanism are returned to normal relation to adapt them to function again in the same manner when another coin is inserted through the slot in the front of the machine.

It has been stated that the package-carrier

110 is returned to first position after the ejection of the coin from the coin-carrier 76, and during this return movement of the carrier its shelf 120 is withdrawn from under the package P resting thereon so that the latter will drop down as indicated by the dash lines in Fig. 13 to slide forwardly on the sloping bottom of the casing 2. As the package P delivers through the opening 33 in the front of the casing its forward edge meets the lip 32 of the shelf 30 to prevent it from sliding off from the shelf while also raising it into position as indicated in the dash lines in Fig. 2 to adapt it to be conveniently grasped in the fingers.

As the package-carrier 110 swings back to the position shown in Fig. 11 the arcuate upper edges of the slides 126 slide in under the under side of the lowermost package in the chute 55 to sustain the whole stack of packages above the rests or ledges 124, that is to say, the weight of the stack of packages is supported on the slides 126 by the resilient pressure of the spring 132 acting against the lower ends of the slides. In this way the cumulative weight of the packages is prevented from exerting any considerable pressure to resist the return movement of the package-carrier so that there is no chance of the latter becoming stuck or impeded in its action. As the carrier reaches its first position as shown in Fig. 11 the slides 126 slide out from under the lowermost package P which thereupon drops down into place on the rests or ledges 124 at the sides of the chute 55.

It has been explained that after a coin has been inserted in the machine and the crank-handle 70 partly rotated to operate the coin-carrier 76, return movement of the carrier is prevented by the engagement of the pawl 69 with the ratchet-teeth 82. The coin-carrier 76 is thus locked in position with its front-plate 71 closing the coin-slot 65 in the manner of a shutter to prevent the reception of another coin until the delivery-mechanism of the machine has functioned to deliver the package and the first coin has been cleared from the mechanism. This provision guards against the clogging of the mechanism by the insertion of a second coin when one is already in place on the coin-carrier and prevents the loss of a coin by the operator. The same means also acts to prevent the insertion of a coin in the machine when the supply of articles is exhausted, in the manner as next explained.

For this latter purpose the trip-lever 140 is caused to rock forward into the position shown by full lines in Fig. 13 when the last package has been slid out from the bottom of the chute 55. After this last package has been delivered from the shelf 120 the return movement of the package-carrier 110 is arrested with the carrier in position as indicated in fragmentary view by the dash lines in Fig. 13 through the engagement of the detent-shoulder 143 on the lever 140 against the forward edge of the shelf 120. This detention of the frame or carrier 110 holds the presser-lever 100 from being returned to first position so that the pawl 69 remains engaged with the last tooth 82 on the ratchet-plate 71 to prevent the coin-carrier from being returned to first position. The coin-slot 65 is therefore maintained closed to prevent the insertion of a coin when the machine is empty. When a fresh supply of packages is placed in the chute 55 the trip-lever 140 is returned to normal position bearing against the sides of the lowermost packages, so that as long as a supply of articles remains in the chute the package-carrier 110 is free to swing back upon the release of the presser-lever 100 at each ejection of a coin.

It will be observed that my invention provides a particularly simple, compact and efficient mechanism for the purpose explained. Both the package delivery-mechanism and the coin-ejecting devices are positive in action and proof against derangement or getting out of order.

The operating mechanism of the machine is contained in a supplemental or sub-casing which may be removed from the main casing as a unit so that if the parts become damaged and require repair or adjustment a new unit can be inserted in its place without rendering the machine inoperative for any considerable period. It is also to be noted that the package delivery-mechanism may be removed from the sub-casing 35 as a unit for repair or replacement by simply removing the screws 50, detaching the back-plate extension 49 and unhooking the link 119. Moreover, the casing for the whole machine is designed for security against tampering with its mechanism or pilfering of its contents and also to guard against theft of coins collected therein, while at the same time being particularly convenient to open for refilling. The casing though constructed mainly of sheet-metal is practically proof against unwarranted opening and particularly strong and rugged to resist attack.

As before noted the coin-operated mechanism is also practically proof against derangement or getting out of order and is designed to operate to protect the purchaser as well as the vendor.

While I have herein shown and described a preferred form of construction of the improved device it is obvious that various modifications may be made in the structure and arrangement of its parts without departing from the spirit or scope of the invention.

Therefore, without limiting myself in this respect, I claim:

1. In a coin-operated vending machine, the combination of a casing comprising a

back-plate adapted to be fastened to a wall or other support, a box-like front portion adapted to fit against the back-plate, overlapping hinges on the back-plate and front portion of the casing, pins connecting the hinges, detent-means enclosed within the casing and engaging the hinge-pins to lock them against removal from the outside, a magazine for the articles to be vended held in the front portion of the casing, delivery-mechanism for delivering the articles successively from the magazine, and coin-actuated mechanism for operating the delivery-mechanism.

2. In a coin-operated vending machine, the combination of a casing having a back-plate adapted to be secured to a wall or other support, a box-like front portion permanently hinged to the back-plate to adapt it to open outwardly therefrom and to drop down to give access to its interior, means for locking the front portion of the casing to the back-plate, an upright chute removably supported in the front part of the casing to contain the articles to be vended and adapted to be drawn out from the top of the front part when the latter is lowered, delivery-mechanism for delivering the articles successively from the chute, and coin-operated mechanism for operating the delivery-mechanism.

3. In a vending machine, the combination of a casing comprising a back-plate adapted to be fastened to a wall or other support, an angle-shaped top-closure secured to the front of the back-plate, a hinge-plate secured to the bottom of the back-plate, a front box-like portion provided with a sloping bottom with hinges connecting it to the hinges on the back-plate and terminating in a horizontal shelf at its forward end with a delivery-opening thereabove, means for locking the front portion of the casing to the back-plate with the top-closure closing its upper end, a magazine in the casing for supporting a plurality of articles in stacked relation, delivery-mechanism in the casing for delivering the articles successively from the magazine to drop and slide out of the delivery-opening, and coin-controlled mechanism for operating the delivery-mechanism.

4. In a vending machine, the combination of a casing comprising a back portion adapted to be fastened to a wall or other support and provided with hinges, a box-like front portion having hinges alining with the hinges on the back-plate, hinge-pins inserted through the hinges from the sides of the casing and formed with detents at their ends, pawls pivoted to the back-plate with their ends adapted to engage the detents on the hinge-pins, and means for normally maintaining said pawls in locking engagement with the hinge-pins.

5. In a vending machine, the combination of a main casing comprising a back-plate, a box-like portion hinged to the back-plate and provided with an opening in its front wall, a lock for fastening the front portion to the back-plate, a sub-casing comprising a front-plate having a lip adapted to hook in under the upper edge of the opening in the main casing with flanges overlapping the side walls thereof and supported therefrom, means on the interior of the main casing for securing the sub-casing in place therein, said sub-casing having slots at the top of its sides, a magazine having lugs engaging the slots in the sides of the sub-casing to removably support it therefrom, and coin-operated mechanism assembled as a unit on the sub-casing and adapted to be actuated to successively deliver the articles from the magazine.

6. In a vending machine, the combination of a main casing having an opening in its front, a sub-casing adapted for insertion into the main casing and provided with a front wall for closing the opening thereof, means for securing the sub-casing within the main casing at points remote from the front thereof to prevent its unauthorized removal therefrom, and coin-operated mechanism assembled as a unit on the sub-casing to adapt it to be bodily removed therewith for repair or replacement.

7. In a vending machine, the combination of a casing having an opening in its front, a sub-casing adapted for insertion in the main casing to close its opening, coin-operated mechanism assembled as a unit on the sub-casing, a frame-like extension removably attached to the sub-casing, and delivery-mechanism assembled as a unit on the extension and connected to be actuated from the coin-operated mechanism to deliver articles from the machine, said sub-casing being removable as a unit for repair or replacement of the coin-operated mechanism and said extension being separately removable for repair or replacement of the delivery-mechanism.

8. In a vending machine, the combination of a main casing having an opening in its front, a sub-casing adapted for insertion into the main casing to close its opening, said sub-casing provided with lateral arms and a back-plate, coin-operated mechanism assembled as a unit on the sub-casing, a frame-like extension having lateral arms and a back-plate removably secured to the sub-casing, and delivery-mechanism assembled as a unit on the extension whereby it is separately removable therefrom for repair or replacement.

9. In a vending machine, the combination of a casing having a delivery-opening at the bottom of its front wall, coin-operated mechanism for delivering articles from the casing through its delivery-opening, a coin-receiving till hinged above the delivery-opening at the front thereof to adapt it to swing down to close the opening, means to lock the till in position to collect the coins discharged from

the operating-mechanism, and indicia on the till adapted to be displayed through the delivery-opening to indicate that the machine is empty when the till is unlocked to drop into position to discharge the coins.

10. In a vending machine, the combination of a main casing having an opening in its front wall, a sub-casing held within the main casing with its front wall closing the opening except for a delivery-opening therebeneath, coin-operated mechanism for delivering articles from the casing to adapt them to be removed through the delivery-opening, a coin-collecting till hinged to the front of the sub-casing below the coin-operated mechanism and adapted to drop into position at the front of the delivery-opening to close the latter, means for locking the till in position to collect the coins discharged from the mechanism, and indicia on the till adapted to be displayed through the delivery-opening when the till is unlocked to indicate that the machine is empty.

11. In a vending machine, the combination with means for supporting a stack of articles to be vended, delivery-means movable with respect to the stack to discharge the articles successively therefrom and to receive the articles in position for delivery, coin-operated mechanism for operating the delivery-means, means for returning said delivery-means to first position to deliver the article received thereon, and means normally maintained in inoperative position by the presence of an article in the stack and adapted to be released upon the discharge of the last article to prevent return of the delivery-mechanism to normal position whereby to detain the coin-operated mechanism in position to prevent the reception of another coin.

12. In a vending machine, the combination of a magazine for holding a supply of articles to be vended, a delivery-frame movable with respect to the magazine and provided with means for pushing the articles out therefrom, a shelf on the frame for receiving the articles as they are pushed out from the magazine, coin-operated mechanism for swinging the frame in one direction to cause it to push out the article and receive it on the shelf, a spring for returning the frame to first position to cause it to discharge the article off from the shelf and a trip-lever normally sustained in inoperative position by engagement with the packages in the magazine and adapted to move into position upon the discharge of the last package to cause it to engage the frame to prevent it from returning to first position whereby to to detain the coin-operated mechanism in position to prevent the reception of another coin.

13. In a vending machine, the combination of means for supporting a stack of articles to be vended, an oscillating-frame movable beneath the stack to successively discharge the articles therefrom, a shelf on the frame for receiving the articles as they are discharged from the stack, coin-operated mechanism for actuating the frame to cause it to discharge an article from the stack and receive it on the shelf, means for returning the frame to first position to cause it to release the article from the shelf, and a trip-lever adapted to hold the frame from return movement after it has discharged a package from the shelf to thereby detain the coin-operated mechanism in position to prevent the reception of another coin, said trip-lever being normally sustained out of the path of the frame through its engagement with the lowermost package in the stack.

14. In a vending machine, the combination of a magazine for holding a supply of stacked articles to be vended, a delivery-frame movable with respect to the magazine to deliver the articles successively therefrom, coin-operated mechanism for actuating the delivery-frame, ratchet-means to prevent retrogressive movement of the coin-operated mechanism when a coin is in place therein, means operated from the delivery-frame upon the discharge of the coin to release the ratchet-means to permit the return of the delivery-means to first position, and means controlled by the articles in the magazine to prevent the frame from operating the releasing-means when the last article has been delivered from the magazine.

15. In a vending machine, the combination of a casing having a delivery-opening in its front wall, coin-operated mechanism for delivering articles from the casing through its delivery-opening, a coin-receiving till hinged to the front wall of the casing at the at the top of the delivery-opening, and means to lock the till in raised position to adapt it to collect the coins discharged from the operating-mechanism of the machine, said till having its bottom portion arranged to swing down across the rim of the delivery-opening to serve as a closure therefor to indicate that the money has been removed from the machine.

In testimony whereof I affix my signature.

FRANK J. ROWSE.