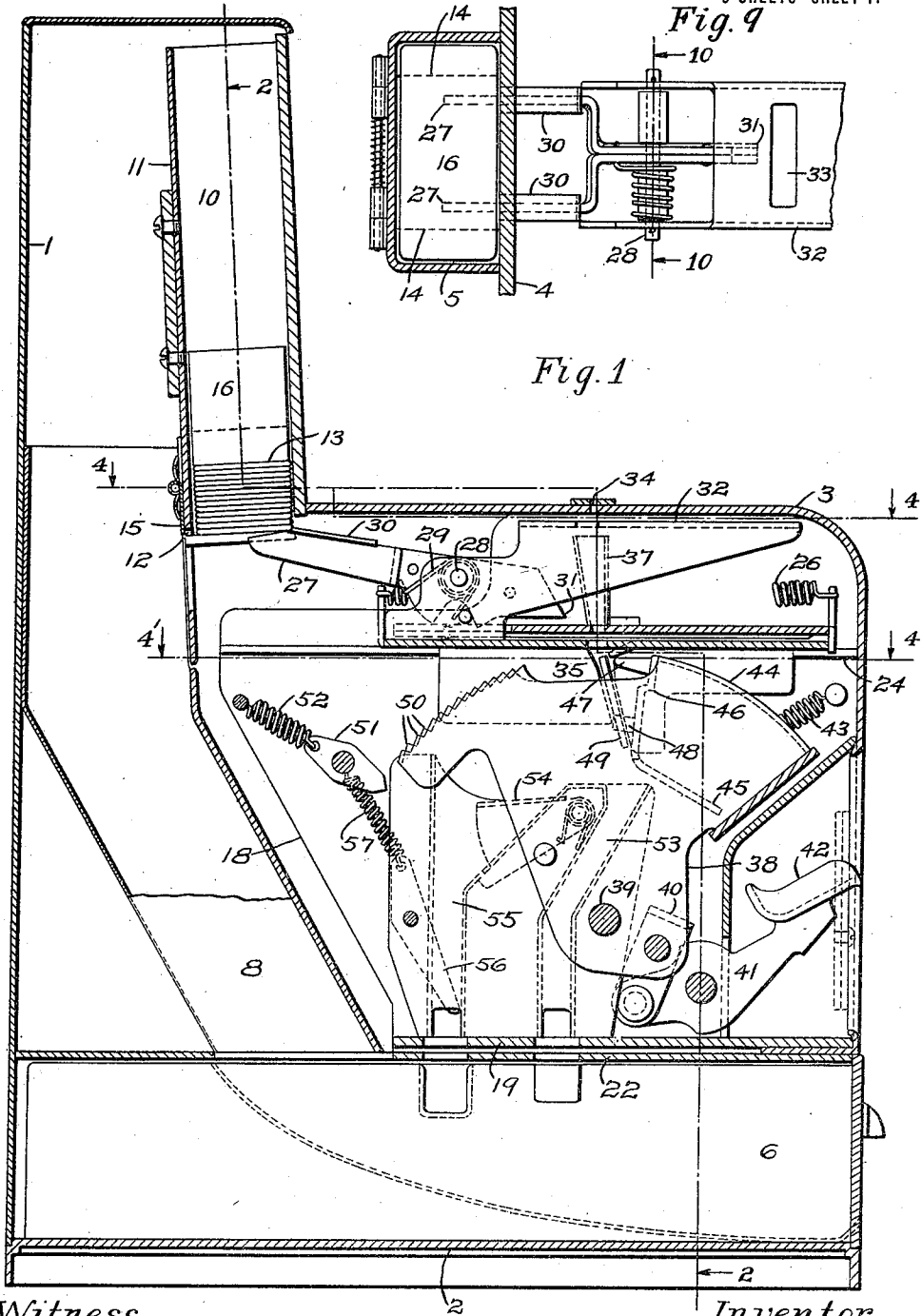


W. A. LORENZ.  
 COIN CONTROLLED MECHANISM FOR VENDING MACHINES,  
 APPLICATION FILED DEC. 5, 1916.

1,293,822.

Patented Feb. 11, 1919.  
 5 SHEETS—SHEET 1.



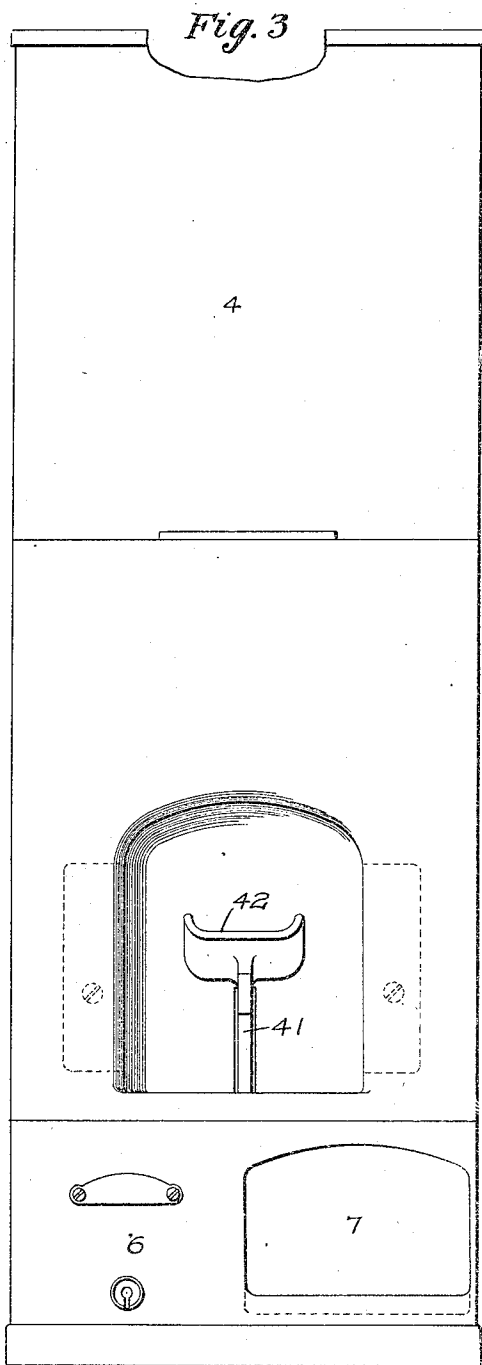
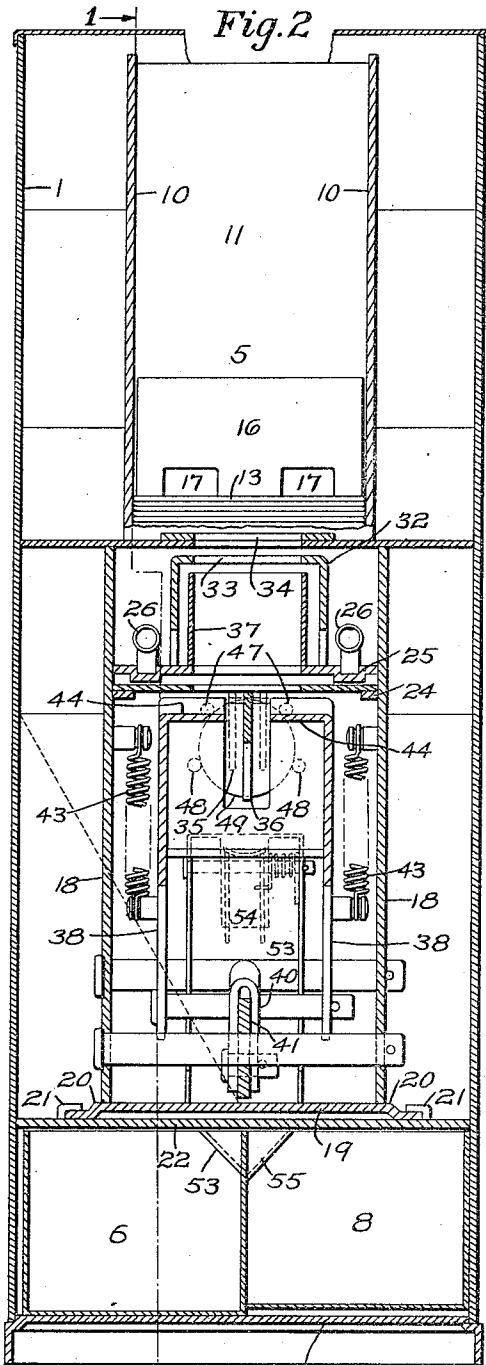
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5 SHEETS—SHEET 3.

Fig. 4

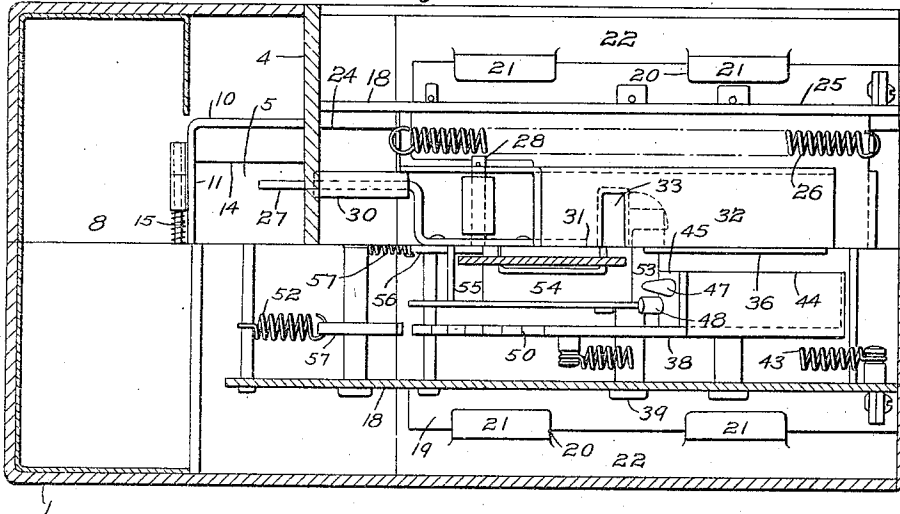


Fig. 8

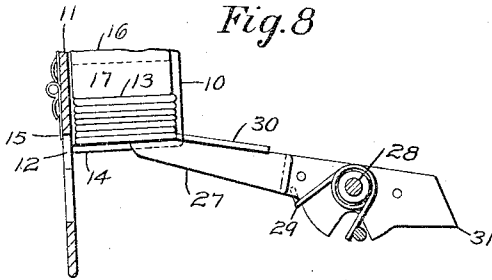


Fig. 10

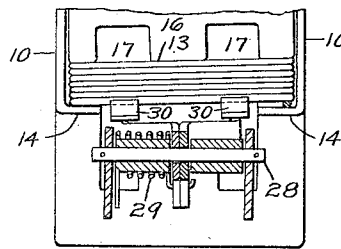
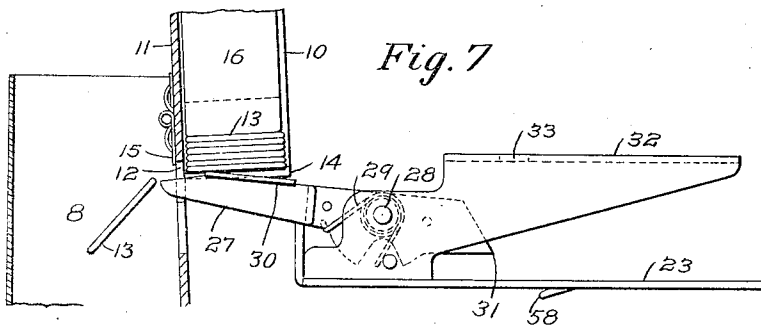


Fig. 7



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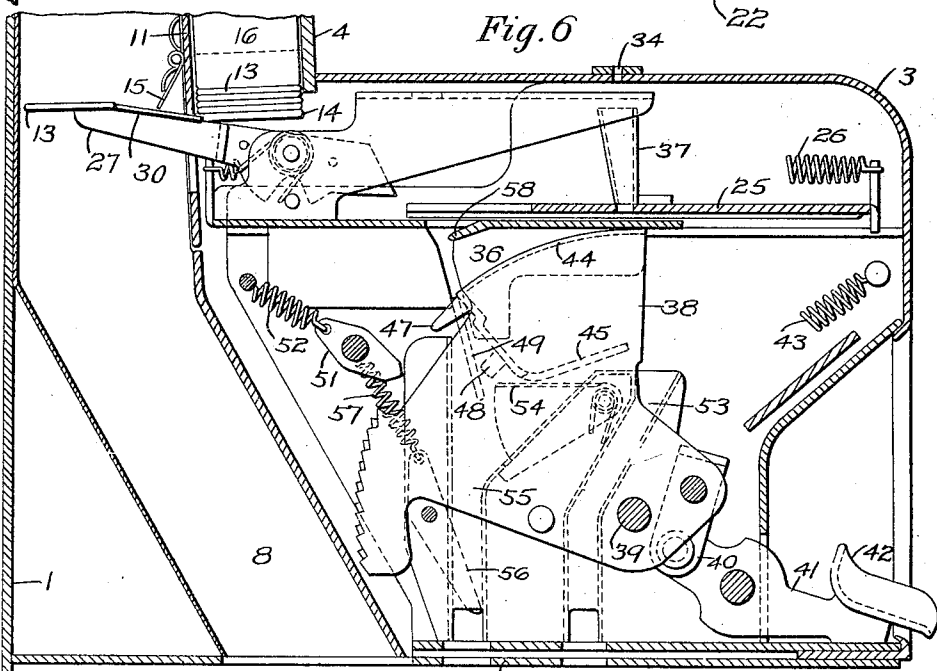
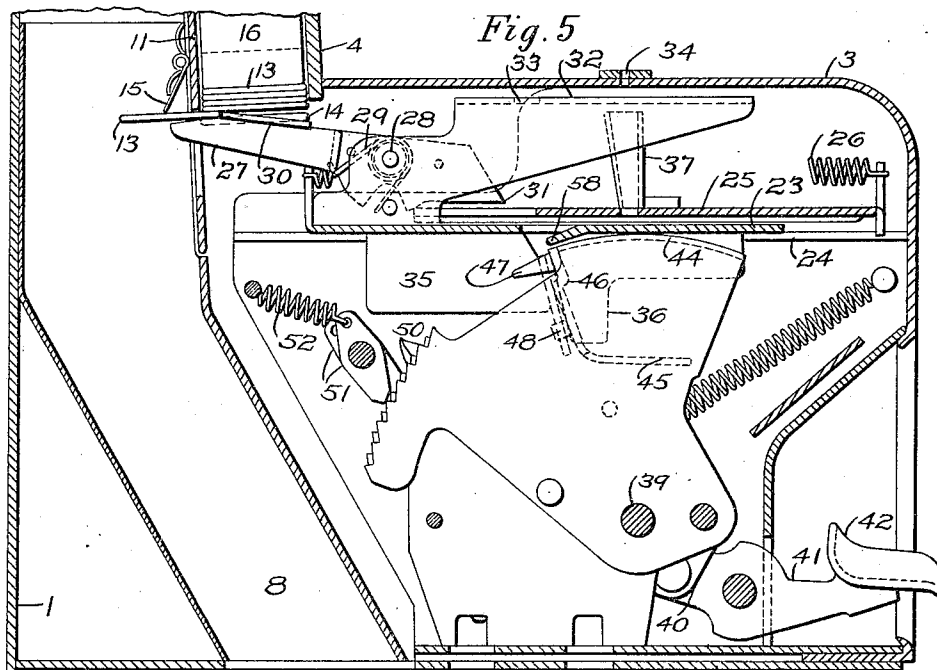
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

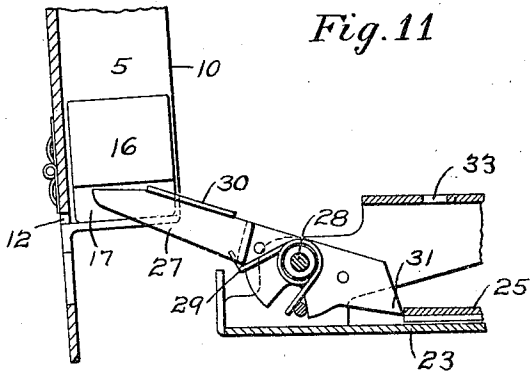


Fig. 11

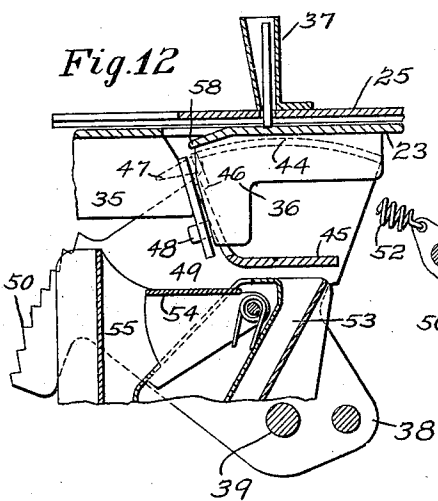


Fig. 12

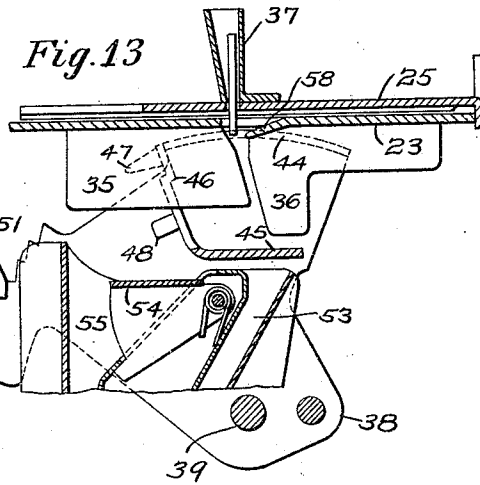


Fig. 13

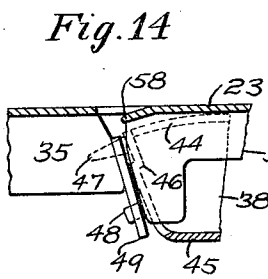


Fig. 14

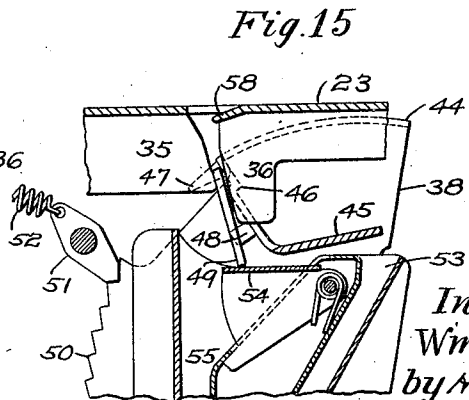


Fig. 15

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# UNITED STATES PATENT OFFICE.

WILLIAM A. LORENZ, OF HARTFORD, CONNECTICUT.

COIN-CONTROLLED MECHANISM FOR VENDING-MACHINES.

1,293,822.

Specification of Letters Patent.

Patented Feb. 11, 1919.

Application filed December 5, 1916. Serial No. 135,138.

*To all whom it may concern:*

Be it known that I, WILLIAM A. LORENZ, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Coin-Controlled Mechanism for Vending-Machines, of which the following is a specification.

This invention relates to the class of machines which are designed to hold a stock of articles or packages of merchandise, or other commodities, and eject the goods a unit at a time when the handle is manipulated if a coin of the proper denomination has been inserted.

The object of the invention is to provide a comparatively simple mechanism for a machine of this nature which cannot be manipulated for removing goods unless a coin of the proper denomination is deposited, or manipulated for extracting a coin for which goods have been delivered, but which, if a coin of the proper denomination is inserted, will surely deliver the consideration therefor.

The invention is illustrated as embodied in a machine adapted for vending thin commodities, such as tickets, although, of course, it may be used for vending other goods. Figure 1 shows a vertical section of such a machine looking toward one side on the plane indicated by the dotted line 1—1 on Fig. 2, with the operating mechanisms in normal position. Fig. 2 shows a vertical section looking toward the rear on the dotted line 2—2 on Fig. 1. Fig. 3 shows a front elevation of the machine. Fig. 4 shows a horizontal section, the upper half of the view being on the dotted line 4—4 on Fig. 1 and the lower half of the view being on the dotted line 4'—4' on Fig. 1. Fig. 5 shows a side elevation of the operating mechanisms in the positions occupied when the ejector is pushing back the lowest ticket of a pile in the holder. Fig. 6 is a similar view with the ejector in its rear position and the ticket completely pushed out and ready to drop into the discharge chute. Fig. 7 shows a side view of the ejector on its return stroke and the ticket dropping into the discharge chute. Fig. 8 shows a side view of the ejector in a position to push a ticket out of the stack. Fig. 9 shows a horizontal section of the stack and a plan of the ejector. Fig. 10 shows a vertical section through the ejector taken on the plane denoted by the dotted

line 10—10 on Fig. 9 and showing the relative positions of the parts when the ejector is pushing out a ticket which lies out of level in the stack. Fig. 11 shows the position assumed by the ejector when the stack is empty, illustrating how it is impossible for it to return under these conditions. Fig. 12 shows a portion of the mechanisms moved from their normal position of rest with a second coin held from entering by the ejector slide. Fig. 13 shows a portion of the mechanisms illustrating how a coin cannot be inserted into the machine during the movement of the coin pusher. Fig. 14 illustrates the cooperation of the ejector slide and coin pusher on a coin at one position during rearward movement. Fig. 15 shows some of the parts with the coin pushed backward by the coin pusher and also held upwardly by means of a latch which prevents the coin from falling down into the coin chute until the movement of the coin pusher has been completed and the goods entirely ejected.

The machine illustrated has a casing 1 mounted on a base 2. The front 3 of the casing is removable to permit the withdrawal of the operating mechanisms, and the cover 4 is removable from the front of the stack 5 to permit the introduction of the goods to be vended. In the bottom of the case on one side is a drawer 6 for holding the coin received for goods delivered, and on the other side is the opening 7 at the end of the discharge chute 8 for the delivery of such goods as are ejected or to return the coin of improper denomination. The casing, cover and coin drawer may be fastened by any suitable means to prevent unauthorized access to money, goods or mechanisms.

The stack shown has two sides 10 and a back 11 that is longer than the sides and that near the bottom has an opening 12 of a size which permits the passage of the ejector fingers and the goods pushed out from the bottom of the stack into the discharge chute when the ejector is moved rearwardly. The tickets 13 or other goods are piled in the stack which is of the necessary size and shape to receive them and they are supported by the inturned lower edges 14 of the sides of the stack. These supports are below the top of the opening through the back plate a sufficient distance to permit the lowest unit of the pile in the stack to be

pushed out, and a rearwardly opening spring trap door 15 is arranged on the back plate to close the upper part of the opening so the goods cannot be shaken out. On the top of the pile of goods in the stack is a weight 16. The lower part of the weight has slots 17 which allow the ends of the ejector fingers to rise when there are no goods in the stack.

The ejector and other operating mechanisms are mounted on a frame consisting of two side plates 18 and a bottom plate 19. The bottom plate has side extensions 20 that slide under lugs 21 on the plate 22 that extends across the case above the coin drawer and discharge opening. When the front of the case is opened all of the operating mechanisms may be removed at once by drawing out the frame (Figs. 2, 4).

The ejector slide 23 is movable back and forth on ways 24 that extend inwardly from the side plates of the frame below a fixed plate 25 (Figs. 1, 2). Springs 26 are arranged to draw the ejector slide toward the front of the machine. The ejector has two rearwardly extending fingers 27 which are fastened together and are pivotally mounted on an arbor 28 carried by the slide. The rear ends of the fingers are normally held raised by a spring 29 and the opening through them is somewhat larger in diameter than the diameter of the arbor 28 upon which they are mounted so that they can tilt. If there are goods in the stack the spring holds the rear ends of the ejector fingers pressing up beneath the goods. Each ejector finger carries a pushing block 30, the rear edge of which is a little less in height than the thickness of one of the units of the goods to be pushed out of the stack into the discharge chute. When there are goods in the stack the rearward movement of the ejector fingers pushes the lowest unit of the pile out into the discharge chute. As the fingers are hung loosely on the arbor and their rear ends are lifted by the spring, if the goods should be out of level, as shown in Fig. 10, or if the goods should be bent or warped, both fingers will engage with the front edges of the goods so as to surely eject the lowest unit of the pile (Fig. 8). The forward end of the ejector is provided with an extension 31, and after the last piece of goods has been ejected from the stack the spring will throw the rear ends of the fingers up, the weight being slotted, as previously described, to admit of this (Fig. 11), and throw the front end down so that it will, when the ejector attempts to return, engage the rear edge of the fixed plate 25 and thus prevent the further forward movement of the ejector.

Attached to the ejector slide is a guard plate 32. This guard plate has a slot 33 that, when the ejector is in its normal posi-

tion of rest, registers with a slot 34 in the casing through which the coin is inserted when it is desired to operate the machine. As the slot in this guard plate only registers with the slot in the case, when the ejector is way forward a coin cannot be inserted unless the stack contains goods and the mechanisms are in their normal position of rest.

Attached to and extending downwardly from the underside of the ejector slide are two nose plates 35 and one nose plate 36, the former being parallel and the latter being in front of the space between the former and projecting lower down. These plates are arranged so there will be a space a little wider than the thickness of a coin between the front edges of the two rear plates and the rear edge of the single front plate. There is an opening through the ejector slide at the upper end of the space between these nose plates, and when the ejector slide is forward in its normal position of rest this opening registers with a passage through a chute 37 that is supported by the fixed plate 25 and that is in line with the coin slot 34 in the casing.

The coin pusher consists of two plates 38 which are pivotally mounted on an arbor 39 that is held by the side plates of the supporting frame. A link 40 connects the coin pusher with the inner end of the operating lever 41 which on its outer end in a recessed portion of the front casing has a finger piece 42. When the finger piece is pressed down the coin pusher swings rearwardly, a pair of springs 43 draw the coin pusher forwardly. The upper edges 44 of the side plates of the coin pusher extend inwardly toward each other and are curved on an arc, the center of which is the axis of the pusher. Extending between the pusher plates is a plate 45. This plate near the top of the pusher is slotted and on each side is bent forward as at 46. Projecting rearwardly from these pushing faces are two pins 47 and two studs 48, the studs being located sufficiently near together to support a coin 49 of the desired size and sufficiently far apart to let drop between them any smaller coin which may be put into the machine. The upper edges of the side plates of the coin pusher near the rear are provided with ratchet teeth 50. These ratchet teeth are cut so that they are not exactly opposite—the teeth of one being intermediate the teeth of the other—and thereby with coarse teeth effecting the result of a fine tooth ratchet. Pawls 51 are arranged to engage the ratchet teeth and prevent the coin pusher from returning until after it has made a complete rearward movement. Springs 52 hold the pawls with their engaging ends pointing substantially toward the axis of the pusher.

When the parts are at rest and a coin is inserted through the slot in the case and

there are goods in the stack, the coin passes through the coin guard and drops through the chute and opening in the bottom of the ejector slide into the space between the edges of the downwardly projecting nose plates carried by the ejector slide. The coin, if it is of the proper denomination to operate the mechanism, is supported in this position by the studs on the coin pusher. If the coin is too small to be supported by the studs it passes between them and drops into the chute 53 that passes down and opens into the discharge chute so that the coin may be regained by the depositor. If the coin is of correct size to operate the machine and it lodges on the studs, when the operating finger piece is depressed and the coin pusher swings rearwardly the pusher acting through the coin and ejector nose pieces moves the ejector rearwardly and causes it to push a unit of the goods from the stack into the discharge chute. As the coin pusher swings rearwardly the top of the coin is engaged by the fingers and held on the studs until the pusher reaches the end of its movement, at which time as the ejector slide moves in a straight line and the pusher swings on the arc of a circle, the pushing faces of the pusher crowd the coin off from the studs and out from under the fingers and beyond the edge of the latch 54 so that it will drop down into the chute 55 and pass into the coin drawer. The pawls prevent the coin pusher from returning until after it has made its full backward stroke and the coin has been cammed off from the studs and latch and from between the nose pieces of the ejector so that it can drop into the coin chute (Fig. 15). At the end of the pusher stroke the latch 54 springs up in front of the coin and prevents it from being carried forward by the return movement of the pusher.

As the coin passes down through the coin chute to the drawer it swings back a latch 56 which is so pivoted and held by a spring 57 that its lower end projects into the chute. The tension of the spring and the arrangement of the latch is such that the coin in dropping down will readily swing back the lower end of the latch and pass it. The latch prevents the return of any coin from the coin drawer and the consequent clogging of the mechanism even should the machine be turned upside down.

A coin cannot be inserted in the machine when the ejector is in any position except normal. If two coins should be inserted before the machine is operated one will pass down into the space between the nose plates below the ejector and will be supported by studs on the pusher, while the other will be lifted back into the chute above the ejector slide by the turned down lip 58 on the slide as the ejector slide moves rear-

wardly and be held there until after goods have been ejected and the ejector has again returned to normal position, then the second coin will drop down into position to operate the machine (Figs. 12, 13). If a coin is inserted when the ejector is in normal position, but the coin pusher has been swung rearwardly to any extent by means of the handle, the coin will pass down and rest upon the curved upper inturned edges of the pusher plates and remain there as the pusher moves until it has been returned to normal position (Fig. 13). When the front of the case is removed the operating mechanism may be drawn out toward the front and cleaned, repaired or readjusted if necessary. If it is desired to adapt the machine for a smaller coin larger studs may be substituted for those which are in use, or if it is desired to have the machine operated with a larger coin then the studs may be made smaller in diameter. If thicker goods are to be vended thicker ejector pushing blocks are substituted.

With the mechanism described goods which are thin, such as tickets, even if warped or bent or out of level in the stack, will surely be ejected. The machine will not operate to deliver goods if a coin of too low a denomination is inserted, but it will return that coin to the depositor. A coin cannot be inserted when the commodities are exhausted and the stack is empty. If two coins of proper value are deposited the machine will operate with one and hold the other until after goods have been delivered by the first and will then operate with the second to further deliver goods. If a coin is deposited when the finger plate is depressed that coin will be held until the finger piece has been returned to its normal position. No coin can be inserted after one has been put in until the mechanisms have made a complete movement and ejected the consideration for the first coin. The operating coin is held securely and cannot be shaken out of the position in which it locks the pusher and ejector together until after the goods have been delivered, at which time it will surely be directed to the coin drawer. The coins cannot be returned into the mechanism by tipping the machine up, or a coin cannot be inserted and afterward be drawn out of the machine by means of a string attached thereto.

The invention claimed is;

1. In a vending machine the combination of a slide, a rocking coin pusher, studs on the pusher for supporting a coin of the proper denomination, pins on the pusher for engaging the upper portion of the coin, means projecting from the slide and adapted to be engaged by the coin when held by the studs and pins, means on the pusher for pushing the coin from the studs and pins

when the pusher has made a complete stroke, and means for swinging the pusher.

2. In a vending machine the combination of a slide, a pusher, means for swinging the pusher, studs projecting from the pusher for supporting a coin of the proper size, means projecting from the slide and adapted to be engaged by a coin held by the studs, and a passage below said studs for receiving and discharging a coin too small to be supported by the studs.

3. In a vending machine the combination of a slide, a coin pusher, means for swinging the coin pusher, means carried by the pusher for holding a coin of the proper size and passing a coin of under size, means projecting from the slide and adapted to be engaged by a coin held by the pusher, and two chutes, one for receiving and discharging a coin too small to be retained by the pusher, and the other adapted to receive a coin pushed off from the pusher after it has made its complete stroke.

4. In a vending machine the combination of a reciprocatory slide with an opening therethrough for the passage of a coin, an oscillatory coin pusher with means for receiving a coin from said opening in the slide when the slide and pusher are in normal position of rest, means on the slide for preventing the passage of a coin to the coin retaining means in the pusher when the slide is out of normal position of rest, means on the pusher for preventing the passage of a coin through the opening in the slide when the pusher is out of normal position of rest, means for swinging the pusher, and means projecting from the slide and adapted to be engaged by a coin received by the pusher.

5. In a vending machine the combination of a slide, a coin pusher, means for moving the coin pusher, means on the coin pusher for retaining the coin in position to engage the slide, and means on the slide for lifting a second coin and retaining it until the first coin carried by the pusher has been released.

6. In a vending machine the combination of a slide, for ejecting goods, means for moving the slide when a coin of the proper denomination is inserted into the machine, and means carried by the slide for supporting a second coin during the movement of the slide and preventing this coin from passing into

operative position until the slide has ejected merchandise and returned to normal position.

7. In a vending machine the combination of a slide, nose-plates with an oblique opening between them depending from the slide, an oscillatory coin pusher, said pusher having means for retaining a coin when it passes down between said nose-plates and having a face adapted to draw the coin down through the space between the plates and push it therefrom and off from the supports into the collecting chute, and means for oscillating the pusher.

8. In a vending machine the combination of a slide, nose-plates depending from the slide with a space between them for the passage of a coin, an oscillatory coin pusher with means for supporting a coin in the space between the plates and a face for engaging the coin and drawing it from said space and pushing it off from the supports, and a latch adapted to support the coin until the pusher and slide have made a complete stroke.

9. In a vending machine the combination of a slide with a passage for a coin, a coin pusher adapted to support the coin with a portion in the coin passage of the slide, means for moving the coin pusher and causing the pusher to withdraw the coin from the slide passage and push it from its support, a ratchet and pawl for preventing the return of the coin pusher until it has made a full stroke, and means for supporting the coin after it has been dislodged from its supporting means until the pusher has made a full stroke and the ratchet and pawl are in such relation that the pusher is free to return.

10. In a vending machine the combination of a slide adapted to remove goods, a coin pusher, means for moving the coin pusher, means whereby the coin pusher may be connected with the slide by a coin, means for disengaging the coin from the pusher and preventing the return of the coin with the pusher, a coin chute for receiving the coin disengaged from the pusher, and a latch projecting into said coin chute and arranged to yield and permit the coin to drop down the chute but prevent the return upward of the coin after it has passed the latch.

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