Feb. 19, 1935. G. A. OLSEN 1,991,865

VENDING MACHINE

Filed Nov. 30, 1931 2 Sheets-Sheet 1

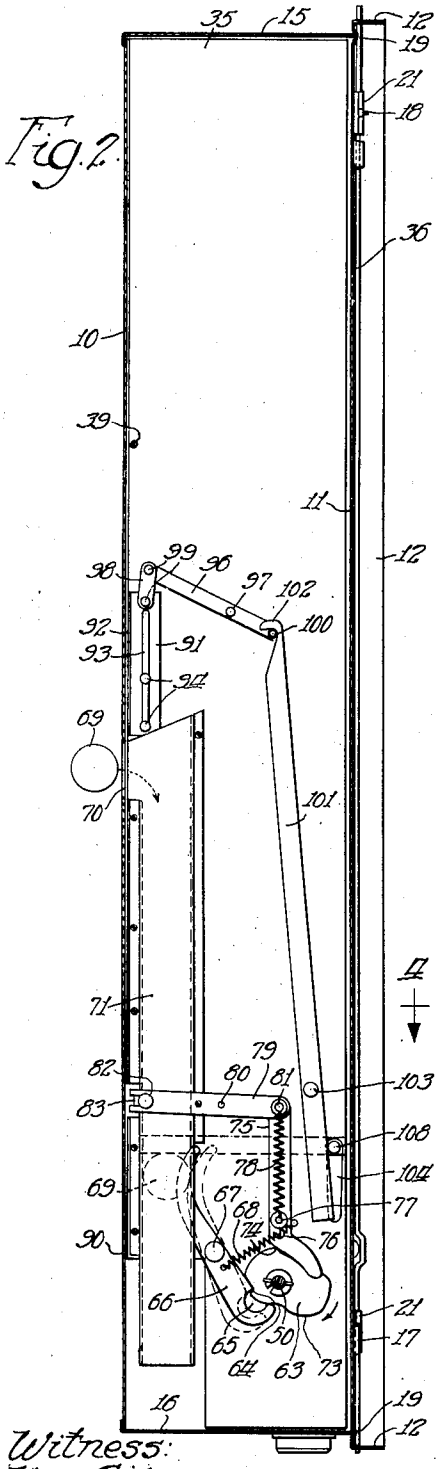


Fig. 2.

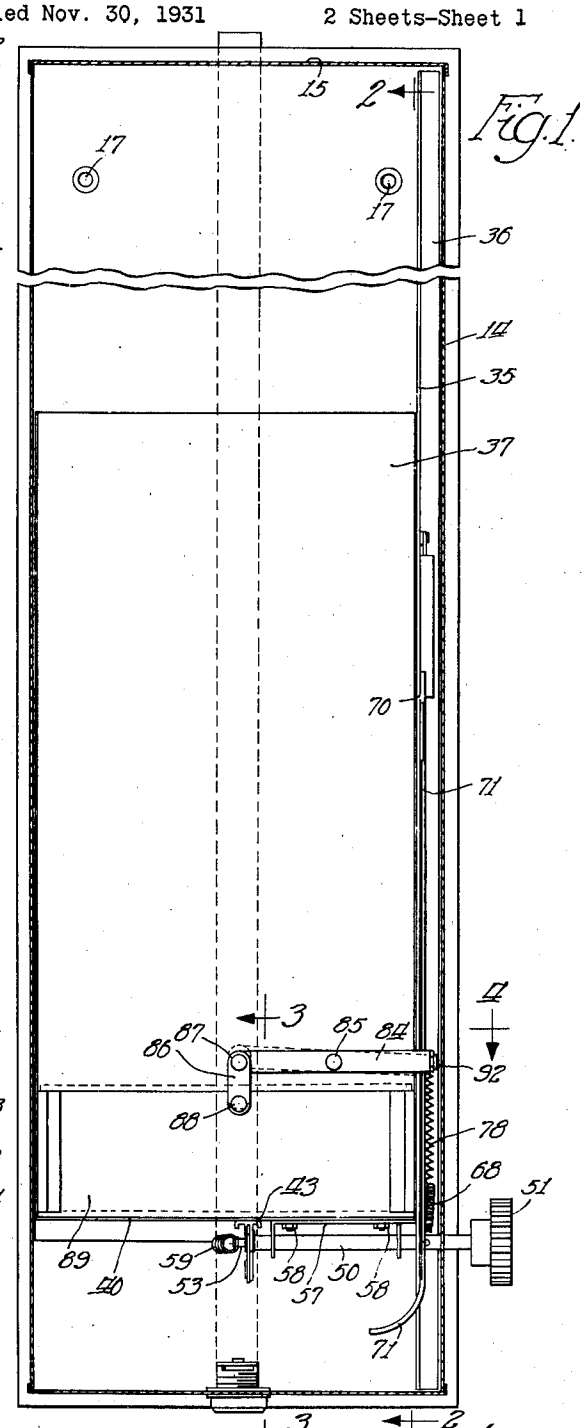


Fig. 1.

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Fig. 3.

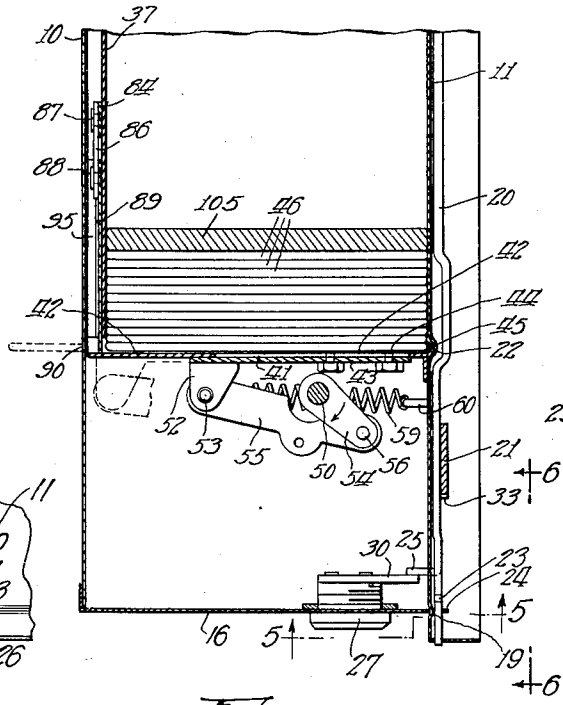


Fig. 5.

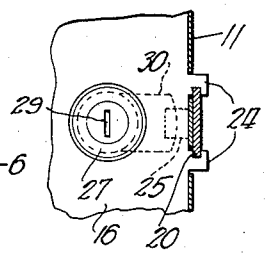


Fig. 6.

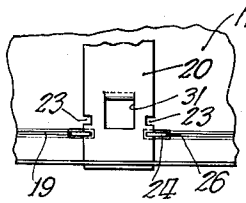
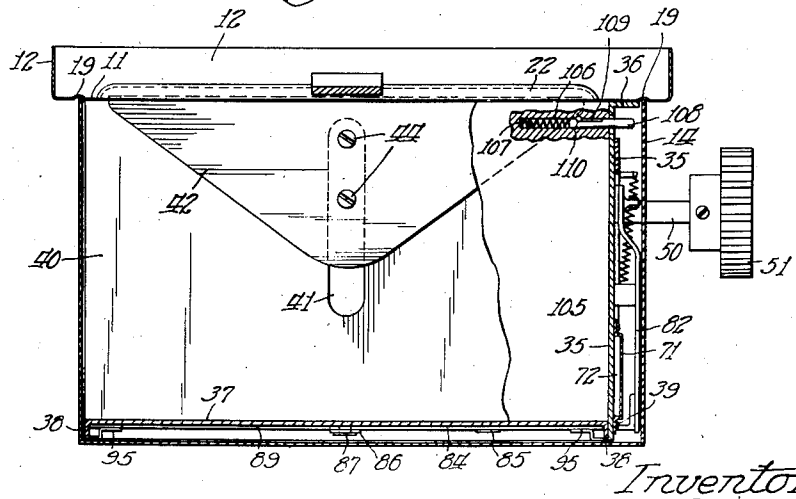


Fig. 4.



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UNITED STATES PATENT OFFICE

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VENDING MACHINE

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3 Claims. (Cl. 312—55)

The invention relates to vending machines, and may be more particularly associated with vending machines, wherein the actuating mechanism is released for operation upon the insertion of a coin.

The primary object of the invention is to provide an improved and relatively simple device of this character whereby upon the insertion of a coin of the correct denomination, the mechanism will be released for operation for the delivery of an article to a position where it is accessible for manual removal from the machine and which insures such delivery of but a single article with each operation.

Another object of the invention is to provide a vending machine of this type, further characterized by improved means for automatically resetting the operating mechanism after an article has been made accessible for removal by the purchaser.

Still another object of the invention is to provide an improved and simple cut-off mechanism for controlling and closing the coin receiving slot when the number of vendible articles contained in the machine has been reduced to a predetermined minimum.

The machine is particularly adapted for the delivery of articles such as towels, napkins and toilet paper folded from sheets of thin flexible paper and preferably arranged as a vertical stack with the lowermost article resting upon an ejector plate, and still another object of the invention is the provision of an improved ejector plate operable to positively engage one edge of the article being vended and to relieve the same of a substantial portion of the weight of the superimposed stack in order that such article may be slid from under the stack to a position where it is accessible to the purchaser.

Still another object is the provision of a vending device of the kind described which is simple in construction, economical to manufacture, easily assembled and satisfactory for its intended purpose.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts.

Fig. 1 is a transverse, vertical sectional view near the front and looking rearwardly of a vending machine embodying the principles of my invention;

Fig. 2 is a sectional view along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view along the line 3—3 of Fig. 1;

Fig. 4 is a sectional view along the line 4—4 of Fig. 1;

Fig. 5 is a view along the line 5—5 of Fig. 3; and

Fig. 6 is a view along the line 6—6 of Fig. 3.

Referring now more particularly to the drawings, in carrying out the present invention I employ an upright cabinet or housing 9 substantially square or rectangular in plan, and of any desired length. The housing or cabinet 9 comprises a front plate 10, a back plate 11, side plates 13 and 14, a top plate 15 and a bottom plate 16, the said plates being associated in any approved manner and the back plate 11 having a flanged edge 12 projecting rearwardly to stiffen and reenforce the cabinet. The cabinet 9 is made in such a form that it may be mounted upon a vertical wall by means of screws or bolts (not shown) adapted to project through holes 17, formed in the plate 11, for that purpose.

The rear edges of the side plates 13 and 14 and the top and bottom plates 15 and 16 respectively, are positioned in a marginal groove 19 extending entirely around the back plate 11. The back plate 11 is permanently fastened to the wall by means of bolts as described and the main body of the cabinet 9 is removable from the plate for the purpose of filling the cabinet with articles to be vended. The main body of the cabinet 9 is detachably fastened to the back plate 11 by means of a longitudinal bar 20, mounted on the rear of the plate with its ends projecting through the upper and lower portions of the flange 12. The intermediate portion of the bar 20 is held in close cooperating relation with the plate 11 by a pair of guide plates 21 having loops providing a runway for and permitting longitudinal movement of the bar. Each end of the bar 20 is provided with a pair of oppositely positioned notches 23. The longitudinal spacing of the pairs of notches 23 corresponds to the distance between the top plate 15 and the bottom plate 16. A pair of L-shaped extensions 24 on each of the plates 15 and 16 are adapted to be inserted through corresponding slots 26 in the plate 11 and through the notches 23 when the bar 20 is positioned with the notches in registry with the slots. The main body of the

cabinet or housing 9 is thereby easily mounted upon and removable from the back or wall plate 11 when the bar 20 is moved to a position where the notches 23 register with the slots 26. The cabinet 9 is fastened to the plate 11 by moving the bar 20 longitudinally so that the notches 23 are out of alignment with the L-shaped extensions 24 and the stem portions of the L-shaped extensions engage the bar 20.

Means is provided for locking the bar 20 against longitudinal movement and thereby preventing an unauthorized person from removing the cabinet 9 from its mounting and gaining access to the interior of the cabinet. For this purpose a vertical slot 31 is provided in the plate 11 near the bottom of the cabinet through which projects a pin 25, suitably mounted on the bar 20. The slot 31 permits the bar 20 to be moved longitudinally in an amount sufficient to operatively engage and disengage the L-shaped extensions 24. The bar 20 is shown in Fig. 3 in a position wherein the cabinet is fastened to the plate 11 and is locked in such position by means of a plate 30 which projects under the pin 25 and holds the bar against further downward movement. The bar 20 is shown in its maximum uppermost position, further upward movement of the bar being prevented by a rearwardly projecting pin 23 in contact with the adjacent plate 21.

The plate 30 is fastened on the end of a tumbler rod 27 of a Yale or similar lock mounted on the bottom plate 16. A key socket 29 permits the tumbler rod 27 to be actuated by a key (not shown) to move the plate 30 into and out of engagement with the pin 25. The device is operable to effectively lock the cabinet and to permit its unlocking only by the use of a suitable key. Further detailed description of the locking mechanism is omitted since such mechanism is not claimed as a part of the invention.

The removal of the main portion of the cabinet 9 gives access to a receptacle, mounted on the wall plate 11, adapted to contain a stack of articles 46 to be vended such as paper towels, napkins or the like. The plate 11 forms the rear wall of the receptacle and a plate 35, extending substantially to the top of the cabinet 9 and positioned adjacent to and parallel with the plate 14 forms a side wall of the receptacle. The plate 35 has a flanged edge 36 by means of which it is fastened to the back plate 11 by welding or the like. A shutter plate 37, arranged in parallel spaced apart relation to the front plate 10, forms the front wall of the receptacle leaving the remaining side open for easy insertion or removal of articles 46. A plate 40 provides the bottom wall of the receptacle and the plate 37 stops short of the plate 40 to provide an opening through which the lower article 46 is moved in delivering the same to the purchaser.

The plate 40 also serves as a mounting for an ejector plate 42, operable to deliver the lowermost one of the stack of articles 46 to the position shown in dotted lines in Fig. 3, in which position it is accessible for manual removal by the purchaser. The ejector plate 42 has its rear edge turned upwardly to provide a curved flange 45 positioned to engage the rear edge of the bottom article 46 and to carry a substantial portion of the weight of the superimposed articles as the plate is advanced to discharge the bottom article. The curved flange 45 is normally positioned in a transversely extending groove 22 in the plate 11 and is retracted sufficiently that the flange clears the articles 46 as they in turn move down to replace the article last ejected.

Mechanism for actuating the ejector plate 42, is positioned adjacent to and below the bottom of the receptacle containing the articles 46. The mechanism includes a bar 43, mounted on the lower face of the plate 40, and connected with the ejector plate 42 by a pair of screw bolts 44 projecting through a slot 41 formed in the plate 40. A shaft 50 extends underneath the plate 40 and is journalled in the downwardly projecting ends of a U-shaped member 57, fastened to the plate 40 by bolts 58. The shaft 50 projects through the plates 35 and 14 and has a knob 51 mounted on its outer end by means of which the shaft is manually rotatable. The inner end of the shaft 50 has a crank arm 54 fixedly mounted thereon and the bar 43 has a pair of spaced apart members 52 projecting downwardly with which the arm 54 is connected by a link 55. The link 55 has a pivot connection 53 with the projections 52 and a pivot connection 56 with the arm 54. Rotation of the shaft 50 and of the arm 54, in clockwise direction as observed in Fig. 3, moves the member 43 and the ejector plate 41 forwardly to their dotted line positions. The length of the slot 41 is such that only a limited rotation of the shaft 50 is permitted by reason of the contact of the forward one of the screw bolts 44 with the front end wall of the slot. A retractile spring 59, having one end fastened to the pivot pin 53 and the other end fastened to the wall plate 11 by means of a hook 60, serves to move the ejector plate 41 and its operating mechanism including the shaft 50 back to its initial position upon release of the shaft.

A cam plate 63, fixedly mounted on the shaft 50, normally locks the shaft against rotation in clockwise direction as observed in Figs. 2 and 3. Rotation of the shaft in counter-clockwise direction is prevented by contact of the ejector plate 42 with the rear wall plate 11. The plate 63 normally locks the shaft 50 against rotation in clockwise direction by means of a shoulder 64 formed on the plate and projecting into a recess 65 in the lower end of a lever 66. The lever 66 is mounted on a pivot 67 and is normally held in its full line position, wherein it has locking engagement with the shoulder 64, by means of a spring 68. Movement of the lever 66 to its dotted line position of Fig. 2 disengages the lever and the shoulder 64 and permits the shaft 50 to be rotated an amount determined by the length of the slot 41 in the bottom plate 40 of the receptacle.

The lever 66 is movable to its dotted line position only by inserting a coin 69 through a slot 70 in the front plate 10. A plate 71 is mounted on the outer face of the plate 35 to form a conduit 72 through which the coin falls to its dotted line position of Fig. 2. The upper end of the lever 66 normally projects into the conduit 72 in the path of the coin. The momentum of the descending coin 69 is such that its contact with the lever 66 moves the lever to its dotted line position against the resistance of the spring 68. The resistance of the spring 68 is such that movement of the lever 66 resulting from contact of the coin 69 therewith is stopped at the indicated dotted line position, in which position the coin remains in the slot 72. The lower edge portion 73 of the plate 63 provides a cam surface which contacts with the lower end of the lever 66 as the shaft 50 is further rotated and moves the lever to a position where the coin 69 is released and permitted to drop and be discharged into

the space between the plate 40 and the bottom plate 16 of the cabinet.

The described rotation of the shaft 50 and the resulting movement of the ejector plate 42 operates to force the lowermost article 46 through the opening between the lower end of the plate 37 and the bottom plate 40 and thence out through a slot 90 provided for that purpose in the front plate 10 in alignment with the opening. The opening between the plate 37 and the plate 40 is normally closed by a gate 89 provided to prevent the surreptitious removal of articles by the insertion of an instrument through the slot 90 without first inserting a coin. The initial rotation of the shaft 50 actuates means operable to open the gate 89 and permit the bottom article 46 of the stack to be moved through the opening between the plates 37 and 40. The means for opening and closing the gate 89 includes a cam member 74, forming a portion of the plate 63, so arranged as to move a bar 75 with which it contacts as the shaft 50 is rotated. A pin 77, mounted on the plate 35 and projecting through a slot 76 formed in the bar 75, permits a limited longitudinal movement of the bar by reason of the camming action of the member 74. The upper end of the bar 75 is connected with a lever 79 by means of a pivot pin 81. A tensile spring 78, having one end fastened to the fixed pin 77 and the other end fastened to the pivot pin 81, tends to hold the bar 75 in the position shown in Fig. 2. Rotation of the shaft 50 and the cam member 74 forces the bar 75 upwardly against the resistance of the spring 78 and causes a corresponding rotation of the lever 79 about its pivot pin 80 with the result that the upward movement of the bar 75 causes a corresponding downward movement of the forward end of the lever 79. The forward end of the lever 79 is provided with a slot 83 in which is positioned a pivot pin 82, fixedly mounted on the inturned end of a lever 84. The lever 84 is pivotally mounted on a pin 85, projecting from the front face of the plate 37 and has the end opposite to the pin 82 connected with the gate 89 by a link 86. The link 86 has a pivot connection 87 with the lever 84 and a pivot connection 88 with the gate 89. The movement of the lever 79, resulting from the upward movement of the bar 75, causes the end of the lever 84 opposite to the pivot pin 82 to be elevated. The described levers, links and pivots comprise means operable to open the gate 89 upon initial rotation of the shaft 50 and upon return of the shaft to its normal inoperative position the tensile spring 78 actuates said means in the opposite direction to cause the gate 89 to close.

Mechanism is provided for closing the coin receiving slot 70 when the number of vendible articles 46 has been reduced to a predetermined minimum. The mechanism includes a plate 105 of substantial thickness and weight which is placed on top of the stack of articles 46 and descends therewith as the height of the stack is reduced by vending the bottom articles in turn. A hole 106 in one edge of the plate 105 contains a pin 108 and a compression spring 107 normally tending to force the pin out of the hole. The pin 108 has a groove 109 through which extends a relatively small pin 110. The pin 110 serves as a stop member operable to limit the longitudinal movement of the pin 108 and is so arranged that the pin 108 may be retracted to a point where its outer end is in alignment with the edge of the plate 105 and also permits it to take the position indicated in Fig. 4. The plate 105 is positioned on top of the stack of articles 46 with its edge in contact with the plate 105 in which position the pin 108 is contained entirely within the hole 106. The weight of the plate 105 is such that the pin 108 is held in its retracted position by contact of the pin with the face of the plate 35. A slot 104 is formed in the plate 35 underneath the pin 108 and is so positioned that as the plate 105 moves downwardly the hole 106 will register with the slot 104 and as a result the spring 107 will force the pin 108 outwardly through the slot 104 to the position shown in Fig. 4. The top of the slot 104 is enlarged to insure that the pin 108 will enter the slot notwithstanding slight displacement of the plate 105 forwardly or rearwardly of the receptacle.

Continued vending of the articles 46 will cause a corresponding lowering of the plate 105 and as the plate descends the pin 108 moves downwardly in the slot 104 into engagement with the lower end of a lever 101. The lever 101 is mounted on a pivot 103 intermediate its ends and as a result the descending pin 108 rotates the upper end of the lever 101 in clockwise direction as observed in Fig. 2. A hook 102 on the upper end of the lever 101 engages a pin 100 on the adjacent end of a lever 96. The lever 96 is pivotally mounted on a pin 97 and has a plate 91 suspended from its end opposite to the pin 100. The plate 91 is suspended from the lever 96 by means of a link 98 which is pivotally connected to the lever 96 and the plate 91 by a pair of pivot pins 99. The plate 91 is provided with a flanged edge 92 normally positioned above and in vertical alignment with the coin slot 70. When the pin 108, projecting from the plate 105, has moved down in the slot 104 to a point where the lever 101 is rotated to disengage the hook 102 from the pin 100, the weight of the plate 91 will cause it to drop and the flanged portion 92 of the plate will close the coin slot 70. The plate 91 contains a vertical slot 93 through which project a pair of vertically aligned pins 94. The pins 94 serve as guides keeping the plate 91 in vertical position and also preventing movement of the plate should pressure be exerted thereon by inserting an article through the slot 70 when the plate has dropped to a position closing the slot. The device is rendered inoperative by the closing of the slot 70 and again becomes operative only by the removal of the cabinet 9 to replenish the supply of articles and to again connect the lever 96 with the lever 101 in order that the slot 70 may be open to receive a coin.

Thus it will be seen that I have provided a vending machine having an ejector plate of novel construction, novel mechanism for actuating the ejector plate as well as novel and simple cut-off mechanism for controlling and closing the coin receiving slot when the number of vendible articles has been reduced to a predetermined minimum.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a vending machine of the kind described wherein a housing having a slot and vending mechanism is provided for dispensing articles one

at a time through the slot, the combination of a gate member located adjacent the slot for normally closing it, a bar pivotally and slidably mounted in the machine and operatively related to said vending mechanism, a plurality of levers including a link providing a connection between said bar and gate member whereby to effect simultaneous movement of the gate member to open the slot upon operation of the vending mechanism, and means for effecting immediate movement of the gate to gradually close the slot during the return movement of the vending mechanism to its normal operative position.

2. In a vending machine of the kind described wherein a housing having a slot and vending mechanism is provided for dispensing articles one at a time through said slot, the combination of a gate member located near the slot for normally closing it, a cam element movably mounted in said housing, a plurality of levers pivotally connected to each other horizontally arranged and pivotally mounted on said housing, a link providing a connection between one of said plurality of levers and said gate, and a bar pivotally and slidably mounted in said housing and having one end pivotally connected to an end of one of said plurality of levers and the other end normally engageable with said cam in a manner whereby movement of said gate to a closed or open position may be effected by operation of the cam.

3. In a vending machine of the kind described wherein a housing having a slot and vending mechanism is provided for dispensing articles one at a time through said slot, the combination of a gate member located near the slot for normally closing it, a cam element rotatably mounted in said housing, a plurality of levers operatively connected and horizontally arranged at right angles to each other and pivotally connected to said housing, a link providing an operable connection between one of said levers and said gate member, and a bar pivotally and slidably connected to said housing and with one end connected to the other of said levers and the other end normally and frictionally engaging said cam in a manner whereby movement of said gate to a closed or open position may be effected by operation of the cam.

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