Dec. 11, 1928. 1,694,599

C. LEA

VENDING MACHINE

Filed Feb. 3, 1922 3 Sheets-Sheet 1

Fig. 1.

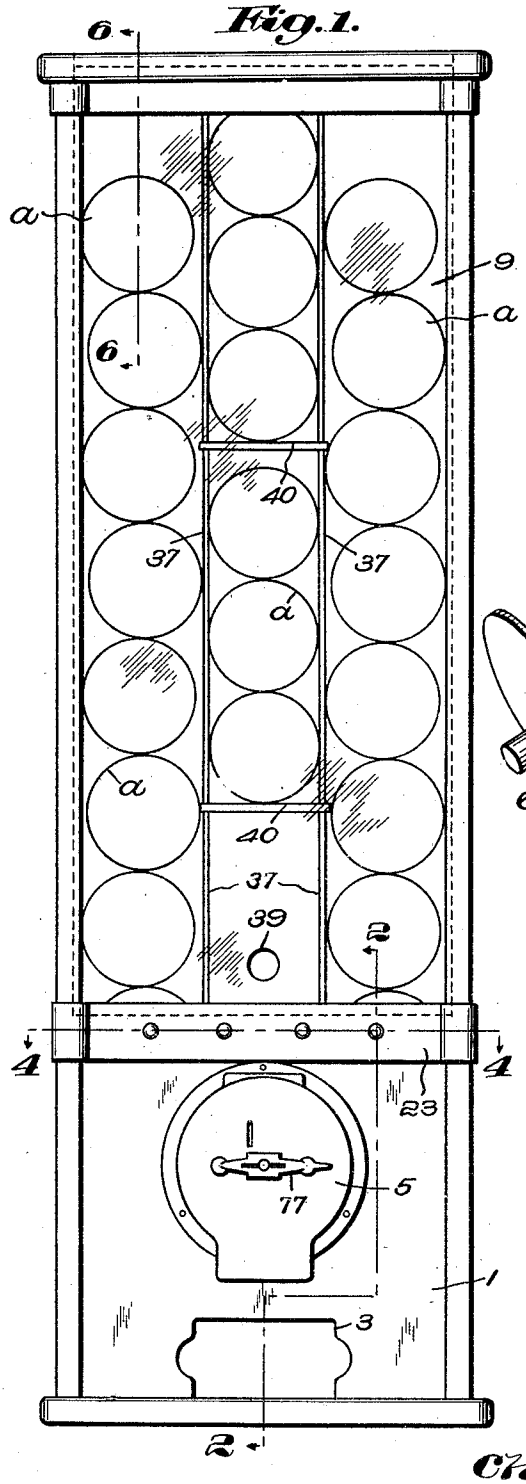


Fig. 3.

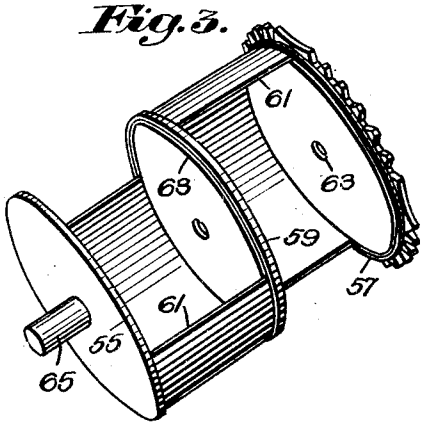
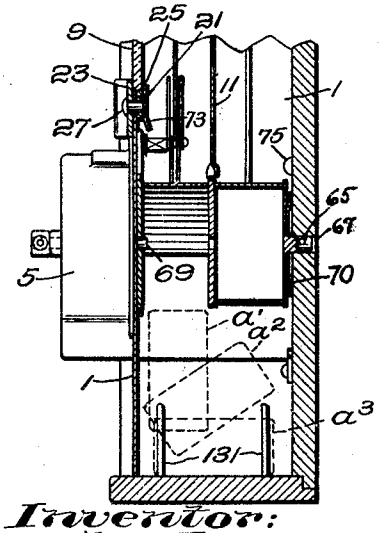


Fig. 2.



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VENDING MACHINE

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Fig. 4.

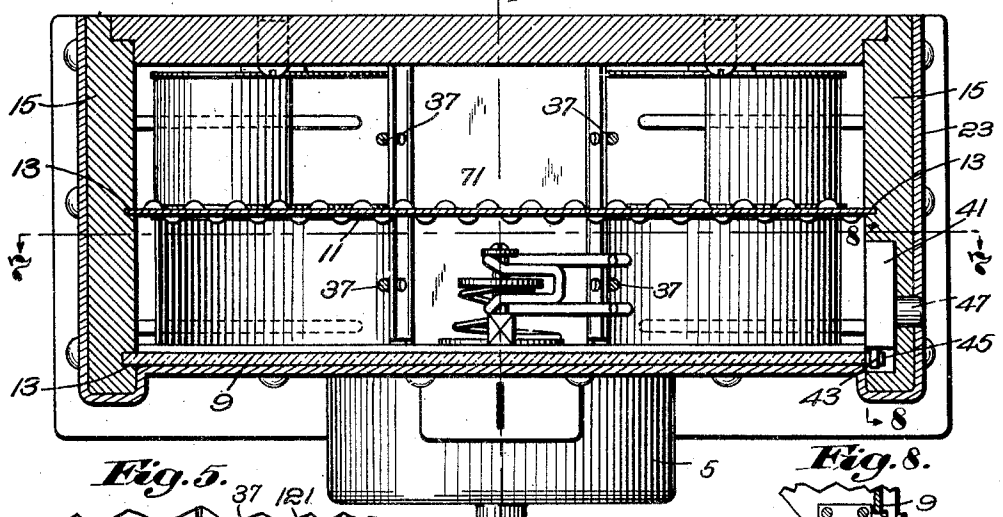


Fig. 5.

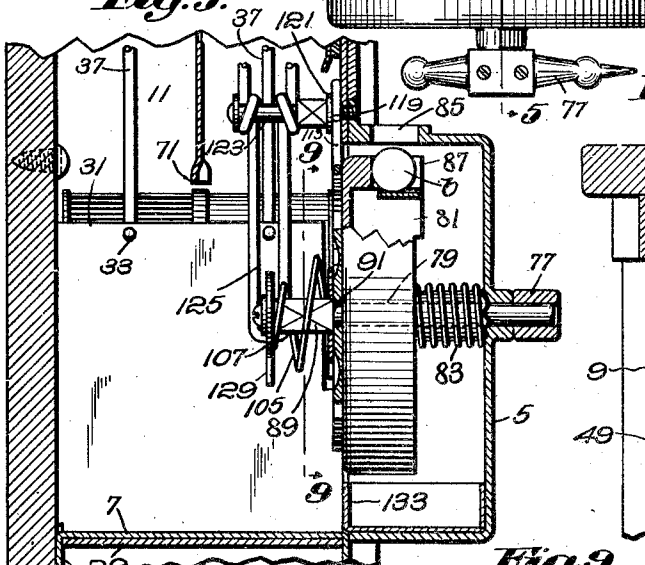


Fig. 8.

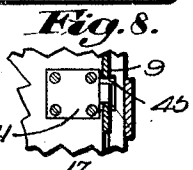


Fig. 6.

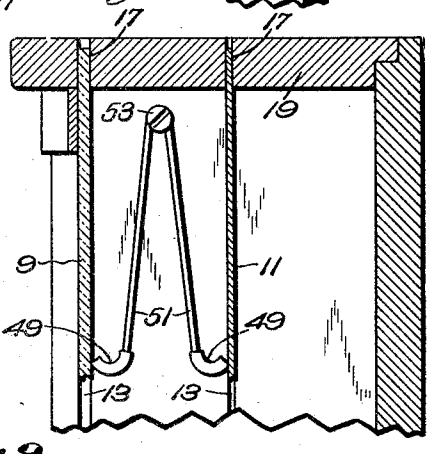


Fig. 9.

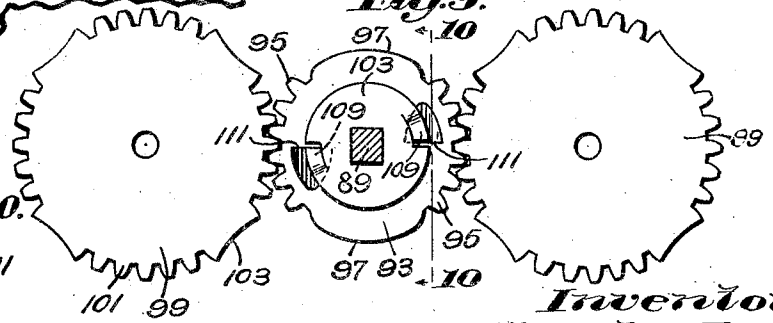
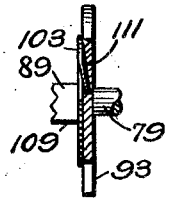


Fig. 10.



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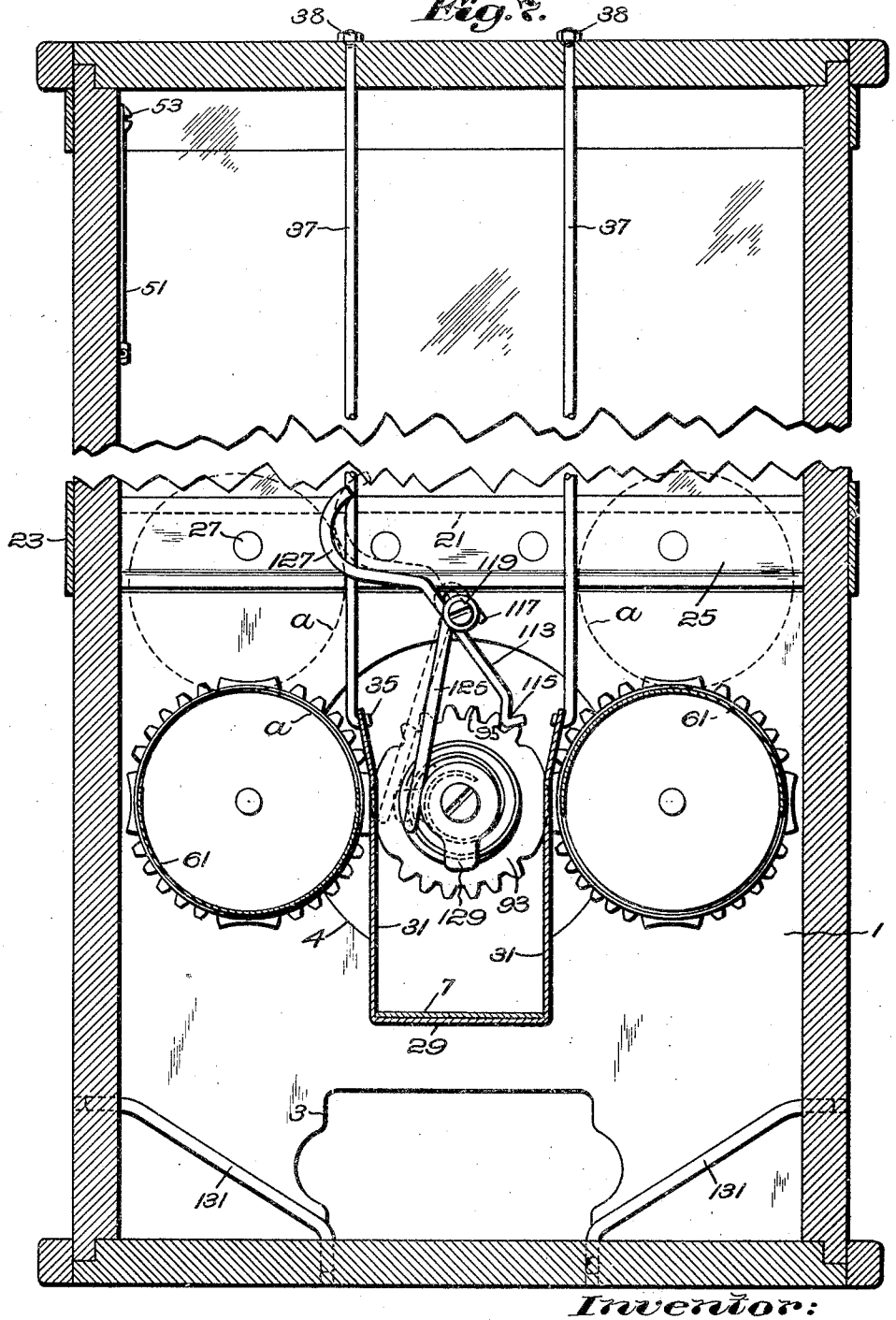
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VENDING MACHINE

Filed Feb. 3, 1922 3 Sheets-Sheet 3

Fig. 2.



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Patented Dec. 11, 1928. 1,694,599

UNITED STATES PATENT OFFICE.

CHARLES LEA, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE AUTOMATIC MERCHANDIZER, INC., OF BOSTON, MASSACHUSETTS, A CORPORATION OF DELAWARE.

VENDING MACHINE.

Application filed February 3, 1922. Serial No. 533,859.

My invention relates to vending machines and will be best understood from the accompanying drawings and following description of one specific embodiment thereof selected for purposes of illustration, while its scope will be particularly pointed out in the appended claims.

In the drawings:—

Fig. 1 is a front elevation of a vending machine;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a perspective of one of the members for discharging material from the vending machine;

Fig. 4 is a section on the line 4—4 of Fig. 1;

Fig. 5 is a section on the line 5—5 of Fig. 4, parts being omitted;

Fig. 6 is a section on the line 6—6 of Fig. 1;

Fig. 7 is a section on the line 7—7 of Fig. 4 with parts broken away;

Fig. 8 is a section on the line 8—8 of Fig. 4;

Fig. 9 is a section on the line 9—9 of Fig. 5 with parts omitted; and

Fig. 10 is a section on the line 10—10 of Fig. 9.

In the embodiment selected for illustrating my invention I have shown a machine arranged for vending cylindrically shaped cans. It will be understood, however, that my invention is not limited to machines for vending cans but that it includes machines for vending other articles and those of a different shape.

Referring particularly to Figs. 1, 2, 4, 5, 6 and 7 of the drawings, I have provided a cabinet constructed to be mounted against a wall or the like and in which cabinet the back, the sides, the top and the bottom are constructed preferably but not necessarily of wood.

Considering the front of the cabinet, the lower portion thereof is closed by a plate 1, preferably of metal, which plate is secured to the bottom and sides of the cabinet in any suitable manner. The bottom edge of this plate is notched out to form the orifice 3 through which the articles to be vended, hereinafter called cans, are removed. Above the orifice the plate is cut away to form an opening 4, which opening conforms to and is closed by the casing 5 of the coin controlled releasing mechanism secured to the plate. Part of the material removed to provide the opening 4 is retained in the form of a strip 7, which is bent inwardly and is secured to the back of the cabinet by the screws 8. The upper portion of the front of the cabinet is provided with a glass or metal plate 9 or if desired a metal plate with a glass sight in front of the central stack of cans as viewed in Fig. 1.

The diaphragm afforded by the plate 9 and a second diaphragm 11 are carried in grooves 13 formed in the side walls 15 of the cabinet and are placed in position by lowering the diaphragms through the slots 17 in the top 19 of the cabinet. The lower end of the diaphragm 11 is normally supported in the position shown by Figs. 1, 2 and 5, this position being determined by the lengths of the grooves 13 for receiving the diaphragm 11. The lower end of the diaphragm 9 normally rests on a bar 21 extending across the front of the cabinet in contiguous relation with the top of the plate 1. For supporting the bar 21 a heavy metal band 23 is provided which extends across the front of the cabinet and has side portions conforming to and secured to the side walls 15. For forming a groove for receiving the bottom of the diaphragm 9, the band 23 extends above the top of the bar 21 and at the inner side of the bar 21 is provided a strip 25 likewise extending above the top of the bar 21. The band 23, the plate 1, the bar 21 and the strip 25 are all secured together by rivets 27.

Below the strip 7 and in contact therewith I place a plate 29 which has the up-turned portions 31. The plate 29 and its up-turned portions 31 are of approximately the same depth as the cabinet, while the distance between the adjacent surfaces of the up-turned portions is that of the width of the plate 7, which construction is clearly shown by Figs. 5 and 7.

Passing through spaced holes 33 positioned adjacent the upper edges of the portions 31 of the plate 29 are the hooked ends 35 of

rods 37. These rods extend through the top of the cabinet, the extending portions being screw-threaded to receive nuts 38. By tightening the nuts, the plate 29 will be pulled firmly against the plate 7 and thereby will be provided a substantially rigid support for the rods 37.

It will be noticed by the construction just described that the space between the back wall of the cabinet and the diaphragm 11, and the space between the diaphragm 11 and the diaphragm 9, are each divided into a plurality of spaces by the rods 37. In banks of hoppers thus formed I have shown cans *a* stacked with their axes arranged horizontally. It will be noticed that I have provided a plurality of banks of stacks or hoppers.

At spaced points along the rods 37 I provide cross bars 40 which are supported at opposite ends by the rods. In the four stacks between the rods 37 I may store articles which may when necessary be removed and placed in the stacks at the remote sides of the rods 37 or when the diaphragm 9 is wholly or partly of glass use this space for display purposes.

The machine may be charged by raising the diaphragms 9 and 11. For facilitating the raising of the diaphragms, I provide each with a finger hole 39, one of which is shown in Fig. 1. For preventing unauthorized tampering with the contents of the vending machine I provide a lock 41 for the diaphragm 9, which lock is mortised into the side wall 15 while the keeper 43 of the lock engages a notch 45 in the edge of the diaphragm adjacent its lower end. The stem 47 of the lock extends through a suitable perforation in the band 23, which band thereby serves as an escutcheon for the lock and prevents tampering therewith.

For holding the diaphragms in their raised position I may provide any suitable catch. Referring to Figs. 6 and 7 I have shown for this purpose a spring wire bent to form the hooked ends 49 and the legs 51. The catch is so constructed that it may be secured by a screw 53 to the upper portion of one of the side walls of the cabinet and in such manner that the upper ends of the portions 51 are rigidly fixed to the side wall, while the ends of the hooked portions yieldingly bear against the surfaces of the diaphragms. As will be obvious, when the diaphragms are raised to bring their lower edges past the hooked portions of the catches, said hooked portions will snap under the lower edges of the diaphragms and will thus prevent the diaphragms from descending until the diaphragms are raised slightly and the catches released.

Beneath the lower ends of the two stacks on each side of the machine I mount a rotary member which serves as a closure for the stacks and which when rotated will serve to discharge the lowermost can from the stack. This member is best illustrated by Figs. 3. It consists of a back plate 55, a front plate 57 and an intermediate plate 59, the plates being in the form of disks and being spaced aproximately equal distances apart by means of curved plates 61. For securing the plates 61 to the plates 55, 57 and 59, each of the latter has formed therein a shallow groove 63 into which the curved edges of the plates 61 are inserted and after insertion soldered to the plates. It will be noticed by this construction that the member illustrated by Fig. 3 comprises pockets which are spaced with relation to each other both longitudinally of the member and angularly thereof.

For supporting the members described by the above paragraph the plate 57 of said member is provided with an opening 63, while the plate 55 carries the trunnion 65. The trunnion 65 is mounted in a hole 67 in the back wall of the cabinet while the plate 1 carries a trunnion 69 which is received by the opening 63 of the plate 57. For preventing longitudinal motion of the members I provide a bow-shaped spring 70 which is perforated to receive the trunnion 65. The ends of the spring bear against the back of the cabinet and the center of the spring against the discharge member adjacent the trunnion.

It will be noticed by reference to Fig. 7, that when the plates 61 of the members are turned to the position shown at the left of said figure, a can will move into the pocket afforded by the member and that this will support the stack of cans. It will also be noticed that when the plate 61 is in the position illustrated at the right of Fig. 7, the can will fall from the pockets and that the stack will be supported by the convex side of the plate.

For guiding the cans into the pockets of the discharge member I have shown the bottom of the diaphragm 11 formed to provide corrugations 71, and the lower portion of the strip 25 bent inwardly as shown at 73 in Fig. 2, while on the back wall I provide the screws 75, the heads of which constitute a guide.

In the present embodiment of my invention the two discharge members are operated by means of a handle 77 on the exterior of the casing 5 of the coin controlled mechanism. Mounted in the casing is a shaft 79 which carries the handle and also a drum 81. The shaft and parts carried thereby are biased towards the position shown by Fig. 1 by means of a torsion spring 83. The casing is provided with a slot 85 through which the coin *b* is inserted, which coin is received by a slot 87 in the drum. It will be noticed by this construction that the coin may be only inserted in the coin controlled mechanism when the

parts are in the initial position illustrated by Figs. 1 and 5 and that the handle 77 after the drum is released may be turned by the operator to its final position, whence on release by the operator it will return to its initial position.

The inner portion 89 of the shaft 79 I have shown as square in cross section and of larger diameter than the main portion of the shaft, whereby is afforded a shoulder 91. Carried by the shaft, adjacent the shoulder is a disk 93, which disk is provided at its periphery with two sets of gear teeth 95 separated by plain cylindrical surfaces 97. This disk forms the driving element of the Geneva-stop. The driven members of the Geneva-stop are provided by the disks 99 carried on the plates 57 of the discharge members. The disks 99 as clearly illustrated by Fig. 9 are provided with four sets of gear teeth 101 separated by concave portions 103. The concave portions 103 and the convex portions 97 of the disk 93 are of the same radius, in order that when the surfaces 97 and 93 are in mesh, the disk 99 will be prevented from rotation.

On the portion of the shaft of square cross section is mounted a disk 103 held yieldingly against the disk 93 by means of a spring 105, the outer end of the spring abutting a washer 107 carried at the end of said portion. The disk 103 is slotted as is illustrated by Figs. 9 and 10 and the material adjacent the slots is bent away from the disk to form ratchet lugs 109. The side of the disk 93 in contact with the disk 103 and toward which side the ratchet lugs extend is milled out to provide the ratchet shoulders 111, which shoulders are engaged by the ratchet lugs when the disk 103 is rotated clockwise as viewed in Fig. 9.

To prevent retrograde movement of the disk 93 I provide a pawl 113 in the form of a wire having a V-shaped end 115 which engages the teeth 95 of said disk. The opposite end portion of the wire 113 is bent parallel to the body portion of the wire. The U-shaped end portion of the wire thus formed embraces the stud 119 and after being adjusted to properly function with the teeth 95 is clamped in position by tightening the stud, which clamps the sides of the U-shaped end between the washer 121 carried by the stud and the plate 1 of the cabinet.

It will be noticed by the above described construction that with the parts in the position shown by Figs. 1, 5 and 7, if a coin is inserted to the slots 85 to release the handle 77, said handle may be turned to cause the ratchet lugs 108 of the disk 103 to engage the ratchet shoulders 111 of the disk 97, which will cause the toothed portion of the disk 97 to engage the toothed portions 101 of the disks 99 and thereby turn the discharge members. When the handle is released the shaft will return to its initial movement under the influence of the torsion spring 83 and during this movement the ratchet lugs ride over the ratchet shoulders.

The parts are so positioned that when the handle is in its initial position the curved surfaces 97 and 103 are in engagement as illustrated by Fig. 7 and this prevents turning of the discharge members in that position of the handle. The two discharge members are so positioned as to bring the pockets under the same bank of stacks 180 degrees apart and the gearing is constructed so as to turn each member 90 degrees each time the handle is operated. From this it follows that the bottom can of the several stacks will be discharged successively.

On the inner end 123 of the stud 119 above referred to I pivot a lever formed of a bent wire, the lower end of the lever forming a bail 125 while the upper ends of the wire are bent each to provide a curved portion 127 situated in the paths of the cans a of one of the stacks. The collar 107 above referred to is provided with an arm 129 while the washer is held in non-rotatable relation to the shaft by any suitable construction. It will be noticed from Fig. 7 that the lever just described is so positioned with relation to its fulcrum that it tends to swing towards the arm 129 by gravity and that it is prevented from so doing as long as there is a can adjacent the ends 127. As indicated by Fig. 7 when the last can falls into the pocket of the discharge member the bail 125 of the lever will move into the path of the arm 129 and thus prevent the shaft 79 from returning to its initial position. From this it results that when the machine has discharged all but one can a coin cannot be inserted through the slot 85.

When the cans fall from the pockets of the discharging members they are guided downwardly by the side walls of the cabinet and the portions 31 of the plate 29 toward the bottom of the cabinet. To cause the cans when discharged from the discharge mechanism to move in front of the opening 3 and also to turn them on end so that they will pass beneath the plate 29, which plate is spaced from the bottom of the cabinet a distance less than the diameter of the cans, and so that they will not move away from in front of the opening, I support at each side of the bottom corners of the cabinet a pair of obliquely positioned obstructions in the form of bars 131. As illustrated by Figs. 2 and 7, when a cam falls from the discharge mechanism, the side of the cylindrical surface of the can will strike one of the bars 131, the can in this position being illustrated at a' in Fig. 2. The can then turns into the position a^2 which brings its end surface on to the opposite bar 131. The can then slides down the bars 131 into the position a^3 on the bottom of the cabinet and stops moving in front of the opening, the bars at the opposite side of the machine insuring the latter.

Referring to Fig. 5, it will be noticed that I have provided in the bottom of the casing 5 a tray 133 for receiving the coins inserted into the casing. The plate 7 and the plate 29 with the portions 31 of the latter prevent access to the tray and mechanism in the casing 5 by way of the orifice 3.

Although I have described for purposes of illustration one specific embodiment of my invention it is to be understood that I am not limited to the mechanical details of this embodiment but that within the spirit of my invention wide deviations may be made from this embodiment without departing from the spirit of my invention.

I claim:

1. A vending machine having, in combination, a plurality of hoppers for the articles to be vended, a plurality of mechanisms operative to permit discharge of articles from said hoppers, actuating means for said mechanisms comprising Geneva-stop-motion-means connecting said mechanisms to each other, and a single operating member for said Geneva-stop-motion-means.

2. A vending machine having, in combination, a plurality of hoppers for the articles to be vended, article discharge mechanism for each hopper, a separate gear for operating each mechanism, each gear having a set of teeth separated by a concave element of a Geneva-stop, the number of said sets of teeth and concave elements corresponding to the number of hoppers, a gear having a set of teeth and a convex element of a Geneva-stop meshing with said separate gears, and means for rotating the last mentioned gear.

3. A vending machine, having, in combination, a plurality of discharge mechanisms for the articles to be vended, actuating means for said mechanisms including gears connecting said mechanisms each to the other for moving them simultaneously, one of said gears having sets of teeth separated by concave elements of a Geneva-stop, the number of said sets of teeth and of said concave elements corresponding to the number of discharge mechanisms, and a driving gear having sets of teeth and a convex element of a Geneva-stop meshing with the said one of said gears.

4. A vending machine having, in combination, an operating shaft having an oscillatory motion, the rotary driving element of a Geneva-stop, a pawl and ratchet connection between said shaft and said element for actuating said driving element in but one direction, a hopper for the articles to be vended, discharge mechanism for said hopper, and a rotary driven element of a Geneva-stop meshing with said driving element and operating said discharge mechanism.

5. A vending machine having, in combination, an operating shaft having an oscillatory motion, the rotary driving element of a Geneva-stop, a pawl and ratchet connection between said shaft and said element for actuating said element in but one direction, means for preventing retrograde motion of said element, a hopper for the articles to be vended, discharge mechanism for said hopper, and a rotary driven element of a Geneva-stop meshing with said driving element and operating said discharge mechanism.

6. A vending machine having, in combination, an operating shaft having an oscillatory motion, the rotary driving element of a Geneva-stop, a pawl and ratchet connection between said shaft and said element for actuating said element in but one direction, a pawl engaging the teeth of said element and preventing retrograde motion thereof, a hopper for the articles to be vended, discharge mechanism for said hopper, and a rotary driven element of a Geneva-stop meshing with said driving element and operating said discharge mechanism.

7. A vending machine having, in combination, means for maintaining a pair of stacks of articles, rotary gates beneath said stacks, said gates being formed for effecting discharge of articles from said stacks when rotated, a gear carried by each gate, said gears comprising sets of gear teeth separated by concave parts, a single gear for turning the first mentioned gears, said single gear having sets of teeth separated by convex parts for meshing with said sets of teeth and concave parts of said first mentioned gears, an operating handle having a reciprocatory motion, and means causing said handle to rotate said single gear when moving in one direction.

8. A vending machine having, in combination, means for maintaining a plurality of stacks of articles, a pair of rotary gates, each gate having parts for controlling the discharge of articles from a plurality of said stacks when rotated, a gear carried by each gate, said gears comprising sets of gear teeth separated by concave parts, the number of sets of teeth and concave elements each corresponding to the total number of stacks, a single gear for turning the first mentioned gears, said single gear having two sets of teeth separated by two convex parts for meshing with said sets of teeth and concave parts of said first mentioned gears, an operating handle having a reciprocatory motion, and means causing said handle to rotate said single gear when moving in one direction.

9. In a vending machine, a hopper for substantially cylindrical articles to be vended, said hopper having means for maintaining said articles with their axes substantially horizontal, a discharge orifice through which articles are to be removed from the machine, means for permitting said articles to fall by gravity from said hopper, and means for en-

gaging said articles when falling to cause them to be thrown and stood on end in front of said orifice.

10. In a vending machine, a hopper for cylindrical articles, means for discharging said articles, and a pair of inclined bars arranged in the path of said articles when being discharged and so located as to stand the articles on end.

11. A vending machine having, in combination, a hopper for the articles to be vended, a rotary gate for controlling the discharge from said hopper, said gate having positions in which it is operative to discharge articles and positions in which it is inoperative to discharge articles, means including mechanism for rotating said gate step by step from one of said positions to the other, said mechanism comprising a mutilated gear having concave peripheral portions corresponding in number to the inoperative positions of said gate and having gear teeth at opposite sides of said concave portions, an operating member, and a gear member operatively connecting said operating member to said mutilated gear, said gear member having a convex peripheral portion for coacting with said concave portions and having gear teeth at opposite sides of said convex portion.

12. A vending machine having, in combination, a hopper for the articles to be vended, a mechanism for controlling the discharge from said hopper, said mechanism having a position in which it is operative to discharge articles and a position in which it is inoperative to discharge articles, means for operating said mechanism successively from one of said positions to the other, said means comprising a mutilated gear having concave peripheral portions corresponding in number to the inoperative positions of said mechanism and having gear teeth at opposite sides of said concave portions, an operating member, and a gear member operatively connecting said operating member to said mutilated gear, said gear member having a convex peripheral portion for coacting with said concave portions and having gear teeth at opposite sides of said convex portion.

13. A vending machine having, in combination, a hopper for the storage of cylindrical articles arranged with their axes substanstantially horizontal, means providing a delivery orifice for said machine, article discharging means for causing articles from said hopper to fall toward said orifice, and means for turning said articles on end while falling comprising a stationary part arranged to be struck by the falling articles.

14. In a vending machine, a hopper for storage of cylindrical articles arranged with their axes substantially horizontal, means forming an orifice through which said articles are to be moved from said machine, means for discharging said articles from said hopper and allowing them to fall toward said orifice, and means for turning said articles while falling and standing them on end in front of said orifice.

15. In a vending machine, means for maintaining a plurality of stacks of cylindrical articles to be vended with their axes substantially horizontal, means forming a common orifice through which said articles are to be removed from said machine, and means for discharging said articles from each of said stacks and standing said articles on end in front of said orifice.

16. In a vending machine, a hopper for cylindrical articles, means for receiving articles discharged from said hopper, means for discharging said articles from said hopper and permitting them to fall toward said first mentioned means, and a bar arranged to be in the path of the falling articles and so located as to turn said articles and stand them on end on said first mentioned means.

17. In a vending machine, a hopper for cylindrical articles, article discharge means for permitting articles to fall from said hopper, and article engaging means arranged in the path of said articles when falling, said last mentioned means being so located as first to engage the periphery of the article near one end thereof so as to turn and stand said articles on end.

18. In a vending machine, a hopper for cylindrical articles, article engaging means for permitting said articles to fall from said hopper, and a pair of inclined article engaging members arranged to be in the path of said articles when falling, said members being so located as to be struck successively so as to stand the articles on end.

19. A vending machine having, in combination, a hopper for the articles to be vended, a discharge mechanism for said hopper having a position in which it is operative to discharge articles and a position in which it is inoperative to discharge articles, an operating handle movable in opposite directions, operating means for said mechanism comprising cooperating members forming the driving and driven elements of a Geneva-stop motion the locked position of which corresponds to the position of said mechanism in which it is inoperative to discharge articles, and means actuated by successive movements of said handle in one of said directions for giving the driving element of said Geneva-stop motion a uni-directional step by step movement, whereby said discharge mechanism will be intermittently operated and will be locked except when said stop motion is actuated.

20. A vending machine having, in combination, an operating member having a reciprocatory motion, cooperating members forming the driving and driven elements of a Geneva-stop motion, means including a pawl

and ratchet actuated by said operating member for giving said stop motion a uni-directional step by step motion, a hopper for the articles to be vended, discharge mechanism for said hopper having a position in which it is operative to discharge articles and a position in which it is inoperative to discharge articles, said discharge mechanism being driven by the driven element of said Geneva-stop motion, the locked position of said Geneva-stop motion corresponding to that position of said discharge mechanism in which the latter is inoperative to discharge articles from the hopper.

In testimony whereof, I have signed my name to this specification.

CHARLES LEA.