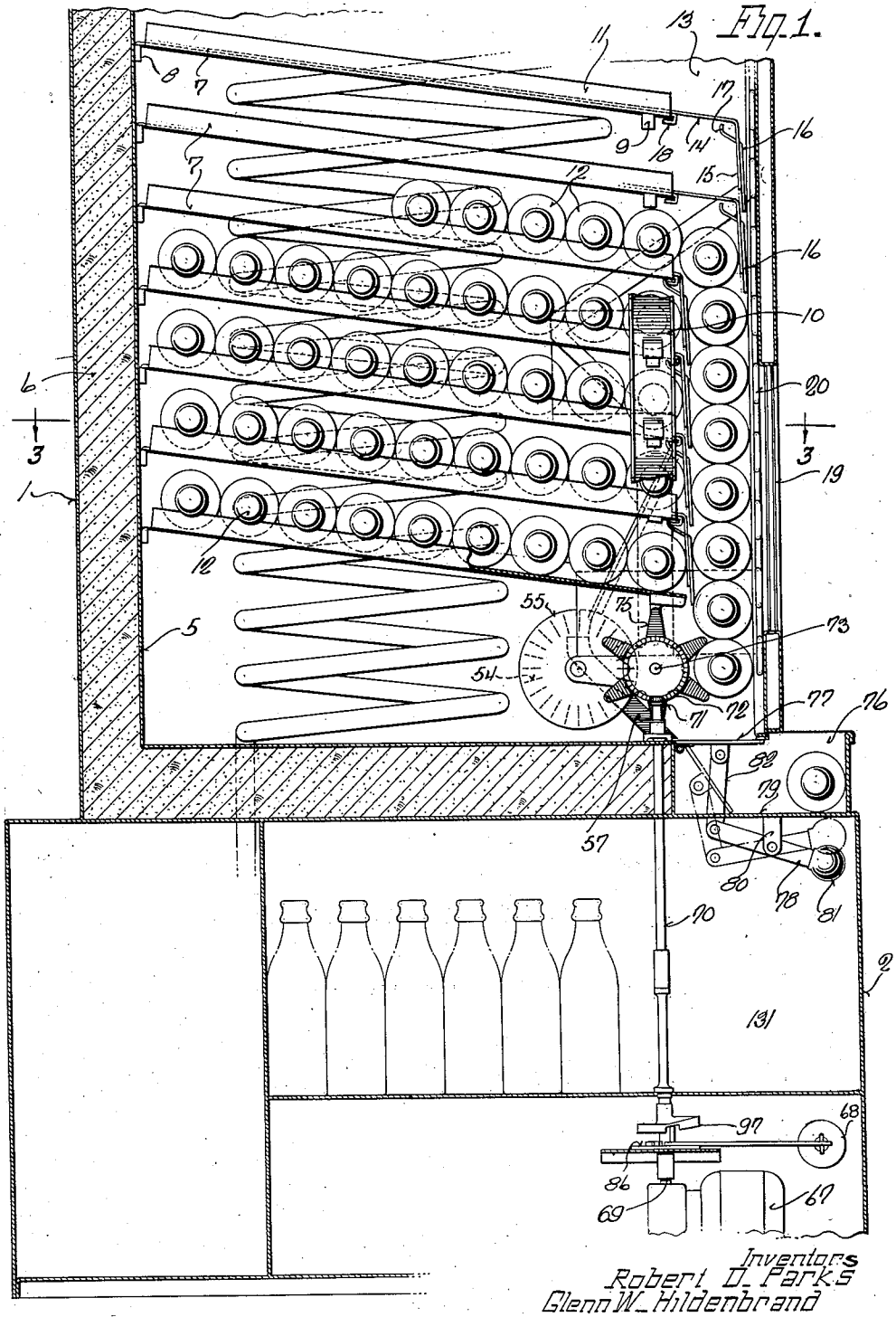
May 28, 1935. R. D. PARKS ET AL 2,002,753

VENDING MACHINE

Filed Feb. 7, 1931 4 Sheets-Sheet 1

Fig. 1.



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VENDING MACHINE

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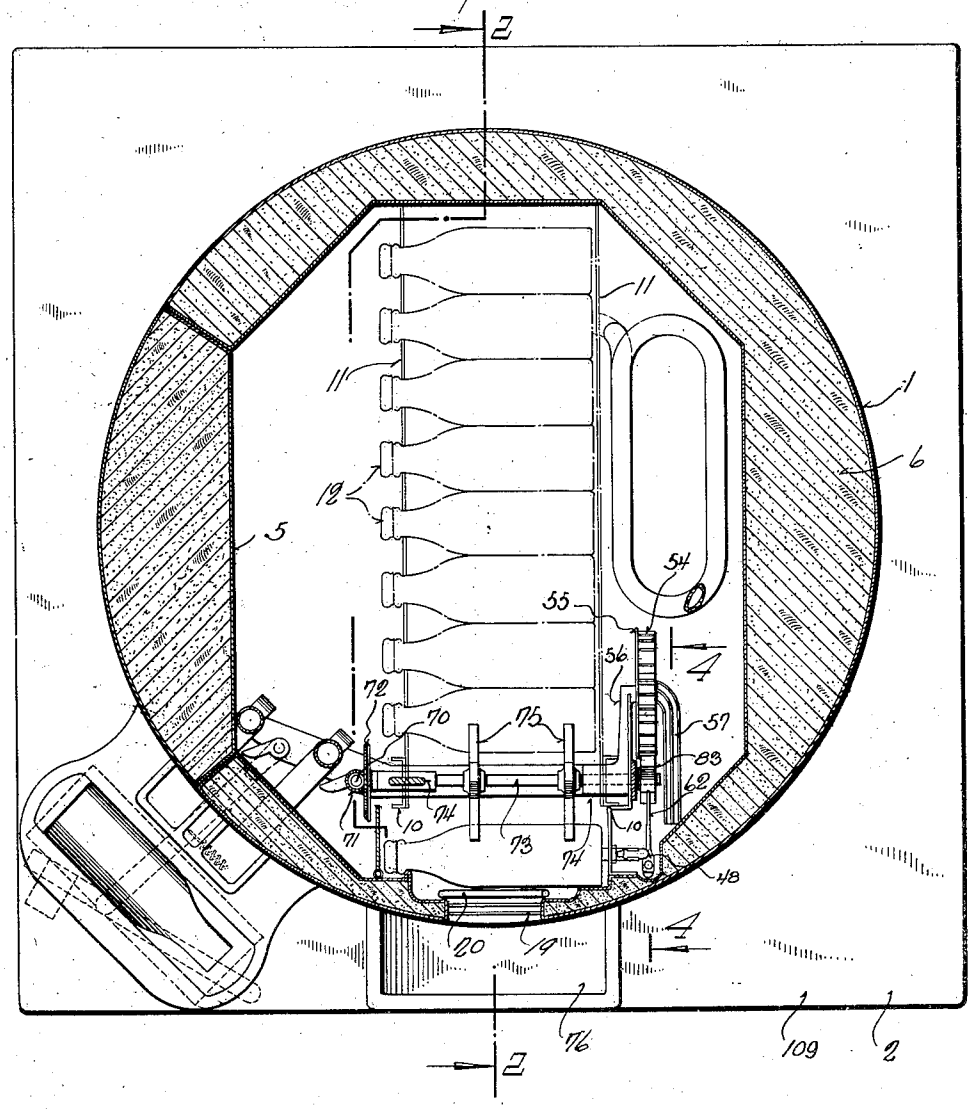
Fig. 2.



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VENDING MACHINE

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Fig. 3.

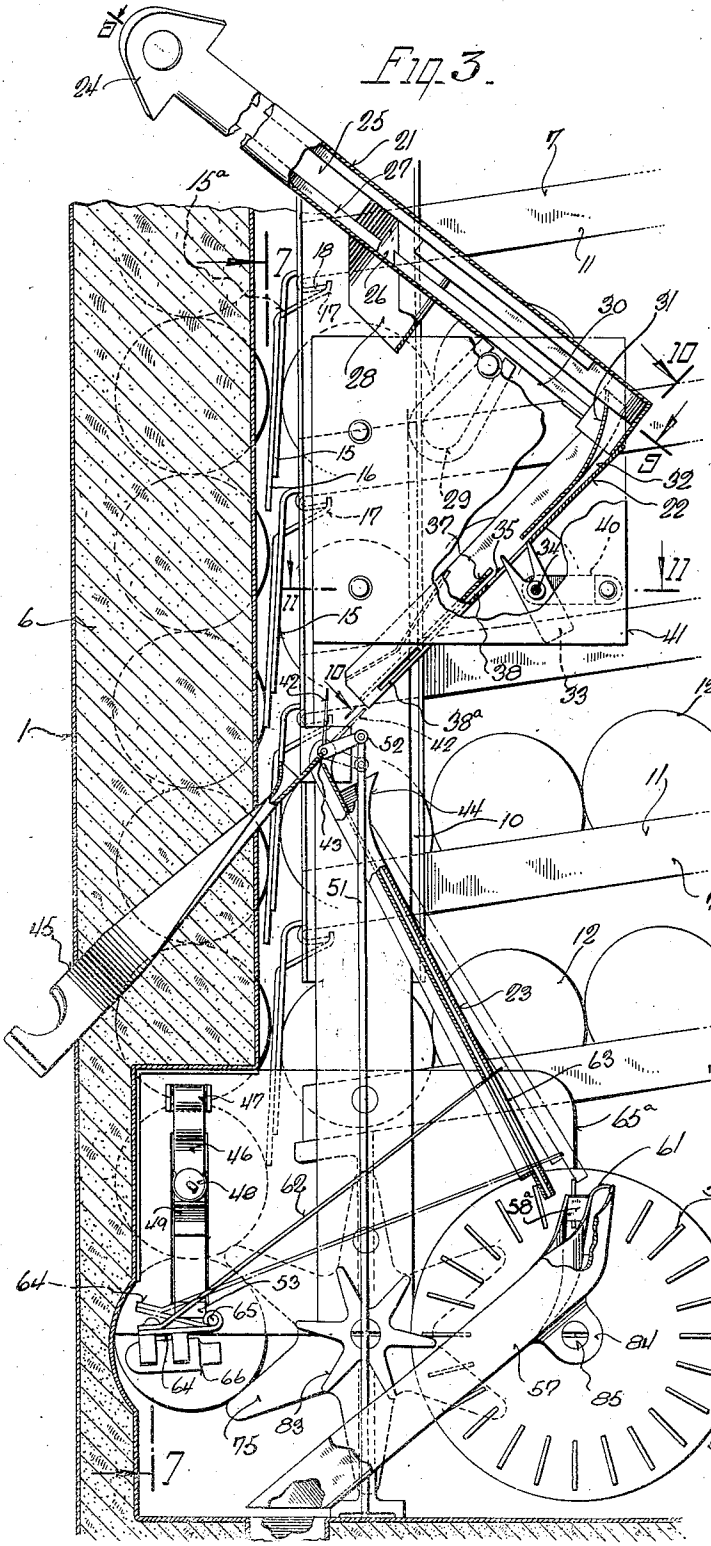


Fig. 4.

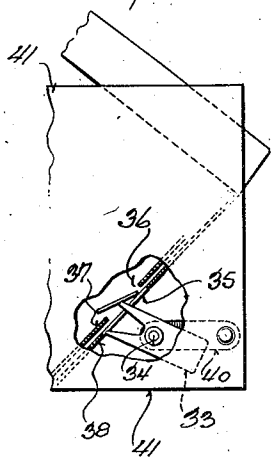
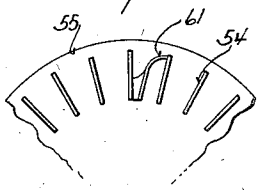


Fig. 5.



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VENDING MACHINE

Filed Feb. 7, 1931 4 Sheets-Sheet 4

Fig. 6

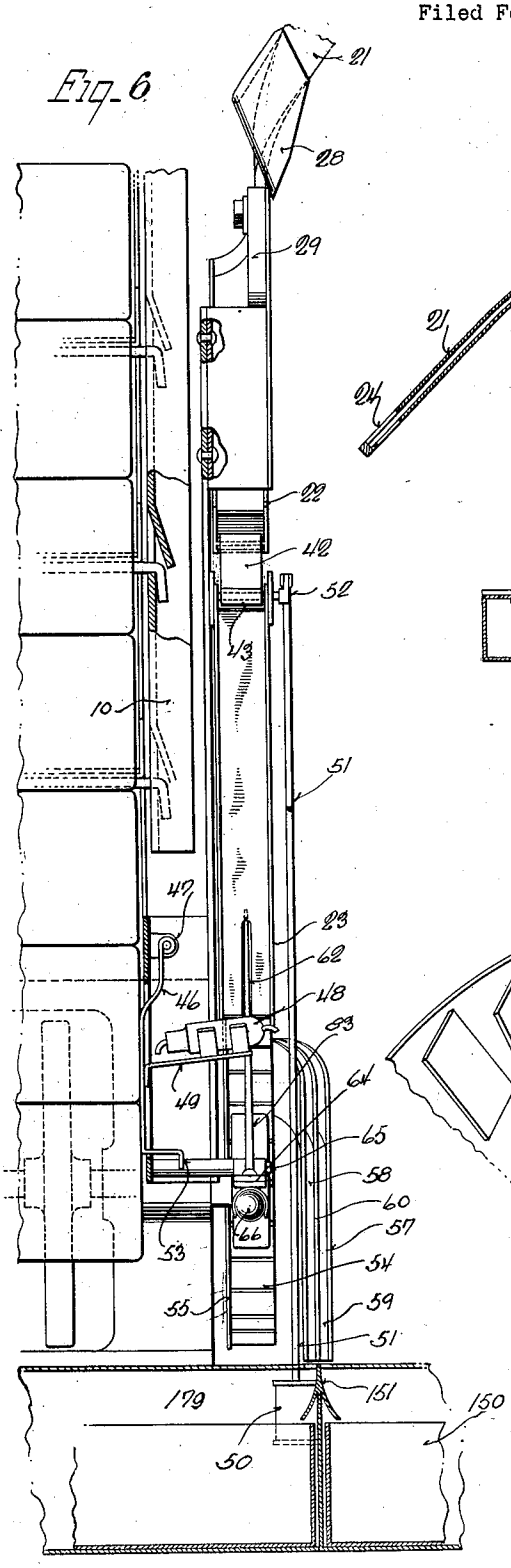


Fig. 8

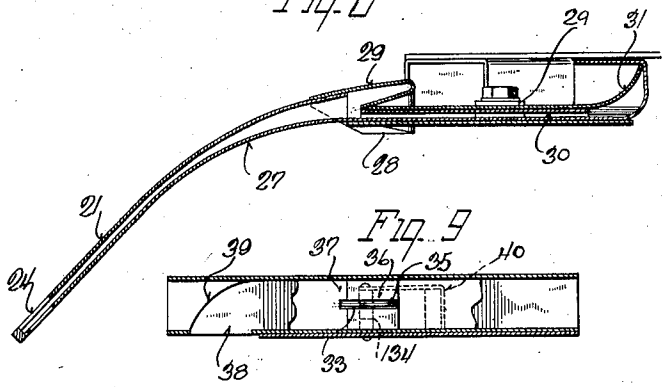


Fig. 9

Fig. 10.

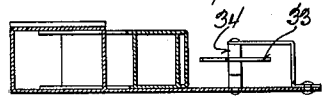
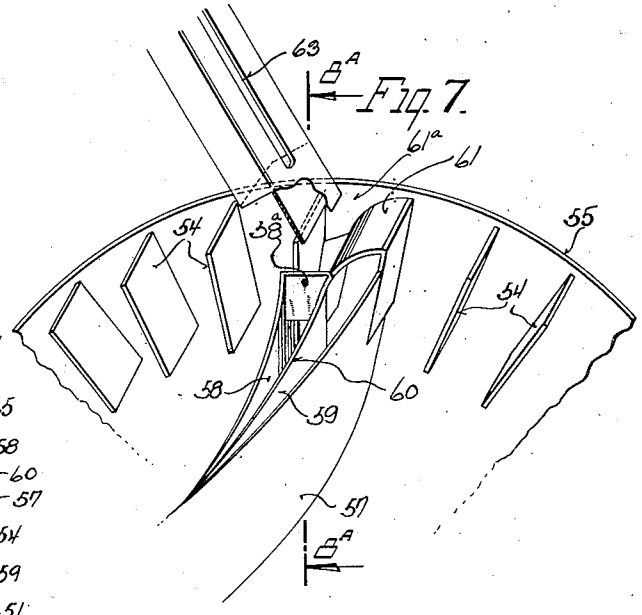


Fig. 7.



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Patented May 28, 1935 2,002,753

UNITED STATES PATENT OFFICE

2,002,753

VENDING MACHINE

Robert D. Parks and Glenn W. Hildenbrand, Lohrville, Iowa, assignors to National Vending Company, Burnside, Pa., a corporation of Delaware

Application February 7, 1931, Serial No. 514,091

7 Claims. (Cl. 194—1)

This invention relates to coin or token controlled vending machines, and more particularly to machines for vending bottled goods of the "beverage" variety.

One object of our invention is to provide a vending machine which is actuated by an electric motor.

Another object of our invention is to provide the machine with means for automatically selecting and storing a certain proportion of the coins inserted into the machine to operate it as a rental charge for the use of the machine.

A further object of our invention is to provide the coin sorting or selecting mechanism in connection with the coin chute of the machine and have the parts so made and arranged that one coin out of a predetermined number as deposited in the machine will be selected for the rental charge.

A further object of our invention is to have the coin in its passage through the coin chute operate a trip member to throw a switch for the motor and thus cause the latter to be operated in the proper timed relation with the passage of the coin through the machine.

Other and further objects of our invention will appear from the following specification taken in connection with the accompanying drawings showing a vending machine embodying the features of our invention and, in which drawings:—

Fig. 1 is an enlarged vertical sectional view taken on line 2—2 of Fig. 3 to show the storage rack for the filled bottles and the bottle ejecting means associated therewith;

Fig. 2 is a horizontal sectional view taken on line 3—3 of Fig. 1;

Fig. 3 is an enlarged vertical sectional view taken on line 4—4 of Fig. 2 to illustrate the coin chute and associated parts of the machine;

Fig. 4 is a view illustrating the action of the washer ejector for the coin chute;

Fig. 5 is an elevational view of a portion of the percentage wheel to be hereinafter described;

Fig. 6 is a vertical sectional view taken on the indirect line 7—7 of Fig. 3;

Fig. 7 is a fragmentary perspective view of a portion of the percentage wheel and the associated chutes to be hereinafter described;

Fig. 8 is a longitudinal sectional view taken through the upper section of the coin chute on line 9—9 of Fig. 3;

Fig. 9 is a similar sectional view through the next or intermediate section of the coin chute on line 10—10 of Fig. 3;

Fig. 10 illustrates the washer ejector and is taken on line 11—11 of Fig. 3;

As shown in Fig. 1, the outer casing of the machine has an upper part 1 and a lower or base part 2. The upper part 1 is preferably made in the form of a gigantic bottle having the representation of a crimped cap at its upper end. The base 2 is generally rectangular in form and is equipped on its lower side with casters or rollers to provide a movable support for the machine. The outer casing 1 provides a housing for the filled bottles or other articles to be dispensed by the machine, while the base 2 provides a housing for the major portion of the operating mechanism for the machine and the empty bottles as they are returned to the machine.

As shown in Figure 2, the upper part 1 has an inner casing 5 providing a compartment in which is located the storage means in the form of a rack for the filled bottles or other articles to be dispensed from the machine. The space between the inner and outer casings 1 and 5 is filled with a suitable heat insulating packing 6, so that the filled bottles in the machine may be kept cool as required for the vending of beverages.

The storage rack is best illustrated in Fig. 1. The rack comprises a tier of sheet metal shelves 7, 7 arranged one above the other at a downward inclination and having their uppermost ends supported by brackets 8 provided on the adjacent wall of the inner casing 5. The lower ends of the shelves are supported on horizontal cross members 9 which extend between upright channel members 10, 10 on opposite sides of the shelves and secured to and depending from the top wall (not shown) of the compartment in which the rack is located. Each shelf 7 is provided with upright side walls 11, 11 to provide a trough to accommodate the filled bottles 12 which are laid on their sides in the respective troughs with the bottoms of the bottles against the inside of one of the side walls and the necks of the bottles resting on and extending across the upper edge of the other side wall, so that the bottles will be maintained in position for ready and easy rolling down the troughs for entering into a vertically disposed discharge passage 13 as shown.

To control the discharge of the bottles on the several shelves into the passage 13, a gate mechanism is provided at the lower or discharge end of each shelf. Each gate mechanism includes a flat sheet metal plate 14 substantially as long and as wide as the associated shelf 7 and slidably supported on top of the bottom wall of the same, as

shown by dotted lines in Fig. 1. The lower end portion of the plate 14 is bent downward as at 15 and extends toward the shelf therebelow to provide a stop for the row of bottles on the lower shelf. A sheet metal strip 16 is vertically arranged on the outer side of the stop 15 and has its lower end extending below the stop and its upper end extending to the rear side of the stop through a slot or aperture 15a therein, as shown in Fig. 3. The extreme upper end of the strip is bent to provide a hooklike portion 17 designed to engage over the rear edge of a tongue or projection 18 provided on the bottom wall of the associated shelf at its lower or discharge end, as shown in Fig. 1. When the stop 15 is in position closing the discharge end of the shelf therebelow, the hook 17 of the strip 16 is held engaged with the rear side of the projection 18 by the bottles in the passage 13 bearing against the outer side of the strip. As soon as the uppermost bottle in the passage frees the lower end of the strip, the pressure on the strip is relieved and the strip springs outward to release its hook from the projection 18, whereupon the gate is unlatched and the bottles on the shelf by their weight on the stop 15 move it outward across the passage 13 and allow the bottles to feed into the same as shown in Fig. 1. The projection 18 is made relatively wide so that the attendant of the machine on filling the rack will be required to purposely see that the hook 17 is engaged back of the projection, thereby avoiding the possibility of an insecure connection which would allow the outward movement of the gate when not desired to jamb the bottles in the discharge passage.

The passage 13 is at the front side of the machine and the inner and outer casings 1 and 5 are provided with a vertically disposed glass covered sight opening 19, so that the bottles or containers passing through the passage 13 may be readily seen and thus enable the attendant as well as the operator of the machine to determine when it is empty and needs refilling, or not in condition for operation, as the case may be. To maintain the contents of the bottles cooled, the machine is equipped with a mechanical refrigerating system, one cooling coil 20 of which is associated with the discharge passage 13 preferably on the front side of the same, and visible through the sight opening 19, as shown in the drawings. As shown in Fig. 2, the inner casing 5 of the machine along the front side of this passage 13 is so formed as to provide a suitable support for the bottles in the passage whereby they are maintained in the proper position to be fed to the bottle discharge mechanism to be presently described.

The coin chute for the machine, as shown in Fig. 3, comprises inclined sections 21, 22, and 23. The section 21 is the uppermost one and has its outer end extending to the exterior of the machine through the outer casing 1, where it is provided with a coin receiving portion 24, as shown in Fig. 3.

The upper section 21 is made in the form of a rectangular tube, vertically disposed, and inclined downwardly so that the coins or tokens will roll on edge down the same. The section is completely closed on one side and has its other side open, as by a slot 25, of a width to prevent the coins or tokens of the proper diameter from falling laterally out of the section on its open side. The machine shown in the drawings is designed to be operated by a dime, and such coin will bridge the slot 25 as it rolls down the section. A similar coin or token will not bridge the slot, and by having the section curved outward, as shown in Fig. 8, with the slot on the outer side of the curve, centrifugal force will cause the coin to roll along the slotted side of the section and thus be in a position to pass out of the section through a notch 26 in the lower edge of the slot at the end of the curve. The lower flange 27 of the slot is flared outward along the curve to the notch so as to insure a guidance of the smaller coin or token out of the section and into a deflector 28, which directs the ejected article to a spurious coin or token receiving trough (not shown) arranged below the chute, and which trough leads to a suitable box or container, inside of the machine.

A permanent magnet 29 is employed with the upper section 21 at a point below its curved portion to retard any magnetic tokens inserted into the section. The magnet causes such tokens to pass out of the section into the spurious coin or token receiver through an elongated slot 30 in the bottom wall of the section as shown in Fig. 3.

The section 22 of the coin chute is in the form of a channel member arranged to have the coins or tokens slide flatwise down the same after leaving the section 21 next above. The section 22 is provided with a deflector strip 31 where it joins the section 21 so as to turn the coins or tokens from the edge-wise to flat-wise position. The deflector 31 is in the form of a strip arranged in the section 22 above its bottom wall to provide a passageway 32 for the coins or tokens in their movement down the section. To eject perforated tokens, such as washers, from the section 22, I provide an ejector member 33 pivoted at 34 below the section 22 and arranged to have its fingers operate in a slot 35 in the bottom wall of the section, as shown in Figs. 3 and 4. A non-perforated coin of the size and diameter to operate the machine will on striking the lowermost finger of the member 33 tilt it in the direction shown in Fig. 4 and cause the uppermost finger to lift and deflect such coin through an opening 36 arranged between the deflector strip 31, and a partition wall 37 located in the section in line with the deflector strip, as shown in Fig. 3. The non-perforated coin when so lifted through the opening 36 will slide flatwise down the upper side of partition 37 to the lowermost section 23 of the chute assembly in a manner to be presently described. A perforated washer will on striking the lowermost finger of the ejector 33 tilt it downward and cause the upper finger to enter the aperture in the washer, and guide the washer into the passageway 38 between the bottom of the section and the partition 37 where the washer will be deflected out of the section through a slot 38a in its side wall as shown in Fig. 3. The deflector referred to is indicated by 39 in Fig. 9. The pivoted ejector 33 is carried by bracket 40 secured to an upright plate 41 to which is also secured the coin chute sections 21 and 22. This plate is secured to one of the upright channel members 10 of the rack as shown in Fig. 3.

A gate member 42 is interposed between the lower end of the section 22 and the upper end of the section 23, as shown in Fig. 3. This gate member is pivoted at 43, and when extending upward therefrom is in a position to deflect coins discharged from the upper side of the partition 37 into the upper end of the section 23, the latter being flared outward at 44 for this purpose.

When the gate member is in lowered position as shown in dotted lines in Fig. 3, it closes the gap between the lower end of the section 22 and the

upper end of a coin return chute 45, which extends to the outside of the machine, as shown in Fig. 3. The inner end of this chute is disposed to receive the coins flatwise from the section 22, and is twisted beyond such point so as to present the coins in edge-wise position outside of the machine when they reach the outer end of the section. The outer end of this section is cut away as shown in Fig. 3, so that the coins can be readily grasped for removal from the chute.

The gate 42 is in the dotted line position as described when the machine is empty, so that any proper coin inserted into the coin chute at its upper end will be returned to the intended operator. To move the gate into this position when the machine is empty, I provide a gravity acting member 46 arranged at one side of the vertical discharge passage 13 adjacent its lower end, as shown in Figs. 3 and 6. The member 46 is pivoted at its upper end to a bracket 47 extending outward from the adjacent upright channel member 10 of the passage. The member 46 operates through a suitable opening in the channel member, and is engaged by the bottoms of the bottles as they pass down the passage 13 in the operation of the machine. The bottles maintain the member 46 in the full line position shown in Fig. 6, and thus disposes the mercoid switch member 48, which is mounted on a bracket arm 49 secured to the outer side of the member 46, in position to close an electric circuit to a solenoid 50, mounted in the base section 2 of the machine, as shown in Fig. 6. The current energizes the solenoid, holding its armature in its upwardly projected position, and through the rod 51 and arm 52 maintains the gate in raised position as shown. When the last filled bottle in the machine passes the member 46, the latter is released and swings inward by gravity until arrested by the stop 53 at its lower end, and tilts the mercoid switch 48 to cut off the current to the solenoid 50, whereupon the gate 42 by gravity swings into its lowermost position so that the coins deposited in the machine will be returned to the intended operator through the return chute 45. Inasmuch as the current to the solenoid 50 is "on" as long as the machine is filled with bottles, or in a condition to operate, the solenoid will heat and for that reason is located out of the refrigerated compartment 1 of the machine.

The coin chute section 23 is pivotally mounted at its upper end on the same fulcrum 43 as provided for the gate 42, so that said section may be swung back and forth as required in the operation of the machine for the vending of containers therefrom. The lower end of the section 23 extends into the path of movement of a plurality of radial blades 54 on one side of a percentage wheel 55, which is mounted for rotation on a bracket arm 56 (Fig. 2), extending from a support to be presently referred to. In the particular machine shown, there are twenty-four blades on the wheel 55. These blades provide coin receiving pockets or chambers, which in the rotation of the wheel are brought opposite the entrance end of a coin chute 57. This chute is divided into two vertical passageways 58, 59, by an interposed partition 60, as clearly shown in Fig. 7. The upper end of the chute is as wide as the distance between the blades 54, which are spaced equal distances apart about the circumference of the wheel. A barrier 58a closes the end portion of the passage 58 on the outer side of the blades 54. The portion of this passage below the barrier extends inward beneath the blades, there being sufficient space afforded for the coins to pass under the barrier and into the passage 58. This occurs when a coin is allowed to pass through the pockets as provided by the blades. All of the spaces between the blades 54 except one are arranged to deliver coins into the passageway 58. One space is provided with a curved wall 61, which as shown in Figs. 5 and 7, extends between the blades and provides a pocket 61a to retain a coin entering the same. With the barrier 58a closing the outer side of this pocket the coin cannot pass out of the same until the wheel 55 is turned forward to bring the pocket 61a opposite the open end of the passage 59, whereupon the coin will enter the same, and be carried to the collecting receptacle 150, as shown in Fig. 6. The passage 58 leads to a receptacle 179, as shown in this figure. A deflector 151 is located between these receptacles to insure that coins for one do not enter the other.

Providing the wheel 55 with twenty-four blades and having a space between two of the blades provided with the curved wall 61 every twenty-fourth coin discharged into the wheel in one rotation thereof will be deflected into the coin receptacle 150 in payment of rent for the machine. The remaining coins will be deposited in the receptacle 179 to which the lessee of the machine has access for securing his profit from the articles vended thereby.

A wire 62 is arranged on the outer side of the coin chute section 23, and has its upper end operable in registering slots 63 in the top and bottom walls, respectively, of the section 23. These slots extend lengthwise of the section, and are located adjacent the lower end of the same where the section ratchets over the upper edges of the blades 54 in the rotation of the wheel 55. The rod 62 is secured to the outer end of an arm 64, the inner end of which is journalled on a stud 65 extending outward from one side of a supporting plate 65a, secured to one of the uprights 10, as shown in Fig. 3. A mercoid switch element 66 is mounted on the under side of this arm in suitable clips as shown, and the weight thus provided on the arm normally rocks it downward to maintain the upper end of the wire 62 at or adjacent the upper end of the slots 63, as shown in full lines in Fig. 3. When the machine is not in operation, the lower end of the section 23 rests against a blade 54 of the wheel 55 on the inner side of the section, and thus the section is maintained in position with the upper end of the rod 62 extending across the channel provided therein. A coin descending this channel will first contact with the rod 62. The weight of the coin and the momentum in its travel down the channel 23 will be sufficient to move the rod 62 downward to the lower end of the slots 63. This will rock the arm 64 upward (see dotted lines, Fig. 3) and tilt the switch element 66 to close the circuit therethrough to an electric motor 67 and solenoid 68, both of which are clearly shown in Fig. 2.

The motor 67 is preferably located in the base section 2 of the machine, and is provided with a relatively short upright shaft section 69 geared to the armature shaft of the motor. A shaft section 70 extends upward from the motor into the upper housing 1 of the machine to a point adjacent the lower end of the discharge passage 13, and is there provided with a bevel pinion 71 in mesh with a bevel gear 72 fixed to a horizontal shaft 73, journalled in standards 74, 74, mounted in the inner casing 5, as shown in Fig. 2. The

standards are on opposite sides of the rack and thus dispose the shaft 73 in a plane parallel to the movement of the bottles down the passage 13 and offset from the inner side thereof as shown in Fig. 1. A pair of star wheels 75, 75 are fixed to the shaft 73 in position for their spokes to extend partway into the lower end of the passage 13 and arrest the movement of the bottles or containers down the same. The spokes of these wheels are so designed and spaced that only one bottle or container will enter between them, and thus permit the wheels in the rotation of the shaft 73 by the motor to feed the bottles or containers from the passageway 13 one at a time into a chamber 76 provided at the lower end of the passageway, and extending outward beyond the outer wall of the casing 1, where such chamber opens upwardly, so that the operator of the machine may reach into the chamber to remove the vended bottle or container therefrom.

A gate 77 normally closes the lower end of the passageway 13, and is preferably made of a suitable heat insulating material such as bakelite, so that the relatively warmer outside air cannot enter the outer casing 1 of the machine through the open chamber 76 to affect the temperature within the casing 1, as provided by the refrigerating coils heretofore referred to. This gate is hinged at its inner end to the upright wall of the chamber 76, and is maintained normally closed by a counterbalance, which may be of any desired construction. In Fig. 1, I have shown the counterbalance in the form of a lever 78, arranged below the bottom wall 79 of the chamber and fulcrumed between its ends on a bracket 80 depending from said wall. The lever is provided with a weight 81 at one end, and is connected at the other end with the gate by a link 82, which extends up into the chamber through a slot or opening in its bottom wall. In addition to closing the connection between the chamber and the passage 13, the gate also serves as a deflector for the bottles or containers as they are discharged into the container from the star wheels, and thus directs the bottles into the forward portion of the chamber, so that they may be readily reached through the opening provided therefor at the outside of the casing 1.

The percentage wheel 55 is arranged at the end of the shaft 73 opposite the bevel gear 72, as shown in Fig. 2. This wheel is rotated by the power furnished to the shaft 73 through the medium of a sprocket wheel 83, fixed to the shaft 73, and arranged to have its spokes engage between the blades 54, as shown in Fig. 3. The arm 56 on which the wheel is mounted may be secured to one of the uprights 74 in which the shaft 73 is journalled. As shown in Fig. 3, the coin chute 57 has a lug 84 on its under side, and fastened by a screw 85 to the arm through the center of the wheel 55, so that the upper or entrance ends of the passageways in this chute will be maintained in proper position below the pockets provided between the blades of the wheel. As the wheel 55 is turned by the sprocket 83, the coin chute section 23 is swung upward as its lower end rides over the blade engaged thereby. The spacing of the blades is such that when the section reaches the extreme upper edge of a blade, the section has been swung far enough to clear the upper end of the wire 62 from the passageway of the section, and thus permits the coin in the section to drop therefrom into the space or pocket between the blades for entry into one of the passageways of the coin chute 57, as heretofore described. When the lower end of the section 23 ratchets over the blade, it swings back into position against the next following blade, and this returns the section to a position with the wire 62 extending across the passageway of the section. The wire being released by the discharged coin, immediately returns to its upward position, and in doing so, rocks the arm 64 to tilt the switch element 66 to cut off the current to the motor 67 and the solenoid 68 heretofore referred to.

A clutch mechanism is provided for selectively connecting shafts 69 and 70 in the use of the vending machine. This mechanism and its control means forms no part of my invention as covered by the appended claims and need not be described in detail herein. It may be said generally that the clutch, which is shown in Fig. 1, comprises a pair of clutch members 86, 87, one keyed to the motor shaft 69, and the other splined on the shaft 70. The clutch members are provided with inter-engageable clutch teeth on their opposed surfaces and these teeth are normally held disengaged by control means which includes the solenoid 68 heretofore referred to. These clutch members are held apart when the machine is idle. When a coin tilts the switch 66, the solenoid 68 is energized and the holding means between the clutch members is withdrawn and the upper clutch drops by gravity into engagement with the lower clutch. The circuit to the motor 67 is also closed on the tilting of the switch 66 and shaft 70 is thereupon rotated to actuate the star wheels 75 to discharge a filled bottle or container from the machine. When the current of the motor is cut off, the solenoid 68 is also de-energized and the separating means for the clutch members functions to disconnect them.

The vending machine is operated as follows: The customer inserts the required coin such as a dime in the coin chute at its upper end 24 and the coin in its passage down the chute tilts the switch device 66 through the rod 62. This closes the circuit to the motor 67 and the solenoid 68 and the clutch mechanism then functions whereby the motor rotates the shaft 70. The percentage wheel 55 is rotated at the same time through the star wheel 83 and the coin drops from the wheel into the coin chute passage 58 where it is discharged into the collection receptacle 179. Every twenty-fourth coin is deflected into the receptacle 150 which collects the coins for the rental of the machine. The star wheels discharge the bottles from the machine one at a time on each operation of the machine by a proper coin.

We claim as our invention:

1. In a vending machine of the character described, a coin chute, electrically actuated means for controlling the discharge of articles from the machine, a switch for said means, an operator for the switch and disposed to be actuated by the coins passing through the chute, and means actuated by the first named means and associated with the chute for automatically selecting therefrom certain of the coins as a rental charge for the machine.

2. In a vending machine of the character described, a coin chute, electrically actuated means for controlling the discharge of articles from the machine, a switch for said means, an operator for the switch and disposed to be actuated by the coins passing through the chute, a rotary member actuated by the first named means, said mem-

ber being associated with said chute and having circumferentially spaced pockets to receive the coins on leaving the chute, and means associated with one of said pockets for automatically selecting the coins entering the same as a rental charge for the machine.

3. In a vending machine of the character described, a coin chute, electrically actuated means for controlling the discharge of articles from the machine, a switch for said means, an operator for the switch and disposed to be actuated by the coins passing through the chute, a rotary member actuated by the first named means and having circumferentially spaced pockets to receive the coins on leaving the chute, a second chute associated with said member and having a pair of coin-ways therein, and co-operating means carried by the chute and the rotary member for one coin-way and one pocket, respectively, for closing one coin-way to all of the pockets except one.

4. In a vending machine of the character described, a coin actuated device for controlling the discharge of articles from the machine, a rotary member having circumferentially spaced pockets through which the coins pass in operating the machine, a chute associated with said member and having a pair of coin-ways therein, a barrier across one coin-way at said pockets, and means in one pocket to carry all coins entering the same past said barrier for entry into the other coin-way.

5. In a vending machine of the character described, a coin chute having a pivoted section, electrically actuated means for controlling the discharge of articles from the machine, a switch for said means, an operator for said switch and operated by the movement of a coin through said section for closing the switch, and means to receive the coins from the section and serving to swing the section to release the operator from the coin to open the switch.

6. In a vending machine of the character described, a coin chute having a pivoted section with an elongated slot therein, electrically actuated means for controlling the discharge of articles from the machine, a switch for said means, an operator for said switch extending into the section through said slot, said operator being normally at one end of the slot and movable by a coin in its passage through the section toward the other end of the slot to close the switch, and means to receive the coins from the section and serving to swing the section to release the coin from the operator to open the switch.

7. In a vending machine of the character described, a coin controlled electrically actuated device for discharging articles from the machine, a coin chute for said device and having a pivoted section, a switch for said device, an operator for said switch, said operator extending into said section to be actuated by the coins passing therethrough to close the switch, and a rotary member having blades over which the section ratchets in the rotation of said member to release the operator from the coins to open the switch.

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