

May 29, 1945.

J. R. CLEM

2,376,960

VENDING MACHINE

Filed Oct. 23, 1941

3 Sheets-Sheet 1

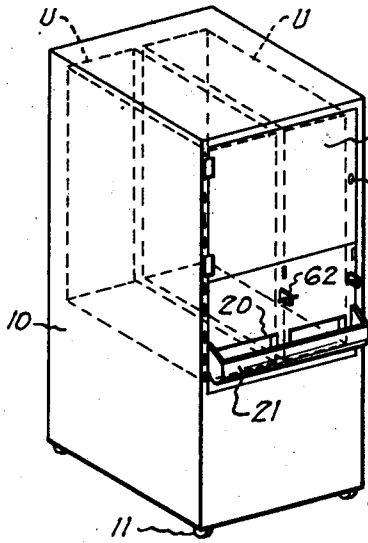


Fig. 1.

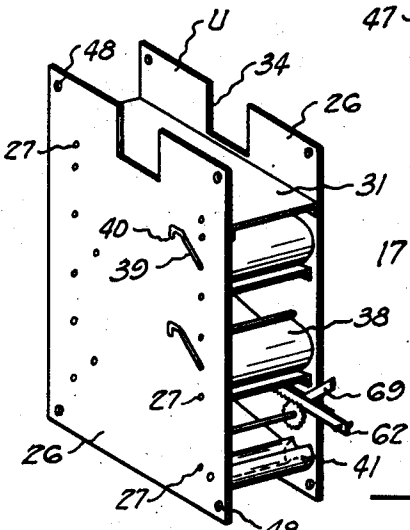


Fig. 3.

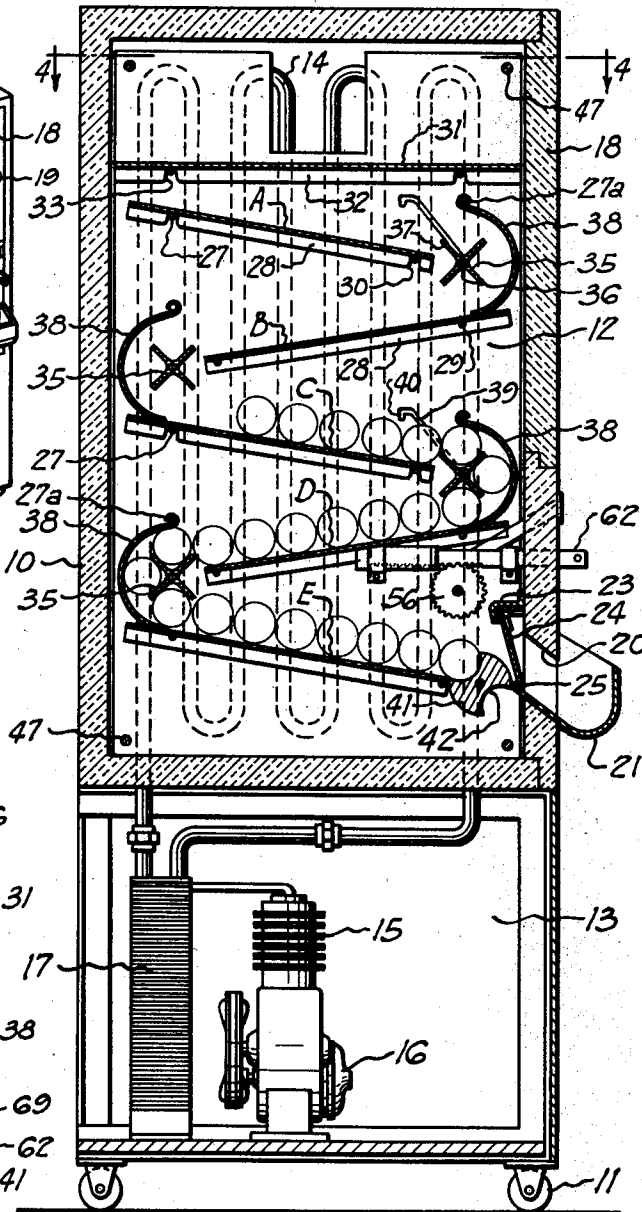


Fig. 2.

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3 Sheets-Sheet 2

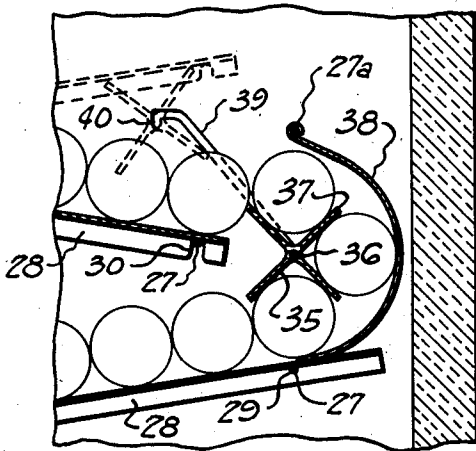


Fig. 5.

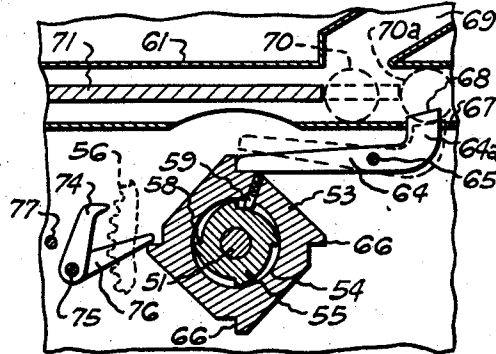


Fig. 10.

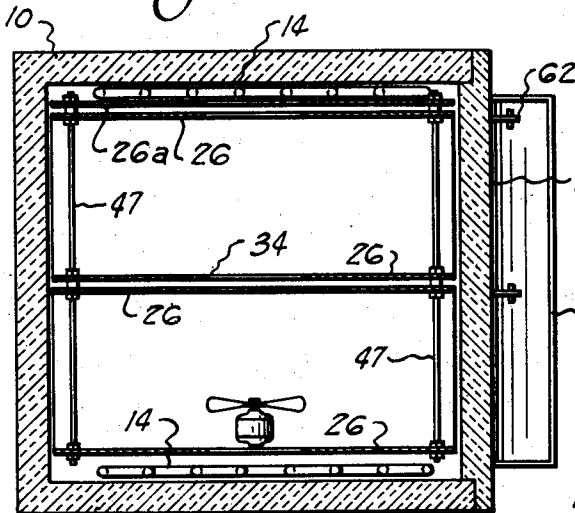


Fig. 4.

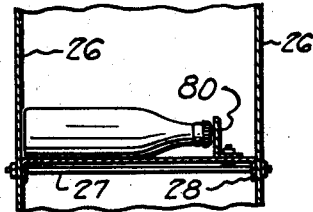


Fig. 11.

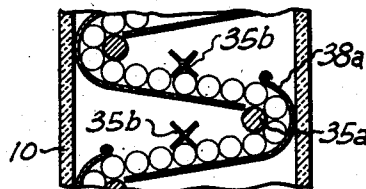


Fig. 12.

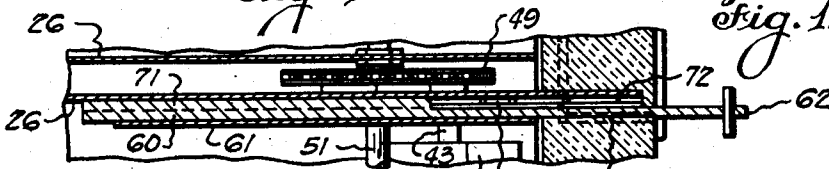


Fig. 9.

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3 Sheets-Sheet 3

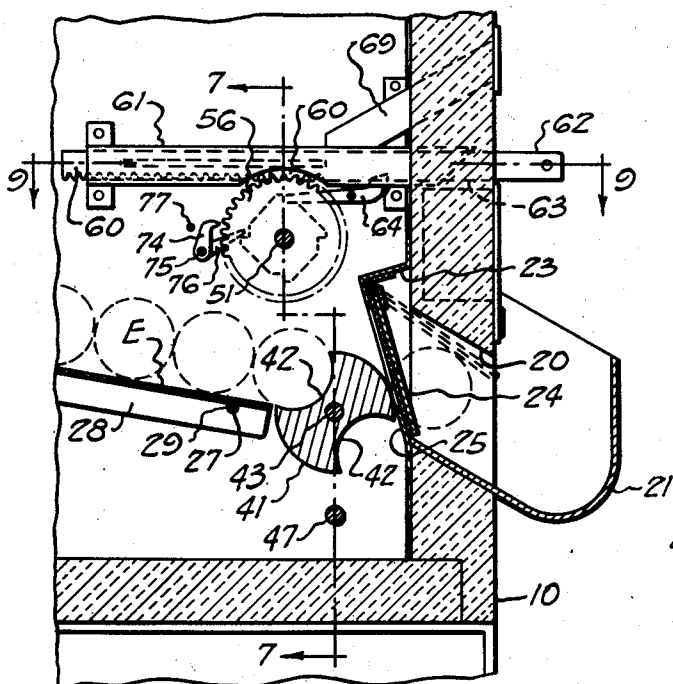


Fig. 6.

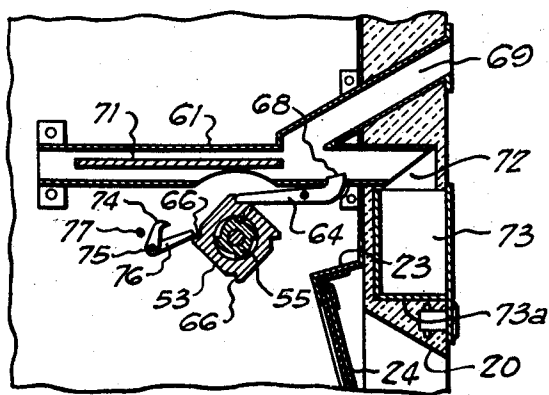


Fig. 8.

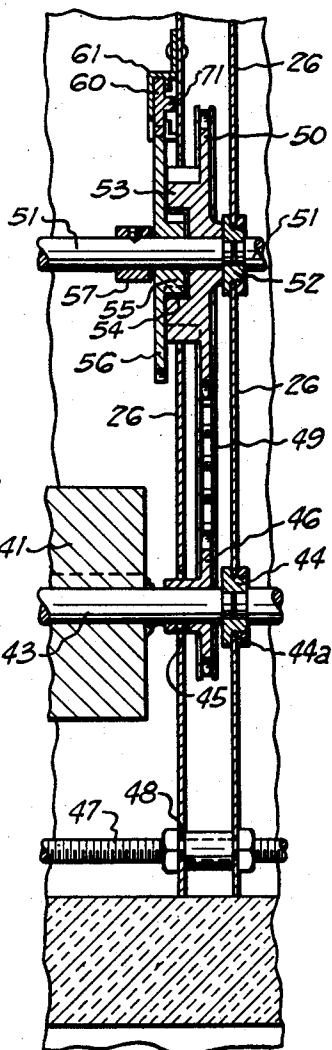


Fig. 7.

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UNITED STATES PATENT OFFICE

2,376,960

VENDING MACHINE

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Application October 23, 1941, Serial No. 416,151

7 Claims. (Cl. 194—57)

This invention relates to new and useful improvements in vending machines.

One object of the invention is to provide an improved vending machine for dispensing a quantity of bottled goods, such as carbonated beverages of various flavors.

A particular object of the invention is to provide an improved coin-controlled machine for receiving and storing bottled goods of various flavors and having means for selectively dispensing the goods, whereby the purchaser or consumer may readily select and receive goods of a desired flavor.

An important object of the invention is to provide an improved vending machine having a plurality of superposed inclined trays for receiving the bottles goods, together with means for guiding or conducting the bottles from one tray to the next tray therebelow, whereby the trays provide a continuous uninterrupted path along which the bottles travel by gravity; the arrangement of the trays permitting a maximum number of bottles to be stored in a minimum amount of space and the gravity feed eliminating the use of mechanically actuated conveyors, carriers or the like for conducting the bottles to the access or outlet openings through which the bottles are removed from the machine.

Another object of the invention is to provide an improved machine, of the character described, wherein a plurality of units of identical construction are assembled within a cabinet or housing, each unit being adapted to receive a plurality of bottles containing goods of the same flavor, whereby the number of units employed is dependent upon the number of different kinds of drinks it is desired to dispense; the identical construction of the units facilitating the manufacture of the machine, since it is only necessary to vary the assembly in order to construct machines of various sizes.

A further object of the invention is to provide a vending machine, of the character described, wherein the supporting trays are mounted in an improved manner so that they may be readily displaced to permit filling or insertion of the bottled goods into the machine.

Still another object of the invention is to provide a bottle vending machine of the dry cold type in which the bottles are fed by gravity along inclined trays to the outlet or access opening, said machine having means for preventing the bottles from jamming or shifting out of alinement in their downward travel, whereby efficient operation is assured.

Another object of the invention is to provide an improved manually operated ejector mechanism which is associated with each bottle receiving unit of the machine for dispensing one bottle from the unit upon each operation thereof, together with an improved coin receiving mechanism which coacts with the ejector in a manner to prevent actuation of the ejector until a coin has been inserted in the coin mechanism.

A still further object of the invention is to provide an improved ejector which is actuated by the movement in one direction of a manual lever, whereby a single bottle is dispensed on each operation of the lever; the ejector mechanism including means for preventing a return movement of the lever until its movement in a direction which actuates the lever is complete, whereby it is impossible to dispense more than one bottle at a time.

The construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, as an example of the invention is shown, and wherein:

Figure 1 is an isometric view of a dispensing machine constructed in accordance with the invention.

Figure 2 is an enlarged, transverse, vertical sectional view of the machine.

Figure 3 is an isometric view of one of the bottle receiving units of the machine.

Figure 4 is a horizontal, cross-sectional view, taken on the line 4—4 of Figure 2.

Figure 5 is an enlarged sectional detail of a portion of the uppermost trays, illustrating the guiding means between said trays.

Figure 6 is an enlarged sectional detail of the ejector drum with the coin receiving chute and operating mechanism shown in elevation.

Figure 7 is an enlarged, vertical sectional view, taken on the line 7—7 of Figure 6.

Figure 8 is a sectional view of the coin receiving chute and illustrating a portion of the operating mechanism associated therewith.

Figure 9 is a horizontal, cross-sectional view, taken on the line 9—9 of Figure 6.

Figure 10 is an enlarged sectional detail of the clutch and cam which forms part of the operating mechanism.

Figure 11 is a transverse sectional view of one of the trays and illustrating said tray adaptable for receiving smaller bottles, and

Figure 12 is a partial, vertical sectional view of the cabinet illustrating a modified form of tray arrangement.

In the drawings, the numeral 10 designates a vertical cabinet which is illustrated as substantially rectangular in cross-section. The cabinet is mounted on suitable rollers 11, and the interior of said cabinet is divided into an upper chamber 12 and a lower chamber 13. The upper chamber 12, which, as will be explained, is adapted to receive the bottled goods to be dispensed, has its walls constructed of a suitable heat insulating material, and continuous cooling coils 14 are disposed within the interior of said chamber for cooling the same. As is clearly shown in Figures 2 and 4, the coils are disposed on opposite sides of the chamber, being located contiguous to the side walls of the cabinet.

The lower chamber 13 has the refrigerating equipment mounted therein, and it is not necessary that the walls of this chamber be insulated. As shown in Figure 2, the refrigerating equipment includes a compressor 15 and a motor 16, as well as the usual condenser 17. The coils 14 have connection with the condenser 17 and the refrigerating equipment operates in the usual manner. Manifestly, since the coils 14 are disposed within the interior of the chamber, said upper chamber will be maintained at the desired temperature at all times.

Access to the interior of the upper chamber 12 may be had through a hinged door 18 which is provided with a suitable lock 19. This door is provided for the purpose of introducing the bottled goods into the chamber, as will be hereinafter explained. The lower portion of the chamber 12 is provided with a plurality of outlet openings 20 through which the bottled goods is ejected, and immediately below these openings, a receiving trough 21 is mounted. When a bottle is ejected through one of the openings 20, it falls into the trough 21 and is removed from the trough by the purchaser or consumer. Each opening 20 is normally closed by a hinged door or gate 24 which has its upper end hinged to a supporting bracket 23 secured to the inner wall of the chamber. The lower end of the door or gate 24 normally abuts an upstanding flange 25 which limits the inward swinging movement of the door. The door is adapted to be engaged by a bottle, as will be explained, and is swung outwardly by the weight of said bottle to permit the same to fall downwardly into the receiving trough 21.

A plurality of bottle receiving and supporting units U are adapted to be mounted within the receiving chamber 12 and the number of these units will vary in accordance with the number of different kinds of bottled goods to be dispensed. Each unit is arranged to receive the bottles of one particular drink or flavor, and thus, if it is desired to dispense two different types of drinks, only two units are provided; if a greater number of different kinds of drinks are to be dispensed, then the units are increased accordingly. As shown in the drawings and as described herein, only two units are illustrated, but it is to be understood that any desired number may be employed.

The various units U are all of an identical construction, and it is believed that a description of one will suffice. Each unit includes a pair of vertical side plates 26 which are connected to each other in spaced relationship by a plurality of tie rods 27. The rods 27 not only connect the

side plates but also serve as supports for a plurality of inclined trays A, B, C, D and E, which trays are located between the side plates. As is clearly shown in Figure 2, each tray includes a depending side flange 28, and the flanges of each tray are contiguous to the inner surface of the side plates 26. The trays B, D and E are stationary or fixed in position and their flanges are provided with openings 29 through which the tie rods 27 extend. The trays A and C are removable and their flanges 28 are formed with notches 30, whereby said trays may be engaged over the supporting rods 27. A removable top 31 which also has depending flanges 32 at its sides, is arranged to be supported on two of the tie rods 27, the flanges of said top being notched at 33 to permit said top to be engaged over the rods. The top 31 is disposed below the upper edge of the side plates, as is clearly shown in Figures 2 and 3, and above this top, the side plates have their central portions cut out or recessed as shown at 34 to permit a free circulation of air past or transversely of the unit.

The trays A to E extend transversely between the side plates 26 and are disposed in staggered relation to each other. Adjacent trays are inclined in opposite directions (Figure 2), that is, the uppermost tray is inclined downwardly and forwardly, while the next below tray is inclined rearwardly and downwardly, and so on. The lowermost tray E has its forward end terminating adjacent the opening 20 associated with the unit. It will be evident that the disposition of the trays in this manner forms a continuous downward path from the uppermost tray A to the lowermost tray E, and thus, a bottle placed on the tray A may roll downwardly by gravity onto the trays B, C and D respectively and then onto the lowermost tray E. From this latter tray, the bottles may be directed through the outlet opening 20, as will be explained, and into the receiving trough 21 on the exterior of the cabinet 10.

The spacing between the side plates 26 is sufficient to accommodate the largest bottle which is to be dispensed by the machine. The bottles are arranged to be placed on the trays so that each bottle extends transversely of the trays between the side plates. For maintaining the bottles in transverse alignment and also for guiding said bottles from one tray to the tray immediately therebelow, an aligning reel 35 is disposed adjacent the lower end of each of the trays A, B, C and D. This reel is mounted on a rotatable shaft 36 which has its ends journaled in the side plates 26. Each reel is provided with a plurality of radially extending blades 37, and the space between the blades is sufficient to receive one bottle. Cooperating with the rotatable reel 35 is a curved deflector or baffle 38 which extends transversely across the unit between the side plates. The lower end of the baffle is secured to the tray immediately below the reel, while its upper end is fastened to a transverse rod 27a which extends between the side plates. It will be obvious that as the bottles roll downwardly from one tray, each bottle will enter one of the spaces between the blades 37 of the reel, and the weight of the bottles will cause a rotation of said reel, whereby the bottles will be carried downwardly to the next tray. The bottles are maintained between the blades of the reel by the curved deflector or baffle 38, as is clearly shown in Figure 2.

The reels 35, which are associated with the trays B and D and are located at the lower ends

of these trays, are mounted in a fixed position. The ends of the shaft 36 of these reels are journaled in circular openings formed in the side plates 26. However, the reels 35 which are located at the lower ends of the trays A and C, which are the removable trays, are also movable within the unit. The ends of each shaft 36 of each of the reels 35 adjacent the trays A and C are mounted within inclined slots 39, being normally located at the lower ends of said slots. Obviously, each shaft 36 may be slid or moved upwardly within the inclined slots 39 and may be engaged within an offset 40 at the upper end of said slot. In such position, the reel would be disposed in the position shown in dotted lines in Figure 5. The purpose of making the reels 35, which are associated with the trays A and B, movable is to facilitate filling of the unit. When it is desired to place the bottles within the unit, the top 31 is first removed and then the tray A is swung upwardly, as indicated by dotted lines in Figure 5, after which the reel 35 associated with this tray is moved upwardly through the inclined slots 39 and its shaft engaged with the offset 40. The reel would thus act to maintain the tray in a raised position. The tray C is then swung upwardly in the same manner and the reel 35 associated therewith moves upwardly through its inclined slots 39 so that its shaft may be engaged with the offset 40, so as to maintain both the reel and the tray C in this raised position. The bottles are then introduced, the lower trays D and E being filled first. After the lower trays are filled, the tray C is again moved downwardly to its original position as shown in Figure 2, and said tray is filled. The tray B is then filled, the placing of the bottles on this tray being permitted since the uppermost tray A has been swung upwardly. After the tray B is filled, the uppermost tray and its reel are returned to the position shown in Figure 2, and this uppermost tray filled with the bottles. The top 31 is then replaced and if desired, bottles may be placed on this top, the space thereabove providing a storage for additional bottles.

For controlling the individual ejection of the bottles from the lowermost tray E and through the outlet opening 20, an ejection drum 41 is mounted adjacent the lower end of the tray E. This drum is provided with diametrically opposed channels or recesses 42, which are of such size as to receive a bottle. The drum 41 is mounted on a shaft 43 (Figure 7) and the ends of this shaft extend outwardly through openings 44a formed in the side plates 26, and one end of this shaft is journaled in a bearing 44 which is mounted in one of the side plates 26 of the unit. The other end of the shaft extends outwardly through an opening 45 in the other side plate 26 and has its end journaled in the bearing 44 of the side plate of the adjacent unit. The extended end of the shaft 43 has a drive sprocket 46 secured thereto, said sprocket being disposed between the adjacent side plates of the adjacent unit. When the sprocket 46 is rotated, a rotation is imparted to the shaft 43 and to the ejection drum 41. The arrangement, as will be hereinafter explained, is such that normally the drum is in the position shown in Figure 2, with the lowermost bottle of the tray E resting within one of the recesses 42 of said drum. Upon an actuation of the mechanism, the sprocket 46 is rotated through 180 degrees whereby the bottle within the recess is carried around and forces the door 24 outwardly, thereby permitting the bottle to roll downwardly

through the opening 20 and into the receiving trough 21. Upon such a rotation of the drum 41, the opposite recess is moved to a position contiguous to the lower end of tray E, whereby the next bottle rolls into this recess. It is obvious that upon each ejection of one of the bottles, gravity will cause the bottles thereabove on the various trays to move downwardly a distance equal to the space which was taken up by the ejected bottle.

The various units U are placed within the chamber 12 side by side, as is indicated by the dotted lines in Figure 1, and connecting rods 47 serve to connect the various units together, said connection rods passing through openings 48 provided for this purpose in the corner of the side plate 26. As previously explained, the shaft 43 of the ejector drum 41 extends outwardly through an opening 45 in one of the side plates, and has its end supported in the bearing 44 of the plate 26 of the adjacent unit. With this arrangement, it will be evident that the end unit within the chamber will have no support for the extended end of the shaft 43, and in order to provide such a support, a supporting plate 26a which is similar to the side plate 26 carrying the bearing 44, is provided. This plate, as is clearly shown in Figure 4, is disposed adjacent the cooling coil 14 at one side of the cabinet, and is preferably connected to the unit within the chamber 12 by the connecting rods 47.

For imparting rotation to the sprocket 46 and thus to the ejector drum 41, the sprocket 46 is connected by a chain 49 with an enlarged sprocket 50. The sprocket 50 is freely rotatable on the extended end of a shaft 51 which is mounted within the unit between the forward ends of the lowermost trays D and E. The shaft 51 is mounted in a manner similar to the mounting of the shaft 43 of the ejector drum and has one end mounted in a bearing 52 provided in one of the side plates 26 of each unit. The opposite or extended ends of the shaft on which the sprocket 50 is mounted is supported within the bearing 52 within the side plate 26 of the adjacent unit. Since the sprocket 50 has a direct connection with the sprocket 46 through the chain 49, it follows that when the former is rotated, a rotation will be imparted to the latter.

As explained, the sprocket 50 is freely rotatable on the shaft 51 which merely serves as a support therefor. The sprocket is formed with an inwardly directed, integral collar 53 which has a general square shape, as is clearly shown in Figure 10. The collar is formed with a circular bore 54 which is adapted to receive a clutch element 55. The clutch element is also freely rotatable on the shaft 51 and is formed integral with a drive gear 56. The gear 56 is also rotatable on the supporting shaft and is confined against the collar 53 by a retaining ring 57. The clutch element 55 which is formed integral with the drive gear 56 is formed with a plurality of radially extending shoulders 58, and the outer periphery of the element is arranged so as to gradually curve from the base of one of the shoulders 58 to the high point of the adjacent or next shoulder. A spring pressed pin 59 is mounted within the collar 53 and when the drive gear and clutch element 55 are rotated in a clockwise direction (in Figure 10), one of the shoulders 58 on the clutch element will strike the pin 59 and will impart a clockwise rotation to the collar 53 and the sprocket 50 integral with said collar. However, a rotation of the drive gear and cam element in

a reverse direction, that is, a counter-clockwise direction (in Figure 10) will merely result in a depression of the pin 59. Thus, the arrangement provides an overriding clutch and rotation in one direction can be imparted to the sprocket 50.

For imparting rotation to the drive gear 56, a gear rack 60 is slidably mounted within a rectangular guide sleeve 61 which is suitably fastened to the inner wall of the side plate 26 of the unit. The outer end of the gear rack is provided with an extension or bar 62 which projects outwardly through an opening 63 formed in the front wall of the cabinet. The operator may grasp the extension 62 and impart an outward sliding movement to the gear rack 60, and such movement will result in a clockwise rotation of the gear 56 (Figures 6 and 10) whereby the clutch element 55 and pin 59 will coast to rotate the sprocket 50 and thereby revolve the ejector drum 41 through the chain 49 and sprocket 46. Thus, rotation of the ejector drum to dispense a bottle is controlled by the outward movement of the bar 62, and each time said bar is actuated, a bottle is ejected through the outlet opening 20 in the front wall of the cabinet. For preventing a lockwise rotation of the gear 56 by means of the gear rack 60 to actuate the ejector drum, as has been explained, a locking bar 64 is pivoted on a pin 65, as is clearly shown in Figure 10. The horizontal leg of the locking bar 64 is adapted to co-act with a plurality of lugs 66 which are formed on the periphery of the collar 53, these lugs being spaced equidistant from each other around said periphery. The locking bar 64 is formed with an upstanding portion 64a which extends upwardly through a slot 67 provided within the lower end of the rectangular sleeve or guideway 61 within which the gear rack is slidable. The extreme upper end of the bar is inclined, as illustrated at 68. When the locking bar is in a lowered position, as shown in full lines in Figure 10, the end of the horizontal leg or portion of said bar is engaged by one of the lugs 66 of the collar 53 which is made integral with the upper sprocket 50. Obviously, if an attempt is made to rotate the gear 56 to impart rotation to the collar, said collar cannot rotate in a clockwise direction because of the engagement of this lug with the locking bar. However, when the locking bar is swung on its pivot 65 to the position indicated in dotted lines in Figure 10, the end of said bar is swung upwardly out of the path of the lug 66, whereby a clockwise rotation of the collar 53 and sprocket 50 may be accomplished.

The locking bar 64 is adapted to be swung by a coin which is inserted into the machine. The coin is inserted into an inclined coin chute 69 which has its upper end extending through the front wall of the cabinet, as is clearly shown in Figure 8. The lower end of the coin chute communicates with the rectangular sleeve or guideway 61, and the coin falls downwardly into the guideway behind the upper end of the locking bar. This position of the coin is illustrated by the dotted line 70 in Figure 10. In order to move the inserted coin forwardly and over the upper end 68 of the locking bar so as to effect a swinging of said bar, the gear rack 60 is provided with a longitudinal rib 71 which is located at one side thereof. As is clearly indicated in Figure 9, the coin falls into the guideway 61 between one wall of said guideway and the gear rack, so as to be disposed in the same plane as the rib 71. When the end bar or extension 62 which is made integral with the gear rack is pulled outwardly, it will be

evident that the rib 71 will engage the coin and will cause the same to move forwardly into the guideway. This forward movement of the coin will force the same over the inclined upper end 68 of the locking bar 64, whereby said bar is swung on its pivot and its end is moved out of the path of the lug 66 on the collar 53. It is pointed out that the clutch element 55 is so disposed with relation to the spring pressed pin 59 within the collar 53 that a partial rotation of the clutch element may occur before one of the shoulders 58 thereon engage the pin 59. This lost motion between the clutch element 55 and the collar 53 is sufficient to permit the coin to move from the position indicated at 70 to the position indicated at 70a as shown in Figure 10. Thus, upon initial outward movement of the hand bar 62 and the gear rack 60, the coin which has been inserted swings the locking bar out of the path of the lug 66 on the collar 53; a continued outward movement of the hand bar then imparts a rotation to the collar 53 and the sprocket 50 which is made integral with said collar. As explained, the rotation of the sprocket 50 results in a rotation of the ejector drum 41, whereby a bottle is ejected through the opening 20 in the wall of the cabinet. It is noted that the continued outward movement of the bar and gear rack, which results in an operation of the ejector drum, causes the rib 71 on the gear rack to move the coin opposite an opening 72 in the forward portion of the guideway, and this opening is in communication with a coin box or holder 73 which is locked within a recess 73a in the front wall of the cabinet.

For preventing the operator from moving the gear rack inwardly prior to the time that a complete outward movement of the gear rack is completed, a pawl 74 is secured on a rotatable shaft 75, which shaft is mounted in one wall 26 of the unit. The pawl 74 is disposed opposite teeth of the gear 56 and is constructed so as to ratchet over the teeth when the gear is moved in a clockwise direction (Figures 6 and 10). However, a counter-clockwise rotation of the gear will result in the pawl engaging the teeth to prevent such counter-clockwise rotation. The swinging of the pawl is controlled by an arm 76 which is also secured to the shaft 75. The arm extends inwardly and is adapted to ride on the periphery of the collar 53 and obviously, as the various lugs 66 on said collar move opposite the arm 76, the arm is swung to rotate the shaft 75 and thereby swings the pawl 74 outwardly out of engagement with the teeth of the gear 56. As the collar 53 rotates and the lug 66 disengages the end of the arm 76, said arm rides downwardly on the inclined surface of the collar and permits the pawl 74 to engage the teeth of the gear 56. For limiting the outward swing of the pawl, a suitable stop pin 77 may be provided adjacent thereof. Prior to the insertion of a coin into the machine, the pawl 74 and arm 76 are in the position shown in Figure 10, the arm being engaged by one of the lugs 66 on the collar 53. In such position, the pawl is held out of engagement with the teeth of the gear 56. After a coin is inserted and the gear rack actuated to swing the locking bar 64, as has been explained, continued movement of the gear rack imparts a clockwise rotation to the gear 56 and collar 53 whereby the lug 66 is disengaged from the arm 76 which permits the pawl 74 to engage the teeth of the gear 56. The pawl merely rides over the teeth as the clockwise rotation of the gear is continued. However, if it is attempted

to move the gear rack inwardly and thereby impart a counter-clockwise rotation to the gear 56, the pawl will prevent such reverse rotation. After the outward movement of the lever 62 and gear rack is completed to eject the bottle, the next lug 66 on the collar 53 has moved opposite the arm 76 and has swung the pawl outwardly out of the path of the teeth of the gear 56. When this occurs, the locking bar 64 has also engaged the next lug and the gear rack 60 may be moved inwardly, such inward movement resulting in a counterclockwise rotation of the gear 56 and of the clutch element 55. Obviously, due to the slippage arrangement between the clutch element 55 and the collar 53, the collar is not rotated in a counter-clockwise rotation with the gear.

Prior to the insertion of a coin into the machine, the parts are in the position shown in Figures 2, 6 and 10. In such position, the lowermost bottle on the bottom tray E has entered one of the recesses 42 in the ejector drum 41. The hand bar 62 cannot be pulled outwardly because the locking bar 64 is engaged with the lug 66 on the collar 53 which is made integral with the operating sprocket 50. When a coin is inserted into the coin chute 69, said coin falls downwardly into the guideway behind the upper extended end 68 of the locking bar and in advance of the outwardly extending rib 71 on the gear rack. After insertion of the coin, the operator grasps the hand bar 62 and moves the gear rack outwardly, whereby a clockwise rotation is imparted to the gear 56. This clockwise rotation of the gear is permitted without moving the collar 53 because of the clearance between the shoulder 58 on the clutch element 55 and the spring pressed pin 59 within said collar. This initial movement of the gear rack moves the coin forwardly and over the inclined upper end 68 of the locking bar, whereby said locking bar is swung on its pivot, so as to move said bar out of the path of the lug 66 on the collar 53.

After the locking bar is swung, a continued outward movement of the hand bar will result in further clockwise rotation of the gear, and this rotation will be transmitted to the collar 53 through the clutch element 55 and the pin 59. As explained, the rotation of the collar 53 will impart rotation to the sprocket 50 and then through the chain 49 to the sprocket 46 on the ejector drum shaft 43, whereby the drum 41 is rotated to move the bottle within the recess of said drum outwardly through the opening 20 in the front wall of the cabinet.

Upon the initial movement of the collar 53 in a clockwise direction, the lug 66 on said collar, which has been in engagement with the arm 76, is moved out of engagement with said arm, whereby the pawl 74 may fall against the teeth of the gear 56. As explained, clockwise rotation of this gear allows the pawl 74 to ratchet over the gear teeth and thus the clockwise rotation of the gear may be completed without interference from the pawl. However, if an attempt is made to return the rack to an inward position, the pawl will immediately engage the teeth to prevent a counter-clockwise rotation of the gear 56 and a resultant inward movement of the gear rack 60.

After the outward movement of the gear rack is complete and the ejector drum has rotated through 180 degrees, the bottle has been ejected and falls into the receiving trough 21 on the front of the cabinet. As the movement of the gear

rack was completed, the coin was moved past the locking bar and into the coin box or receptacle 73. As soon as the coin passed the upper end of the locking bar, the weight of said bar caused the same to fall downwardly on the periphery of the collar 53. Thus, as the collar completes its movement, the next lug 66 engages the locking bar, and further rotation of the collar and the sprockets 50 and 46 is prevented. At the same time that the lug 66 engages the locking bar to halt the rotation in a clockwise direction, the next lug also engages the arm 76 to swing the pawl 74 out of engagement with the teeth of the gear 56. When this occurs, the hand bar may then move inwardly and the gear rack will be returned to its original position within the guideway. The inward movement of the gear rack 60 will result in a counter-clockwise rotation of the gear 56, but this counter-clockwise rotation will not be imparted to the collar 53 and the sprocket 50 because of the slippage of the clutch element 55 within the collar 53. Thus, the parts are again returned to their original position and are ready for the next operation.

From the above, it will be seen that a simple and efficient dispensing machine is provided. The bottles are fed by gravity from the various trays downwardly to the ejector drum 41. As each bottle is dispensed, the weight of the additional bottles causes the next bottle to engage the ejector drum. The units are preferably identical in construction, and obviously, any desired number may be incorporated within a single cabinet to dispense any desired number of different kinds of drinks. The mounting of the trays facilitate the filling of the various units and also makes for an exceptionally simple construction.

The device is actuated by a single outward movement of the hand bar 62. The mechanism associated with the hand bar prevents the operation of the device until the insertion of a coin into the machine. The device is fool-proof because it is necessary that the outward movement of the hand bar and gear rack be entirely completed before it can again be returned to an inward position. This arrangement makes it essential that a bottle be ejected each time that the bar is actuated. It is pointed out that the clearance between the ejector drum 41 and the bracket 23, to which the door 24 is hinged, is such that the bottle will barely clear the bracket as the drum is rotated. Thus, it is impossible for any one to reach into the machine through the opening 20 and remove a bottle, because when the drum is in a position shown in Figures 2 and 6, the space between the periphery of the drum and the bracket is insufficient to pass a bottle. Thus, the unauthorized removal of bottles from the machine is prevented.

As has been stated, the width of each tray is preferably sufficient to accommodate the largest bottle which will be dispensed. The unit might be constructed to dispense bottles of a given size and it might become desirable to dispense smaller bottles. In such case, it would only be necessary to attach an angle bar 80, as shown in Figure 11, to the upper surface of the tray. The provision of this angle bar would in effect narrow the width of the tray, whereby a bottle of smaller size may be dispensed from the unit without changing the construction of said unit.

It is pointed out that the reels 35 not only aid in guiding the bottles from one tray to the next

but also maintain the bottles in an aligned or transverse position at all times. The provision of these reels prevents the bottles from assuming a position parallel to the longitudinal axis of the trays and thus becoming jammed with a resultant inefficient feeding of the bottles to the ejecting mechanism.

Instead of providing the reels 35 at the ends of the inclined trays, such reels may be eliminated and transverse rollers 35a substituted therefore, as is illustrated in Figure 12. These rollers are freely rotatable and cooperate with curved baffles 38a to guide the bottles from one tray to the next. Where these rollers are employed, it may be desirable to locate freely rotatable reels 35b midway above each tray for maintaining the bottles in transverse alignment; in actual practice, however, it has been found that the co-action between the rollers 35a and the baffles 38a prevents misalignment of the bottles, and the intermediate reels 35b are not essential.

The foregoing description of the invention is explanatory thereof, and various changes in the size, shape and materials, as well as in the details of the illustrated construction, may be made, within the scope of the appended claims, without departing from the spirit of the invention.

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

1. As a sub-combination in a vending machine, an operating mechanism including, a drive sprocket, a drive gear, a clutch connecting said sprocket and gear and adapted to impart rotation in one direction only from the gear to the sprocket, a slidable gear rack engaging the gear for rotating the same, a locking element adapted to engage the sprocket to prevent rotation of the sprocket and gear, the gear rack adapted to actuate means for engaging the locking element when the rack is slid, whereby said means swings the element out of engagement with the sprocket to permit rotation of the latter.

2. A vending machine including, a casing, for receiving a plurality of articles to be vended and having a discharge opening in its wall, means for discharging an article from the interior of the casing through the opening upon each actuation of the means, a rotatable drive member having a driving connection with said discharging means for actuating the same to effect discharge of the article, a slide bar for imparting rotation to the drive member, locking means associated with said drive member and slide bar for locking the parts against operation, said slide bar adapted to actuate means for engaging the locking means when said bar is slid, whereby the actuated means moves said locking means into an inoperative position to permit operation of the drive member and slide bar.

3. In a vending machine having a casing for

receiving a plurality of articles to be vended and means for discharging an article from the casing upon each actuation of the means, an operating mechanism including, a drive sprocket having a driving connection with said discharging means for actuating the same to effect the discharge of the article, a drive gear, a clutch connecting the sprocket and gear and adapted to impart rotation in one direction only from said gear to said sprocket, a slidable gear rack engaging the gear for rotating the same, and means engaging said gear for preventing a reverse rotation thereof and a reverse movement of the gear rack until after rotation of the sprocket and actuation of the discharging means.

4. A vending machine as set forth in claim 3 wherein the preventing means is disengaged from the drive gear after actuation of the discharging means to permit reverse movement of said gear and gear rack to their original positions, the clutch permitting such reverse movement without a similar rotation of the sprocket and actuation of said discharging means.

5. A vending machine is set forth in claim 3 including means associated with the drive sprocket and adapted to actuate the preventing means upon completion of actuation of the discharging means so as to disengage said preventing means from the drive gear and thereby permit reverse movement of said gear and the gear rack to their original positions.

6. A vending machine as set forth in claim 3 including, locking means adapted to engage the drive sprocket to prevent rotation of said sprocket and the drive gear, said gear rack adapted to actuate means for engaging the locking means when said rack is slid, whereby said locking means is rendered inoperative to permit operation of the sprocket and gear.

7. In a vending machine having a casing for receiving a plurality of articles to be vended and means for discharging an article from the casing upon each actuation of the means, an operating mechanism including, a rotatable drive member having a driving connection with said discharging means for actuating the same to effect the discharge of the article, a slide bar for imparting rotation to the drive member, the slide bar being moved in one direction only to rotate said drive member and actuate said discharging means, means for preventing a reverse movement of said slide bar until after completion of actuation of the discharging means, the preventing means being inoperative after actuation of said discharge means to permit reverse movement of the slide bar to its original position, locking means associated with the drive member for preventing operation of the same, said slide bar adapted to actuate means for engaging the locking means when said bar is slid, whereby said locking means is rendered inoperative to permit operation of said drive member.

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