April 1, 1941. C. C. KUHL 2,236,688

BOTTLE DISPENSING MACHINE

Filed Aug. 3, 1939 3 Sheets-Sheet 1

FIG. 1.

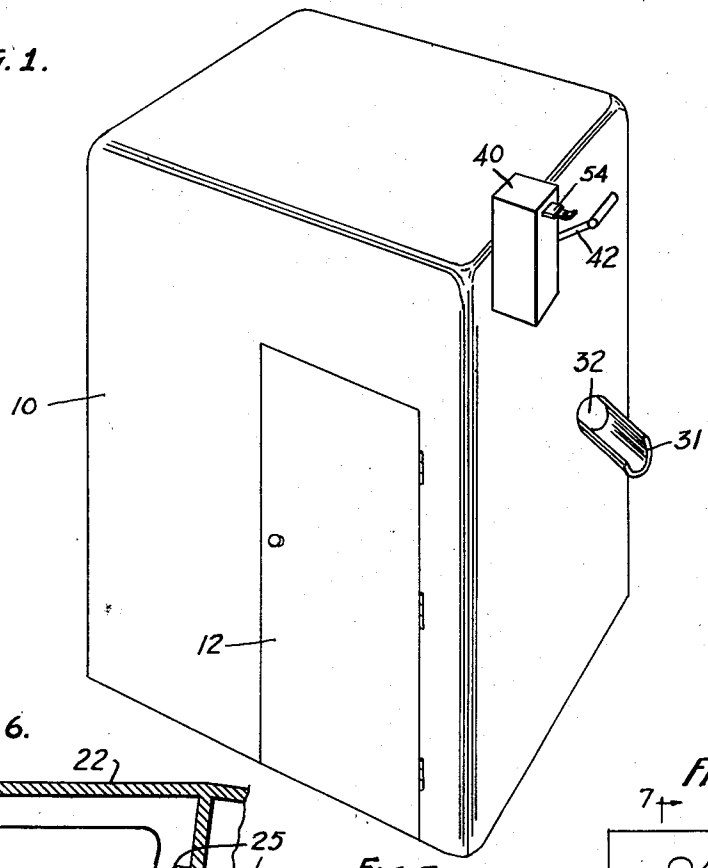


FIG. 6.

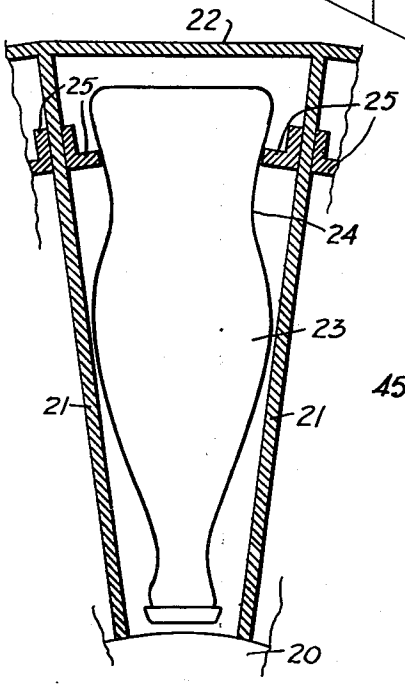


FIG. 7.

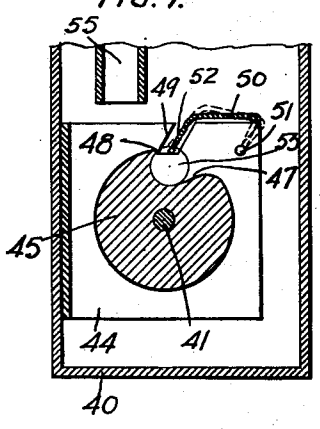
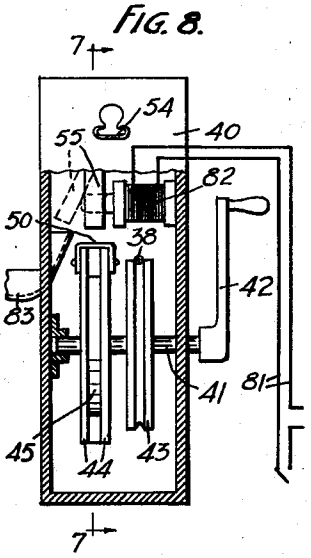


FIG. 8.



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BOTTLE DISPENSING MACHINE

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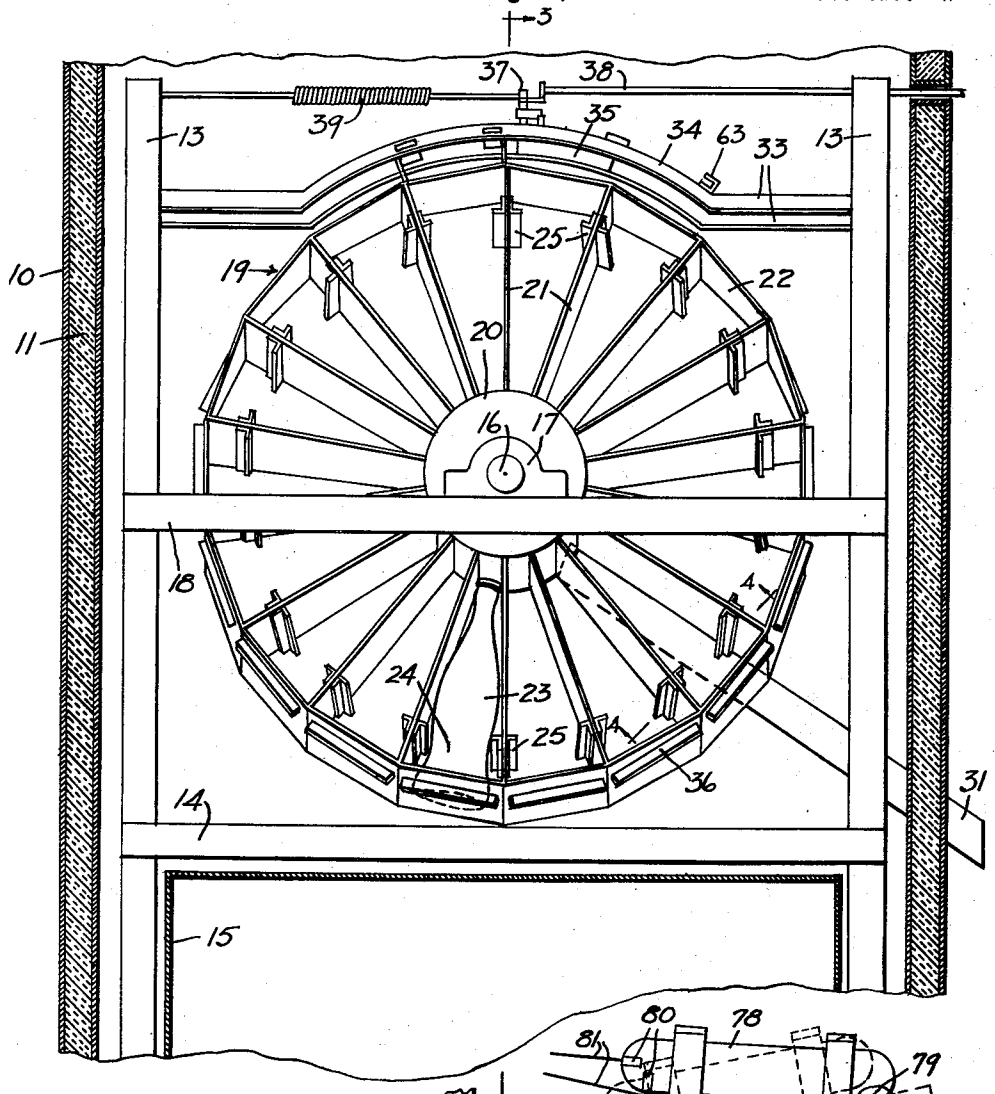

FIG. 2.

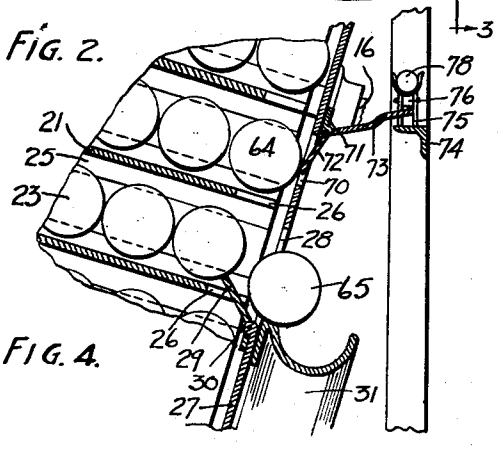

FIG. 4.

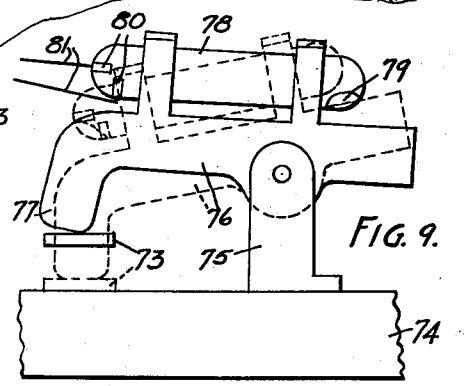

FIG. 9.

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BOTTLE DISPENSING MACHINE

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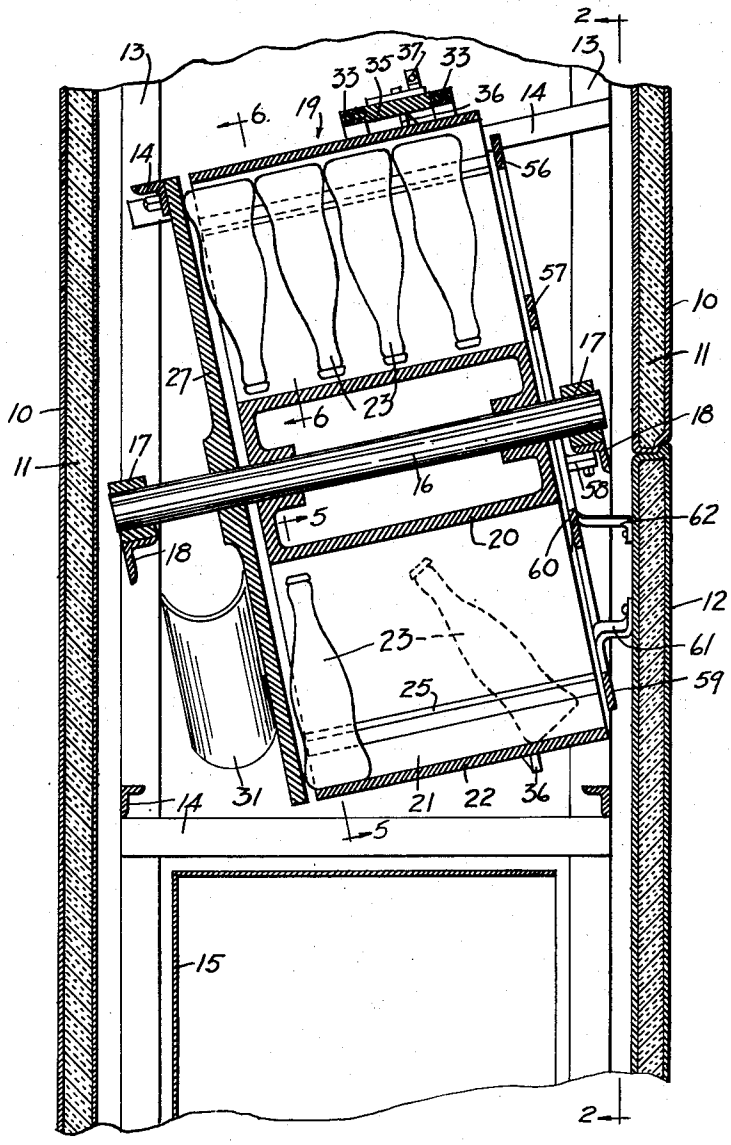

FIG. 3.

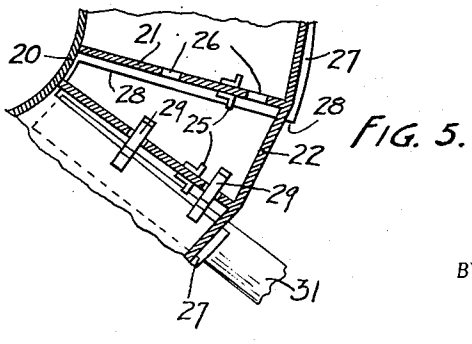

FIG. 5.

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Patented Apr. 1, 1941 2,236,688

UNITED STATES PATENT OFFICE

2,236,688

BOTTLE DISPENSING MACHINE

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Application August 3, 1939, Serial No. 288,101

13 Claims. (Cl. 312—88)

This invention relates to dispensing machines, and more particularly to coin controlled machines for dispensing beverage bottles. However, various types of articles may be dispensed thereby.

The primary object of this invention is to provide a dispensing machine which is simple and sturdy in construction, and positive and non-jamming in operation.

A further object is to provide a device of this character in which bottles are held in operative position for feeding at all times and under all conditions of use, and are not displaced or jammed by rough handling.

A further object is to provide a device of this character with means to positively prevent feeding or discharge of more than one bottle for each operation.

A further object is to provide a device of this character having a reel rotatable on an inclined axis and divided by radial partitions into a plurality of compartments each receiving a plurality of bottles and provided with bottle positioning means.

A further object is to provide a device of this character including a rotatable reel having elongated inclined compartments provided with longitudinal guide projections therein adapted to be engaged by a reduced diameter portion of bottles in said compartments to properly position said bottles in said compartments.

Another object is to provide a device of this character with means operable when the machine is empty for rendering the same inoperative.

Other objects will be apparent from the description and appended claims.

In the drawings:

Fig. 1 is a perspective view of the device.

Fig. 2 is a fragmentary transverse vertical sectional view taken on line 2—2 of Fig. 3.

Fig. 3 is a fragmentary vertical sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a fragmentary sectional detail view taken on line 4—4 of Fig. 2.

Fig. 5 is a fragmentary sectional detail view taken on line 5—5 of Fig. 3.

Fig. 6 is an enlarged fragmentary sectional detail view taken on line 6—6 of Fig. 3.

Fig. 7 is an enlarged fragmentary sectional detail view of the coin control taken on line 7—7 of Fig. 8.

Fig. 8 is an enlarged front elevation of the coin control and operating mechanism with parts broken away.

Fig. 9 is an enlarged detail view of the electrical control mechanism of the device.

Referring to the drawings, which illustrate the preferred embodiment of the invention, the numeral 10 designates a suitable casing for the device which is preferably insulated at 11. The casing is provided with an access door 12 provided with a suitable lock. Door 12 preferably extends from adjacent the bottom of one side wall of the casing to a point spaced below the top of the casing, and is located off-center of said side wall.

A frame is mounted within the casing 10 and comprises uprights 13 and horizontal cross bars 14 between said uprights. A storage compartment 15 is carried by the frame at the lower part of casing 10. Suitable refrigerating means (not shown) are preferably mounted in casing 10 to render chamber 15 a cooling chamber.

A shaft 16 is mounted centrally between opposite vertical walls of casing 10 and above chamber 15 by members 17 carried by opposite horizontal frame cross bars 18. The bar 18 adjacent the side wall which mounts door 12 is positioned at a higher level than the opposite bar 18, whereby said shaft 16 is downwardly inclined toward the rear of casing 10.

A reel 19 is journaled on shaft 16. Reel 19 comprises a central drum portion 20, a plurality of radial partitions or walls 21 projecting outwardly from said drum in equi-spaced relation and parallel to shaft 16, and an outer wall 22 of polygonal shape. The drum 20, walls 21 and outer wall 22 define a plurality of elongated, radially inwardly tapering, rearwardly inclined compartments in the drum, said compartments each being open at both ends and being of a length to receive a plurality of bottles therein disposed side-by-side and in alignment. The bottles 23 receivable in the compartments are preferably provided with a reduced diameter portion 24 intermediate the base and neck thereof. Each of the compartment walls 21 is provided with a longitudinally extending inwardly projecting angle member 25 adjacent to its outer or large dimension end opposite said reduced bottle portion 24. The inner edges of opposite members 25 are preferably spaced apart a distance less than the diameter of the bottle at the base and greater than the diameter thereof at portion 23, for purposes to be set forth hereinafter. At the rear of the reel each wall 21 is provided with a pair of radially spaced narrow elongated cut-outs 26 extending parallel to each other and to shaft 16. Reel

19 preferably rotates in clockwise direction (Fig. 2) as viewed from door opening 12.

A plate 27 of substantially the same diameter as reel 19 is positioned in spaced parallel relation to the rear thereof, suitably mounted on the frame and shaft 16 concentric with the reel. Plate 27 is stationary, and serves to hold the bottles within the inclined reel compartments. This plate is provided with an opening 28 therein of substantially the same size and shape as the cross sectional dimension of the bottle receiving compartments; said opening 28 extending in downwardly inclined relation at the right or downward-movement side thereof and of the reel as viewed in Figs. 2 and 5 and arranged to register with the respective compartments as the reel is rotated. A pair of upwardly and forwardly inclined spring pressed fingers 29 are pivoted at 30 to plate 27 just below opening 28; said fingers being positioned to pass through the cut-outs 26 in reel walls 21 with their inner ends spaced forwardly from the plane of plate 27 and opposite opening 28. An inclined discharge trough 31 is fixedly carried by plate 27 at the rear thereof and below opening 28. Trough 31 extends through a suitable discharge opening 32 in the casing.

The frame of the device includes a pair of spaced cross guide bars 33 above reel 19 transverse of shaft 16, and these bars are provided with curved intermediate portions 34 substantially concentric with and positioned adjacent to the reel. The curved portions 34 slidably mount a shoe 35 provided with suitable escapement means (not shown) engageable with a plurality of circumferentially arranged vanes 36 carried by the outer wall of the reel. A member 37 projects from shoe 35 for connection of a forwardly extending operating cable 38 and a coil spring 39 extending in opposed relation to cable 38 and connected to the frame. The construction of the guides, shoe, escapement mechanism and associated operating parts are more fully described and illustrated in my copending application, Serial No. 288,100 filed August 3, 1939, and issued March 18, 1941, as Patent No. 2,235,641.

A small housing 40 projects from the outer upper end of the casing 10 and journals a shaft 41 operable by crank 42. Shaft 41 mounts a sheave 43 to which the outer end of cable 38 is connected for operation by said crank. A pair of closely spaced parallel plates 44 are carried by housing 40 and extend transversely of and journal shaft 41. A disc 45 is fixedly mounted on shaft 41 between and preferably in engagement with plates 44. Disc 45 is provided with a coin receiving notch 47 therein having a sharp cornered shoulder 48 at one side thereof. Plates 44 are notched at 49 opposite notch 47, and a locking element 50 is pivoted at 51 to plates 44 and has a part 52 extending into notches 49 and 47 to normally be engaged by shoulder 48 of disc 45 upon rotation of shaft 41 by crank 42. Notch 47 in the disc is of a size to receive a coin 53 which projects slightly above shoulder 48 and over which part 52 of member 50 may run to be pivoted at 51 and thereby avoid interlocking engagement with shoulder 48. A suitable coin receiver 54 is mounted in housing 40 and feeds coin 53 to a coin chute 55 positioned above disc 45 to discharge the coin into notch 47 of said disc.

A pair of concentric rings 56 and 57 is arranged adjacent the front of reel 19, carried by brackets 58 secured to the frame, as to front frame member 18 (Fig. 3). These rings are arranged adjacent the inner and outer portions of the bottle compartments of the reel. The rings are preferably sectional, with the sections 59 and 60 located opposite door 12 being secured to said door by brackets 61 and 62, respectively, whereby said sections are shifted away from the reel to fully expose the reel compartments adjacent the door 12 when the door is opened and to be returned to operative position relative to the reel when the door is closed.

The operation of the device is as follows: The reel is filled from the door opening, for which purpose suitable means (not shown) may be provided for releasing the escapement device of the operating mechanism to permit free rotation of the reel. The reel is preferably filled with the bottles stored in cooling chamber 15 which is also accessible through door 12. The bottles are positioned in the reel side-by-side, guided by members 25 positioned opposite the reduced diameter bottle portions 24. The bottles slide against each other and against plate 27 by virtue of the inclination of the reel and the compartments. Should the device be roughly handled, as by shaking, tilting or the like as frequently occurs where efforts are made to pilfer devices of this type, the bottles will all be retained within the compartments by plate 27 and by rings 56, 59 and 57, 60. Also, upon such rough handling when the compartments are only partially filled, the guides 25 will limit displacement or tilting of the bottles from desired radial position, as shown in dotted lines in Fig. 3. The guides in the chambers at the upper part of the device also serve to suspend the bottles in their compartments as illustrated in Fig. 6, so that the rough handling cannot tilt or displace the bottles from operative position. It will also be seen that the bottles in the bottom part of the reel which may be tilted, as shown in dotted lines in Fig. 3, will be righted when the reel compartment reaches uppermost position. Hence bottles are always positioned in proper relation and position in their compartments to be fed when they reach discharge position, and the device can not be jammed, injured, or rendered inoperative by rough handling.

When the customer deposits a coin in coin receiver 54, it passes through chute 55 into notch 47 of disc 45. This conditions the mechanism for operation by lever 42 which rotates shaft 41, sheave 43 and disc 45, with the lock 50 rendered inoperative by coin 53 over which lock part 52 slides. Rotation of sheave 43 serves to pull cable 38 against the action of spring 39, thereby sliding shoe 35 on guides 34 to rotate the reel through the angle between opposite walls 21 of one compartment by engagement of the shoe carried escapement mechanism with one or more of the vanes 36. In order to limit this rotation to exact desired extent, each vane 36 is of a length substantially equal to the width of the outer portions of the compartments, and suitable stop means 63 are fixedly mounted on guides 34 for engagement by shoe 35. This operative extent of reel rotation is effected by partial rotation of crank 42 and associated parts, incident to which the coin 53 is discharged into a suitable coin box (not shown). Release of the crank permits the parts to return to normal position with the lock 52 again positioned in front of shoulder 48 of disc 45 to lock the parts against repeated operation. The vanes 36 are so positioned that the shoe and its escapement

mechanism do not take a new operating position until the shoe is fully returned, thereby permitting lock 52 to become set. The escapement mechanism also includes means for preventing spinning of the reel.

Referring now particularly to Figs. 4 and 5, the discharging operation of the reel is as follows: The parts are shown in said Figs. 4 and 5 in normal or starting position, with reel movement downward. Hence the outermost bottle 64 in the compartment next above opening 28 is the one which will be discharged upon the next succeeding operation of the reel. Upon said operation, the rotation of the reel brings bottle 64 opposite opening 28 in plate 27 so that said bottle may roll through said opening 28 by virtue of the inclination of its compartment, and pass into trough 31 as illustrated at 65 in Fig. 4. The fingers 29 are positioned to permit such discharge of the outermost bottle, but they project into the compartment in advance of the adjacent bottle in said compartment to prevent the same from following the bottle discharged. Upon the next operation of the reel the bottle which was stopped by fingers 29 is shifted past said fingers to a position below plate opening 28, so that it will be retained in its compartment by the plate 27 until a complete revolution of the reel occurs, whereupon it is discharged by virtue of its outermost position in its compartment. This mechanism thus enables each bottle compartment to receive and store a plurality of bottles, which are discharged one at a time, and which are successively fed to discharge position by the inclined position of the compartments.

The pivoted mounting of fingers 29 is provided to permit each compartment to be loaded with its full complement of bottles, by pushing the same into parallelism with plate 27 when the compartment opposite thereto is loaded, and said fingers are retained in such position during free rotation of the drum incident to loading. The fingers 27 are released after the loading operation is completed, so that they will assume normal position illustrated in Fig. 4 as soon as the first operation of the device occurs.

The capacity of the device depends solely upon the width of the reel, and both large and small size devices operate upon the same principle of step-by-step reel rotation and gravity feed and discharge. The simplicity of the construction gives the advantages of substantial freedom from requirements for repair and adjustment, and also permits a sturdy construction which will withstand hard usage and rough handling.

The device may also be provided with electrical means for rendering it inoperative when empty, which means is best illustrated in Figs. 4, 8 and 9. Referring first to Figs. 4 to 9, the retainer plate 27 is provided with an opening 70 spaced above opening 28 to be positioned adjacent bottle 64 while bottle 65 in the next compartment is being discharged. A bracket 71 is carried by plate 27 above opening 70 and pivotally mounts a lever intermediate its ends, with one end 72 of said lever projecting through opening 70 and the other end 73 thereof being heavier and extending substantially horizontally away from plate 27 to terminate adjacent and above a frame member 74. The lever is so positioned and arranged that when its portion 72 passing through opening 70 engages a bottle bearing against plate 27, the opposite portion 73 is positioned above frame member 74; whereas said portion 73 falls upon frame member 74 when there is no bottle in the reel compartment opposite thereto with which portion 72 may engage.

A bracket 75 is mounted on frame member 74 adjacent the lever portion 73 and pivotally mounts an unbalanced carrier member 76 whose unbalanced end portion 77 overlies and engages the end of lever part 73. Carrier 76 mounts a mercury switch unit comprising a container 78 receiving a globule 79 of mercury and having a pair of spaced electrical contacts 80 projecting therein at the end of container 78 corresponding to the unbalanced end of carrier 76. Switch member 78 is interposed in an electrical circuit 81 which includes a solenoid 82 mounted in housing 40 opposite the coin chute 55, which is preferably pivoted. A coin return 83 is mounted in the housing 40 in laterally off-set relation to the normal position of coin chute, but below the position to which chute 55 is pivoted by the armature of solenoid 82 upon operation of said solenoid. If desired, signal means or the like may also be incorporated in the circuit 81.

It will thus be seen that when the device is emptied, and there is no bottle in the reel compartment which would normally be shifted into registration with discharge opening 28 upon the succeeding operation, the lever shifts to inoperative position upon frame member 74 thereby permitting carrier 76 to pivot to dotted line position with mercury 79 closing the circuit between contacts 80 and thereby permitting solenoid 82 to operate and pivot coin chute 55 to dotted line position. Hence any coin inserted in coin receiver 54 will be returned automatically at coin return 83, and the device will not feed a coin to coin notch 47 of locking disc 45 until the reel has been refilled.

I claim:

1. A bottle dispensing machine comprising a casing, a reel rotatable in said casing on an inclined axis, said reel having a plurality of axially elongated radial compartments therein each open at its ends and adapted to receive a plurality of radially positioned bottles, a stationary plate positioned adjacent the lower end of said reel and having an opening therein of a shape complementary to the shape of said compartments and positioned for registration with said compartments upon reel rotation, whereby a bottle in the registering compartment may roll through said opening; and an inclined discharge trough below said opening and projecting exteriorly of said casing.

2. A bottle dispensing machine as defined in claim 1, and means in each compartment for maintaining a bottle in operative position therein during rotation of said reel.

3. A bottle dispensing machine as defined in claim 1, wherein said compartments are axially elongated to receive a plurality of bottles positioned radially therein, and stop means carried by said plate adjacent said opening and projecting into the lowermost end portion of the compartment registering with said plate opening above the lowermost bottle therein.

4. A bottle dispensing machine as defined in claim 1, and a stationary retainer adjacent the upwardly positioned end of said reel.

5. A bottle dispensing machine as defined in claim 1, and a door in said casing adjacent the upwardly positioned end of said reel, and a retainer carried by said door and normally positioned adjacent the end of said reel.

6. In a dispensing machine for bottles each having a reduced diameter portion intermediate

its base and neck, a casing, a reel rotatable in said casing on an inclined axis, said reel having a plurality of axially elongated radial compartments, and guide members substantially parallel to the axis of said reel and projecting into said compartments, said guides being spaced apart less than the diameter of the bases of said bottles and greater than the intermediate reduced diameter portions of said bottles, said guides engaging the reduced diameter portions of said bottles to radially position them in said compartments upon reel rotation and guide sliding thereof to the lower ends of said compartments.

7. In a dispensing machine for bottles each having a reduced diameter portion intermediate its base and neck, a casing, an inclined reel rotatable in said casing, said reel having a plurality of radial partitions defining elongated radial, inclined, bottle-receiving compartments, and a pair of longitudinally extending opposed elongated guide members carried by the partitions of each compartment and spaced apart less than the base diameter of a bottle, the reduced diameter intermediate portions of said bottles being slidably receivable between said guides whereby said guides maintain said bottles in substantially radial position relative to said reel.

8. In a dispensing machine, a rotatable bottle-holding reel comprising a hub, a plurality of radial partitions projecting radially from said hub in equi-spaced relation and parallel to the axis of the hub, an outer peripheral member carried by the outer ends of said partitions, said partitions and peripheral member defining elongated open-ended radial bottle-receiving compartments, and elongated members parallel to the hub axis carried by said partitions adjacent the outer ends thereof and projecting into said compartments at opposite sides thereof for engagement with radially positioned bottles in said compartments adjacent the lower ends thereof.

9. In a dispensing machine, an inclined rotatable reel having a plurality of radial open-ended compartments therein each receiving a plurality of radially positioned bottles and defined by radial partitions, a stationary plate adjacent the lower end of said reel for retaining the bottles in said reel, said plate having a bottle discharging opening with which said compartments are adapted to register, each partition having a cut-out parallel to the axis of the reel adjacent said plate, and a finger carried by said plate below said opening and projecting angularly upwardly therefrom to pass through said cut-outs to retain the uppermost bottles while the lowermost bottle is discharged through said opening.

10. In a dispensing machine, an inclined rotatable reel having a plurality of open-ended, inclined radial compartments therein and each receiving a plurality of bottles, said compartments being slotted at their lower ends, a retainer adjacent the lower end of said reel for retaining said bottles in said compartments and having a discharge opening, and means carried by said retainer and projecting through said slots into the compartment adjacent said opening at a point above the lowermost bottle to retain the remaining bottles while the compartment registers with said opening.

11. The combination defined in claim 10, wherein said last named means is pivoted to said retainer for positioning across said opening while said reel is being filled.

12. In a dispensing machine, a reel rotatable on an inclined axis and having a plurality of radial compartments therein, means for retaining articles in said compartments, said last named means having a discharge opening therein, and means in each compartment for guiding sliding movement of said articles longitudinally in said compartments by gravity, said last named means maintaining said articles in predetermined angular relation to said compartments incident to rotation of said reel.

13. A bottle dispensing machine comprising a casing, a bottle carrier rotatable in said casing on an inclined axis, said carrier having a plurality of axially elongated open ended compartments each adapted to receive and substantially radially position a plurality of bottles therein, said compartments having means whereby the bottles are guided in their respective compartments for shifting in axial direction only, a retainer adjacent the lower end of said carrier for normally retaining bottles in said compartments and having a discharge opening with which said compartments successively register.

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