Dec. 26, 1939. C. A. ROPP 2,184,946

STEP-BY-STEP MECHANISM

Original Filed April 17, 1937 4 Sheets-Sheet 1

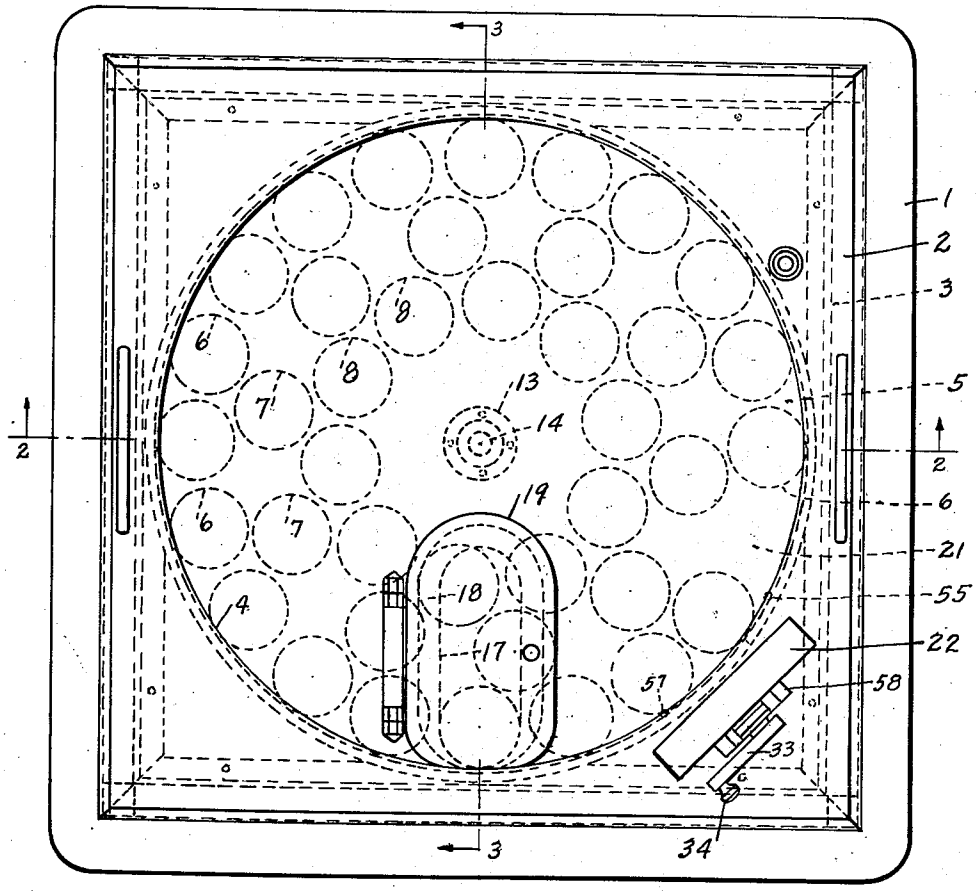


FIG. 1

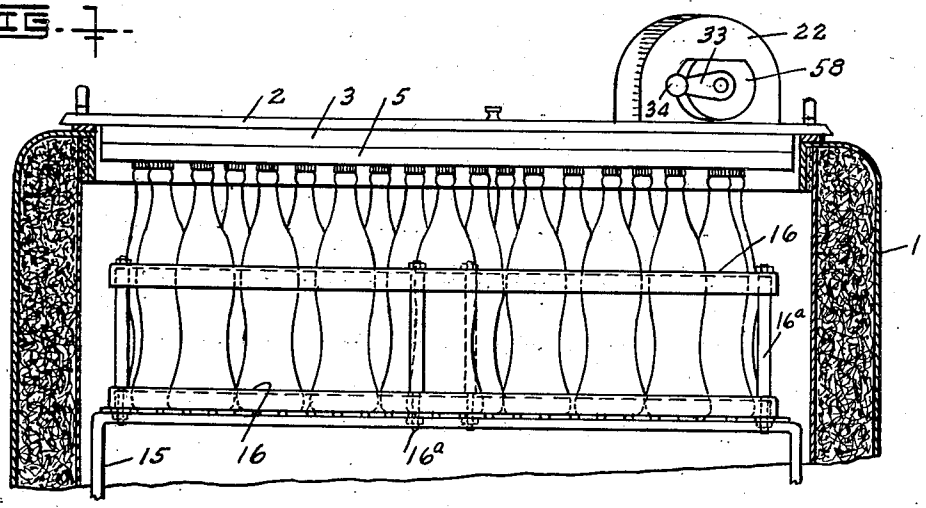


FIG. 2

INVENTOR.
CHESTER A. ROPP
BY Lauzen Mann
ATTORNEY.

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STEP-BY-STEP MECHANISM

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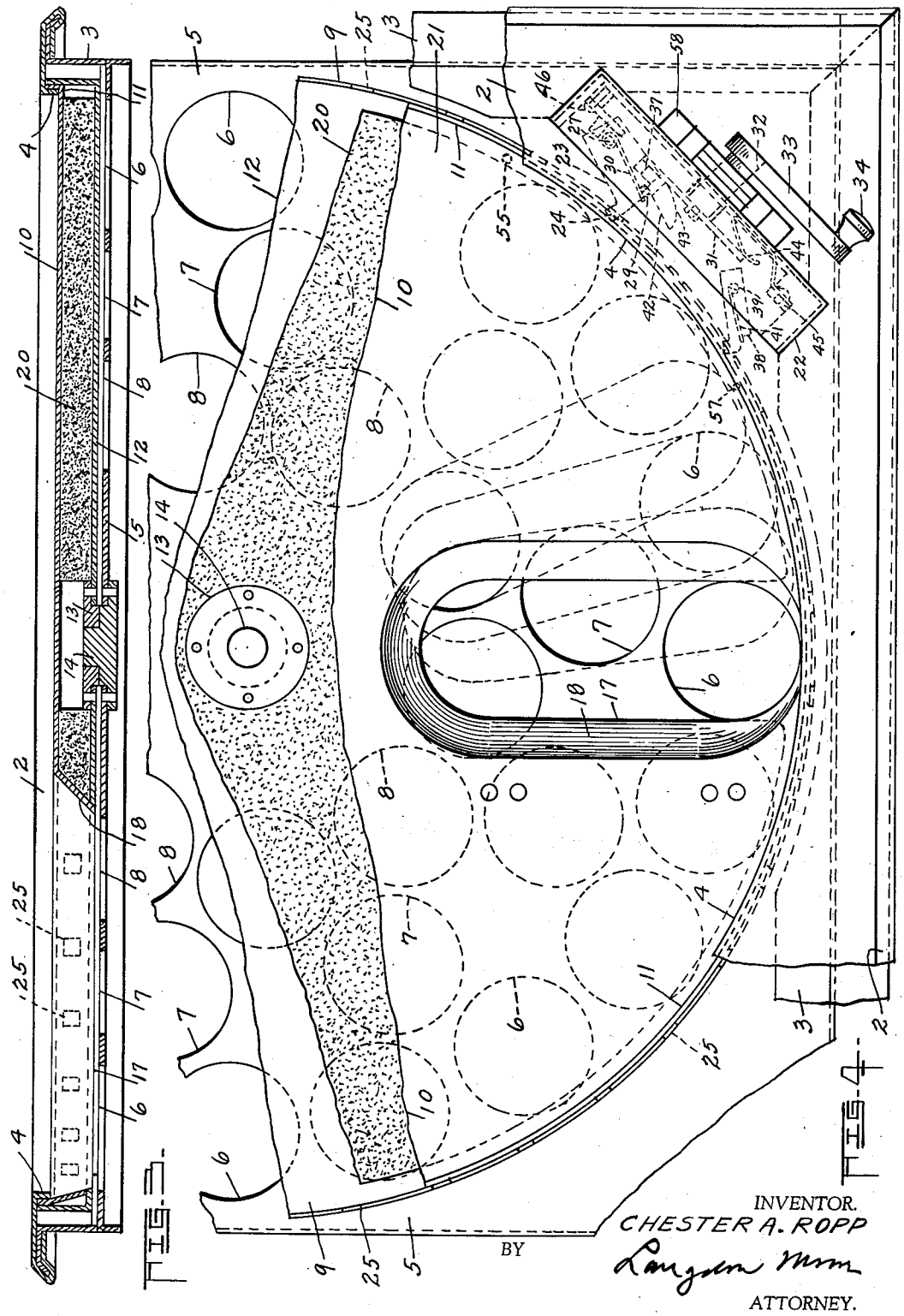


FIG. 3.

FIG. 4.

INVENTOR.
CHESTER A. ROPP
BY
Langson Mann
ATTORNEY.

Dec. 26, 1939. C. A. ROPP 2,184,946

STEP-BY-STEP MECHANISM

Original Filed April 17, 1937 4 Sheets-Sheet 3

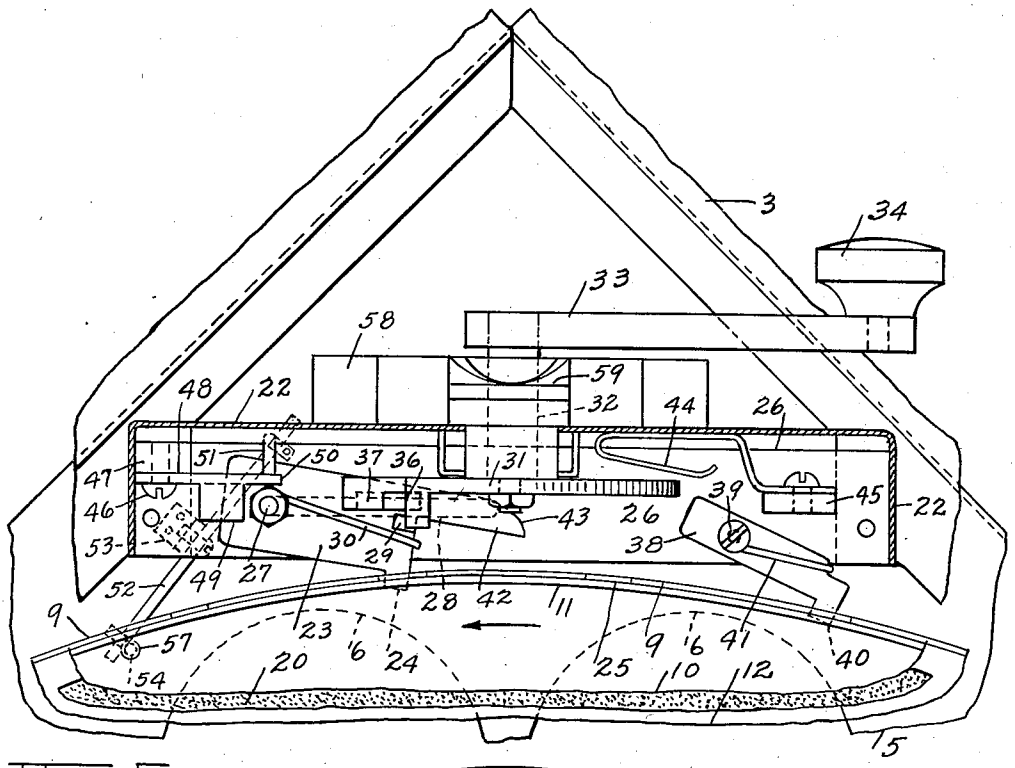


FIG. 5.

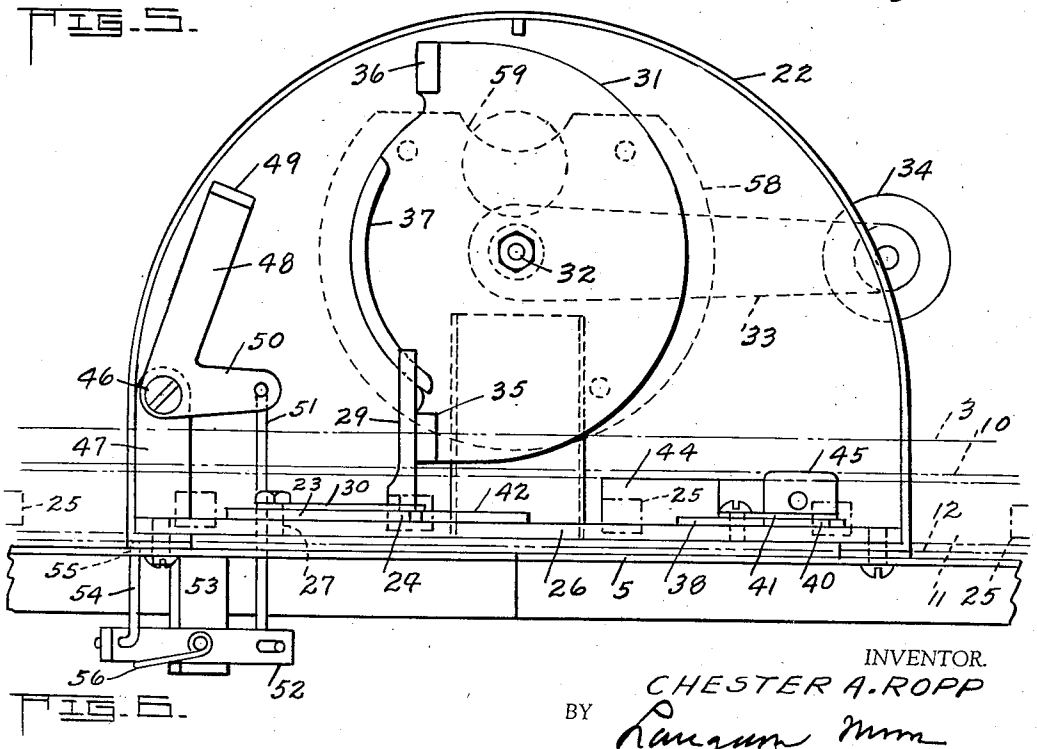


FIG. 6.

INVENTOR.
CHESTER A. ROPP
BY Langum Mann
ATTORNEY.

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STEP-BY-STEP MECHANISM

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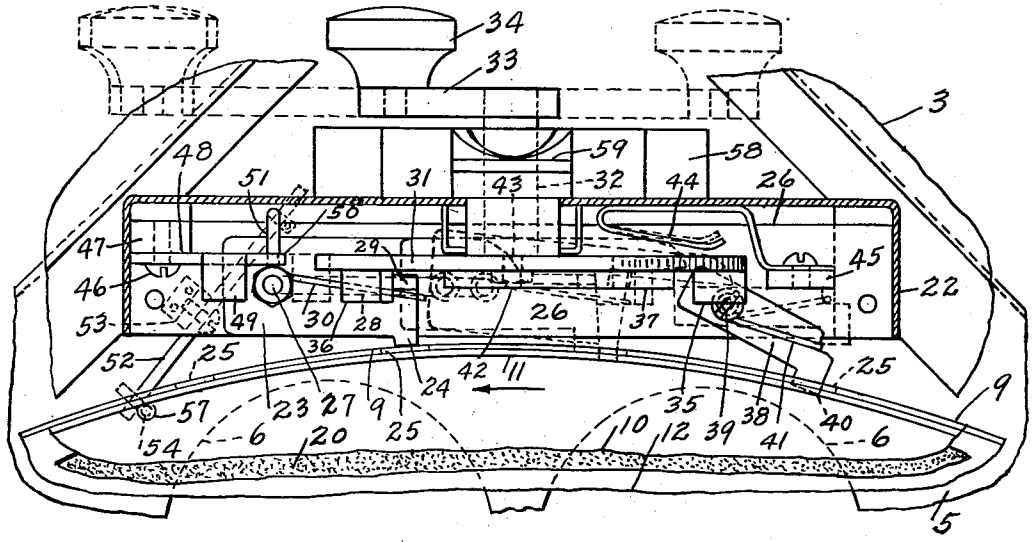


FIG. 7.

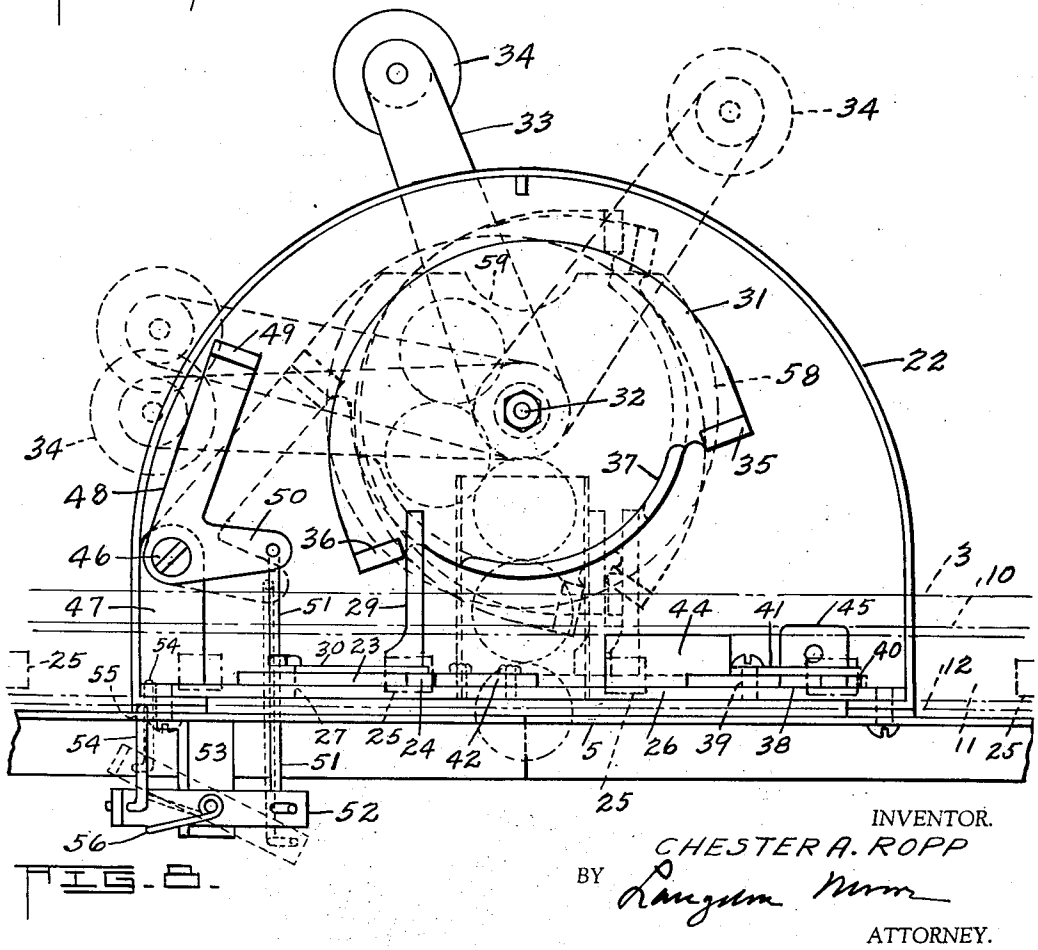


FIG. 8.

INVENTOR.
CHESTER A. ROPP
BY Langston Mann
ATTORNEY.

Patented Dec. 26, 1939

2,184,946

UNITED STATES PATENT OFFICE

2,184,946

STEP-BY-STEP MECHANISM

Chester A. Ropp, Bloomington, Ill., assignor to Williams Oil-O-Matic Heating Corporation, Bloomington, Ill., a corporation of Illinois

Original application April 17, 1937, Serial No. 137,460. Divided and this application May 25, 1938, Serial No. 209,902

10 Claims. (Cl. 74—126)

This invention relates to improvements in dispensing apparatus and more particularly to an improved device of this character for cooling and dispensing bottled beverages or other bottled goods.

It is an object of this invention to provide a closed cabinet for containing, and cooling if desired, bottled goods contained in bottles of uniform size so arranged therein as to be successively removable upon the depositing of a coin to release a manually operable closure to allow the removal of a bottle.

This application is a division of the applicant's prior co-pending application Serial No. 137,460, filed April 17, 1937, and relates to the particular step-by-step mechanism disclosed therein.

With these and other objects in view, reference is made to the accompanying sheets of drawings which illustrate a preferred form of this invention, with the understanding that detail changes may be made without departing from the scope thereof.

In the drawings:

Figure 1 is a top plan view of a preferred form of cabinet and dispensing apparatus constructed in accordance with this invention.

Figure 2 is a fragmentary view in central vertical section taken on the line 2—2, Figure 1, looking in the direction of the arrows, showing the dispensing apparatus and bottles in elevation.

Figure 3 is an enlarged detail view in vertical section of the dispensing apparatus taken on the line 3—3, Figure 1, with the exterior cover for the dispensing opening removed.

Figure 4 is an enlarged fragmentary top plan view of the cover of Figure 1 mounting the coin-controlled operating mechanism, with parts broken away.

Figure 5 is an enlarged fragmentary detail plan view of the operating mechanism shown in Figure 4, with parts broken away, partly in section and with parts removed, illustrating the position assumed by the elements after the mechanism has operated to allow the removal of a bottle and the step-by-step movement is in locked position.

Figure 6 is a view partly in elevation and partly in section of Figure 5, with parts removed, and indicated in dot and dash lines.

Figure 7 is a view similar to Figure 5 illustrating in full lines the position assumed by the elements of the step-by-step mechanism when the operating handle has been released and rotated to the left to allow the movement dog to be retracted and in dotted lines the position assumed by the mechanism in reciprocating the movement dog to be in position to impart the next movement step upon further rotation of the handle to the right.

Figure 8 is a view in elevation of Figure 7, with parts removed, illustrating the progressive positions assumed by the elements of the step-by-step mechanism in dotted lines.

The embodiment of this invention illustrated includes a rectangular cabinet 1 open at the top and provided with a rectangular closure 2 which may be secured thereto in any desired manner, as by a depending flange 3 engaging the inner walls of the cabinet. The top of the closure 2 is provided with a circular opening concentric with vertical axis of the cabinet, which opening terminates in a depending annular flange 4. The bottom of the rectangular closure includes a plate 5 having a plurality of perforations of sufficient size for the passage of a bottle therethrough. The perforations are arranged in three circular rows with the outer peripheries of the outer row of perforations 6 arranged in line with the inner circumference of the annular flange 4 of the top closure 2. An intermediate row of perforations 7 is arranged upon equally spaced-apart centers between every other pair of perforations of the outer row, and an inner row of perforations 8 is formed upon equally spaced-apart centers on each side of the perforations forming the intermediate row, as shown in dotted lines in Figure 1. The relation and purpose of the three rows of perforations will be hereinafter explained.

The means for successively allowing of the removal of a bottle from the cabinet is contained within a cylindrical dispenser turntable 9 concentric with the opening in the top of the closure 2. The circular top 10 of the rotatable turntable 9 is provided with an upstanding flange 11 adapted to slidably engage the inner surface of the depending flange 4 of the circular opening of the closure 2 to position the casing. The bottom 12 of the turn-table is provided with a central cylindrical perforated bearing member 13 adapted to rotatably engage a stud 14 mounted upon the perforated plate 5 whereby the cylindrical turn-table is rotatably mounted and closes the circular opening in the top of the closure 2.

The bottles to be dispensed are supported upon a shelf 15 within the cabinet 1 with their tops adjacent the under side of the rectangular perforated plate 5, and are arranged in a bottle rack or containers composed of circular discs 16 having a plurality of perforations arranged in circular rows, supported by studs 16a and secured to

the shelf 15 to lie directly below each perforation in each of the three rows in the plate 5.

The bottom 12 of the rotatable cylindrical turn-table mounted in the closure 2 is provided with a radial opening 17 extending from the outer periphery of the outer row of perforations to the inner periphery of the inner row of perforations 8 and of a width equal to the diameter of said perforations in the plate 5. The circular top 10 of the rotatable turn-table is provided with a similar opening and the sides 18 are beveled to join the edges of the opening 17. When the rotatable turn-table is in the position shown in Figure 4, the opening 17 completely uncovers one perforation 6 of the outer row on plate 5, while the bottom 12 of the rotatable turn-table 9 partially covers the adjacent perforation 7 in the intermediate row and the adjacent perforations 8 in the inner row, so that the bottle below the perforation 6 may be withdrawn from the cabinet while the others are covered or partially covered by the rotatable turn-table. If a step-by-step movement is imparted to the rotatable turn-table, the contiguous perforation 7 to the right in the intermediate row will be completely uncovered while the adjacent perforations in the outer and inner rows will be partially covered, as shown in dotted lines in Figure 4, and upon the next step in the movement, the contiguous perforations 8 in the inner row will be uncovered while the adjacent perforations in the outer intermediate rows will be partially covered. This cycle repeats itself upon continued rotation in the same direction.

From the above description, it is seen that by the arrangement of the perforations 6, 7 and 8 in the plate 5 of the closure 2 and by imparting a continuous step-by-step movement to the rotatable turn-table contained in the closure thereabove, the bottles may be successively removed from the cabinet through the opening 17 in the closure. It is to be noted in this arrangement that two bottles in the outer row are removed to every one in the intermediate row and inner row. If desired, the opening 17 and beveled walls 18 may be provided with a spring-pressed cover 19, preferably hinged at one side as shown in Figure 1. This is especially desirable when the cabinet contains ice or other bottle-cooling medium, and in such an event it is preferable to provide the rotatable turn-table 9 with insulation material 20 between the top 10 and bottom 12 thereof, as shown in Figure 3. A step-by-step movement, hereinafter to be described, is arranged to advance the opening 17 of the closure to uncover the bottles as hereinbefore described. It is desirable to prevent further rotation of the rotatable turn-table of the closure 2 after the last bottle has been removed, and to accomplish this, one perforation 6 of the outer row is omitted in plate 5 and as the opening 17 passes over this continuous solid portion 21 in uncovering the last bottle in the inner row, the plate 5 will coact with means forming a part of the step-by-step movement to lock the mechanism against further movement.

The step-by-step movement is mounted in a casing 22 and is provided with a reciprocating slide 23 having an outstanding dog or lug 24 at one end thereof adapted to engage and disengage equally spaced-apart apertures 25 in the cylindrical sides of the turn-table 9, as shown in dotted lines in Figures 3 to 8 inclusive. The casing 22 passes through an aperture provided therefor in the top of the closure 1 and is secured upon the perforated plate 5 and the bottom of the casing 22 is secured to a rectangular base 26 tangential to the circumference of the rotatable turn-table 9. The reciprocating slide 23 is pivoted at one end upon a stud 27 which is mounted to reciprocate in a slot 28 arranged longitudinally in the base 26. The length of this slot 28 is such that when the slide 23 is at one end of its movement with the dog 24 in engagement with the slot 25 in the rotatable turn-table 9, as shown in Figures 4 and 5, it will allow the slide, when the dog 24 has been removed from engagement with the turn-table, to be caused to travel to the right a sufficient distance to allow the dog 24 to engage the next aperture 25 to the right, as shown in dotted lines in Figure 7. The slide 23 is provided with an upstanding post 29 in approximate transverse alignment with the dog 24. A spring 30 anchored at one end to the stud 27 engages the post 29 and normally exerts a pressure to retract the dog 24 from engagement with the turn-table 9. In order to withdraw the dog 24 of the slide 23 from engagement with the turn-table 9 as shown in Figure 7, reciprocate the slide 23 to the other end of its movement and allow the dog 24 to engage the next aperture 25 in the turn-table 9, and then impart the next step of the step-by-step movement to the turn-table 9, an operating disc 31 is mounted upon an operating shaft 32 extending through the casing 22 to engage an operating lever 33 provided with an operating handle 34, as shown in Figures 4 to 8, inclusive. The operating disc 31 is provided with a projecting stop 35 adapted to engage the post 29 when the slide 23 is at the end of its movement, as shown in Figures 5 and 6, when the operating handle 34 has rotated the operating shaft 32 to the end of its movement to the right. The operating disc is provided with another projecting stop 36 adapted upon rotation of the handle 34 to the left to engage the other side of the post 29, as the handle 34 is rotated to the left to reciprocate the slide to the other end of its movement, as shown in dotted lines in Figure 8, when the handle 34 has reached the end of its movement to the left. The operating disc 31 is cut away between the stops 35 and 36 on the arc of a circle concentric with the disc and its edge is provided with an arcuate flange 37 projecting in the same direction as the stops and adapted to engage the adjacent side of the post 29 and rotate the slide 23 against the tension of the spring 30 to cause the dog 24 to enter an aperture 25 in the turn table 9, as shown in Figure 6, and maintain its engagement therewith. To allow the dog 24 to be retracted from engagement with the turn-table 9, the flange 37 is terminated short of the stop 36 so that when the disc 31 has been rotated to the left, as shown in full lines in Figure 8, the post 29 is freed from contact with the flange 37 and the pressure of the spring 30 will move the post 29 to be in the path of the stop 36, and at the same time withdraw the dog 24 so that further rotation of the disc to the left will move the slide 23 to the right end of its reciprocatory movement, so that as the handle 34 is again rotated to the right, the flange 37 will engage the post 29 and cause the dog 24 to engage within the aperture 25 in the rotatable turn-table 9 and upon continuing the rotation of the handle 34 to the end of its travel in that direction, the slide 23 will be reciprocated and impart one step in the movement to the turn-table 9. This cycle is repeated to impart the step-by-step movement to the casing 9.

It is preferable to lock the rotatable turn-table 9 during the reciprocation of the slide 23 preparatory to imparting the next step of the movement. To accomplish this, a latch 38 is pivotally mounted intermediate its ends upon a stud 39 upon the base 26 having a projecting dog or lug 40 upon one end adapted to enter an aperture 25 in the side of the casing 9 when the slide 23 has been reciprocated to impart a rotation step to the turn-table 9 at the end of its movement, as shown in Figure 5. The latch 38 is provided with a spring 41 secured at one end to the post 39 with its free end in engagement with the body of the latch opposite the lug 40 to normally urge the lug against the side of the turn-table 9 and enter an aperture 25 when aligned therewith. To free the latch 38, the slide 23 is provided with a prolongation 42 extending from the rear of the post 29 and a sufficient distance in the direction of the latch 38, so that when the slide 23 has been withdrawn from engagement with the turn-table and moved in the direction of the latch 38, the under side of the projection 42 will engage over the portion of the latch extending in that direction from its pivotal point. The rear of the projection 42 is provided with a curved surface 43 adapted to engage the free end of a leaf-spring 44 bent back upon itself and secured to a lug 45 extending upward from the base 26, so that as the movement of the slide 23 continues, the prolongation 42 travels between the spring 44 and latch 38, and as the pressure of the spring 44 increases as it travels up the curved surface 43, the dog 40 of the latch 38 will be completely withdrawn from engagement with the turn-table 9 as the slide 23 reaches the end of its movement in that direction. As the slide 23 reaches the end of its movement toward the right, the dog 24 is brought opposite the next aperture 25 in the turn-table 9 at the same time the lug 40 of the latch 38 is withdrawn and the pressure of the leaf-spring 44 causes the end of the prolongation 42 to rotate the latch about its pivotal point to cause the dog 24 to engage the registering aperture 25, as shown in dotted lines in Figure 7. When the operating handle is rotated in the opposite direction, the flange 37 upon the operating disc 31 engages the post 29 and holds the dog 24 in engagement with the turn-table 9, so that the dog 24 will lock the casing while the latch 38 is removed, and when the stop 35 engages the post 29 to impart a movement to the slide, the withdrawal of the prolongation 42 frees the latch 38 so that it will ride over the wall of the turn-table 9 until opposite the next aperture 25 is reached as the slide 23 reaches the other end of its travel to again lock the turn-table against rotation.

After the last bottle has been removed from the perforation 8 in the inner row of bottles, the further rotation of the turn-table 9 is prevented by an additional mechanism. A bell-crank lever is pivotally mounted at its apex 46 upon the upper end of a post 47 extending upwardly from the base 26 within the casing 22, as shown in Figure 6. The upper arm 48 of the bell-crank lever is provided with a stop 49 adapted upon rotation to enter the path of the stop 36 upon the operating disc 31, as shown in dotted lines in Figure 8, and prevent the stop 36 from engaging the post 29 to reciprocate the slide 23 to impart the next step-by-step movement of the turn-table 9. The end of the other arm 50 of the bell-crank lever is connected by the pivoted link 51 passing through the plate 5 to one end of a cross-head 52 pivotally mounted at its center upon a bracket 53 secured upon the under side of the plate 5. The other end of the cross-head 52 pivotally mounts a pin 54, the free end of which is adapted to pass through an aperture 55 provided therefor in the plate 5 to normally engage the under side of the bottom plate 12 of the turn-table 9 and to hold the bell-crank lever with its stop 49 out of the path of the stop 36, as shown in Figure 6. A spring 56 secured at one end to the pivotal point of the cross-head 52 exerts an upward pressure upon the free end of the pin 54. A perforation or aperture 57 is provided in the solid portion 21 of the base plate 12 formed by the omission of the perforation 6. As the last bottle in the inner row is uncovered, the aperture 57 is brought in register with the end of the pin 54, so that the spring 56 will operate the cross-head 52 to rotate the bell-crank lever through the link 51 to bring the stop 49 into the path of the stop 36 of the operating disc, as shown in dotted lines in Figure 8. When the closure 2 is removed from the cabinet 1 to refill, the pin 54 is manually withdrawn and the mechanism operated to the next stop which normally would uncover the omitted perforation 6 in the outer row, and when replaced over the filled cabinet the adjacent perforations 7 and 8 will be partially covered by the casing 9.

It is desirable to have a dispensing apparatus of this character provided with a coin-controlled mechanism preventing the operation of the step-by-step mechanism until after the deposit of a coin for the purchase of a bottle of the beverage contained within the cabinet. The rear of the casing 22 is therefore provided with a coin-controlled mechanism of commercial form mounted within a casing 58 through which the operating shaft 32 passes. This coin-controlled mechanism may be of any form desired which will operate upon the deposit of a coin in the slot 59 to either free the operating lever 31 for manual operation or connect the operating lever 31 with the operating shaft 32 upon manual operation to reciprocate the step-by-step movement as the coin passes through the mechanism, as indicated in dotted lines in Figure 8. This particular coin-controlled mechanism forms no part of this invention and, as above said, may be of any type desired.

What I claim is:

1. A step-by-step movement for a cylindrical turn-table having a plurality of equally spaced-apart apertures in its circumference including a base spaced apart from a tangent to said turn-table, a pivoted reciprocable slide having its pivot mounted to travel in a slot in the base, said slide having a dog adapted to engage in an aperture in the turn-table, resilient means normally maintaining the dog out of engagement with the turn-table, a pivoted operating disc mounted above the base, means upon the slide adapted to be engaged by spaced-apart means upon the disc to reciprocate the slide upon an oscillatory movement of the disc, and means on the disc between said spaced-apart means to reciprocate the slide to engage the dog in an aperture during a movement in one direction.

2. The structure of claim 1, wherein said last-named spaced-apart means releases the slide at the end of said movement and allows the slide to be moved in the opposite direction when the disc is oscillated in the opposite direction.

3. The structure of claim 1, wherein the means

upon the slide includes a post and the spaced-apart means upon the disc includes two spaced-apart stops adapted to engage opposite sides of said parts.

4. The structure of claim 1, wherein the means upon the slide includes a post and the spaced-apart means upon the disc includes two spaced-apart stops adapted to engage opposite sides of said post, and wherein the means between the stops includes an arcuate flange upon the disc between the stops.

5. The structure of claim 1, wherein the means upon the slide includes a post and the spaced apart means upon the disc includes two spaced apart stops adapted to engage opposite sides of said parts, wherein said means between the stops releases the slide at the end of said movement and allows the slide to be moved in the opposite direction when the disc is oscillated in the opposite direction, and wherein the last-named means includes an arcuate flange upon the disc between the stops terminated short of the stop that rotates the turn-table.

6. A step-by-step movement for a cylindrical turn-table having a plurality of equally spaced apart apertures in its circumference including a base spaced apart from a tangent to said turn-table, a pivoted reciprocable slide having its pivot mounted to travel in a slot in the base, said slide having a dog adapted to engage in an aperture in the turn-table, resilient means normally maintaining the dog out of engagement with the turn-table, a pivoted operating disc mounted above the base, means upon the slide adapted to be engaged by said spaced-apart means upon the disc to reciprocate the slide upon an oscillatory movement of the disc, means on the disc between said spaced-apart means to rotate the slide to engage the dog in an aperture during a movement in one direction, said means to reciprocate the slide including means to engage the dog with the turn-table when moved in one direction to impart a rotary movement to the turn-table, and a latch pivoted upon the base with resilient means normally urging the latch against the turn-table and adapted to engage an aperture in the turn-table at the end of said movement of the slide to lock the turn-table as the slide is moved in the opposite direction.

7. The structure of claim 6, wherein the slide is provided with means to engage and rotate the latch out of engagement with the turn-table as the dog on the slide engages in an aperture in the turn-table.

8. The structure of claim 6, wherein the slide is provided with means to engage and rotate the latch out of engagement with the turn-table as the dog on the slide engages in an aperture in the turn-table, including a prolongation upon the slide adapted to engage and rotate the latch.

9. The structure of claim 6, wherein the slide is provided with means to engage and rotate the latch out of engagement with the turn-table as the dog on the slide engages in an aperture in the turn-table, including a prolongation upon the slide adapted to engage and rotate the latch, and a stationary resilient member coacting with said prolongation.

10. The structure of claim 6, wherein the slide is provided with a prolongation adapted to engage and slide over the free end of the latch as the slide approaches the end of its movement toward the latch, and wherein a resilient member is provided adjacent the free end of the latch, and the end of the prolongation is terminated in a taper adapted to enter between the resilient member and latch and rotate the latch to free the turn-table as the slide reaches the end of its movement in the direction of the latch.

CHESTER A. ROPP.