

Sept. 20, 1949.

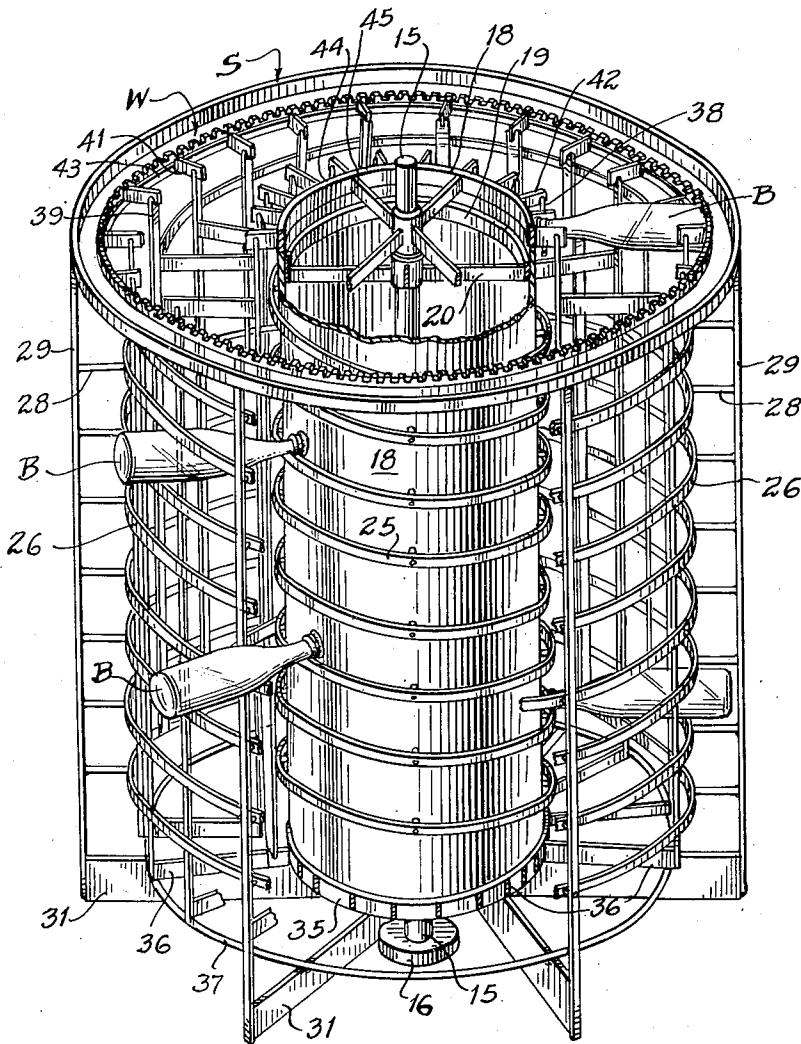
H. S. CHILDERS
DISPENSING APPARATUS

2,482,245

Filed Feb. 26, 1944

5 Sheets-Sheet 1

Fig. 1.



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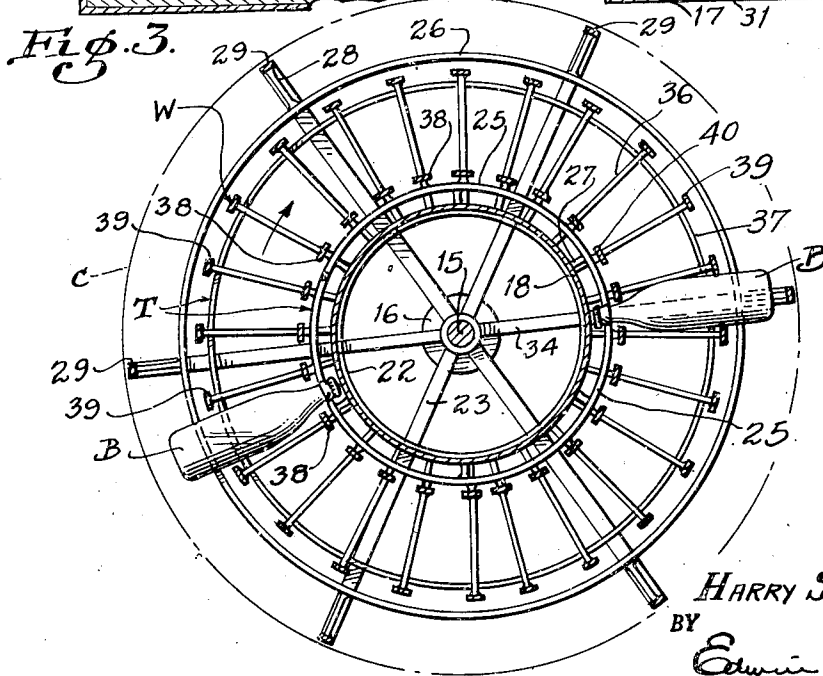
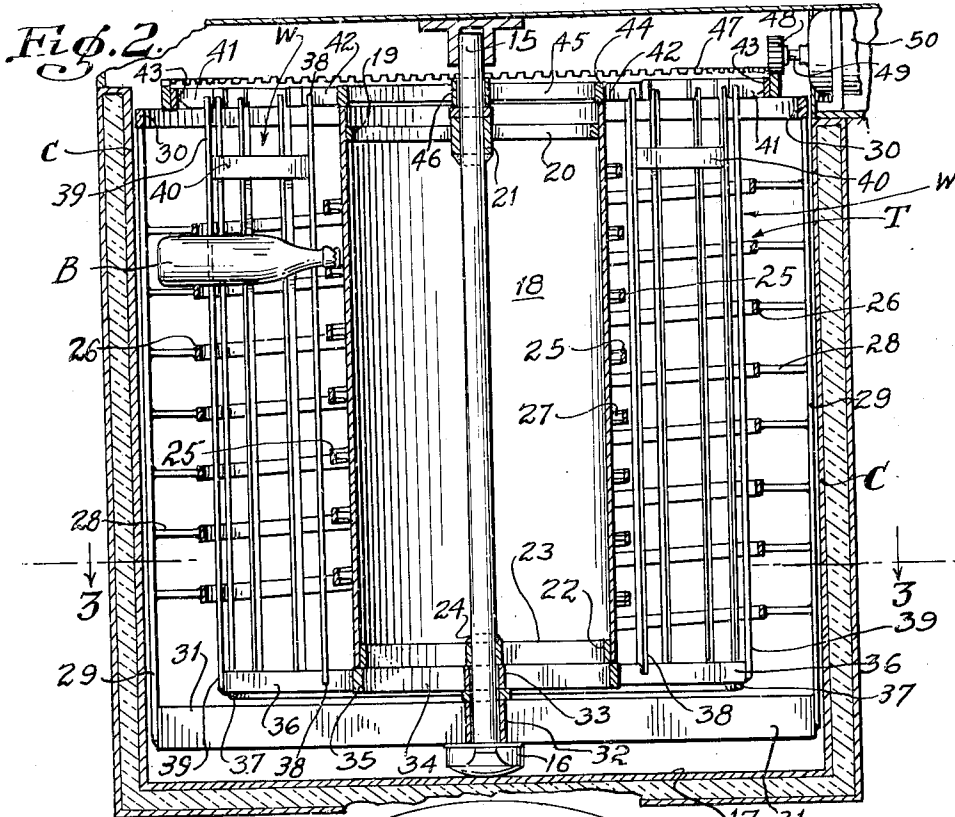
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Fig. 4.

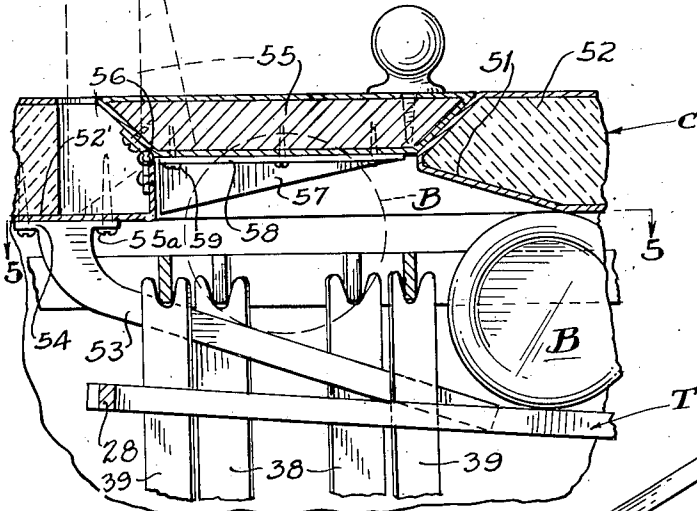


Fig. 6.

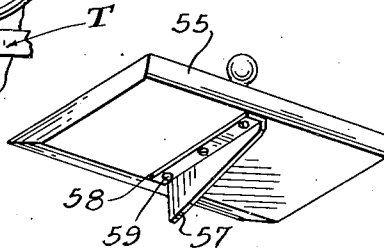


Fig. 5.

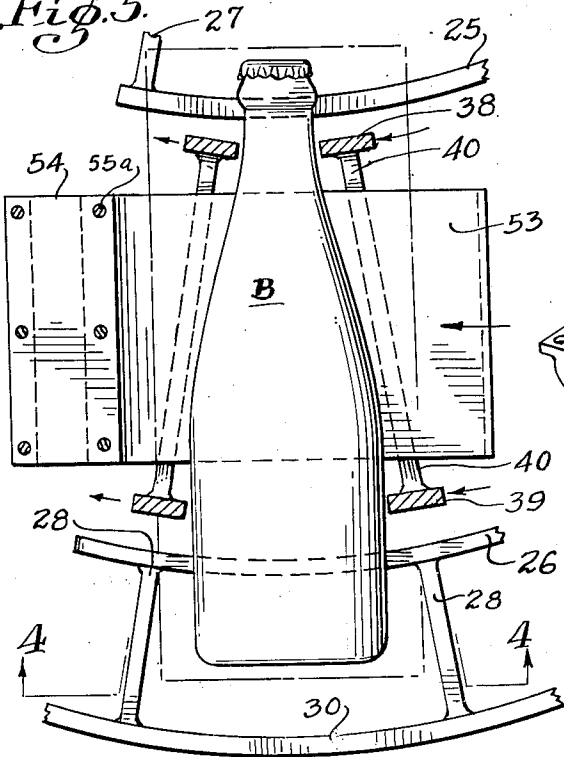
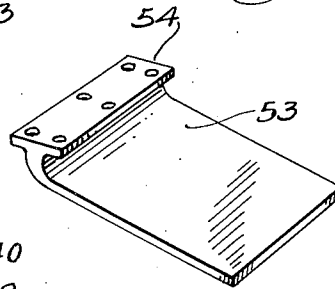


Fig. 7.



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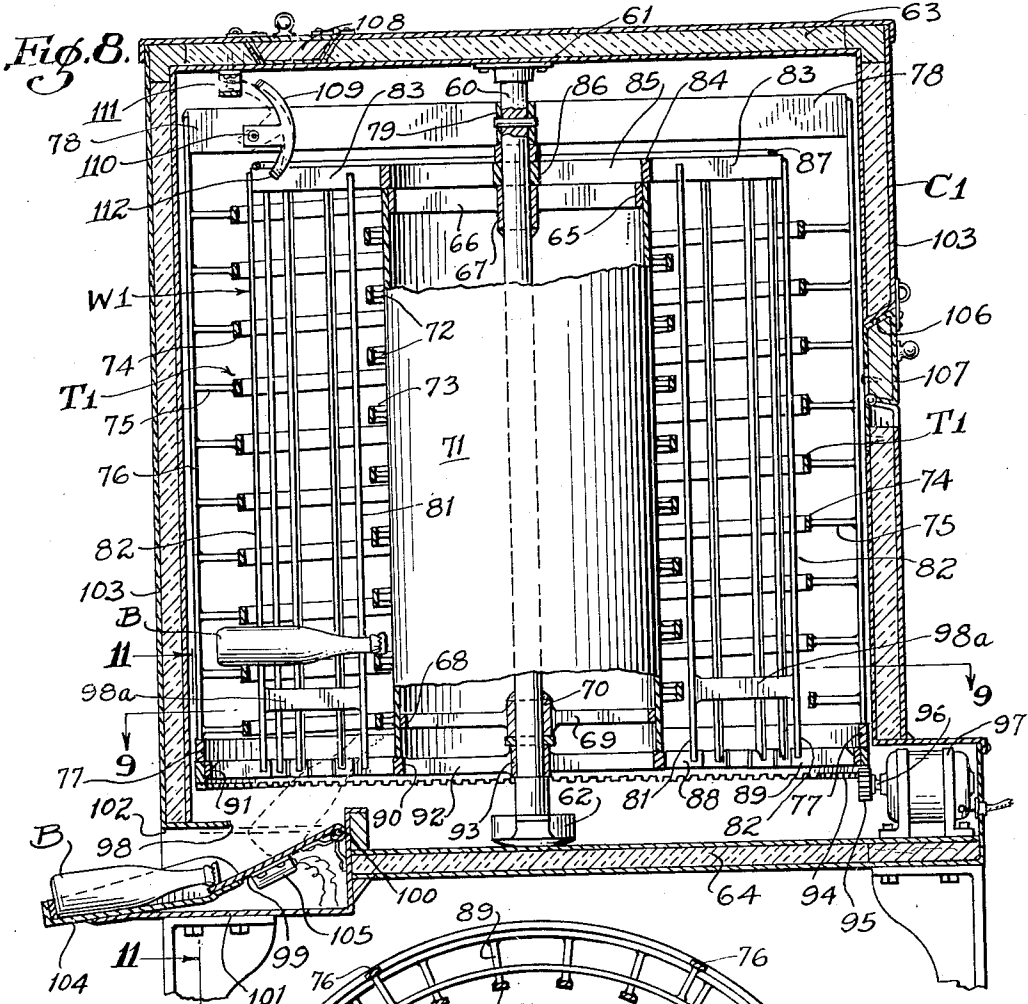
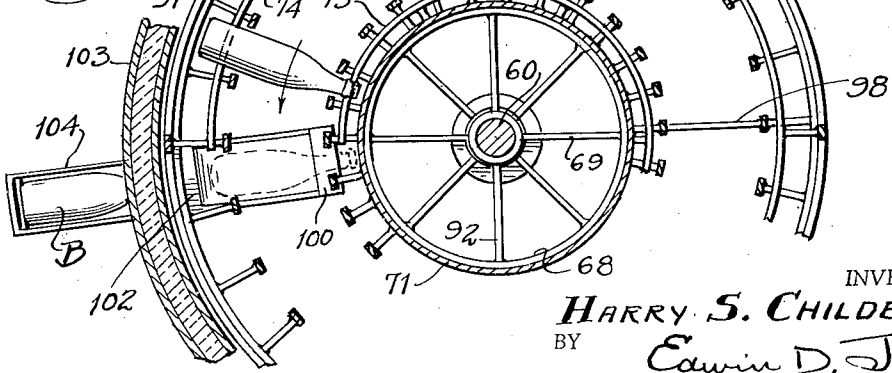


Fig. 9.



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Fig. 10.

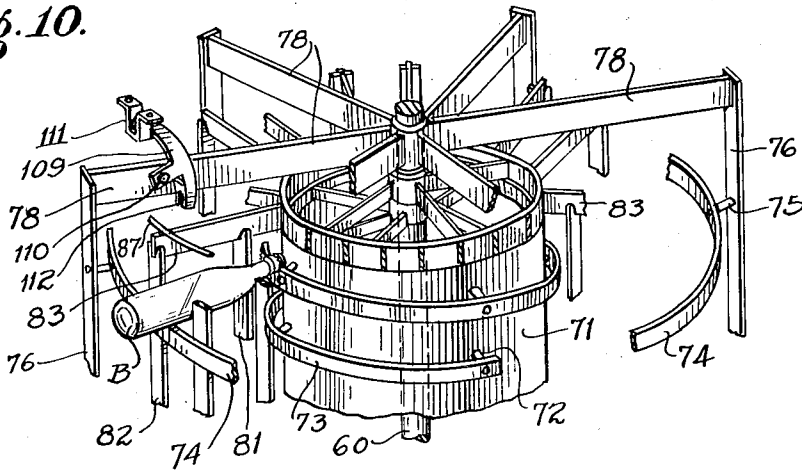
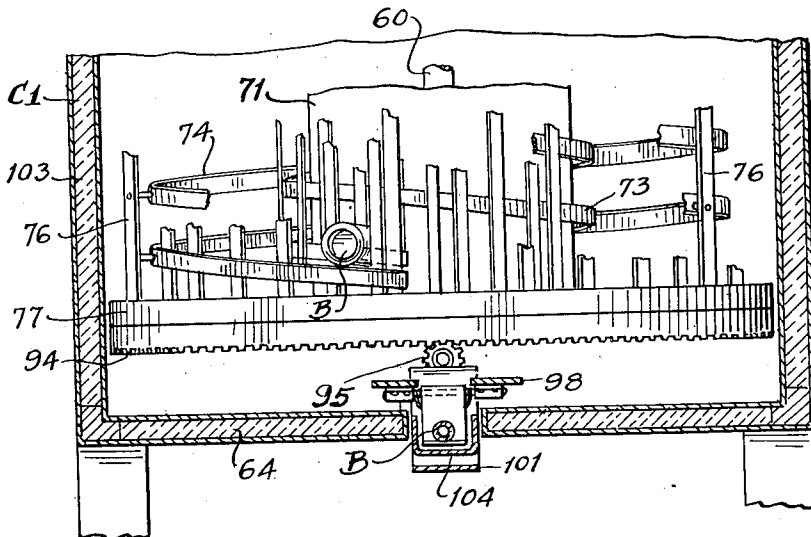


Fig. 11.



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UNITED STATES PATENT OFFICE

2,482,245

DISPENSING APPARATUS

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Application February 26, 1944, Serial No. 524,020

6 Claims. (Cl. 312—97.1)

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My invention relates to apparatus for dispensing articles of various characters, and it has particular reference to dispensing apparatus as used in coin-operated vending machines, and especially, although not necessarily, to machines for vending bottles containing beverages.

It is a purpose of my invention to provide a dispensing apparatus for bottles and the like, which is characterized by its large bottle holding and dispensing capacity resultant of a bottle support or carrier constructed to support a multiplicity of bottles in an ascending or descending helical or spiral series, and by the presence of means for advancing the bottles along the support to effect their discharge singly and successively from the support into a delivery opening.

It is also a purpose of my invention to provide a dispensing apparatus in which the bottle advancing means is operable in one direction to permit loading of the support with bottles, and in another direction to effect dispensing of the bottles.

A further purpose of my invention is the provision of a dispensing apparatus wherein the bottle support is of helical form, and the means for moving the bottles on the support is operable to advance the bottles upwardly of the support for successive discharge into a delivery opening in the top of the cabinet in which the apparatus is contained.

Another purpose of my invention is the provision of a dispensing apparatus in which the bottle support is normally stationary, and the bottle moving means is operable to advance the bottles downwardly on the support to a delivery opening in the bottom of the cabinet, but where the bottle support can be made movable with the bottle moving means when loading the support with bottles, and in a manner to prevent delivery of bottles during the loading operation.

Still another purpose of my invention is the provision of an apparatus particularly designed for the dispensing singly of round bottles of non-uniform diameter, and wherein the bottles are maintained separate one from the other and supported to roll on the helical support, whereby the bottles can be readily advanced on the support and without scratching or otherwise marring them.

I will describe a preferred form of dispensing apparatus embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawings:

Fig. 1 is a view showing in perspective but

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partly broken away, the bottle support and moving means of the first form of dispensing apparatus embodying my invention.

Fig. 2 is a vertical sectional view of the first form of dispensing apparatus as it appears in the cabinet of a vending machine.

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

Fig. 4 is an enlarged fragmentary vertical sectional view showing one means embodying my invention of effecting automatic discharge of a bottle into the top delivery opening of the vending machine cabinet, and the automatic opening of a door normally closing the delivery opening.

Fig. 5 is a horizontal sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is a detail perspective view of the door shown in Fig. 4.

Fig. 7 is a detail perspective view showing the bottle delivery cam of Fig. 4 on a reduced scale.

Fig. 8 is a vertical sectional view of another form of dispensing apparatus embodying my invention.

Fig. 9 is a horizontal sectional view taken on the line 9—9 of Fig. 8.

Fig. 10 is a fragmentary perspective view of the upper portion of the bottle support in advancing means of the apparatus shown in Fig. 8.

Fig. 11 is a fragmentary vertical sectional view taken on the line 11—11 of Fig. 8.

Referring specifically to the drawings my invention is seen to comprise a bottle support or carriage designated generally at S, and which includes a vertical centrally positioned non-rotatable axle 15 supported at its lower end by head 16 which in turn is adapted to be supported on the bottom 17 of a cabinet C. A non-rotatable cylinder 18, preferably of sheet metal, is fixed concentrically to the axle 15 by an upper spider comprising a rim 19, spokes 20, and a hub 21 secured by welding to the axle 15. At its lower end the cylinder is secured to the axle by a similar spider comprising a rim 22, spokes 23, and a hub 24.

That part of the bottle support upon which the bottles are directly mounted comprises a helical track T having an inner rail 25 and an outer rail 26. The inner rail 25 is fixed to the outer periphery of the cylinder 18 by radial studs 27 arranged in a helical series and sufficiently strong adequately to support the rail and the load of the bottles thereon. The outer rail 26 is similarly supported by relatively long studs 28 arranged in a plurality of vertical series, with the studs of each series secured at their inner ends to the

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rail 26 and at their outer ends to vertical and preferably flat rods 29. The upper ends of these rods are connected to each other by an annular band 30, and at their lower ends by a plurality of arms 31 extending radially from a hub 32 suitably fixed to the axle 15 above supporting head 16.

As will be clear from the illustration of the bottles B in Figs. 1, 2, and 3, the spaced rails 25 and 26 of the track T provide a helical support for a multiplicity of bottles, with the inner rail supporting the neck of each bottle, and the outer rail supporting the butt end thereof. The bottles upon the track extend horizontally in side by side relationship in a helical series about the cylinder 18 for the entire length of the track which thus provides a relatively large bottle supporting capacity.

The bottles are adapted to be advanced upwardly of the track T through the provision of a bottle moving means which may comprise a wheel W rotatable about the axle 15 as a center, and constructed to form individual cages for the bottles so that under rotative movement thereof the bottles are collectively advanced in spaced relationship. This wheel includes a lower spider having a hub 33 journalled on the axle 15 and connected by radial spokes 34 to its rim 35. Secured to and extending radially from the rim 35 is an annular series of arms or bars 36 which are rigidly connected at their outer ends to a wire ring 37. The arms 36 provide supports for the lower ends of an inner annular series of vertical rods 38 and an outer annular series of vertical rods 39. The rods 38 and 39 carried by each bar 36 are secured one to the other a short distance below their upper ends by radial cross bars 40.

As an additional means for securing the vertical rods 38 and 39 in upright position and against possible bending, I provide at their upper ends an outer annular series of horizontal bars 41, and an inner annular series of relatively short horizontal bars 42. The bars 41 are secured to and extend radially inward from a ring 43. The bars 42 are secured to and extend radially outwardly from an inner ring or rim 44 situated immediately above the cylinder 18 and connected by spokes 45 to a hub 46 journalled on the shaft 15. The outer ends of bars 42 are secured to uprights 38.

The parts of the bottle moving wheel just described are so arranged that the outer series of rods 39 are disposed adjacent to the inner side of the outer track rail 26 to engage and space the bottles B adjacent their butt ends while the inner series of rods 38 are positioned adjacent the outer side of the inner rail 25 to engage and space the necks of the bottles. Thus under rotative movement of the wheel the outer and inner series of rods 39 and 38 will cause the bottles to roll along the rails and in one direction or the other depending upon the direction of rotation of the wheel. In this manner the bottles are individually and not collectively advanced in spaced relationship along the rails thus eliminating any possible jamming of the bottles, or scratching thereof and at all times insuring free and easy movement of the bottles in either direction along the rails. Also, by virtue of the cage-like frames provided by the rails 25 and 26 and rods 38 and 39 the bottles are maintained in spaced radial positions about the cylinder. It is apparent in Fig. 5 that the inner track rail 25 and the outer track rail 26 are radially spaced to engage opposite end portions of the bottle B and thus are spaced ac-

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ording to the length of the bottle to be accommodated by the dispensing apparatus. To the end of adapting the track for the desired smooth rolling action of the bottles thereon, as described, and to the obviating of sliding of the bottles, the diameters of the helical track rails 25 and 26 respectively are predetermined to provide the proper radial spacing, as above noted, and further to cause the length of the outer track rail 26 to be a multiple of the circumference of the bottle at the position thereof rolled on the outer track rail 26 (a position adjacent the butt end) and to cause the length of the inner track rail 25 to be the same multiple of the circumference of the bottle at the position (the neck) thereof rolled on said track rail 25. The multiple may be either a whole number or a fractional number, the significant feature being that the ratio of the length of the outer rail to that of the inner rail should be substantially equal to the ratio of the circumferences of the bottles engaged with the respective rails.

The entire structure just described, that is those parts comprising the bottle support and the wheel, may be placed bodily within the cabinet C, which latter constitutes part of a bottle vending machine. When my dispensing apparatus is incorporated in a bottle vending machine, suitable means is provided for driving the wheel W to effect dispensing of bottles and to facilitate loading of the track T with bottles. In the present instance, such wheel driving means may comprise a ring gear 47 fixedly secured to the ring 43 for rotation therewith and constantly meshing with a pinion 48 fixed to the shaft 49 of an electric motor 50. It will be understood that depending upon the direction of rotation of the motor shaft the pinion 48, through the gear 47, will drive the wheel W in one direction or the other. When the wheel W is driven in a clockwise direction, as when viewed in Fig. 3, the bottles radially stacked on the stationary track T, will be individually engaged by the rods 39 and 38 and rolled collectively upwardly of the track rails to position the uppermost bottle in a delivery opening 51 in the top 52 of the cabinet C (Fig. 4).

In order that each bottle as moved to the delivery opening may be accessible for removal, provision is made for automatically lifting it from the track T and into the opening. In this instance a cam 53 (Figs. 5 and 7) is provided for the purpose, and is formed with a flange 54 secured by screws 55a to the underside of the top 52 of the cabinet. The positioning of the cam is such that from its end of securement it extends downwardly from above the upper ends of the track rails 25 and 26 to a point between the rails so that the bottle in its movement upwardly on the track rails under the force exerted by the wheel rods 39 and 38 will ride onto and upwardly of the cam and into the delivery opening, as illustrated in broken lines in Fig. 5.

As the interior of the cabinet C is adapted by suitable refrigeration to be maintained at a relatively low temperature to keep the bottled beverages cold, the delivery opening 51, when not in use, should be closed. For this purpose a door 55 is provided to close the opening being mounted by hinges 56 for swinging movement upwardly to the vertical position shown in broken lines in Fig. 4. To accommodate the door in this open position that edge of the delivery opening to which the door is hinged is recessed as shown in dotted lines in Fig. 5.

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Automatic opening of the door 55 with each discharge of a bottle upwardly into the delivery opening, is effected by a cam 57. This cam is secured by a flange 58 and screws 59 to the underside of the door (Fig. 6) so that its lower inclined edge will be engaged by the bottle as it moves upwardly to throw the door to open position. It is clearly apparent that the convergent relation of the cams 53 and 57 respectively, as shown in Fig. 4 causes the cams to exercise a cooperative effect as each bottle in its movement upwardly on the track rails is urged between the cams. The cam 53 urges the bottle upwardly and the cam 57 translates upward and continued helical movement of the bottle into increased upward pivoting of the door 55 resulting in a sudden impelling of the door into the position shown in broken line in Fig. 4.

To load the track T with bottles rotation of the wheel W in a counterclockwise direction, as when viewed in Fig. 3, may be effected manually or by so energizing the motor 50 that its shaft 49 and pinion 48 will drive the ring gear 47 in the desired direction to advance the bottles downwardly on the track T. As the wheel is rotated bottles can be singly and successively lowered into the opening 51 to positions between arcuately spaced inner and outer rods 38 and 39, respectively, as they pass below the opening, so the bottles being pointed inwardly that the neck of each bottle reposes on the inner rail 25 and the butt end thereof on the outer rail 26. In this manner the track can be loaded from the top, the bottles being forced downwardly until they define a helical series about the cylinder 18, each bottle being positioned horizontally and radially of the cylinder.

In the adaptation of my dispensing apparatus to a coin controlled bottle vending machine, operation of the motor 50 to cause dispensing of the bottles may be effected by any suitable coin controlled electrical circuit, and as the circuit forms no part of my invention it has not been illustrated.

With the track T loaded as described, the deposit of a coin operates to energize the motor 50 for the required period to rotate the wheel W in a clockwise direction as when viewed in Fig. 3, and for a distance sufficient to discharge the uppermost bottle of the helical series into the delivery opening under the elevating action of the cam 53 as has been described. This is followed accompanied by opening of the door 55 through coaction of the bottle and the door cam 57 to allow the vendee to remove the bottle readily. From a consideration of Fig. 4 it will be clear that the bottle next in the rear of the one vended, is not accessible for removal because it is sufficiently removed from the delivery opening to prevent the gripping thereof and is also spaced by a pair of rods 38 and 39. Manifestly foregoing operation if the wheel, in response to the successive deposit of coins in the machine, is actuated in a step-by-step sequence to advance the bottles upwardly of the track T to deliver them singly and successively to the opening 51 the apparatus may be completely emptied of bottles. It is also clear that the short bars 41 and 42 near the tops of the rods 38 and 39 leave an unobstructed annular space thereabove and between the rods to accommodate the cam 53 without interfering with rotation of the wheel, and allow the bottles to be singly ejected or removed from the delivery opening.

Referring now to Figs. 8 to 11, I have here shown the second form of dispensing apparatus

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which is likewise incorporated in a vending machine, and which broadly is an inversion of my first form of apparatus. That is to say, the bottles instead of being advanced upwardly of the helical track and delivered at the top of the cabinet, are advanced downwardly of the track and delivered at the bottom of the cabinet. This mode of bottle delivery obviously necessitates a different mode of bottle loading, as will be described hereinafter.

This second form of dispensing apparatus comprises a shaft 60 vertically supported in the cabinet C1 by suitable bearings 61 and 62 in the top and bottom cabinet walls 63 and 64. An upper spider comprising a rim 65, spokes 66, and a hub 67, and a lower spider comprising like elements 68, 69, and 70, are secured to the shaft to fixedly support a cylinder 71 thereon.

A helical series of studs 72 fixedly support the inner rail 73 of the helical track T1 on the cylinder 71, while the outer rail 74 of the track is supported by studs 75 secured to vertical rods 76. The rods 76, in turn, are secured at their lower ends to an annular band 77, and at their upper ends to the outer ends of spokes 78 radiating from a hub 79 pinned to the shaft 60.

As in the first form of my apparatus the foregoing structure constitutes the helical bottle support or carriage upon which the bottles are adapted to be stacked in a helical series about the cylinder, each bottle being positioned horizontally and radially of the cylinder, and with its neck innermost.

The wheel W1 for individually moving the bottles upwardly or downwardly of the track T1, likewise comprises an inner annular series of vertical rods 81, and an outer annular series of vertical rods 82 arranged between the rails 73 and 74 to engage the bottles transversely between their ends. These rods 81 and 82 are at their upper ends, secured to arms 83 radiating from a rim 84 of an upper spider including spokes 85 and a hub 86 journaled on the shaft 60 between the hubs 67 and 79. The arms 83 are braced by a wire ring 87 secured thereto adjacent their outer ends. The lower ends of the rods 81 and 82 are secured respectively to bars 88 and 89 secured respectively to a rim 90 and a ring 91. The rim 90 is part of a lower spider which includes spokes 92 and a hub 93 journaled on the shaft 60 below the hub 70. The ring 91 has secured to its outer side a ring gear 94 which meshes with a pinion 95 on the shaft 96 of an electric motor 97. Brace bars 98a rigidly connect the rods 81 and 82 just above the bars 88 and 89.

The bottom wall 64 of the cabinet is formed with a delivery opening 98 normally closed by a door 99 having a spring hinge 100 for urging it to closed position. The hinge is mounted on a box-like structure 101 which provides an opening 102 in the side wall 103 of the cabinet, and leading from this opening is a chute 104 for receiving a bottle as it is discharged from the cabinet. A mercury switch 105 is mounted on the door 99 so that as the door is closed or opened the switch is closed or opened.

The elements described in the preceding paragraph are not new to my present invention, but are disclosed in my Patent No. 2,290,275 issued July 21, 1942. As in this patent the switch 105 is embodied in a coin controlled circuit for energizing the motor 97, and it operates to permit reenergization of the motor by the coin controlled circuit only after a discharged bottle has been removed by the vendee from the chute 104, for

until then the bottle retains the door in open position to maintain the switch 105 open.

As shown in Fig. 8, this side wall 103 of the cabinet is provided with a bottle loading opening 106 normally closed by a door 107. Through this opening the track T1 can be initially loaded with bottles, or reloaded when empty. Incident to this loading or reloading it is necessary in order to prevent bottles being discharged from either end of the track T1, that the wheel W1 be locked to the track for rotation therewith. Also, in order that the wheel W1 may when rotated in the proper direction by the motor 97, operate to discharge bottles from the track into the delivery opening 98, it is necessary that the track be locked against rotation and in a position in which its lower end is just to that side of the delivery opening which will permit the bottles falling into the opening (Fig. 9).

For the dual purposes just described a latch is provided (Figs. 8 and 10) which is accessible through opening of a door 108 in the top of the cabinet. This latch may comprise an arcuate bill 109 pivoted as at 110 on one of the spokes 78, and a U-shaped keeper 111 secured to the inner side of the cabinet top. The lower end 112 of the latch bar 109 is bifurcated to engage the upper edge of any one of the arms 83 of the wheel.

In the lowered position of the latch bar 109 (Fig. 8) wherein its end 112 engages one of the spokes 78, the wheel W1 is locked to the bottle support so that the track T1 is rotatable in either direction with the rods 81 and 82 to allow loading of the track through the opening 106 and without discharge of bottles from either end of the track. It will be understood that rotation of the wheel and the track in either direction to effect such loading may be accomplished manually or by operation of the motor 97. In the elevated position of the latch 109 (Fig. 10) wherein it engages the keeper 111, the wheel W1 is freed for rotation, while the bottle support is locked against rotation and in such position that the lower end of the track T1 is in the position shown in Fig. 9.

In the operation of the apparatus to effect dispensing of bottles, the motor 97 when energized through deposit of a coin to close the motor circuit as in the machine of my aforementioned patent, operates to rotate the wheel W1 in the direction of the arrow in Fig. 9. In consequence the lowermost bottle on the track T1 will be moved by the rods 81 and 82 off the rails 73 and 74 to fall through the delivery opening 98 onto the door 99, as shown in dash lines in Fig. 8. The weight of the bottle swings the door downwardly to engage the chute 104, thus allowing the bottle to slide into the chute where it is accessible to the vendee.

It will be understood that as in the first form of my apparatus, energization of the motor 97 is only for a period sufficient to rotate the wheel W1 a distance to cause a single bottle to be delivered into the chute, and that the motor cannot be reenergized by the deposit of a succeeding coin until the delivered bottle has been removed from the chute to allow reclosing of the switch 105 by return of the door 99 to closed position.

Although I have herein shown and described only a preferred form of dispensing apparatus embodying my invention, it is to be understood that various changes and modifications may be made therein without departing from the spirit of my invention and the spirit and scope of the appended claims,

I claim:

1. In a dispensing apparatus: an enclosed chamber having a delivery opening at the bottom thereof; and a loading opening at the side thereof; a helical support for articles within said chamber and rotatable about a vertical axis past said loading opening; means for latching said support against rotating movement; rotary article feeding means for advancing articles downwardly of said support for discharge into said delivery opening when said support is latched; and means for latching said support to said feeding means for rotation therewith in either direction to allow loading of said support with articles through said loading opening without discharge of articles into said delivery opening.

2. In a dispensing apparatus: a cabinet having a bottom delivery opening, and a side loading opening; a helical article support rotatable within said cabinet about a vertical axis and accessible through said loading opening; article feeding means rotatable within said cabinet; and latching means within said cabinet movable to one position in which said support is held stationary while said feeding means is rotatable in one direction to feed articles downwardly of said support for discharge therefrom into said delivery opening and to another position in which said support and said feeding means are rotatable together and in either direction to allow article loading of said support through said loading opening without discharge of articles from said support.

3. In a dispensing apparatus: a cabinet having a bottom delivery opening, and a side loading opening; a helical article support rotatable within said cabinet about a vertical axis and accessible through said loading opening; article feeding means rotatable within said cabinet; and a latch within said cabinet having a keeper fixed to said cabinet, and a bill mounted on said support and movable to one position in which it engages said keeper to hold said support against rotation, and to another position in which it engages said feeding means so that said support and said feeding means are rotatable together to allow article loading of said support through said loading opening without discharge of articles from said support.

4. In a dispensing apparatus: a cabinet having a loading opening and a delivery opening, a helical support for articles mounted for rotation about its axis in the cabinet in a substantially erect position for movement past the loading and delivery openings, a rotary article feeding means rotatably mounted in the cabinet concentrically of the helical support for rotary motion relative to said helical support, said feeding means having portions in arrangement with the support to engage articles borne thereby, and means for locking said support against rotation in the cabinet.

5. In a dispensing apparatus: a cabinet having a loading opening and a delivery opening, a helical support for articles mounted for rotation about its axis in the cabinet for movement past the loading opening, a rotary article feeding means rotatably mounted in the cabinet concentrically of the helical support for rotary motion relative to said helical support, the feeding means defining compartments for articles on the support which compartments are successively movable past the delivery opening by relative rotational movement of the support and feeding means, and means optionally interconnecting the helical support and

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the feeding means for unitary rotational movement past the loading opening.

6. In a bottle dispensing apparatus: a cabinet, a helical bottle support mounted in the cabinet in an erect position for rotation about its axis adapted to receive bottles radially thereon for rolling movement longitudinally of the support, a rotary bottle feeding means rotatably mounted on the cabinet concentrically of the helical support for rotation relative to said helical support and engagement with bottles arranged thereon, and means alternatively employed to lock the support against rotation in the cabinet for rotation of the feeding means relative thereto and to interconnect the support and the feeding means for unitary rotational movement of said support and feeding means relative to the cabinet.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|-----------|----------------|---------------|
| 929,733 | Vierling ----- | Aug. 3, 1909 |
| 1,097,893 | Thompson ----- | May 26, 1914 |
| 1,905,180 | Lowther ----- | Apr. 25, 1933 |
| 1,906,928 | Heller ----- | May 2, 1933 |
| 2,233,118 | Williams ----- | Feb. 25, 1941 |
| 2,348,927 | Runsvold ----- | May 16, 1944 |
| 2,351,432 | Jennings ----- | June 13, 1944 |