Nov. 27, 1945. T. F. GREEN, JR 2,389,619

REFRIGERATED BOTTLE DISPENSING DEVICE

Filed April 8, 1941 2 Sheets-Sheet 1

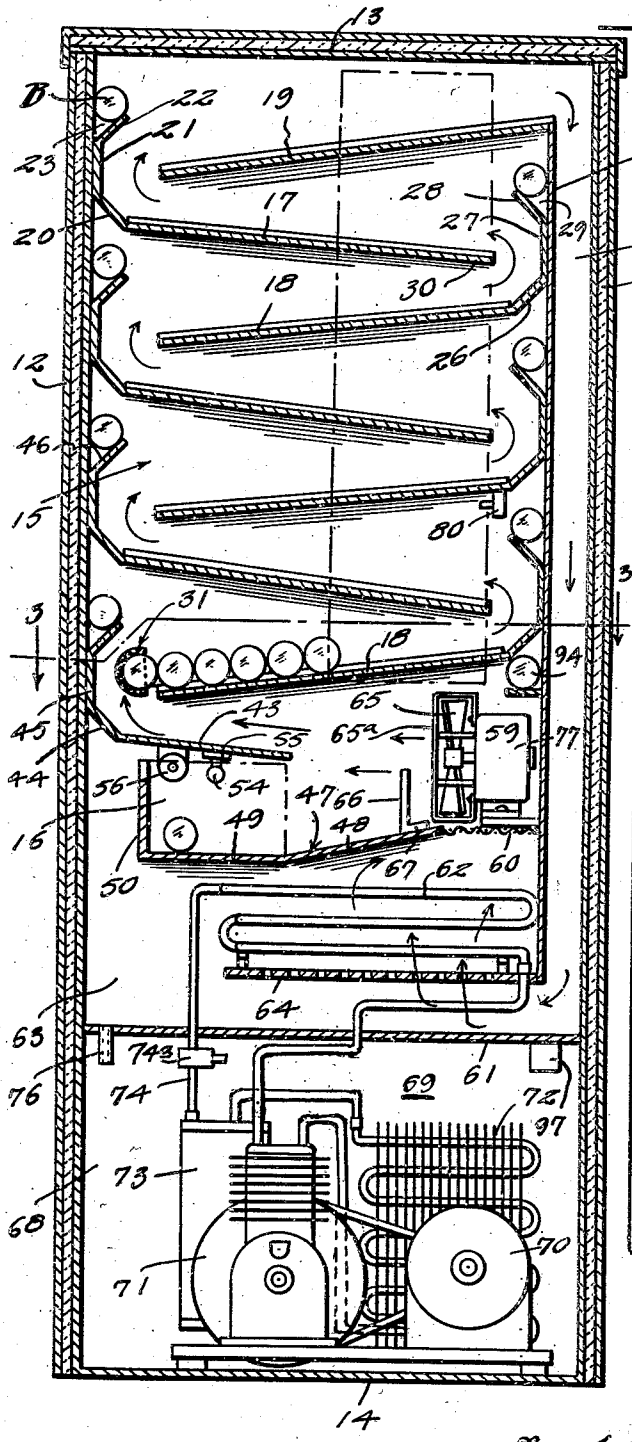


Fig. 2.

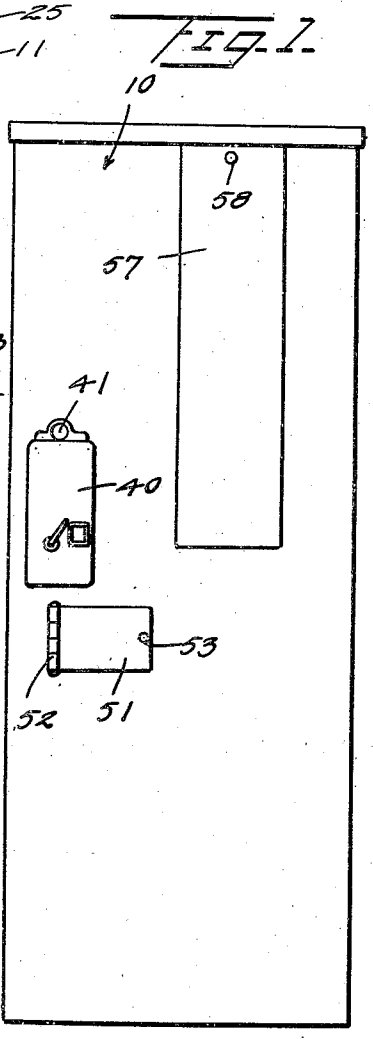


Fig. 1.

Inventor
T. F. Green, Jr.

By Kimmel & Crowell
Attorneys

Nov. 27, 1945. T. F. GREEN, JR 2,389,619

REFRIGERATED BOTTLE DISPENSING DEVICE

Filed April 8, 1941 2 Sheets-Sheet 2

Fig. 3.

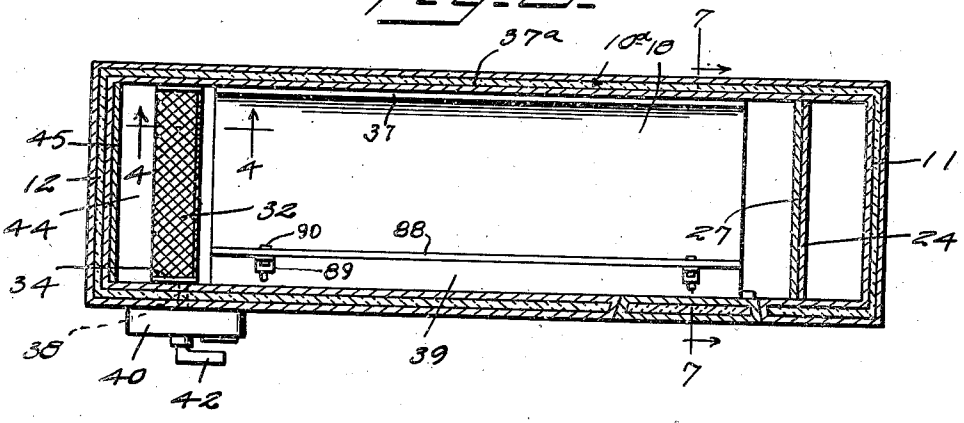


Fig. 6.

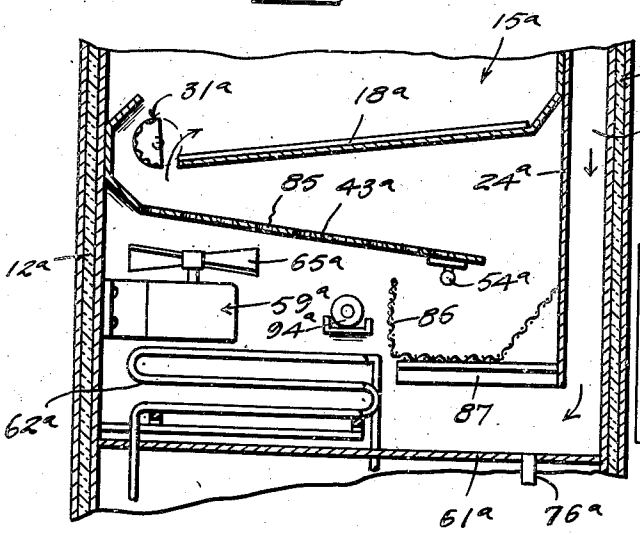


Fig. 5.

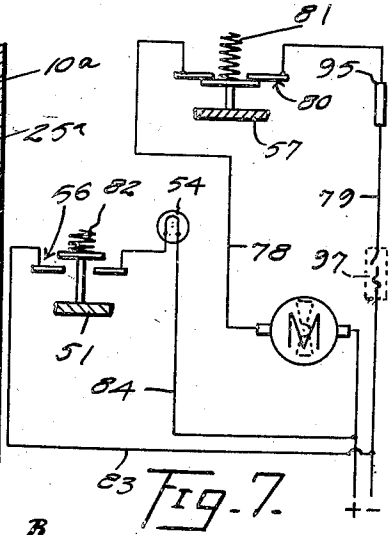


Fig. 7.

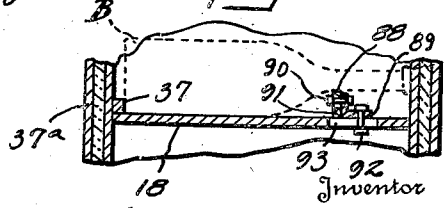


Fig. 4.

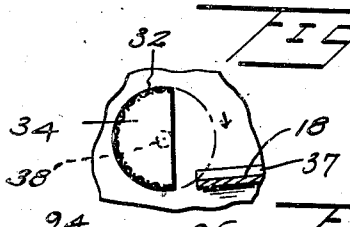
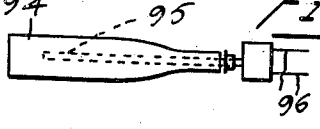


Fig. 8.



Inventor

T. F. Green, Jr

By Kimmel & Crowell

Attorneys

Patented Nov. 27, 1945 2,389,619

UNITED STATES PATENT OFFICE

2,389,619

REFRIGERATED BOTTLE DISPENSING DEVICE

Thomas Francis Green, Jr., Richmond, Va.

Application April 8, 1941, Serial No. 387,497

6 Claims. (Cl. 62—102)

This invention relates to dispensing devices and more particularly to a device for dispensing bottled beverages.

An object of this invention is to provide a device of this kind wherein the bottled beverage is maintained in a cooled condition.

Another object of this invention is to provide a device of this kind which may have associated therewith a conventional cooling unit and which includes means for circulating cooled air within a closed housing and about the bottles in the housing.

A further object of this invention is to provide an improved supporting track for the bottles and an improved means for circulating cooled air aloing the track.

A further object of this invention is to provide an improved discharging cage for discharging one bottle at a time, the cage being associated with a coin or check controlled mechanism for regulating the operation of the discharging cage.

A further object of this invention is to provide an electrically operated air circulating fan structure in a device of this kind and interposing a normally closed spring-pressed switch in circuit with the fan, the switch being normally held closed by the charging door, and movable under spring action to a circuit breaking position upon opening of the charging door so as to thereby stop circulation of the cool air by the fan during the time that the bottle track is being filled with bottles.

A further object of this invention is to provide an improved bottle track or guide which is so constructed that additional bottles may be supported from the end portions of the track and within the housing in order to pre-cool such additional bottles before they are inserted in the track. In this manner the dispenser will be immediately available for dispensing a number of pre-cooled bottles after the track is recharged with uncooled bottles, the pre-cooled bottles being positioned in advance of the uncooled bottles.

A further object of this invention is to provide in a device of this kind an improved bottle discharging cage which is of perforate construction so that cooled air may pass therethrough, and which comprises a movable end of the bottle track, the cage being so constructed that upon movement thereof to a bottle discharging position, the cage will prevent the discharge of additional bottles from the track until the cage has been returned to its original position and subsequently operated by deposit of another coin or check.

To the foregoing objects and to others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawings wherein are shown embodiments of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a detail front elevation of a combined bottle dispensing and cooling device constructed according to an embodiment of this invention,

Figure 2 is a vertical section taken through the device,

Figure 3 is a sectional view taken on the line 3—3 of Figure 2,

Figure 4 is a fragmentary sectional view taken on the line 4—4 of Figure 3,

Figure 5 is a schematic view of the electric circuits associated with this invention,

Figure 6 is a fragmentary vertical section of the modified form of this invention,

Figure 7 is a sectional view taken on the line 7—7 of Figure 3, and

Figure 8 is a side elevational view of the thermostat and housing therefor.

Referring to the drawings the numeral 10 designates generally a vertically disposed housing including side walls 11 and 12, a top wall 13 and a bottom wall 14. The housing 10 may be constructed out of metal or the like and may also be insulated by any conventional insulating means so that the cold air within the housing 10 will not be unduly affected by the temperature of the atmosphere outside of the housing.

The housing 10 is provided on the interior thereof with a bottle cooling chamber, generally designated as 15, and in this bottle cooling chamber 15 there is positioned a bottle supporting track by means of which the bottles containing the desired beverage are adapted to roll from an uppermost position on the track to a lowermost position for selective discharge into a lower discharging or receiving chamber 16. The bottle supporting track comprises a plurality of opposed elongated tracks or plates 17 and 18, which are inclined to the horizontal, the track member 17 being inclined to the horizontal in a direction opposed to the inclination of the track member 18. An upper track member 19 is disposed above

the uppermost track member 17 and is positioned in parallel relation to the track member 18. Each of the track members 17 is provided at its outer end portion with an upwardly inclined extension 20 and a vertically disposed extension 21 extends obtusely from the extension 20 and is fixedly secured to the inner face of the side wall 12.

An upwardly and inwardly inclined obtusely disposed extension 22 extends upwardly from the vertical extension 21 and provides a bottle receiving chamber 23 between the outer side of the extension 22 and the inner face of the side wall 12, within which a bottle B is adapted to engage in order to pre-cool the bottle B when the entire track structure is filled with bottles. The outer end of the upper track member 19 is fixedly secured to an inner wall 24, which is disposed in inwardly spaced relation to the side wall 11, thereby providing a return duct or air chamber 25. The several track members 18 are of like construction to the track members 17 and each track member 18 is provided with an upwardly extending obtusely disposed extension 26. A vertically disposed extension 27 extends upwardly at an obtuse angle to the extension 26, and an inwardly projecting extension 28 extends upwardly and obtusely from the upper end of the extension 27. The extension 28 provides a botttle receiving chamber 29 similar to the chamber 23 for initially receiving bottles, which are adapted to be pre-cooled and which are adapted to be subsequently disposed within the track structure at a subsequent recharging of the track structure.

The inner end portion of the upper track member 19 is disposed in spaced relation to the vertical extension 21, so that bottles may gravitatingly roll down over the upper surface of the track member 19 and then drop down over the inner end of the track member 19 and engage on the track member 17. In like manner the inner end 30 of the track member 17 is disposed in spaced relation to the vertical extension 27 and is also disposed in spaced relation to the upper end portion of the track member 18.

The oppositely inclined track members 17 and 18 not only provide a means for supporting the bottles for gravitational movement toward the lower portion of the cooling chamber 15, but also provide a means whereby a cooled draft of air may be forced upwardly and vertically through the cooling chamber 15. The track members 17 and 18 provide a tortuous passage for the cooled air as it moves vertically within the cooling chamber 15, so that any bottles engaging on the several tracks or supporting members will be cooled by the rising cool air. A bottle delivering cage, generally designated as 31, is disposed forwardly of the lower end of the lowermost track member 18 and comprises a semi-cylindrical perforate body 32, which is fixedly mounted between a pair of semi-circular discs or end members 33 and 34.

The end member 34 has secured thereto a shaft 38, which extends through the front wall 39 of the housing 10. The shaft 38 extends through a small housing 40, which is secured to the outer face of the front wall 39, and preferably the housing 40 encloses a coin operating mechanism which is operatively connected with the shaft 38, so as to release the shaft 38 upon deposit of a coin in a coin slot or opening 41 at the upper end portion of the housing 40. The shaft 38 projects forwardly through the housing 40 and is provided at its forward end with an operating handle 42. In this manner upon deposit of a coin in the slot or opening 41 the handle 42 may be rocked downwardly so as to rotate the cage member 31 in a clockwise direction and thereby release one bottle, which is adapted to engage in the open side of the cage 31. The open side of the cage 31 faces the upper portion of the lowermost track 18 and faces the bottles on the lowermost track 18, so that one bottle will normally be positioned within the cage 31 as shown in Figure 2.

In addition to providing a means for discharging or delivering the lowermost bottle from the lower track 18, the cage 31 also provides a means whereby the next succeeding bottle is locked against downward movement as rotation of the cage 31 in a clockwise direction will cause the arcuate surface of the perforate member 32 to contact with the next succeeding bottle prior to the complete discharge or delivery of the bottle which engages within the cage 31.

The bottle which is released or delivered by means of the cage 31 is adapted to gravitatingly drop down on a bottle delivering track or plate 43, which is disposed below the lowermost track 18 and which is inclined in a direction parallel with the track members 17. The outer end portion of the track 43 is provided with an upwardly inclined extension 44 disposed on an obtuse angle to the length of the track 43 and a vertical extension 45 extends upwardly from the extension 44 and is fixed to the inner side of the side wall 12. An upwardly and inwardly inclined extension 46 extends from the upper end of the vertical extension 43 and engages partly over and in spaced relation to the cage 31, as shown in Figure 2. This extension 46 also provides a bottle supporting means whereby a bottle may rest on the extension 46 in order that such bottle may be cooled during the time that the complete track structure is filled with bottles. The lower delivery track 43 is substantially shorter in length than the width of the front and rear walls 37 and 39, and the track 43 is adapted to deliver a bottle onto a lower delivery member 47. The delivery member 47 includes an inner inclined track structure 48, which is inclined to the horizontal and inclined downwardly to the left as viewed in Figure 1, so that the bottle engaging the track 48 will roll to the left and onto a horizontally disposed bottle supporting member 49.

The bottle supporting member 49 is provided with a vertical end wall 50, and the bottle which is released by rotation of the cage 31 is adapted to normally engage on the horizontal delivery wall 49. A delivery door or closure 51 is hingedly secured as at 52 to the front wall 39 below the housing 40 and preferably the door 51 is spring-pressed to a normally closed position and is provided with a knob or handle 53. A light bulb 54 is supported from a socket 55, which is secured to the under side of the delivery track 43 and the light bulb 54 is disposed inwardly of the door 51.

A normally open switch structure 56 is disposed in a position whereby the closing of the door 51 will hold the switch 56 in an open position, but upon opening of the door 51 the switch 56 will move to a circuit closing position in order to energize the light 54. In this manner the customer opening the door 51 will be able to readily view the bottle which has been released from the track by rotation of the cage 31.

The housing 10 is provided in the front wall 39 thereof with a charging door 57 having a lock mechanism 58 of conventional construction and preferably the charging door 57 is of such a

length that when the door 57 is opened, the substantial full length of the track structure will be exposed in order that the desired number of bottles may be inserted within the track structure. At the same time the opening of the door 57 will permit the placement of bottles on the auxiliary bottle supporting members 22, 28 and 46, so that these latter bottles may be cooled by the cool air in the cooling chamber 15, but will not be disposed in a position for delivery through the delivery door 51. After the track structure has been substantially emptied the pre-cooled bottles resting on the supporting members 22, 28 and 46 may be removed therefrom and placed adjacent the lowermost track structure for immediate delivery by operation of the cage structure 31. In this manner the dispensing device will, upon reloading thereof, be immediately available for delivery of cooled bottles.

An air circulating fan structure 59 is disposed below the cooling chamber 15, being supported on a horizontal supporting bracket 60 which is secured to and extends inwardly from the inner wall 24. The fan structure 59 is disposed above a perforate wall 60 and below the lowermost track member 18. A horizontally disposed inner bottom wall 61 is disposed above the bottom wall 14 and below the bottle guiding and delivering wall 48. A cooling coil 62 is disposed in a cooling chamber 63, which is positioned above the inner bottom 61 and below the delivery track 48. The inner side wall 24 terminates at its lower end above the inner bottom wall 61, so that the downwardly moving air in the duct 25 may pass under the lower edge of the inner side wall 24 and also pass through perforated plate 64 and between the convolutions of the cooling coil 62. The coil 62 may be supported in the cooling chamber 63 by means of the plate 64.

In order to provide a means whereby the downwardly rolling bottles which drop from the track member 43 will be prevented from striking the fan blades 65, I have provided one or more vertically disposed guard straps 66 provided with a base leg 67 secured to the upper side of the perforate delivery wall or track 48. In practice there may be two or more of the vertical straps 66, which may be of resilient construction so that the bottles will not be injured upon engagement with the straps or guards 66 and the blades 65 may also be protected by a fan guard 65a.

The space between the inner bottom wall 61 and the lower bottom 14 constitutes a machinery chamber 68, within which a cooling unit generally designated as 69 is adapted to be positioned. The cooling unit 69 is of conventional construction and includes a power member 70, a compressor 71, a condensor 72 and a reservoir 73. The reservoir 73 is connected by a pipe 74 to a coil 62 and the opposite end of the coil 62 is connected by a pipe 75 to the compressor 71. A conventional expansion valve 74a is also interposed in the pipe 74. The power member 70 is preferably an electric motor, which is connected to a suitable source of electric current supply and may be operated either continuously or periodically by a well-known controlling or regulating means for providing the desired cooling of the coil 62. The inner bottom 61 not only forms a cooling chamber 63, but also forms a bottom wall for holding condensed moisture which forms in the cooling chamber 63. This moisture may be drained from the cooling chamber 63 by means of a drain pipe 76 which may be connected to a suitable carry-off means or receiver.

The fan motor 77 is connected by means of a pair of conductors 78 and 79 to a normally closed switch structure 80, which is supported within the housing 10 in a position for engagement with the door or closure 57. When the door 57 is closed the switch structure 80 will be in a circuit closing position, as shown in Figure 5, and upon opening of the door 57 the switch structure 80 will be moved to a circuit breaking position by means of spring 81. The switch structure 56 is somewhat similar to the switch structure 80 with the exception that the closure or door 51 will maintain the switch structure 56 in a normally open position as shown in Figure 5, and upon opening of the door 51 the switch structure 56 is urged to a circuit closing position by means of a spring 82. The switch structure 56 is connected to a pair of conductors 83 and 84, which are connected to the conductors 78 and 79 respectively, and the light bulb 54 is interposed in the conductor 84. The conductors 78 and 79 are adapted to be connected to the source of electric current supply which supplies electric current to the motor 70.

Air is drawn by a fan blade 65 through the coil 62 and cooled thereby and then forced upwardly along the track structure, as shown by the arrows in Figure 2, and when the cool air reaches the top wall 13 the air will return downwardly through the return duct 25.

In order to provide a means whereby the bottles rolling downwardly on the track structure may be prevented from twisting and thus clogging the track, I have provided a narrow rail 87 which is secured to one longitudinal edge of each track and which, as shown in Figure 7 is adapted to engage against the bottom of the bottle. In this manner the bottom of the bottle is held against contact with the adjacent rear wall 37a of the housing and this rail also facilitates the gravitational movement of the bottles on the several inclined tracks due to the fact that only a very small portion of the bottle bottom contacts with the rail 37.

The bottle B is further prevented from twisting on the several tracks as it moves therealong by mounting a front rail 88 on each track with the rail 88 in a vertical or edgewise position, as shown in Figure 7, and engaging the neck of the bottle. The front rail 88 is adjustably supported on a track by means of a pair of angle supporting members 89 which have their vertical sides secured to a face of the rail 88 by fastening members 90 engaging in vertical slots 91 formed in the rail 88 so that the rail 88 may be vertically adjusted to engage the necks of different sizes of bottles. The angle members are adjustably secured to the tracks by fastening devices 92 engaging in elongated slots 93 carried by the several tracks adjacent the front wall 39.

In order to provide a means whereby the bottles may have the contents thereof cooled to the desired degree I have provided an improved thermal control for the cooling unit 69 in the form of a liquid receptacle 94 adapted to be filled with a suitable liquid, and a thermostat bulb 95 is extended through the stopper 96 and engages in the liquid contained by the bottle. The thermostat 95 is interposed in the conductor 79, and preferably a control box 97 is also interposed in the conductor 79, the control box 97 housing a manual switch and a conventional fuse. The receptacle 94 may be positioned at any suitable point in the

cooling chamber 15 and in Figure 2 the receptacle 94 is positioned adjacent the fan 59.

Referring now to Figure 6, there is here disclosed a housing structure 10a, which is similar in substantially every detail to the housing 10 and which has a bottle cooling chamber 15a disposed therein. The housing 10a also includes an inner wall 24a forming a return air duct 25a and the track structure shown in Figure 2 is disposed within the housing 10a. The lowermost track member 18a terminates adjacent a bottle releasing or delivering cage 31a similar to the cage 31 and upon release of a bottle by rotation in a clockwise direction of the cage 31a, the released bottle is adapted to drop downwardly onto an inclined track 43a. The track 43a in the present instance is perforated, as at 85, so that air may readily pass through the track 43a. In the present instance the track 43a is adapted to deliver the released bottle to a substantially U-shaped receiving member 86, which is disposed below the lower or free end of the track 43a. The receiving member 86 may be of perforate construction and is supported by a supporting bracket or arm 87 secured adjacent the lower end of the inner wall 24a.

The returning air moving downwardly in the return duct 25a is adapted to pass beneath and then through the receiving receptacle 86 and along the upper surface of an inner bottom or wall 61a. A drain pipe 76a may be connected to the wall 61a so as to drain out any condensate, which may collect on the inner wall or bottom 61a. The cooling coil 62a is disposed to the left of the receiving receptacle 86 is a position to intersect the movement of air along the upper surface of the bottom 61a and at a point above the coil 62a there is mounted a fan structure 59a, which is secured to the side wall 12a of the housing 10a. The fan structure 59a is disposed in an inverted position whereby the fan blade 65a will force the air upwardly and vertically through the perforations 85 of the track 43a. In other respects the structure shown in Figure 6 is similar in every detail to the structure shown in Figures 1 to 5 inclusive.

A thermostat supporting receptacle 94a similar to the receptacle 94 may be positioned at one side of the fan 59a, and a light bulb 54a may be disposed above the receiver 86. The light bulb 54a and the thermostat bulb in the receptacle are interposed in circuits similar to those shown in Figure 5.

In the use and operation of this bottle dispensing and cooling device the housing 10 is initially charged by opening the charging door 57 and inserting the bottles within the cooling chamber 15 and on the track members 17 and 18. The entire track structure may be filled with bottles, the filling operation being performed by filling the lowermost tracks and then passing to the next succeeding tracks. After the entire track structure has been filled additional bottles may be placed within the cooling chamber 15 by placing the bottles on the supporting members 22, 28 and 46. These latter or additional bottles will not be available for discharge or delivery upon deposit of a coin in the coin controlled mechanism 40, but after the track structure has been exhausted of bottles the pre-cooled bottles may be removed from the supporting members 22, 28 and 46 and then placed in the lower portion of the track structure for immediate delivery. Additional uncooled bottles may then be placed in the track structure to substantially completely fill the track structure and at this time further bottles may be placed on the supporting members 22, 28 and 46.

Upon deposit of a coin in the coin controlled mechanism 40, the shaft 38 will be released so that the handle 42 may be rocked downwardly to thereby rotate the cage 31. Rotation of the cage 31 in a clockwise direction will release the lowermost bottle in the cooling chamber 15 and this released bottle will drop downwardly onto the short track 43, rolling down this track and dropping onto the track or wall 48. The bottle on the track 48 will then roll to the left into the delivery chamber 16 so that the released bottle may be removed by opening of the door 51. The short track 43 provides a guard means above the open top delivery chamber 16, so that it will not be possible for a person to open the door 51 and reach into the housing 10 to remove a bottle from the track structure.

The fan structure 59 is adapted to be substantially continuously operated so as to maintain a continuous circulation of cool air from the coil 62 upwardly along the track structure in the cooling chamber 15, and then downwardly in the return chamber 25. At the time the charging door 57 is open to charge the tracks with bottles the switch structure 80 will be moved by means of the spring 81 to a circuit breaking position, so that the fan 65 will not draw in warm air in the cooling chamber 15 or force any of the cool air in this chamber out through the open doorway. Upon opening of the delivery door 51 after the handle 42 has been operated, the light bulb 54 will be lighted by means of the spring 82 moving the switch structure 56 to a circuit closing position. As soon as the delivery door 51 has been closed the switch structure 56 will be moved to a circuit breaking position which is the normal position of the switch 56, as shown in Figure 5.

What I claim is:

1. A refrigerated bottle dispensing structure comprising a cabinet, a bottle cooling chamber in said cabinet, a plurality of opposed and oppositely inclined substantially J-shaped track forming members in said cabinet, said members being disposed in superposed relation and one portion of each member constituting a supporting means for holding bottles in disengaged position with respect to the track for pre-cooling certain bottles in said cabinet, a charging door carried by said cabinet confronting a portion of said members, means circulating cool air in said chamber, and means engageable with said door and connected with said circulating means for stopping said air circulating means when said door is opened.

2. A refrigerated article dispensing structure comprising a cabinet, a cooling chamber in said cabinet, a coil chamber below said cooling chamber, an article supporting track in said cooling chamber including a plurality of opposed and oppositely inclined J-shaped track forming members disposed in superposed relation, a semi-cylindrical perforate delivery cage at the lower end of said track and normally disposed with the concave side thereof confronting the lower end of said track, means for rotating said cage to deliver an article below said track while simultaneously holding the next succeeding article against downward movement, a vertically disposed air return duct in said cabinet, a cooling coil below said chamber, a circulating fan for drawing air from the lower portion of said duct through said coil and forcing said air upwardly into said cooling chamber, a delivery track be-

low said cage, guard means carried by said delivery track forwardly of said fan and means for cooling said coil.

3. A refrigerated article dispensing structure comprising a cabinet, a cooling chamber in said cabinet, a coil chamber below said cooling chamber, an article supporting track in said cooling chamber including a plurality of opposed and oppositely inclined J-shaped track forming members disposed in superposed relation, a semi-cylindrical perforate delivery cage at the lower end of said track and normally disposed with the concave side thereof confronting the lower end of said track, means for rotating said cage to deliver an article below said track while simultaneously holding the next succeeding article against downward movement, a vertically disposed air return duct in said cabinet, a cooling coil below said chamber, a circulating fan for drawing air from the lower portion of said duct through said coil and forcing said air upwardly into said cooling chamber, a delivery track below said cage, guard means carried by said delivery track forwardly of said fan, means for cooling said coil, a charging door carried by said cabinet, and means engageable with said charging door and connected with said fan for stopping said fan when said door is opened.

4. In a bottle dispensing structure, a bottle supporting track including a plurality of opposed and oppositely inclined substantially J-shaped superposed track forming members, a bottle bottom engaging rail fixed to each member adjacent one longitudinal edge thereof, a bottle neck engaging rail, and means mounting said latter rail on a member inwardly of the opposite longitudinal edge of said member for adjustment toward or from said first rail.

5. In a bottle dispensing structure, a bottle supporting track including a plurality of opposed and oppositely inclined substantially J-shaped superposed track forming members, a bottle bottom engaging rail fixed to each member adjacent one longitudinal edge thereof, a bottle neck engaging rail, means mounting said latter rail on a member inwardly of the opposite longitudinal edge of said member for adjustment toward or from said first rail, and means for vertically adjusting said second rail relative to a member.

6. As a new article of manufacture a regulating device for regulating the temperature of bottled liquids comprising a closed receptacle for receiving a liquid, a stopper for said receptacle, and a thermostat disposed in said receptacle and supported from said stopper.

THOMAS FRANCIS GREEN, JR.