Feb. 16, 1943. T. F. LILLY 2,311,449

BOTTLE COOLING AND VENDING MEANS

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Fig. 1.

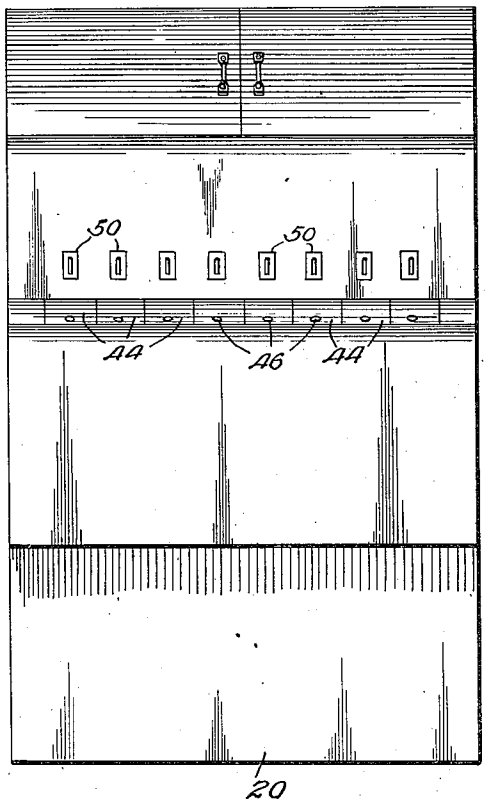


Fig. 4.

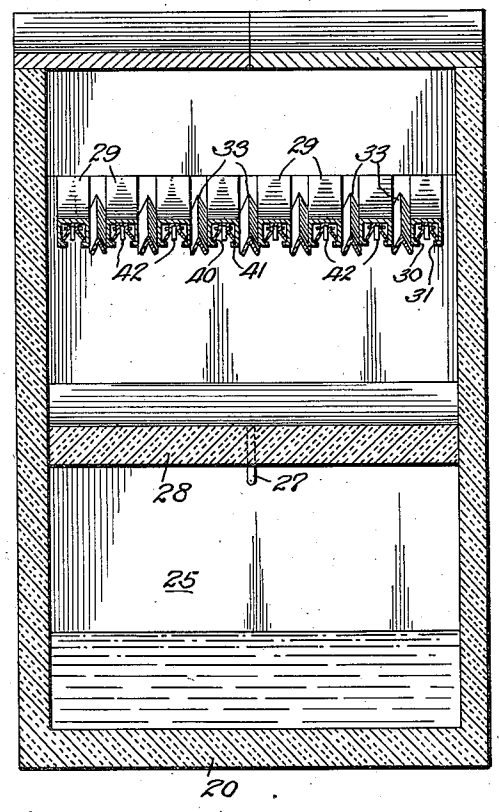
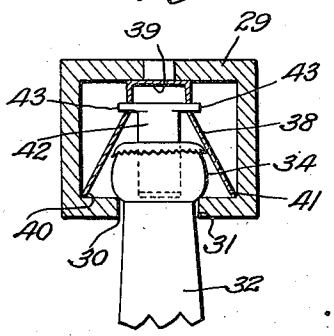


Fig. 10.



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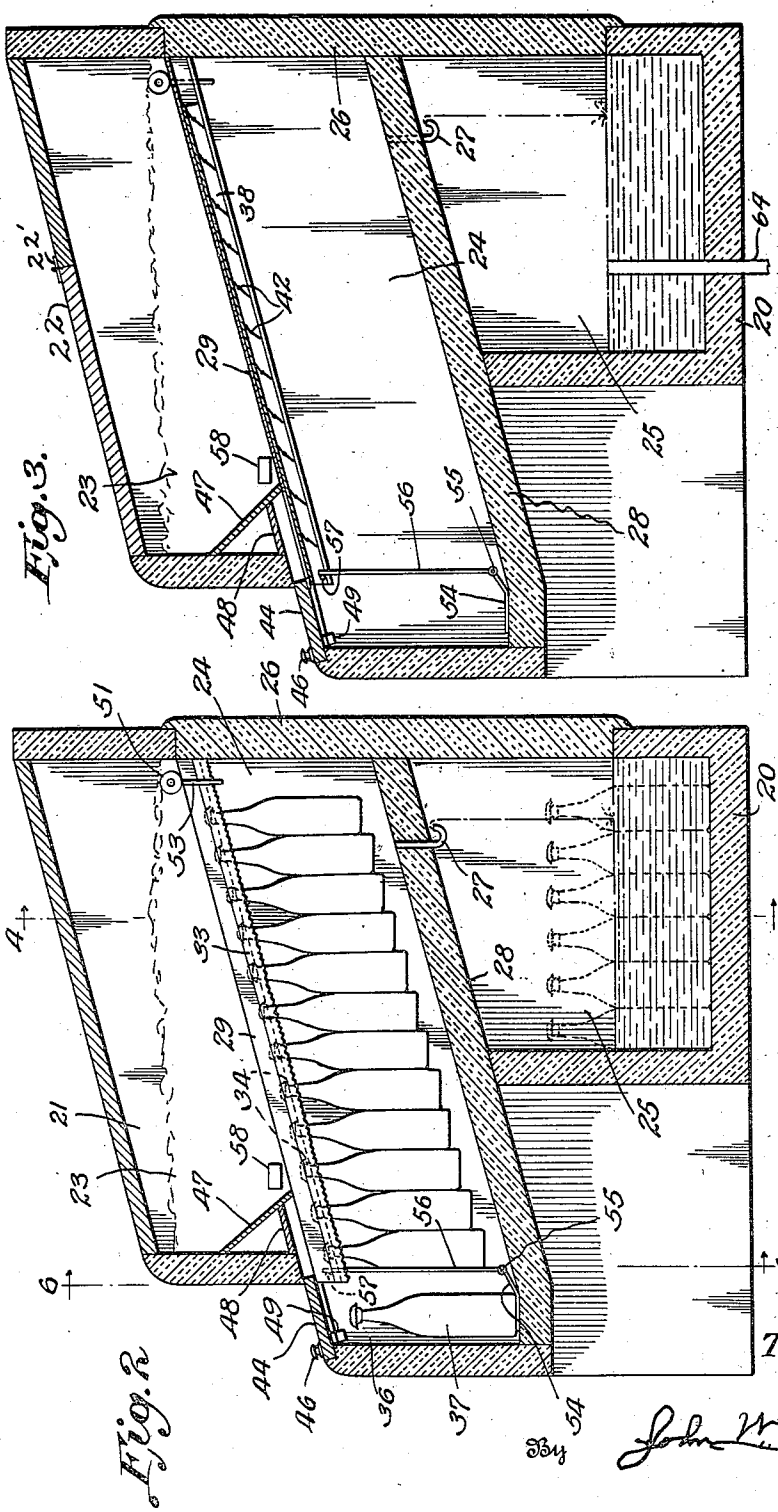
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BOTTLE COOLING AND VENDING MEANS

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BOTTLE COOLING AND VENDING MEANS

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Fig. 5.

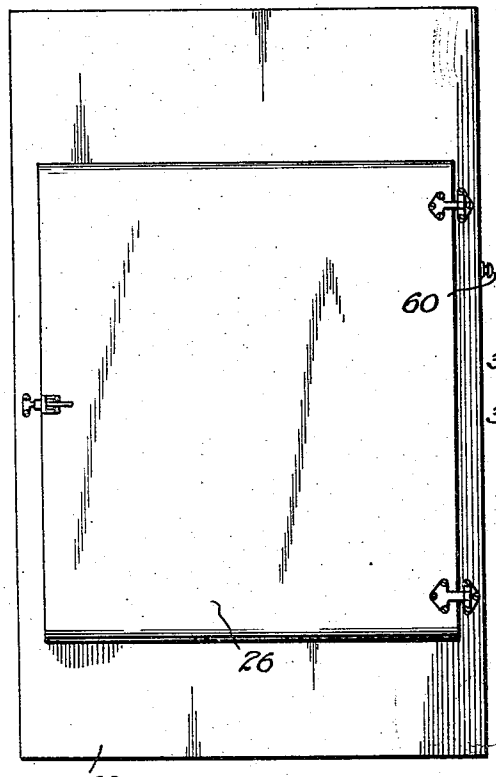
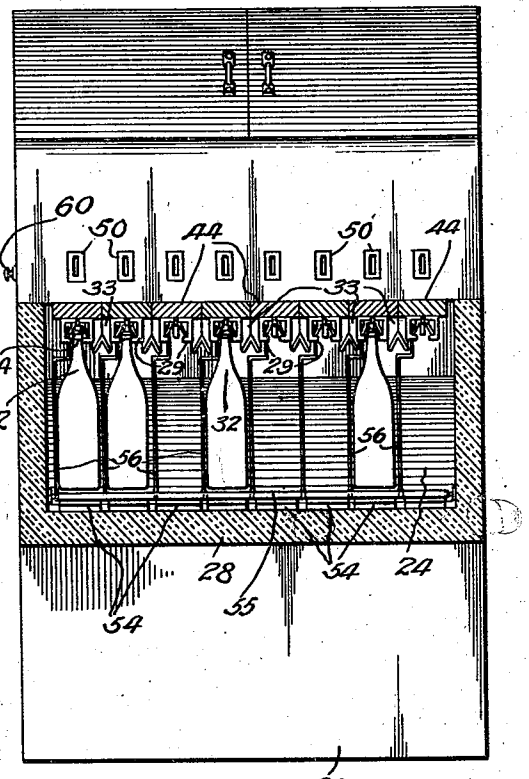


Fig. 6.



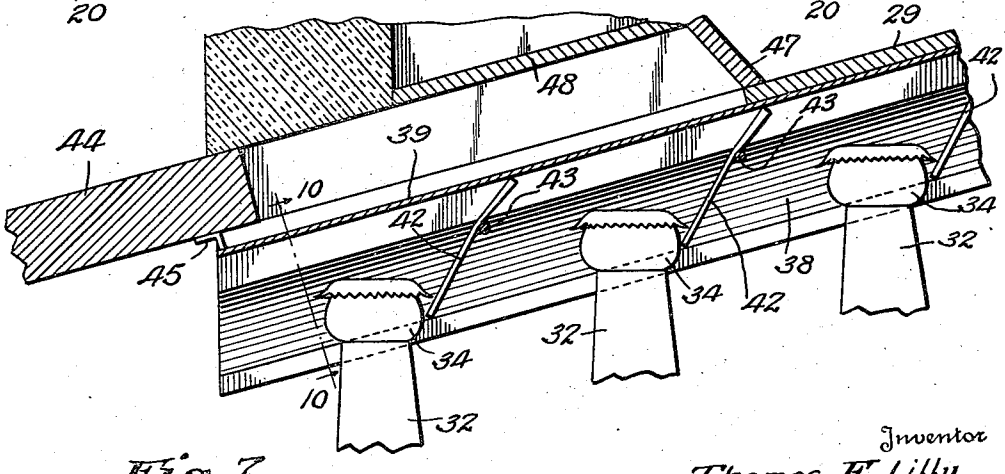


Fig. 7.

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BOTTLE COOLING AND VENDING MEANS

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Fig. 8.

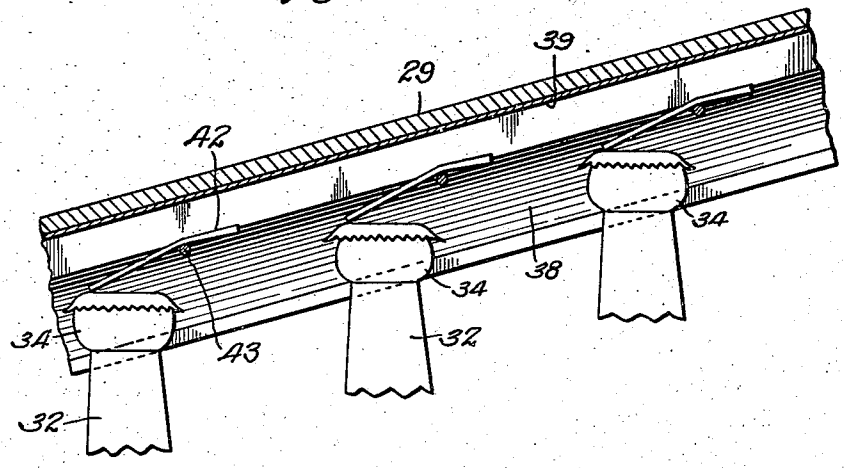


Fig. 9.

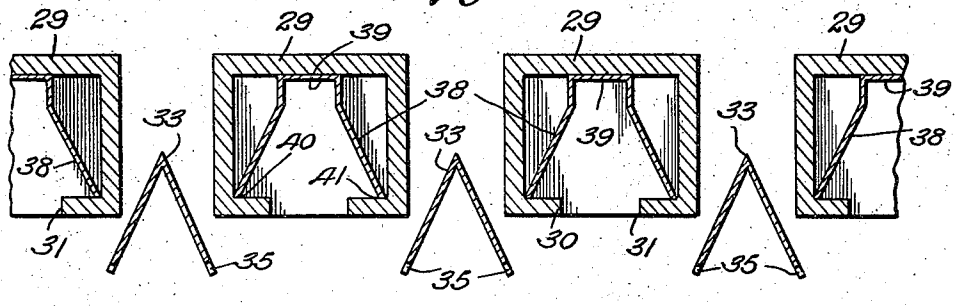


Fig. 11.

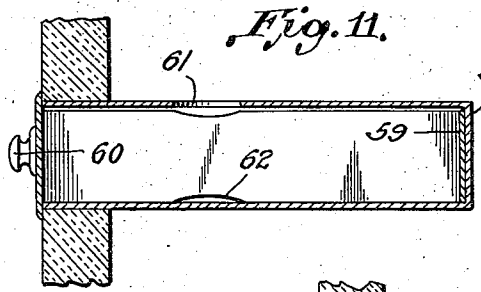
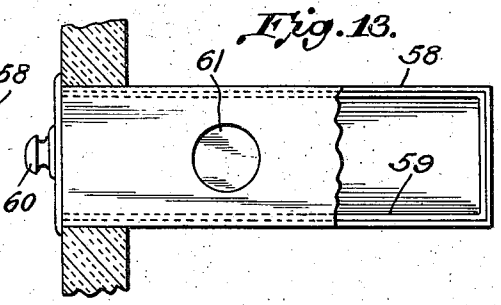


Fig. 13.



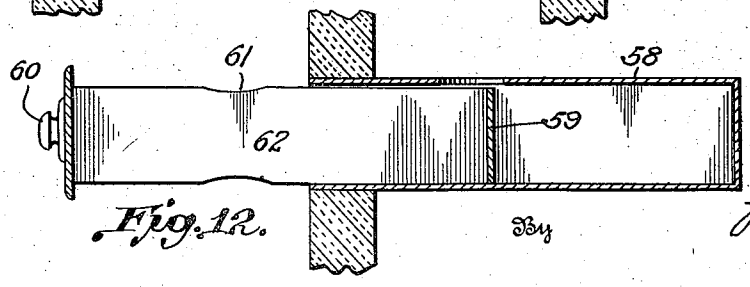


Fig. 12.

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UNITED STATES PATENT OFFICE

2,311,449

BOTTLE COOLING AND VENDING MEANS

Thomas F. Lilly, Memphis, Tenn.

Application April 10, 1940, Serial No. 328,964

20 Claims. (Cl. 312—36)

My invention relates to a bottle cooling and vending means and it is an object of the same to provide an improved device which shall meet the demand for a more sanitary way of handling bottled beverages. As most commonly handled at present, such bottled beverages are placed in a tank of cold water indiscriminately and are selected therefrom by persons who usually grasp the top of the desired bottle and remove it from the tank, after which the cap is removed and very commonly the contents are imbibed by merely tilting the bottle and drinking directly from the mouth of the same. Since the hands that contact with the bottle carry many germs, and since the water in the tank is also full of germs it frequently happens that diseases of various sorts are spread by such use of the bottles, even though dealers and users attempt to exercise care in handling them. By the use of my device handling is reduced and contact of the hands with the upper part of the bottle is largely or entirely avoided and the operation of the cooling means is such that the cooling water is prevented from contacting with the cap or with the top of the bottle.

Another object of my invention is to provide an improved method of supporting the bottles in a cabinet for cooling them, the arrangement being such as to facilitate convenient vending.

Another object of my invention is to provide means for segregating bottles containing a particular beverage or a particular flavor from all the other bottles in the container and vending them separately in a convenient and expeditious manner, with handling means of such a nature that a bottle of a desired character or flavor will be delivered promptly and in convenient position to be grasped at a point below its neck and withdrawn from the cabinet.

Another object of the invention is to provide mechanically controlled gravity feeding means, in combination with means whereby all bottles except the lowermost one of a series are positively held back out of delivery position.

Another object of the invention is to provide convenient means for delivering small quantities of sized or cracked ice from the ice compartment of a cabinet, as for icing beverages, etc.

Another object of the invention is to provide bottle supporting means in such relation to an ice compartment that the bottles will be below the ice but very close to it.

Another object is to provide a bottle cooler that will accommodate either short or long bottles indiscriminately.

Another object is to provide bottle cooling and vending means with an inclined bottle support so located with reference to a tank of cold water that the water can rise no higher than about one and one-half inches below the crown or cap of a bottle on the support.

Another object is to make such a tank of a shape that will cause circulation of water about the bottles carried by the overhead bottle support.

Another object is to provide for the passage of air from the front of the chamber upward and backward so as to impinge on the ice at the highest portion of the grid next the rear wall of the cabinet.

Another object of the invention is to provide compact and convenient means for storing bottles to be vended and for cooling them while so stored, in combination with compact and convenient means for maintaining ice out of contact with the bottles and providing convenient means for storing bottles for precooling, all such means being interconnected for automatic operation, so that a minimum amount of personal attention is desired. Other objects and advantages will appear from the annexed specification.

Referring to the drawings which are made a part of this application and in which similar reference characters indicate similar parts:

Fig. 1 is a front elevation of my improved device;

Fig. 2, a longitudinal vertical section of the same;

Fig. 3, a similar section with the bottles omitted;

Fig. 4, a vertical section transversely of the device;

Fig. 5, a rear elevation;

Fig. 6, a vertical section near the front of the device;

Fig. 7, an enlarged vertical section, showing on a larger scale certain parts illustrated in Fig. 3;

Fig. 8, a view similar to part of Fig. 7 but showing parts in a different position;

Fig. 9, an enlarged detail of parts shown in Figs. 4 and 6;

Fig. 10, a section on line 10—10 of Fig. 7;

Fig. 11, a vertical section of dispensing means for sized ice;

Fig. 12, a similar view with parts in a different position;

Fig. 13, a plan of the same, and

Fig. 14, a detail of a drip guide.

In the drawings reference character 20 indi-

cates generally the cabinet which is the subject of my invention, said cabinet having at its upper end an ice compartment 21 with a door 22 which may be hinged at 21' or otherwise supported in such manner as to permit easy access for filling the compartment with ice or for removing ice therefrom, etc. Preferably, though not necessarily this compartment is to be supplied with sized or broken ice as indicated at 23.

Below the compartment 21 there is a compartment 24 for bottles which are to be cooled and vended and below said compartment there is a precooling compartment 25 in which bottles may be subjected to preliminary cooling. A rear door 26 is here shown as being common to both of said compartments although separate doors may be used if desired. It will be noted in Fig. 2 that the water in the cooling compartment will reach a predetermined level after which it will overflow through a drainpipe 27 into the precooling compartment, said drainpipe being mounted in a partition 28 between compartments 24 and 25 and being so shaped as to provide a trap to prevent air from the precooling compartment from rising into the cooling compartment 24.

Between the ice compartment 21 and the cooling compartment 24 there are a number of grid members which extend from front to rear of the cabinet and which form a floor for the ice compartment. The grid thus formed consists of two sets of grid members. In the one set there are a number of parallel hollow metal rack bars 29 (Fig. 9), here shown as being parallel to one another and rectangular in section and having a longitudinal slot at the bottom of each one, so that they are substantially of inverted U-shape. The sides 30 and 31 of the slot in each case are spaced apart far enough to admit the neck of a bottle 32 between them, as best shown in Fig. 10, but are close enough together so that the bottle is securely held thereby and these members are so mounted, as shown in Fig. 2, that bottles may be inserted one by one at the highest point of such a rack bar and will be supported thereby for sliding movement down the inclined rack bar but can only be released after they reach the lower end of the rack bar. In the illustrated embodiment of the invention there are shown a series of eight such rack bars mounted in a row extending transversely of the cabinet. This means that beverages of eight different varieties or flavors or otherwise differentiated from one another may each be supplied to one of the runways thus formed and each will be separately delivered at the front of the machine.

Between the rack bars or runways 29 there are arranged members 33 of another set of grids. Said members form drip guides, the members 33 being each of inverted V-shape and being secured at their ends in a suitable supporting means for holding both sets of grids in the indicated positions. It will be seen that the runways 29 constitute floor members for the ice compartment and will generally carry the weight of the ice therein though small pieces of ice may slip down between them and rest on the drip guides 33. As the ice melts the cold water will run down between the rack members 29 and still be carried by the sides of the drip guides toward the bottles which are suspended below them. Since the bulge 34 (Fig. 10) at the neck of the bottle is within a runway 29 in each instance and so is mounted at a substantial elevation above the lower margin of each adjacent drip guide it will be seen that the cooling water will fall on the shoulder or lower parts of the bottles and will never come in contact with their caps or upper portions. As best shown in Fig. 14, the drip guides 33 are serrated at their lower edges at 35, or otherwise shaped so that the water will drip from them on the shoulders of the bottles and will not merely run down the inclined edges of said drip guides.

At the lower end of the grid formed by the rack members 29 and the drip guides 33 there are delivery cells at 36 providing a floor or ledge for supporting bottles of each series after they pass beyond the rack bars. These cells are here shown as forming merely a continuation of the cooling chamber and as being in effect a continuous cell extending across all the rack members but they may be separated by partitions to insure that the bottles therein will stand up, or they may be otherwise formed for convenient delivery of bottles.

It will be appreciated that the bottles tend to slide down the rack members by the action of gravity but in order to insure uniform and certain delivery of the bottles I preferably provide each rack member with means for positively moving all the bottles therein toward the delivery cell and for causing one of them to assume the position of bottle 37 in Fig. 2, i. e., to be ready for delivery. Such means comprises, as herein shown, a slidable member 38 which may be substantially of inverted U form in cross section and which is so proportioned that the upper flat part at 39 slides against the adjacent flat face of the runway 29 while the lowermost edges at 40 and 41 rest against opposite corners of the chute, so as to hold the U-shaped member securely in place. This U-shaped member 38 has pivotally supported thereon a series of T-shaped pawls 42 with lugs 43 extending through the side members of the U-shaped support as shown in Fig. 10. Said pawls are preferably bent as in Fig. 8 and are so mounted that their longer ends tend to fall into the position shown in Fig. 7. It will thus be seen that if the part 38 which carries the pawls is reciprocated the pawls will ride over the tops of the bottles, as in Fig. 8, until they have passed the respective bottles and will then tilt downward into the position shown in Fig. 7. When the feeder is now moved back toward the left or downward it will carry with it the bottles in the rack and will cause the foremost of the series to enter its delivery cell.

For thus moving the feeder of each row of bottles I provide doors 44 each individual to one row of bottles and each secured to one of the feeders, as by means of an angle iron 45 shown in Fig. 7. These doors are slidable and for that purpose are furnished with buttons 46 at the front end of the ice compartment. There is an inclined partition 47 and another partition 48 which is parallel to the door, these partitions providing an unobstructed slideway for the doors and preventing access of the ice to such slideway. In order to prevent any of the bottles in the rack from moving into the delivery cell when the corresponding door is opened and while the bottle therein, as at 37, is being removed the door is provided with a stop 49 which engages the foremost bottle in the runway and holds back all the bottles in that runway until the door is again closed when it forces the remaining bottles in the runway toward the front of the cabinet, as above described.

For each of the doors I provide a coin con-

trolled device, indicated at 50, so that upon insertion of a coin one of the doors will be unlocked and a bottle withdrawn from the delivery cell, while all the remaining doors remain locked.

Above each runway I provide a register, as indicated at 51 in Fig. 2, said register having a depending arm 53 so positioned that when the bulge at the neck of the bottle is entered in the runway it must actuate the arm 53 to operate the register and so count each bottle that is placed in that runway.

Preferably, though not necessarily, I provide a lifter adjacent the delivery position for the bottles in each runway. The delivery device comprises a rock arm 54 pivoted at 55 and having an upwardly extending arm 56 extending into the path of a lug 57 on the sliding door. The rock arm 54 is of course laterally extended sufficiently to engage under a substantial part of the bottom of the bottle and when the door 44 is opened the lever formed by arms 54 and 56 will be tilted on its pivot to lift the bottle so that it can be grasped more readily and particularly so that it can readily be grasped at a distance below the cap so as to preserve the sanitary condition of the top of the bottle adjacent the cap.

It is frequently desirable to be able to remove a small quantity of sized ice from the ice compartment, so for icing a glass of water or the like, and for this purpose I have provided means such as shown in Figs. 11 to 13 and comprising a casing 58 projecting into the ice compartment, for example in such a position as shown in Figs. 2 and 3. Within the casing there is a telescoping chamber 59 having a handle 60 at its outer end. The two parts are provided with registering apertures at the top as indicated at 61 and there is a similar aperture 62 at the bottom of the member 60. The apertures are of such suitable size as to permit the ice fragments to enter and fill the chamber more or less completely and it will be seen that upon retraction of the chamber the ice fragments can fall out through the lower opening 62, or the chamber can if necessary be completely withdrawn and the fragments shaken out. Preferably the parts are of such size that the space between the openings will contain a convenient amount of ice for the purpose stated.

At a suitable level in the precooling compartment there is provided a drain 64 which will carry off excess water so that the water level will be approximately at the height indicated by the dot and dash line in Figs. 2 and 3.

The arrangement of parts is such that the melting ice is near to but spaced from the bottles; that the cold water dripping off the plates 33 will fall on the shoulders of the bottles well below their caps or crowns, and preferably at least one-half inch below them, or somewhat below the bulge near the mouth of a bottle; that the cold water collects about the lower ends of the descending bottles that are being cooled and gradually rises higher with respect to the bottles but never higher than about one and one-half inches below the crown of a bottle; and the shape of the bottle chamber is such that there is continuous circulation of water about the lower parts of the bottles.

The functions of the grid that separates the ice chamber from the cooling chamber are manifold. Thus they hold the bottles in orderly manner while cooling; they permit the bottles to slide forward and downward so as to be presented in order for vending them and so as to insure that the coldest of a series is sold first; they support the bottles close to the ice and in such position that the cold water passing from the ice is applied to the bottles most effectively, i. e., substantially over their entire length and circumference while still moving and before it reaches the bottom of the cooling chamber or is collected therein; they act as guards to prevent wetting or soiling of the tops of the bottles; they act as guides to direct the water against the shoulders of the bottles; as ice circulators for conducting air from the front of the cooling chamber to the highest part of the grid on which the ice rests; and they act as carriers for the bottle feeder shells.

It will be obvious to those skilled in the art that many changes may be made in the bottle feeders and in other elements of my invention, all without departing from the spirit of the invention; therefore, I do not limit myself to what is shown and described in the specification but only as indicated in the appended claims.

Having thus fully described my invention, what I claim is:

1. Cooling and vending means for bottled beverages and the like comprising a compartment for ice, an inclined floor for said compartment, means in connection with said floor providing covered runways for supporting bottles by their neck portions, and means between said runways for directing the water from the melting ice in said compartment against said bottles below their necks.

2. A device as in claim 1, including a cooling compartment below said ice compartment, a delivery cell at the lower end of a runway for delivery of bottles and forming a part of said cooling compartment, the cooling compartment being arranged to collect the water from the melting ice and to maintain a body of such water in the path of bottles in said runways with the upper level of said body of water lower than the top of a bottle in a delivery cell, means for moving all the bottles in the runway toward said cell, and means for preventing delivery of more than a predetermined number of bottles to said cell.

3. A device as in claim 1, including a cooling compartment below said ice compartment, a delivery cell at the lower end of a runway and forming a part of said cooling compartment, the cooling compartment being arranged to collect the water from the melting ice and to maintain a body of such water in the path of bottles in said runways with the upper level of said body of water lower than the top of a bottle in a delivery cell, a door individual to said runway, and means correlated with the movements of the door for delivering a bottle to said cell as the door is closed.

4. A device as in claim 1, including a cooling compartment below said ice compartment, a delivery cell at the lower end of a runway and forming a part of said cooling compartment, the cooling compartment being arranged to collect the water from the melting ice and to maintain a body of such water in the path of bottles in said runways with the upper level of said body of water lower than the top of a bottle in a delivery cell, a door individual to said runway, and means operating in timed relation with the movement of the door for raising a bottle in the cell into more readily accessible position as the door is opened while still holding a substantial portion of said bottle submerged.

5. A device as in claim 1, including a cooling compartment below said ice compartment, a de-

livery cell at the lower end of a runway and forming a part of said cooling compartment, the cooling compartment being arranged to collect the water from the melting ice and to maintain a body of such water in the path of bottles in said runways with the upper level of said body of water lower than the top of a bottle in a delivery cell, a door individual to said runway, and means correlated with the movements of the door for raising a bottle in the cell as the door is opened and for delivering another bottle to the cell as the door is closed.

6. In a store service apparatus, the combination of a cabinet having an inclined runway for bottles, a compartment for cooling liquid including a floor substantially parallel to said runway, a delivery station at the lower end of the runway, said delivery station forming the lowest part of said compartment, and means for maintaining the level of cooling liquid in said compartment below the top of a bottle at said delivery station.

7. In a store service apparatus, the combination of a cabinet having an inclined runway for bottles, a compartment for cooling liquid including a floor substantially parallel to said runway, a delivery station at the lower end of the runway, said delivery station forming the lowest part of said compartment, means for maintaining the level of cooling liquid in said compartment below the top of a bottle at said delivery station, a door for covering said delivery station and means connected to the door for lifting a bottle at the delivery station as the door is opened while keeping a substantial portion of said bottle submerged.

8. Cooling and vending means for bottled goods comprising a compartment for ice, an inclined floor for said compartment, said floor comprising a series of inclined rack bars each having means to support a bottle by its neck portion and each being closed at the top, and means between said rack bars for directing water from the melting ice against the bottles below said rack bars.

9. Cooling and vending means for bottled beverages and the like including a compartment for cracked ice, an inclined floor for said compartment comprising a plurality of spaced inclined rack bars, some of said bars being approximately of inverted U-shape in section so as to support a bottle by engaging under the bulge adjacent its mouth while covering and protecting the upper end of the bottle, and other intermediate grid members being shaped to cause down-flowing water to impinge on said bottles at a distance from their upper ends.

10. A device as in claim 9, said intermediate grid members being approximately of inverted V-shape and being serrated along their lower edges, as and for the purpose set forth.

11. A device as in claim 9, including means in said U-shaped rack bars for engaging the upper ends of bottles supported thereby to move them along the rack bars.

12. A device as in claim 9, including a reciprocatory bar fitting in the U-shaped rack bar of each runway, and pawls to engage said bottles to force them down along said rack bars upon movement of said reciprocatory bar in one direction but riding over the bottle tops upon reverse movement of said bars.

13. A device as in claim 9, including a reciprocatory bar fitting in the U-shaped rack bar of each runway, and pawls on each reciprocatory bar to engage said bottles and force them down along said rack bars upon movement of said reciprocatory bar in one direction but riding over the bottle tops upon reverse movement of said bar, a delivery station at the lower end of each rack bar, a door for closing said delivery station, and means connecting each reciprocatory bar to the corresponding door.

14. Cooling and vending means for bottled beverages comprising an upper ice compartment, a cooling compartment below the ice compartment, a delivery station at one end of said cooling compartment, means in said cooling compartment for suspending a series of bottles by their neck portions, means for causing said bottles to enter to said delivery station successively, and means to direct the drip from said ice compartment so as to cause it to impinge only on parts of the bottles below their mouth ends.

15. A cooling and vending cabinet for bottled beverages and the like comprising an upper compartment for ice, an intermediate compartment having inlet and outlet openings, spaced rack bars in the intermediate compartment inclined from the inlet toward the outlet, means on said bars for supporting bottles suspended by their neck portions and for covering their upper portions, means for directing water from the melting ice against the lower portions of suspended bottles, an inclined floor for said intermediate compartment, a pre-cooling compartment below said intermediate compartment, and a drain in said floor for permitting water to pass from the intermediate compartment to the lower compartment, said drain being spaced from the lower end of said floor to permit water to stand around the lower portions of the suspended bottles.

16. Cooling apparatus for bottles and the like comprising an upper compartment for ice, an intermediate compartment having inlet and outlet openings, means inclined from the inlet to the outlet opening for suspending bottles by their neck portions, an inclined floor for said intermediate compartment, a pre-cooling compartment below said floor, and means at an elevated portion of said floor for draining water from the intermediate to the lower compartment.

17. Vending apparatus comprising a cabinet, a series of rack bars therein each arranged to suspend a row of bottles by their necks, a supply door common to all of said bars for affording access thereto, delivery cells at the outlet end of said bars including a ledge on which a bottle may stand after leaving its bar, a door for each of said cells, and a separate means for locking each of said doors.

18. Cooling and vending means comprising a cabinet having an inclined grid separating an ice compartment from a cooling compartment, said grid including upwardly and rearwardly inclined rack bars approximately of inverted U-shape in section, means at the under side of such rack bars for engaging under a bulge adjacent the mouth of a bottle to support the bottle in suspended position for gravital movement along a rack bar, said rack bar also serving to conduct warm air from the front of the cooling chamber to the rear thereof adjacent the highest part of said grid.

19. In a bottle cooling and vending cabinet, a pair of similarly inclined floors dividing the cabinet into an upper ice chamber, a lower precooling chamber and a middle chamber for cool-

ing bottles; said upper floor provided on its underside with means for suspending bottles by their necks for downward sliding movement along said inclined floor, said upper floor also providing means for covering the tops of said bottles while causing ice-water to run down their sides from the ice on said floor, and a drain leading through an elevated part of the lower floor to said pre-cooling compartment.

20. In a refrigerator, an upper ice compartment, a lower compartment for bottles, means in said lower compartment for suspending bottles by their neck portions, means providing a shield over the tops of the bottles to prevent wetting by the drip from the ice, said means directing the drip against the lower parts of the bottles.

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