Feb. 4, 1941. W. G. CARROLL 2,230,862

COOLER APPARATUS

Filed June 16, 1934

FIG. 1.

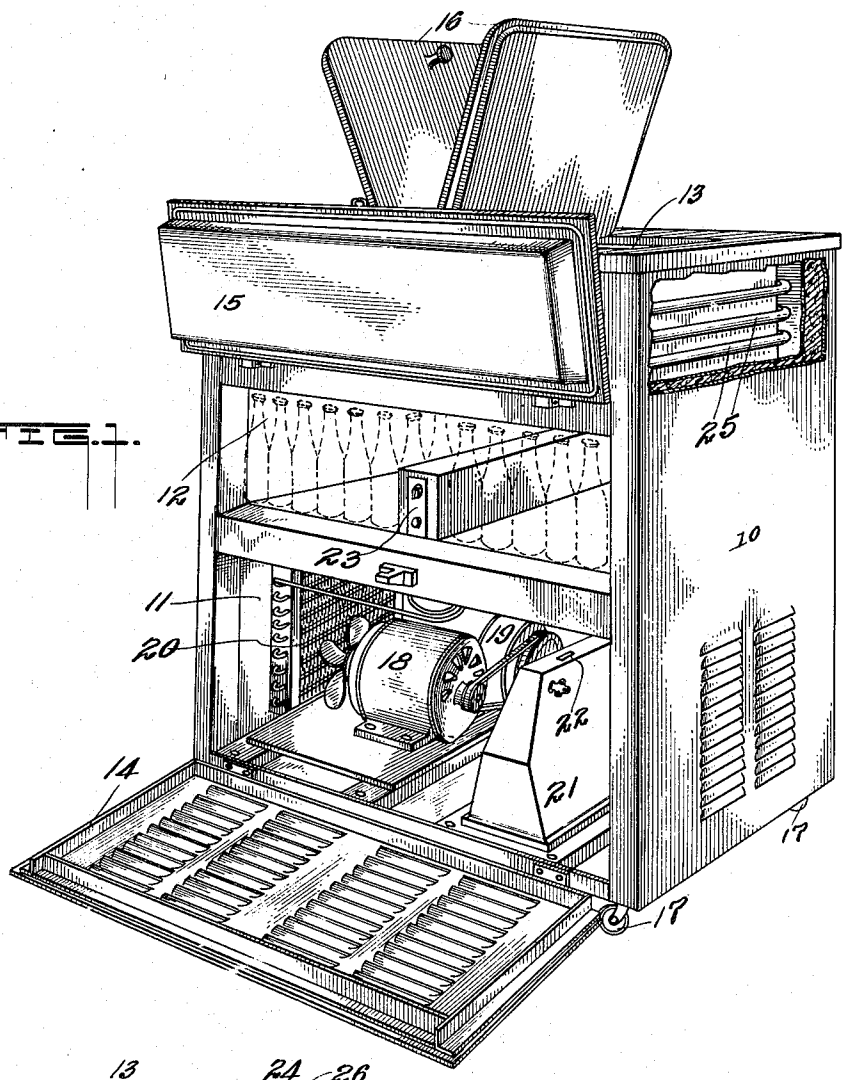
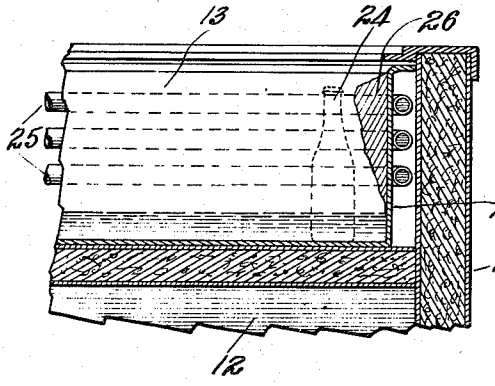


FIG. 2.



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COOLER APPARATUS

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8 Claims. (Cl. 62—141)

This invention has reference to cooler apparatus for bottled beverages, particularly to coolers of the self-contained type adapted for use in retailing establishments where beverages are sold.

An object of the invention is to provide a beverage cooling and storage unit containing a refrigerating unit, a coin operated meter for controlling operation of the same, means for precooling bottled beverages and additional cooling means whereby the beverages are maintained at a suitable temperature for consumption.

Another object is to provide a cooler of the class described having special means for cooling the beverages just prior to consumption.

Still another object is to provide a self-contained storage and cooling unit of sturdy construction, handsome appearance and maximum utility as will be set forth in the following description and accompanying drawing in which—

Fig. 1 is a perspective view of the apparatus with covers open and a portion broken away to permit clear view of the interior arrangement; and

Fig. 2 is a fragmental sectional view of a portion of the upper wall showing details of construction to be described.

Fig. 1 discloses the unit as comprising a cabinet 10 having a lower compartment designated 11, a central compartment 12 and an upper compartment 13, the interior of which is best shown in Fig. 2.

Compartments 11 and 12 are provided with suitable doors 14 and 15 opening outwardly at the side of the cabinet, while compartment 13 is provided with doors 16 opening upwardly, as shown, to provide convenient access to the compartment.

The portion af the cabinet surrounding compartments 12 and 13, as well as doors 15 and 16, are suitably insulated, as indicated in the drawing, to avoid loss of refrigeration. The partition member which separates and defines the compartments 12 and 13 differs in heat insulation characteristics from the portion of the cabinet surrounding these compartments in that it is adapted to absorb and transfer only a certain amount of heat. It is well understood that no insulation is perfect and the partition may be made only as efficient as desired as a heat insulator to permit only a limited amount of heat to be absorbed to produce the desired relative temperature conditions in the two compartments. Castors such as 17 may be attached to provide portability. The walls of compartment 11 and door 14 are provided with louvers or other form of openings to allow free circulation of air therethrough.

Within the compartment 11 is disposed a conventional refrigerating unit generally comprising a motor 18, a compressor 19 and a radiator 20.

The refrigerating unit is provided with a conventional thermostatic control element whereby the refrigerating action of the unit is controlled within predetermined limits.

Also within the cabinet is disposed a coin control meter 21. Since the particular mechanism of this meter does not comprise a part of the present invention, it will not be described further than to say that the power connection of motor 18 is routed through the meter, and the mechanism of the meter is adapted to be controlled by a coin inserted in the slot 22 thereof in such a manner that the motor remains in circuit during a certain period of operation for each coin inserted in the slot.

By the means described, operation of the refrigerating unit is limited to an amount in accordance with the number of coins inserted, whereby a measured paid-in-advance service is provided. Additional on and off control of the motor is provided by a switch 23 disposed in the central compartment 12.

Reference to Fig. 2 will disclose that the upper compartment 13 comprises a pan 23', adapted to contain water of sufficient depth to substantially cover bottles such as 24 placed therein for cooling.

Surrounding the upper portion of pan 23', but disposed inside of the insulated walls of the cabinet, are expansion pipes 25, so disposed as to absorb heat more rapidly from the upper side portions of the pan 23', whereby, with the pan filled to an ordinary working depth and the refrigerating unit in operation, a rim or wall of ice is quickly formed substantially as shown at 26 in Fig. 2.

Since the pipes 25 extend entirely around the pan 23, it follows that the ice forms in a substantially continuous rim about the interior of the pan.

It will be apparent that the rim of ice so formed may be chipped away from the walls of the pan to float freely about among the bottles therein and absorb heat from the cooling water. The same effect may be produced by stopping operation of the refrigerating unit as by means of the switch 23, whereby elevation of the temperature of the pan walls will rapidly cause the ice to fall away from the walls and float about in the water as described.

The utility of the novel arrangement of heat

absorbing elements will be apparent when it is explained that in the case of a substantially large cubical body to be cooled, such as a pan of water containing bottles of liquid, uniform cooling throughout the body is quite difficult to accomplish for the reason that heat is most rapidly absorbed from the liquids at the points immediately adjacent the heat absorbing elements while absorption of heat from the central or remote portions of the body of liquid is relatively slow.

Thus the body of liquid, as a whole, cannot be uniformly cooled without more or less elaborate means for circulating the liquid so as to continuously bring all portions of the liquid into contact with the heat absorbing surfaces, or as an alternative the heat absorbing elements must be more or less uniformly distributed throughout the body of the liquid in order to absorb heat uniformly from all portions thereof.

In a device of the class here considered, neither of the foregoing methods is practicable for the reasons that utilization of either means entails considerable extra complication and manufacturing cost and would require the use of valuable space which otherwise could be used for accommodation of more merchandise. Further, in a device such as this, the bottles contained in pan 23' are constantly being hurriedly withdrawn, replaced and moved about in such a manner that any extra apparatus in the pan would be always subject to damage and therefore highly unsatisfactory.

With the foregoing in mind, it will be apparent that by the structure described I provide a simple, highly efficient means for uniformly cooling the liquid and contents of pan 23'.

In practical use, ice is continuously being formed at 26, as already explained, and is frequently released in more or less small pieces to float about in the surrounding water amongst bottles in pan 23', to absorb heat therefrom and thus maintain the entire body of water and beverages at a uniform, satisfactory temperature for dispensing.

Compartment 12 provides a pre-cooling chamber, the ceiling of which, through the heat absorbing action taking place in pan 23', is adapted to absorb a certain amount of heat from the air therein, whereby the temperature of merchandise placed in the compartment is lowered somewhat from that of the atmosphere and is thus prepared for subsequent transfer to compartment 13, where it is quickly cooled to the desired dispensing temperature as above described.

The pre-cooling chamber is intended only to partly cool the bottles. The partition with its limited heat insulation characteristics is only used as a regulator or choke to control the amount of heat removed from the hot bottles disposed in the lower chamber 12. If no insulation were used the hot bottles would in all probability radiate sufficient heat to prevent proper cooling of the bottles in the upper chamber 13.

What I claim is:

1. A cooler having, in combination, a case provided with upper closures, an open top metal tank disposed within the case toward the upper end thereof and dimensioned relative to the case to form a space between the side walls of the case and the side walls of the tank, and a refrigerating unit expansion coil disposed in said space and embracing said metal tank walls to effect efficient thermal contact between the expansion coil and said tank walls.

2. In a refrigerating device, an upper compartment provided with a tank forming a container for bottled beverages and the like, a refrigerating compartment below said tank providing a precooler for the bottled beverages, and a refrigerant-evaporator in said upper compartment surrounding the tank.

3. In a refrigerating device, an upper compartment provided with a tank for containing bottled beverages and the like, a lower dry refrigerating compartment providing a precooler for the bottled beverages, access to said tank being had through openings in the top of said refrigerating device, and a refrigerant-evaporator in the upper compartment surrounding said tank.

4. A refrigerating device comprising a cabinet including insulated top and side walls, said cabinet providing an upper compartment having a tank for containing bottled beverages and the like, the top of said cabinet having openings closed by covers permitting access to said tank, a lower dry refrigerating compartment, and a refrigerant-evaporator located in the upper compartment and surrounding said tank.

5. A refrigerating device comprising a cabinet including insulated top and side walls, said cabinet providing an upper compartment having a tank for containing bottled beverages and the like, the top of said cabinet having openings closed by covers permitting access to said tank, a lower dry refrigerating compartment, and a refrigerant-evaporator in the form of a relatively long coil located in the upper compartment and surrounding said tank, whereby said coil presents a large surface area.

6. A refrigerating device comprising a cabinet including insulated top and side walls, said cabinet providing an upper compartment having a tank for containing bottled beverages and the like, and a dry refrigerating compartment located below said tank, the side walls of said tank being spaced from the insulated side walls of the cabinet, and a refrigerant-evaporator in the form of a cooling coil substantially occupying said space and surrounding said tank.

7. A cooler for bottled beverages and the like having in combination a case provided with upper closures and an open top relatively shallow metal tank disposed within the case toward the upper end thereof, said metal tank being of a size to hold a large volume of cooling water to act as a thermal flywheel, a lower compartment in said case under the tank, a refrigerant liquefying mechanism in said compartment, said tank having walls constructed and arranged to provide a space between the side walls of the case and the interior of the tank, and a refrigerating coil connected to said mechanism disposed in said space arranged to absorb heat from the contents of the tank, the coil being protected against physical contact with the beverage bottles and arranged to prevent substantial circulation of the cooling water around the coils thereby to protect the coils from physical damage and to provide a sanitary, easily cleanable tank.

8. The combination of a cooling device including a container having cooling water therein and bottled beverage material disposed in said cooling water; said container including a relatively shallow open top metal tank disposed within the device toward the upper end thereof, said metal tank being of a size to hold a large volume of cooling water to act as a thermal flywheel, a lower compartment in said device under the tank, refrigerant liquefying mechanism in said compartment, said tank having walls constructed

and arranged to provide a space between the side walls of the case and the cooling water in the tank, and a refrigerating coil connected to said mechanism disposed in said space and arranged to absorb heat from the cooling water in the tank, the coil being protected against physical contact with the beverage bottles and arranged to prevent substantial circulation of the cooling water around the coils thereby to protect the coils from physical damage and to provide a sanitary, easily cleanable tank.

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