

April 3, 1934.

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1,953,271

REFRIGERATING APPARATUS

Filed Dec. 15, 1930

2 Sheets-Sheet 2

37 *Fig. 3.*

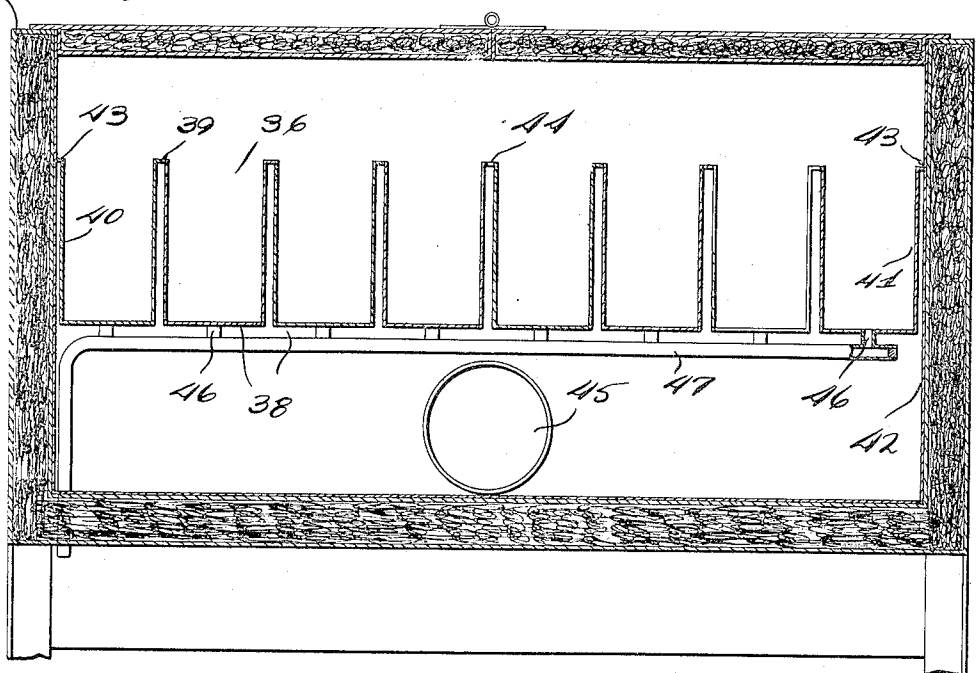
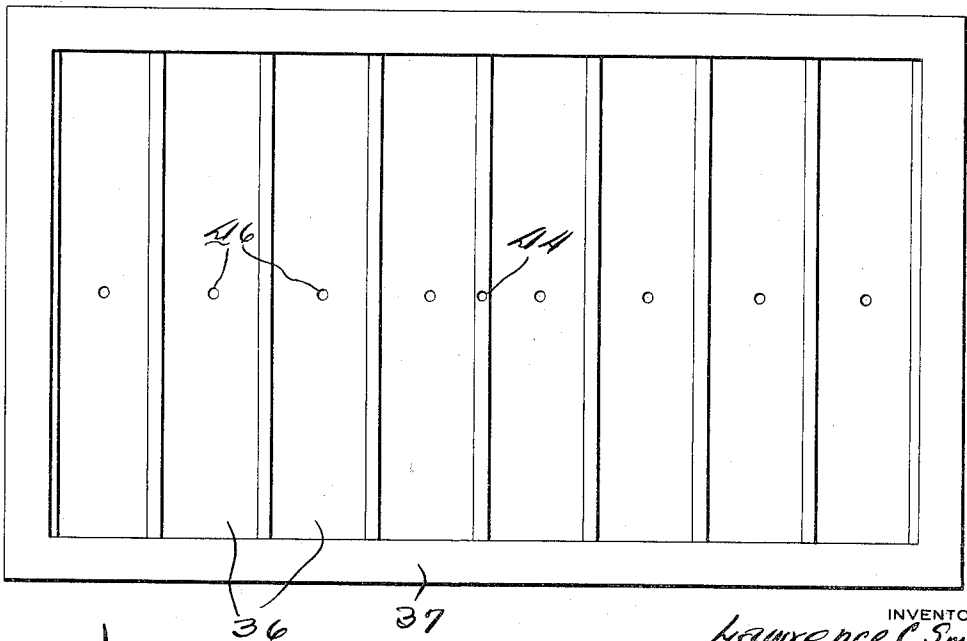


Fig. 4.

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1,953,271

REFRIGERATING APPARATUS

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Application December 15, 1930, Serial No. 502,553

1 Claim. (Cl. 62—76)

This invention relates generally to refrigerating apparatus and refers more particularly to bottle cooling devices.

In mechanically operated bottle coolers as now commercially produced, the refrigerating unit usually in the form of expansion coils or an evaporator is submerged in a bath of water within which the bottles to be cooled are also inserted. With the above arrangement it is practically impossible to obtain as cold a bottle as is desirable since it is necessary to maintain the temperature of the water bath substantially above the freezing point of the latter so that the same will not freeze and form ice on the unit which materially retards refrigeration and thereby appreciably affects the efficiency of the cooler.

Coolers of the type briefly outlined above, in addition to being undesirable for the foregoing reasons, are further objectionable owing to the difficulty encountered in cleaning the same. In order to clean such coolers, it is necessary to destroy the refrigerant or water and by so doing all refrigeration is lost until a fresh supply of water is cooled which not only consumes considerable time, but also materially increases operation cost. As a consequence, cleaning of the coolers is liable to be neglected with the result that they become unsanitary, especially when considering that the bottles are submerged in the water and served wet which in itself is objectionable.

It is, therefore, one of the principal objects of this invention to eliminate all of the foregoing objections and otherwise improve such apparatus by providing a cooler which may be maintained at any desirable temperature to cool the contents thereof accordingly, and also one which permits frequent and thorough cleaning without interfering with the refrigerant thereby materially reducing operation cost.

In addition to the foregoing, the present invention contemplates a construction which is thoroughly sanitary in design since the refrigerant is not permitted to come in direct contact with the bottles and accordingly the latter are comparatively dry when served.

A further advantageous feature of the present invention resides in the provision of a bottle cooler wherein each bottle is individually cooled with the result that refrigeration is materially expedited.

A still further object of the present invention is to provide a cooler of the type specified above which, in addition to being compact and simple in design, is also capable of being manufactured at a relatively low cost and accordingly other objects of the invention reside in the novel details of construction which will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawings, wherein:

Figure 1 is a transverse sectional view through a cooler constructed in accordance with this invention;

Figure 2 is a sectional view on the line 2—2 of Figure 1;

Figure 3 is a view similar to Figure 1 showing a slightly modified form of construction; and

Figure 4 is a top plan view of the construction shown in Figure 3 with the cover of the cooler removed for the sake of clearness.

Referring now more in detail to the drawings, it will be noted that there is illustrated in Figure 1 a bottle cooler 10 comprising a cabinet 11 having an opening 12 in the top thereof adapted to be closed by a suitable cover. The cover 13 is preferably formed of a pair of sections 14 and 15 having the outer marginal edges thereof adapted to engage the vertical side walls of the cabinet and having their inner edge portions hingedly connected together substantially centrally of the cabinet by means of the hinge 16. The cooperating sections 14 and 15 of the cover are formed of a pair of laterally spaced upper and lower sheet metal plates 17 and 18, respectively, cooperating with each other to form a chamber for receiving the insulating material 19 which prevents the heat surrounding the cabinet from being radiated into the latter through the sheet metal cover. The chamber within which the insulating material 19 is placed is of such dimension as to extend through the opening 12 in the chamber and form marginal shoulders 20 adapted to engage the inner surfaces of the side walls of the chamber to prevent sliding movement of the cover relative to the chamber. The sides and bottom walls 21 and 22, respectively, of the chamber 10 are also formed of laterally spaced sheet metal members having insulating material 23 therebetween for preventing radiation of heat inwardly into the cabinet.

Positioned within the cabinet and resting upon the bottom wall of the compartment therein, is a refrigerating unit 24 which may be equipped with either an evaporator or expansion coil, depending upon whether the cooler is to be used in connection with a dry expansion system or one of the flooded type. Since practically any type of mechanical unit may be used in connection with the cooler illustrated herein, and since the particular type of device employed forms no part of the present invention, the same is not shown or described herein. In detail, the refrigerating unit comprises a receptacle 25 adapted to be filled through the opening 26 with a refrigerant such as brine or the like and is provided with a plurality of individual containers 27 for receiving the articles to be cooled. The containers 27 are spaced from each other so that a solution of brine completely surrounds each container. As shown particularly in Figures 1 and 2, the receptacle 25

is formed of top, bottom and side walls 28, 29 and 30, respectively, preferably of sheet metal and defining a cross-sectional area slightly less than the cross-sectional area of the compartment 10 so as to permit the same to be readily inserted therein and removed therefrom. The top and bottom walls 28 and 29, respectively, are formed with aligned openings 31 preferably circular in contour and adapted to receive the opposite ends of the containers 27 which are in the form of annular sleeves. The opposite ends of the sleeves 27 are flush with the top and bottom surfaces of the walls 28 and 29 and are adapted to be welded or otherwise secured thereto so as to prevent the refrigerant in the receptacle 25 from escaping past the joints between the sleeves and the top and bottom walls aforesaid. Thus, from the foregoing it will be seen that each of the sleeves 27 are surrounded by the refrigerant with the result that the bottles or other articles within the sleeves 27 may be cooled to any desirable temperature without coming in contact with the refrigerant. The above arrangement is of particular importance when the refrigerating unit is used for cooling bottles or the like since it permits serving the latter comparatively dry which is not only advantageous from the standpoint of sanitation, but also from the standpoint of general appearance.

The mechanical device for cooling the brine whether it be an expansion coil or an evaporator is preferably supported directly within the receptacle 25 substantially centrally thereof and preferably in the space designated by the reference character 32. If desired, a relatively large cooling compartment 33 may be inserted within the chamber in rear of the space 32 for receiving package goods of various sizes. The compartment 33 is also surrounded by the brine solution and is open at both ends in the same manner as the sleeves 27 with the result that the articles therein and in the sleeves are supported directly by the bottom wall of the compartment 10. Moreover, by reason of the above arrangement, all of the containers including the compartment 33 may be drained by a single drain opening 34 in the cabinet 10 which, as shown in Figure 1, establishes communication between the interior of the cabinet and the exterior of the same. As will be apparent from the foregoing, the cabinet 10 may be readily cleaned by merely flushing the same, with water without interfering with the refrigerant contained in the receptacle 25. It will further be seen from the previous description that the refrigerating unit 24 including the cooling device may be readily removed for inspection and inserted within the cabinet 10 without necessarily interfering with the articles in the compartments 27 and 33 since these articles are supported directly upon the base of the compartment 10 and without removing or otherwise disturbing the refrigerant.

The construction illustrated in Figure 3 differs from the one previously described in that the compartments 36 for receiving the articles to be cooled are substantially U-shaped in cross-section and extend longitudinally of the refrigerator cabinet 37. The substantially U-shaped compartments 36 extend transversely across the cabinet 37 with the base portions 38 thereof spaced a substantial distance above the bottom wall of the cabinet and the leg portions thereof spaced from each other

and having the upper ends connected together as at 39. The front and rear legs 40 and 41, respectively, of the opposite end compartments are connected to the adjacent side walls of the receptacle 42 in spaced relation thereto as at 43 with the result that the compartments 36 cooperate with each other to form the top wall of the receptacle 42. The receptacle 42 is preferably filled with a refrigerant such as brine through an opening 44 formed in the connecting portion for adjacent legs of a pair of compartments 36 and is further provided with a space indicated by the reference character 45 for receiving an evaporator or expansion coils (not shown). Thus, from the foregoing it will be observed that the longitudinal side walls or legs of each compartment 36 together with the base portions 38 thereof are exposed to the refrigerant within the chamber 45 with the result that the articles within the compartments 36 are rapidly cooled and may be served dry as in the first-described form of the invention.

In order to permit cleaning of the compartments 36, the base portions 38 of the latter are provided with drain openings 46 communicating with a drain pipe 47 which in turn communicates with a point exteriorly of the refrigerator. While the drain conduit 47 is connected to each of the compartments 36 within the chamber 42, nevertheless, the construction is such as to permit the chamber 42 to be removed from the cabinet 37 as a unit so as to permit cleaning the latter whenever desired. In this connection it is to be noted that the compartments 36 may be cleaned without interfering with refrigeration and the chamber 42 may be removed without disturbing the refrigerant therein.

While in describing the present invention particular stress has been placed upon the use of my invention for cooling bottled goods, it is to be noted that the same may be used with equal facility for cooling various other articles or food stuffs and accordingly reservation is made to make such changes as may come within the purview of the accompanying claim.

What I claim as my invention is:

A bottle refrigerating device comprising a cabinet having a heat insulated compartment therein, said compartment being open at its top, an insulated closure member for the compartment, a rectilinear receptacle mounted on the bottom of the compartment in engagement with the vertical walls thereof and having a top wall formed to provide a plurality of vertical partitions connected at their bases by contiguous horizontal base portions, said vertical partitions being disposed in parallelism to each other to form bottle receiving aisles and being spaced to provide intimate thermal contact with bottles placed therebetween, said receptacle including the partitions thereof being adapted to contain a body of liquid refrigerant to cool said partitions and thereby the bottles therebetween and the air in said compartment, and means for retaining the bottles in a dry condition by removing the condensed water from the aisles, comprising a drain conduit mounted in the receptacle and extending there-through and through said cabinet, said drain conduit communicating with the compartment through the base portion of each aisle.

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