July 31, 1928.

1,679,292

J. O. CARREY

COOLING TANK

Filed March 27, 1924

2 Sheets-Sheet 1

Fig. 2

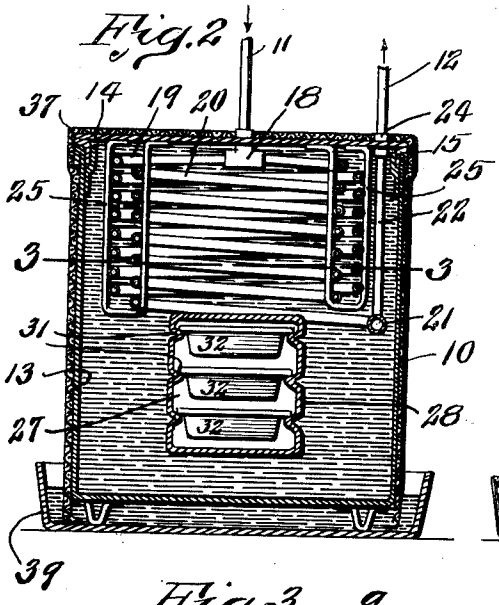


Fig. 1

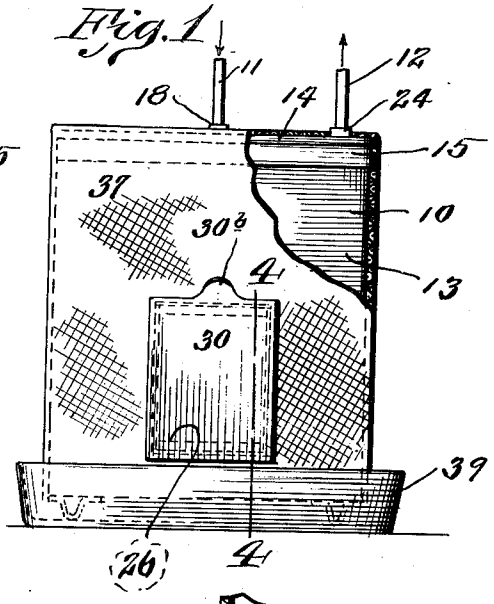


Fig. 3

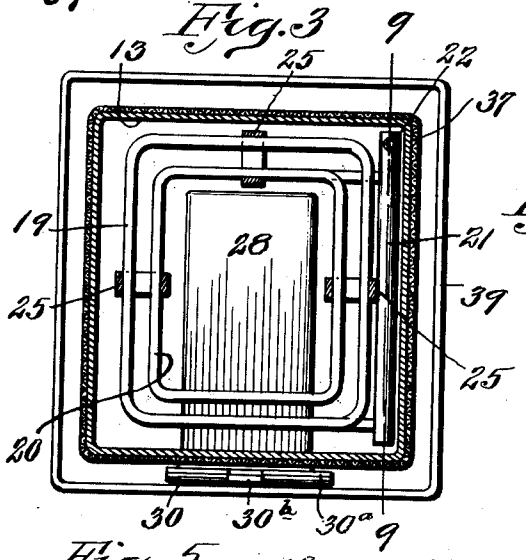


Fig. 4

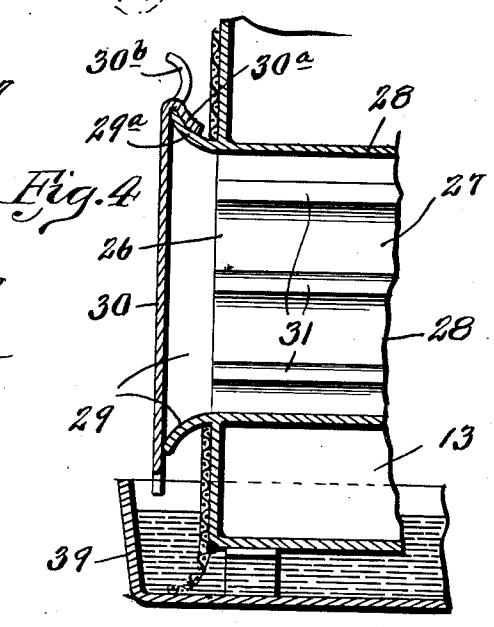
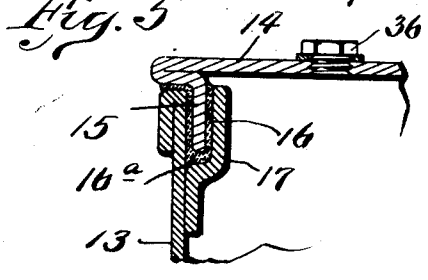


Fig. 5



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Fig. 6

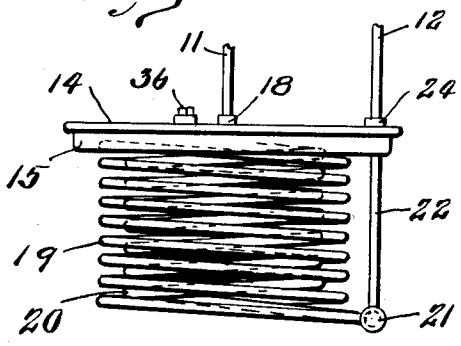


Fig. 7

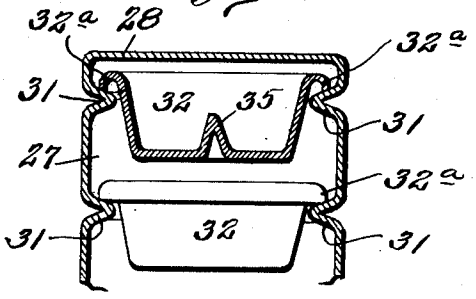


Fig. 8

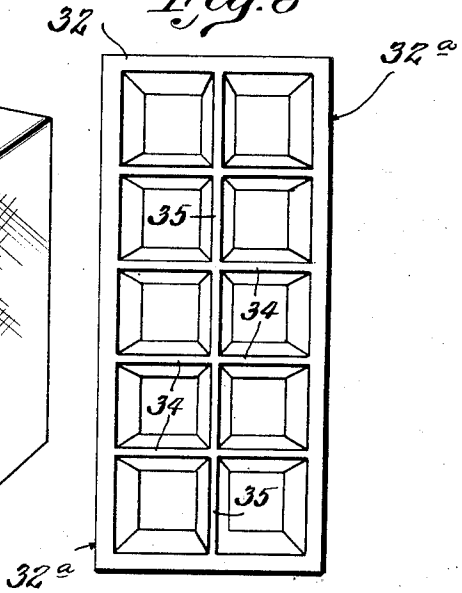


Fig. 10

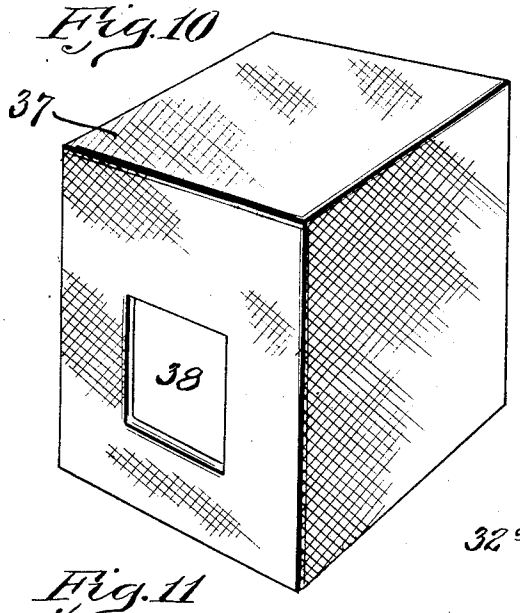


Fig. 11

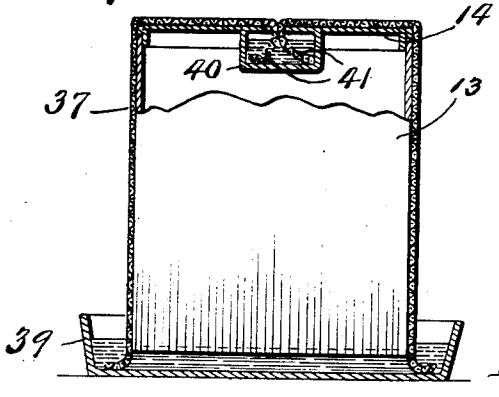
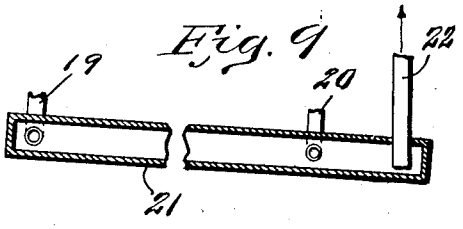


Fig. 9



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By Cornwall, Bidell & Janney Attys.

Patented July 31, 1928.

1,679,292

UNITED STATES PATENT OFFICE.

JOHN O. CARREY, OF ST. LOUIS, MISSOURI, ASSIGNOR TO CARREY-MORSE ENGINEERING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

COOLING TANK.

Application filed March 27, 1924. Serial No. 702,363.

This invention relates to new and useful improvements in cooling tanks for refrigerating systems and to a novel and useful method for de-icing such tanks.

The objects of the invention are to provide a tank which is of strong and durable construction, is highly efficient in performing its intended functions, and which can be sealed so as to prevent the spilling or evaporation of the cooling liquid contained therein.

Further objects of the invention are to provide a tank having a suitable freezing compartment and a suitable closure member therefor and to provide suitable trays adapted to be removably positioned in said compartment for the purpose of chilling or freezing liquid contained in said trays and to so construct said trays that a minimum amount of supporting contact is necessary between said trays and the supporting portions of the tank, thereby preventing freezing and sticking of the trays in said compartment.

A still further object of the invention is to provide new and useful methods of de-icing the tank whereby the outer surfaces of said tank are kept free from ice and snow under all conditions without impairing the efficiency of the tank.

With these and other objects in view, my invention consists in certain novel features of construction and arrangement of parts, hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a front elevational view of the tank with the covering partly broken away.

Figure 2 is a vertical cross section through the tank.

Figure 3 is a horizontal section taken on line 3—3 of Figure 2.

Figure 4 is a vertical cross section taken on line 4—4 of Figure 1.

Figure 5 is a detail view showing the manner in which the cover is sealed in position on the tank.

Figure 6 is a front elevational view of the cover and the expansion coil supported thereby.

Figure 7 is an enlarged detail view of the freezing compartment and the trays supported therein.

Figure 8 is a top plan view of one of the trays.

Figure 9 is a detail cross section taken on the line 9—9 of Figure 3.

Figure 10 is a perspective detail view of the fibrous tank covering.

Figure 11 is a vertical cross section through the tank and showing a modified form of the tank.

Heretofore cooling tanks utilized in refrigerating systems become covered with ice and snow and where trays are used in combination with such tanks they freeze to the compartment and difficulty is experienced in removing the trays therefrom. With my improved method the tanks are kept free of ice and snow and the trays may be easily removed from the compartment. The method of de-icing consists in covering the tank or portions thereof with a layer of fibrous material which is kept saturated with a suitable non-freezing solution and the solution is supplied to the covering by capillary action or in any other suitable manner. My improved tank is sealed and forms a self-contained unit which can be charged with the liquid at the factory or at the distributing point and can be then transported without danger of spilling said liquid, thereby facilitating the transportation and installation of the tanks.

Referring by numerals to the accompanying drawings, 10 designates a cooling tank which is preferably box-shaped but may be of any other shape to fit the compartment of the refrigerator. This tank has an inlet pipe connection 11 and an outlet pipe connection 12 which extend outwardly through a wall of the refrigerator and are connected to the respective terminals of a refrigerating system.

The tank 10 comprises an open-topped body portion 13 and a removable cover 14. This cover 14 has depending marginal flanges 15 which, when said cover is placed in position on the container, are adapted to be seated in channels 16 formed in the edges of said container preferably by securing to the inner faces of the walls of the container suitable members 17. Channels 16 are slightly wider than the flanges 15 and the space thus formed is filled with a suitable sealing compound 16^a as shown in Figure 5 whereby when the cover is in position the tank is sealed and prevents evaporation of the cooling liquid contained there-

in. The inlet pipe 11 is connected at its inner end to a T connection 18 which is secured to cover 14 and has connected thereto the upper ends of expansion or cooling coils 19 and 20. These coils extend a suitable distance into the tank and have their lower ends connected to a sump or pipe 21 which is of comparatively large diameter. Extending into this pipe is the lower end of a vertically disposed pipe 22, the upper end of which is connected to a coupling 24 which is secured to said cover and extends therethrough for receiving the inner end of outlet pipe 12. Coils 19 and 20 are secured to the cover by virtue of their connection to T connection 18 and coupling 24 and are further secured to said cover by means of straps 25 which are preferably U-shaped and pass under the lowermost sections of said coils and have their ends secured to cover 14. Thus all of the elements of the tank circulating system are supported by and form an integral part of the cover so that when the latter is raised and removed from the tank said elements are withdrawn from the tank and it is not necessary to disconnect any parts thereof. Thus the assemblage of said elements is facilitated and they are rendered more accessible for the purpose of inspection or repairs.

The front wall of the tank is provided with an opening 26 which serves as an entrance to a chilling compartment 27 formed in said tank by a box-shaped casing 28 which extends thereinto as shown in Figure 3. The margins of this opening are provided with outwardly flared flanges 29 and said opening is closed by a removable closure member 30 having at its upper end a downwardly inclined flange 30^a designed to lie over the upper flange 29^a thereby supporting member 30 in closed position. A portion of flange 30^a is deflected upwardly and is curved as indicated at 30^b to provide a suitable hold whereby the closure plate may be removed. The flared marginal flanges 29 and 29^a form a water shed and prevent the condensate and the liquid used for de-icing the tank from entering compartment 27.

The side walls of casing 28 are provided with a series of horizontally and oppositely disposed ribs 31 which serve to receive the side edges of trays 32 whereby the latter may be removably positioned in compartment 27. These side edges are preferably bent downwardly as indicated at 32^a so that the supporting contact between the trays and the ribs 31 is reduced to minimum to prevent freezing of trays in said compartment and facilitate the removal of trays therefrom. Trays 32 have preferably inwardly inclined end and side walls and the bottoms of said trays are provided with upwardly presented transverse ribs 34 and longitudinally disposed ribs 35, the walls of said ribs having the same angle of inclination as the walls of the trays. Thus the bottom of each tray is divided into equal squares and when the water contained in such tray is frozen, the underside of the ice block is formed with a longitudinal groove and a series of transverse grooves which are of sufficient depths to permit breaking of the ice block into a plurality of cubes of desired sizes.

Cover 14 is formed with a threaded opening through which the tank may be filled with liquid and which is adapted to be closed by a plug 36.

The method of de-icing the tank consists in causing the walls of the tanks to be constantly washed or kept moist with a non-freezing solution, thereby preventing the formation of ice or snow on said walls. The preferred means for maintaining the tank moist consists of a fibrous covering 37 which completely encloses said tank with the exception of closure member 30, an opening 38 being formed in the front wall of said cover for accommodating the flared marginal flanges 29 and 29^a. This covering is kept saturated with a non-freezing solution by capillary action, a portion of said covering extending into a suitable container filled with such solution.

In the preferred form illustrated in Figures 1 to 10, the lower end of the tank rests in a pan 39 which contains the non-freezing solution and the lower portion of the covering extends into said pan and is submerged in said liquid. The covering 37 is thus by capillary action maintained saturated with the non-freezing liquid contained in said pan.

In Figure 11 a modified form is shown wherein an auxiliary container 40 is provided on the cover 14 and is filled with non-freezing liquid. Portions 41 of the covering extend into said container through a suitable opening formed in cover 14 and supply the fibrous covering with the non-freezing liquid.

I claim:

1. A cooling tank for refrigerating systems comprising an open topped container, a removable cover therefor, an expansion coil secured to and extending from said cover into said container, an inlet and an outlet connection for said expansion coil, a horizontally disposed sump arranged below said coil and connected to the discharge end of said expansion coil and said outlet connection and a fibrous covering for said tank, said covering being kept saturated with a non-freezing medium to prevent formation of ice and snow on said tank.

2. A cooling tank for refrigerating systems comprising an open topped brine container, a removable cover therefor, an expansion coil secured to and extending from

said cover into said container, an inlet connection for said expansion coil, a horizontally disposed oil sump connected to the discharge end of said coil, an outlet connection extending into said sump and having a vertically disposed intake end extending into and terminating in the lowermost portion thereof, an absorbent material covering the entire surface of said tank, and a container containing a solution of non-freezing liquid for maintaining said absorbent material saturated with said liquid.

3. A cooling tank for refrigerating systems comprising a brine container, a detachable cover for said container, expansion coils secured to and depending from said cover, inlet and outlet connections detachably connected to the respective ends of said coils and secured to and extending through said cover and a removable fibrous cover enveloping said tank and kept saturated with a non-freezing liquid to prevent formation of ice and snow on said tank.

4. In cooling tanks for domestic refrigerating machines, the combination with a tank and a refrigerating coil arranged therein, of a suitable receptacle filled with a non-freezing solution and a fibrous covering for said tank, portions of said covering extending into said receptacle and being submerged in the non-freezing solution contained in said receptacle whereby said covering is kept saturated with said solution by capillary action and the surfaces of the tank are thus kept moist with said non-freezing solution to prevent frosting of said tank.

In testimony whereof I hereunto affix my signature this 15th day of March, 1924.

JOHN O. CARREY.