April 17, 1934. M. WILDRICK 1,955,266

REFRIGERATION APPARATUS

Filed Jan. 7, 1931

Fig. 1.

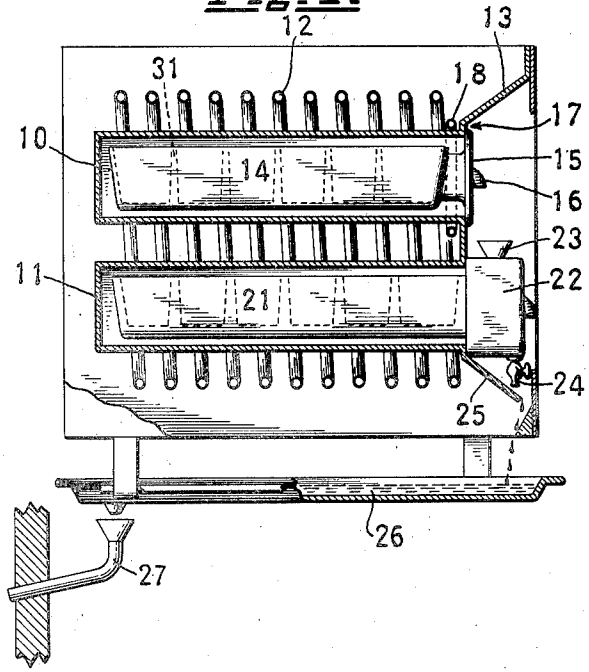


Fig. 2.

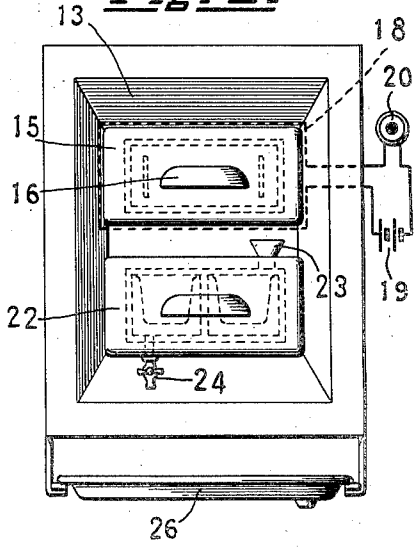


Fig. 3.

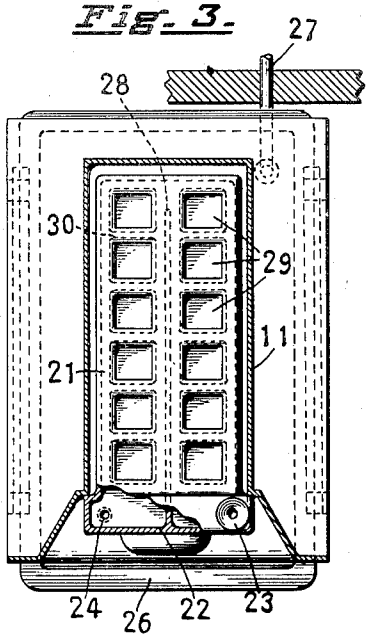


Fig. 4.

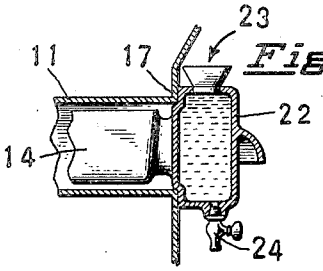


Fig. 5.

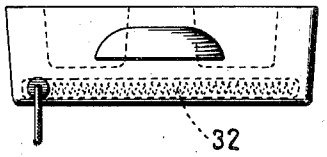
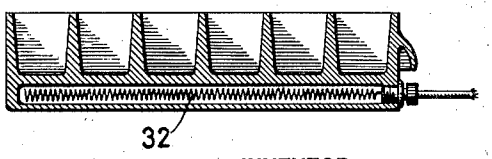


Fig. 6.



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1,955,266

REFRIGERATION APPARATUS

Meade Wildrick, Wilmington, Del.

Application January 7, 1931, Serial No. 507,137

11 Claims. (Cl. 62—108.5)

It is customary in household refrigerators and the like to employ trays or pans in which liquids may be frozen. These trays are supported in compartments which are chilled below the freezing point by means of artificial refrigeration.

On account of the conditions which exist within such refrigerators the trays are frequently frozen in place by the collection of frost, particularly at the point where the front of the tray contacts with the edge of the compartment. This causes a great deal of annoyance, trouble and delay. In fact it frequently becomes necessary to defrost the entire refrigerator in order to release the tray. This, of course, allows the temperature of the refrigerator to rise so that the food is not maintained at a proper temperature. It also means that there is a considerable waste of current or other power.

I accordingly have sought to provide convenient means for releasing the tray and for facilitating the removal of the contents.

The invention may be embodied in a number of different forms, each having its own advantages.

Fig. 1 is a longitudinal sectional view of a refrigerating unit showing two trays with means for melting the ice sufficiently to permit the trays to be withdrawn and also showing means for loosening the individual cakes of ice from one tray.

Fig. 2 is a front view of the same apparatus as that shown in Fig. 1.

Fig. 3 is a horizontal section and plan showing the lower tray and compartment of Figs. 1 and 2.

Fig. 4 is a fragmentary sectional view of a modification.

Fig. 5 is a front view of a modified form of tray.

Fig. 6 is a longitudinal sectional view of the apparatus shown in Fig. 5.

Compartments or chambers such as 10 and 11 are formed of metal and usually surrounded by refrigerating coils 12, the unit being covered at the front by a re-entrant face plate 13, the whole being, of course, usually contained within a suitable cabinet, the contents of which are refrigerated by the same coil.

The tray 14 is of the usual type provided with a front plate 15 and a suitable hand pull or grip 16. These trays frequently are frozen tight in their compartments. The point of particular difficulty is at the mouth 17 of the compartment where the edges of the front plate 15 contact with the metal of the compartment.

I accordingly provide means for warming the parts particularly at this point sufficiently to melt the ice and release the tray. This warming means may take several different forms. For instance, in Figs. 1 and 2 I have shown a heating resistance coil 18 surrounding the mouth of the compartment 10 adjacent the face plate 15. This coil receives current from a suitable source 19, the circuit being controlled by a switch 20 located in any convenient place. To loosen the tray in case it is frozen it is only necessary to turn on the heater for a few moments whereupon the heater may be turned off and the tray withdrawn. It is thus unnecessary to defrost the entire refrigerator and a great deal of time and expense can be saved.

In the construction shown in the lower half of Figs. 1 and 2 and in Fig. 3 the tray 21 is provided with an extension 22 which forms a water chamber having an entrance or inlet 23 at the top and an outlet 24 at the bottom, preferably controlled by a valve or pet-cock. It will be seen that as hot water is poured into this chamber 22 and allowed to stand for a few moments it will heat up the outer end of the compartment 11 and melt any ice which may be holding the tray in place. Hot water may be continuously poured into and drawn from the chamber 22 if desired or it may be left in the chamber by turning off the valve 24. In the construction shown the water as it runs out of the chamber drains down the incline 25 into the usual drip pan 26, from which it runs out into the drain 27.

The hot water chamber may be extended along the bottom of the tray 21 so as to make it possible to warm up the entire tray when desired. By providing a central partition 28 the water may be caused to flow down one side from the inlet 23 and forwardly along the other side to the outlet 24. Obviously, however, the outlet might be made in the rear end if desired.

In the form shown in the lower half of Figs. 1 and 2 and in Fig. 3 a series of small pockets 29 are provided and there are passages 30 between them open to the refrigerated atmosphere for facilitating the freezing and permitting the flow of water between the small compartments in order to loosen the contents when frozen.

It should be understood, however, that the usual removable grid 31 might be provided as shown in the top of Fig. 1.

In the form shown in Fig. 4 the compartment 22 for the hot water extends only across the front where the greatest difficulty usually occurs.

In Figs. 5 and 6 I have shown another modi-

fication in which an electrical heating coil 32 is provided in the bottom of the tray. This can be plugged into a power circuit in any suitable manner and serves not only to loosen the tray from its containing compartment (not shown) but also makes it possible to loosen the individual cubes or other contents of the tray without the necessity of inverting the tray and pouring hot water on the bottom of it as is customarily done.

It should be understood that other changes in details of construction and arrangement may be made without departing from the spirit and scope of my invention.

The invention is of value not only for freezing and discharging cubes or blocks of ice but for preparing ice cream, frozen custards, ices and other desserts which are especially difficult to remove when frozen hard and which can not be handled as conveniently as ice cubes.

I claim:

1. Refrigeration apparatus comprising a refrigeration compartment, a tray removably mounted therein and having a liquid entrance and a drain at one end thereof whereby the tray can be heated by liquid while it is still within the compartment.

2. A tray for a mechanical refrigerator having a hot water compartment in the bottom thereof with an entrance and a drain at the front end thereof.

3. A tray for a mechanical refrigerator having a hot water chamber extending across the front thereof with an entrance at the top and a controlled outlet at the bottom.

4. Refrigeration apparatus comprising a freezing chamber, a receptacle removably mounted therein and having a water conduit in a wall thereof, said conduit having a water inlet and a water outlet to permit passage of water through the conduit while the receptacle is in the freezing chamber.

5. Refrigeration apparatus comprising a freezing chamber, a liquid containing receptacle removably mounted therein and having a water conduit with an inlet at one end of the conduit and an outlet at the other end of the conduit for draining the water conduit of the receptacle while the receptacle is held within the freezing chamber.

6. In a refrigerator, a hot water chamber for heating an ice tray around its front end to loosen it from the freezing compartment and means for draining water from said chamber into the usual drip pan.

7. An ice tray for a refrigerator having a hot water chamber at its front end for loosening the tray from its freezing compartment, said hot water chamber having an inlet at its upper side and an outlet at its lower side.

8. In a refrigerator, an ice tray having a hot water chamber with an entrance at its front end and means for draining said chamber while it is in the usual freezing compartment.

9. Refrigeration apparatus comprising a horizontal freezing compartment open at its front end and surrounded by freezing coils, a freezing tray removably mounted in said compartment for containing water to be frozen and having a vertical flange surrounding the joint between the tray and the front of the opening in the compartment and means for heating the flange of the tray while the tray is in the compartment and without defrosting the compartment.

10. Refrigeration apparatus comprising a horizontal freezing compartment open at its front end, freezing means surrounding said compartment, a freezing tray removably mounted in said compartment for containing water to be frozen and insertable and removable from the open front end of the compartment, said tray having a liquid-containing chamber extending across its front end and having liquid-containing channels in its bottom only, communicating at the front end with said chamber, the side walls of the tray being free of air pockets, so that the normal freezing action can take place at the surface and the sides of the tray and so that when hot water is poured in the chamber in the front of the tray and in the channels in the bottom of the tray, the tray will be loosened from the freezing compartment and the ice formed by the freezing of water in the tray can be readily removed.

11. Refrigeration apparatus comprising a metallic tray adapted to be slid into a horizontal freezing compartment of a refrigerator and to be there surrounded by freezing means, said tray having a hot water chamber extending across the front thereof with an entrance at the top and a longitudinal hot water channel extending from the bottom of the chamber at the front of the tray rearwardly, the sides of the tray being free of air pockets, said tray having its interior constructed to receive water to be frozen in contact with the bottom and side walls of the tray, the ice formed by freezing of water in the tray being readily removed from the tray when hot water is poured into the hot water chamber at the front of the tray and in the hot water channel in the bottom of the tray.

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