June 19, 1934. F. J. STOLLSTEIMER 1,963,565

REFRIGERATOR

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Fig. 1.

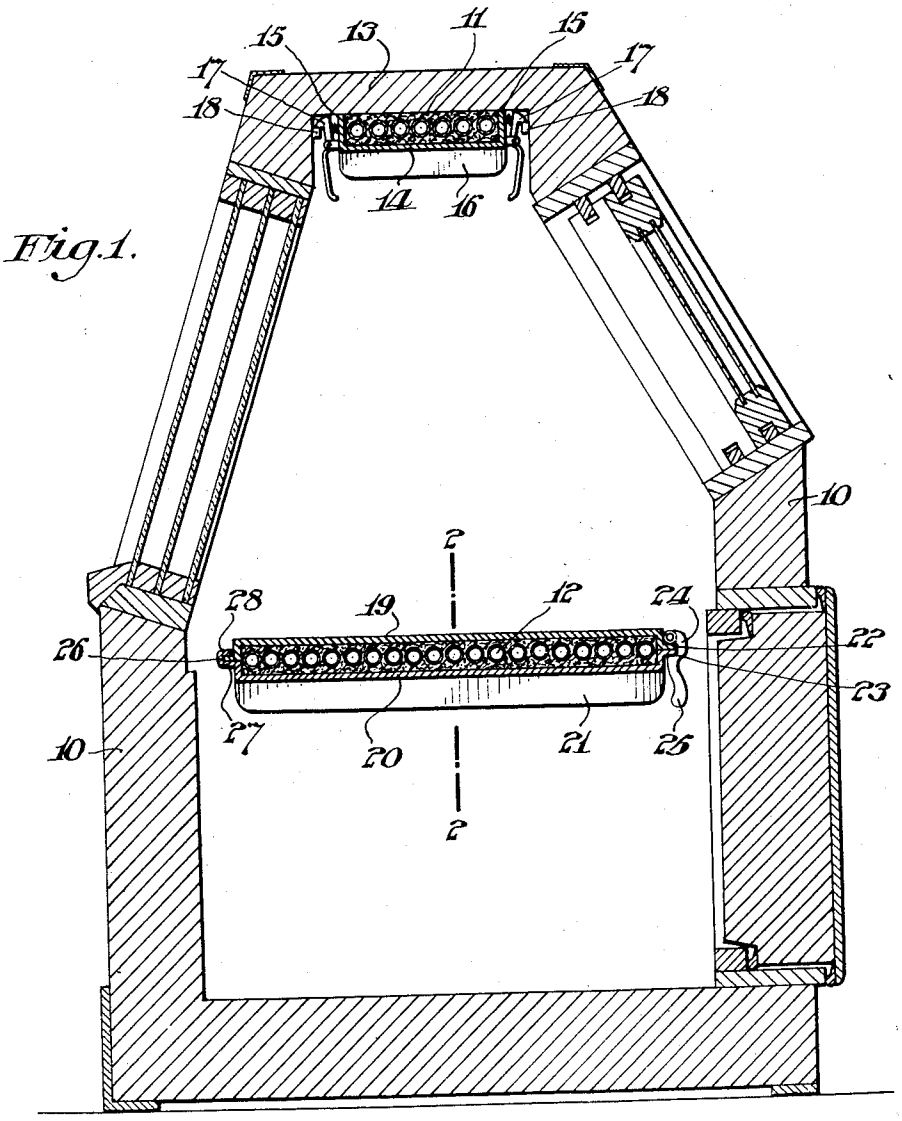
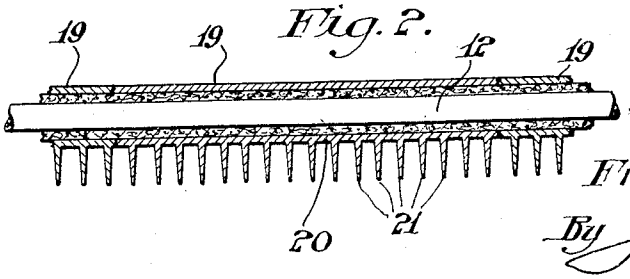


Fig. 2.



Inventor:
Frederick J. Stollsteimer;
By Jas. C. Wolcutt
Attorney.

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Fig. 3.

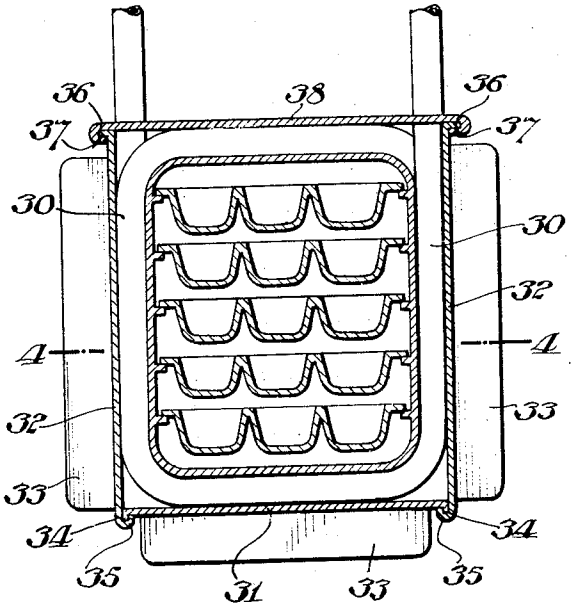
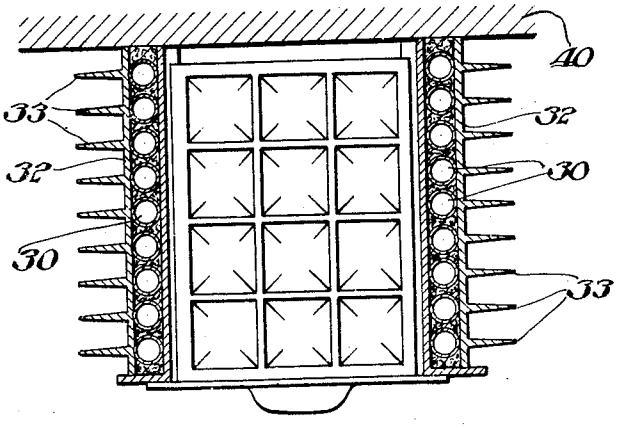


Fig. 4.



Inventor:
Frederick J. Stollsteimer,
By Jas. C. Wobusmith
Attorney.

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UNITED STATES PATENT OFFICE

1,963,565

REFRIGERATOR

Frederick J. Stollsteimer, Brookline, Pa.

Application January 26, 1931, Serial No. 511,207

5 Claims. (Cl. 62—89.6)

My invention relates to refrigerators, and it relates more particularly to the defrosting of the cooling units thereof.

It is well known that one of the principal difficulties encountered in the use of mechanical refrigerators is the removal of the frost which forms upon the exposed surfaces of the cooling units thereof. This frost has definite insulating properties, and seriously lowers the efficiency of the cooling unit after a certain quantity thereof has accumulated. Consequently, it becomes necessary periodically to remove the frost in order to restore the cooling unit to its most efficiently operating condition.

Heretofore, the various methods which have been used for defrosting the cooling units of refrigerators have required the suspension of the refrigerating action for a certain period of time, during which a heating fluid is usually passed through the cooling unit.

One of the modern developments in the merchandising of food products consists in the initial freezing, in the packing house, of such products, in conveniently sized, marketable packages. However, most of such frozen products must be maintained in their frozen condition up to the time they are actually used, as otherwise, if allowed to thaw, they quickly spoil.

This method of merchandising requires the use, in retail stores, of refrigerators and show cases having extremely low temperatures; and household refrigerators are now being manufactured having compartments wherein the temperature is maintained below the freezing point, in which such frozen products may be preserved.

However, in such low temperature refrigerators, the frost accumulates much faster upon the cooling units thereof, for obvious reasons, and consequently the defrosting of such cooling units presents a much more serious problem than the defrosting of the units of ordinary refrigerators, and usually requires a longer period of time than is safe for the preservation of the frozen food products.

The object, therefore, of my present invention is to provide improved means whereby the cooling units of refrigerators may be quickly and conveniently defrosted, said means not only being applicable to the cooling units of ordinary refrigerators, but finding a most valuable application in low temperature refrigerators, which may thereby be defrosted without substantial loss of temperature in the interior thereof.

The nature and characteristic features of my invention will be more readily understood from the following description, taken in connection with the accompanying drawings forming part hereof, in which:

Figure 1 is a transverse vertical sectional view of a refrigerator of the display case type, having the cooling units thereof provided with removable casings embodying the main features of my present invention;

Fig. 2 is a fragmentary section thereof, taken approximately on the line 2—2 of Fig. 1;

Fig. 3 is a vertical transverse section of a cooling unit adapted for use in a refrigerator of the household type, provided with another form of removable casing embodying the features of my invention; and

Fig. 4 is a horizontal section thereof, taken on the line 4—4 of Fig. 3.

It will, of course, be understood that the drawings and description herein contained are illustrative merely, and that various modifications and changes may be made in the structure disclosed without departing from the spirit of my invention.

Referring now more particularly to Figs. 1 and 2 of the drawings, my invention is there shown applied to cooling units of a refrigerator 10 of the display case type. The particular refrigerator there shown is provided with two cooling units, 11 and 12, which may be of the slab type, in which the coils through which the refrigerant passes are embedded in a suitable material, so as to present a slab-like appearance. Such types of cooling units are well known in the art.

The upper cooling unit 11 is mounted directly upon the under interior face of the top slab 13 of the refrigerator structure. Consequently, the bottom and side surfaces thereof are the only ones upon which the frost would ordinarily accumulate.

The removable casing of my invention is preferably made of metal or other suitable heat conducting material, and comprises, as applied to the upper cooling unit 11, bottom plates 14 and side plates 15, which are shaped to conform to the dimensions of the cooling unit. The lower plate 14 is preferably provided with a plurality of extending fins 16, to increase the surface area and thus facilitate the absorption of heat from the interior of the refrigerator.

The sides of the removable casing may be provided with spring latches 17, which engage lugs 18 secured to the refrigerator structure at the proper locations. It will be seen that by releasing the latches 17 from engagement with the lugs 18, the casing may be readily removed from the cooling unit 11.

The cooling unit 12, in the central portion of the refrigerator shown in Fig. 1 of the drawings, may, and usually does serve as a shelf upon which the articles to be preserved may be arranged and displayed. For this arrangement, the top surface, as well as the bottom and side surfaces, are enclosed within the removable casing, which is made in two parts, the upper member 19 preferably having a smooth top surface, and the lower member 20 being provided with extending fins 21, to facilitate the absorption of heat from the interior of the refrigerator.

On one side, the abutting portions of the two members of the casing may be provided with coacting flanges 22 and 23, and a clamping member 24 is conveniently hinged to one member of the casing. The clamping member 24 is provided with an extending handle 25, which may be used to clamp the abutting flanges to each other. On the other side of the two part casing, each member may also be provided with extending flanges 26 and 27. One of said flanges 27 may have a lip 28 extending around the other flange 26, as shown in Fig. 1 of the drawings.

To remove the casing above described, the clamping member 24 is swung to a position to release its hold upon the abutting flanges 22 and 23, after which the lower portion 20 of the removable casing may be swung downwardly a sufficient distance to be then shifted to cause the lip portion 28 to be disengaged from the flange 26 of the other member. The several parts of the casing may then be removed from the cooling unit 12.

Where the cooling unit is of a length such as is usually found in refrigerators of the display case type, the removable casing may be made in sections, lengthwise, as shown in Fig. 2 of the drawings, whereby it may be more conveniently handled during its removal and replacement.

In Figs. 3 and 4 of the drawings, there is shown a form of the invention as applied to a cooling unit 30, such as is used in household refrigerators. In this instance, the removable casing is made in four separable parts, extending around the top, sides and bottom of the coils. The bottom member 31, and side members 32, are shown provided with fins 33, to facilitate the absorption of heat from the interior of the refrigerator.

The side edges of the bottom member 31 are provided with beads 34, which are adapted to be sprung into engagement with the turned over lips 35 at the bottom edges of the respective side members. The top edges of the side members are provided with outwardly extending flanges 36, which are mounted in grooves 37, provided by the turned over edges of the top member 38.

In assembling the casing as above described, the side members 32 are first brought into engagement with the top member 38, and the turned over lips 35, at the bottom edges of the side members 32, are then sprung over the beads 34 to lock the casing members in position around the coil.

As shown in Fig. 4, there is no casing member required for the back of the cooling unit, as the same abuts against the interior surface of one of the walls of the refrigerator structure 40.

In the use of any of the forms which the invention may assume, the removable casing parts are preferably provided in duplicate, so that, after the frost has accumulated on the casing which is mounted on the cooling unit, the same may be detached, and immediately replaced by the duplicate which is provided for that purpose. The casing parts with the frost thereon are removed from the interior of the refrigerator to a warmer atmosphere, to allow the frost to melt, after which said parts are ready to replace the other set when the frost has in turn accumulated on that set.

It will be noted that the removable casings for cooling units may assume a wide variety of forms, depending upon the shape and character of the particular cooling unit with which the casing is to be used. In every instance, however, the removable casing covers those portions of the cooling unit from which it would otherwise be necessary to remove the frost from time to time by other means.

It will be found that, where the otherwise exposed surfaces of the cooling units are covered by the removable casing members, the frost will accumulate entirely upon the outside of the casing, as it is well known that the frost comes from the moisture contained in the air which is constantly circulating over the outer surfaces of the casing.

I claim:

1. Means for removing the accumulation of frost on the cooling unit of a refrigerator chamber, comprising a plurality of casings made of heat conducting material, each of said casings being adapted to be removed from the cooling unit whereby the frost which has accumulated thereon may be melted therefrom apart from the cooling unit, and said casings being adapted to be used alternately whereby one of the casings may replace the other.

2. The combination, with the cooling unit of a refrigerator chamber, of means for removing frost therefrom, without substantially increasing the temperature thereof, comprising a plurality of removable casings for the exposed surfaces of said cooling unit, said casings being adapted to replace each other to effect the defrosting.

3. The combination, with the cooling unit of a refrigerator chamber, of means for removing frost therefrom, without substantially increasing the temperature thereof, comprising a casing for the exposed surfaces of said cooling unit, said casing being made of separable removable members.

4. The combination, with the cooling unit of a refrigerator chamber, of means for removing frost therefrom, without substantially increasing the temperature thereof, comprising a casing for the exposed surfaces of said cooling unit, said casing being made of separable removable members, and certain of said members being provided with fins on the outer faces thereof.

5. The combination, with the cooling unit of a refrigerator chamber, of means for removing frost therefrom, without substantially increasing the temperature thereof, comprising a removable casing for the exposed surfaces of said cooling unit, certain of the outer faces of said casing being provided with extending fins.

FREDERICK J. STOLLSTEIMER.