Aug. 6, 1935. N. F. FRETTER 2,010,259

MEANS FOR DEFROSTING REFRIGERATING UNITS

Filed Feb. 2, 1933 2 Sheets-Sheet 1

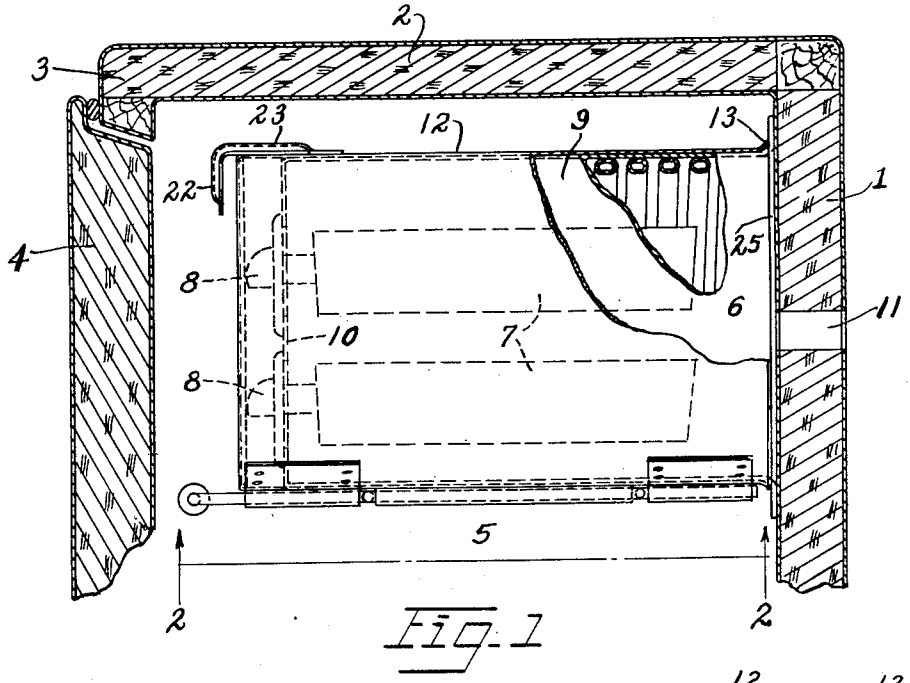


Fig. 1

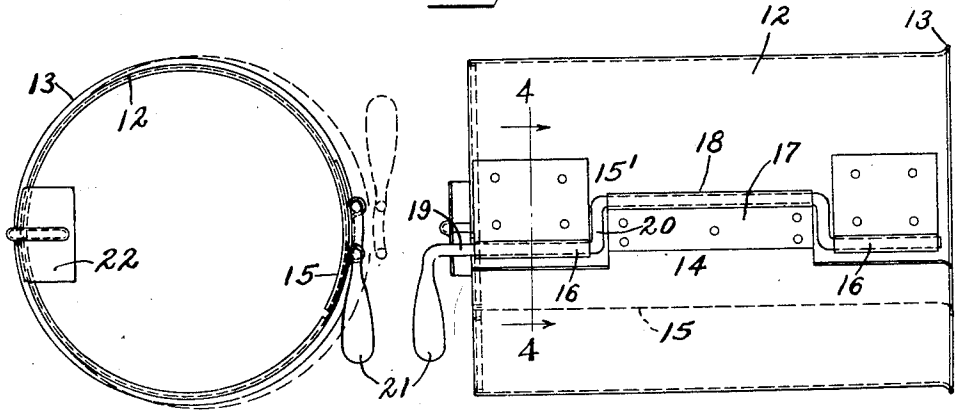


Fig. 3

Fig. 2

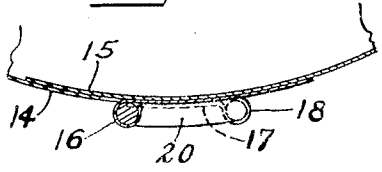


Fig. 4

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MEANS FOR DEFROSTING REFRIGERATING UNITS

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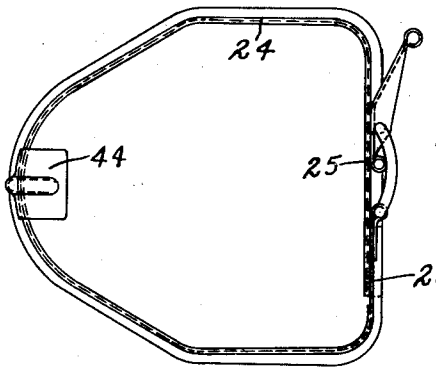


Fig. 6

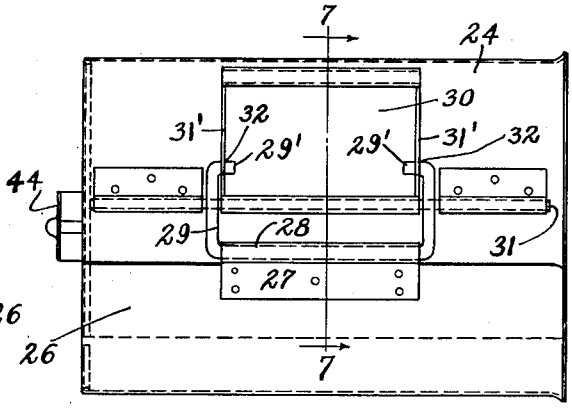


Fig. 5

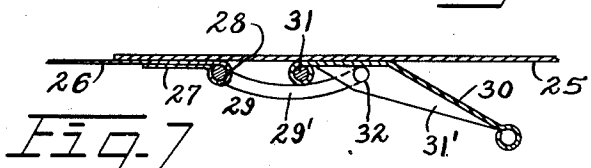


Fig. 7

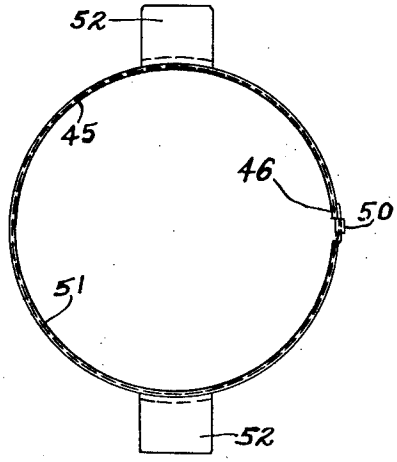


Fig. 8

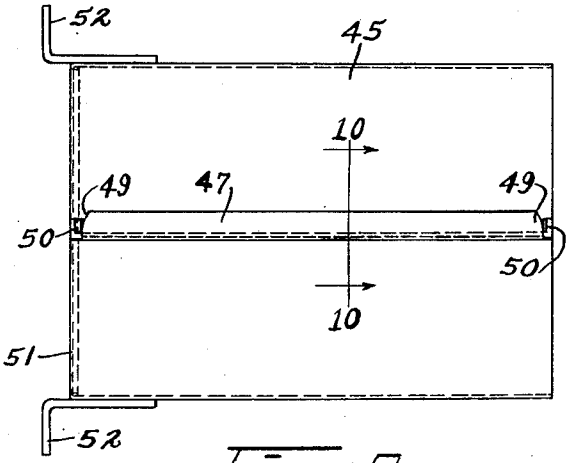


Fig. 9

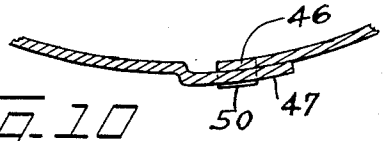


Fig. 10

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UNITED STATES PATENT OFFICE

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MEANS FOR DEFROSTING REFRIGERATING UNITS

Nathan F. Fretter, Cleveland Heights, Ohio

Application February 2, 1933, Serial No. 654,787

10 Claims. (Cl. 62—126)

This invention relates to refrigerating apparatus and more particularly to a novel means for defrosting the evaporator or refrigerating unit thereof.

My defrosting means is particularly, though not exclusively, intended to be used in connection with mechanically refrigerated apparatus or systems. The exemplified application of my invention consists of a refrigerator casing or cabinet wherein is provided a refrigerating unit which may include a series of trays removably placed therein.

One object of this invention is to provide improved means, that are relatively simple, durable and inexpensive in construction, for defrosting the refrigerating unit.

Another object is to provide an improved refrigerating unit defrosting means which can be operated quickly and without stopping the operation of the unit, thereby saving time and continuously maintaining a low temperature in the refrigerator.

Another object of the invention is to provide a removable shield for and in contact with the refrigerating unit and providing a surface on which frost may accumulate, so that upon its removal, defrosting is readily effected without affecting the temperature of the areas or chambers in the refrigerator and/or stopping operation of the refrigerating unit.

Another object is to provide an improved defrosting means adapted to guard or protect the front wall of the unit and trays, so that water resulting from the melting of frost on the upper portion of the unit, cannot, in flowing downwardly, contact with the front wall and trays and become frozen thereon and thus prevent ready operation of the latter.

Further objects and advantages of the present invention will be apparent from the following description, references being had to the accompanying drawings, wherein three different forms of the invention are presented herein for the purpose of exemplification, but it will of course be understood that the invention is susceptible of other embodiments within the scope of the claims.

In the accompanying drawings;

Fig. 1 is a fragmentary sectional view through a portion of a refrigerator showing therein a refrigerating unit and a defrosting means embodying my invention, parts being broken away.

Fig. 2 is a bottom view on the line 2—2 of Fig. 1.

Fig. 3 is an end elevation of Fig. 2.

Fig. 4 is a fragmentary section on the line 4—4 of Fig. 2.

Figs. 5, 6 and 7 are views corresponding to Figs. 2, 3 and 4 respectively, showing another form of the invention; and Figs. 8, 9 and 10 are views corresponding to Figs. 2, 3 and 4 respectively, showing still another form of the invention.

In the drawings, a portion of a refrigerator is shown. 1 denotes generally the rear wall, 2 the top wall and 3 a portion of the front wall of the refrigerator, these walls being constructed in a manner well known in the art to minimize heat transfer. The front wall is provided with a door 4 providing access to the space 5 within the refrigerator and the refrigerating unit 6. 7 indicates ice trays of the ordinary construction and slidable outwardly and inwardly, the handles 8 serving as the operating means therefor.

The refrigerating unit, as shown, is secured to the rear wall 1 in any suitable way and comprises a series of conduits mounted in a casing 9 having a front wall 10, which is formed with openings for the trays 7. The wall 1 has a suitable opening 11, for the refrigerant supply and discharge conduits to pass through.

Tightly surrounding the refrigerating unit casing 9 and in intimate thermal contact therewith throughout its outer surface is a metallic shield or shell 12, preferably constructed of any suitable heat conducting material. The object of having the shell 12 fit tightly around the refrigerating unit casing 9 is not only to have an intimate thermal contact with the latter, but also to prevent the entrance of moisture (free moisture or vapor) between the shell 12 and the refrigerating unit casing 9. In this arrangement the shield or shell 12 serves to entirely enclose the unit (except its front wall), so that vapor and free moisture circulating within the refrigerator will, when precipitated as frost, snow or ice, accumulate on the shield or shell, which being readily removable, permits the defrosting operation to be effectively and quickly carried out. For example, when removed, the shield may be thrust into a body of water or another shield may be substituted. The rear circumferential edge is flared or curved outwardly at 13 to facilitate the positioning of the shell on the refrigerating unit casing 9.

The shell 12 removably fits the casing 9 and when positioned as shown in Fig. 1, its rear flared end 13 is in close, detachable engagement with the wall 1 or a pad 25 forming the back for the unit 6.

The front end of the shell 12 extends beyond the front end of the refrigerating unit casing 9 to form a guard for such end to prevent any water from running down the front wall of the casing 9 and forming ice on or around the ice trays 7, so that the latter may be easily operated at all times.

The front end portion of the shell 12 is preferably beaded over, for example inwardly, to form a re-inforcement for the shell, and to avoid a rough or sharp edge, which might cause damage when handled, as well as to improve the appearance of the shell. The shell is formed from a section of sheet metal and rolled into substantially cylindrical form, the metal section in the direction of its circumference being of such length that the opposite longitudinal marginal portions preferably overlap from end to end, as shown at 14, 15, so that no portion of the casing 9 is exposed and danger of moisture entering between the casing and shell is eliminated. The overlapping portions 14, 15, are preferably connected together by a means, indicated as an entirety at 15', which, when operated in one direction, serve to tighten the shell around the casing 9 and when operated in the opposite direction, serve to open or flex the shell outwardly, substantially radially (see dotted lines in Fig. 3), so that it may be readily positioned and removed. The connecting means 15' preferably comprises a pair of aligned, spaced bearings 16, 16, fixed to the shell 15 beyond the marginal portion 14 when the shell is in position, a tongue 17 disposed between the bearings 16 and extending from the marginal portion 14 and provided at its free end with bearings 18 extending parallel to the bearings 16, 16, and an operating member 19. The end portions of the operating member 19 are rotatably mounted in the bearings 16, 16, whereas its intermediate portion is offset to form a crank 20, which extends through and rotatively fits the bearing 18. The outer end of the member 19 is preferably bent laterally to form a handle 21. The crank 20 is arranged to move the marginal portions 14, 15, one relative to the other, so as to clamp the shell in position, as shown in full lines in Fig. 3, or to expand the shell, as shown in dotted lines in Fig. 3. To clamp the shell around the casing 9, the crank 20 is swung toward the shell wall, thus providing a toggle joint effect by producing a gradual increasing pressure on the shell around the refrigerating unit casing 9 until the crank 20 reaches its dead center, where the pressure is the greatest and by further movement of the crank 20 it passes dead center and rests against the outside of the shell with the pressure built up in the shell pulling on it, thereby locking the crank in operated position. Operation of the crank 20 in the opposite direction will expand the shell 12, as already set forth. A handle 22 is preferably secured to the front end of the shell 9 in diametrical relation to the member 19. The handle 22 preferably consists of an L shaped metal section, one leg 23 being securely welded to the shell adjacent its front end and the other leg being spaced a short distance from such end and depending downwardly forming the handle. This handle, in co-operation with the handle 21, forms a suitable means for readily removing and replacing the shell on the refrigerating unit.

When the owner or operator of the refrigerator notices the frost on the shield 12 is dense enough to require defrosting, the handle 21 is turned in a clockwise direction (as viewed in Fig. 3) which expands the shell relative to the refrigerator unit casing 9, then with the other hand gripping the handle 22 and pulling on both handles in a forward direction the shell is readily removed. The frost can then be quickly removed from the shell and the latter replaced on the refrigerating unit. In such replacement the handle 21 is turned in a counter clockwise direction which tightens the shell on the refrigerating unit.

Due to the short time required to effect defrosting, the unit may be retained in operation and the refrigerator left closed, so that removal of food from the refrigerator and raising of the temperature therein is avoided.

The shell shown in Figs. 5, 6 and 7 differs from the shell shown in Figs. 1, 2 and 3 in that it has a different shape in cross section and a modified form of a clamping mechanism. In these views, 24 indicates the shell having overlapping ends 25, 26, the outer one being provided with a tongue 27 projecting from its center. The free end of the tongue is bent back on itself and shaped to form a bearing 28 for the pivot of a link 29. The link 29 comprises a rod having its central portion extending through and rotatably fitting the bearing 28 and its ends bent laterally, to form arms, as shown at 29', and engaging a lever 30. The lever 30 is mounted at its inner end on a shaft 31 which is suitably supported at its opposite ends on the shell beyond the marginal portion 26. The lever 30 is provided with flanged ends 31' in which are formed aligned openings 32. The ends of the arms 29' are bent inwardly and extend into the openings 32 to pivotally connect the link 29 to the lever 30. As this connection is spaced from the pivot 31 for the lever 30, the operation of the latter in one direction will clamp the shell 24 in position and operation of the lever in the opposite direction will expand the shell, whereby it may be positioned or removed. The arms 29' are curved, as shown in Figs. 6 and 7 and the openings 32 are arranged so that when the lever 30 is in clamping position the axes of the pivots for the link and lever are in a substantially common plane.

The shell 45 shown in Figs. 8, 9 and 10 differs principally from the previous forms in that it has no clamping mechanism other than the spring of the metal in the shell tending to bring the edges together, to make the shell snugly fit on the refrigerating unit.

The end portions of the shell 45 overlap as shown at 46, 47. The latter portion is off-set and its ends are beveled, as shown at 49, to engage lugs 50 extending outwardly from the marginal end 46. The shell has at its front edge a bead 51 and is provided with handles 52 welded or otherwise suitably secured.

The handles 52 are preferably located diametrically opposite to each other and approximately 90° from the overlaps of the shell ends, the handles thus located serve the purpose of springing or expanding the opposite portions of the shell one relative to the other to permit assembly or removal of the shell.

To those skilled in the art to which my invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. My disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

What I claim is:

1. Means for defrosting the unit of a refrig-

erating apparatus, comprising a frost collecting shield shaped in cross section to removably fit the walls of the unit, said shield having separable longitudinal portions permitting the flexing of the shield walls, whereby it may be positioned on or removed from the unit.

2. Means for defrosting the unit of a refrigerating apparatus, consisting of a shield surrounding the unit and removable therefrom, and having thermal contact therewith substantially throughout the interior of said shield, said shield comprising a sheet of flexible, heat conducting material and means for flexing said sheet to permit it to be positioned on or removed from the unit.

3. Means for defrosting the unit of a refrigerating apparatus, comprising a shield surrounding the unit and removable therefrom, and having thermal contact therewith throughout the interior of said shield, said shield comprising a sheet of flexible, heat conducting material having separable longitudinal portions permitting it to be positioned on or removed from the unit, said shield extending from end to end of the unit and beyond the exposed end thereof.

4. In a defrosting means for the refrigerating unit of a refrigerator wherein the unit is supported at one end on one wall of the refrigerator and is provided at its opposite end with an opening to receive a receptacle, a shield open at its opposite ends and removably surrounding the unit in thermal contact therewith and engaging the supporting wall therefor at its inner end, the outer end of the shield extending beyond the opposite end of the unit and the receptacle provided therein.

5. In a defrosting means for the refrigerating unit of a refrigerator wherein the unit is supported at one end on the wall of the refrigerator, a shield removably surrounding the unit in thermal contact therewith and engaging the supporting wall therefor at one end, the opposite end of the shield extending beyond the exposed end of the unit and means for relatively moving the end portions of the shield to clamp it in engagement with the unit.

6. Means for defrosting the unit of a refrigerating apparatus, comprising a sheet metal shield open at its opposite ends and shaped in cross section to surround a unit and engage walls thereof; said shield having longitudinal marginal portions throughout its length arranged to be related when the shield is in position upon the unit and separable to permit expansion of the shield circumferentially to permit its removal from the unit.

7. Means for defrosting the unit of a refrigerating apparatus, comprising a sheet metal shield open at its opposite ends and formed of resilient material and shaped in cross section to normally engage the unit when in position, said shield having longitudinal marginal portions throughout its length arranged to be related when the shield is in position upon the unit and separable to permit expansion of the shield circumferentially to permit its removal from the unit.

8. Means for defrosting the unit of a refrigerating apparatus, comprising a hollow sheet metal casing open at its opposite ends and adapted to be removably positioned in enclosing relation and in thermal contact with the walls of a unit, said casing having longitudinal separable marginal portions, and releasable means for clamping said marginal portions together.

9. Means for defrosting the unit of a refrigerating apparatus, comprising a hollow sheet metal casing open at its opposite ends and adapted to be removably positioned in enclosing relation and in thermal contact with the walls of a unit, said casing having longitudinal separable marginal portions, and means between said marginal portions for effecting relative movement thereof to secure the casing in position on the unit or to remove it therefrom.

10. Means for defrosting the unit of a refrigerating apparatus, comprising a hollow sheet metal casing open at its opposite ends and adapted to be removably positioned in enclosing relation and in thermal contact with the walls of a unit, said casing having longitudinal separable marginal portions, and means between said marginal portions for effecting relative movement thereof to secure the casing in position on the unit or to remove it therefrom, said means comprising a crank fulcrumed on one marginal portion and pivotally connected to the other marginal portion.

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