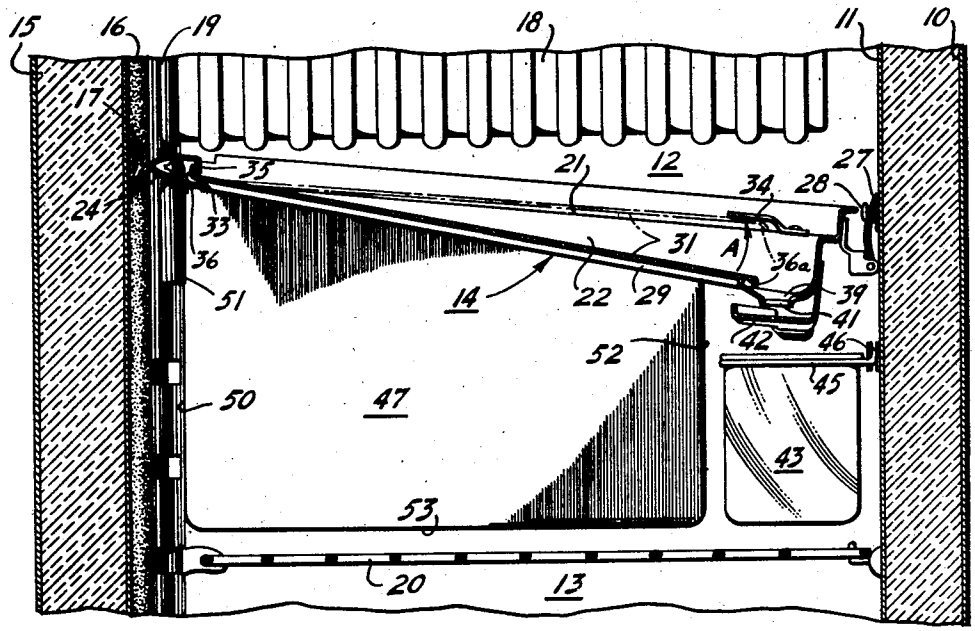
Sept. 28, 1948. M. G. SHOEMAKER 2,450,305

PARTITION FOR REFRIGERATORS

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FIG. 1.



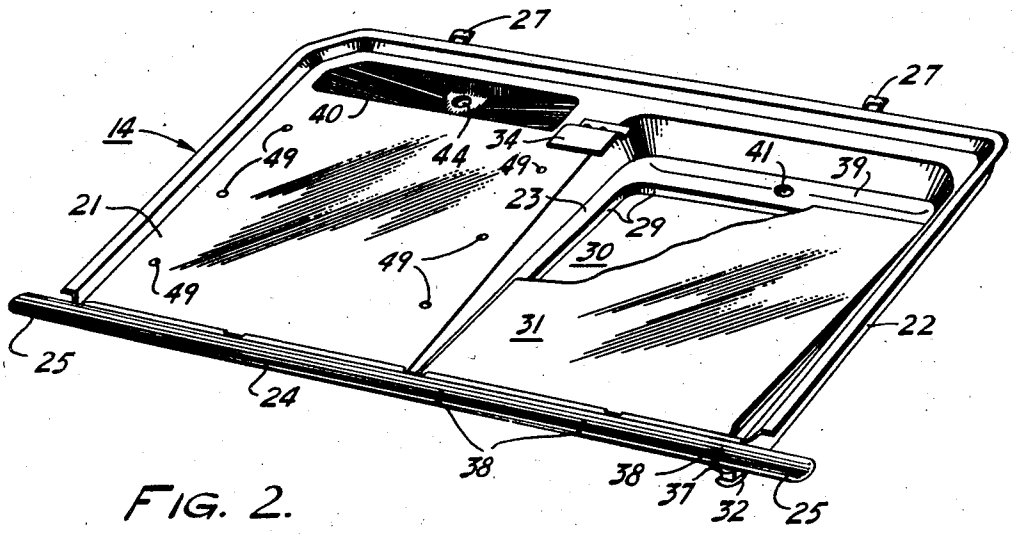


FIG. 2.

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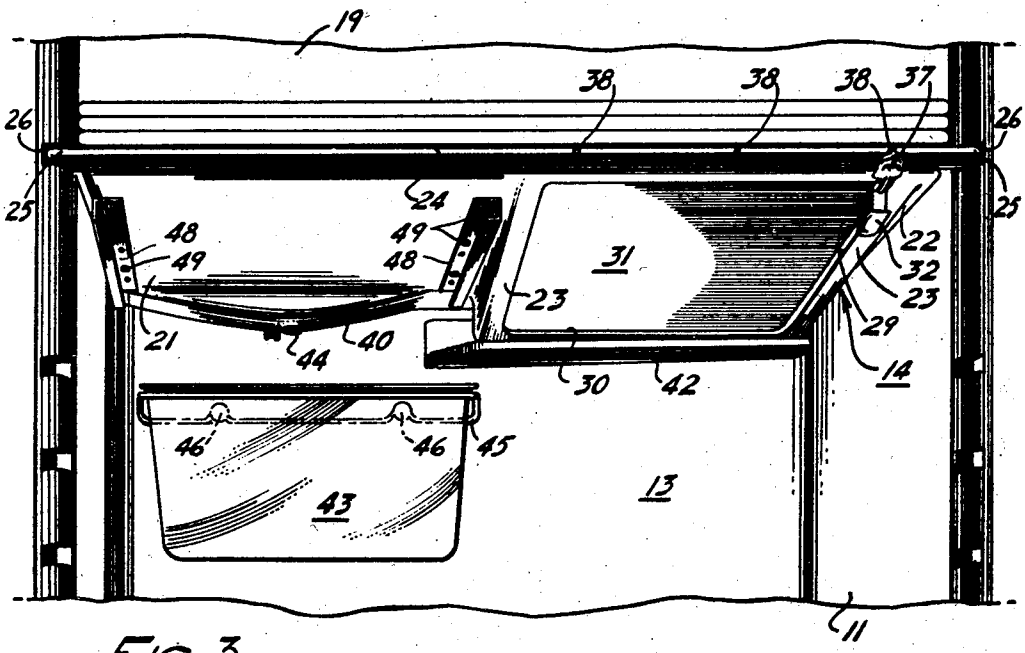


FIG. 3.

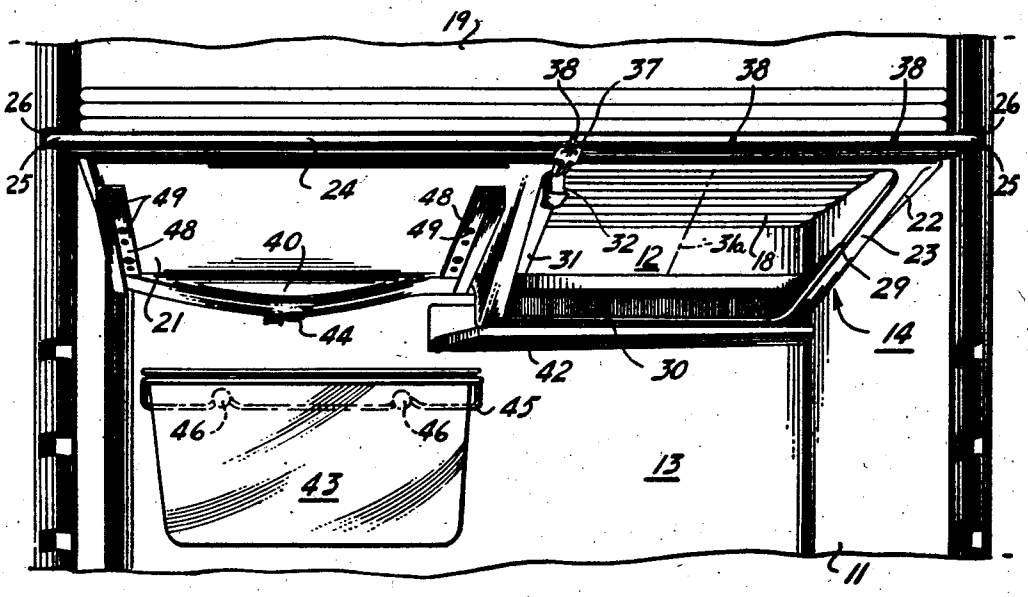


FIG. 4.

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2,450,305

PARTITION FOR REFRIGERATORS

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Application February 5, 1948, Serial No. 6,477

9 Claims. (Cl. 62—103)

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The present invention relates to refrigerators and, particularly, to the construction of a household refrigerator of the type in which a partition is provided to separate the interior of the refrigerator cabinet into two compartments, one compartment enclosing an evaporator, and the other compartment providing a refrigerated space for the storage of foodstuffs. More specifically, the invention has to do with improvements in the structure of the partition and in its association with and its function within the cabinet.

In the construction of a household refrigerator of the above mentioned variety, the evaporator is customarily mounted in the upper portion of the cabinet interior, and the partition is usually designed and arranged to extend horizontally across said interior and, normally, serves to isolate the evaporator from the food storage compartment. Attempts have been made to maintain proper temperature-humidity relationship within the food storage compartment so as to prevent objectionable condensation of moisture upon the walls of said compartment, and to avoid dehydration of foods stored therein.

It is a well known fact that the temperature-humidity relationship within the food storage compartment is effected by prevailing seasonal weather conditions. For that reason, it has been proposed to provide the partition with vent means which is adapted to establish communication between said storage compartment and the cold evaporator compartment when hot humid weather tends to raise the temperature and the humidity content of the air within the food storage compartment. In this manner, the warm moisture laden air from the food storage compartment is permitted to circulate through the cold evaporator compartment, so that this warm moisture laden air co-mingles with the cold air within said evaporator compartment and flows past the evaporator. As a result, the air is cooled and some of its moisture is absorbed and frozen out (by the cooling effect of the evaporator) and accumulates in the form of ice or frost upon the evaporator surfaces. Also, it has been proposed to provide the partition with means effective to close the mentioned vent means and, thus, to prevent communication between the two compartments, when cool dry weather tends to create a condition in which the temperature-humidity relationship within the food storage compartment is apt to reach such low values that dehydration of foods would result if the already lowered moisture content of the air within the storage compartment were allowed to be absorbed and frozen

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out. However, it has been found that partitions of known construction lack the ability to control the communication and to regulate the flow of air between the compartments, with that required nicety which is necessary to insure the desired results throughout the various seasons of the year.

It is, therefore, the primary object of this invention to overcome the difficulties and objections to which arrangements of the kind here contemplated have been heretofore subjected. To that end, the invention provides a partition arrangement in which the parts cooperate in a novel manner, either to effect substantial isolation between the compartments or to provide for controlled communication and regulated circulation of air between the compartments, so as to obtain and to maintain the most favorable condition within the food storage compartment, regardless of the effect which prevailing seasonal weather may have on such a condition.

Another object of the invention is to provide arrangement which makes it possible to expose more or less evaporator surface for direct heat exchange with the air in the food storage compartment, so that the temperature and humidity of said air may be adequately brought to and efficaciously held at the proper values during various seasons of the year. For that purpose, the invention provides a partition which is so constructed and arranged that a part thereof is capable of being adjusted in various positions to provide a greater or smaller unobstructed passageway between the food storage compartment and the evaporator compartment, and directly below the evaporator.

Still another and more specific object of the invention resides in the provision of a partition of the above mentioned character which is adapted to assist, during defrosting cycles, in the disposal of water resulting from the melting of ice or frost accumulated on the evaporator. This particular object is accomplished by providing the partition with portions constructed and arranged for the reception and drainage of the defrost water.

These and other objects, and the manner in which they are obtained, will be more fully understood from the following description based on the accompanying drawings which illustrate a preferred embodiment, and in which:

Figure 1 is a vertical sectional view of a portion of a refrigerator cabinet in which a partition constructed in accordance with the invention is installed, the partition being shown in section;

Figure 2 is a perspective view of the partition

With a portion broken away to illustrate certain constructional features;

Figure 3 is a fragmentary view, in perspective, looking into the refrigerator cabinet toward the underside of the partition, the latter being adjusted in position to seal the communication between the compartments; and

Figure 4 is a view similar to Figure 3, but shows the partition adjusted in a position to establish communication between the compartments.

Referring more particularly to the drawings, the refrigerator, as seen in Figure 1, comprises a cabinet construction having an outer shell 10 and an inner shell or liner 11 which is spaced from the outer shell and is insulated therefrom in the usual well known manner. The inner liner defines a space which is divided into an upper compartment 12 and a lower compartment 13 by means of a partition indicated, generally, at 14. The open front of the cabinet is provided with a door 15 of conventional construction and having the usual resilient gasket 16 which is adapted to effect a seal about said open front when the door is closed. The door further has a horizontal gasket portion 17 which is disposed at the level of partition 14 and is arranged to engage the forward edge of said partition and to effect a seal along said edge when the door is closed.

The upper compartment 12 encloses an evaporator 18 which, in practice, is of the so-called flat U-shaped type and occupies substantially the entire length, width and depth of said upper compartment. The evaporator 18 is conveniently provided with the ordinary closure 19 which seals the open front side of said evaporator. It is, of course, to be understood that the evaporator forms a part of the usual refrigerator system (not shown) and is in series with the customary condensing unit included in such system. In operation, the evaporator is maintained at a temperature range well below freezing, and the inside of the evaporator provides a chamber into which ice trays may be placed, and frozen foods may be stored. It will be understood that the evaporator may take other forms than that above described. For example, evaporator coils may be arranged in any suitable known manner, for heat exchange with compartment 12.

In the arrangement shown, the lower compartment 13 is adapted to be cooled, at a temperature range above freezing, by convection currents of air set up by the cooling effect of the evaporator in upper compartment 12. For that purpose, the partition 14 is constructed of material having good heat conductive capacity and is arranged below and adjacent the bottom surface of the evaporator to be directly subjected to its cooling effect. In this manner, adequate cooling of the lower compartment is effected by conduction of heat, through the partition, to air within the upper compartment in which the evaporator serves to extract the conducted heat. It will be understood that the lower compartment may also be cooled by any known convenient form of refrigerating means, for instance, by means of a suitable secondary system associated, in the customary manner, with said lower compartment. Ordinary wire shelves, similar the one indicated at 20 in Figure 1, are conveniently arranged within the lower compartment to accommodate the storage of foodstuff therein.

As hereinbefore indicated, it is desirable at times, particularly during periods of hot humid weather, to establish communication and to regulate the flow of air between the two compartments so as to control the temperature-humidity relationship within the lower compartment. Consequently, the improved partition is adapted to provide for this desirable feature in the manner to be presently described.

In accordance with the invention and as more clearly seen in Figure 2, the partition 14 takes the form of a shallow substantially rectangular tray having a generally flat substantially imperforate section 21 and a dished open-top section 22. Each section occupies approximately half of the partition, the imperforate section 21 occupying the left half, and the dished section 22 occupying the right half of the partition, as viewed in Figures 2, 3 and 4.

The dished section 22 is such that its bottom wall 23 slants downwardly toward the back of said partition. The front of the partition is provided with a trim member 24 which extends slightly beyond the sides of the partition to provide end projections 25. These end projections are adapted for engagement with suitable side recesses 26 (see Figures 3 and 4) at the open front of the cabinet, and cooperate with said recesses to anchor the front of the partition. Hanger straps 27 are conveniently attached to the rear of the partition for engagement with suitable hooks, such as the one shown at 28 in Figure 1, to support the rear of the partition on the rear wall of the cabinet. It is to be noted that the relative arrangement of end projections 25, recesses 26, hanger straps 27 and hooks 28 is such that the partition is suspended within the cabinet in a rearwardly slanting position for the purpose to be hereinafter stated.

The bottom wall of the dished section 22 is constructed to provide a reentrant portion 29 defining an opening 30 which occupies the major part of said bottom portion. A substantially flat metallic baffle plate 31 is freely received in the dished section 23 and rests on the reentrant portion 29. In this manner, the plate 31 normally serves to cover the opening 30 (see Figure 3) but is capable of being moved and selectively adjusted to uncover said opening either partially or fully (see Figure 4).

In order to facilitate movement and adjustment of plate 31, a handle 32 is conveniently attached to the underside of said plate. In the arrangement shown and as more clearly appears in Figures 2, 3 and 4, the handle 32 is disposed at the extreme right-hand front corner of the plate so that by manually imparting a rearward rotational movement to the handle, the plate is caused to rotate upwardly about pivot point 33 (Figure 1) which pivot point is provided by the front section of reentrant portion 29. Thus, as indicated by arrow A in Figure 1, the plate is moved to a raised position above imperforate section 21, as is indicated in broken lines in said Figure 1. Plate 31 is then free to slide over said section 21 in response to manual movement of the handle to the left from the position shown in Figure 3, and to uncover the opening 30, as is shown in Figure 4. Upward movement of the plate to its raised position is limited by means of an abutment 34 conveniently provided at the rear portion of the partition and disposed to overlap the plate 31 without interfering with the free sliding movement of said plate over section 21. The plate is guided in its sliding movement by means of said abutment and, also, by means of an overhanging rail 35 (Figure 1) with which an upturned flange 36, at the front of plate 31, is in sliding engagement. A depending flange 36a

disposed along the rear marginal portion of plate 31, serves to provide an edge surface adapted to glide along section 21 and to lift the body of plate 31 off said section, thereby easing the sliding motion of said plate. A pointer 37 which is suitably fixed to the plate adjacent handle 32, cooperates with appropriate markings 38 on the front trim member 24 of the partition, to provide for ready indication of the position of said plate in the covering or the uncovering of opening 30.

With particular reference to Figure 4, it is important to note that the association and cooperative relation of partition 14 with evaporator 18, and of plate 31 with opening 30, make it possible to provide, between compartments 12 and 13, a passageway the size of which can be increased or decreased to expose more or less evaporator surface to compartment 13. In this manner, a greater or lesser portion of the evaporator is placed in direct heat exchange relationship with the air from within said compartment, so that the cooling of and moisture removal from said air is, in effect, accurately controlled, it being understood that the cooling and, consequently the removal of moisture, will take place at a slower rate when the plate is adjusted in an intermediate position as shown, for instance, at 31*a*, than when the plate is adjusted in position to uncover the opening to its full extent.

As previously mentioned, the partition, during defrosting, is adapted to assist in the removal of water resulting from the melting of ice or frost from the evaporator 18. For that purpose, the partition is provided with sumps 39 and 40. As shown, the sump 39 is disposed at the rear portion of section 22 and has an aperture 41 for discharging the water in a gutterlike member 42 which, as illustrated in Figures 1, 3 and 4, depends from the partition and drains into a suitable receptacle 43. The other sump 40 is disposed at the rear portion of section 21 and has an opening 44 through which water is discharged directly into receptacle 43. The mounting of the partition in a slanting position provides for the natural drainage of the water into the sumps and, thence into the receptacle 43. The water receptacle is advantageously supported in a fixed predetermined position on the back wall of inner liner 11, for instance, by means of a rack 45 hanging on supporting pins 46 which are conveniently secured to said back wall. It will be understood that, during a defrosting cycle, the plate 31 is adjusted to close opening 30 so as to prevent defrost water from dripping into the food storage compartment.

Moreover, the partition is adapted to support a food container, such as a meat pan, indicated at 47 in Figure 1. For that purpose, channel members 48 (Figures 3 and 4) are suitably attached to the underside of section 21, for instance, by means of securing elements, such as rivets 49. These channel members slidably receive lateral flanges (not shown) which are customarily provided along the open top of the pan. It is to be noted that the front portion 50 of the pan, which portion is provided with a handle 51, is of greater height than the rear portion 52 of said pan. Because of this construction, the bottom 53 of the pan lies in a horizontal plane although the pan-supporting channel members lie in a plane paralleling the slanting plane of the partition.

By using a partition constructed in accordance with the invention, it will be appreciated that during periods of cool dry weather, or whenever it becomes desirable to prevent freezing out of the moisture within the food storage compartment, the cooling and attendant dehydrating effect of the evaporator is advantageously reduced to a minimum by adjusting the baffle plate in position to isolate the evaporator from the food storage compartment. During periods of hot humid weather, or whenever a condition of excessive humidity is apt to develop within the food storage compartment, additional cooling and consequent increase in the air dehydration is readily obtained by adjusting the baffle plate to expose a portion of the evaporator to the food storage compartment, so as to establish direct heat exchange between said portion of the evaporator and the air within the food storage compartment. Moreover, the construction is such that a greater or a smaller portion of evaporator surface can be advantageously exposed to the food storage compartment, by adjusting the baffle plate to that intermediate position which is most suitable to maintain the proper temperature-humidity relationship within said storage compartment. Also, it will be appreciated that the use of a partition constructed in accordance with the invention has many advantages which result from the fact that said partition serves for various purposes, such as controlling the communication and regulating the flow of air between compartments, assisting in the disposal of defrost water, and supporting food containers, such as a meat pan.

I claim:

1. For refrigerators, a partition having two side-by-side sections, one section having a substantially imperforate portion and the other section having an open portion, a member mounted on the partition for movement relatively to each section and for adjustment into position to cover said open portion and in position to overlap said imperforate portion and to uncover said open portion, and sump means to one side of each of said portions to provide for the reception and drainage of defrost water.

2. In a partition for refrigerators, a tray-like body having a substantially imperforate section and a dished section, said dished section having a bottom wall provided with an opening, and a member received within said dished portion to cover said opening, said member being movable out of the dished section and in overlapping relation with the imperforate section to uncover said opening.

3. In a partition for refrigerators, a tray-like body having a substantially imperforate section and a dished section, said dished section having a bottom wall provided with an opening occupying the major part of said bottom wall, and a plate received within said dished portion to cover said opening, said plate being movable out of the dished section and in overlapping relation with the imperforate section to uncover said opening.

4. In a partition for refrigerators, a tray-like body having a substantially imperforate section and a dished section, said dished section having a bottom wall provided with a reentrant portion defining an opening, and a plate received within said dished section to rest upon said reentrant portion to cover said opening, said plate being movable out of the dished section and in overlapping relation with the imperforate section to uncover said opening.

5. In a partition for refrigerators, a tray-like body having a substantially imperforate section and a dished section, said dished section having a bottom wall provided with an opening, a plate

received within said dished section to cover said opening, said plate being movable out of the dished section and in overlapping relation with the imperforate section to uncover said opening, and a handle on said plate to move the same.

6. In a refrigerator, a cabinet, an evaporator in the upper portion of the cabinet, a partition supported in the cabinet below and adjacent the evaporator and cooperating with inner walls of the cabinet to define a storage compartment in the lower portion of the cabinet, said partition having a substantially imperforate section and a dished section, said dished section having a bottom wall provided with an opening to expose a surface of the evaporator to said compartment, and a baffle plate received within said dished portion to cover said opening, said plate being movable out of the dished section for placement in selectively adjusted position in overlapping relation with respect to said sections to uncover said opening to greater or lesser extent to expose more or less evaporator surface to said compartment.

7. In a refrigerator, a cabinet, an evaporator in the upper portion of the cabinet, a partition supported in the cabinet below and adjacent the evaporator and cooperating with inner walls of the cabinet to define a food storage compartment in the lower portion of said cabinet, said partition having a substantially imperforate section and a dished section, said dished section having a bottom wall provided with a reentrant portion defining an opening occupying the major part of said bottom wall to expose a substantial surface of the evaporator to said compartment, and a baffle plate received within said dished portion to rest on said reentrant portion and to cover said opening, said plate being movable out of the dished section for placement in selectively adjusted position in overlapping relation with respect to said sections to uncover said opening to greater or lesser extent to expose more or less evaporator surface to said compartment.

8. In a refrigerator, a cabinet, cooling means in said cabinet, a partition supported in the cabinet adjacent said cooling means and cooperating with inner walls of the cabinet to define a food storage compartment, said partition having two side-by-side sections, one section being substantially imperforate and the other section having an opening through which a portion of the cooling means is exposed to said compartment, a baffle member mounted for movement in selectively adjusted position in overlapping relation with respect to said sections to increase or to decrease the size of said opening for exposing a greater or lesser portion of the cooling means to said compartment, and means in cooperative association with said plate and with an edge portion of the partition to indicate, along said edge portion, the adjusted position of the plate with respect to said opening.

9. In a refrigerator, a cabinet, cooling means in said cabinet, a partition supported in the cabinet adjacent said cooling means and cooperating with inner walls of the cabinet to define a food storage compartment, said partition having two side-by-side sections, one section being substantially imperforate and the other section having an opening therein to expose a portion of the cooling means to said compartment, a baffle member mounted for placement in selectively adjusted position in overlapping relation with respect to said sections to increase or to decrease the size of the opening for exposing a greater or lesser portion of the cooling means to said compartment, and sump means to one side of each of said portions to provide for the reception and drainage of defrost water.

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