Oct. 21, 1941. E. H. BODDY 2,259,993

REFRIGERATOR CABINET

Filed March 20, 1940 2 Sheets-Sheet 1

Fig. 1.

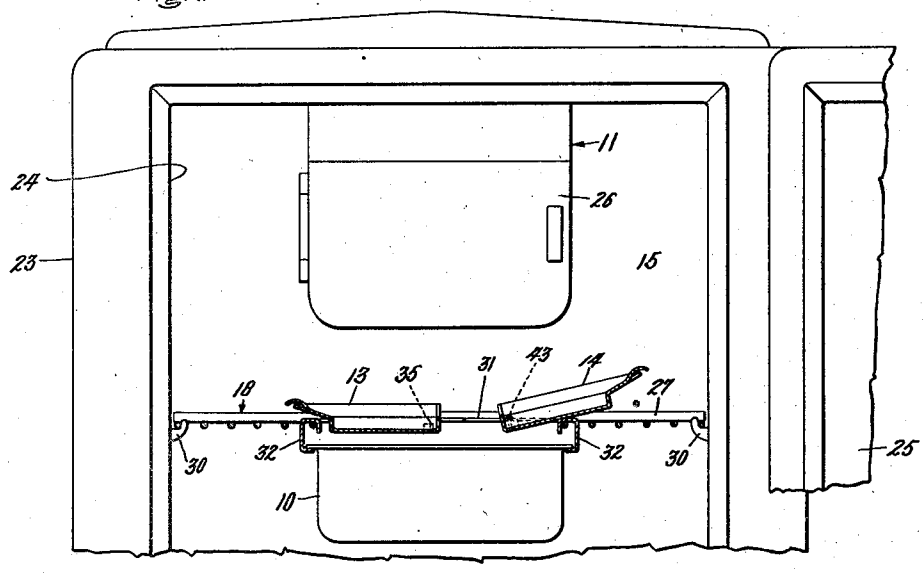
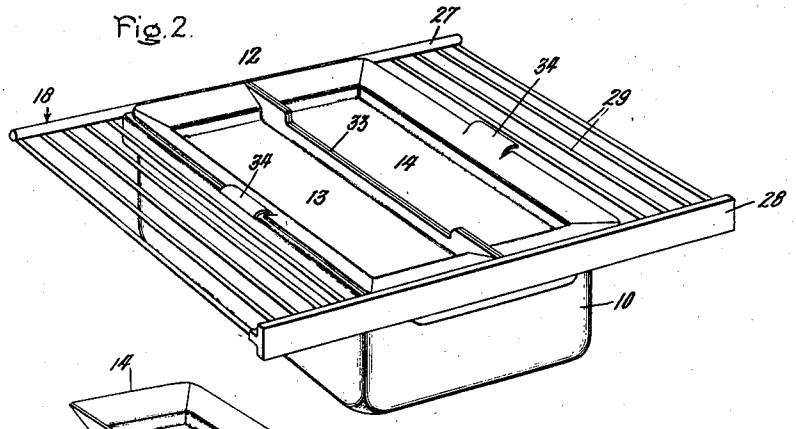


Fig. 2.



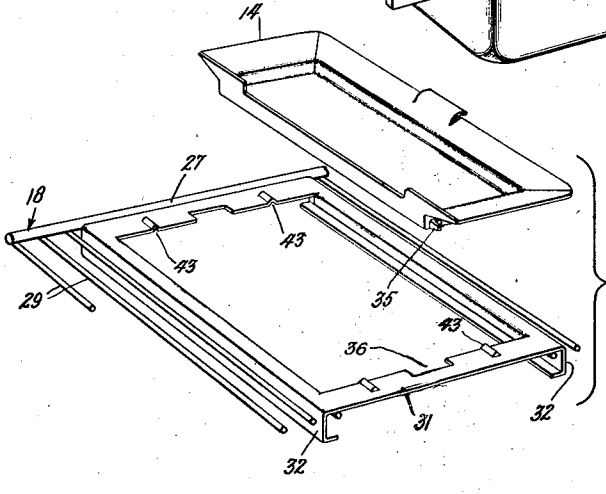


Fig. 3.

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Fig. 4.

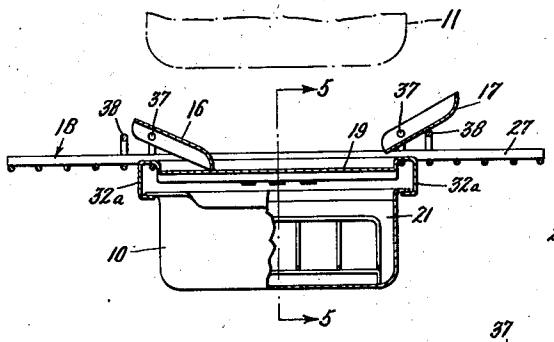


Fig. 5.

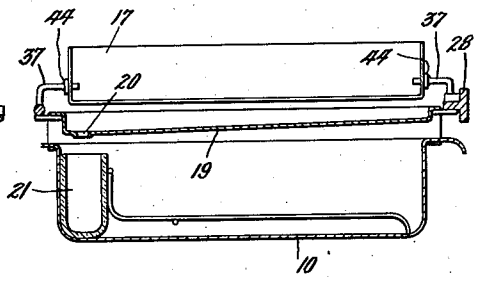


Fig. 6.

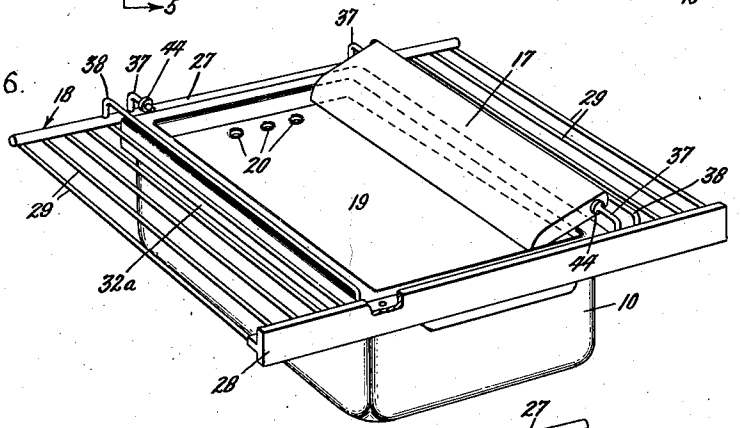


Fig. 7.

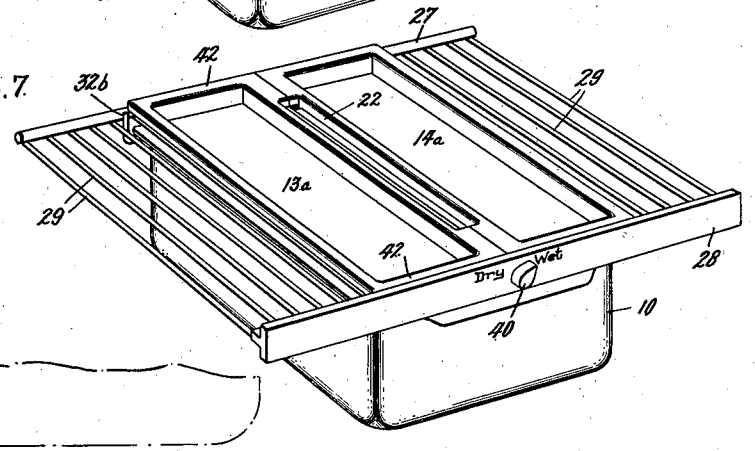
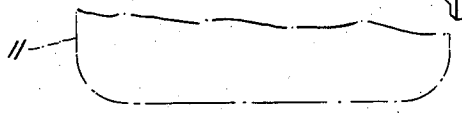
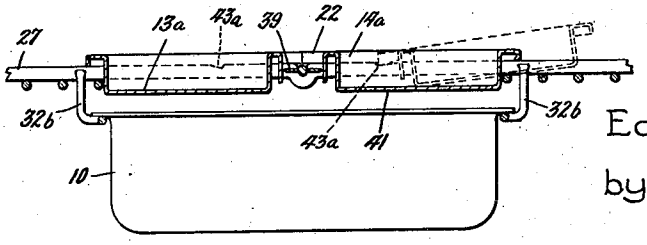


Fig. 8.





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UNITED STATES PATENT OFFICE

2,259,993

REFRIGERATOR CABINET

Edwin H. Boddy, Erie, Pa., assignor to General Electric Company, a corporation of New York

Application March 20, 1940, Serial No. 325,016

15 Claims. (Cl. 62—89)

My invention relates to refrigerator cabinets.

The air within the refrigerated compartment of a household refrigerator is usually maintained at a temperature of approximately 40° F. to 45° F. for general refrigeration purposes. This temperature is maintained by convection currents of air set up by the cooling unit of evaporator usually disposed in the upper portion of the refrigerated compartment. In the usual refrigerator, this temperature is obtained by keeping the surface of the evaporator or cooling unit considerably below freezing, as approximately 20° F., for example. When the evaporator is operated at a temperature of this order of magnitude in moist air, the evaporator becomes covered by ice and frost. It has been customary to defrost the unit when necessary as by stopping operation of the refrigerating machine until the temperature within the refrigerated compartment rises sufficiently to melt the ice and frost or by operating the evaporator on a comparatively long defrosting cycle, as between limits of approximately 19° F. and 50° F.

It is an object of my invention to provide means to assist in the disposal of water resulting from such melting and any particles of ice or frost which may drop from the cooling unit and guard against such water or ice falling on to the articles stored within the refrigerator.

Occasionally, condensation and drip will take place even during operation of the refrigerating machine, especially in some portions of the southern states at certain seasons of the year. It is another object of my invention to provide means to assist in the disposal of such drip.

It is also an object of my invention to provide a combined drip tray and defrosting guard for use with cooling units of the above described type.

Further objects and advantages of my invention will become apparent as the following description proceeds and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of my invention reference may be had to the accompanying drawings in which Fig. 1 is a front elevational partial view of a refrigerator of the household type illustrating an application of the principles of my invention; Fig. 2 is an enlarged perspective view of the combined drip trays and defrosting guards illustrated in Fig. 1; Fig. 3 is a perspective exploded view illustrating details of the arrangements illustrated in Figs. 1 and 2; Fig. 4 is a view, partly in section, of a modification of my invention; Fig. 5 is a sectional view of the modification shown in Fig. 4 taken along the line 5—5 of Fig. 4; Fig. 6 is a perspective view of the modification disclosed in Figs. 4 and 5; Fig. 7 is a perspective view of a different embodiment of the invention disclosed in Figs. 1 to 3; and Fig. 8 is a front elevational view, partly in section, of the embodiment illustrated in Fig. 7.

In accordance with the form of my invention illustrated in Figs. 1 to 3, inclusive, I have illustrated a food storage receptacle 10 disposed below an evaporator or cooling unit 11. In order to accommodate any liquid dripping from the evaporator 11 I provide a divided drip tray 12 comprising separable members 13 and 14, each of which is provided with a depressed portion for retaining any moisture dripping from the evaporator 11. In order to prevent water and ice from falling on to the articles stored within the refrigerated compartment 15, the members 13 and 14 are arranged to be moved apart into the tilted position shown for the member 14 in Fig. 1. In this position, any ice or water falling from the side of the evaporator or cooling unit 11 will be directed by the guard member upon which it falls into the interior of the food storage receptacle 10 utilized to receive the drip water and ice during the defrosting operation.

In the modification illustrated in Figs. 4 to 6, inclusive, I have shown a pair of defrosting guards 16 and 17 which are pivotally supported on a shelf 18 along opposite sides of the evaporator. These guards may be rotated into the position shown for member or guard 17 in Fig. 4 when it is desired to defrost the cooling unit 11, the guard members serving the same function during defrosting as the members 13 and 14. In order to receive any drip water during the refrigerating cycle I have provided a cover 19 for the receptacle 10, the cover sloping rearwardly to direct the drip water to openings 20 at the rear of the cover 19. The drip water may flow through the openings 20 into a suitable receptacle 21 disposed within the receptacle 10.

In Figs. 7 and 8 there is illustrated an embodiment of my invention similar to that disclosed in Figs. 1 to 3, inclusive. However, the adjacent sides of the members 13a and 14a are recessed to provide a damper controlled opening 22 when the members 13a and 14a are placed adjacent each other whereby variable ventilation may be provided for receptacle 10.

Describing my invention in greater detail, I have provided a household type refrigerator 23 having thermally insulated walls. A door open-

ing 24 in the front wall of the cabinet is closed by a door 25 suitably hinged to the cabinet 23. In order to cool the air within the food storage or refrigerated compartment 15 there is provided an evaporator or cooling unit 11 of any suitable type preferably disposed in the upper portion of the compartment 15. I have illustrated an evaporator the front of which is closed by a door 26. Below the cooling unit 11 there is disposed a shelf 18 comprising marginal side and rear frame members 27, a decorative front frame member 28 and longitudinally extending cross bars 29 forming an article supporting surface. The shelf 18 is supported below the unit 11 in any suitable manner as by means of brackets 30.

The portion of the shelf immediately below the cooling unit 11 is left open and a frame member 31 is suitably secured to the shelf in the opening. As illustrated in the drawings, the frame 31 is provided on each side thereof with a downwardly and inwardly turned flange 32, the inwardly turned portions serving as tracks or supports for a removable food and storage receptacle 10.

The two combined drip trays and defrosting guards 13 and 14 fit on the top of the frame 31 forming a cover for the storage pan and at the same time catching any condensation from the cooling unit. As previously stated, the drip tray 12 comprises a pair of similarly formed members 13 and 14. Each of the members 13 and 14 is provided with a depressed portion covering substantially the entire area thereof. The members along their adjacent edges are formed to provide a split partition 33 when placed together, as in Fig. 2. This split partition is provided in order to retain any drip water while the members are being removed for emptying and cleaning purposes. The depressions are so formed that a supporting ledge is provided along the remaining marginal edges of the members. The frame 31 is so dimensioned as to support the members 13 and 14 on three sides thereof by engaging the supporting ledge. Handles 34 are provided to enable the user to draw apart the members 13 and 14. On each end of each member or tray 13 and 14 preferably adjacent the partition 33 there is provided a prong or guide member 35 arranged to engage the underside of the front and back portions of the frame 31, this prong tilting the tray into the position shown for member 14 in Fig. 1 upon sidewise movement of the member. The frame 31 is notched as indicated by the numeral 36 in order to permit the prongs 35 to clear the frame 31 when the tray members are removed. I have provided a plurality of suitable depressions 43 on the underside of frame 31 for reception of prongs 35 in the defrosting position. These depressions serve to properly locate the tray members when defrosting is desired and also serve to retain the tray members in the defrosting position.

In the embodiment of my invention illustrated in Figs. 4 to 6 inclusive, I propose to use the same storage receptacle 10 as that illustrated in connection with Figs. 1 to 3, inclusive, but instead of having a frame 31 for supporting the receptacle 10 in the opening in the shelf 18 below the cooling unit, I have provided a cover 19 having flanges 32a serving as guides for the receptacle 10. The cover 19 is imperforate except for the plurality of openings 20 at the rear of the cover and the cover is constructed with a slight slope toward the rear in order to drain to the back of the tray any water dripping from the evaporator. A jar 21 is located in the storage pan directly below the holes in the cover. The receptacle 21 can be removed from time to time and emptied. As shown in Fig. 5, the jar or receptacle 21 is not large enough to catch all of the water from defrosting but is of sufficient volume to catch any condensation or dripping from the evaporator during the normal operating cycle of the refrigerator. During defrosting it is intended that the storage receptacle 10 will be emptied of food and the pan used to catch the defrost water. However, it is quite possible to use a receptacle 21 large enough to catch the defrost water in which case it would not be necessary to remove the food stored within the receptacle during defrosting. The wings or defrosting guards 16 and 17 are mounted above the drip tray 10 and cover 19 in any suitable manner. As illustrated in Figs. 4 to 6, inclusive, the wings 16 and 17 are pivotally supported from the shelf 18 as by means of supports 37. In order to properly position the wings 16 and 17 for directing drip water and ice into the cover 19, I have provided stop members 38 suitably secured in the proper position to the shelf 18. As best shown in Fig. 6, the support members 38 comprise longitudinally extending bars secured at either end to the frame members of the shelf.

If it is desired to vary the temperature within the storage receptacle 10, the wings may be made adjustable to a plurality of positions to regulate the circulation of air in the space between the cooling unit and the receptacle. Thus, if the wings 16 and 17 are in the position shown for the wing 16 in Fig. 4, maximum circulation will be permitted and the maximum temperature within receptacle 10 will result. If the wings 16 and 17 are placed vertically, the space between the cooling unit and the cover 19 will be substantially closed along the sides of the cooling unit and the circulation through this space will be minimized thereby increasing the transfer of heat between the storage receptacle and the cooling unit. In the arrangement shown in Figs. 4 to 6, inclusive, the wings 16 and 17 are retained in the desired positions by frictional engagement between the ends of the wings and the shoulders 44 on supports 37.

In the form of my invention shown in Figs. 7 and 8, I have provided rails or supports 32b in the form of longitudinally extending wires for slidably supporting the food storage receptacle 10, the members 32b being suitably secured at either end thereof to the frame of shelf 18. The tray members 13a and 14a fit in the opening in the shelf 18 and are supported by the rear frame member 27 and the front frame member 28 of the shelf. A humidity control or damper 39 extends longitudinally of the opening in the shelf 18 and is suitably fastened for rotative movement about its longitudinal axis. The split drip trays 13a and 14a fit on either side of the control or damper so that the damper fills the recess or opening formed in the adjacent sides of the drip trays. A control knob 40 is provided for imparting rotative movement to the damper 39 and suitable calibration marks may be provided to indicate the amount of ventilation to the user of the refrigerator. The tray members 13a and 14a are provided with depressed portions for the reception of drip water during normal operation of the unit, the bottom walls 41 of the recessed portions extending below the shelf members 29. It will be understood that when it is desired to move the tray members laterally toward the defrosting position, the tray members must be lifted

slightly to permit the bottom walls to ride on the bar 29 defining the edge of the opening in the shelf 18 thereby tilting the tray members. As long as the tray members are not moved too great a distance, the weight of the trays will cause the end flanges 42 thereof to rest on the shelf frame members 27 and 28. If desired, stop members may be provided to limit the movement of the combined tray members and defrosting guards. Depressions 43a are provided to position and retain the members in the proper positions for defrosting.

Many modifications of my invention are possible. For example, the combined drip tray and defrosting guards 13 and 14 may be supported directly on the shelf 18 according to the manner illustrated in Figs. 7 and 8, the prongs 35 engaging the undersides of the frame members 27 and 28 of the shelf. Further, the wing type defrosting guards shown in Figs. 4 to 6, inclusive, may be utilized with any type of storage pan as, for example, one having an invertible cover which may be used either as a cover or as a drip tray and may be supported directly on the receptacle, if desired.

While I have shown a particular embodiment of my invention, I do not desire my invention to be limited to the particular construction shown and described and I intend in the appended claims to cover all modifications within the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a refrigerator cabinet including a cooling unit, a shelf disposed below said unit, a receptacle supported by said shelf below said unit, and means supported by said shelf and adjustable to extend above said receptacle and beyond the sides of said unit when desired for cooperating with said unit to direct water or ice incident to the defrosting of said unit into said receptacle.

2. In a refrigerator cabinet including a cooling unit, a shelf disposed below said unit, a receptacle supported by said shelf below said unit, and means supported by said shelf and adjustable to extend above said receptacle and beyond the sides of said unit when desired for cooperating with said unit to direct water or ice incident to the defrosting of said unit into said receptacle, and also cooperating with said unit to control the circulation of air in the space between said unit and said receptacle for varying the temperature within said receptacle.

3. In a refrigerator cabinet including a cooling unit, a receptacle supported below said unit, a divided cover for said receptacle, said cover comprising a pair of members, each of said members having a depressed portion for retaining any water dripping from said unit during the normal refrigerating cycle of said unit.

4. In a refrigerator cabinet including a cooling unit, a receptacle supported below said unit, a divided cover for said receptacle, said cover comprising a pair of members, each of said members having a depressed portion for retaining any water dripping from said unit during the normal refrigerating cycle of said unit, said members being removable in order to permit emptying thereof.

5. In a refrigerator cabinet including a cooling unit and a receptacle supported below said unit, a divided cover for said receptacle, said cover comprising a pair of members, each of said members being arranged to receive and retain any water or ice dripping from said unit during the normal refrigerating cycle of said unit and also arranged to be moved into a position for cooperating with said unit to direct into said receptacle the water or ice falling from said unit during defrosting of said unit.

6. In a refrigerator cabinet including a cooling unit, a receptacle supported below said unit, a divided cover for said receptacle, said cover comprising a pair of members, and means for causing said members to tilt when moved apart whereby any water or ice dripping from said unit is directed into said receptacle.

7. In a refrigerator cabinet including a cooling unit, a receptacle supported below said unit, a divided cover for said receptacle, said cover comprising a pair of members, said members cooperating with said shelf for causing said members to tilt when moved apart in order that the water and ice dropping from said unit during defrosting thereof will be directed into said receptacle.

8. In a refrigerator cabinet including a cooling unit, a receptacle supported below said unit, a divided cover for said receptacle, said cover comprising a pair of members, each of said members having a depressed portion for retaining any water or ice falling from said unit during the normal refrigerating cycle of said unit, and means for causing said members to tilt when moved apart in order that during the defrosting cycle of said refrigerator any water and ice falling from the unit will be directed into said receptacle.

9. In a refrigerator cabinet including a cooling unit and a shelf below said cooling unit, a receptacle removably supported from said shelf, a divided cover for said receptacle, said cover comprising a pair of members, means for causing said members to tilt when moved apart, and means for locating and retaining said members in a predetermined tilted position during the defrosting cycle for directing into said receptacle any drip water or ice falling from said unit.

10. In a refrigerator cabinet including a cooling unit, a shelf below said cooling unit, means for removably supporting a receptacle from said shelf, a pair of defrosting guards carried by said supporting means, said guards and said means being so constructed and arranged as to tilt said guards as said members are moved apart.

11. In a refrigerator cabinet including a cooling unit, a shelf disposed below said unit, a frame supported by said shelf, a receptacle removably supported by said frame, a pair of members removably supported by said frame and serving as a cover for said receptacle, said frame and said members cooperating for causing said members to tilt when moved apart in order to direct ice or water incident to defrosting into the interior of said receptacle.

12. In a refrigerator cabinet including a cooling unit and a shelf below said cooling unit means for removably supporting a storage receptacle from said shelf, a pair of members carried by said means for closing the open side of said storage receptacle, each of said members having a projecting portion engaging the underside of said means, the bottom portion of each of said members engaging the edges of said means so that when said members are moved apart the members are tilted in order to direct drip water and ice from said unit into said receptacle.

13. In a refrigerator cabinet including a cooling unit and shelf disposed below said unit, a receptacle removably supported by said shelf, a pair of members serving as combined drip tray

and defrost guards supported by said shelf, said members forming a cover for said receptacle and also serving to catch any drip from said cooling unit during normal operation thereof, said members being removable for emptying and cleaning, said members also being constructed and arranged to be separated slightly for providing variable ventilation for said receptacle and separated still further to receive drip water or ice during the defrosting of said unit and direct said water or ice into said receptacle.

14. In a refrigerator cabinet including a cooling unit and shelf disposed below said unit, a receptacle removably supported by said shelf, a pair of members serving as combined drip tray and defrost guards supported by said shelf, said members forming a cover for said receptacle and also serving to catch any drip from said cooling unit during normal operation thereof, said members being removable for emptying and cleaning, said members also being constructed and arranged to be separated slightly for providing variable ventilation for said receptacle and separated still further and tilted to receive drip water or ice during the defrosting of said unit, and direct the drip water or ice into said receptacle.

15. In a refrigerator cabinet including a cooling unit, a receptacle supported below said unit, a divided cover for said receptacle, said cover comprising a pair of members, said members being so formed as to provide an opening between adjacent edges thereof, and damper means disposed in said opening for controlling ventilation of the interior of said receptacle.

EDWIN H. BODDY.