June 12, 1945. G. K. IWASHITA 2,377,941

REFRIGERATOR

Filed March 6, 1943

Fig. 1.

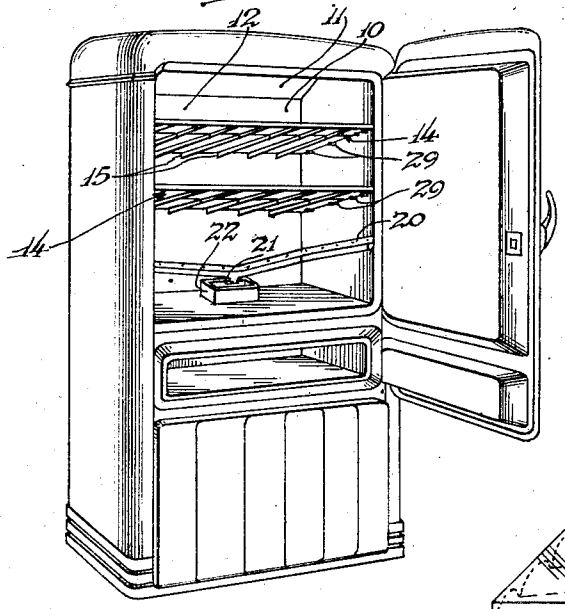


Fig. 5.

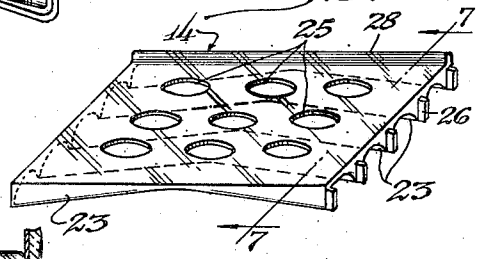


Fig. 2.

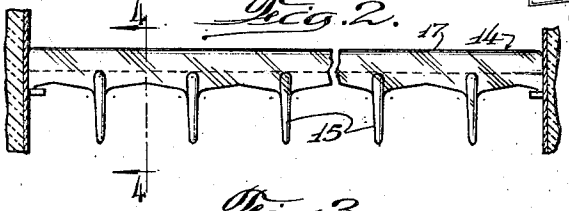


Fig. 6.

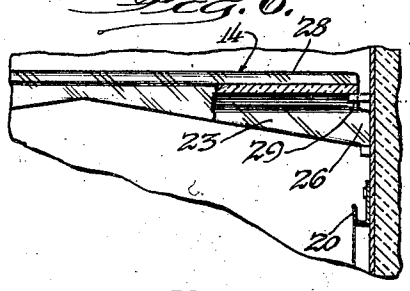


Fig. 3.

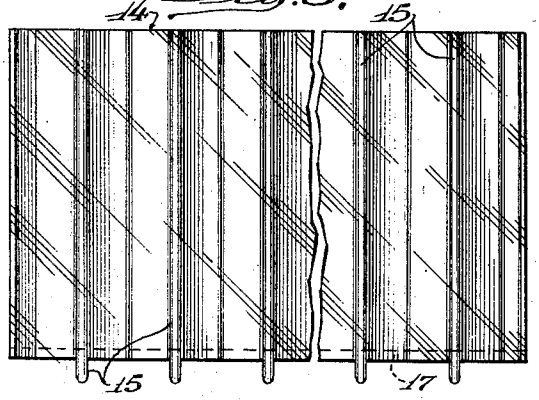


Fig. 7.

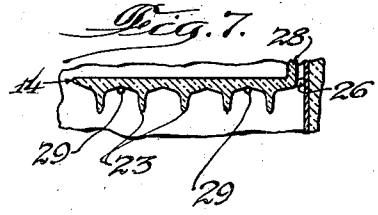
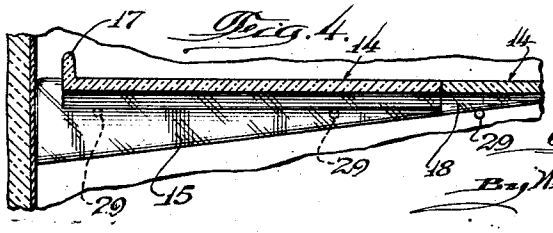


Fig. 4.



Inventor:
George K. Iwashita
By Williams, Bradbury & Hinkle
Attorneys.

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UNITED STATES PATENT OFFICE

2,377,941

REFRIGERATOR

George K. Iwashita, Indianapolis, Ind., assignor, by mesne assignments, to Admiral Corporation, Chicago, Ill., a corporation of Delaware

Application March 6, 1943, Serial No. 478,185

12 Claims. (Cl. 62—103)

My invention relates to refrigerators of the dual temperature type and more particularly to a construction for preventing the dripping of moisture from the undersides of trays or shelves in the higher temperature compartment.

In refrigerators provided with a plurality of compartments to be maintained at different temperatures, the food compartment is usually held at about 40° Fahrenheit, whereas other compartments for freezing and maintaining foods in frozen condition are usually operated at a temperature in the neighborhood of zero Fahrenheit. In accordance with my invention, the cooling coils for the higher temperature compartment are located beyond the lining of the compartment and in a chamber from which moisture is excluded by sealing. I preferably cool three of the sidewalls and the top and bottom walls of the compartment so that the temperature of the cooling surfaces will be only slightly below the temperature of the air and food in the compartment. The only uncooled surface from which radiation takes place when the compartment is closed is that of the inside of the door. Since none of the surfaces exposed to the higher temperature compartment is maintained below the freezing point, there is no collection of ice upon any of the cooled surfaces, with the result that the air circulating within the compartment continually comes into contact with moist surfaces, resulting in the continuous maintenance of a sufficient amount of moisture in the air to prevent the dehydration of stored foods.

My invention relates particularly to the formation of the undersides of the shelves in the higher temperature compartment for draining moisture which condenses on the undersides of these shelves to the sidewalls of the compartment to prevent its dripping onto food stored below the shelves. The shelves are preferably made of glass and may be sandblasted or etched on their undersides to aid in the dispersion of the moisture and the prevention of its collection in drops.

The preferred embodiment of my invention is illustrated in the accompanying drawing in which:

Fig. 1 is a perspective of a refrigerator cabinet with the door open;

Fig. 2 is a rear edge elevation of one of the glass shelves;

Fig. 3 is a bottom view of one of the shelves;

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

Fig. 5 is a perspective of a modification of my invention;

Fig. 6 is a fragmentary elevation of the modification shown in Fig. 5, and

Fig. 7 is a section taken on the line 7—7 of the embodiment shown in Fig. 5.

In accordance with the preferred embodiment of my invention the higher temperature compartment 10 has a ceiling 11 which slopes rearwardly at such an angle to the horizontal that the moisture which collects thereon drains backwardly to the rear wall 12, instead of forming into globules or drops which would eventually grow large enough to drop onto foods stored below. The compartment 10 is provided with shelves 14 preferably made of glass and provided on their undersides with depending ribs 15, the bottoms of which slope downwardly into contact with the rear wall 12. Between the ribs the under surfaces of the shelves 14 slope downwardly toward the ribs. The ribs 15 extend slightly beyond the rear edges of the shelves 14, as shown in Fig. 3, for the dual purpose of providing air circulating space between the shelves and the rear wall 12 and for eliminating the possibility of water being drained off the rear wall 12 onto the top surfaces of the trays. The trays 14 are preferably provided with turned up rear edges 17, as shown in Fig. 4, for the purpose of preventing plates and pans from contacting with the rear wall 12 in such a manner that water draining down the rear wall 12 might be transferred into the plates or pans.

If desired the shelves 14 may be made in two pieces, as shown in Fig. 4, so that the forward part of a shelf may be removed to accommodate tall articles on the shelf below. When the shelves 14 are made in two pieces, the ribs 18 on the forward piece contact with the ends of the ribs 15 on the rearward piece, so that the moisture can pass from one shelf to the other along the bottoms of the sloping ribs.

Attached to the sidewalls and back wall of the compartment 10, below the bottom shelf 14, is a gutter 20 sloping downwardly toward the rear along the sidewalls and downwardly toward an intermediate position along the back wall for the collection of moisture running down the walls of the compartment. At the low point in the gutter, a spout 21 delivers the collected moisture into a pan 22 resting on the floor of the compartment.

In accordance with the embodiment shown in Figs. 5, 6 and 7, the ribs 23 extend crosswise of the shelves and taper downwardly from a central position to the points of contact of the ribs with the sidewalls of the higher temperature compartment. The ribs 23 extend slightly beyond the edges of the shelves to make contact with the side-

walls of the compartment for the transfer of moisture from the bottoms of the ribs to the sidewalls. The shelves proper are of slightly less width than the width of the compartment to prevent the collection of moisture on top of the shelves as it runs down the sidewalls.

The shelves of the modification shown in Figs. 5, 6 and 7 are preferably provided with openings 25 for the circulation of air. They are provided with two or more projections 26 (Fig. 7) to prevent the upturned lip 28 at the back of the shelf from contacting the rear wall of the compartment. The shelves of the embodiment of Figs. 5, 6 and 7 are conveniently supported by pins 29 extending outwardly a short distance from the sidewalls and engaging the shelves between the ribs.

While I have shown and described a preferred embodiment of my invention, it will be readily understood by those skilled in the art that variations may be made in the construction disclosed without departing from the basic features of my invention. I therefore do not wish to be limited to the precise construction disclosed, but wish to include within the scope of my invention all such modifications and variations which will readily suggest themselves.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent of the United States is:

1. In a refrigerator having a compartment cooled by surfaces maintained above the freezing temperature, a shelf for the compartment provided with ribs on its underside sloping downwardly into contact with one of the walls of the compartment for draining collected moisture to the sidewall and preventing dripping from the underside of the shelf.

2. A glass shelf for a refrigerator compartment provided with a plurality of ridges on its underside, the bottom of the shelf between the ridges sloping toward the ridges, and the bottom edges of the ridges sloping gradually and substantially uniformly into contact with a vertical wall of the compartment.

3. A glass shelf for a refrigerator compartment formed of forward and rear sections, each section being provided with ribs extending downwardly from the lower sides of the sections, the ribs of the forward section contacting the ends of the ribs of the rearward section, the joined ribs sloping substantially uniformly downwardly to the rear wall of the compartment.

4. A glass shelf for a refrigerator compartment provided with a substantially level upper surface, parallel ribs on the under surface of the shelf having their bottoms sloping downwardly into contact with a vertical wall of the refrigerator compartment, the shelf above the ribs being shorter than the ribs so that only the ends of the ribs contact the compartment wall.

5. A glass shelf for a refrigerator compartment provided with ribs on its underside sloping toward and contacting with a vertical wall of the compartment, the ribs and the underside of the shelf being sandblasted to aid in the dispersion of moisture condensed upon the underside of the shelf.

6. A shelf for a refrigerator compartment provided with an upturned edge spaced from the wall of the refrigerator compartment and provided with parallel ridges on its underside sloping toward and contacting with the wall from which the shelf is spaced.

7. A shelf for a refrigerator compartment provided with a plurality of parallel ridges on its underside extending across the compartment and contacting with the opposite sidewalls of the compartment, the bottoms of the ridges sloping from a mid position in the shelf downwardly to the sidewalls.

8. A shelf for a refrigerator compartment provided with a plurality of parallel ridges on its underside extending across the compartment and contacting with the opposite sidewalls of the compartment, the bottoms of the ridges sloping from a mid position in the shelf downwardly to the sidewalls, the shelf being provided with a plurality of circulation openings therethrough.

9. A shelf for a refrigerator compartment provided with a plurality of parallel ridges on its underside extending across the compartment and contacting with the opposite sidewalls of the compartment, the bottoms of the ridges sloping from a mid position in the shelf downwardly to the sidewalls, the shelf being provided with an upturned edge spaced from the backwall of the compartment.

10. A shelf for a refrigerator compartment provided with a plurality of parallel ridges on its underside extending across the compartment and contacting with the opposite sidewalls of the compartment, the bottoms of the ridges sloping from a mid position in the shelf downwardly to the sidewalls, the shelf proper being of less width than the width of the compartment, whereby water draining down the sidewalls of the compartment will pass the edges of the shelf.

11. A shelf for a refrigerator compartment provided with a plurality of parallel ridges on its underside extending across the compartment and contacting with the opposite sidewalls of the compartment, the bottoms of the ridges sloping from a mid position in the shelf downwardly to the sidewalls, the shelf proper being spaced from all of the walls of the compartment and provided with an upturned edge at the rear to prevent dishes from contacting the back wall.

12. In a refrigerator, a compartment cooled by surfaces maintained above the freezing point of water, said compartment being provided with a ceiling sloping to one wall of the compartment for draining moisture condensed upon the ceiling to said wall, a shelf for said compartment having ribs on its underside sloping downwardly into contact with a wall of said compartment for draining moisture condensed upon said shelf to said wall, the upper surface of said shelf being spaced apart from said first-mentioned wall to permit draining of condensed moisture, and means near the bottom of said walls for catching the flowing moisture.

GEORGE K. IWASHITA.