May 12, 1936. C. J. SEKYRA 2,040,634

REFRIGERATING APPARATUS

Filed Sept. 10, 1934 2 Sheets-Sheet 1

Fig. 1.

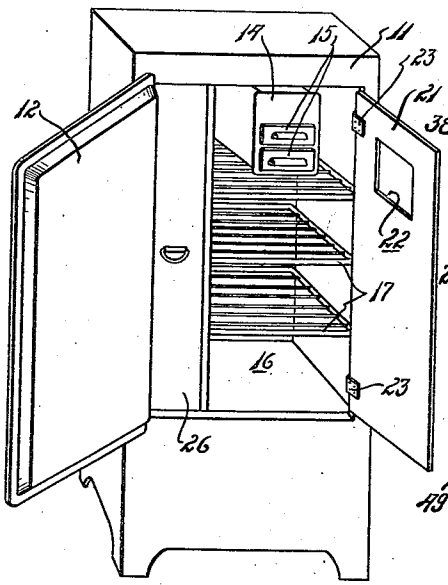


Fig. 2.

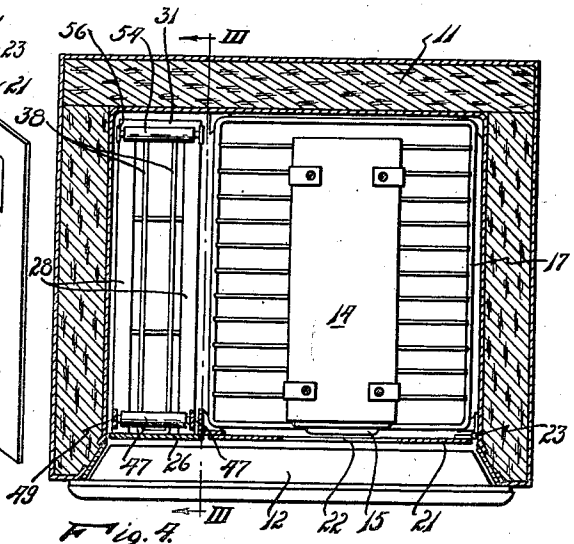


Fig. 4.

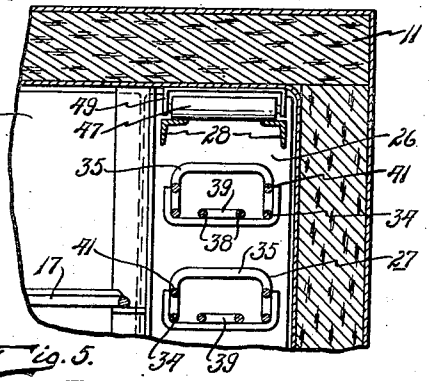


Fig. 3.

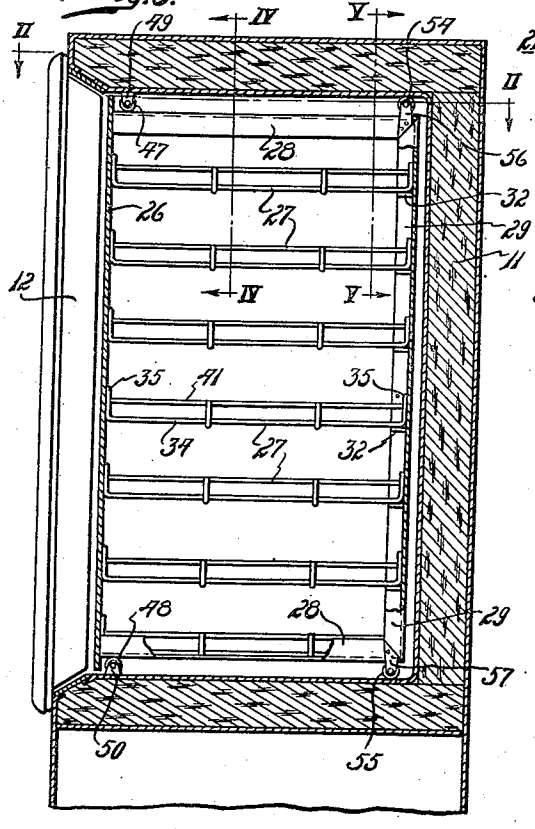
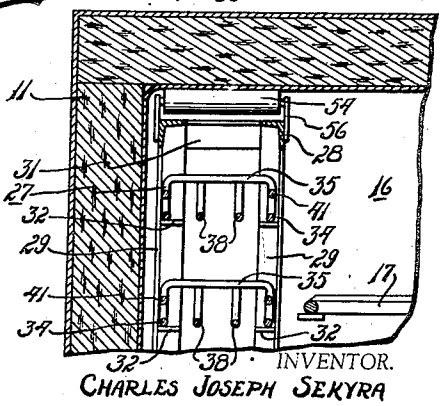


Fig. 5.



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Fig. 6.

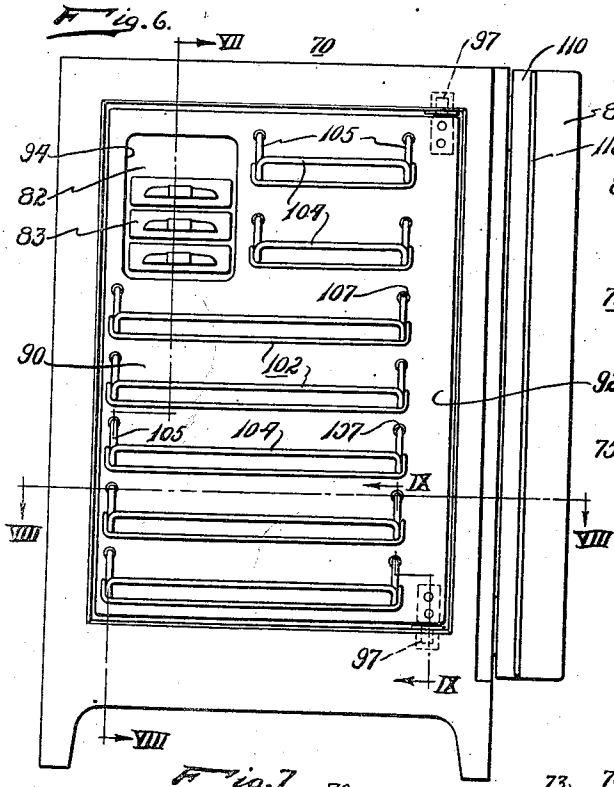


Fig. 9.

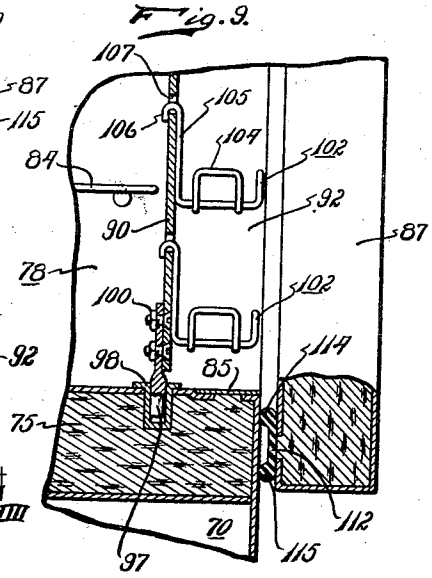


Fig. 7.

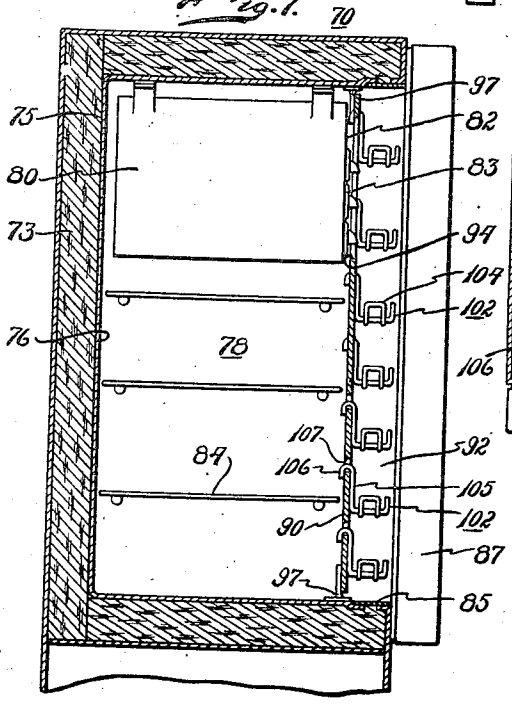
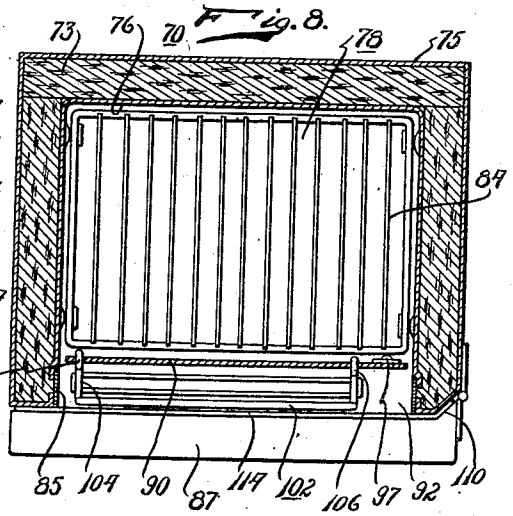


Fig. 8.



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UNITED STATES PATENT OFFICE

2,040,634

REFRIGERATING APPARATUS

Charles Joseph Sekyra, Troy, Ohio, assignor of one-half to Kelvinator Corporation, Detroit, Mich., a corporation of Michigan

Application September 10, 1934, Serial No. 743,336

8 Claims. (Cl. 62—89)

My invention pertains to refrigerator cabinets and more particularly to an improved arrangement of shelves for storing small articles and a shield associated therewith.

It is an object of my invention to provide a refrigerator cabinet with a cold storage compartment shield in conjunction with slidable shelves whereby either ice cubes or small articles may be conveniently removed without adversely affecting the thermal efficiency of the cabinet by releasing the cold air from the storage compartment and admitting warm air therein.

It is a further object of my invention to provide a shield in a refrigerator cabinet to protect the cold storage compartment from the entrance of warm air while ice cubes are being removed and which is conveniently removable to afford access to the storage compartment.

It is also an object of my invention to provide an improved arrangement of drawer shelf compartments for the storage of small food articles in a refrigerator cabinet.

The invention itself, however, both as to its construction and its utilization together with additional objects and advantages thereof, will best be understood from the following description of specific embodiments, when read in conjunction with the accompanying drawings, in which:

Figure 1 is a perspective view illustrating a refrigerator provided with my cold storage compartment shield and an improved drawer shelf construction showing the door of the cabinet and the shield in open positions;

Figure 2 is a horizontal sectional view of the refrigerator on line II—II with the door and shield in their respective closed positions;

Figure 3 is a vertical sectional view taken on line III—III;

Figures 4 and 5 are fragmentary sectional views taken on lines IV—IV and V—V, respectively;

Figure 6 is a view in elevation of a modified form of a refrigerator embodying features of my invention; and

Figures 7, 8 and 9 are views in cross section, taken along the lines VII—VII, VIII—VIII and IX—IX, respectively, of Figure 6.

Referring more particularly to the drawings, I have selected as a specific embodiment to illustrate the application of my invention, a small household refrigerator comprising a heat insulating cabinet 11 closed by a heat insulating door 12 which may be hinged at one side and latched at the other in a well known manner. A cooling unit 14 supported in the upper portion of the food storage compartment encloses a freezing chamber provided with freezing trays 15 for freezing ice cubes, frozen desserts and the like. The cold storage compartment 16 which surrounds the cooling unit is provided with suitable shelves 17 for supporting food articles or other material to be stored therein.

In ordinary use the large door 12 which closes the front of the refrigerator cabinet will be open frequently for the purpose of removing ice cubes, frozen desserts and the like from the freezing trays 15 and the cabinet will often remain wide open for an appreciable time sufficient to release the cold air and admit warm air. In order to retain the cold air in the food storage compartment 16, I have provided a shield 21 inside of the cabinet door 12 which seals the open area around the freezing chamber.

The cold sealing shield 21 comprises a flat closure member of suitable material and is provided with an aperture 22 directly in front of the freezing trays 15 to permit their convenient removal therethrough. The shield 21 is mounted upon hinges 23 provided along one edge whereby it may be quickly turned away from the refrigerator cabinet to afford convenient access to the large storage compartment when desired. A suitable handle may be provided on the outer surface of the pivotally mounted shield 21 to facilitate its removal from the opening.

The cold storage compartment shield 21 may extend entirely across the front open area of the cabinet, if desired, but in the preferred embodiment of my invention the shield terminates at an intermediate point adjacent a vertical drawer plate 26 which comprises a sliding drawer cooperating with the shield 21 to completely close the front opening of the cabinet. Secured to the back of the plate in any suitable manner are numerous shelves 27 which provide small compartments extending into the food storage compartment, as shown in Figures 3, 4 and 5, for the storage of small food articles therein.

A framework is provided to rigidly support the shelves at the rear of the drawer plate which comprises two horizontally disposed pairs of angle irons 28 which project rearwardly from the corners of the drawer plate 26 and which are joined to a pair of vertically disposed angle irons 29 adjacent the rear wall of the cabinet. Cross pieces 31 of angle iron rigidly unite the vertical members 29 and suitable corner pieces or brackets 32 project from the vertical angle iron for supporting the rearwardly extended ends of the shelves 27.

The shelves are preferably of open wire construction comprising four wires disposed in a horizontally extending plane to define the bottom of each drawer compartment, as clearly shown in Figures 3, 4 and 5. The two outermost wires 34 may be united at their ends in closed U-shaped loops 35 to provide a rigid structure and to facilitate attachment to the drawer plate 26 to which the front U-shaped loop is secured in any suitable manner as by welding, soldering or other fastening means. To provide an improved support the U-shaped loops are preferably upturned. The front ends of the innermost pair of wires 38 on the bottom of the drawer are preferably joined in a U-shaped loop 39 and similarly secured to the vertical drawer plate 26. The rear ends of the inner wires 38 are preferably turned up independently and secured to the upturned U loop 35 of the outer pair of wires. Above each of the outermost pair 34 of the four wires a horizontally disposed wire 41 extends in parallel spaced relation to define the upper edges of the drawer compartment. The ends of this pair of wires 41 may be secured to the upturned U loop 35 of the lower wires 34 in any suitable manner.

Cross wires 44 are provided at suitable intermediate points to rigidly unite the long horizontal wires. As shown in Figures 3 and 4, the cross wires may extend around the outside of the horizontal wires to which they may be conveniently secured in any suitable manner such as spot welding, for example. The rear ends of the shelves 27 may be secured to the corner brackets 32 on the vertical angle irons 29 or they may rest freely thereon. The open construction of the shelves 27 permits the cold air to press freely therethrough while supporting small food articles such as eggs, butter, cheese and the like.

The complete drawer shelf assembly is supported in the cabinet on rollers and a handle 46 is provided on the front of the drawer plate 26 whereby the entire assembly may be conveniently drawn forward to remove the articles stored in the drawer compartments. The two front rollers 47 and 48 are journalled in brackets 49 and 50 which are rigidly secured to the respective upper and lower walls of the cabinet. The two rear rollers 54 and 55 are journalled in brackets 56 and 57 rigidly secured to the rear ends of the respective upper and lower angle irons 28 of the shelf assembly.

As the shelf assembly is drawn forward the rear rollers 54 and 55 carried thereby approach the front rollers 47 and 48 supported on the cabinet and thus the rollers serve a dual function of limiting the movement of the shelves and reducing friction. In its extreme extended position the rear of the shelf assembly, which may be closed by a sheet of suitable material, approaches the edge of the closed shield 21 thereby limiting and restricting the flow of cold air from the large food storage compartment while small articles are being removed.

When the slidable shelf assembly is replaced it cooperates with the closed shield 21 to seal the front of the cabinet while permitting the convenient removal of ice cubes and frozen substances from the freezing chamber.

It will be seen that I have provided a refrigerator cabinet with a cold storage compartment shield and a slidable shelf assembly relatively so arranged that either small food articles or frozen substances may be removed from the storage compartment or the freezing chamber, respectively, without releasing the cold air and admitting warm air, thus greatly improving the average efficiency of refrigerators and rendering effective the improved heat insulating qualities of modern refrigerator cabinets.

Referring now to Figs. 6 to 9, inclusive, there is shown a modified form of a refrigerator embodying features of my invention. In these figures there is disclosed a refrigerator cabinet 70 having heat insulated walls 73 enclosed within an exterior metal casing 75 and provided with an inner metallic liner 76. The inner liner serves to form the interior walls of a food storage compartment 78 and is provided preferably with a coat of vitreous enamel, such, for example, as porcelain. Within the compartment 78 there is disposed a refrigerant evaporating or cooling element 80 which is provided with a freezing chamber 82 in which there is disposed a plurality of ice trays 83. Also, within the food storage compartment is placed a plurality of shelves 84. The food storage compartment 78 is provided with a door opening 85 closed by a door 87. At the rear of the door 87 there is pivotally mounted a substantially flat, rectangular shaped shield 90. This shield is spaced from the door 87 in order to provide a second food storage compartment 92. As shown in the drawings, the shield 90 is provided with a cutaway portion 94 for gaining access to the freezing chamber 82 without movement of the shield 90. When it is desired to gain access to the food storage compartment 78, the shield 90 is swung outwardly on its pivotal mountings 97. Preferably, the mountings 97 are received in socket members 98 on one end and rigidly attached to the shield 90 on their opposite ends by means of screws 100.

Preferably, the auxiliary food storage compartment 92 is provided for the purpose of storing small objects, and for this purpose I have provided a plurality of wire shelves 102 which are removably mounted to the shield 90 at the side of and below the freezing chamber 82. Preferably, these wire shelves are made of two pieces including members 104 and 105. The member 104 is bent to provide a bottom supporting portion of shelf and the member 105 is bent to provide a front ledge for the shelf and supporting legs having bent portions 106 which extend through holes 107 in the shield 90. By this arrangement it is possible to readily remove the shelves if it is so desired. Preferably, the marginal edges of door 90 are spaced slightly (¼" or more) from the marginal edges of the door opening to permit the free circulation of cooled air in compartment 92.

In Fig. 8 it will be noted that the door 87 is disposed entirely on the exterior of the food storage compartment 78. This gives maximum space within the cabinet 70 for the provision of food storage compartments 78 and 92. The door is preferably of rectangular formation and has a bevelled edge 110 on the hinged side thereof. In order to effectively seal the food storage compartment opening 85, I have provided a gasket sealing member 112 which extends entirely around the door and abuts against the front wall of the cabinet. As shown, this gasket sealing member has two sealing gasket portions 114 and 115. If desired, the gasket sealing member 112 may be made in two pieces instead of one to provide the two sealing surfaces 114 and 115.

From the foregoing description, it will be noted that I have provided a new refrigerator wherein

access may be had to the freezing chamber of the evaporating unit without permitting the escape of cool air from the main food storage compartment or permitting warm air to enter said compartment. It will also be noted that if only small food articles are to be removed from the cabinet the same may be removed therefrom without losing the cool air of the main food storage compartment. In addition, it will be noted that access may be readily had to the ice making chamber, the main food storage compartment or the auxiliary food storage compartment.

While it is necessary for the purposes of illustration to describe the disclosed form of my invention in detail, it will be apparent that my invention is not so limited and that other forms and applications thereof are embraced within the scope of the appended claims.

I claim as my invention:

1. The combination with a refrigerator comprising a heat insulating cabinet open at one side, a heat insulating door for closing the open side of said cabinet, a cooling unit mounted in the storage compartment enclosed by said cabinet to cool said compartment and a freezing chamber associated therewith adjacent said door, of a removable shield disposed in the open side of said cabinet adjacent said door to close the open area around said freezing chamber whereby the cold air is retained in the storage compartment when the door is opened to enter the freezing chamber.

2. In a refrigerator the combination of a heat insulating cabinet having an open portion, a heat insulating door closing said open portion, a cooling unit comprising means for dividing the space within said cabinet into a freezing chamber surrounded by a cold storage compartment, and a pivotally mounted shield disposed within said open portion to close the open area around said freezing chamber, whereby cold air is retained in the cold storage compartment when the door is open to enter the freezing chamber.

3. In combination in a refrigerator a heat insulated cabinet open at one side, a heat insulated door for closing the open side of said cabinet, a cooling unit mounted in the storage compartment enclosed by said cabinet for cooling said compartment, a freezing chamber associated therewith, and shielding means cooperatively disposed in the open side of said cabinet to retain the cold air within the compartment while small food articles or frozen substances are being removed from the storage compartment or the freezing chamber respectively.

4. In combination in a refrigerator a heat insulated cabinet open at one side, a heat insulated door for closing the open side of said cabinet, a cooling unit mounted in the storage compartment enclosed by said cabinet for cooling said compartment, a freezing chamber associated therewith, a slidable shelf assembly and a pivotally mounted shield cooperatively disposed in the open side of said cabinet to retain the cold air within the compartment while small food articles or frozen substances are being removed from the storage compartment or the freezing chamber respectively.

5. In combination in a refrigerator a heat insulated cabinet open at one side, a heat insulated door for closing the open side of said cabinet, a cooling unit mounted in the storage compartment enclosed by said cabinet for cooling said compartment, a slidable shelf assembly comprising cold air sealing means disposed inside of said door for closing the open side of said cabinet to retain the cold air within the compartment while the door is open and articles are being removed.

6. In combination in a refrigerator a heat insulated cabinet open at one side, a heat insulated door for closing the open side of said cabinet, a cooling unit mounted in the storage compartment enclosed by said cabinet for cooling said compartment, a shelf assembly comprising shelves of open construction to permit the cold air to pass freely therethrough while supporting small food articles in said storage compartment, means for movably supporting the shelf assembly in said cabinet and means for closing the open side of said cabinet to retain the cold air while the shelves are in either extreme position.

7. In combination in a refrigerator a heat insulated cabinet open at one side, a heat insulated door for closing the open side of said cabinet, a cooling unit mounted in the storage compartment enclosed by said cabinet for cooling said compartment, a freezing chamber associated therewith, a shield having an aperture therein, means for movably supporting said shield in the open side of said cabinet with the aperture disposed before said freezing chamber, and a slidable shelf assembly, said shield and shelf assembly being suitably proportioned and disposed in the open side of said cabinet to cooperatively retain the cold air when food articles or frozen substances are being removed from the storage compartment or the freezing chamber respectively.

8. Refrigerating apparatus comprising, in combination, a cabinet having a food compartment and a door opening, a door for closing said opening, a refrigerant evaporating element within said cabinet for cooling said compartment, a pivotally mounted shield in the rear of said door and spaced therefrom to provide a space therebetween, said shield being provided with a cutaway portion for gaining access to said evaporating element, and being arranged to be swung outwardly for gaining access to said food compartment, and a plurality of shelves mounted on the outside of said shield and at the side of and below said cutaway portion.

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DISCLAIMER

2,040,634.—*Charles Joseph Sekyra*, Troy, Ohio. REFRIGERATING APPARATUS. Patent dated May 12, 1936. Disclaimer filed March 14, 1938, by the patentee and the assignee, *Kelvinator Corporation*.

Hereby enter this disclaimer to claims 1, 2, and 8 in the specification of said Letters Patent.

[*Official Gazette April 12, 1938.*]