

June 15, 1943.

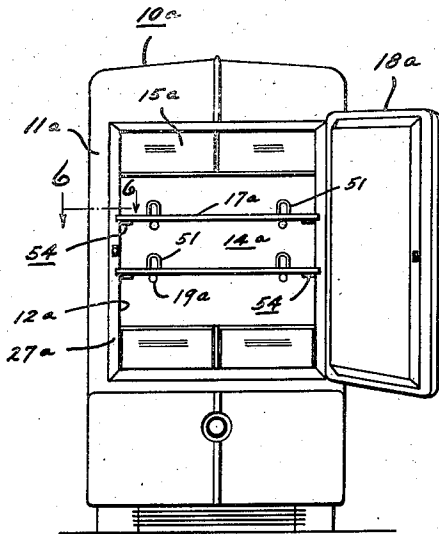
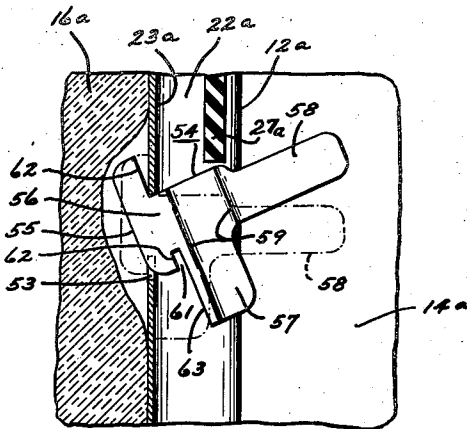
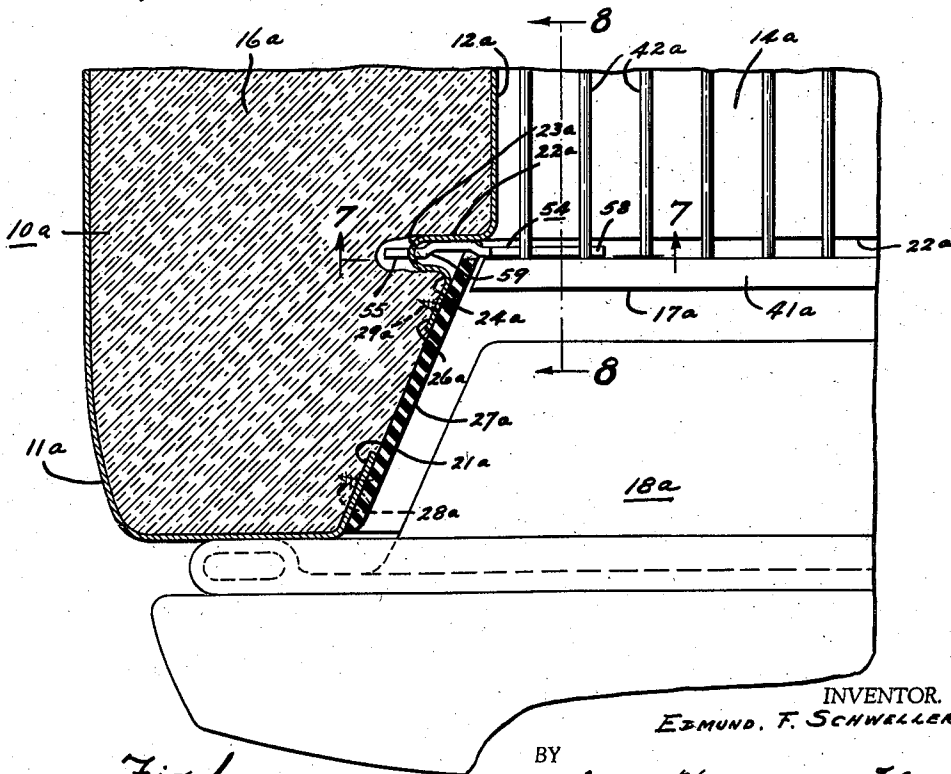
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2,321,865

REFRIGERATING APPARATUS

Filed Sept. 19, 1940

3 Sheets-Sheet 2



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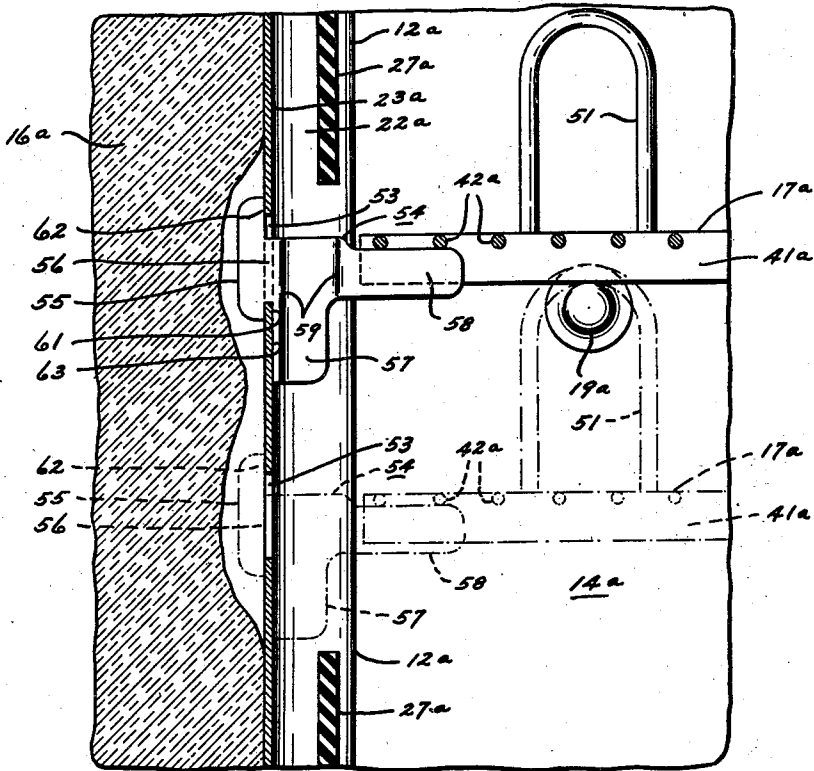


Fig. 7

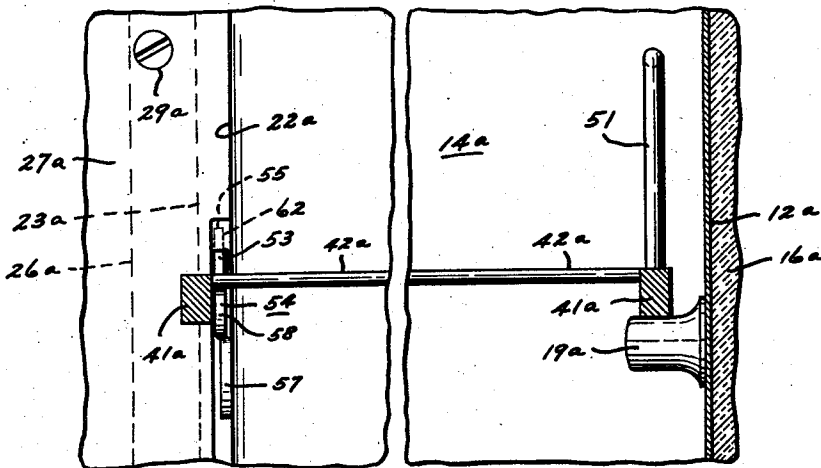


Fig. 8

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UNITED STATES PATENT OFFICE

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REFRIGERATING APPARATUS

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10 Claims. (Cl. 312—156)

This invention relates to refrigerating apparatus and particularly to refrigerator cabinets.

An object of my invention is to improve the appearance of the interior of a household refrigerator cabinet by providing an improved device for and method of mounting food supporting shelves within the food storage chamber of such refrigerators.

Another object of my invention is to improve the appearance of the interior of a refrigerator cabinet by incorporating mounting devices, for shelves positioned in the food storage chamber thereof, in the chamber throat structure or in the access door opening wall construction of the cabinet.

In carrying out the foregoing objects, it is a still further object of my invention to incorporate adjustable shelf supports or mounting devices for food supporting shelves of a refrigerator cabinet in the food storage chamber throat structure or in the access door opening wall construction of the chamber in such a manner that the devices may be readily removed and mounted in other elevated positions to accommodate vertical changes of a shelf within the food storage chamber of the cabinet.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Fig. 1 is a front view of a refrigerator cabinet showing the food storage chamber door is open position and having shelves supported in the chamber in accordance with the present invention;

Fig. 2 is an enlarged front view of one side of the food storage chamber throat or door opening showing the support of a shelf therefrom;

Fig. 3 is a horizontal sectional view of a portion of the refrigerator cabinet taken on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary vertical sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a front view of a refrigerator cabinet showing the food storage chamber door in open position and having shelves supported in the chamber in accordance with a modified form of my invention;

Fig. 6 is an enlarged horizontal sectional view taken on the line 6—6 of Fig. 5;

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6 in a direction toward the rear of the food chamber showing a shelf and its support in two vertically adjusted positions;

Fig. 8 is a fragmentary sectional view taken in the direction indicated by the lines 8—8 of Fig. 6; and

Fig. 9 is a fragmentary view similar to Fig. 7

and illustrating the removal of a shelf support from the refrigerator cabinet.

Referring to the drawings, for illustrating my invention, I have shown in Fig. 1 thereof, a refrigerating apparatus comprising a refrigerator cabinet 10 having outer metal walls or wall member 11 and an inner metal liner member 12 providing a food storage chamber 14 within the cabinet. Any suitable or desirable soft or resilient insulation material 16 may be located between the outer cabinet walls 11 and liner 12 (see Fig. 3) to prevent heat leakage into the food storage chamber. An evaporator 15, of a closed refrigerant circulating system, may be disposed within the upper part of chamber 14. The chamber 14 is divided into a plurality of superimposed compartments or storage spaces by vertically spaced apart horizontally disposed shelves 17. The cabinet outer metal wall member 11 and the metal liner 12 are each provided with an aperture which register with one another to provide the chamber 14 with an access opening at the front of the cabinet 10. A pivotally mounted and suitably insulated door 18 normally closes the food storage chamber access opening. The shelves 17 may be supported at the rear of chamber 14 by pegs or the like 19 mounted upon or secured to the chamber back wall. Since the present invention is directed to improving the appearances of the interior of a food storage chamber of a refrigerator cabinet and particularly at the front portion thereof, I contemplate the elimination of shelf hooks or pegs projecting from the side walls of the chamber metal liner.

The inturned edge 21 of the outer cabinet wall member 11 (see Fig. 3) and the edge of the metal liner 12 of chamber 14 are spaced apart at the throat or door opening to break the metal-to-metal contact therebetween and prevent transference of heat from exteriorly of the cabinet 10 to the interior of chamber 14. A portion of the liner 12 inwardly of its edge is formed outwardly away from or substantially at right angles to the chamber vertical side wall, as at 22, and is reversely bent as at 23. This portion of liner 12 is also bent, as at 24 to provide a flange-like mounting portion 26 adjacent its edge. A mould element or trim strip 27, of any suitable or desirable substantially hard insulating material, overlaps the edges of the metal members 11 and 12 and bridges the gap between their edges at the access opening of cabinet 10 to form a wall for the chamber throat or door opening. A plurality of spaced apart screws 28 extend through mould element 27 and are threaded into the edge portion 21 of the outer cabinet wall 11. A plurality of screws 29 extend through the mould element 27 at spaced apart points therealong adjacent its other or inner edge portion and are threaded into the mould mounting edge portion

26 of liner 12. These screws 28 and 29 securely hold the mould element 27 in position on the cabinet walls and definitely space the edge of the metal members a predetermined distance apart. At vertically spaced apart points, along the flanged mounting edge portion 26 of liner 12, I provide a plurality of depressed portions 31 (see Fig. 4). A rigid means or element such as a flat angle iron-like metal piece 33 is disposed between the inner edge of mould element 27 and the outwardly formed portion 22 of liner 12. This element 33 has a part 34 thereof extending behind the mould element 27 and disposed in one of the depressed portions 31 provided in the mounting edge portion 26 of liner 12. A screw 36 passes through the extension or part 34 of element 33 and through the liner flange 26 and has a nut 37 threaded upon the end thereof to rigidly secure the element 33 to the liner 12 at a point beyond or outside of the wall of chamber 14. The part of element 33 disposed between the edge of mould element 27 and the outwardly formed portion 22 of liner 12 lies in a plane substantially paralleling the plane of the liner portion 22 and extends or projects, as at 38, inwardly of the mould element beyond the side wall of chamber 14. The projecting end part 38, of element 33, provides a support for one of the shelves 17 and this support is located between the inner face of door 18 and the storage chamber proper. Each shelf 17 includes relatively heavy front and back rails 41 having a plurality of spaced apart wires 42 secured thereto to form a food supporting surface within chamber 14 and to divide the chamber into superimposed food storage spaces or compartments. The projecting end part 38, of element 33, extends away from the chamber throat or away from the wall of the door opening a sufficient distance to permit, preferably, two of the wires 42 at each side of a shelf 17 to be supported upon supports 38 disposed in horizontal alignment with one another and located upon opposite sides of the chamber throat. In this form of the invention the shelf supports are stationarily mounted exteriorly of chamber 14 adjacent the front thereof and shelf supports of the type disclosed can, if desired, be detachably mounted to accommodate changed positions of vertically adjustable shelves. For this reason, I will hereinafter describe an adjustable shelf mounting incorporated in the throat or door opening structure of a food storage chamber of a refrigerator cabinet.

Referring now to Figs. 5 to 9 inclusive, of the drawings, I have shown a modified form of my invention wherein the shelf supports are detachable from the refrigerator cabinet for the purpose of adjusting same vertically to accommodate different elevated positions of a shelf. In Fig. 5, I show a refrigerator cabinet 10a, which is of substantially the same construction as the previously described cabinet 10 but which is provided with shelves 17a, each having a pair of spaced apart inverted U-shaped members 51 secured to the back rim 41a thereof (see Figs. 7 and 8). Except for the provision of the members 51, for cooperating with the pegs 19a in a manner to be presently described, the shelves 17a are of the same construction as the shelves 17. In the form of my invention shown in Figs. 5 to 9 inclusive, the depressed portions in the mounting flange edge portion 26a of the liner 12a are omitted and a plurality of spaced apart vertically elongated openings 53 (see Fig. 7) are provided in the reversely bent portions 23a of the

liner 12a along both side walls of the door opening for the chamber 14a. A substantially flat metal shelf support generally represented by the reference character 54 and comprising an inner enlarged head portion 55, a web part 56, a depending leg 57 and an end portion 58, is disposed between the mould element 27a and the outwardly formed portion 22a of the chamber liner 12a. The shelf support or metal element 54 lies in a plane substantially paralleling the outwardly formed portion 22a of liner 12a and is bent as at 59 (see Fig. 6) so as to cause a part of the element 54 to abut or bear against the portion 22a of liner 12a. A notch 61 provided in element 54, and which notch creates the formation of the web portion 56 thereof, fits over the bottom wall of an opening 56 in the reversely bent part of liner 12a. The bordering edges 62 of the head part 55 of element 54 engage the one surface of the liner portion 23a and a bordering edge 63 of leg 57 engages the other surface of liner portion 23a to removably retain the element 54 in position. The end portion 58 of element 54 projects inwardly of mould element 27a beyond the wall of chamber 14a to provide a support for one of the shelves 17a. With the element 54 attached to the cabinet as shown in full lines in Fig. 7, of the drawings, the back rail 41a of shelf 17a engages and is supported upon the peg 19a, while the side wires 42a engage and are supported upon the support element 54. When the shelf 17a is desired to be adjusted or lowered into a different horizontal plane within chamber 14a, the shelf supporting element 54 is removed from the one opening 56 and is replaced into another or a lower opening 56, as shown in dot-dash lines in Fig. 7, by vertical movement thereof along the edge of mould element 27a. With the element 54 mounted as shown in Fig. 7, in the dot-dash line position thereof, the back rim 41a of shelf 17a is disposed a considerable distance below the peg 19a and the yoke portion of the inverted U-shaped members 51 thus serve to engage the peg 19a and support the shelf at the rear of chamber 14a, in its adjusted or lowered position.

It will be noted that the openings 56 in the reverse bent portion 23a of liner 12a, are of a greater elongation than the distance across the web portion 56 of the shelf support element 54. Therefore, in order to remove the element 54 from its attachment to the liner 12a, it is first elevated to permit the lower wall 62 of the head thereof to clear the bottom wall of opening 53. Thereafter the end 58 of element 54 is rotated to cause the bottom portion of head 55 to move outwardly of opening 56 into an angular position as shown in Fig. 9 of the drawings. Element 54 is then lowered, to remove the upper portion of its head 55 from the opening 56. This movement of element 54 takes place within the space between the mould element 27a and the outwardly formed portion 22a of liner 12a to detach same from the cabinet. The attachment to the cabinet of element 54 or the replacement thereof into another of the openings 53 is carried out in reverse order to that described relative to detachment thereof.

From the foregoing, it will be apparent that I have provided an improved means for supporting shelves within the food storage chamber of a refrigerator cabinet. The improved shelf supporting means eliminates the necessity of providing a shelf support or a series of such supports in or along the smooth chamber side walls. Since the front edge or rail of the shelf is dis-

posed in the same horizontal plane with the shelf supporting parts of the supports it substantially conceals the relatively thin metal shelf supports at the chamber opening and the front shelf supports are invisible or unnoticeable when viewed from exteriorly of the chamber to thereby improve the appearance of the front portion of the chamber. By incorporating a shelf support in the throat structure of a food storage chamber or in the wall construction of the access door opening to the chamber, I facilitate the manufacture of refrigerator cabinets and reduce the cost thereof. My invention is applicable to adjustably mounted shelf supports as well as to stationarily mounted supports.

While the form of embodiment of the invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In combination, a refrigerator cabinet provided with a metal outer wall member and an inner metal liner member defining walls of a food storage chamber within said cabinet, each of said members having an aperture therein registering with one another to provide an access opening for said chamber, a door for normally closing said access opening, the edges of said metal members being spaced apart at said access opening to break the metal-to-metal contact therebetween, a mold element forming a wall for said access opening and concealing the edges of said members at said opening, a portion of said metal liner adjacent the edge thereof being formed outwardly, shelf supporting means disposed between the edge of said mold element and said liner, said means having a part thereof concealed by said mold element and secured to said liner in back of the mold element, and said means also having another part thereof projecting inwardly of said mold element beyond said liner to provide a support for a shelf adapted to be positioned within said chamber.

2. In combination, a refrigerator cabinet provided with a metal outer wall member and an inner metal liner member defining walls of a food storage chamber within said cabinet, each of said members having an aperture therein registering with one another to provide an access opening for said chamber, a door for normally closing said access opening, the edges of said metal members being spaced apart at said access opening to break the metal-to-metal contact therebetween, a mold element forming a wall for said access opening and concealing the edges of said members at said opening, a portion of said metal liner adjacent the edge thereof being formed outwardly, shelf supporting means disposed between the edge of said mold element and said liner, said means having a part thereof concealed by said mold element and secured to a portion of said liner adjacent its edge, and the part of said means disposed between the edge of said mold element and the outwardly formed portion of said liner terminating inwardly of said mold element beyond said liner to provide a support for a shelf adapted to be positioned within said chamber.

3. In combination, a refrigerator cabinet provided with a metal outer wall member and an inner metal liner member defining walls of a food storage chamber within said cabinet, each of said members having an aperture therein registering with one another to provide an access

opening for said chamber, a door for normally closing said access opening, the edges of said metal members being spaced apart at said access opening to break the metal-to-metal contact therebetween, a mold element forming a wall for said access opening and concealing the edges of said members at said opening, a portion of said metal liner adjacent the edge thereof being formed outwardly, a relatively thin rigid metal shelf supporting element disposed between the edge of said mold element and said outwardly formed portion of said liner, said metal element having a part thereof concealed by said mold element and secured to a portion of said liner adjacent its edge, and the part of said metal element disposed between the edge of said mold element and the outwardly formed portion of said liner terminating inwardly of said mold element beyond said liner to provide a support between the chamber proper and the inner face of said door for a shelf adapted to be positioned within said chamber.

4. In combination, a refrigerator cabinet provided with a metal outer wall member and an inner metal liner member defining walls of a food storage chamber within said cabinet, each of said members having an aperture therein registering with one another to provide an access opening for said chamber, a door for normally closing said access opening, the edges of said metal members being spaced apart at said access opening to break the metal-to-metal contact therebetween, a mold element forming a wall for said access opening and concealing the edges of said members at said opening, a portion of said metal liner adjacent the edge thereof being formed outwardly, said outwardly formed portion of said liner being reversely bent and having a flanged edge part extending therefrom to provide a mounting portion for said mold element, a rigid angle iron-like shelf supporting element having a part thereof disposed between the edge of said mold element and said outwardly formed portion of said liner, one end portion of said angle iron-like element extending parallel with said mold element and being secured to the flanged edge part of said liner in back of said mold element, and the part of said angle iron-like element disposed between the edge of said mold element and the outwardly formed portion of said liner terminating inwardly of said mold element beyond said liner to provide a support for a shelf adapted to be positioned within said chamber.

5. In combination, a refrigerator cabinet provided with a metal outer wall member and an inner metal liner member defining walls of a food storage chamber within said cabinet, each of said members having an aperture therein registering with one another to provide an access opening for said chamber, a door for normally closing said access opening, the edges of said metal members being spaced apart at said access opening to break the metal-to-metal contact therebetween, a mold element forming a wall for said access opening and concealing the edges of said members at said opening, a portion of said metal liner adjacent the edge thereof being formed outwardly, said outwardly formed portion of said liner being reversely bent and having a flanged edge part extending therefrom to provide a mounting portion for said mold element, shelf supporting means disposed between the edge of said mold element and said outwardly formed

portion of said liner, said means having a part thereof paralleling said mounting portion of said liner and said mold element and being secured to the flanged edge part of said liner in back of said mold element, and the part of said means disposed between the edge of said mold element and the outwardly formed portion of said liner terminating inwardly of said mold element beyond said liner to provide a support between the chamber proper and the inner face of said door for a shelf adapted to be positioned within said chamber.

6. In combination, a refrigerator cabinet provided with a metal outer wall member and an inner metal liner member defining walls of a food storage chamber within said cabinet, each of said members having an aperture therein registering with one another to provide an access opening for said chamber, a door for normally closing said access opening, the edges of said metal members being spaced apart at said access opening to break the metal-to-metal contact therebetween, a mold element forming a wall for said access opening and concealing the edges of said members at said opening, a portion of said metal liner adjacent the edge thereof being formed outwardly, said outwardly formed portion of said liner being reversely bent and having a flanged edge part extending therefrom to provide a mounting portion for said mold element, said reversely bent portion of said liner having a plurality of spaced apart openings therein, shelf supporting means disposed between said outwardly formed portion of said liner and an edge of said mold element, said means having a part thereof fitting within one of said openings in said reversely bent portion of said liner and interlocked therewith, said portion of said means disposed between said outwardly formed portion of said liner and the edge of said mold element terminating inwardly of said mold element beyond said liner to provide a support for a shelf adapted to be positioned within said chamber.

7. In combination, a refrigerator cabinet provided with a metal outer wall member and an inner metal liner member defining walls of a food storage chamber within said cabinet, each of said members having an aperture therein registering with one another to provide an access opening for said chamber, a door for normally closing said access opening, the edges of said metal members being spaced apart at said access opening to break the metal-to-metal contact therebetween, a mold element forming a wall for said access opening and concealing the edges of said members at said opening, a portion of said metal liner adjacent the edge thereof being formed outwardly, said outwardly formed portion of said liner being reversely bent and having a flanged edge part extending therefrom to provide a mounting portion for said mold element, said reversely bent portion of said liner having a plurality of spaced apart openings therein, a relatively flat metal shelf supporting piece disposed between said outwardly formed portion of said liner and an edge of said mold element, said metal piece having a part thereof extending through one of said openings in said reversely bent portion of said liner and terminating in a hooked end engaging the outer surface of said liner to hold the metal piece in position, and said metal piece extending inwardly of said mold element beyond said liner

to provide a support for a shelf adapted to be positioned within said chamber.

8. In combination, a refrigerator cabinet provided with a metal outer wall member and an inner metal liner member defining walls of a food storage chamber within said cabinet, each of said members having an aperture therein registering with one another to provide an access opening for said chamber, a door for normally closing said access opening, the edges of said metal members being spaced apart at said access opening to break the metal-to-metal contact therebetween, a mold element forming a wall for said access opening and concealing the edges of said members at said opening, a portion of said metal liner adjacent the edge thereof being formed outwardly, said outwardly formed portion of said liner being reversely bent and having a flanged edge part extending therefrom to provide a mounting portion for said mold element, said reversely bent portion of said liner having a plurality of spaced apart openings therein, a relatively flat metal shelf supporting piece disposed between said outwardly formed portion of said liner and an edge of said mold element, said metal piece having a part thereof extending through one of said openings in said reversely bent portion of said liner and terminating in a hooked end engaging the outer surface of said liner to hold the metal piece in position, said metal piece extending inwardly of said mold element beyond said liner to provide a support for a shelf adapted to be positioned within said chamber, and said metal piece being movable to release its hooked end from said liner and permit same to be detached from said cabinet.

9. In combination, a refrigerator cabinet provided with an inner liner defining walls of a food storage chamber therein, said cabinet having an aperture therein providing an access opening for said chamber, a mold element forming a wall for said chamber access opening, a door for normally closing said opening, shelf supporting means disposed between said liner and said mold element at each side of said chamber access opening, each of said means including a part secured to said cabinet exteriorly of said chamber and concealed by said mold element, and each of said means including another part extending inwardly of the side walls of the chamber access opening to form supports at the front of said chamber for a shelf adapted to be positioned therein.

10. In combination, a refrigerator cabinet provided with an inner liner defining walls of a food storage chamber therein, said cabinet having an aperture therein providing an access opening for said chamber, a mold element forming a wall for said chamber access opening, a door for normally closing said opening, shelf supporting means disposed between said liner and said mold element at each side of said chamber access opening, each of said means including a part secured to said cabinet exteriorly of said chamber and concealed by said mold element, and each of said means including another part extending inwardly of the side walls of the chamber access opening between the chamber proper and the inner face of said door to form supports at the front of said chamber for a shelf adapted to be positioned therein.

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