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REFRIGERATOR CABINET FRAME
CONSTRUCTION

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4 Claims. (Cl. 220—9)

The principal objects of this invention are to provide a construction of refrigerator cabinet in which the metallic structure of the outer wall of the casing is completely insulated from metallic connection with the inner casing structure which is subjected to low temperatures and to provide a reinforcing structure surrounding the opening to the interior of the cabinet which eliminates any metallic parts extending from the inside of the casing to the outer shell, thereby reducing the conduction of heat to the inner casing to the minimum.

A still further and important object is to provide a structure which will present a channel for the reception of wires or conduits leading to the electrical apparatus and the evaporator.

A still further object is to provide a door structure with a construction similar to the frame of the cabinet in which the inner wall of the door is rigidly supported and spaced from the outer wall.

The principal features of the invention consist in spacing the terminal edge of the inner shell from the terminal edge of the cabinet or door and securing rigid reinforcing metal strips upon the spaced edges of said shells and connecting said reinforcing members rigidly with a non-metallic rigid element; the space between the spaced edges of the said shells being enclosed by a non-metallic "breaker strip" supported by independent supports extending from the inner shell structure.

In the accompanying drawing,

Figure 1 is an enlarged horizontal sectional view taken through the adjacent engaging portions of a refrigerator cabinet frame and the door.

Figure 2 is an enlarged sectional perspective detail of a portion of the cabinet frame structure looking from the inward side and illustrating the manner of supporting the "breaker strip" between the inner and outer cabinet shells.

According to the more recent development of the construction of refrigerator cabinets it has been the custom to build inner and outer shells of sheet metal and to arrange a filling of suitable insulating material between the inner and outer shells to prevent the transference of room temperatures to the interior of the refrigerator.

Considerable difficulty has been experienced in supporting the inner shell without having some metallic connection between such shells which results in the formation of frost and the condensation of moisture at spots on the outer shell. Further, it has been found difficult to support the inner shell within the outer shell while maintaining an unbroken surface in the outer shell. This is extremely desirable because the outer shells as now manufactured are enamelled and the use of screws or other fasteners going through this enamelled shell are highly detrimental in

that they create cracks and an undesirable appearance. Also because of the enamel coating on this outer shell, welding is prohibited because the enamel coating has to be completed when the inner and outer shells are separated and it is to overcome these difficulties that the present invention has been devised as well as to accomplish other desirable results.

In reference to the accompanying drawing, the outer shell 1 of the refrigerator casing is formed of a suitable gauge of sheet metal fabricated with a front wall 2 which surrounds the entrance to the inner or refrigerating chamber and the inward edge of the wall 2 is turned inwardly in the form of a flange 3.

A reinforcing strip 4, preferably of a heavier gauge of metal than the outer shell 1 and formed in a U-shape, is arranged on the inner side of the portion 2 of the outer shell with the flange 5 thereof coinciding with the flange 3 and suitably secured thereto by spot welding or otherwise, the flange 3 being not enamel-covered at its inner edge. A flange 6 of the member 4 is preferably much deeper than the flange 5 and gives strength and rigidity to the frame.

Intermediate of the width of the U-shaped reinforcing member 4 there is secured an angle strip 7, one flange thereof being welded to the member 4, and secured to the other flange thereof, preferably by means of metal stitches 8, is a strip of strong insulating material 9, such as vulcanized fibre.

A metal strip 10 of U-shaped cross section has its flanged edge 11 secured to the fibre strip 9 by means of the metal stitches 12.

The inner shell 13 of the refrigerator cabinet, which is formed of enamelled sheet metal, is provided with an offset edge 14 which is secured to the flange 15 of the strip 10 by means of the flat-headed screws 16. It will thus be understood that the inner shell of the refrigerator cabinet is supported around its entire open side by means of the rigid U-shaped member 10 carried by the rigid fibre strip 9 and it will be understood that there is provided around the opening to the interior of the cabinet, a spacious channel X in which wires and conduits leading to and from the evaporator and other mechanism of the refrigerator may be housed, and access to these is obtained through the wide space between the outward edge of the flange 14 of the inner shell of the cabinet and the inturned flange 3 of the outer shell.

The space between these terminal edges of the inner and outer shells is closed by a "breaker strip" 17 which is formed of a strip of fibre or Bakelite and overlaps the outer side of the flange 3 and the offset flange 14. This "breaker strip" is held in place by a plurality of narrow offset bracket arms 18 which are preferably secured to

the inside of the flange 15 of the strip 10 by the screws 16 and the outer ends are secured to the inside of the "breaker strip" by suitable screws or rivets 19. This "breaker strip" 17, as stated, overlaps the flanges 3 and 14 and also covers the screws 16.

The channel X is closed at its bottom ends by plugs of rubber or other suitable non-conducting material through which the pipes or wires pass and prevent circulation of air from other parts of the cabinet and said channel is filled with insulation before the "breaker strip" is secured in place.

If found desirable an insulating washer may be placed between the flange 15 of the reinforcing strip 10 and the brackets 18 for carrying the "breaker strip," but there is very little conducting material to conduct the temperature of the inner casing outwardly to the screws 19. However these screws are not open to external temperature but are enclosed within the refrigerating chamber.

The refrigerating chamber formed by the inner shell 13 is closed by means of the door 20. This door is formed of separate inner and outer shells. The inner shell 21 is formed of sheet metal, preferably enamelled, and from its inner face it is bevelled outwardly and terminates in the flanged edge 22.

A right angled metal strip 23 is rigidly secured to the inner door sheet adjacent to the offset portion 24 thereof and a strip 25 of a rigid insulating material, such as vulcanized fibre, is secured to the member 23 by rivets or stitches 26. A formed sheet metal strip 27 is secured by stitches 28 to the outward edge of the reinforcing strip 25 and the outward edge thereof is curved inwardly and has an intumed flange 29 at its outer edge.

The outer shell 30 of the door structure is formed of an enamelled metal plate having its outer edges rounded and flanged inwardly to fit snugly around the curved outer edges of the strip 27 with an intumed flange 31 overlapping the flange 29, and to which it is preferably secured by welding or otherwise. The inwardly turned edges of the flanges 29 and 31 are spaced from the outward edge of the flange 22 of the inner plate of the door, leaving a narrow slot, separating the inner door shell from the outer sheet, so there will be no direct transference of temperature between the inner and outer shells.

A rubber sealing strip 32, which is preferably hollow, is formed with a flat face to engage the inward faces of the flanges 22 and 31, and has a narrow strip portion 33 provided with a flanged head 34 which is pressed through the narrow slot and grips the opposite edges thereof, thereby holding the rubber strip 32 in position on the flange of the door so that its rounded face will engage the front wall 2 of the outer shell 1 of the refrigerator cabinet, forming an insulating seal therewith.

It will be understood that in both forms of structure, that is, the shell of the cabinet and the construction of the door, the inner shell is supported from the outer shell and frame structure by an insulating strip of fibre which is an extremely poor conductor of heat and in both cases this fibre strip is secured to both inner and outer shell structures by angle-shaped reinforcing steel members.

The structure created is thus very rigid although its weight is extremely light and the structure is such that it is very easily fabricated and neither the door nor the cabinet has fasten-

ing screws or rivets breaking uniform enamelled surfaces.

What I claim as my invention is:

1. A refrigerator cabinet comprising an outer sheet metal shell having an intumed terminal edge flange, a reinforcing sheet metal strip arranged within said outer shell having a flange to coincide with the flange of the shell and a flange spaced therefrom, a rigid strip of insulating material secured to said metal strip intermediately between its flanged edges, a flanged metal strip secured to the inward edge of said insulating strip, an inner shell of sheet metal supported on said flanged metal strip, and an insulating closure member extending between the outward edge of the inner shell and the inward edge of the outer shell.

2. A refrigerator cabinet comprising an outer sheet metal shell having an intumed terminal edge flange, a sheet metal reinforcement arranged within said outer shell having an edge flange to coincide with the flange of the shell and being permanently secured thereto and having its opposite edge flanged inwardly with the intermediate portions bearing against the outer shell and forming a support therefor, a metal angle strip rigidly and permanently connected to the aforesaid reinforcing metal member intermediately between its flanges, a strip of rigid insulating material rigidly secured to the inwardly-extending flange of said angle strip, a U-shaped metal strip secured by its inner flange to said insulating strip, an inner shell having its outward edge rigidly secured to the outer flange of said U-shaped strip, a plurality of bracket strips secured to the outer flanges of said U-shaped strip, and a strip of insulating material secured to said bracket strips and overlapping the outer edge of the inner shell and the intumed edge of the outer shell, said respective insulating strips forming with the associated structure a channel adapted for the reception of wires, conduits or the like.

3. In a refrigerator construction, an outer sheet metal shell having an intumed terminal edge flange, a reinforcing sheet metal strip arranged within said outer shell having a flange to coincide with the flange of the shell, a rigid strip of insulating material secured to said metal strip in parallelly-spaced relation to the flange thereof, a flanged metal strip secured to the inward edge of said insulating strip, an inner shell of sheet metal supported on said flanged metal strip, and an insulating closure member extending between the outward edge of the inner shell and the inward edge of the outer shell.

4. In a refrigerator construction, an outer sheet metal shell having an intumed terminal edge flange, a reinforcing sheet metal strip arranged within said outer shell having a flange to coincide with the flange of the shell, a rigid strip of insulating material secured to said metal strip in parallelly spaced relation to the flange thereof, a flanged metal strip secured to the inward edge of said insulating strip, an inner shell of sheet metal supported on said flanged metal strip, an insulating closure member extending between the outward edge of the inner shell and the inward edge of the outward shell, and individual supporting lugs extending from at least one of said flanged metal strips and presenting offset ends closely underlying said insulating closure member centrally of the width thereof and secured thereto as the sole means of supporting the said insulating closure member in place.