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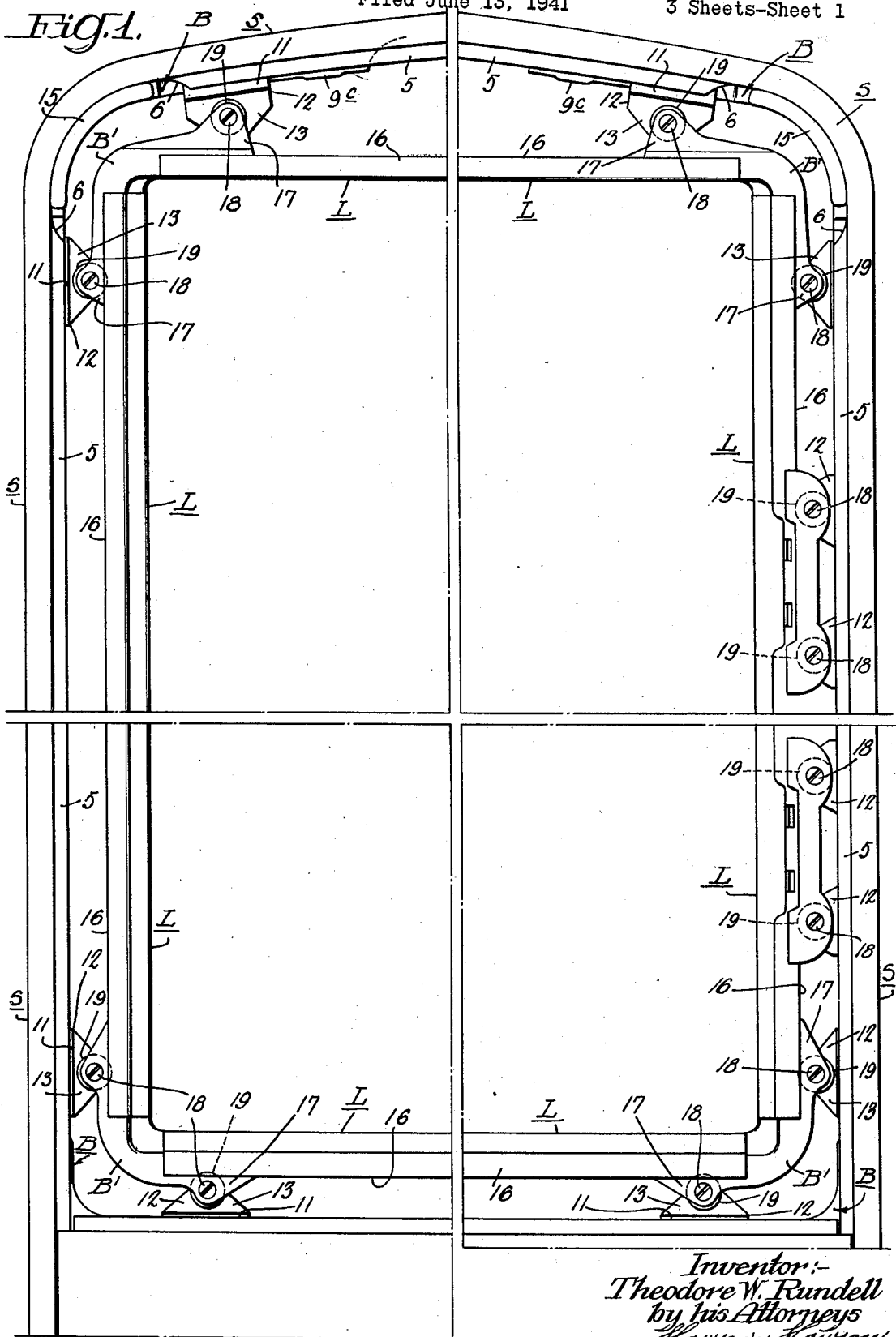
T. W. RUNDELL

2,331,845

REFRIGERATOR CONSTRUCTION

Filed June 13, 1941

3 Sheets-Sheet 1



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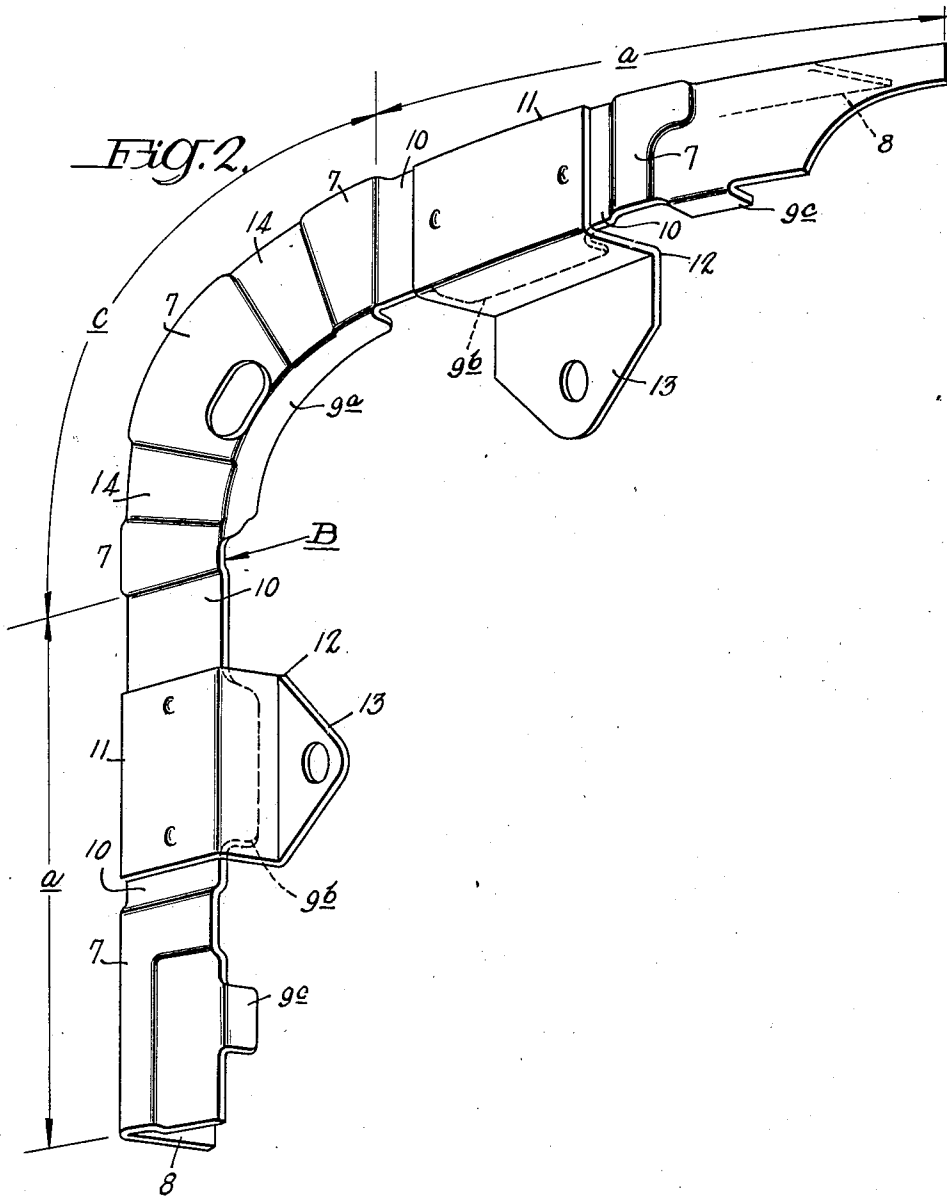
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3 Sheets-Sheet 2



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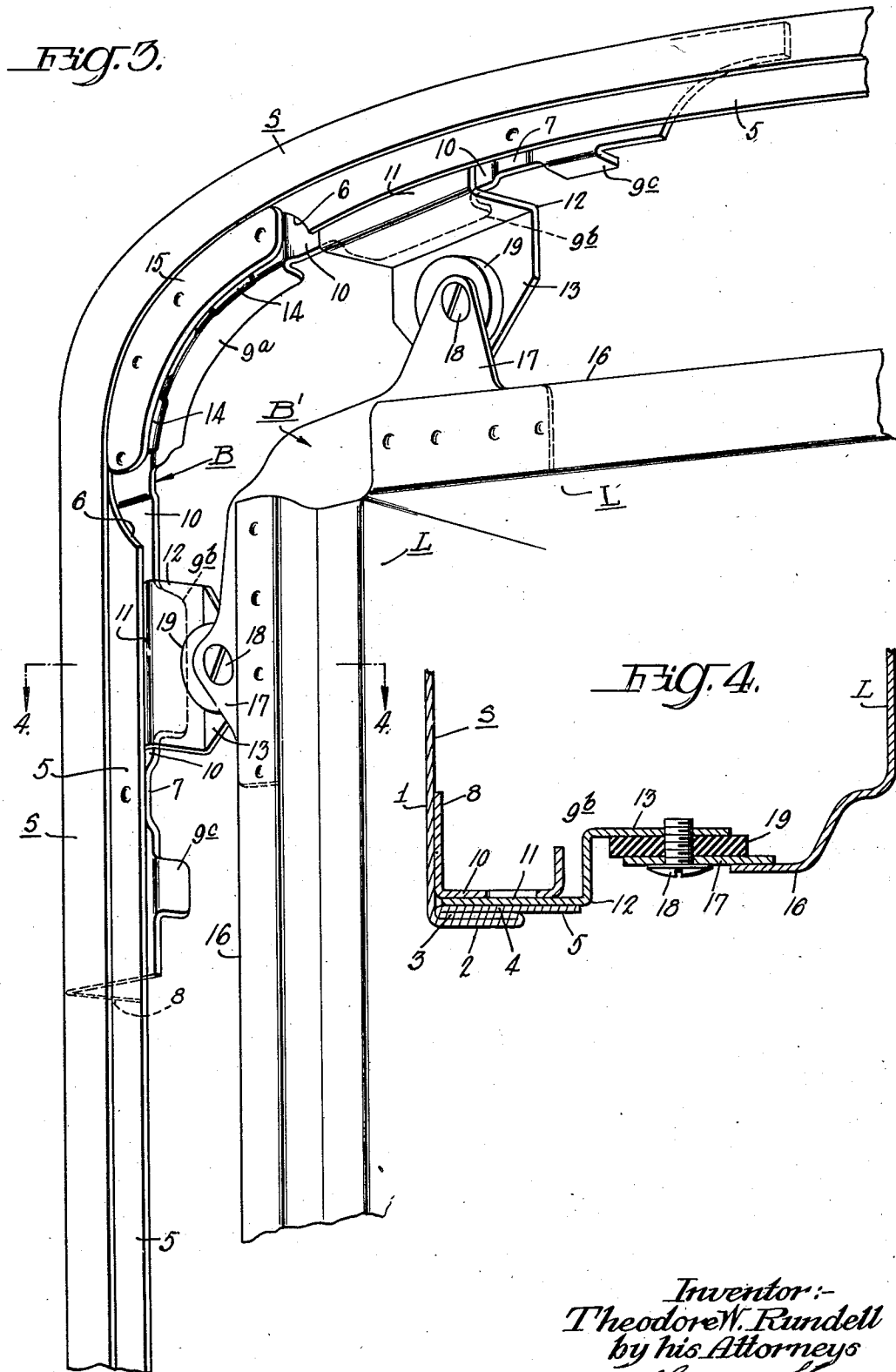
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,331,845

REFRIGERATOR CONSTRUCTION

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5 Claims. (Cl. 220—15)

This invention relates to new and useful improvements in refrigerator cabinet construction and, more particularly, to a novel construction and arrangement for bracing the outer shell of the cabinet and for supporting the cabinet food compartment liner within such outer shell.

In domestic refrigerators having an outer cabinet shell of the top wrap-around type, wherein a sheet of metal of inverted U-shape forms the exterior sides and top of the refrigerator, it is necessary to provide suitable bracing at the upper corners of the outer shell in order to impart strength and rigidity thereto. Heretofore, it has been customary to support the food compartment liner from suitable diagonally arranged corner gussets by providing suitable tabs at the front corners of liner, and to secure these tabs to the diagonal corner gussets at a point midway between their ends. However, this manner of supporting the food compartment liner from the corner gusset braces of the outer shell has been found particularly unsatisfactory for the reason that all of the strain due to the weight of said liner is concentrated at the corners thereof, with the result that, during shipment of the refrigerator, the corners are quite often placed under sufficient tension to cause the porcelain coating on the liner to chip or flake off in the region of the corners. Hence, it is very often necessary to touch up, with paint, lacquer, or other suitable material, the front corner portions of the liner upon arrival of the refrigerator at its destination.

Accordingly, and with the foregoing in mind, the principal object of the present invention is to provide, in a domestic refrigerator, a novel construction and arrangement for bracing the outer cabinet shell, and for supporting the food compartment liner therein in a manner to minimize tension upon said liner, thereby eliminating chipping or flaking of the porcelain coating therefrom.

Another object of the invention is to provide a refrigerator cabinet construction as set forth, wherein adequate bracing of the outer shell and support for the food compartment liner is provided with the use of a minimum quantity of pieces and material.

A further object of the invention is to provide a refrigerator cabinet construction of the type described which is efficient and, at the same time, relatively simple and inexpensive to use.

These and other objects of the invention and the various features and details of the construction and arrangement thereof are hereinafter

fully set forth and described, and shown in the accompanying drawings, in which:

Figure 1 is a fragmentary view in front elevation showing the four corner portions of the front of a refrigerator.

Figure 2 is a view in perspective of an outer cabinet shell brace member made according to the present invention.

Figure 3 is an enlarged view in perspective of the upper left hand corner portion of the refrigerator cabinet shown in Figure 1; and

Figure 4 is a view in section taken on line 4—4, Figure 3.

Referring now more particularly to the drawings, there is disclosed a domestic refrigerator cabinet which comprises an outer shell S of sheet metal, and an inner metal shell or food liner L, the interior of which liner L provides the usual food storage compartment open at the front.

In the present instance, the outer metal shell S of the refrigerator cabinet may be formed of a single piece of sheet metal 1 bent to generally inverted U-shape, to form the outer top and side walls of the refrigerator (see Figure 4). Before this sheet 1 of metal is bent to inverted U-shape, the front edge portion thereof preferably is bent at right angles to the sheet as shown at 2, then is bent back upon itself as at 3 and then again bent, as at 4, reversely upon itself outwardly in a direction parallel to the first bent portion 2 to provide, at the front edge of said sheet, an edge of triple thickness extending along said sheet and at right angles thereto.

The last bent edge portion 4 preferably is of greater length than the bent portions 2 and 3 so that it projects beyond the latter and forms therewith a recessed seat 5 extending continuously along the front edge portion of the shell. This inner flange edge portion 4 is cut-away, as at 6, (see Figure 3), to enable bending of the sheet into the inverted U-shape, aforesaid, and the radii of the upper corners of the bent shell S are such that, with the cut-aways 6 at said corners, the metal of the shell does not wrinkle or require slitting. After the sheet 1 is bent to inverted U-shape to form the outer shell S, the food liner L is inserted within said outer shell, and heat-insulating material (not shown) is disposed between the side and top wall portions of the shell and the food liner in the usual manner.

Now the present invention involves, inter alia, the provision, in a domestic refrigerator, of a novel construction and arrangement of parts for bracing the outer shell S and for supporting the food liner L therein, and referring, there-

fore, to Figure 2 of the drawings, there is disclosed a brace member, generally designated B. This brace member B is of generally channel shape in cross-section for predetermined portions at intervals along the length thereof, and in the remaining portions is substantially L-shape in cross-section. Specifically, the brace member comprises a horizontal web portion 7, a continuous leg portion 8 at its outer edge, and a series of spaced leg portions 9a, 9b and 9c, respectively, located at the inner edge of the web portion 7 and parallel to said leg 8.

The brace member B is bent, as shown in Figure 2, to conform to the curvature of the upper or top corner portions of the cabinet outer shell S, and the construction and arrangement of said brace member B preferably is such that the outer surface of the leg 8 thereof will engage against the inner surface of the corner and adjacent side and top wall portions of said shell, with the outer or forward surface of the web portion 7 of said brace member disposed rearwardly of, and in contact with, the rear surface of the shell bent flange 5, for example, as shown in Figure 3 of the drawings.

Bent to this shape, the brace member B may be said, for purposes of description, to comprise a central corner section c, and adjacent arm portions a which extend from opposite ends of said corner section c. In the web portion 7 of these arm sections a, adjacent section c, there are provided recessed portions 10 to receive the legs 11 of suitable mounting tabs 12 which are securely welded, for example, at the places indicated, to said brace member B in the relative positions shown in Figure 2. The depth of these recessed portions 10 is substantially equal to the thickness of the legs 11 of the mounting tabs 12 so that the outer surfaces of said legs lie in the plane of the surfaces of the adjacent portions of the web portion 7 of said brace member that are not recessed. Another leg portion 13 of the tabs 12 is offset rearwardly with respect to the inturned front edge of the shell S, and these leg portions 13 extend inwardly of said shell in the direction of the food liner L. Likewise, there may be formed in the web portion 7 of the corner section c of the brace member, a plurality of recesses 14, of a depth approximately the same as that of the recessed portions 10 in the brace member arm sections a, the purpose for which is hereinafter set forth.

As previously stated, the shell bent edge portion 4 is cutaway as at 6 at the corners to permit the shell to be bent into inserted U-shape, and, for the purpose of providing a "filler piece" for these cut-away portions of the edge 4 at the corners of the shell, there may be secured to the outer surface of the brace member web portion 7, in its corner section c, an arcuate shaped piece of metal 15 of the same thickness as said shell edge portion 4. This metal piece 15 is of such size and configuration that it fits into the cut-outs 6, and substantially fills them. Such a metal piece 15 may be secured to the web portion of the corner section c of the brace member B by welding, for example, at the places indicated in Figure 3 of the drawings, and, thus positioned, the previously mentioned recesses 14 cooperate therewith to provide clearance or space at the rear of the filler piece 15 thereby permitting suitable breakerstrip securing means to be attached to the inner edge of said filler piece 15. Of course, a filler piece, such as 15, may or may not be employed, as desired, and, even

if employed, may be secured to the brace member B, as aforesaid, either before or after said brace member is secured in place at the top corners of the shell S.

A brace piece B, with the tabs 12 welded thereto, as aforesaid, is placed within the outer shell S of the refrigerator cabinet at the top corners thereof, in the manner and relation shown in the drawings, with the web portions 7 of said brace members, and the legs 11 of said tabs 12, abutting the rearward surface of the shell edge portion 4, and with the leg 8 of said brace member abutting the adjacent side and top wall portions of said shell S throughout the entire length of said brace members. Thus positioned, the web portion 7 of the brace member B, and the shell edge portion 4 are welded together to secure the brace members permanently within the shell. It will be seen, by this construction and arrangement, that the brace members B greatly strengthen the corners of the shell S, and that an even more important factor, the tabs 12 which are welded to the said brace members, are firmly secured and spaced with respect to each other and the cabinet shell S.

In generally similar manner, there is secured to each of the front corners of the food liner L, an angularly shaped bracket or brace member B'. These brace members B' each comprise a central corner "filler piece," arranged to fill in the corner of the food liner L between the adjacent ends of the front edge portions 16 of said liner (see Figure 3), and comprise, also, arm portions which extend at right angles with respect to each other from opposite ends of the corner section, and are arranged to abut the inner surfaces of the top and side flange edge portions 16 of the liner adjacent the corners thereof.

The aforesaid arm portions of these brace members B' include tabs 17 which project beyond the liner flange portions 16 in the direction of the outer shell S, and these tabs 17 and the tabs 12 of the brace members B, are so positioned and arranged with respect to one another that each of said tabs 17 of the member B' are spaced forwardly of the corresponding tab 12 on the shell brace member B with suitable screw apertures, provided in each thereof, properly aligned.

While the foregoing description of the invention has been confined, for the purpose of brevity, to the top corner portions of the outer shell and liner of the refrigerator cabinet, it is pointed out that brace members B' likewise are provided also at the lower corner portions of the liner and that brace members B are secured at the adjacent corners or junction of the shell side walls and a cabinet cross-frame member at the bottom of the refrigerator food storage compartment.

Thus, with the brace members B and B' secured, as aforesaid, to the shell S and liner L, respectively, the liner may be positioned within the said shell and properly supported therein by securing together the corresponding pairs of the tabs 17 and 12 by means of screws or the like 18, a suitable washer or like element 19 of suitable insulating material, preferably being interposed between the corresponding sets of tabs, as shown in Figure 4, to provide the usual thermal break between the liner L and outer shell S of the refrigerator cabinet.

From the foregoing, it will be seen that the present invention provides an arrangement

wherein the outer shell S is braced continuously around the bend of the top corners thereof, and also at its side walls, with the result that great strength and rigidity are imparted to the cabinet and, at the same time, the tabs 12, being welded to the brace members and clamped between them and the shell front edge flange 5, are rendered immovable relative to each other and to the shell. Also, and of equal, if not greater, importance is the fact that by the present construction the tabs 17, associated with the brace members B' at the top and bottom corner portions of the food liner L, not only are spaced from each other, but are spaced or removed also from the corners of said food liner. This arrangement of the tabs 17 provides a construction wherein stresses and strains, due to movement of the liner during shipment of the refrigerator, are not transmitted to and concentrated at the corners of the food liner but, by reason of the tabs, spaced as aforesaid, are transmitted to the flange portions 16 of the liner L in which they are distributed and spent to an extent sufficient to prevent excessive stress and strain at the corners of said liner, and, in actual practice, this construction has been found to eliminate, substantially entirely, chipping or flaking off of the procelain at the corners of the food liner, while at the same time providing such a construction that is both inexpensive and efficient from the standpoint of bracing and supporting the shell and liner with respect to each other.

While a particular embodiment of the invention has been herein illustrated and described, it is not intended that said invention be limited to this disclosure, but that changes and modifications may be made and incorporated therein within the scope of the annexed claims.

I claim:

1. In a domestic refrigerator cabinet construction comprising a one-piece sheet metal outer shell bent to form the top and side walls of the cabinet, said shell having an inturned front edge flange at right angles to the top and side walls thereof, a food liner disposed within the shell and spaced therefrom, said food liner having front edge flanges extending in the direction of the front edge flange of said shell, an elongated reinforcing member shaped to the configuration of the top corner and adjacent wall portions of the shell and secured interiorly of said shell around the top corner portions thereof in abutting relation with the inner surface of the front edge flange of the shell and in continuous bracing contact with the inner surface of the corner and adjacent side and top wall portions thereof, said reinforcing member extending continuously between points at opposite sides of the corner portions and having supporting tabs thereon adjacent the ends of said member so that said tabs are disposed at respectively opposite sides of each top corner of the shell, a reinforcing member secured to the flanges of the food liner at the top corner portions thereof and having tabs thereon spaced from each other and from each top corner of said liner at respectively opposite sides thereof, said tabs being correspondingly positioned with respect to the tabs of the reinforcing members of the outer shell, and means connecting together the corresponding pairs of the tabs of the reinforcing members of the outer shell and food liner.

2. A refrigerator cabinet construction as claimed in claim 1 wherein the supporting tabs

are secured to the shell corner reinforcing members and the portions of the shell corner reinforcing members to which the tabs are secured are recessed a depth equal to the thickness of said tabs so that the outer surfaces of the latter reside in the plane of the surfaces of the portions of said members adjacent said recessed portions thereof.

3. In a domestic refrigerator cabinet construction comprising a one-piece sheet metal outer shell bent to form the top and side walls of the cabinet, said shell having an inturned front edge flange at right angles to the top and side walls thereof, a food liner disposed within the shell and spaced therefrom, said food liner having front edge flanges extending in the direction of the front edge flange of said shell, an elongated rigid reinforcing member shaped to the configuration of the top corner and adjacent wall portions of the shell and extending therein around the top corner portions of said shell between points located at respectively opposite sides of said top corner portions, said reinforcing members being of channel shape in cross-section along spaced portions of their length and being disposed with the web portions thereof in abutting relation with the inner surface of the front edge flange of the shell and with a leg portion thereof disposed in continuous bracing contact with the inner surface of the top corner and adjacent side and top wall portions thereof, and said reinforcing member being secured to said front edge flange of the shell and having supporting tabs thereon adjacent the ends of said member so that said tabs are disposed at respectively opposite sides of each top corner of the shell, a reinforcing member secured to the flanges of the food liner at the top corner portions thereof and having tabs thereon spaced from each other and from each top corner of said liner at respectively opposite sides thereof, said tabs being correspondingly positioned with respect to the tabs of the reinforcing members of the outer shell, and means connecting together the corresponding pairs of the tabs of the reinforcing members of the outer shell and food liner.

4. In a domestic refrigerator cabinet construction comprising a one-piece sheet metal outer shell bent to form the top and side walls of the cabinet, said shell having an inturned front edge flange at right angles to the top and side walls thereof, a food liner disposed within the shell and spaced therefrom, said food liner having front edge flanges extending in the direction of the front edge flange of said shell, an elongated reinforcing member shaped to the configuration of the top corner and adjacent wall portions of the shell and secured interiorly of said shell around the top corner portions thereof in abutting relation with the inner surface of the front edge flange of the shell and in continuous bracing contact with the inner surface of the corner and adjacent side and top wall portions thereof, said reinforcing member extending continuously between points at opposite sides of the corner portions and having supporting tabs thereon adjacent the ends of said member so that said tabs are disposed at respectively opposite sides of each top corner of the shell, reinforcing members secured respectively to opposite sides of the shell and cabinet construction adjacent the bottom corner portions of the food liner and embodying tabs spaced from each other, reinforcing members secured to the food liner at each corner portion thereof and having

tabs thereon spaced from each other and from each top corner of said liner at respectively opposite sides thereof, said tabs being correspondingly positioned with respect to the tabs of the reinforcing members of the outer shell, and means connecting together the corresponding pairs of the tabs of the reinforcing members of the outer shell and food liner.

5. In a domestic refrigerator cabinet construction comprising a one-piece sheet metal outer shell bent to form the top and side walls of the cabinet, said shell having an intumed front edge flange at right angles to the top and side walls thereof, a food liner disposed within the shell and spaced therefrom, said food liner having front edge flanges extending in the direction of the front edge flange of said shell, an elongated rigid reinforcing member shaped to the configuration of the top corner and adjacent wall portions of the shell and extending therein around the top corner portions of said shell between points located at respectively opposite sides of said top corner portions, said reinforcing members being of channel shape in cross-section along spaced portions of their length and being disposed with the web portions thereof in abutting

relation with the inner surface of the front edge flange of the shell and with a leg portion thereof disposed in continuous bracing contact with the inner surface of the top corner and adjacent side and top wall portions thereof, and said reinforcing member being secured to said front edge flange of the shell and having supporting tabs thereon adjacent the ends of said member so that said tabs are disposed at respectively opposite sides of each top corner of the shell, reinforcing members secured respectively to opposite sides of the shell and cabinet construction adjacent the bottom corner portions of the food liner and embodying tabs spaced from each other, reinforcing members secured to the food liner at each corner portion thereof and having tabs thereon spaced from each other and from each top corner of said liner at respectively opposite sides thereof, said tabs being correspondingly positioned with respect to the tabs of the reinforcing members of the outer shell, and means connecting together the corresponding pairs of the tabs of the reinforcing members of the outer shell and food liner.

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