July 12, 1938. L. C. LUNEKE 2,123,588

REFRIGERATING APPARATUS

Filed May 15, 1936 2 Sheets-Sheet 1

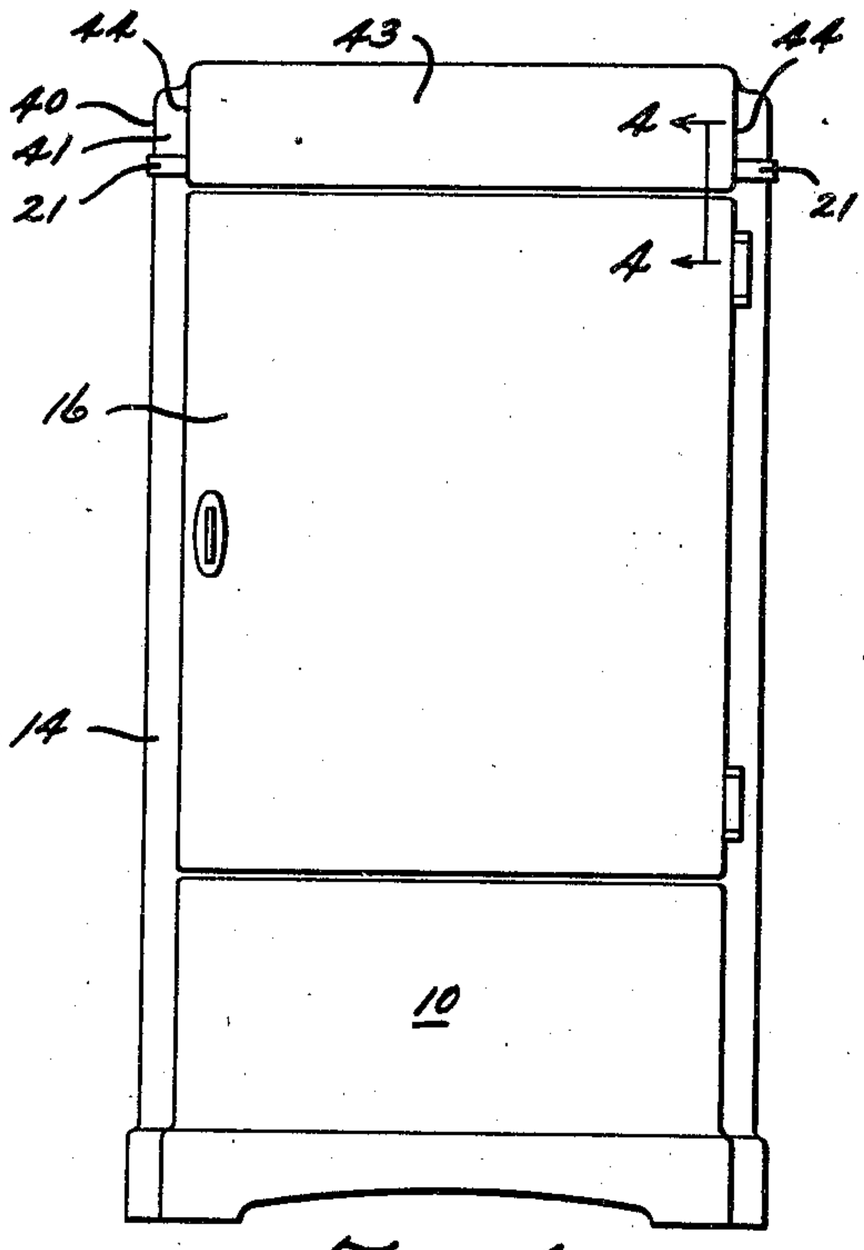

Fig. 1

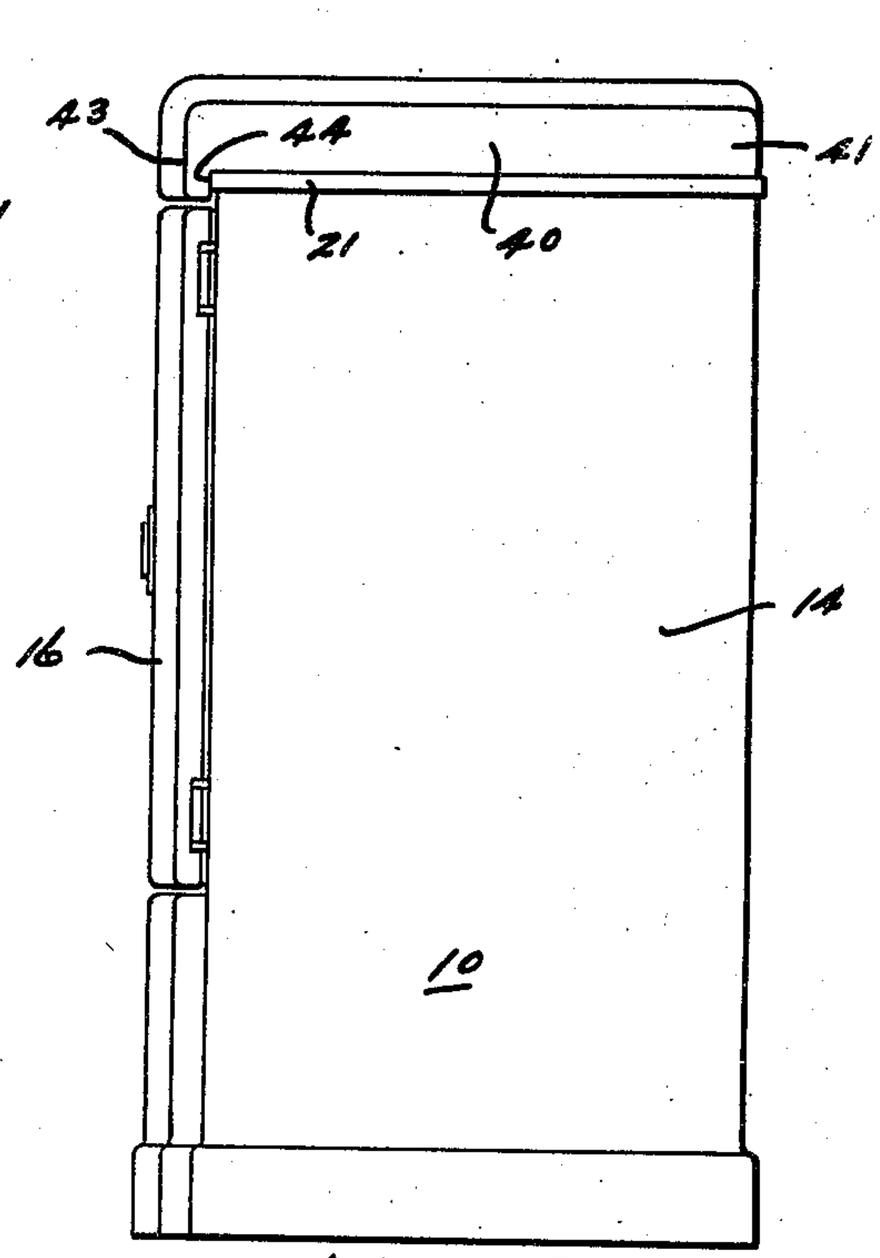

Fig. 2

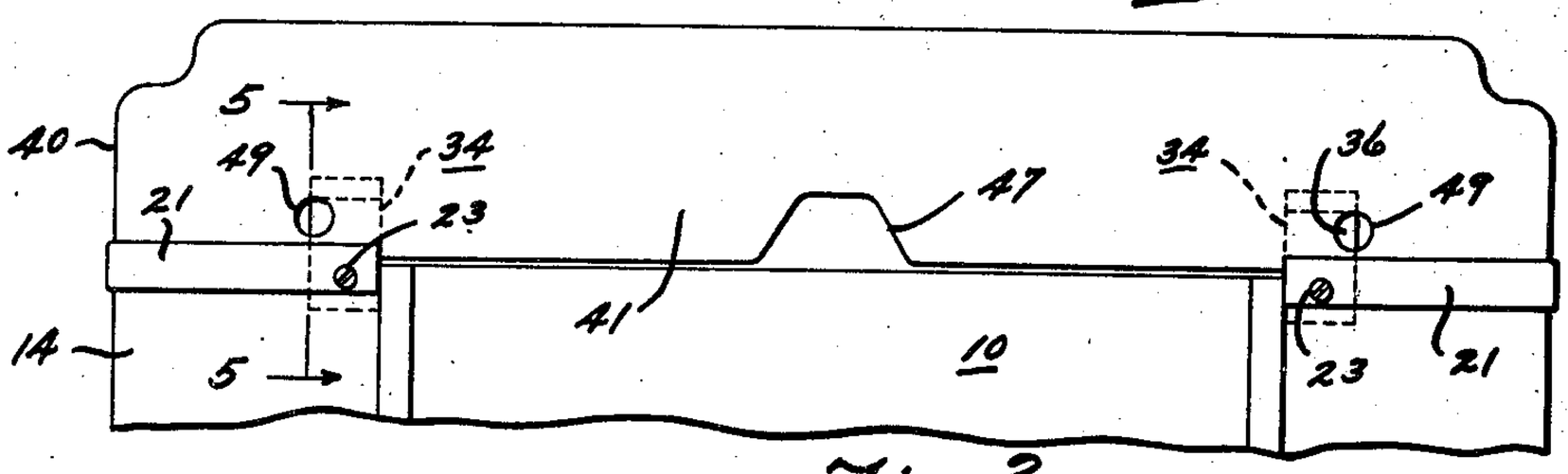

Fig. 3

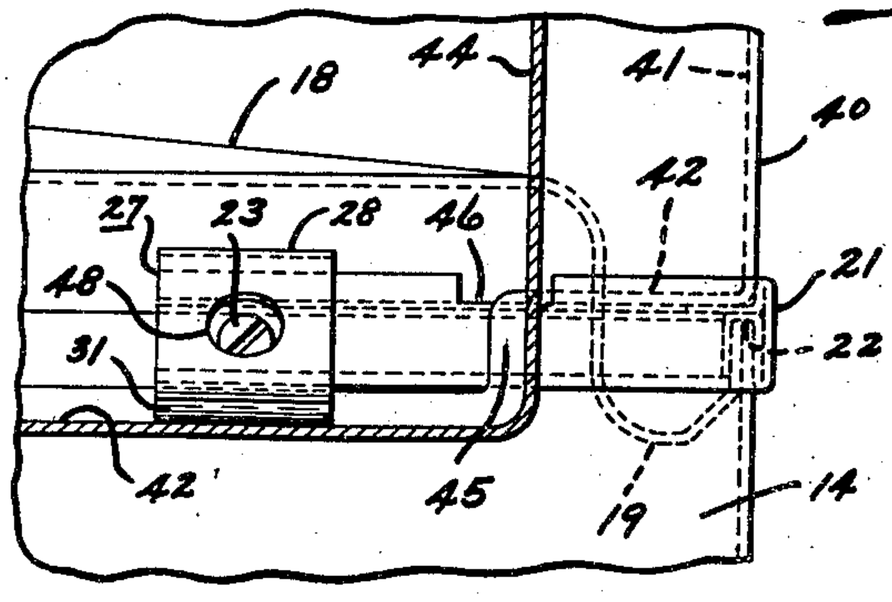

Fig. 6

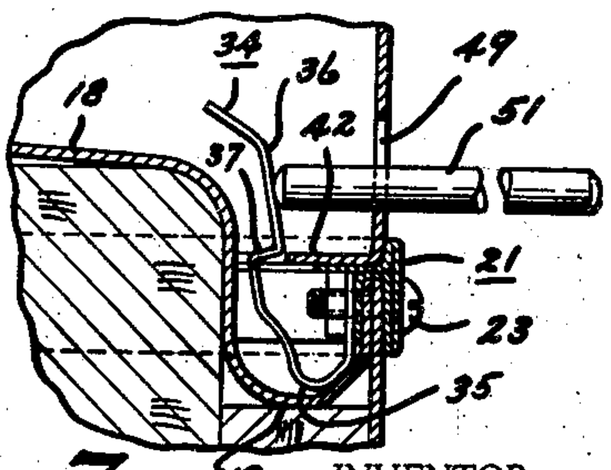

Fig. 7

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REFRIGERATING APPARATUS

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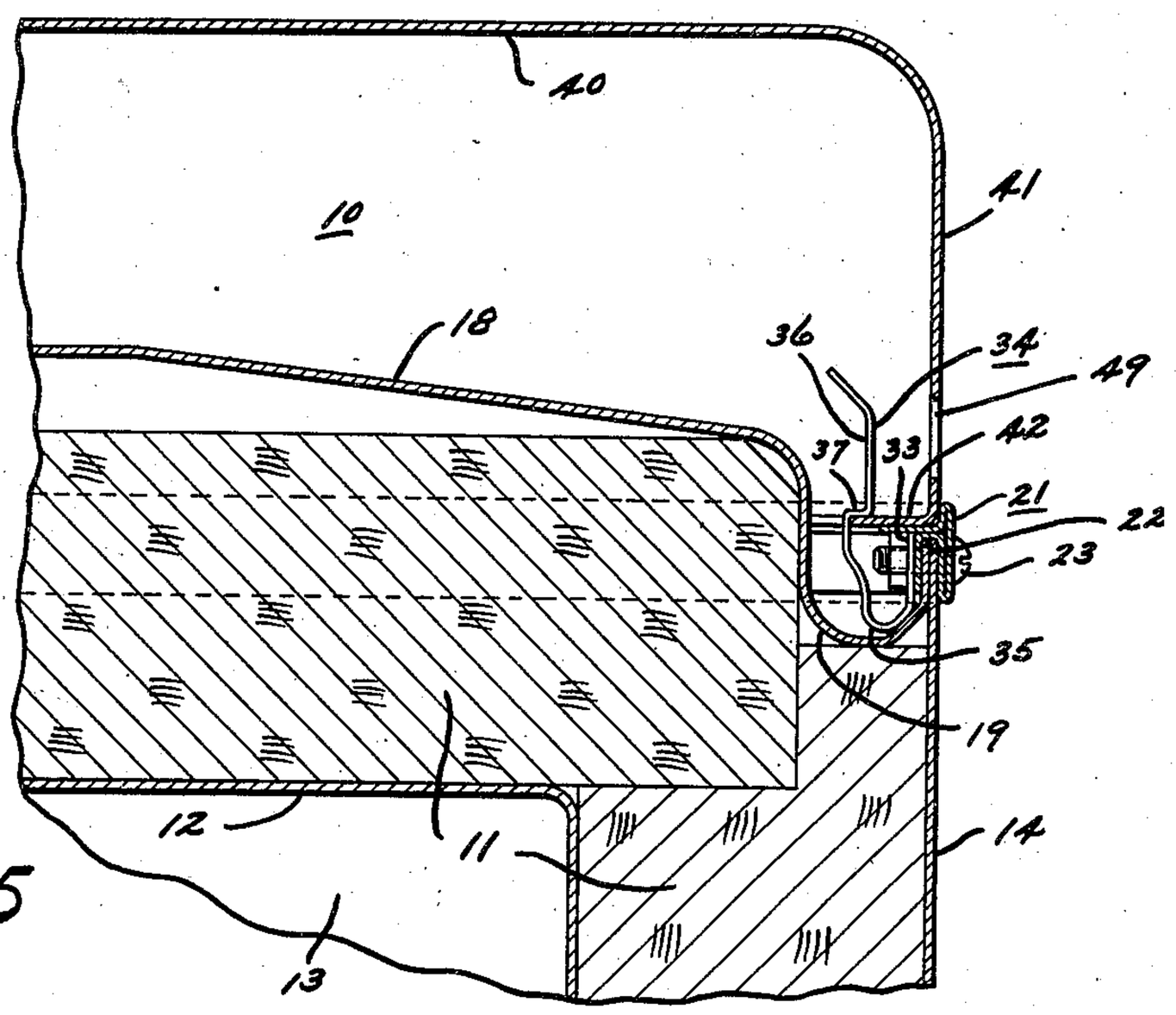

Fig. 5

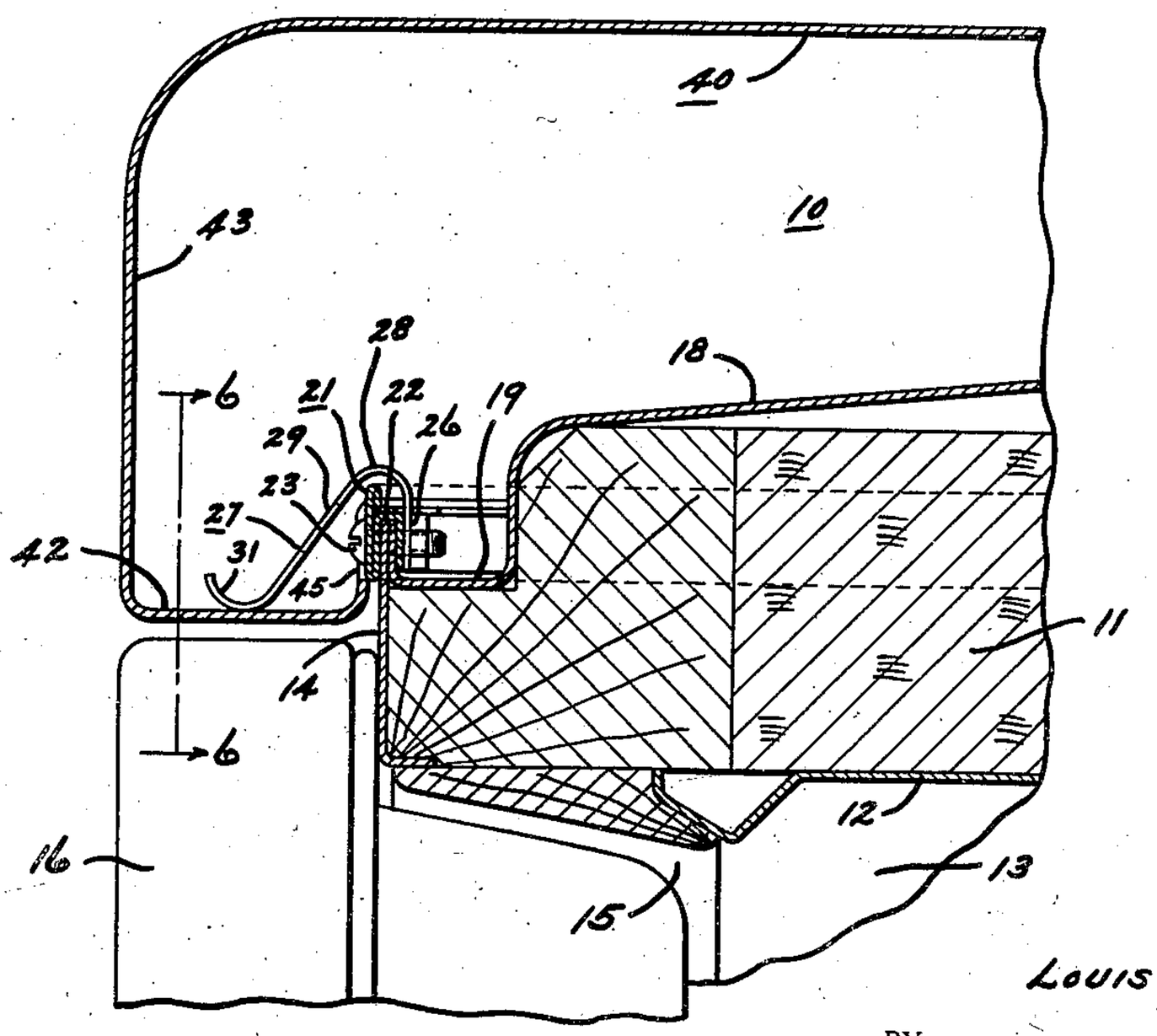

Fig. 4

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UNITED STATES PATENT OFFICE

2,123,588

REFRIGERATING APPARATUS

Louis C. Luneke, Dayton, Ohio, assignor to General Motors Corporation, Dayton, Ohio, a corporation of Delaware

Application May 15, 1936, Serial No. 79,983

5 Claims. (Cl. 220—55)

This invention relates to cabinets and particularly to insulated refrigerator cabinets.

At present refrigerator cabinets having a refrigerating system mounted therein are shipped from a factory to various localities for installation in crates or the like to prevent damage to the refrigerating apparatus. It is customary to place the refrigerator cabinet within a crate with the top and bottom of the cabinet rigidly secured to the crate to prevent movement of the cabinet relative to the crate during shipment thereof. In order to rigidly secure or clamp the cabinet within a crate the exterior finished metal top wall of the cabinet is omitted from the structure placed in the crate and is shipped separately therefrom. This separate shipping of the cabinet finished top wall permits the top portion as well as the leg or bottom portion of the cabinet to be rigidly anchored to the interior of a crate in any suitable or desirable manner. However, this shipping of the cabinet exterior finished metal top wall presents the problem of providing some means for readily attaching the top wall to the cabinet during installation of the refrigerating apparatus and my invention therefore particularly relates to the provision of a refrigerator cabinet exterior finished top wall that can be removably attached to a refrigerator cabinet without damaging same and without impairing its neat exterior finish or obstructing the general contour of the cabinet exterior walls.

An object of my invention is to provide an improved refrigerator cabinet construction.

Another object of my invention is to provide a refrigerator cabinet with an exterior finished top wall that can be removably attached to the cabinet to provide access beneath same for any desirable purpose.

A further object of my invention is to provide a refrigerator cabinet with an exterior finished top wall that is removably attached to the cabinet by improved clamping or attaching means which are concealed from view and do not obstruct the exterior contour of the cabinet.

In carrying out the foregoing objects it is a still further object of my invention to provide means permitting access to the improved and concealed cabinet exterior top wall clamping or attaching means so as to permit detachment of the cabinet top wall when desired and which access means does not impair the neat appearance 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 elevational view of a refrigerator cabinet having my invention embodied therein;

Fig. 2 is a side elevational view of the refrigerator cabinet disclosed in Fig. 1;

Fig. 3 is a fragmentary elevational view of the rear top portion of the cabinet disclosed in Figs. 1 and 2;

Fig. 4 is an enlarged sectional view of a front portion of the refrigerator cabinet showing one of the concealed cabinet top wall attaching means and is taken on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged sectional view of a rear portion of the refrigerator cabinet showing another of the concealed cabinet top wall attaching means and is taken on the line 5—5 of Fig. 3;

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 4 showing the front of the cabinet top wall attaching means; and

Fig. 7 is a fragmentary sectional view similar to Fig. 5 showing the cabinet top wall attaching means at the rear of the cabinet in released position.

Referring to the drawings, for illustrating the present invention, I have shown in Fig. 1 thereof a refrigerator cabinet of the household type generally represented by the reference character 10. Cabinet 10 may be of the usual or conventional construction including insulated walls 11 (see Figs. 4 and 5) surrounding a liner 12 which forms a food storage compartment 13 therein and which walls 11 are enclosed in a plurality of metal panels or a metallic shell 14 that form the exterior walls of the cabinet. The panels or shell 14 are coated with porcelain enamel or the like to provide a highly finished exterior for cabinet 10. The food storage compartment 13 is provided with access opening 15 (see Fig. 4) at the front of cabinet 10 which opening is closed by a door 16. A sheet metal sub-top 18 is disposed over the insulation 11 at the top of cabinet 10. This sub-top 18 may have studs or bolts (not shown) of any suitable construction or form secured thereto and which may serve as attaching means to secure the top portion of cabinet 10 rigidly within a crate or the like during shipment of the refrigerator cabinet. The cabinet sub-top 18 is of an inverted pan-shape and has an outwardly and upwardly extending periphery flange 19. The upstanding portion of flange 19, on the cabinet sub-top 18, abuts the upper end of the metal panels or shell 14 of cabinet 10 and is adapted to

be secured thereto. A pair of decorative trim strips or bands, generally indicated at 21, of any suitable material, preferably Monel metal or stainless steel, each extending from one side of the front of cabinet 10 around the front corner thereof and along the cabinet side wall and thence around the cabinet rear corner to a point at one side of the cabinet back wall. These trim strips or bands 21 have a reverse bend portion 22 which provides a groove receiving and fitting over the top edge of shell 14 and the upstanding periphery portion of flange 19 on pan 18. Any suitable number of bolts or the like 23 may extend through the trim strips 21, top edge portion of shell 14 and through the peripheral upstanding portion of flange 19 on pan 18 to firmly secure the cabinet sub-top 18 to shell 14. In the present disclosure only four such bolts 23 are shown because the four bolts 23 have been found to be sufficient to rigidly secure the cabinet sub-top 18 to the cabinet outer walls or shell 14 and because the design of the trim strips disclosed are such that they cannot get out of aligned position when the cabinet exterior finished metal top to be hereinafter more fully described is assembled onto the cabinet.

It will be noted that the bolts 23 at the front of cabinet 10, which secure the cabinet sub-top 18 to shell 14, also clamp a vertically extending portion 26 of spring 27 between the bolts and the trim strip 21. There are two of the clips 27 at the front cabinet 10 one of which is located on each side of the cabinet front wall. Spring clips 27 include the vertically extending securing portion 26, a curled-over portion 28 and a downwardly directed portion 29 having a turned over end 31. It will be noted that the bolts 23 at the rear of the cabinet 10, which secure the cabinet sub-top 18 to shell 14, also clamp the vertically extending portion 33 of spring clips, generally represented by the reference character 34, between the bolts and the trim strip 21. There are two of the clips 34 at the rear of cabinet 10 one located on each side of the cabinet rear wall. Spring clips 34 include the vertically extending securing portion 33, a curled-over portion 35 and an upstanding portion 36. A part of the clips 34 located intermediate the portions 35 and 36 thereof are bent to provide a shoulder 37 for a purpose to be hereinafter described. Both sets of clips 27 and 34 are preferably formed of spring metal and these clips normally apply pressure in the direction of their mounting upon cabinet 10.

A cabinet top or hood 40 formed of metal having a highly finished coating of porcelain enamel or the like thereon to match the finish provided on the cabinet side walls 14 is adapted to be secured to the cabinet 10. This finished cabinet top is provided with downwardly extending side walls 41 which have their lower edge bent inwardly to provide the flange 42 around the bottom thereof. It will be noted that the top 40 has an outwardly bulged part 43 at the front thereof and this part 43 of top wall 40 is of the same contour as the outer face of the cabinet door 16 and is in the same vertical alignment therewith. The bulged part 43 of top 40 extends across the major portion of the cabinet front but terminates short of the cabinet front corners so as to correspond with the width of door 16. The bulged part 43 of top 40 is bent backwardly as at 44 (see Figs. 1 and 6) toward the cabinet front wall. The flange 42 along the lower edge of the top 40 extends entirely around the top including the front bulged portion 43 thereof. This flange 42 extends or is bent down as at 45 through a cut-away part 46 of the trim strips 21 (see Figs. 4 and 6) beyond the lower extremity thereof which extends around the side and back wall of the top 40. It will be seen that the bulged out part 43 of the cabinet top 40 extends downwardly of the main body portion thereof to a point closely adjacent the top edge of the door 16 to conceal the clips 27 at the front of cabinet 10. The cabinet top 40 is provided with the cut-away portion 47 (see Fig. 3) in its rear wall 41 for the passage therethrough of refrigerant pipe lines or electrical cords, (not shown). These refrigerant pipes may lead to an evaporator of a refrigerating system disposed within the food compartment 13 of cabinet 10 and the electrical cords may lead through the opening 47 to suitable control switches mounted beneath the top 40. It will be noted that the spring clips 27 at the front of cabinet 10 are provided with an opening 48 (see Fig. 6) in the downwardly directed part 29 thereof and that these openings 48 permit access to the screw head parts of bolts 23 of a screw-driver or the like for tightening the bolts at the front of the cabinet. There is also an opening 49 (see Figs. 3, 5 and 7) provided near the back wall 41 of top 40 adjacent each back spring clip 34 and this opening 49 is for the purpose of permitting any suitable tool such as a rod or the like 51 (see Fig. 7) to be extended through the back wall 41 of top 40 into engagement with the spring clips 34 as will be presently described.

Having described and illustrated the construction of the improved cabinet 10 I will now proceed to describe the assembly of top 40 onto the cabinet and the detachment therefrom. Assuming that the cabinet 10 has been installed in a home or the like the finished top 40 thereof, which has been shipped separately of the cabinet, is now ready to be placed upon and secured to the cabinet. The top 40 is placed upon and extends over the front portion of cabinet 10 in a tilted position; that is, the front portion of top 40 is permitted to rest upon the front of cabinet 10 while the back portion thereof is held by the hands of the operator above the cabinet to permit the front part of top 40 to be slid under the ends 31 of front clips 27. After the flange 42 has been located under the clips 27 the front portion of top 40 is raised and moved rearwardly of cabinet 10 so that the wall 41 adjacent the outwardly bulged wall 44 can be placed behind the trim strip 21 at the front of cabinet 10. The inner upstanding front edge portion of flange 42 will ride past the curled-over end 31 of the front spring clips 27 and the top 40 will engage the front wall of cabinet 10. This raising of the front of top 40 to position the front wall 41 thereof behind strip 21 along the front wall of cabinet 10 elevates the end 31 of clips 27 but the clips assume their normal position shown in the drawings when the front part of the top is again lowered behind the strip 21. The top 40 is now attached to the front of cabinet 10 and the rear of the top can be lowered into position. The raised back part of top 40 is then moved downwardly so that the inner edge of flange 42 formed thereon engages the rear spring clips 34 and rides over the shoulder 37 provided thereon. It is therefore apparent that the end 31 of the front spring clips 27 bears against the horizontal flange 42 of top 40 at the front thereof to hold the top

in position and to prevent movement thereof relative to cabinet 10 along the cabinet front wall. The shoulder 37 provided on the rear spring clips 34 fits over the edge of flange 42 and locks the top upon the cabinet at the rear thereof. The underside of flange 42 provided on top 40 rests upon an inwardly directed part of trim strips 21 and conceals the spring clips 27 and 34 from view.

To detach the finished top 40 from cabinet 10 the tools or rods 51 are pushed through the openings 49 at the rear of cabinet 10 into engagement with the spring clips 34. Force applied to the tools or rods 51 moves spring clips 34 into the position disclosed in Fig. 7 of the drawings to release shoulders 37 from flange 42 formed around the bottom of the side walls 41 of top 40. The top 40 can now be elevated away from or out of engagement with the clips 34 at the rear of the cabinet. The front portion of top 40 is then raised, while holding the rear portion thereof upwardly of cabinet 10, to release the front wall of the top from behind the trim strip 21. Top 40 is then slid forwardly of cabinet 10 until the raised inner edge of flange 42, which is provided only along the front of top 40, passes under the ends 31 of the front clips 27. Top 40 is now released from its associated securing clips or clamps and can be removed from the cabinet. Removal of top 40 from cabinet 10 permits access to refrigerant pipes or valves and electric switches which as hereinbefore stated may be mounted beneath the top 40 and above the cabinet subtop 18.

From the foregoing it will be seen that I have provided an improved refrigerator cabinet construction in which the finished exterior top wall thereof is removably secured to the cabinet by clamping means that are concealed from view by the removable or detachable cabinet top wall. The finished top wall is thereby rigidly secured to the cabinet to prevent vibration thereof. The removable top wall by concealing the means which secures same to the cabinet greatly improves the appearance of the cabinet and permits the top finished wall to be formed in any desired shape to conform to the outline of the cabinet. The improved securing means disclosed permits the exterior cabinet side walls and its top wall to be coated with any desirable material without danger of damaging the finish thereon when removing the top wall from the cabinet or when placing same thereon.

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. A refrigerator cabinet having finished metal side walls and a finished metal top wall, a decorative metal strip fitted over the top edge of said cabinet side walls and extending therealong, means for securing said strip to said cabinet side walls, said top wall having downwardly directed sides resting upon said decorative strip, a plurality of spring clips attached to said cabinet walls by said strip securing means and adapted to engage a part of the downwardly directed sides of said top to secure the top to said cabinet, said spring clips being located inwardly of the walls of said cabinet and concealed thereby, and one of said cabinet walls having an opening therein providing access to certain of said spring clips from the exterior of said cabinet for disengaging the clips from said top wall to permit removal of said top wall from the cabinet.

2. A refrigerator cabinet having finished metal side walls and a finished metal top wall, a decorative metal strip fitted over the top edge of said cabinet side walls and extending therealong, means for securing said strip to said cabinet side walls, said top wall having downwardly directed sides resting upon said decorative strip, a plurality of spring clips attached to said cabinet walls by said strip securing means and adapted to engage a part of the downwardly directed sides of said top to secure the top to said cabinet, said spring clips being located inwardly of the walls of said cabinet and concealed thereby, and said top wall having an opening in the back downwardly directed wall thereof providing access to a spring clip from the exterior of said cabinet for disengaging the clip from said top wall to permit removal of said top wall from the cabinet.

3. A refrigerator cabinet having finished metal side walls and a finished metal top wall, a decorative metal strip fitted over the top edge of said cabinet side walls and extending therealong, means for securing said strip to said cabinet side walls, said means including a pair of spring clips at the front of said cabinet and a second pair of spring clips at the rear of the cabinet, said top wall having downwardly directed sides and inwardly directed flange portions resting upon said decorative strip, said spring clips engaging the inwardly directed flange portions on said top to secure said top to said cabinet, said spring clips being located inwardly of the walls of said cabinet and concealed thereby, and said cabinet top having a pair of openings in the back wall thereof adjacent said pair of spring clips at the rear of the cabinet providing access to said rear spring clips from the exterior of said cabinet for disengaging the clips from said flange on said top to permit removal of said top from said cabinet.

4. A refrigerator cabinet having finished metal side walls and a finished metal top wall member, said top wall member having downwardly directed sides registering with and forming upwardly directed continuations of the cabinet side walls, the lowermost portion of the downwardly directed sides of said top wall member terminating with inwardly directed flange means adapted to rest upon the tops of the cabinet side walls, a spring clip attached to one of said cabinet side walls and having its free movable end extending above the lowermost portion of the downwardly directed sides of said top wall member and adapted to fit over and engage the inwardly directed flange means on said top member, said spring clip being located inwardly of the finished walls of said cabinet and concealed thereby, one of the downwardly directed sides of said top wall member having a small opening therein adjacent said free movable end of said spring clip providing access thereto, and said end of said spring clip being movable from the exterior of said cabinet for disengaging said clip from said flange on said top wall member to permit removal of the top from the cabinet.

5. A refrigerator cabinet having finished metal side walls and a finished metal top wall member, said top wall member having downwardly directed sides registering with and supported upon the tops of said cabinet side walls to form upwardly directed continuations thereof, the downwardly directed sides of said top wall member terminating with inwardly directed flange means, means

for securing said top wall member to said cabinet, said means including a pair of spring clips at the front of said cabinet and a second pair of springs at the rear of said cabinet, said spring clips engaging the inwardly directed flange means on said top wall member, and being located inwardly of the walls of said cabinet and concealed thereby, and said back wall of said cabinet having a pair of small openings therein adjacent said second pair of spring clips providing access thereto, and said second pair of spring clips being movable from the exterior of said cabinet for disengaging said rear spring clips from said flange on said top wall member to permit removal of the top wall from the cabinet.

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