June 25, 1940. F. M. SMALL 2,205,826

CABINET STRUCTURE

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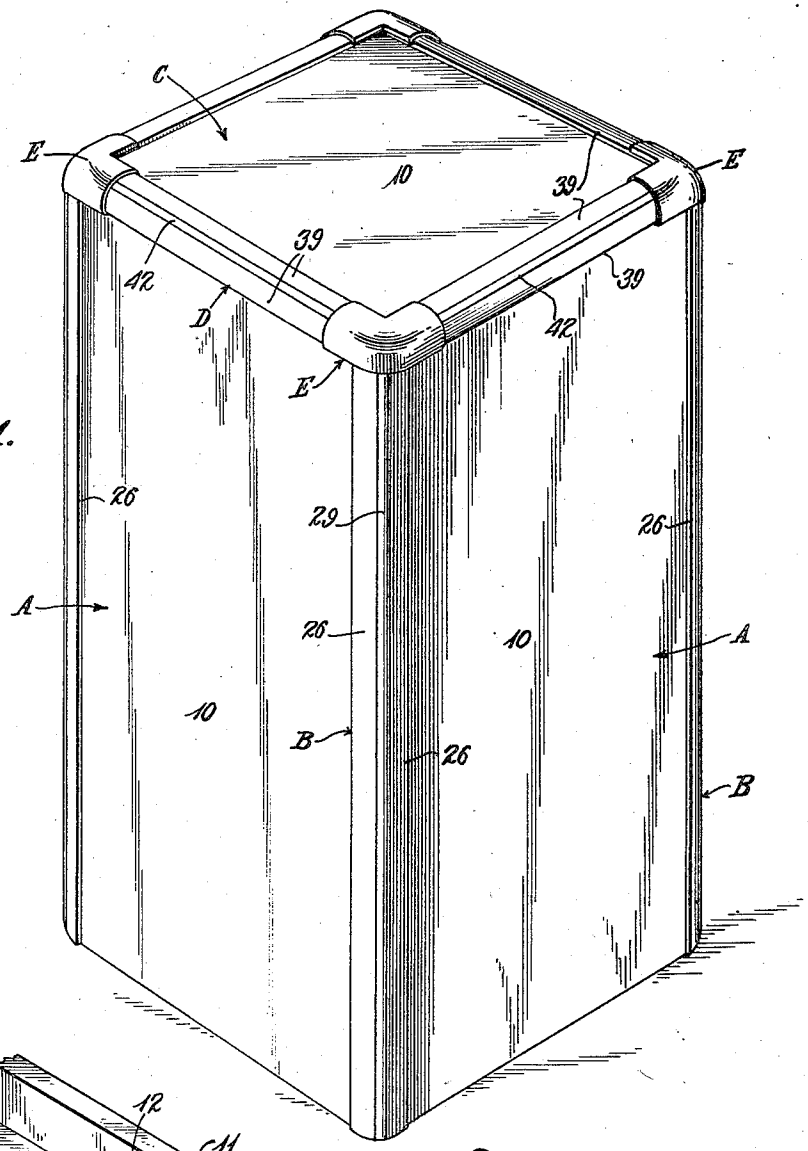


Fig. 1.

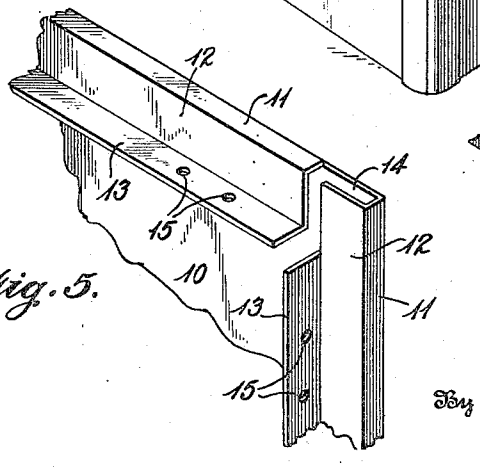


Fig. 5.

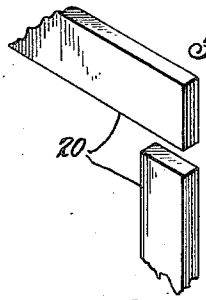


Fig. 6.

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Fig. 2.

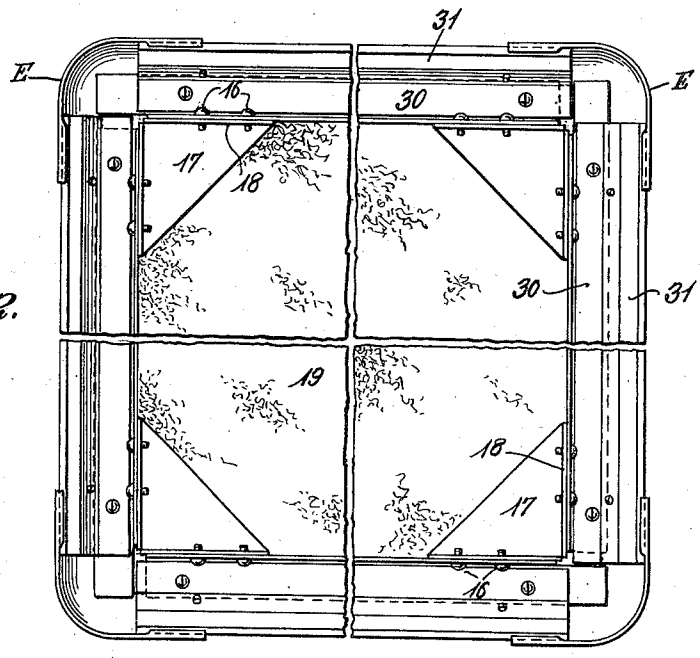
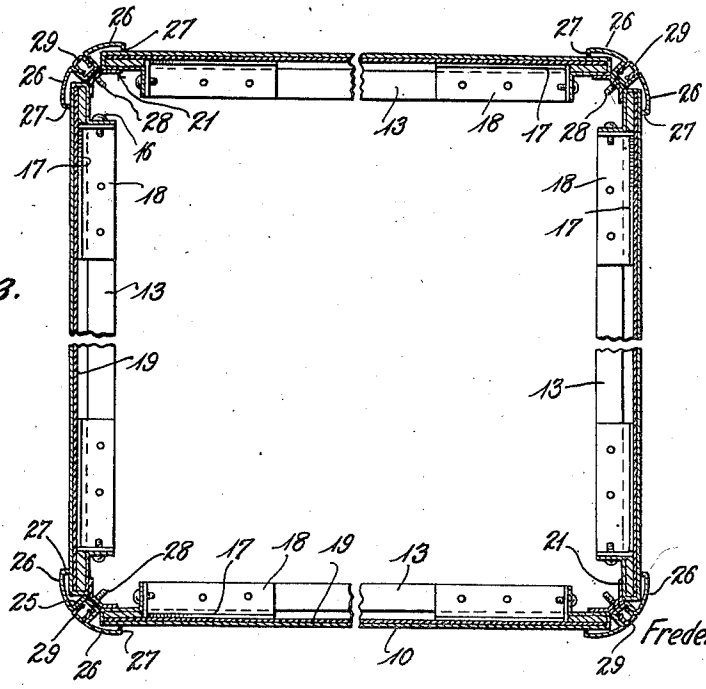


Fig. 3.



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Fig. 4.

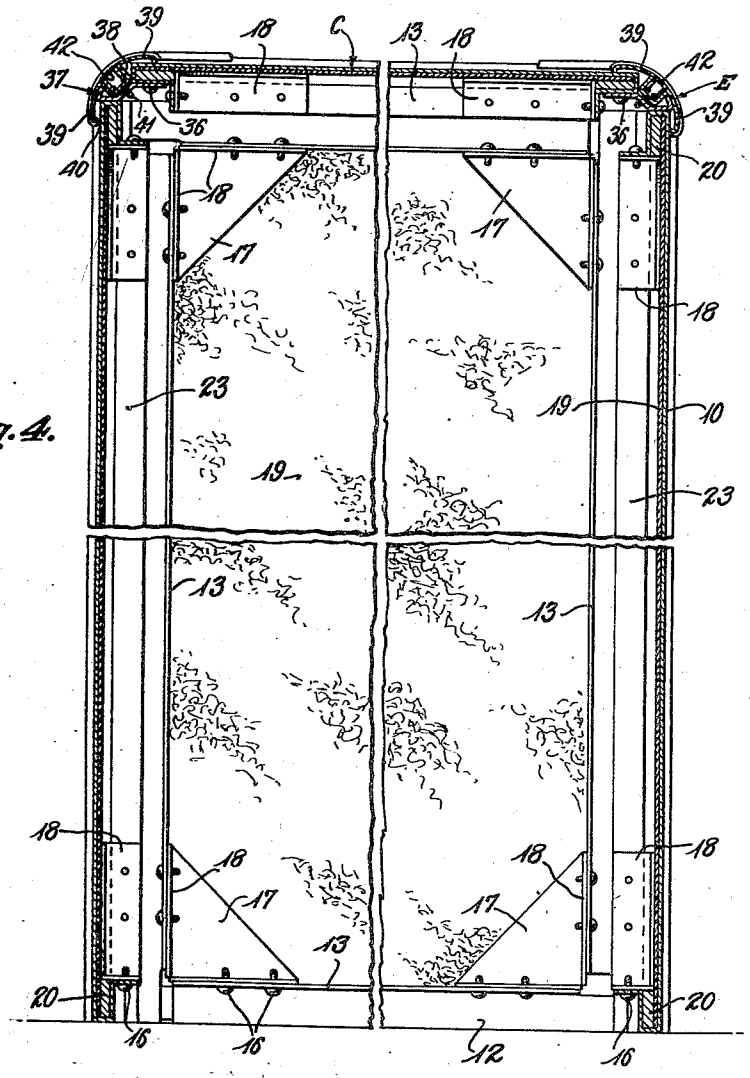


Fig. 7.

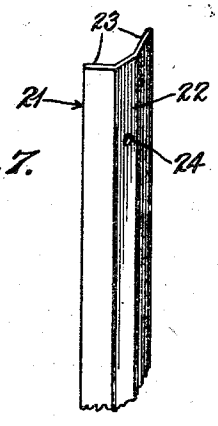
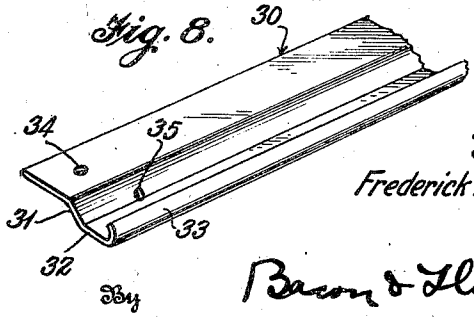


Fig. 8.



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Fig. 9.

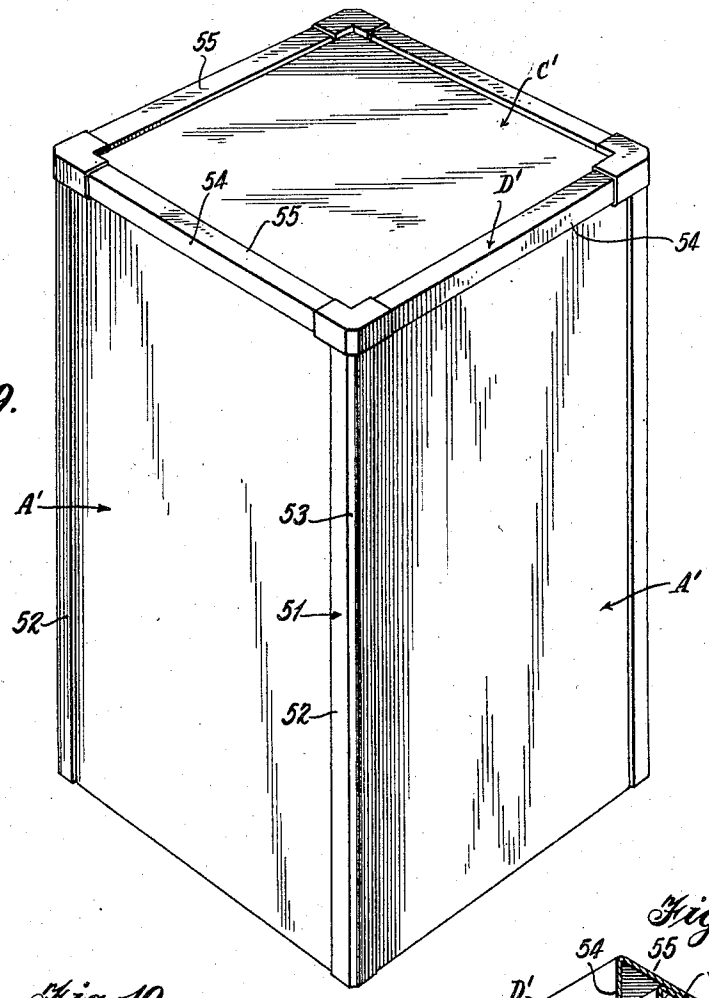


Fig. 10.

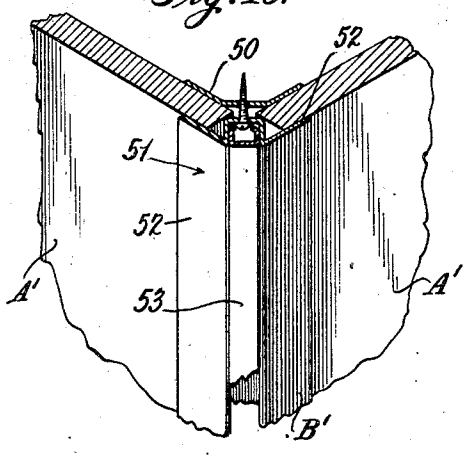
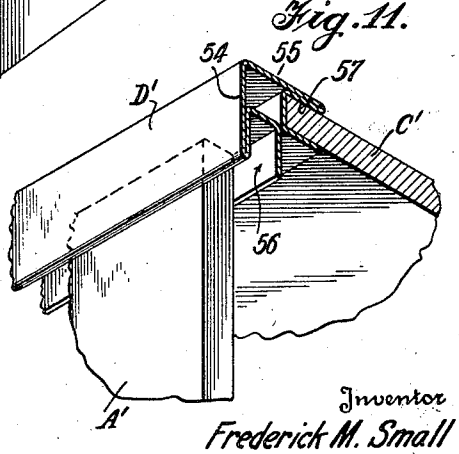


Fig. 11.



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UNITED STATES PATENT OFFICE

2,205,826

CABINET STRUCTURE

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Application October 17, 1936, Serial No. 106,213

6 Claims. (Cl. 220—84)

This invention relates to new and useful improvements in cabinet structures.

One primary object of the invention is to provide a cabinet structure of a completely knock-down character, the various panels or units of which may be completely fabricated at the factory, or point of manufacture, so that the cabinet may be assembled at the point of use.

A further primary object of the invention is to provide a cabinet structure of the knock-down type which is especially adapted for use in enclosing stationary installations of all characters of mechanical apparatus where but little head and side clearance is available for manipulating the various cabinet units during installation of the cabinet.

A further important object of the invention is to provide a cabinet structure constructed of a plurality of preformed panel units which are connected together at their adjacent edges solely by readily detachable clamping devices so as to form the desired side and top walls of the cabinet and wherein a cabinet structure will be provided which will be extremely strong and rigid in construction and yet will not include or be dependent upon any internal or sub-framework for its strength and rigidity.

A further object of the invention is to provide a cabinet structure of the above mentioned type which has been found to be particularly suitable for use in enclosing practically any kind of mechanical apparatus in the use of which an ornamental exterior appearance is desired.

A still further object of the invention is to provide a knock-down cabinet structure which is constructed of a plurality of preformed panel units with means for uniting the various edges of the units in such a manner as to entirely eliminate the objectionable appearance of securing screws, bolts, or the like from the exterior of the cabinet.

Another object of the invention is to provide a cabinet structure which is formed of a plurality of panel units preferably constructed from relatively thin gauge sheet metal with the margins or the edge portions of each unit constructed and arranged to afford the greatest rigidity and strength possible with minimum weight.

A specific object of the invention is to provide a cabinet structure formed of a plurality of panel units, each unit of which is formed by a sheet metal jacket enclosing a suitable filler which may take the form of a sheet or layer of heat insulating and sound deadening material.

A further object of the invention is to provide a cabinet structure of artistic design and in which many color combinations and finishes may be provided to enhance the esthetic appeal afforded by the cabinet structure.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is a perspective view of a cabinet structure embodying this invention;

Figure 2 is a bottom plan view of the top wall panel unit of the cabinet structure;

Figure 3 is a transverse sectional view taken on a horizontal plane through the cabinet structure;

Figure 4 is a vertical sectional view of the structure illustrated in Fig. 1;

Figure 5 is a detailed perspective view taken from the inside of one corner of a panel unit which may be either a side wall panel unit or a top wall panel unit;

Figure 6 is a detailed perspective view of two filler strips employed in a manner to be described at a later point for retaining in place a sheet of insulating material associated with a panel unit;

Figure 7 is a detailed perspective view of one form of base plate employed in one of the two types of molding devices provided for interconnecting panel units;

Figure 8 is a detailed perspective view of a second form of base member which constitutes a part of the second type of molding device;

Figure 9 is a perspective view of a slightly modified form of cabinet structure embodying this invention;

Figure 10 is a detailed perspective view disclosing the form of molding device employed for connecting two side wall panel units in the form of cabinet disclosed in Figure 9; and

Figure 11 is a detailed perspective view disclosing the type of molding employed for connecting the cabinet top panel unit to the side walls of the cabinet.

In the drawings, wherein for the purpose of illustration are shown two preferred embodiments of this invention, the reference character A, in Figures 1 to 8 inclusive, designates in its entirety each one of the side wall panel units. It is to be understood that these units may be completely manufactured or fabricated at the factory and shipped in a knock-down condition to the point of use where they may be connected at their

edges by molding devices, designated in their entirety by the reference character B. These side wall panel units may be manufactured in standard sizes to meet any particular requirements to adapt the cabinet for any particular use. The side wall panel units have not been illustrated as being provided with any particular arrangement of apertures or openings to allow for the passage therethrough of pipes, wires, or the like, or to permit of ingress or egress with respect to the interior of the cabinet. Such openings or apertures and suitable closures may be provided to adapt the cabinet structure to any particular use.

The reference character C is employed for designating in its entirety the top wall panel unit, which naturally should be manufactured in any desired size or shape to enable the top wall unit to rest upon and accurately cover the space defined by the assembled side wall panel units. This top wall panel unit C is adapted to rest upon the top edges of the side wall panel units A and to be frictionally, removably connected thereto by means of the molding devices designated in their entirety by the reference character D. These molding devices D differ slightly in construction from the molding devices B. These differences in construction will be specifically pointed out at the time of describing in detail the various elements which form the molding devices.

For the purpose of finishing the cabinet construction and concealing the joints between the various molding devices, corner caps, designated in their entirety by the reference character E, are provided for the various corners of the cabinet. These caps are mounted by snapping the same over the molding devices D.

All of the panel units A and C are of the same basic construction, and for that reason a detailed description of one of these units is believed to be sufficient for all. Each panel unit preferably is made from No. 26 gauge, full cold-rolled, full pickled, stretcher-leveled steel. The flat blank from which the panel is constructed usually will be of rectangular or square formation in plan, and, as illustrated particularly in Figure 5, each marginal edge portion will be shaped to provide a plurality of angularly arranged flanges. The main body portion of the panel will be identified by the reference character 10. Extending at right angles from the plane of this body portion is a first flange 11. Extending at right angles to this first flange and in spaced parallelism with the body 10 is a second flange 12. This second flange is of greater width than the first flange and extends inwardly from the edge of the body portion 10 a greater distance than the distance between the body portion and the flange 12. It will be appreciated, particularly by inspecting Figure 5, that the flanges 11 and 12 cooperate with the main body portion 10 to form, at all of the edges of the main body portion, a transversely inwardly opening recess. The free edge of the flange 12 is provided with a laterally extending flange 13. The detailed disclosure of Figure 5 clearly illustrates that one set of flanges 11, 12, and 13 is cut away so that it does not extend to the right-angularly arranged, adjacent edge of the main body portion 10. This cutting away of one set of flanges permits the flanges 11 and 12 of the adjacent set of flanges to be extended to its right-angularly arranged edge of the main body portion 10. It will be noted that this construction provides an end opening 14 for one set of flanges. It further will be noted from this detailed figure that the laterally projecting flange 13 for the set of flanges having the end opening 14 is of less length than its associated flanges 11 and 12. This particular flange 13 is cut off so that its end substantially registers with the plane of the flange 13 for the adjacent set of flanges.

The flanges 13 are illustrated as being provided with apertures 15. These apertures are intended to receive self-threading screws 16 for connecting to the flanges 13, at the various corners of the unit, a bracing and reinforcing gusset 17. One of these gussets 17 is provided for each corner of each panel unit. The body of the gusset is of triangular shape and has formed on its right-angularly arranged edges the upstanding flanges 18. These flanges are suitably apertured to receive self-threading screws 16. Figures 2 and 4 very clearly illustrate the manner in which the gussets 17 are employed.

The self-threading screws referred to throughout this specification are of the type which will cut its own thread in an aperture formed in sheet metal, or the like, when the diameter of said aperture bears a proper relation to the diameter of the threaded portion of the screw. In the present use of self-threaded screws for drawing together two panel connecting strips which cooperate to form a molding device, the front or cover strip is provided with a longitudinal series of apertures, each one of which is sufficiently over-sized to permit a screw to pass freely therethrough. The back or base strip is usually formed without any apertures so that when the two strips are brought together to form a complete molding device for connecting panel units, the apertures may be punched or drilled in the back or base strip at the desired points and in proper alignment with desired apertures in the front or cover strip. The apertures drilled in the back or base strip will be of a proper diameter to cause the screws driven therethrough to tap their own threads. The screws, being loosely received in the apertures of one strip and threaded in the apertures of the other strip, will each function in the same manner as the adjusting screw for the two jaws of a vise and will tightly draw the two strips together. The use of self-threading screws in this manner is of great advantage in all paneling work for it permits the panel clamping or connecting strips to be drawn together by securing elements which can be completely manipulated from one side of the panel units. This is not the case where bolts and nuts are used as the connecting elements for the panel clamping strips.

Again returning to the detailed disclosure of Figure 5, it will be explained that each set of flanges 11, 12, and 13 is cut away at one end only so that at one corner the flanges 11 and 12 of each set of flanges will extending to the right-angularly arranged edge of the main body portion 10. This same set of flanges 11 and 12, at the other corner of the panel with which these flanges are associated, will be cut away, as explained in connection with this detailed disclosure.

Each panel A or C has a sheet of heat insulating and sound deadening material 19 arranged to overlie the inner surface of the main body portion 10 and to be of a proper size to cause its edges or margin to extend into the recesses formed by the various sets of flanges 11 and 12. For the purpose of retaining the sheet of insulating and sound deadening material in place, a set of filler members 20 is provided for each panel unit. These filler members are illustrated in fragmentary detail in Figure 6.

After a sheet of insulating material 19 is positioned within its panel unit, one filler member 20 is inserted into its panel recess through an end opening 14. The filler member, for example, will be inserted into the opening 14 of the structure shown in Figure 5 and will be moved downwardly through the recess provided with this opening until the outer end, or the last end of the filler member to enter the recess, will be arranged in alignment with the end of the flange 13 associated with the same. The second filler member disclosed in Figure 6 then will be inserted into the recess formed by the second set of flanges disclosed in Figure 5 and from the other end of this set of flanges where an opening 14 is provided. This second filler member will be inserted into its recess until its inner end abuts against the flange 11 of the set of flanges described in connection with Figure 5 as receiving the first filler member. This second filler member, therefore, will close the opening 14 disclosed in this figure against the removal of the filler member described as being inserted through this opening. In a complete panel, it will be appreciated that the various filler members will assist in retaining the remaining filler members in place within their respective recesses. The previously described gussets 17 are intended to be connected to the flanges 13 so that the main triangular body portions of the gussets will be arranged inwardly of the plane occupied by the flanges 12, or closer to the plane occupied by the main body portion 10 than the positioning of the flanges 12 with respect to this main body portion. This arrangement of the gussets 17 will retain the filler strips 20 against transverse inward movement out of the recesses.

It will be understood that I do not desire to be limited to the use of a sheet of heat insulating and sound deadening material inside each panel as many other kinds of material may be used if desired. It further will be appreciated that by eliminating the flanges 11, 12, and 13 from one edge of a panel, the sheet of material 19 can be made approximately the same size as the main body portion 10 of a panel and be inserted into the panel from said edge. Such a structure will, of course, dispense with the use of the set of filler members 20.

In Figures 3 and 7 there is illustrated a form of molding device which is employed for connecting the vertical edges of the various side wall panel units A to bridge or close the space between these panels and to retain the latter in their desired assembled relation. These molding devices will constitute the sole connecting means for the various side wall panels.

It will be noted by inspecting Figure 5 that the flanges 13 are set inwardly from the edges of the main body portion 10, and the entire margin of a panel unit, therefore, will be formed with an edge capable of being engaged by a clamping structure. The molding devices B employed for connecting the edges of the side wall panel units A, therefore, are designed to be clamped upon or to frictionally grip the margins of the side wall panels.

In Figure 7 there is disclosed a base member 21. This base member consists of a longitudinally extending central section 22 and the diverging edge flange portions 23. The central section 22 is provided at desired spaced intervals with apertures 24 for the reception of self-threading connecting screws. The cover strip or top of this molding device is shown in section in Figure 3 as including a channel-shaped, longitudinally extending mid-section 25 and transversely curved side sections 26. Each outer longitudinal edge of the side sections 26 is formed with inwardly turned beads or narrow flanges 27. The base strip 21 and the cover strip are adapted to be arranged on opposite sides of the associated edges of two panel members so that the divergent wings or sections 23 of the base strip will engage the inner faces of the margins of the two panels. The beads or narrow flanges 27 should be arranged to engage the outer surfaces of the associated panel edges. Securing, self-threading screws 28 are employed for connecting these two molding strips to retain the same in the relative positions illustrated in Figure 3 and to draw the two strips together to cause the associated panel edges to be tightly gripped between the two strips. The heads of the securing screws 28 will be positioned within the channel-shaped mid-section of the cover strip. For the purpose of covering or concealing the heads of the screws 28, a final filler strip 29 is positioned within the channel of the cover strip.

Figures 4 and 8 disclose the formation of a molding device D employed for connecting the top wall panel unit C to the side wall panel units A. Figure 8 discloses the base strip of this type of molding device. This base strip includes a longitudinally extending inner section 30 which has integrally formed with one longitudinal edge a flange 31. The section 30 and flange 31 are adapted to extend at an obtuse angle with respect to each other. The free longitudinal edge of the flange 31 has joined thereto a second flange 32. This second flange is arranged on a plane which extends substantially in parallelism with the plane occupied by the first mentioned section 30. A narrow flange or bead 33 is joined to the free edge of the flange 32. The main section 30 is provided with a suitable number of securing screw receiving apertures 34. The flange 31 also is provided with a suitable number of securing screw receiving apertures 35.

In the vertical sectional view set forth in Figure 4, it will be seen that the main section 30 of the unit disclosed in Figure 8 is fixedly secured to the top wall panel unit by means of self-threading screws 36 which are passed through the apertures 34 to be embedded into the margin of the top wall panel unit. A cover strip 37 is provided to be associated with the base strip disclosed in Figure 8. This cover strip 37 is of the same formation as the cover strip described in connection with Figure 3 or the molding device B and includes a channel-shaped mid-section 38 and the transversely curved side sections 39 with the inwardly bent beads or flanges 40 at the edges of the side sections. Self-threading screws 41 are passed through the channel-shaped mid-section 38 of the top strip to be threaded into the apertures 35 of the base strip. These screws 41, therefore, connect the cover strip to the base strip and clamp the edge of the top wall panel unit C between the cover strip and the base strip. The flange portions 31, 32, and 33 of the base strip function as a seat for the cover strip of this molding device. To close the channel-shaped mid-section 38 and conceal the heads of the screws 41, a filler strip 42 is positioned within this channel-shaped mid-section. It will now be seen that the molding device designated by the reference character D differs from the molding device designated by the reference character B in the form of the base

strip employed. This base strip for the molding device D does not extend so as to underlie one edge flange or bead 40 of the cover strip. This edge flange or bead, when the top wall panel unit is fitted onto the upper edges of the side wall panel units, will frictionally engage the outer surfaces of the side wall panel units to retain the top wall unit in place and to hold the side wall panels against movement relative to each other. It will be understood, however, that this top wall panel unit C may be readily removed when desired.

It will be appreciated by inspecting Figures 3 and 4 that the channel-shaped mid-sections 25 and 36 of the cover strips for the molding devices B and D are substantially square in cross-section. The filler strips 29 and 42, which are received in the channels of said mid-sections 25 and 36 respectively, are not truly square in cross-section. The side walls of these strips diverge outwardly so that they are spaced farther apart at their outer edges than at their inner edges. The outer edges are rolled inwardly slightly to facilitate insertion in the channels. This arrangement causes the filler strips, when forced into the channels, to be wedged in place and firmly, frictionally held against removal.

In Figures 9 to 11, inclusive, there is shown a modified form of cabinet structure. This structure includes side wall panel units A' which are connected together by molding devices B'. The top of the cabinet is formed by a panel unit C'. The various edges of the top panel unit C' have positioned thereupon the molding devices D' which function to removably connect the top panel, or the entire top as a unit, to the assembled side walls of the cabinet. Suitable corner caps E' are employed to perform the same function as the caps E disclosed in and described in connection with Figure 1 of the drawings. The caps E' are attached by snapping the same over the molding devices D'.

In this modified form of cabinet structure, the panel units A' and C' do not take the form of the panel units A and C of the previously described cabinet structure. The modified panel units consist of veneer boards or any other form of wallboard structure.

The corner molding devices B' comprise a back or base strip 50 which corresponds structurally in every respect to the strip 21 disclosed in detail in Figure 7. This back strip is of angular formation and is intended to be applied to the rear faces of the adjacent edge portions of two panel units A'.

The cover strip 51 is identical in most respects to the cover strip of the molding device B employed in the previously described cabinet structure. The only material difference between the cover strip of the molding device B' and the cover strip of the molding device B is that the side sections 52 are flat instead of being transversely curved. The filler strip 53 is of the same construction as the filler strips 29 and 42 for the molding devices B and D of the previously described cabinet structure.

Figure 11 discloses in detail the construction of the molding device D' which is employed for connecting the top and side wall panel units. This molding device D' is formed from a single blank of thin gauge sheet material which is shaped to provide the right-angularly arranged outer face sections 54 and 55. The material arranged outwardly of the longitudinal edge of the face section 54 is shaped to provide a panel edge receiving channel 56. The material arranged outwardly of the free longitudinal edge of the face section 55 is bent to form an additional panel edge receiving channel 57. The channels 56 and 57 receive the adjacent edges of the various side wall panels A' and the top wall panel C'. The said channels 56 and 57 preferably are formed with a width or diameter which will cause the panel units to be tightly, frictionally retained in place. If desired, however, securing screws or the like may be driven through channels and the edge portions of the panel units received therein to more positively lock the molding device D' to the panel units connected by the same.

It is to be understood that the form of this invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:

1. A panel for use in cabinet construction comprising a sheet metal member having angularly arranged flanges at the edges thereof and additional flanges extending from said angular flanges and disposed substantially parallel with said member, the set of flanges at each edge of said member extending at one end to the adjacent edge of said member and terminating at the other end short of the opposite adjacent edge of said member whereby each set of flanges is provided with an end opening, a layer of insulating material lying adjacent said member and terminating short of the edges thereof and filler strips disposed between the edges of said layer of insulating material and the adjacent edges of said member and insertable in the end openings of said flanges.

2. A panel for use in cabinet construction comprising a sheet metal member having angularly arranged flanges at the edges thereof and additional flanges extending from said angular flanges and disposed substantially parallel with said member, the set of the aforesaid flanges at each edge of said member having an open end through which filler strips may be inserted, lateral flanges projecting from said additional flanges, a layer of insulating material lying adjacent said member, means secured to said lateral flanges and overlying said insulating material to retain said insulating material in assembled relation to said member and filler strips bonding the edges of said layer of insulating material and positioned within said adjacent edge flanges whereby to prevent displacement of said layer of insulating material transversely of said member.

3. A panel for use in cabinet construction comprising a sheet metal member having angularly arranged flanges at the edges thereof and additional flanges extending from said angular flanges and disposed substantially parallel with said member, lateral flanges projecting from said additional flanges, a layer of insulating material lying adjacent said member, and a flanged gusset plate having the flanges thereof secured to said lateral flanges of said member whereby said gusset plate overlies said insulating material to retain said insulating material in assembled relation to said member.

4. In a cabinet construction of the type described, separate side wall panel units, a separate top wall panel unit, and molding devices clamped to the adjacent edges of said units to close the spaces between the units and to hold

the units in desired assembled relation, said molding devices comprising base strips, the base strips for the top wall panel unit molding devices being integral with said top wall panel unit and resting upon the upper adjacent ends of the side wall panel units, cover strips each having a longitudinally extending channel formed therein, means operable exteriorly of the cabinet and extending through the bottom wall of said channel and said base strip for detachably connecting said strips, and a filler strip positioned within the channel of the cover strip to conceal said means.

5. A panel for use in cabinet construction comprising a sheet metal member having angularly arranged flanges at the edges thereof and additional flanges extending from said angular flanges and disposed substantially parallel with said member, lateral flanges projecting from said additional flanges, a layer of insulating material lying adjacent said member and having portions disposed beneath said additional flanges, and means for retaining said insulating material in assembled relationship with said member, the said retaining means being secured to said lateral flanges and bearing against said insulating material.

6. In a cabinet construction of the type described having top and side wall panel units comprising, sheet metal members, flanges forming open ended recesses at marginal edges of said members, a layer of insulating material secured to the body portion of said members, filler strips received in said recesses and bordering the adjacent edges of said layers of insulating material whereby to prevent displacement of said layers of insulating material, and molding devices clamped to the adjacent edges of said units to close the spaces between the units and to hold the units in desired assembled relationship, said molding devices comprising base strips, the base strips for the top wall panel unit being integral with said top wall panel unit and having portions resting upon the upper adjacent ends of the side wall panel units, cover strips for said base strips and means operable exteriorly of the cabinet and extending through said base and cover strips for detachably connecting said strips.

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