

Oct. 6, 1953

J. D. BEAMER ET AL

2,654,449

SECTIONAL WALL CLIP

Filed June 3, 1948

3 Sheets-Sheet 1

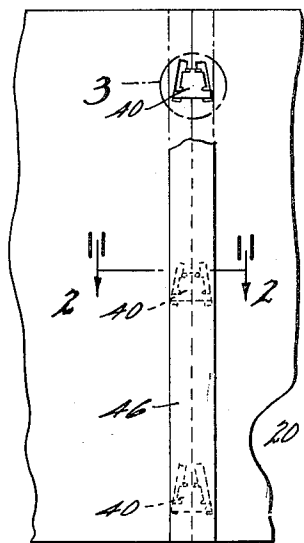


FIG. 1.

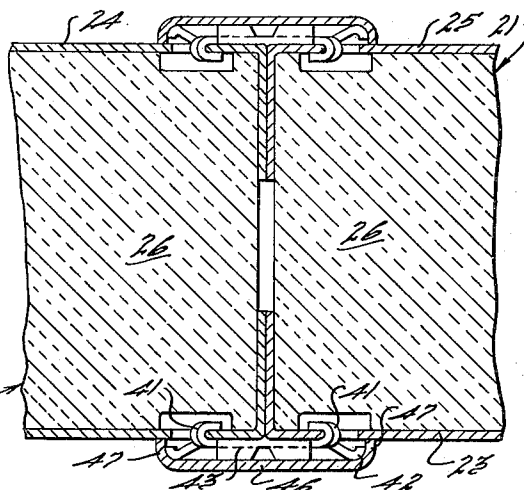


FIG. 2.

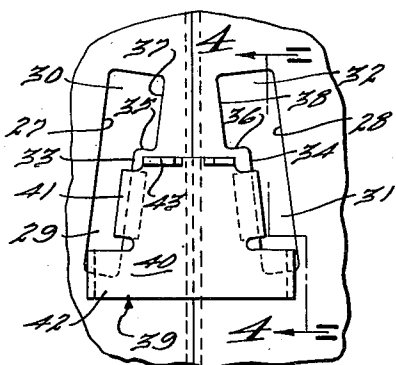


FIG. 3.

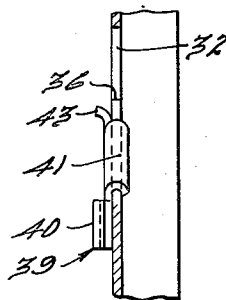


FIG. 4.

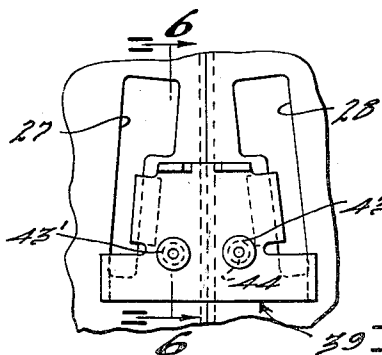


FIG. 5.

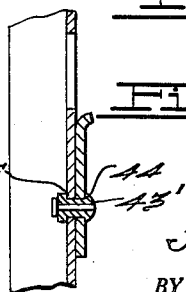


FIG. 6.

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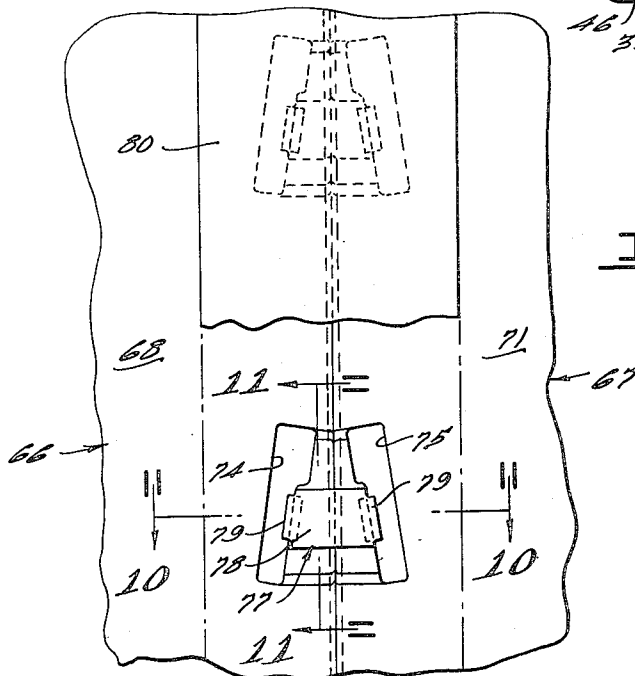
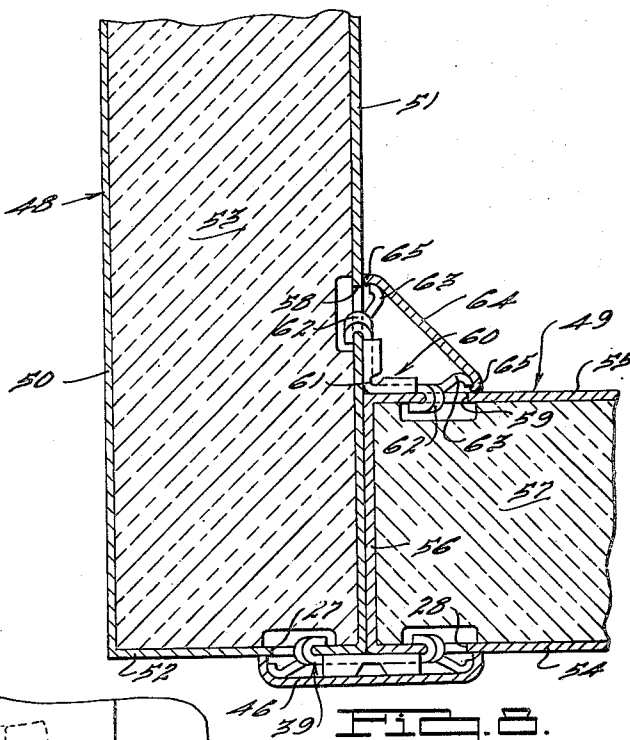
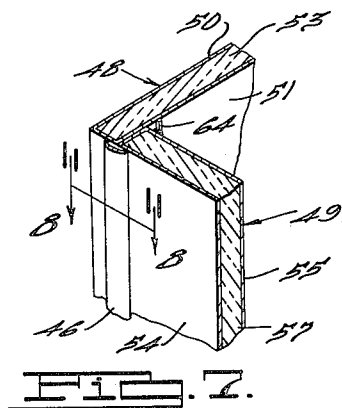
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SECTIONAL WALL CLIP

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3 Sheets-Sheet 2



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SECTIONAL WALL CLIP

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3 Sheets-Sheet 3

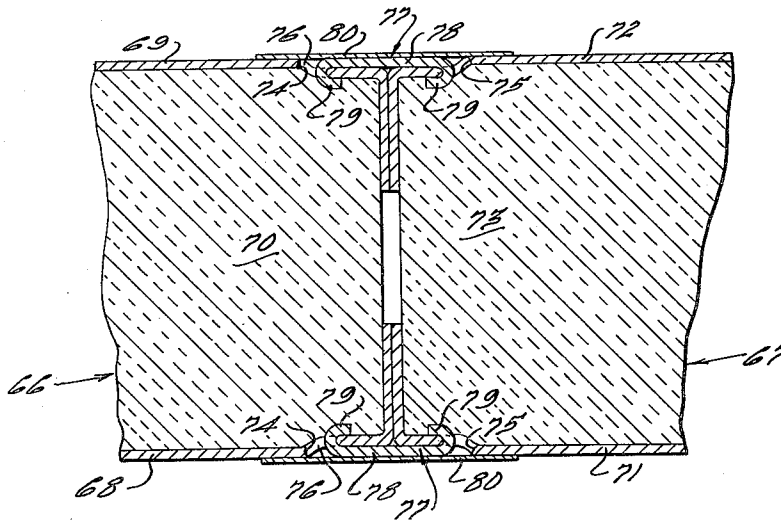


FIG. 10.

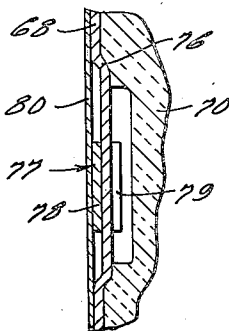


FIG. 11.

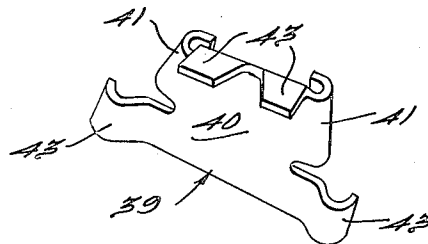


FIG. 12.

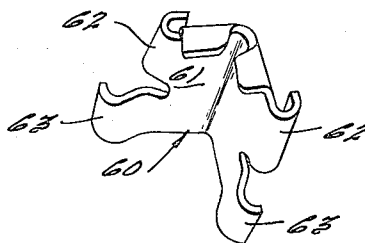


FIG. 13.

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UNITED STATES PATENT OFFICE

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SECTIONAL WALL CLIP

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Application June 3, 1948, Serial No. 30,954

1 Claim. (Cl. 189—34)

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Our invention relates to improvements for facilitating the assembly of a plurality of structural panels and, more specifically, the invention relates to panels of the type which include spaced facings or skins and a filler therebetween.

An object of the invention is the provision of an improved panel which may be utilized as a component in a space enclosing structure or building and to provide an improved arrangement for securing such panels together: to provide an arrangement by which the panels can be secured one to the other where relatively aligned or disposed in angular relationship, and to provide an arrangement which will readily accommodate detachment and disassembly of the panels.

Panels of the foregoing type may be so employed as to form the wall for structures in which the space enclosed by the latter is either heated or cooled and, as a result, the corresponding disposed skins or faces of the panels are subjected to a temperature differing from that of the other correspondingly disposed skin and the temperature differential will thus cause a relatively different reaction between the inner and outer faces of the panels. This is particularly true when the panels are wall forming components in a structure defining a space which is refrigerated.

A further object of our invention, therefore, is to so secure the panels together as to accommodate expansion and contraction of correspondingly disposed skins relatively to the other correspondingly disposed skins, and, in carrying out this feature of the invention, the innermost skins of the adjacent panels are secured together independently of the securing of the outer skins together. The panels are thus subject to a minimum distorting force incident to relatively difficult temperature reactions of the panel facings or skins.

Still another object of our invention is the provision of a plurality of clip members that are adapted to clampingly hold the inner and outer facings or skins of the abutting panels by frictional engagement therewith.

Another object of our invention is to provide the abutting panels with an elongated strip which covers the juncture of the panels and is carried by portions of the clip members.

Other objects and advantages of our invention will become more apparent from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a fragmentary front elevational view of abutting panels embodying our invention.

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Fig. 2 is a fragmentary transverse sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged fragmentary view of the wedge clip and abutting panels showing the structure within the circle marked 3 in Fig. 1.

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

Fig. 5 is a fragmentary view similar to Fig. 3 showing a modified form of the clip.

Fig. 6 is a fragmentary sectional view taken on the line 6—6 of Fig. 5.

Fig. 7 is a fragmentary perspective view of a clip and panel assembly wherein the panels abut at a 90° angle.

Fig. 8 is a fragmentary transverse sectional view taken on the line 8—8 in Fig. 7.

Fig. 9 is a fragmentary front elevational view of clips and abutting panels showing a modification to that shown in Fig. 1.

Fig. 10 is a fragmentary transverse sectional view taken on the line 10—10 of Fig. 9.

Fig. 11 is a fragmentary sectional view taken by the line 11—11 of Fig. 9.

Fig. 12 is a perspective view of the clip shown in Figs. 1, 2, 3, and 4.

Fig. 13 is a perspective view of the clip shown in Figs. 7 and 8.

Referring to Figs. 1, 2, 3, and 4, we have shown a pair of abutting structural panels, generally designated by numerals 20 and 21. Each of the panels 20 and 21 comprises inner faces or skins 22 and 23 and outer faces or skins 24 and 25, respectively, with a filler material 26 between the faces or skins of each panel and secured thereto by surface bonding.

The abutting skins 22 and 23 are provided with regulating slots 27 and 28, each of which is of an L-shaped configuration. The slot 27 comprises a leg portion 29 and a foot portion 30, the foot portion extending toward the abutting edge of the skin 22. The slot 28 similarly comprises a leg portion 31 and a foot portion 32, the foot portion 32 extending toward the abutting edges of the skins 22 and 23. The longitudinal axes of the leg portions 29 and 31 each converge toward the juncture of the skins 22 and 23 and cross the line of junction at the same angle. The innermost edge portions 33 and 34 of the leg portions 29 and 31 of the slots 27 and 28 are parallel to the respective longitudinal axes of the leg portions 29 and 31 and form a wedge. The edge portions 33 and 34 are connected by steps 35 and 36 to the innermost edges 37 and 38 of the foot portions 30 and 32 of the slots 27 and 28, respectively. These edges 37 and 38 form a smaller wedge than the edge portions 33 and 34 and serve

to initially receive portions of a clip, generally designated by the numeral 39. The clip 39 so employed comprises a body portion 40, a pair of converging U-shaped flanges 41 extending inwardly of the body portion 40 and a pair of substantially L-shaped flanges 42 extending side-wardly of the lower part of body portion 40. The clip 39 is also provided with a pair of small lips 43 extending outwardly from the upper portion of the clip which facilitate placement of the clip in the registering slots 27 and 28. The clip 39 is employed to clampingly connect the abutting skins 22 and 23 by inserting the U-shaped flanges 41 within the foot portions 30 and 32 of the slots 27 and 28 thereafter moving the clip downwardly, as more clearly shown in Figs. 1 and 3, so that the channels formed by the inner surfaces of the flanges 41 engage the edge portions 33 and 34 of the registering slots 27 and 28 and clampingly hold the skins 22 and 23 together. The clip 39 may be retained in this position by the frictional engagement of the flanges 41 with the edge portions 33 and 34 of the slots 27 and 28. However, if it is found expedient to provide some means for securing clip 39 in this position, small nut and bolt assemblies 43' may be employed for this purpose, as more clearly shown in Figs. 5 and 6. This may be readily accomplished by providing the body portion 40 of the clip 39 with a pair of holes 44 which align with holes 45 in the skins 22 and 23 when the clips have reached a predetermined clamping position. Thereafter the nut and bolt assemblies 43' may be positioned within the aligned holes 44 and 45 to hold the clips in this position.

As more clearly seen in Fig. 1, the plurality of clips 39 are employed to join the faces 22 and 23 and are so disposed to lie in vertical alignment. A cover plate 46 having inwardly extending edge portions 47 may be employed to cover the vertically aligned clips 39 as well as the juncture of the abutting panels 20 and 21. The plate 46 is secured to the panels by snapping the edge portions 47 thereof over the sidewardly extending L-shaped flanges 42 of the clips 39. Although we have described the clips 39, the slots 27 and 28, and the plate 46 as being associated with skins 22 and 23, it should be understood that identical clips, slots, and plates are employed for clampingly connecting the skins 24 and 25, as shown in Fig. 2. In this manner the panel 20 and 21 are connected at both the inner and outer surfaces.

In Figs. 7 and 8, we have shown a modification of our invention. 48 and 49 represent structural panels which are disposed at an angle of 90° to each other. The panel 48 comprises an outer skin 50, an inner skin 51, an end skin 52, and filler material 53 adhered therebetween. The panel 49 comprises an outer skin 54, an inner skin 55, an end skin 56, and filler material 57 adhered therebetween. As illustrated in Figs. 7 and 8, the end skin 56 of the panel 49 engages the inner skin 51 of the panel 48 so that the end skin 52 of the panel 48 and the outer skin 54 of the panel 49 lie in the same plane. The abutting edge portions of the skins 52 and 54 are provided with the slots 27 and 28 which receive the clips 39, the slots and clips being identical and bearing identical numbers as those shown in Figs. 1, 2, 3, and 4. The cover plate 46 also may be employed with this structure. The inner skin 51 of the panel 48 and the inner skin 55 of the panel 49 are each provided with a plurality of slots 58 and 59, respectively, which are

identical to the slots 27 and 28, as disclosed in Figs. 1, 2, 3, and 4, with the exception that the slots in skin 58 lie in a plane normal to the slots 59 in the skin 55. A plurality of clips 60 cooperates with the registering slots 58 and 59 in the skins 51 and 55, respectively, to clampingly connect the panels 48 and 49. The clips 60, only one of which is shown in Fig. 8, comprise body portions 61, inwardly extending converging U-shaped flanges 62, and sidewardly extending L-shaped flanges 63, and are disposed at predetermined distances along the juncture of the skins 51 and 52. As more clearly shown in Figs. 12 and 13, the clips 60 are identical to the clips 39 with the exception that the clips 60 are bent along their central axis so that the body portions 61 of the clips 60 form 90° angles. A clip so constructed is adapted to form to the configuration of the juncture of the panels. A sufficient number of the clips 60 may be used to clampingly hold the panels 48 and 49 together. A cover plate 64, having its edge portions curved to form flanges 65, is so disposed to cover the clips 60 and the juncture of the skins 51 and 55 of the panels 48 and 49, respectively.

In Figs. 9, 10, and 11, we have shown another modification of our invention. 66 and 67 represent structural panels disposed in a longitudinally aligned abutting relationship. The panel 66 comprises an outer skin 68 and an inner skin 69, with filler material 70 adhered therebetween. The panel 67 similarly comprises an outer skin 71, and an inner skin 72 with filler material 73 adhered therebetween. The abutting edges of the respective outer skins 68 and 71 are provided with registering slots 74 and 75, respectively, which are identical to slots 27 and 28 in Fig. 3 in configuration and relative position, as previously described, with the exception that the edge portions of the skins in which the slots 74 and 75 are cut are recessed, as clearly shown at 76 in Figs. 10 and 11.

A plurality of clips 77, each of which comprises a body portion 78 and a pair of opposed converging inwardly extending U-shaped flanges 79, is so disposed relative to the slots 74 and 75 to clampingly connect the skins 68 and 71 as well as the skins 69 and 72. The flanges 79 engage the edge portions of the slots 74 and 75 in the same manner as the flanges 41 of the clip 39 engage the edge portions 33 and 34 of the slots 27 and 28, respectively, as viewed in Fig. 3.

The body portions 78 of the clips 77 when the clips 77 are in their clamping positions lie in the same planes as the unrecessed portions of the outer skins 68 and 71 and inner skins 69 and 72. By disposing the clips 77 in this manner, plates 80 may be employed to cover the junctures of the inner skins 69 and 72 and the outer skins 68 and 71 as well as the clips 77. The clips 77 are disposed in an aligned relation and may be conveniently covered by the plate 80. The plate 80 may be secured to the panels by a suitable adhesive or by any conventional method.

The filler material 26 and 26' in Fig. 2, 53 and 57 in Fig. 8, and 70 and 73 in Fig. 10 may be of any conventional composition. The following compositions have been found to be very satisfactory: nitrogen filled hard synthetic rubber sponge; reclaimed hard sponge rubber; cellular core of any construction, cellular cellulose acetate; fiber board; and balsa wood. The filler material is bonded or adhered to the respective skins by a suitable adhesive or cement.

In Figs. 1, 2, 3, 4, 9, 10, and 11, we have shown

the structural panel disposed in longitudinal aligned abutting relationship. It should be noted that in these views there is no skin connection between the respective inner and outer skins. This construction is especially advantageous when the panels form the walls for structures in which the space enclosed by the latter is either heated or cooled. By having the inner skins connected separately of the outer skins, either may move a small amount relative to the other; the expansion or contraction of the skins being due to the temperature differential between the inner and outer skins.

It may be readily seen that, in all forms of our invention, a plurality of structural panels may be clampingly connected to form as large a structure as desired. In this regard, it may also be seen that if it ever be expedient for the panels to be transported or moved through portals that are smaller than the assembled panels, they may be readily disassembled by merely removing the cover plates and clips.

We claim:

In combination, edgewise adjacent panel sections each having spaced sheet metal skin elements wherein edgewise adjacent skins are provided with oppositely disposed diverging slots, an integral clip member comprising a body portion,

opposed inwardly extending diverging U-shaped flanges having portions extending through said slots and clampingly engaging said skin elements to thereby hold said skin elements in the aforementioned edgewise adjacent relationship and opposed L-shaped flanges extending outwardly from said body portion, and a cover strip clampingly engaging said L-shaped flanges and being disposed over the juncture of said adjacent skins.

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