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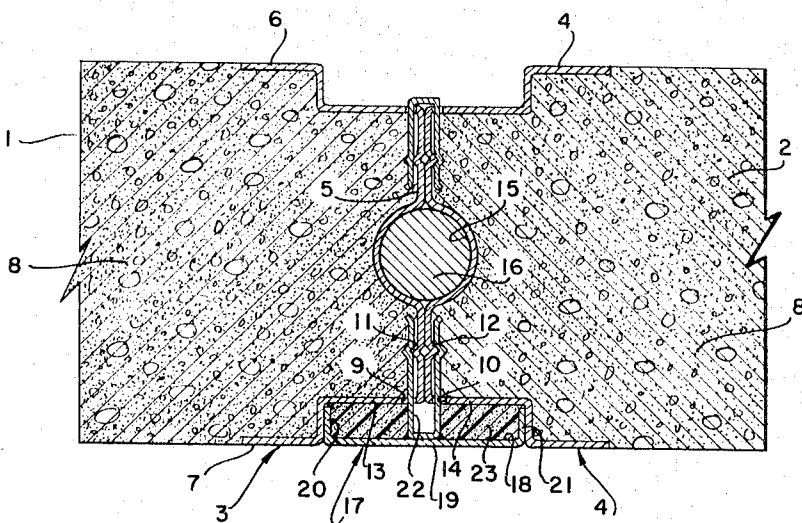
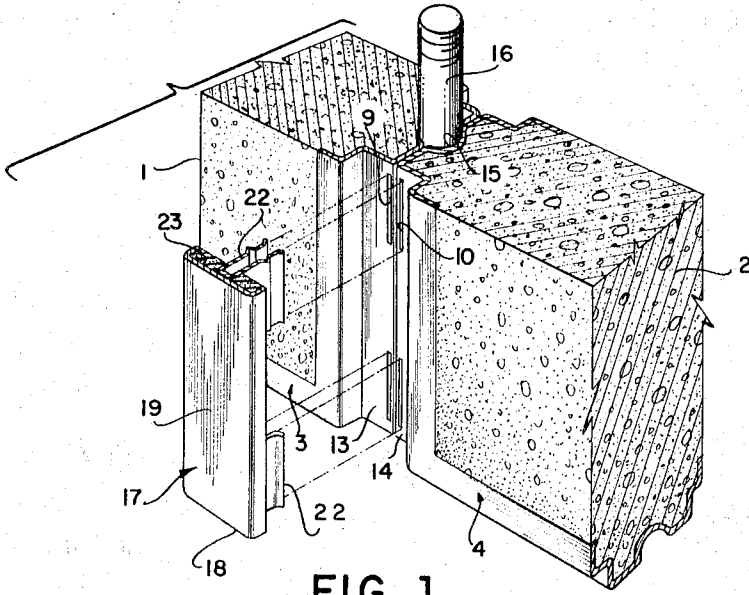
G. C. RUSSELL

3,350,828

ABUTTING WALL PANELS AND SEALING STRUCTURE THEREFOR

Filed April 12, 1965

3 Sheets-Sheet 1



INVENTOR
GORDON C. RUSSELL

BY

George Sullivan
Agent

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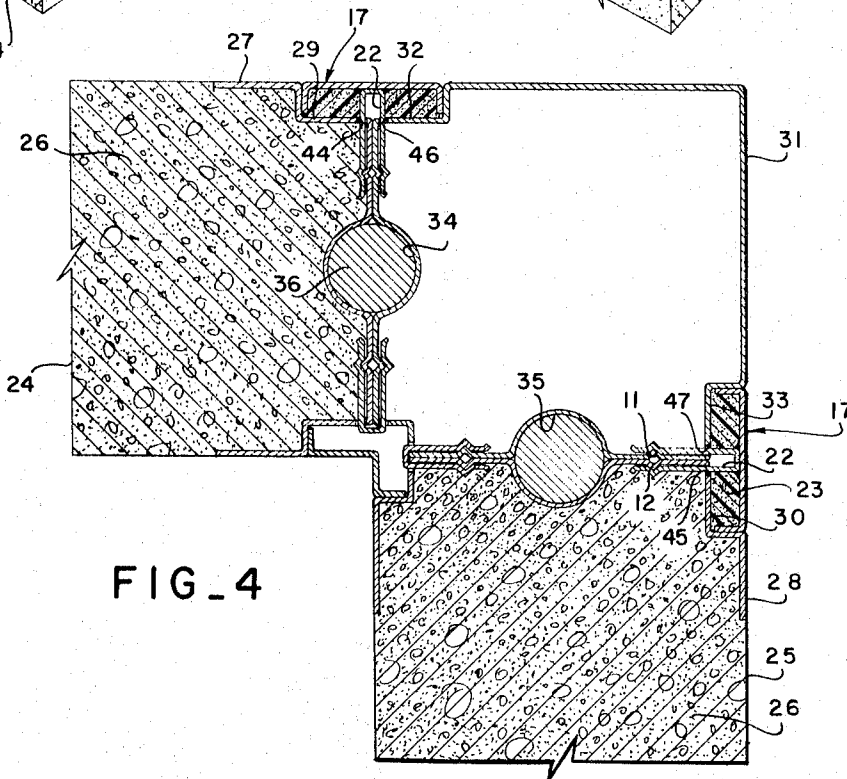
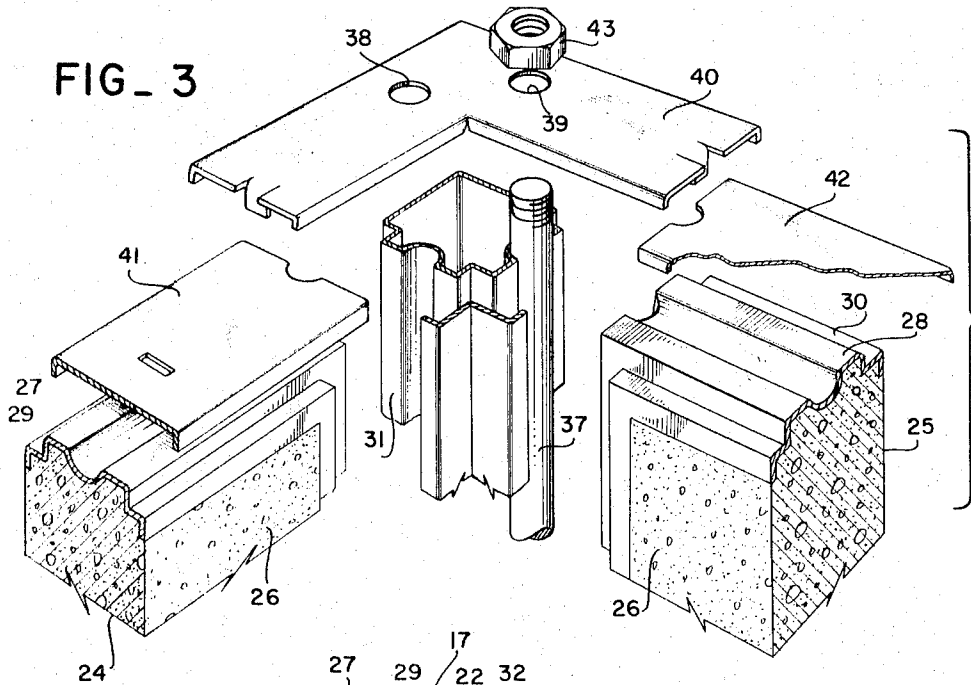
G. C. RUSSELL

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INVENTOR.
GORDON C. RUSSELL

BY

George Sullivan

Agent

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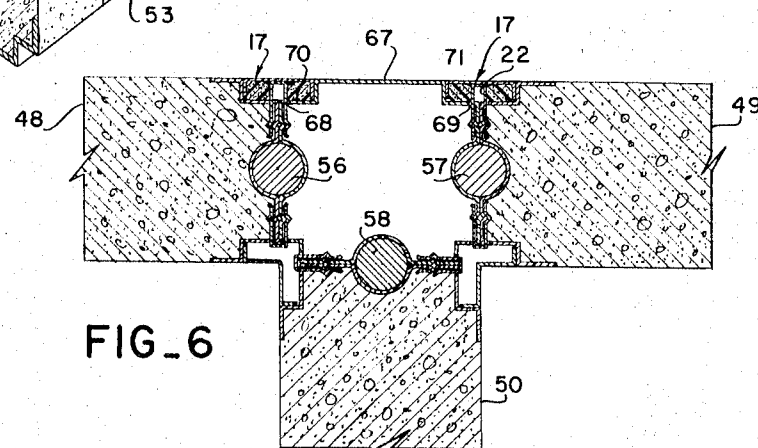
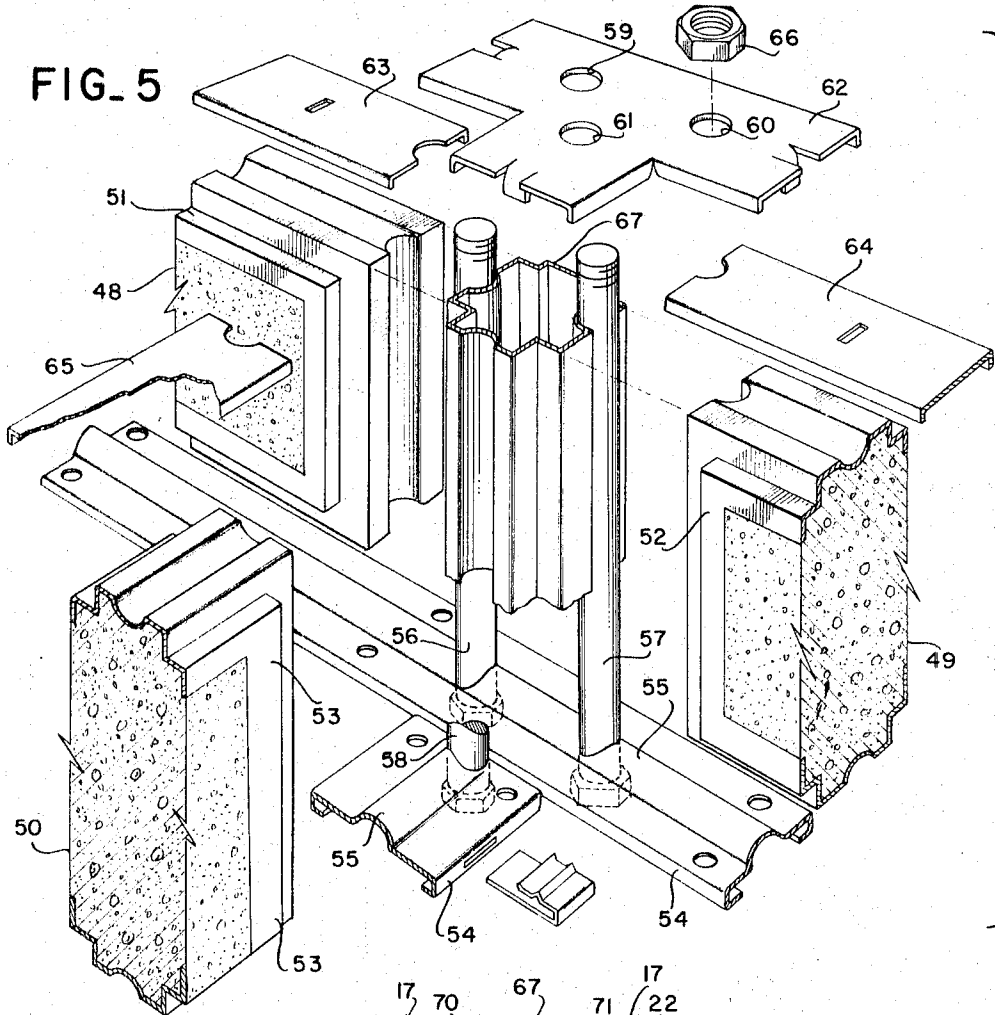


FIG. 6

INVENTOR.
GORDON C. RUSSELL

BY
George Sullivan
Agent

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3,350,828

ABUTTING WALL PANELS AND SEALING STRUCTURE THEREFOR

Gordon C. Russell, Studio City, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
 Filed Apr. 12, 1965, Ser. No. 447,192
 4 Claims. (Cl. 52-395)

ABSTRACT OF THE DISCLOSURE

A sealing structure for the sealing of joints between abutting prefabricated wall panels. The sealing structure is inserted into a recess located between the abutting wall panels so that the sealing structure is flush with the outside wall. A clip is provided so as to retain the wall panels in an abutted relationship and to retain the sealing structure in place.

This invention is particularly directed to a sealer cap and clip structure which is useful in prefabricated building structures and arranged to close and seal the junctures between abutting exterior wall panels.

In nearly every climate on the earth, man must build shelter from the elements. This shelter is to protect man and his goods from various weather conditions, from rain and snow, temperature extremes and wind. Such shelter often serves the further purpose of providing privacy for man and his goods. Many different types of buildings have been created in accordance with the climatological and sociological factors of the individual locale and in accordance with the availability of suitable building materials.

In the past, these structures have required a tremendous amount of hand work and individual skills, so that the cost thereof has risen in proportion to the cost of employment of the skilled labor. In order to reduce the cost of such structures considerable interest is being shown in buildings made of prefabricated panels which are assembled at the site of the building to create the building. One of the problems of such prefabrication is the proper closure of the panel joints and maintaining sealed condition against adverse climatological conditions.

The present invention provides a sealing structure for sealing and retaining together the joints between prefabricated building panels. The prefabricated building panels are made of indigenous material and are framed with a structure which extends around its edges. The frame structure has facing edge surfaces which abut each other when two panels are put in edgewise association. Between these abutting surfaces in the outside faces of the wall panels, the frames are provided with recesses. The sealing structure of this invention is inserted into this recess so that it is flush with the outside wall.

The sealing structure comprises an outer face of the same material as the frame structure and sealing material beneath the outer face. This sealing material is foamed polymer composition material coated with a tacky material such as an adhesive, or is a suitable plastic material which flows to the configuration of the recess for its sealing or other suitable sealant. A clip is secured to the interior of this sealing structure cover plate and engages in both of the adjoining and abutting wall panels so as to engage the wall panels together and so as to retain the sealing structure in place.

It is a primary object of this invention to provide a sealed structure which is particularly suitable for sealing the joints between prefabricated building panels.

It is another object of this invention to provide a clip which aids in retention of the panels together and carries upon it a seal which seals the joint against entrance of air or moisture.

It is another object of this invention to provide a seal

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which provides a relatively flush exterior surface so that the building panels and the joints therebetween are relatively smooth.

It is another object of this invention to provide a sealing structure for covering the joints between different varieties of building panel joints.

The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings, in which:

FIGURE 1 is an exploded isometric view of a joint structure between two prefabricated building panels showing the manner in which the sealing structure of the present invention is associated therewith;

FIGURE 2 is an enlarged horizontal section through the structure of FIGURE 1;

FIGURE 3 is an exploded isometric view showing a corner structure for a prefabricated building employing prefabricated building panels wherein the sealing structure of this invention is useful;

FIGURE 4 is an enlarged horizontal sectional view through the structure of FIGURE 3;

FIGURE 5 is an exploded isometric view of a T intersection between prefabricated building panels wherein the sealing structure of this invention is useful; and

FIGURE 6 is a horizontal section through the structure of FIGURE 5 showing the sealing structure of this invention employed therewith.

Referring now to FIGURES 1 and 2, a joint between prefabricated wall panels is shown and the relationship of the sealing structure of this invention thereto is indicated by corresponding numerals. Wall panels 1 and 2 adjoin each other on a common edge to form a butt joint, and this joint is to be sealed by means of the seal construction of this invention.

Each of the wall panels 1 and 2 comprises a frame which is filled with suitable filler material. The frame of wall panel 1 is indicated at 3 and the frame of wall panel 2 is indicated at 4. Wall panels 1 and 2 are identical in construction and each is arranged with its frame in rectangular configuration so as to define the outlines of the wall panel. Frame 3 is of generally channel shaped construction with a web 5 which defines the edge of wall panel 1 and flanges 6 and 7 which aid in providing a strong inter-relationship between filler material 8 and frame 3. Frame 3 is preferably metallic construction and is of sheet material which is rolled, cut, bent and spot welded at the joints so as to provide suitable rigidity.

Filler material 8 is preferably indigenous material of compactible nature, and hardenable materials are preferred. Thus, concrete is preferred as filler material 8, should the components thereof be readily available. However, in other particular circumstances compactible material such as adobe clay is useful. If suitable compactible materials are not available, plywood facings may be placed within frame 3 and indigenous material placed therebetween as a filler. In such a case a waterproof facing for at least the exterior face of panel 3 is preferred.

Frames 3 and 4 are provided with holding clip openings 9 and 10 adjacent each other through the flanges of the frames for the reception of suitable holding clips. The webs of these frames are provided with locking ribs 11 and 12 which are arranged for engagement by the hereinafter described sealing structure.

Frame 3 is arranged so that flanges 6 and 7 extend from web 5 in a planar, parallel configuration for a short distance which is narrower than the full thickness of wall panel 1. Thus, the width of web is not as wide as the full thickness of the wall panel. Approximately half way between the web 5 and the terminal edge of flanges 6

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and 7 they are turned outwardly so that their outer surfaces correspond to the maximum thickness of wall panel 1. Thus recesses 13 and 14 are formed on wall panels 1 and 2 to form a joined, larger recess at the butt joint between the two wall panels.

Web 5, and the corresponding web in frame 4 are each formed with a hemicylindrical recess so as to create cylindrical opening 15 when panels 1 and 2 are positioned so that they are in edgewise butt joint relationship. Bolt 16 extends through opening 15 from the foundation to the wall panel cap structure so as to restrain the wall panels 1 and 2 upon their foundation. The hemicylindrical recesses which form recess 13 extend along each of the edges of panels 1 and 2, for frames 3 and 4 are of uniform cross section around the panel.

The sealing structure arranged to seal the joint between wall panels 1 and 2 is generally indicated at 17. Sealing structure 17 comprises channel 18 which has web 19 and flanges 20 and 21. The web 19 is of sufficient width to occupy the entire space created by recesses 13 and 14 and flanges 20 and 21 are of sufficient depth so as to reach to the bottom of these recesses. Thus, the outer surface of web 19 is substantially coplanar with the outer surfaces of the flanges of frames 3 and 4, for example, flange 7. Secured longitudinally along the center line of the inside of web 19 are locking clips 22. Locking clips 22 are preferably of resilient material and of such dimension as to enter into openings 9 and 10. Furthermore, the fingers of locking clips 22 extend far enough through openings 19 and 20 to engage over locking ribs 11 and 12. Recesses in the fingers of locking clips 22 retain the locking clips in position. The material of channel 18 is either of metallic or polymer composition material. Metallic material is preferred so as to be compatible with the structure of frames 3 and 4 and to provide a similar surface appearance. When channel 18 is of metallic nature, locking clips 22 are also of metallic nature and are secured thereto by conventional means such as by spot welding. However, should channel 18 be of polymer composition material, locking clips of polymer composition are also useful for ease of securement.

Secured to the interior of channel 18 and occupying the entire space between its flanges 20 and 21 is a sealant 23. Sealant 23 can be any suitable sealant adaptable for the purpose. Accordingly, plastic materials which will flow to conform to and engage the surfaces of the flanges of frames 3 and 4 within the recess in sealing engagement therewith are of excellent character for this use. Furthermore, resilient or flexible polymer composition materials, such as foamed polyurethane and the like are useful. In the case of flexible polymer composition material it is desirable that they be coated with a tacky, or pressure sensitive adhesive for firm sealing engagement with the flange surfaces. By means of this adhesive securement, and the locking of locking clips 22 upon locking ribs 11 and 12, sealing structure 17 is firmly engaged in place and presents proper seal characteristics so that the opening between wall panels 1 and 2 is closed against passage. Among the polymer composition materials suitable for service as sealant 23, depending upon the service are the olefin polymers including polyethylene and polypropylene, the polymers derived from dienes including polystyrene, acrylics, polyvinylesters and chlorine containing polymers, the fluorocarbon polymers and the heterochain thermoplastics including polyamides, polyesters, polyurethanes, polypeptides, ether and acetal polymers, polysulfides and polycarbonates.

Referring now to FIGURES 3 and 4, these figures show the manner in which the sealing structure of this invention is useful in another situation. Wall panels 24 and 25 are identical to wall panels 1 and 2 and comprise a body of indigenous material 26 and frames 27 and 28. Frames 27 and 28 are identical to frames 2 and 4 and are provided with recesses 29 and 30 between the

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faces and edges thereof. In view of the fact that frames 27 and 28 of wall panels 24 and 25 are not compatible for a direct right angle corner, corner frame 31 is provided. Corner frame 31 has recesses 32 and 33 which respectively adjoin recesses 29 and 30 so as to form a location for the insertion of a sealing structure. Furthermore, corner frame 31 has hemicylindrical recesses 34 and 35 which cooperate with the corresponding recesses in wall panels 24 and 25 so as to form cylindrical openings. Bolts 36 and 37 are positioned within these recesses and engage through openings 38 and 39 in corner cap 40. Corner cap 40 rests upon top channels 41 and 42 to engage them. Furthermore, top channels 41 and 42 engage the top edge frame portions of wall panels 24 and 25. Nuts engage upon the tops of bolts 36 and 37, one of which is seen at 43, to restrain corner cap 40 with respect to the wall panels and to urge the wall panels downwardly into firm engagement with their foundations.

Wall panels 24 and 25 are provided with openings 44 and 45 of the manner previously described and corner frame 31 is provided with openings 46 and 47 adjacent the openings 44 and 45 to permit the entry of the fingers of locking clips 22 for engagement upon the previously described locking ribs provided on the webs of frames 27 and 28. Thus, sealing structures 17 are positionable within the recesses defined at 29 and 32 as well as at 30 and 33 so as to close the openings between the wall panels and corner frame 31. Such sealing structure provides complete closure against passage of material there-through and locking clips 22 aid in the retention of the various elements shown in FIGURE 4.

Referring now to FIGURES 5 and 6, another application of the sealing structure of this invention is shown therein. In the case of FIGURES 5 and 6, three panels are arranged so as to provide a T intersection therebetween. Thus, wall panels 48 and 49 are arranged so as to lie substantially in the same plane while wall panel 50 is arranged to intersect at right angles thereto so as to form a partition with respect thereto. Wall panels 48, 49 and 50 are respectively provided with frames 51, 52 and 53 so as to be identical to the structures of the earlier described wall panels 1 and 2. Furthermore, similar to the earlier described wall panels, wall panels 48, 49 and 50 are filled between the frame structure with indigenous compactible material so that each provides a unitary wall panel. Each of the wall panels 48, 49 and 50 has its frame provided with recesses adjacent the faces and corners, and recesses of hemicylindrical nature provided along the length of each edge.

Foundation frame 54 is provided with a suitably up-standing hemicylindrical rail 55 which is of suitable dimension as to fit within the hemicylindrical recess along the bottom edge of each of the panels. Thus, foundation frame 54 is positioned in the manner desired of wall panels 48, 49 and 50. Bolts 56, 57 and 58 extend upwardly and engage through openings 59, 60 and 61 in cap 62. Top channels 63, 64 and 65 are respectively engaged over the tops of wall panels 48, 49 and 50, and cap 62 engages thereover so as to restrain the cap with respect to the channels and the channels with respect to the wall panels. Cap 62 is maintained in place by nuts engaging upon bolts 56, 57 and 58, one of which is seen at 66. Thus, wall panels 48, 49 and 50 are locked in position. Frame 67 is positioned between bolts 56, 57 and 58, so as to fill the spaces between them, to embrace them and to abut the vertical edges of the frames of wall panels 48, 49 and 50. Frame 67 is provided with openings 68 and 69 and is provided with recesses 70 and 71. Recesses 70 and 71 cooperate with the recesses on the edges of the wall panel frames so as to define recesses for the positioning of sealing structure 17. As was previously described, the locking clips 22 on sealing structure 17 enter into the openings along the frames of the wall panels and into the openings 68 and 69 of frame 67 so as to retain the

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sealing structure 17 in position and so as to aid in retaining the wall panels 48 and 49 in place. Thus, it is seen that the sealing structures 17 are useful as well in such wall panel intersections.

This application is companion to my application entitled Foundation, executed concurrently herewith, filed April 12, 1965, Serial No. 447,366, now Patent 3,334,455, and is also a companion to my application entitled Joint Cap, executed concurrently herewith, filed April 12, 1965, Serial No. 447,191, now Patent 3,330,084, the entire disclosure of which are incorporated herein by this reference.

This invention having been described in its preferred embodiment, it is clear that it is susceptible to numerous modifications and changes within the spirit of the invention and without the exercise of the inventive faculty. Accordingly, the scope of this invention is defined by the scope of the following claims.

I claim:

1. The combination of abutting wall panels and sealing structure, said wall panels comprising:

rectangular frames defining faces and edges on said wall panels, said frames having recesses adjacent said faces and edges, said edges of said wall panels being adapted to be engaged in edgewise abutting relationship, the frames having openings adjacent said edges;

said sealing structure comprising a channel having a web and having flanges extending away from said web, said web having an outside surface and an inside surface, said outside surface extending across the entire width of the recess and being substantially coplanar with the outer surfaces of the abutting wall panels, said flanges extending away from said outside surface thereof intermediate said flanges thereon, sealant positioned on said inside surface of said web and extending away from said inside of said web at least as far as said flanges; and

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locking clips positioned within said openings adjacent said edges of said wall panels, and said channel being positioned within said recesses in said wall panels so that said sealant engages with said frames so as to seal the butt joint therebetween and so that said locking clips retain said wall panels together.

2. The sealing structure of claim 4 wherein locking ribs are formed in said frames and locking recesses are provided in said locking clips, said recesses in said locking clips engaging over said locking ribs in said frames so as to retain the sealing structure within said recesses.

3. The sealing structure of claim 2 wherein said locking clips are of U-shaped configuration and have fingers extending therefrom, said fingers extending into said openings in said frames, said locking recesses being formed in said fingers.

4. The sealing structure of claim 3 wherein said sealant has adhesive character at least on its face adjacent said frame so that said sealant is adhesively sealed to said frames.

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FRANK L. ABBOTT, *Primary Examiner.*

ROBERT S. VERMUT, *Assistant Examiner.*