Sept. 3, 1963 J. B. DUNNINGTON 3,102,612

JOINT ASSEMBLY FOR WALL PANELS

Filed Aug. 12, 1960

2 Sheets-Sheet 1

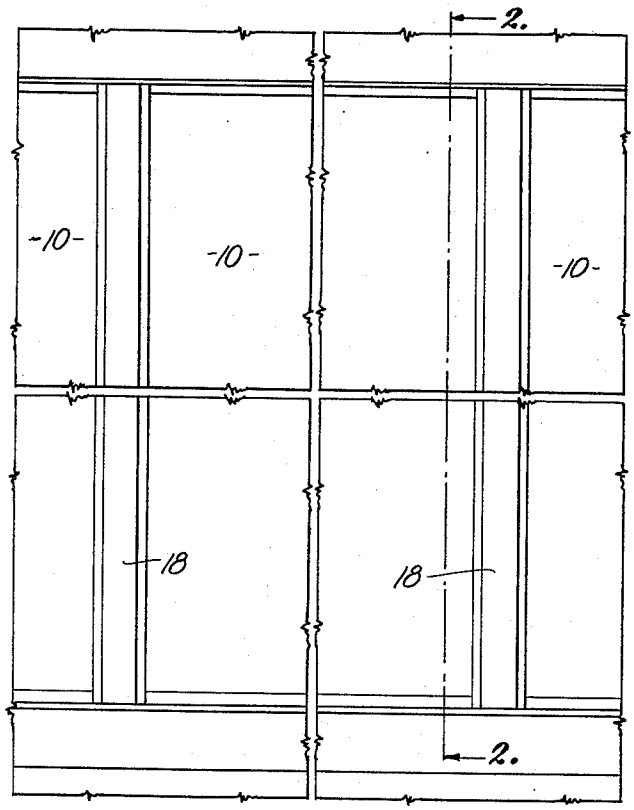


Fig. 1.

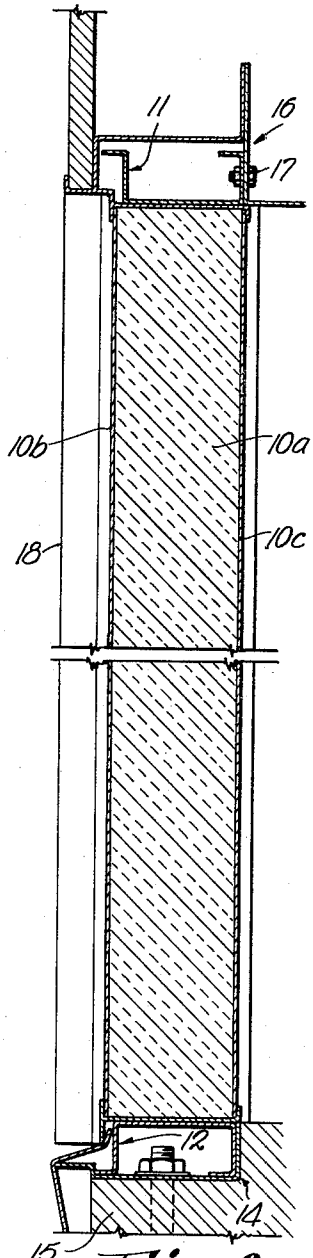


Fig. 2.

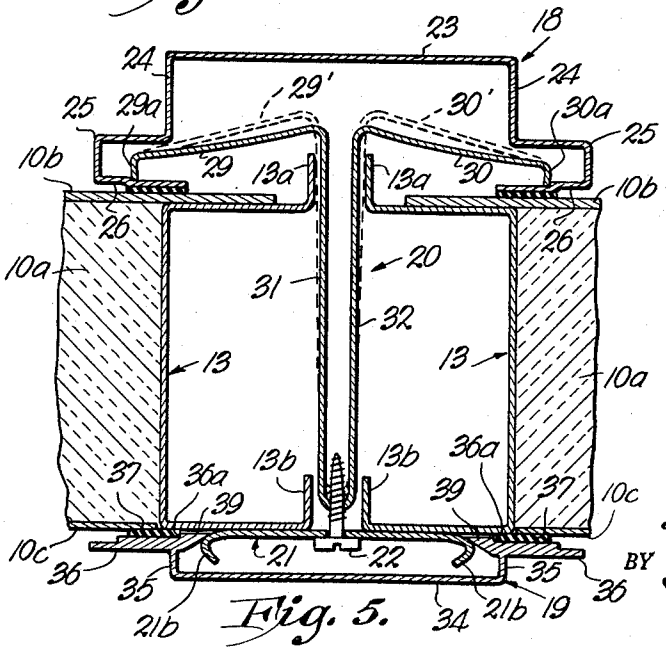


Fig. 5.

INVENTOR.
Jon B. Dunnington
BY Thos. E. Scofield
ATTORNEY.

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JOINT ASSEMBLY FOR WALL PANELS

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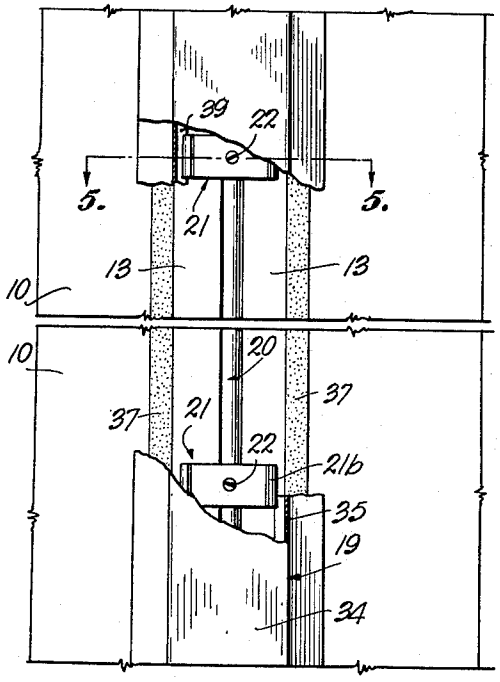


Fig. 3.

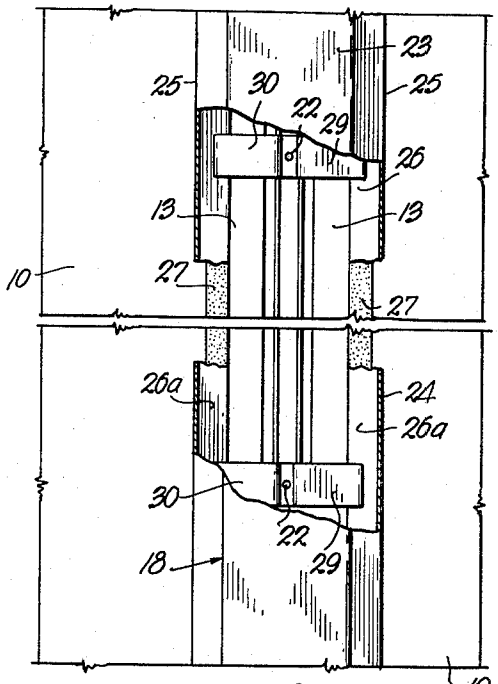


Fig. 4.

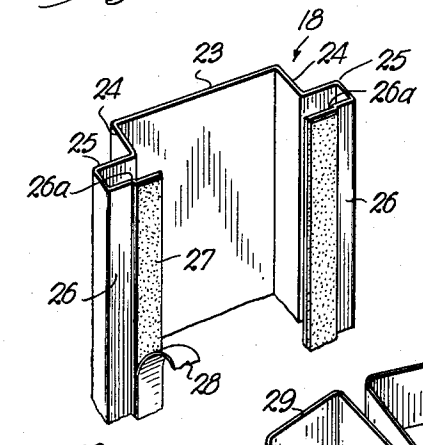


Fig. 6.

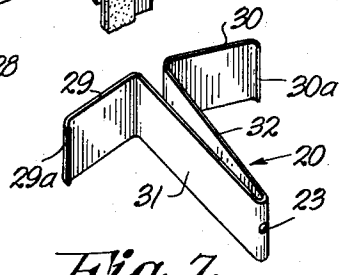


Fig. 7.

Fig. 8.

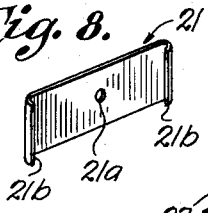
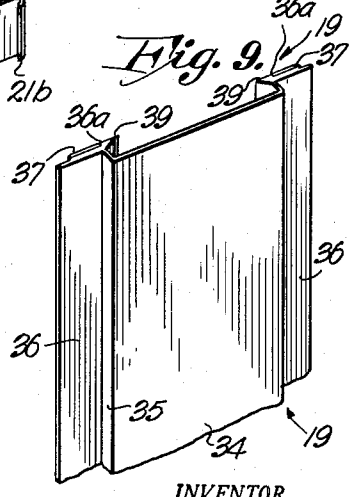


Fig. 9.



INVENTOR.
Jon B. Dunnington
BY Hugo E. Hirsfeld
ATTORNEY.

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JOINT ASSEMBLY FOR WALL PANELS

Jon B. Dunnington, Leawood, Kans., assignor to Butler Manufacturing Company, Kansas City, Mo., a corporation of Missouri

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5 Claims. (Cl. 189—34)

This invention relates generally to the joining of modular panels to form a continuous wall and refers more particularly to an improved joint assembly for such panels.

One of the principal areas of difficulty in any prefabricated building having outside walls made up of a plurality of panels placed in side-by-side coplanar relationship is the obtaining of a satisfactory seal between the edges of the adjoining panels. For obvious reasons the sealed joint must be attractive. It must also be completely weatherproof and moreover, should be so designed as to inhibit as much as possible the transfer of heat between the inside and outside walls. This is particularly important in buildings used in cold climates or in the winter in temperate climates. Unless steps are taken to insulate as much as possible the inside surface of the joints on the outside, the inside surface will become so cold as to cause condensation of moisture with attendant frosting or build-up of ice thereon. Obviously, too, the joint assembly should be capable of rapid installation and composed of as few parts as possible.

One of the main objectives of the present invention is to provide a sealing joint between modular wall panels which is completely weatherproof, yet which can be installed with a minimum of effort and requires no specialized tools. It is a special feature of the invention that the tight weather seal in the joint is obtained without requiring any perforation of or application of fasteners to the panels themselves, thus preserving the integrity of the panels and avoiding any damage thereto.

Still another object of the invention is to provide a joint cover and seal of the character described in which the inside and outside components are so tied together as to inhibit, if not eliminate altogether, any conductance of heat between the inside and outside of the building to the joint. This feature is particularly advantageous in that it provides a frost or ice free joint and also one in which condensation of moisture on the inside joint components, even though no icing occurs, is avoided.

Yet another object of the invention is to provide a joint cover and seal of the character described in which the assembly of the inside and outside cover strips for the joint is achieved without requiring penetration of those strips by screws or other fasteners.

Other and further objects of the invention together with the features of novelty appurtenant thereto will appear in the course of the following description.

In the accompanying drawings which are to be read in conjunction with the specification and in which like reference numerals indicate like parts in the various views;

FIG. 1 is an elevational view of the outside of a portion of a typical wall incorporating the present invention, parts being broken away to indicate length and width;

FIG. 2 is a sectional view on an enlarged scale taken generally along the line 2—2 of FIG. 1 in the direction of the arrows;

FIG. 3 is a fragmentary elevation of a portion of the inside wall, showing the inside batten strip for one of the joints, portions of the strip being broken away to reveal the structure thereunder;

FIG. 4 is a view similar to FIG. 3 but of a portion

of the outside wall showing the outside batten strip, portions of the latter being broken away to reveal the structure thereunder;

FIG. 5 is an enlarged fragmentary section through the joint, being taken along the line 5—5 of FIG. 3 in the direction of the arrows;

FIG. 6 is a fragmentary perspective view of the outside batten strip;

FIG. 7 is a perspective view of a typical connector member;

FIG. 8 is a perspective view of the batten clip; and

FIG. 9 is a fragmentary perspective view of the inside batten strip.

Referring to the drawings, in FIGS. 1 and 2 there is shown a portion of a typical panel type wall in which the joints between adjacent panels are constructed in accordance with the present invention. The individual panels are indicated generally by reference numeral **10** and are of rectangular shape. Typically, each panel is constructed of a central core **10***a* which may be of the usual honeycomb structure or of suitable rigid thermal insulating material, faced on opposite sides with sheet metal skins **10***b* and **10***c*. All four edges of each panel have secured thereto and running lengthwise thereof a frame element in the form of an outwardly open channel, the upper and lower frame elements **11** and **12** being seen in FIG. 2 and typical side frame elements **13** in FIG. 5. It will be understood that the frame elements form an integral part of the panel, being connected thereto in any suitable fashion.

The panels are, as will be understood, mounted in coplanar relationship in any convenient way. For purposes of illustration, I have shown a base channel **14** set in and bolted to the foundation **15** of the building. The lower frame element **12** of the panel seats therein. The upper end of the panel is received in an upper retainer structure **16** which forms a part of the structural framework of the building. Bolts such as **17** may be employed to secure the panels in place.

The particular panels shown and described herein have been selected solely for the purposes of illustrating the invention and consequently the invention hereinafter to be set forth is not to be construed as limited to application to the illustrated panels alone.

The panels are mounted in the building framework as earlier described, with the edges of abutting panels slightly spaced to provide a narrow gap therebetween. A typical spacing may be seen in FIG. 5, the gap being between the respective outturned flanges **13***a* and **13***b* at the edges of the vertical panel frame elements **13**.

The joint assembly according to the specific form of the invention shown comprises the outer batten strip **18**, inner batten strip **19**, connector member **20**, inside batten clip and tie plate **21**, and thrust screw **22**. These elements are individually shown, with the exception of screw **22**, in FIGS. 6–9, inclusive.

The outer and inner batten strips **18** and **19**, respectively are elongate members adapted to be superposed over the joint on the inside and outside of the wall to completely conceal same. Both are preferably extruded shapes, the material employed being any suitable building material, for example, aluminum.

The outer batten is of symmetrical cross section having the main web portion **23** connected by inwardly directed legs **24** to the lateral extensions **25** which terminate in reversely bent flanges **26** parallel with the web. A marginal portion of each flange **26** is offset to provide a shoulder **26***a* parallel with and spaced inwardly from the outer edge of the flange. It will be noted that the exterior surfaces of flanges **26** are adjacent the outside skin **10***b* of the adjoining panels, a strip of gasket material **27** be-

ing interposed therebetween. Preferably the gasket material is bonded or adhered to the flanges 27 during manufacture of the batten 18 and is covered during shipment and ordinary handling by a removable strip 28 of paper or the like. As will later be made clear, during assembly of the building the strip 28 is removed so as to expose the gasket material and permit contact between it and the panel. Alternatively, any preformed sealing compound can be applied to the batten in the field before the batten is pushed into place.

It will be observed that each connector member approximates the shape of a T, having the laterally extending arms 29, 30 which are individually joined to slightly diverging members 31, 32 which form the stem of the T. The connector member is formed from a single piece of good quality metal, preferably steel. The members 31, 32 are joined by a bight portion in which is centered an aperture 33 for threadedly receiving the thrust screw 22 during assembly as will later be described.

The arms or lateral extensions 29, 30 of the connector member extend from the respective members 31, 32 at something less than a 90° angle, for example, approximately 75°. The distal ends are provided with curved lips 29*a*, 30*a*, which in the assembled condition (FIG. 5) engage against the respective shoulders 26*a* on the spaced flanges 26 of the outside batten. As is evident, the stem portion formed by the members 31, 32 extends through the gap between panels toward the inside face, terminating short of the plane of the inside face.

It may be helpful to note at this point that in installing the joint assemby the connector members 20 are inserted at intervals into coupling arrangement with the outside batten strip 18 prior to bring the batten strip into position over the joint. To do this the members 31, 32 of the connector are squeezed together as between thumb and forefinger and the connector manipulated into a position where, when the squeezing pressure is released, the lips 29*a* and 30*a* will spread apart and engage the respective shoulders 26*a*. To assist in guiding the lips into contact with the shoulders, the corners formed between legs 24 and extensions 25 on the batten strip are designed to maintain the edges of the lips 29*a*, 30*a* in engagement with the faces of flanges 26 by engaging the confronting surfaces of the arms 29, 30 when the squeezing pressure is released. The relative position of the arms 29, 30 in the batten at this time is shown in broken lines at 29′, 30′, of FIG. 5.

In constructing the connector member 20, the lips 29*a*, 30*a* are spaced apart a slightly greater distance than the distance between the shoulders 26*a* on the opposite sides of the batten so that in order to position the connector in the batten it is necessary to squeeze the members 31 and 32 toward one another. As a result, when the lips are in position in the batten in engagement with shoulders 26*a*, the connector is in a stressed condition. This has the effect of stabilizing the connector member in the batten strip with the stem pointing outwardly so that when the batten is brought into position over the joint, the stem of the connector member will project through the gap between the panels.

Once the outside batten 18 is in position over the joint with the stem of the connector in the space between the joints, the combined tie plate and clip 21 for each connector is installed. This is accomplished simply by placing the clip across the gap with the aperture 21*a* therein aligned with the aperture 33 of the connector and inserting the screw 22 therethrough to engage it with the aperture 33 in the connector. The screw is then tightened, drawing the stem of the connector toward the tie clip.

As the thrust on the stem is increased, the lips 29*a* and 30*a* on the connector member more firmly press against the flanges 26 of the outside batten, thus compressing them firmly against the gasket material 27. It will be noted that the shoulders 26*a* are so located with respect to the gasket material as to cause the pressure to be applied near the outside of the gasket strip, thus providing a tight and effective seal against intrusion into the joint structure of water or water vapor.

It will be noted that the spacing of the member 31 and 32 which form the stem of the connector is such that when the connector has been drawn into the final condition by screw 22, portions 31 and 32 are spaced from and nowhere in contact with the components of the panels. Thus the only metal to metal contact occuring is at the lips 29*a* and 30*a*. Since the area of engagement is quite small, the amount of heat that can be transmitted from the outside of the panel to the inside through the connector member is infinitesimal.

In order to further inhibit conductance of heat through the components of the joint itself, the screw 22 can be composed of a thermal insulating material such as nylon or other plastic.

As will be evident, the tie plate and clip 21 provides the support for the thrust screw 22 on the inside of the wall structure. It also serves the additional purpose of providing a mounting or retention for the inner batten strip 19.

The inner batten strip 19, like the outer strip 18, runs the length of and covers the gap between the panels. It is of symmetrical cross section, having the web portion 34 joined by legs 35 to flanges 36. The faces of the flanges which confront the panel have adhered thereto strips 37 of gasket material which are adapted to contact the panel. The strips may be positioned on flanges 36 by shoulders 36*a*. The thickness of the gasket material is such that it will prevent metal to metal contact between the batten strip 19 and the metal components of the panel.

As is again best seen in FIG. 5, the combined tie plate and clip 21 is provided at its opposed edges with reversely bent flange portions 21*b*. These cooperate with bevelled extensions 39 formed on the batten 19 to retain the batten in place. To install the inner batten strip on the joint it is first initially positioned in alignment with the joint with the tips of the bevelled portions 39 bearing against the outcurved portion of the curved flanges 21*b* of the clip members. The batten is then pressed inwardly. The flexibility and resiliency of the web 34 of the batten, or of the curved flanges 21*b* of the clips, or both, is sufficient to permit the temporary spreading of the bevelled portions 39 as the batten is pressed inwardly to move past the outermost edges of the curved flanges 21*b* and return to the locked position illustrated in FIG. 5. In other words, the inside batten strip 19 is "snapped on" the clips 21 and is retained in position on the panel structure thereby.

The number of connector members 20 that will be used in any continuous joint will depend on the length of the joint. Preferably they are spaced at intervals of two feet.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth together with other advantages which are obvious and which are inherent to the structure.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In a covering and sealing assembly for concealing and sealing the gap between a pair of coplanar, edge adjoining wall panels, the combination of an outside cover member running lengthwise of the gap on one side of the panels and having a longitudinal cavity overlying and in communication with the gap, said cover member further provided with portions abutting the respective panels

and presenting spaced surfaces within the cavity on opposite sides of the gap substantially parallel with the planes of the panels, a connector member having a central stem extending normal to the plane of the panels and positioned in the gap and oppositely extending resilient arms at one end of the stem and in said cavity, said arms having their distal ends in engagement with said spaced surfaces of the outside cover member, said spaced surfaces provided with shoulders which also engage said distal ends to prevent relative movement of said ends away from one another, and means associated with said connector member and operable to apply a thrust force to said stem tending to pull same through the gap toward the other side of said panels whereby to cause said distal ends of the arms to tightly compress said cover member surfaces toward the faces of said panels.

2. The combination as in claim 1 wherein said stem comprises a pair of resiliently connected spaced portions, the arms extending respectively from said portions.

3. In a covering and sealing assembly for concealing and sealing the gap between a pair of panels mounted in coplanar relationship, the combination of a batten strip bridging and extending lengthwise of the gap on one side of the panels, said batten strip including a pair of surfaces disposed on opposite sides of said gap and facing away from the panels, the strip being formed to provide an opening outwardly of said surfaces and communicating with said gap, the connector member including a pair of oppositely extending arms having distal ends disposed in said opening in engagement with said surfaces, stop means engaging said distal ends to prevent displacement thereof away from each other in a direction parallel to the plane of the panels, and means operable through said gap for drawing the other ends of said arms in a direction to firmly engage said distal ends against said surfaces and stop means whereby to put said arms in longitudinal compression and compress said strip against the panels.

4. In a covering and sealing assembly for concealing and sealing the gap between a pair of coplanar, edge

adjoining wall panels, the combination of an outside cover member running lengthwise of the gap and having a longitudinal cavity overlying and in communication with the gap, said cover member further provided with portions abutting the respective panels and providing spaced bearing surfaces within the cavity on opposite sides of the gap, a connector member having a central stem portion extending normal to the plane of the panels and positioned in the gap with one end inside said cavity, said connector member further including a pair of oppositely disposed arm members resiliently connected with said one end of said stem portion and extending toward said bearing surfaces, said arms respectively having their distal ends in engagement with said bearing surfaces, stop means cooperating with said bearing surfaces and distal ends and operable to prevent said ends from moving further apart from one another, and means associated with the other end of said stem portion of said connector member and operable to apply a thrust force to said stem portion tending to pull same through the gap toward the other side of the panels whereby to flex said arm members and cause said distal ends to tightly compress said cover member surfaces toward the faces of said panels.

5. The combination as in claim 4 wherein said stem portion comprises a pair of members spaced from each other and resiliently connected with each other at said other end and having said arm members extending respectively from the unconnected ends.

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