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W. GILLETT ET AL

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BUILDING STRUCTURE

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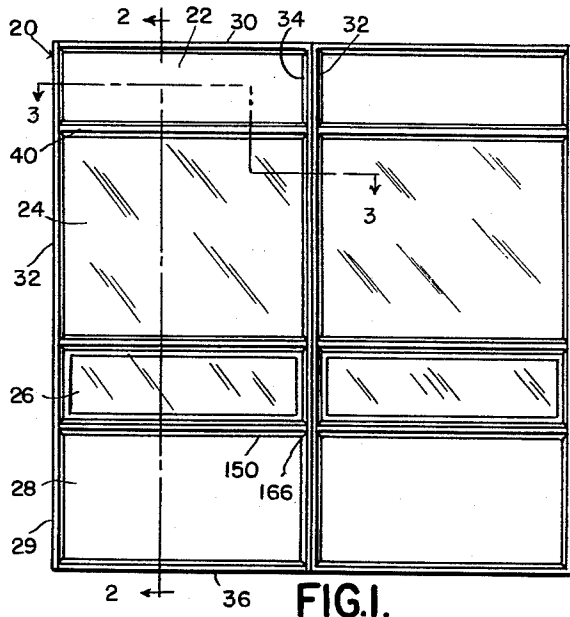


FIG. 1.

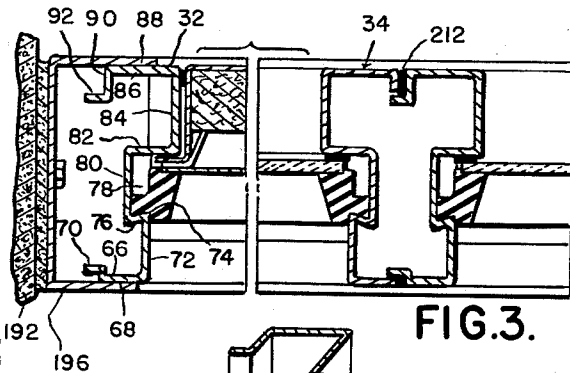


FIG. 3.

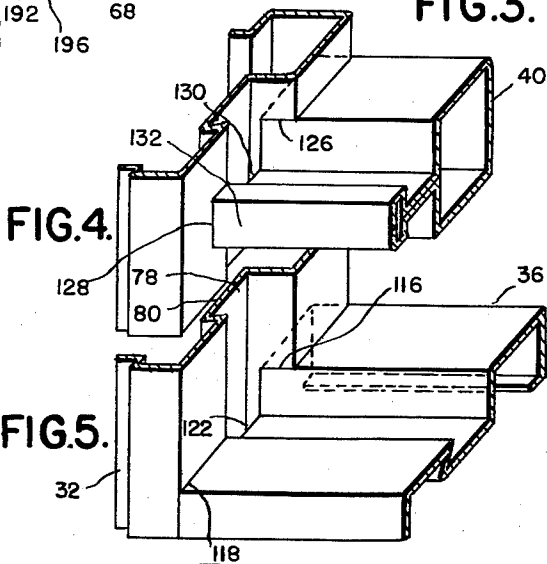


FIG. 4.

FIG. 5.

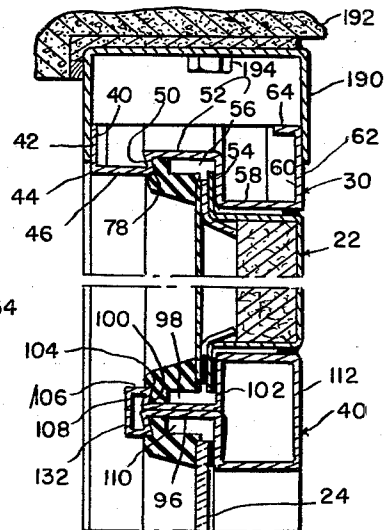
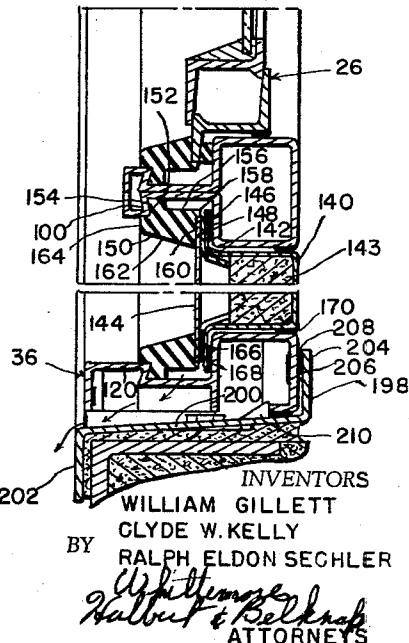
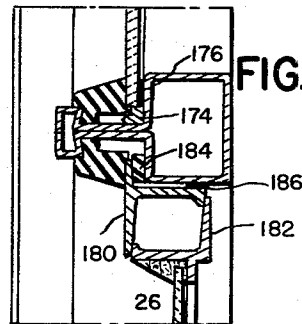


FIG. 2.



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BUILDING STRUCTURE

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3 Claims. (Cl. 20—11)

The present invention relates to building structures and refers particularly to structures that form the exterior walls of a building.

It is an object of the present invention to provide a building wall structure of unitary construction that can be easily installed to form a curtain wall.

It is a further object of the present invention to provide a building wall structure comprising a frame having insulated panels, sash and glazing, with the panels, sash and glazing being assembled in the frame by means of a novel molding strip.

It is still a further object of the present invention to provide a building wall structure comprising a frame having insulated panels, sash and glazing, with the panels, sash and glazing being assembled in the frame by means of a novel molding strip with means to provide drainage for any moisture that might collect behind the molding.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawings, illustrating a preferred embodiment of the invention, wherein:

FIGURE 1 illustrates a view of the wall structure with two units assembled in side by side relationship.

FIGURE 2 is an enlarged partial sectional view taken through the line 2—2 in FIGURE 1.

FIGURE 3 is an enlarged partial sectional view taken through the line 3—3 in FIGURE 1.

FIGURE 4 is an enlarged perspective view of a horizontal member joining a vertical member of the frame structure.

FIGURE 5 is an enlarged perspective view of the lower left corner of the frame structure.

Referring now to the drawings, there are illustrated two wall units 20 assembled in side by side relation. Each unit 20 has an upper insulated panel 22, a fixed light of glass 24, a sash unit 26 and a lower insulated panel 28, all assembled in frame member 29.

The view of FIGURE 1 is shown looking toward the outside face of the wall that is exposed on the outside of a building structure. The sectional view of FIGURE 2 has the outside face to the left of the illustration and the inside face that is at the inside of the building structure to the right.

Frame member 29 is comprised of a top or head frame member 30, a side or jamb frame member 32, a jamb frame member 34, and a bottom or sill frame member 36. A horizontal mullion member 40 divides the frame to provide openings for the panels, fixed lights and sash units.

The frame members can be formed from any suitable material such as aluminum or steel. Sheet steel of a heavy gage gives excellent results in forming the material and providing a strong rigid frame.

Head frame member 30 has an upstanding leg portion 40 with the surface 42 being at the outer face of the wall unit. Leg 40 is bent at right angle at 44 to form portion 46 that extends inwardly to point 48 where it is bent sharply to form the portion 50 that extends in the same direction but at an angle to leg 40. Portion 52 extends parallel to portion 46 then bent at right angles to form the portion 54 that extends parallel to but in direction opposite to portion 40. Portions 50, 52 and 54 form a

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groove or channel 56. Portion 58 extends inwardly and parallel to 46 and 52 where it is bent at right angles to form portion 60 with the surface 62 being at the inner face of the wall. Portion 64 is at the terminal edge of the frame member.

Side frame member 32 has portion 66 with surface 68 at the outer face of the wall unit. Portion 70 is set back from and extends parallel to 66 and forms the terminal edge of the member. Portion 72 extends at right angles to 68 to point 74 where it is bent sharply to form the portion 76 that extends in the same direction and at an angle to portion 66.

A groove or channel 78 is formed by the portions 76, 80 and 82. Portion 84 extends parallel to 72 and 80 with the portion 86 extending at right angles to 84 and having the surface 88 facing the interior of a building structure. Portion 90 is bent at right angles to form the portions 92 at the terminal edge of the material.

Mullion member 40 can be formed from a single strip of material that is bent back upon itself to provide a double thickness of metal 96. Channel 98 is formed by portions 96, 100 and 102 with portion 100 extending parallel with and at an angle to portion 102 to the point 104 where it is bent to form the portion 106 and further bent forming the portion 108 at the terminal edge of the material. The member 40 is symmetrical about a plane through the surface where the double thickness of metal 96 is joined with the groove 110 opposite to groove 98. Surface 112 faces the inside of the building structure.

Jamb member 34 and sill member 36 are of identical cross sectional shape as member 30 previously described. Members of desired length are assembled together to form the frame unit 29, and being joined at their ends in the manner shown in FIGURES 4 and 5. The frame members with the exception of horizontal mullion 40 are all of the same width from outer surfaces 42 and 68 to inner surfaces 62 and 88, and channels 56 and 78 of the head, jamb and sill members are in alignment with each other and with the channels 98 and 110 of the horizontal mullion members.

The corner construction of the frame 29 is shown in FIGURE 5 and illustrates the manner in which the joint is made at each of the four corners. Jamb member 32 is cut out or coped as at 116 to allow the sill member that has been cut off square at the ends to abut against the jamb member as at 118. The members are joined together by welding preferably along surfaces where the welding will not be exposed to view when the assembly is in place in building structure as at 120, FIGURE 2. Edge 122 of the channel 56 of the sill member is spaced from portion 80 of channel 78 of the jamb member to allow channel 78 to be free of obstructions.

FIGURE 4 illustrates the manner in which the horizontal mullion members 40 are joined to the jamb members 32 and 34. The jamb members are coped at 126 to allow the square end of the mullion to abut the jamb member at 128. Edges 130 of the channels 98 and 110 of the mullion are also spaced from the portion 80 of the jamb member. The members are joined together in the same manner as previously described for the corners with surface 112 in alignment with surfaces 62 and 88 and surface 132 of the mullion offset from surfaces 68 and 42.

With the frame members joined together channels 56, 78, 98 and 110 are in alignment with each other and with channel 78 of the jamb members clear of obstructions from end to end of the member for purposes later to be described.

Insulated panel 28 has a pan shaped sheet material member 140 having a flange 142 around its periphery. Member 140 is of a shape and size to fit the rectangular opening provided by the sill jamb and mullion mem-

bers. A batt of fibrous insulating material 143 fits in the member 140. Sheet metal material 144 encloses the member 140. A plurality of members 146 are attached to 144 by welding as at 148 and hold the batt in place. Sheet 144 can be fabricated from plastic or aluminum with porcelanized steel giving excellent results.

To hold the assembly in the opening, strip 150 is provided. Strip 150 can be of any resilient material. Polyvinyl chloride or neoprene rubber both of a durometer hardness to provide resiliency that will allow the strip to be readily assembled in place and be rigid enough to permanently hold the assembly in the opening give excellent results. The strip has a portion 152 having an angular side 154 that abuts against the member 100 of the mullion members. Edge 156 terminates in a shoulder portion 158 that abuts against the end of the plate 144. Surface 160 presses against the plate 144 with surface 162 receding at an angle away from the plate to the surface 164.

The strip 150 extends around the periphery of the opening. The corners can be mitre cut and if desirable the cut can be attached by adhesion.

To prevent the entrance of air and moisture, sealing strips 166 and 168 are used. Caulking or sealing material 170 closes the cracks between pan 140 and the frame members.

A strip having the same cross sectional shape as strip 150 is used to hold panel 22, glass 24, and sash unit 26 in place in the openings provided by the frame members in the same manner as previously described for member 28. The strip 150 is dimensioned to have a right fit when assembled in place with a suitable tool that forces portion 154 in place against member 100 with the angular side preventing accidental or unintentional dislodgement. The strip can be removed by a suitable tool if desirable.

Fixed light of glass 24 has a member 174 that helps support the glass and sealing strip 176 prevents the passage of air and moisture.

The sash unit 26 has a frame 180 and vent 182 that opens outward. Sealing strip 184 and caulking 186 prevent the passage of air and moisture.

It will be noted that with the strips 150 in place that channels 56, 78, 96 and 98 are open and clear with the channels extending around the periphery of the openings for each member and the channels of each jamb member open from top to bottom. This provides a passage for moisture that may collect in the channels to drain toward each jamb member. The moisture can go down each jamb member and exit from the wall as shown by arrows in FIGURE 2.

The wall units can be preassembled before installing in a building structure or if desirable the frame unit 29 can be installed in the building structure with the panels, sash and glass installed later to prevent damage when work is in progress on the structure.

To hold the wall units in place, channel shaped metal member 190 is secured to the building structure 192 by bolt 194 or other suitable means at the head of the building opening provided. A similar member 196 is provided at the jambs of the building opening. The wall unit 20 is placed in the opening by sliding into members 190 and 196 that are dimensioned to receive the frame 29 with a tight sliding fit. The unit is then dropped down on sill member 198.

Sill 198 has a portion 200 that slopes toward the outside of the building structure to facilitate drainage of any moisture that may collect and a downturned leg 202. Portion 204 has a plurality of projections 206 to space the sill member 36 away from portion 204 to allow caulking material 208 to fill the opening. A plurality of lugs 210 hold the unit in place. If desirable the wall units can be attached to members 190 and 196 by welding.

A second wall unit 20 can be assembled in place in

the same manner as previously with the second unit interfitting with the first unit as shown in FIGURE 3. Caulking compound 212 prevents passage of air or moisture. In a similar manner more units can be installed in the opening if desirable.

The drawings and the foregoing specification constitute a description of the improved building structure in such full, clear, concise and exact terms as to enable any person skilled in the art to practice the invention, the scope of which is indicated by the appended claims.

What we claim as our invention is:

1. A building panel comprising a frame including head, jamb and sill members providing a rectangular opening, each of said members having a longitudinal channel therein, each of said channels having a bottom portion, a side perpendicular to said bottom, a second side extending at an angle to said bottom and toward said first mentioned side, said first mentioned side extending a greater distance away from said bottom than said second side, said head and sill members being joined to said jamb members with said channels being in alignment with each other, the terminal ends of the bottom portion of the channels on said sill members being spaced from the bottom portion of the channels on said jamb members, a closure for said opening having first surfaces adjacent the peripheral edges abutting the first mentioned side of said channel, a closure strip in each of said channels, each of said strips having a first portion bearing against the second side of said channels and a second portion bearing against second surfaces opposite the first mentioned surfaces of said closure, each of said strips having a third portion between the first and second portion and spaced away from the bottom of said channel, with the third portion of said strip in said jamb members being substantially in alignment with the terminal end of said bottom portions of said sill member channels to provide an open channel for substantially the complete height of said jamb members in communication with open channels in said sill member.

2. A building panel comprising a frame including head, jamb, sill and mullion members providing a plurality of rectangular openings, each of said members having a longitudinal channel therein, each of said channels having a bottom portion, a side perpendicular to said bottom, a second side extending at an angle to said bottom and toward said first mentioned side, said first mentioned side extending a greater distance away from said bottom than said second side, said head, sill and mullion members being joined to said jamb members with said channels being in alignment with each other, the terminal ends of the bottom portion of the channels on said head and sill members being spaced from the bottom portion of the channels on said jamb members, closures for said sill and mullion having first surfaces adjacent the peripheral edges abutting the first mentioned side of said channel, a closure strip in each of said channels, each of said strips having a first portion bearing against the second side of said channels and a second portion bearing against second surfaces opposite the first mentioned surfaces of said closure, each of said strips having a third portion between the first and second portion and spaced away from the bottom of said channel, with the third portion of said strip in said jamb members being substantially in alignment with the terminal end of said bottom portions of said head and sill member channels to provide an open channel for substantially the complete height of said jamb members in communication with open channels in said head, sill and jamb members.

3. A building panel comprising a frame including head, jamb and sill members defining an opening and each having a longitudinal channel therein, each of said channels having a bottom portion, a first and second side, said head and sill members being joined to said jamb members with said channels in alignment with each other, the terminal ends of the bottom portion of the channels on said sill

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member being spaced from the bottom portion of the channels in said jamb members to provide a drainage connection between the channels and the exterior of the frame, a closure for said opening, the periphery of which is positioned in said channels, a closure strip in each of said channels, each of said closure strips having a first portion bearing against the first side of said channels and a second portion bearing against the periphery of said closure to hold said closure against the second side of said channels, said closure strips having a longitudinally recessed portion between said first and second portions spaced away from the bottom of said channels to provide connected open drain means entirely around said frame

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and through said sill member thereof in conjunction with said channels.

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