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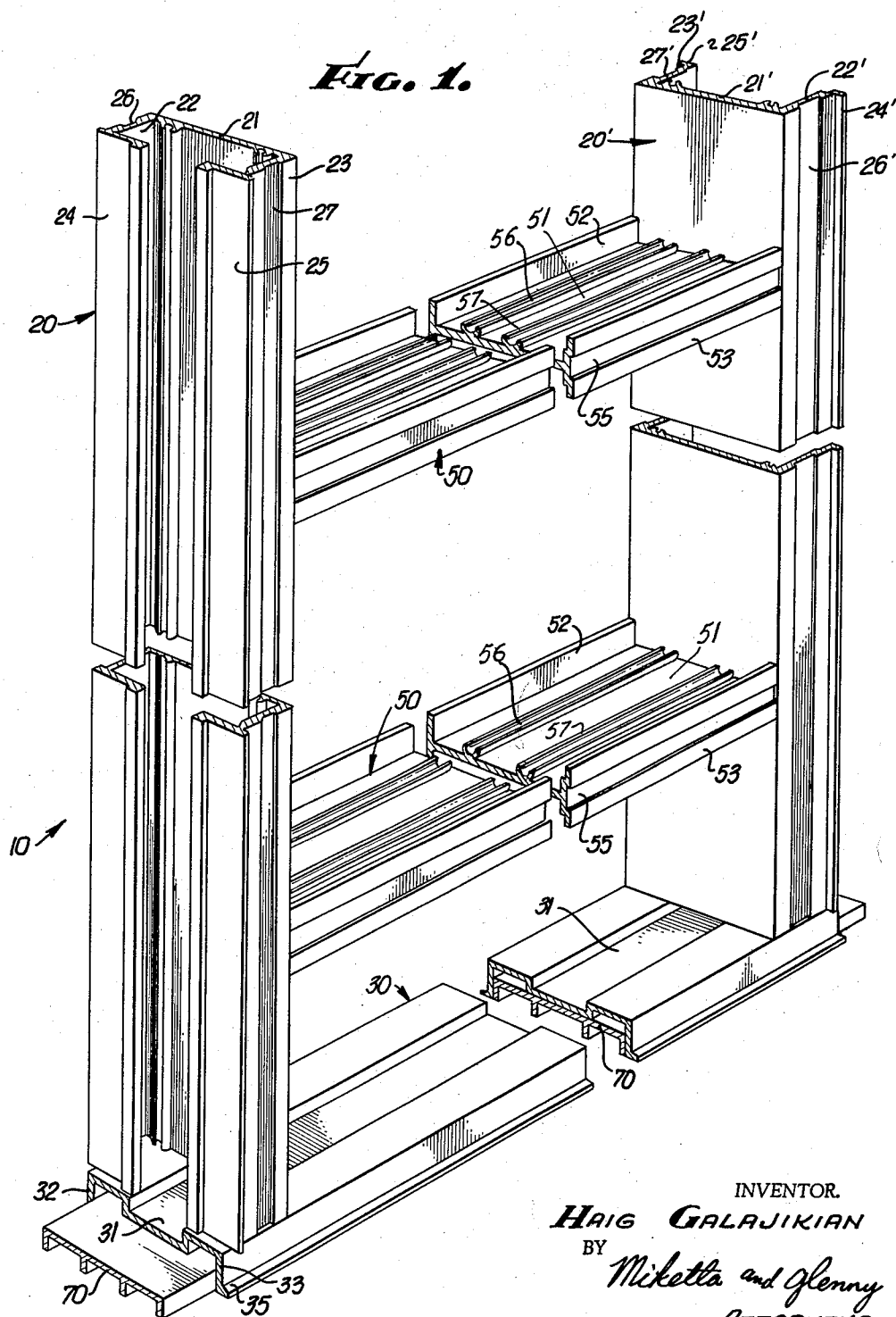
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PREFABRICATED EXPANDABLE BUILDING CONSTRUCTION

Filed May 29, 1961

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PREFABRICATED EXPANDABLE BUILDING CONSTRUCTION

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FIG. 2.

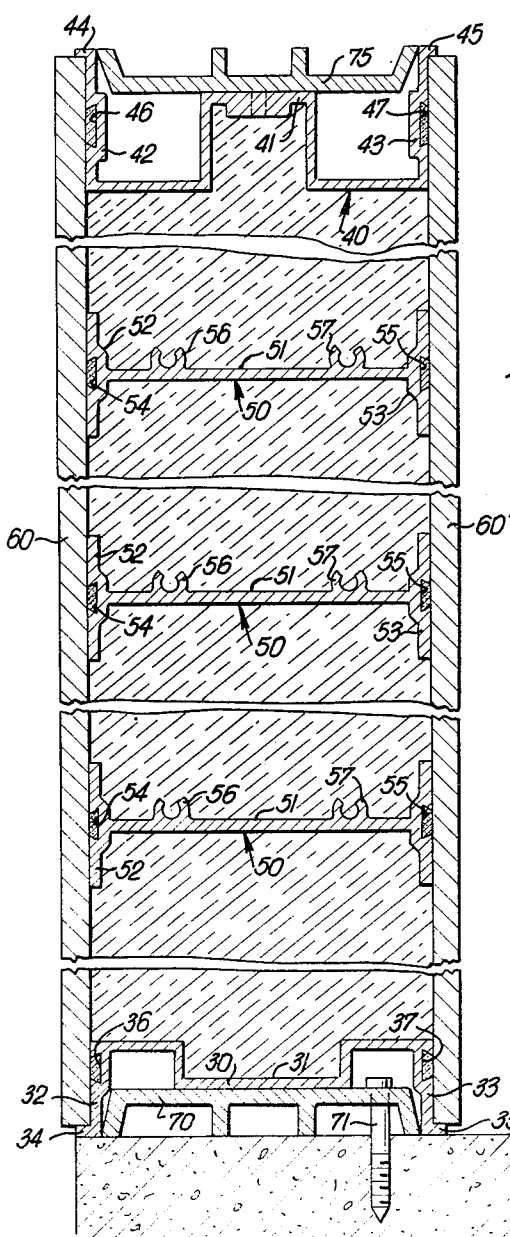


FIG. 3.

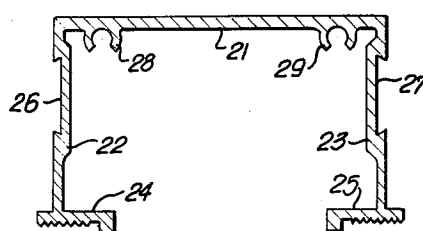
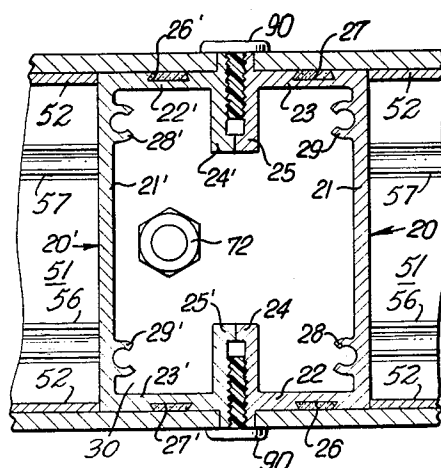


FIG. 4.



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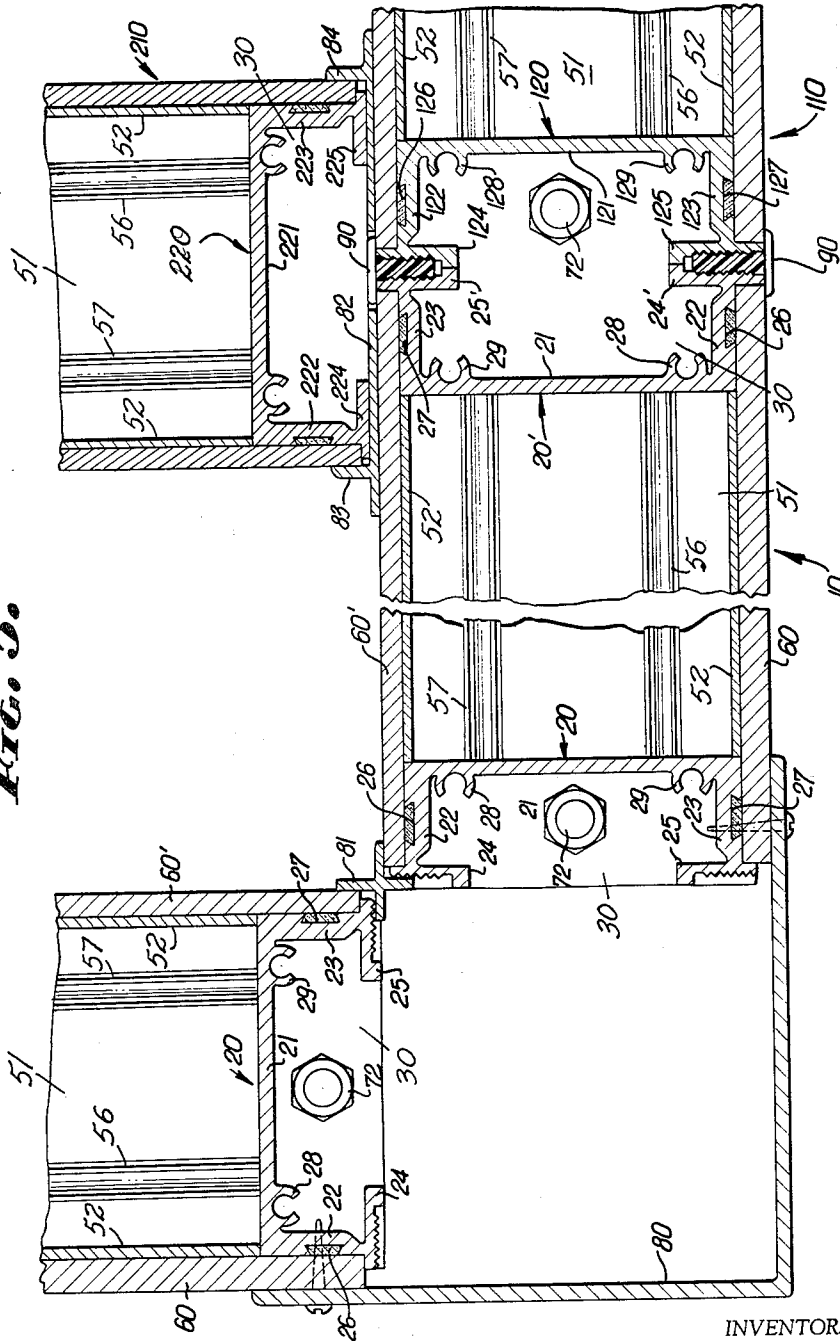
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PREFABRICATED EXPANDABLE BUILDING CONSTRUCTION

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FIG. 5.



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PREFABRICATED EXPANDABLE BUILDING CONSTRUCTION

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3 Claims. (Cl. 189-34)

This invention relates generally to prefabricated building construction particularly suitable for use in warm, moist climates infested with rodents, insects and the like, and which may be readily assembled, disassembled and modified in size as desired. More particularly, the invention relates to a novel, light weight, sturdy wall panel construction which may be inexpensively prefabricated at a point distant from the ultimate location of use and readily transported to and assembled into a building construction at the desired building site to provide a low cost economical building which is impervious to the passage therethrough of rodents, insects and the like, and which allows integrally provided, wall insulation of superior nature preventing the passage of heat therethrough.

In many areas of the world the presence of insects, such as termites and the like, and an environment of generally hot, moist weather present serious problems in building construction. A building made according to conventional methods of wood siding and frame construction is extremely susceptible to early deterioration due to the combined action of wood gnawing rodents and insects and wood rotting damp or moist weather conditions. Such building construction is expensive to insulate properly as well. I have devised a mode of building construction particularly well suited for constructing buildings in such climates, as well as in more favorable climates, which is inexpensive to employ and which allows rapid assembly of a building at a construction site.

Generally stated, my invention comprises the provision of a panel construction frame which may be readily assembled out of extruded aluminum parts at an assembly plant. The panels are adapted to be readily assembled into wall constructions at the building site, having already received wall board facing panels, to make a complete wall. The building construction is also provided with means for readily expanding the building by the addition of more panel frames and wall board facing panels similar to those already assembled. The construction, being made of extruded aluminum frame parts and hard wall board facing panels, is impervious to termites and the like. All joints between panels may also be sealed by sealing means as described in the detailed description of an exemplary construction contained herein. Furthermore, an air space provided within the panels between the hard wall board facing panels may be filled with an insulation to provide good climate control characteristics for the interior of the building so constructed.

More particularly, a panel construction frame, according to my invention, is comprised of a pair of spaced vertical studs including a transverse web and outwardly extending spaced side flanges. The flanges are provided with lip having lip portions adapted to abut similar lip portions on an adjoining panel and to receive sealing means between the lips of such adjoining panels. A horizontally extending panel base member and a top frame member, each of generally channel section interconnect the vertical studs to provide a frame member. A plurality of horizontal braces may be provided for added strength and rigidity of the frame member. Outwardly facing flanges of the frame members are provided that have indirect keyways therein such that a mechanical bond may be effected between such members and facing panels which are glued thereto by epoxy type resins. Furthermore, the frame members are each provided with longi-

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tudinally extending nail-grasping means or tensioning lips formed integrally in the extruded members. The various frame members may therefore be readily assembled into a panel frame by forcing fastening means such as studs, nails or threaded screws through preformed holes in the frame members into the nail-grasping means on the associated frame member being assembled thereto.

It is an object of my invention therefore to disclose and provide a prefabricated building construction which is inexpensive and easy to employ and which provides building constructions that are generally impervious to creeping and crawling insects, such as termites and the like.

It is another object of my invention to disclose and provide a prefabricated building construction which allows ready expansion of the construction when desired.

It is a further object of my invention to disclose and provide a prefabricated building wall panel construction member which may be readily fabricated at a point distant from the point of use and quickly assembled into a building construction by simple inexpensive means.

It is a still further object of my invention to disclose and provide simple effective assembly means including nail-grasping means integrally formed in extruded aluminum panel frame members whereby a wall panel, according to my invention, may be easily and readily fabricated.

Further objects and various advantages of my invention will become apparent to one skilled in the art by a consideration of the following detailed description of an exemplary wall panel construction and assembly. Reference will be made therein to the appended sheets of drawings in which:

FIG. 1 is a perspective view of a wall panel frame construction according to my invention;

FIG. 2 is a transverse section of the panel frame construction of FIG. 1 taken in a vertical plane through a mid-portion thereof with outer facing panels assembled thereto;

FIG. 3 is an enlarged transverse section of a vertical stud portion of the panel frame construction of FIG. 1;

FIG. 4 is a transverse section showing an exemplary junction between two adjoining wall panels, according to my invention; and

FIG. 5 is a plan view of a portion of an exemplary building construction employing wall panel construction according to my invention.

Referring now particularly to FIGS. 1 and 2, an exemplary embodiment of the wall panel frame construction, according to my invention, is shown with outer facing panels assembled thereto in FIG. 2 only.

The wall panel construction comprises, in general, a panel frame, indicated generally by 10, in FIG. 1, and a pair of continuous facing panels 60 and 60', as seen in FIG. 2, which are glued to the frame 10 after its fabrication by epoxy type plastic resins. The panel frame 10 includes, generally, a pair of opposed spaced vertical studs or frame members 20 and 20' which are interconnected by a horizontally extending panel base member 30 and a horizontally extending panel ceiling or top frame member 40 (shown only in FIG. 2), all being of generally channel cross-section. A plurality of horizontal braces 50 may also be provided to give added strength and rigidity to the panel frame 10.

The panel frames 10 may be readily fabricated of aluminum extrusions and be provided with facing panel boards at a fabricating plant. The spaces provided between the inner and outer facing boards 60 and 60' are preferably filled with a suitable insulating material, such as generally rigid bats of fiberglass or the like during the fabricating operations as well. The completed panels may be then transported to the location of use. Since the panel frames are made of light weight aluminum, they

are easily handled and readily transportable to the building construction site.

Considering the panel frame 10 in greater detail now, it may be seen in FIG. 1, and particularly FIG. 3, that vertical studs 20 and 20' are of generally channel cross-section having a main transverse web 21 and outwardly spaced side flanges 22 and 23, said side flanges providing vertical recesses within the vertical studs adapted to enclose electrical wiring and accessories as desired. The panel frame members, including studs 20 and 20', are preferably made of extruded aluminum. The side flanges 22 and 23 of the vertical stud members are provided with end lips 24 and 25, respectively, which extend inwardly and outwardly therefrom.

Indirect keyways 26 and 27 are also provided on the outer side surfaces of the flanges 22 and 23, respectively, of each vertical stud to facilitate bonding the facing panel boards 60 and 60' to the panel frame member. Epoxy type resins are used to glue the panel boards to the frame member. The excess resin used will tend to move into the keyways so provided to form mechanical locking bonds between the frame 10 and facing panels 60 and 60' in addition to the normal adhesion effected therebetween by the resin.

Horizontally extending panel base member 30 is provided with a transverse web portion 31 and side flanges 32 and 33. Web portion 31 abuts the lower ends of the vertical studs and terminates at its longitudinal ends in a plane even with that of the end lip portions of the vertical studs, as shown in FIG. 1. The side flanges 32 and 33 also lie in the same planes as those of the respective flanges of the vertical studs to receive the facing panel boards thereon. Side flanges 32 and 33 are also provided with lips 34 and 35, respectively, which extend outwardly of the flanges to guidingly receive the ends of the facing panel boards. Indirect keyways 36 and 37 are also provided which aid in bonding the facing panel boards 60 and 60' thereto.

Top frame member or panel ceiling member 40 is provided with a transverse web portion 41, abutting at its ends in a plane even with that of the end lips of the vertical studs, and side flanges 42 and 43. Side flanges 42 and 43 lie in the same planes as the flanges of the vertical studs and panel base member 30 to receive the facing panel boards thereon. Lips 44 and 45 are similarly provided, as on the panel base member 30, to guidingly receive the facing panel boards. Facing panel boards 60 and 60', as shown in FIG. 2, are held at top and bottom edges by the lips of the top frame member 40 and panel base member 30. The vertically extending lips carried by the vertical studs 20 and 20' guidingly receive the facing board therebetween along their vertical side edges. The facing boards are thereby surrounded about their edges by the aluminum lips of the panel frame members and securely bonded to the frame by mechanically keyed epoxy type resins. The side flanges 42 and 43 are further provided with indirect keyways 46 and 47, as are the base panel member flanges.

To facilitate the fabrication of the panel frame 10, the vertical frame members 20 and 20' are provided with nail-grasping means or tensioning lip means, adapted to receive a nail or stud therein. As shown in FIG. 3, the vertical studs are provided with longitudinally extending, integrally formed nail-grasping channels 28 and 29 on the inner surface of the transverse web portion 21. The panel base member 30 and the panel ceiling member 40 may be securely attached to the vertical studs by driving sheet metal screws or the like through preformed positioning holes, therein, into the nail-grasping channels 28 and 29. The panel frame 10 may thereby be readily fabricated without the use of difficult and expensive metal welding steps.

A plurality of horizontally disposed braces 50 are preferably provided. Braces 50 include a transverse web 51 and end flanges 52 and 53, as shown in FIG. 2. End

flanges 52 and 53 present outer surfaces lying in similar planes as outer surfaces of the respective side flanges of the vertical studs, panel ceiling member and panel base member to receive a facing panel board thereagainst. The outer surfaces of the flanges 52 and 53 are further provided with indirect keyways 54 and 55, respectively, to facilitate a mechanical bond between the flanges and facing panel boards as in the case of the other panel frame members. Nail-grasping channels 56 and 57 are also provided to mount the braces between the studs 20 and 20'. The braces 50 are assembled to the frame therefore, by merely driving sheet metal screws, or the like, through pre-punched positioning holes in the vertical studs into the preformed grasping channels or tensioning lips 56 and 57.

After the panel boards have been glued to the panel frame with rigid bats of fiberglass insulation positioned therebetween, the fabricated panels may be transported to the building site for assembly into a building wall construction. At the building construction site, floor runners 70 may be ram set or spiked to the floor, where a wall is to be assembled, by the use of threaded studs 71, as shown in FIG. 2. A panel is then set upon the runners 70 with the panel base member 30 straddling it. Each panel base member 30 is adapted to exert a spring tension grasping action on the runner 70 such that lateral movement of the panel is impeded. The panel may be then bolted down by means of conventional means, as the nut and bolt connector 72 shown in FIG. 4. Each panel is bolted at only the open, readily accessible end as successive panels are assembled to the building wall. Adjoining panels are interlocked with each other upon the floor runner 70 by means of a ceiling strip of inverted floor runner 75, shown in FIG. 2.

A building wall assembly, employing wall panel construction, according to my invention, is shown in FIG. 5. The outer wall assembly is started and stopped at the same corner with a corner plate 80 of aluminum bolted to the wall panels at the corner. A vertical star member 81 may be provided at the intersection of the inner walls of the corner. It may be seen therefore, that the building may be expanded very readily by merely removing the corner plate 80, and one wall of the building, and adding further wall panels until the enlarged building is provided. Inside wall partitions may be provided, as shown, by providing an aluminum plate 82, with flanges 83 and 84, which is adapted to receive a panel 210. Panel 210 is fabricated just as panel 10 except that the end lips 224 and 225 are provided with generally flat outwardly facing surfaces to abut against the plate 82.

As shown in FIG. 5, successive panels as 10 and 110 abut against one another at the lip portions of vertical stud frame members. A sealing means or vertical strip of plastic 90 may be driven or forced into the vertical joint formed by the abutting lip portions 24', 25' and 125, 124 between lips of the vertical studs 20' and 120, respectively, to reduce metal to metal contact between the adjoining panels and prevent the passage of condensation therethrough. The lips of the vertical studs may be provided with outwardly facing vertical ribs, as shown, to receive vertically extending plastic strips 90 which are similarly ribbed to form an interlocking engagement therebetween.

It may be seen from the foregoing detailed description of an exemplary embodiment of building panel construction that a very strong and sturdy wall construction is provided by my invention which is virtually impervious to the passage of insects and gnawing of termites or the like. Furthermore, the provision of bats of insulation between the panel boards at the time of panel fabrication instills very good insulating characteristics in the panel before it reaches the building site. Therefore, when the panels are received at a building site, they need be only assembled into vertical relationship over the floor runners and secured in place as described. The ease with which

the building walls may be assembled greatly reduces labor costs and speeds the erection of a building markedly. It is therefore obvious that low cost economical buildings may be erected in large numbers by relatively unskilled laborers, easily and very rapidly, when building panels, according to my invention, are employed.

Having described an exemplary embodiment of a prefabricated, expandable building construction and wall panel construction, according to my invention, what I claim is new and desire to protect by Letters Patent is:

1. A hollow metallic frame prefabricated building panel having no exposed metallic portions so as to prevent sweating or condensation therethrough, said panel comprising:

a pair of spaced metallic vertical studs, a horizontally extending panel base member supporting said studs and a horizontally extending top frame member;

side flanges on said studs, base member and top frame members all lying in the same plane to receive a non-metallic planar facing sheet thereon;

indirect keyway means in each of said flanges for receiving and mechanically bonding adhesive therein;

a non-metallic planar facing sheet overlying said flanges on said studs, base member and top frame members;

adhesive bonding means bonding said facing sheet to said flanges and keyway means;

a lip at the outer edge of each of said flanges on said studs, each said lip extending outwardly of said stud side flange to be abutted by an edge of said facing sheet; and

vertical strip means of insulating material to overlie each of said lips and adjacent edges of said facing sheet.

2. The hollow metallic frame prefabricated building panel of claim 1 wherein:

each of said lip on said stud flanges is provided with a ribbed surface and

said strip means is a vertically extending strip of plastic material having a ribbed configuration interlocked with ribs on the stud flange lip it overlies.

3. A prefabricated building panel joint construction comprising:

a pair of vertical metallic studs mounted on a common horizontally extending panel base member;

each of said studs including a main transverse web and a pair of side flanges extending generally at right angles outwardly from and spaced by said web;

a lip at the outer edge of each flange extending outwardly of the flange generally parallel to the plane of said web and adapted to be abutted by an edge of a non-metallic facing sheet to be bonded to said flange, the lips of said pair of studs being spaced apart to provide a joint therebetween;

a non-metallic facing sheet adhesively secured to each of said flanges and abutting each of said lips; and a vertical strip means of insulating material within said joint and overlying said lips and adjacent edges of the facing sheets,

whereby a joint construction is provided with no exposed metallic portions thus preventing sweating or condensation through said joint.

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