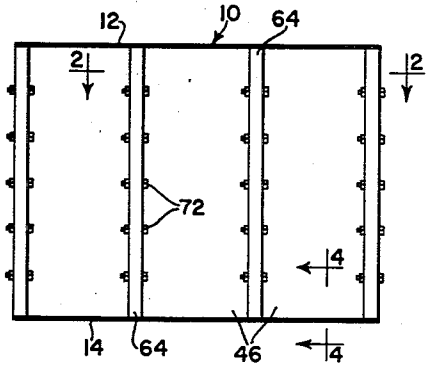
Oct. 27, 1964 H. A. HARRY 3,154,179

BUILDING STRUCTURE

Filed Dec. 30, 1959

FIG. 1



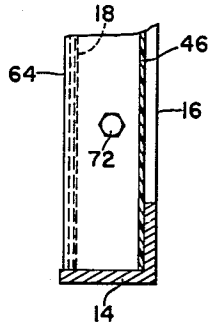


FIG. 4

FIG. 2

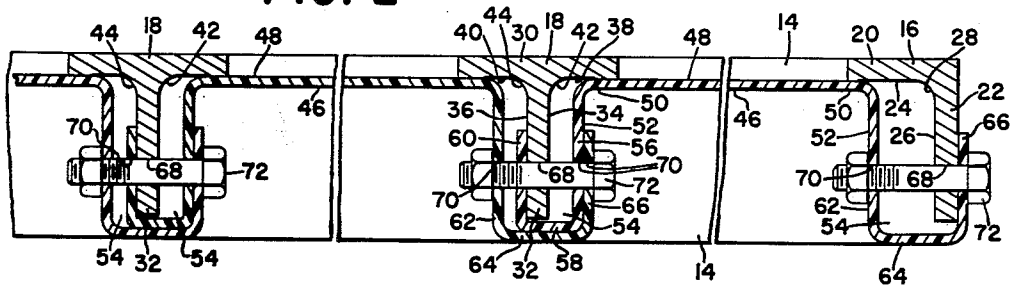
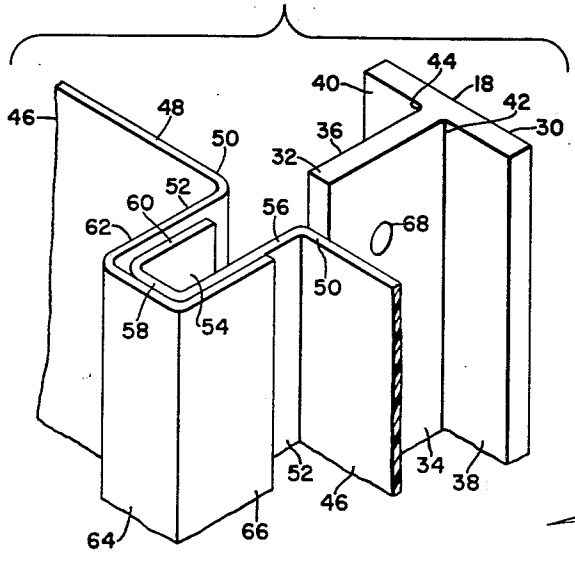


FIG. 3



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United States Patent Office 3,154,179 Patented Oct. 27, 1964

3,154,179

BUILDING STRUCTURE

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Filed Dec. 30, 1959, Ser. No. 862,971
2 Claims. (Cl. 189—34)

This invention relates to a building structure and more particularly to improved means for supporting a plurality of related panels on framework.

The invention finds particular utility in the assembly of skylights and similar windows and like structures; although, the features and principles of the invention will be found useful in the assembly of equivalent structures in the building and other trades wherein walls and the like are made up of a plurality of panels supported on intervening framework.

It is a significant object of the invention to provide the panels in the form of sheet material of the type commercially known as fiber glass, which is often used as a substitute for glass, because of its known advantages over glass, such as virtual immunity to breakage and its ability to stand rather sharp changes in temperature. One problem encountered heretofore in the use of fiber glass or equivalent paneling structure is that involving prefabrication, at least to the extent of the formation of holes or openings for receiving fasteners, since it was heretofore thought that these holes had to be formed preliminarily so that they would register with holes in the supporting framework. According to the present invention, the novel concept is developed in which reliance is placed upon the ability of the panel material to pass ordinary light, whereby, when the panels are assembled on the supporting framework, the holes in the framework are visible through the panels and thus serve as aids or guides enabling the location of fastener means. For example, if it is desired to drill holes in the panels, the holes in the supports can be seen through the panel and the panel holes can be drilled, thus avoiding the necessity of drilling the holes ahead of time and thus eliminating the requirement that the holes be accurately placed. It is a further feature of the invention to provide each panel with channel means along its opposite edges which embrace the intervening supports. As an extension of this feature, the invention utilizes, in panels of the type noted, cooperative channel means on neighboring panels, which channel means interfit with each other and with a portion of the support. Both panels, at least in the areas involving the overlap of the support, are capable of passing light so that the aperture-locating feature can be exploited. Because of the double overlap feature of the panel channels and the related support, substantially water- and weather-tight seals are provided without the requirement that additional sealing material, such as putty, be used.

The foregoing and other important objects and desirable features inherent in and encompassed by the invention will become apparent as a preferred embodiment thereof is disclosed in detail in the ensuing specification and accompanying sheet of drawings, the figures of which are described below.

FIGURE 1 is an elevation, on a reduced scale, of a typical structure involving a frame and a plurality of panels supported thereon.

FIGURE 2 is an enlarged fragmentary section as seen generally along the line 2—2 of FIGURE 1, with portions of the structure broken away to enable the production of a larger view.

FIGURE 3 is an exploded fragmentary perspective showing the relationship between the panels and a support prior to assembly.

FIGURE 4 is an enlarged section on the line 4—4 of FIGURE 1.

The disclosure will proceed on the basis of the use of the framework and panels in a skylight; although, as stated above, the invention is applicable to analogous structures. Likewise, such expressions as "top," "bottom," "front," "rear," etc. are used as terms of convenience rather than of limitation, since the parts may be otherwise geographically disposed.

The representative illustration is based on the use of a frame 10 made up of a plurality of frame members including a top member 12, a bottom member 14, opposite end members 16 and a plurality of intermediate support members 18. The top, bottom and end members are preferably angles, as shown, which are or may be structural angle irons of types commercially known. Using the angle 16 as an example, it will be seen that this member has a pair of angularly related flanges, one of which, at 20 affords a back flange and the other of which, at 22, affords a forwardly projecting rib. The back flange 20 has a front face 24 which cooperates with an adjacent face 26 on the rib 22 to afford an inside corner 28. The same relationship exists, of course, in the other angles, which will be apparent without further description.

Each of the intermedite support members 18 is in the form of a T in cross section, having a back flange 30 afforded by the bar of the T and a forwardly projecting rib 32 afforded by the leg of the T. The rib has opposite side surfaces 34 and 36, respectively, which cooperate with front faces 38 and 40, respectively, to provide a pair of inside corners 42 and 44, one at each side of the rib 32. These characteristics are repeated of course in the other T-shaped members in the assembly. All members are previously rigidly secured together, as by welding or other known means, so that they are generally coplanar. For example, the front faces 38 and 40 of the members 18 are coplanar with the front faces 24 of the frame angles, and the plane developed here is used to accommodate the paneling structure, here made up of a plurality of like panels 46.

Each panel is constructed of relatively rigid material of the character already described and is furnished in sheets of common lengths and widths. For example, in the present case, each panel is high enough to extend vertically between the top and bottom frame members 12 and 14 and has a width sufficient to span the distance between the one end member 16 and the adjacent T-shaped member 18. The spacing among the members 18 is the same as the spacing between each member 18 and its proximate end member, so that the panels in a certain structure may be provided of predetermined widths and lengths.

Each panel 46 has its back surface 48 resting, for example, on the coplanar front facte 24 and 38 along opposite lengthwise edge portions 50 of the panel. Each edge portion has integral therewith and running lengthwise thereof a forwardly directed element 52 which is here constructed and shaped so as to provide a rearwardly opening or facing channel 54. The channel along one element 52 is formed of a plurality of integrally angularly related panel portions 56, 58 and 60, providing a relatively small channel, whereas the channel 54 along the opposite element 52 is provided of integral angularly related panel portions 62, 64 and 66. Thus, each panel is different, dimensionally, along its opposite elements 52; that is, the channel made up by the portions 56, 58 and 60 is along one edge and the other channel is along the other edge. When the panels are assembled, the smaller channel embraces the rib 32 and is in turn embraced by the larger channel, as seen in the intermediate portion of FIGURE 2. In a case where the panel meets an angle member, as at the right hand side of FIGURE 2, only the larger channel will of course appear and this will occupy a relationship relative to the flange 22 similar

to the relationship between the smaller flange and the rib **32** on the T-shaped member **18**. In both cases, the embraced relationship among the channels and ribs affords an adequate water- and weather-tight seal so that putty and caulking may be eliminated. It may be desirable, however, to use caulking or putty along the bottom and top edges of the panels between those edges and the top and bottom frame members **12** and **14**. However, the joints provided between the ribs and channels eliminates a considerable amount of caulking and puttying and even to this extent cuts down materially the cost of manufacture and installation.

In one form of construction, the frames may be made up preliminarily and the flanges or ribs **22** and **32** may be previously drilled to provide apertures or fastener-receiving portions **68**. However, the panels need not be pre-drilled to register with the apertures or openings **68**, since this process can be accomplished when the panels are installed. Thus, when the panels are in place with their channels overlapping each other and the associated rib **32**, for example, the sides of the channels, being capable of passing light, render the associated openings **68** visible from outside or in front of the panels. It is therefore an easy matter to use the visible apertures as guides so that the panels may be drilled on the job to provide registering apertures **70** and fasteners, such as bolts **72**, passed directly therethrough. This will readily suggest that fastener means other than the bolts **72** could be used in conjunction with fastener-receiving portions other than the apertures **68**, the feature being that the fastener-receiving portions, represented here by the apertures **68**, are covered by the channels but are yet accessible because of the capacity of the panels, at least in the channel-forming portions, to pass light so that the fastener-receiving portions are visible.

The features and advantages outlined herein may be exploited in original assemblies or in assemblies in which glass, for example, is replaced by the improved panels. For example, in a skylight in which the glass has been broken and removed, the putty-receiving grooves will provide the inside corners such as those illustrated here. Thus, the assembly process described above can be followed, since the rib-embracing function of the end elements on the panels will still be effective. If the ribs on the repaired skylight have not been previously drilled, drilling may be accomplished before installation of the panels, and the channels of the panels can be subsequently drilled, using the rib apertures as guides. In any event, this relationship assures that proper registry or alinement of channel and rib apertures will occur easily and without making complicated calculations.

Features and advantages other than those categorically enumerated will readily occur to those versed in the art, as will many modifications and alterations in the preferred embodiment disclosed, all of which may be achieved without departure from the spirit and scope of the invention.

What is claimed is:

1. In a structural frame having transversely spaced longitudinally extending angular members connected at their end portions by transversely extending angular members and connected intermediate said end portions by longitudinally spaced transversely extending inverted T-shaped members providing a plurality of panel receiving openings defined by upright peripheral frame portions and inturned opposing horizontal flanges for respectively connecting with and providing support for panels closing said openings, each said panel being comprised of

(*a*) a substantially rigid rectangular body portion of light transmitting plastic material overlying and supported upon the adjacent opposing flanges of said frame panel receiving opening,

(*b*) a first transverse marginal edge of each said panel body portion being defined by an upstanding flange disposed in substantially parallel spaced relation to one face of an adjacent frame transverse upright portion and terminating in an outwardly spaced inwardly directed flange portion overlying said frame transverse upright portion and depending downwardly over a portion of the opposite face thereof,

(*c*) a second transverse marginal edge of said panel body being defined by an upstanding flange of less vertical height than the first said panel body upstanding flange and disposed in substantially parallel spaced relation to the adjacent face of an adjacent frame transverse upright portion defining the panel opening and terminating in an outwardly spaced inwardly directed portion overlying the opposite face of the said adjacent frame transverse upright portion, and

(*d*) means connecting each said frame transverse upright portion with the adjacent panel flanges.

2. In a structural frame having transversely spaced longitudinally extending angular members connected at their end portions by transversely extending angular members and connected intermediate said end portions by longitudinally spaced transversely extending inverted T-shaped members providing a plurality of panel receiving openings defined by upright peripheral frame portions and inturned opposing horizontal flanges for respectively connecting with and providing support for panels closing said openings, each said panel being comprised of

(*a*) a substantially rigid rectangular plastic body portion overlying and supported upon the adjacent opposing flanges of each said panel frame receiving opening,

(*b*) a first transverse marginal edge of each said panel body portion being defined by an upstanding flange disposed in substantially parallel spaced relation to one face of an adjacent frame transverse upright portion and terminating in an outwardly spaced inwardly directed flange portion overlying said frame transverse upright portion and depending downwardly over a portion of the opposite face thereof,

(*c*) a second transverse marginal edge of said panel body being defined by an upstanding flange of less vertical height than the first said panel body upstanding flange and disposed in substantially parallel spaced relation to the adjacent face of an adjacent frame transverse upright portion defining the panel opening and terminating in an outwardly spaced inwardly directed portion overlying the opposite face of the said adjacent frame transverse upright portion, and

(*d*) means connecting each said frame transverse upright portion with the adjacent panel flanges.

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