

July 16, 1940.

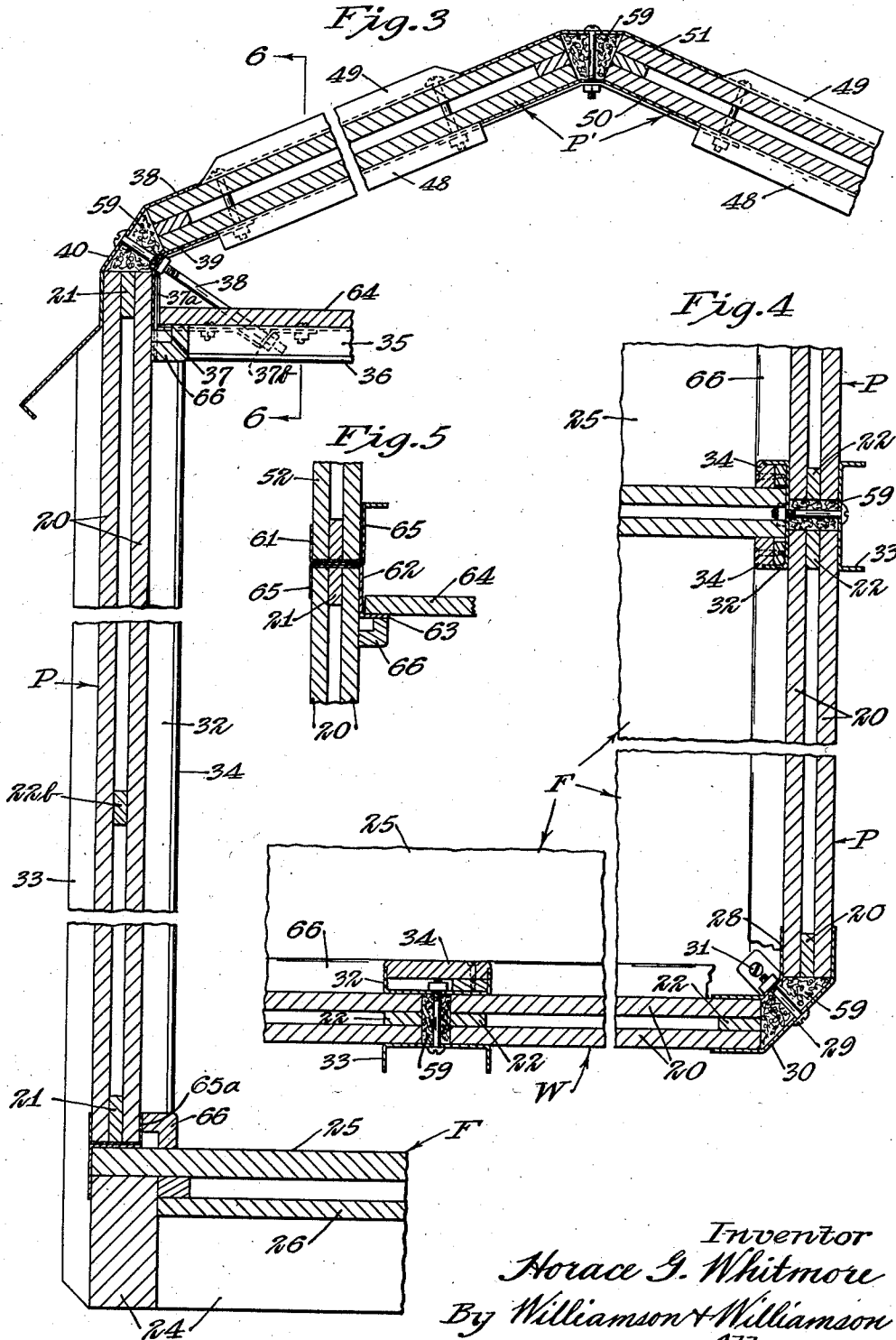
H. G. WHITMORE

2,208,010

PORTABLE AND SECTIONAL BUILDING CONSTRUCTION

Filed April 19, 1937

4 Sheets-Sheet 2



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PORTABLE AND SECTIONAL BUILDING CONSTRUCTION

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4 Sheets-Sheet 3

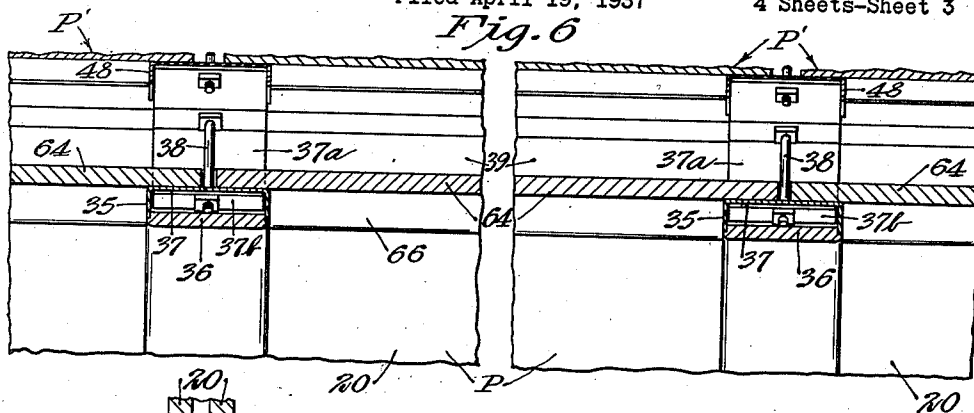


Fig. 7

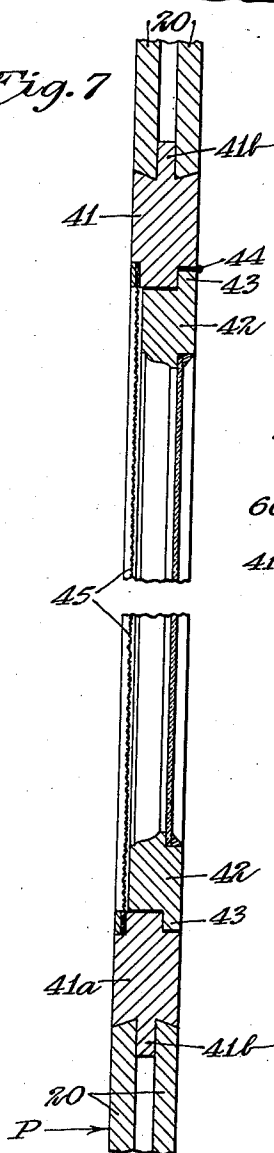


Fig. 9

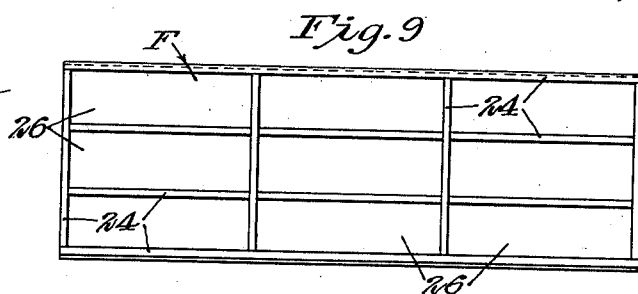


Fig. 10



Fig. 8

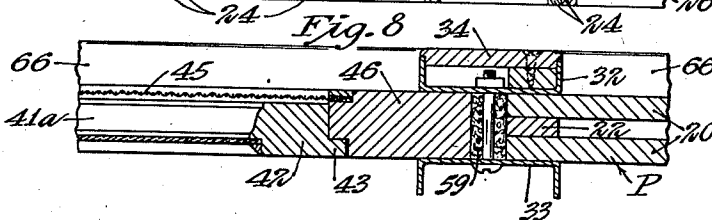
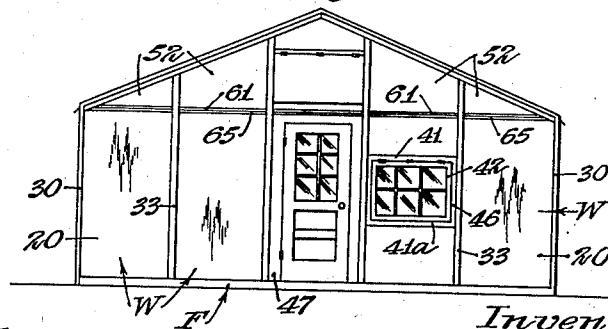


Fig. 11



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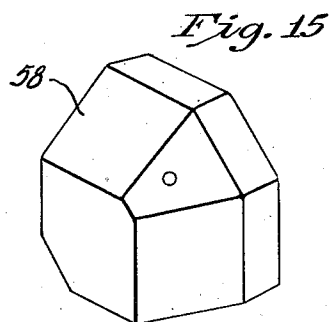
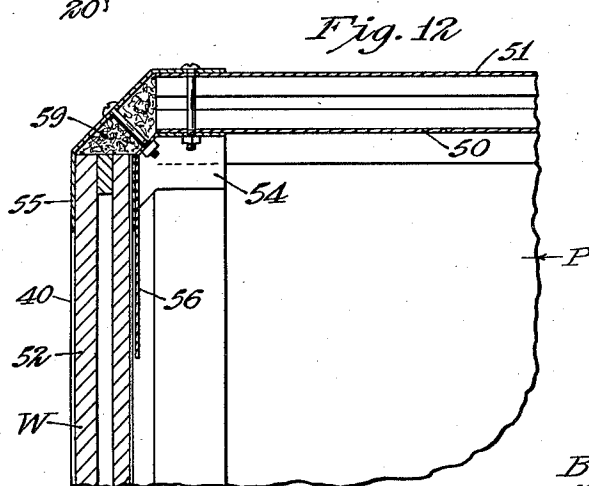
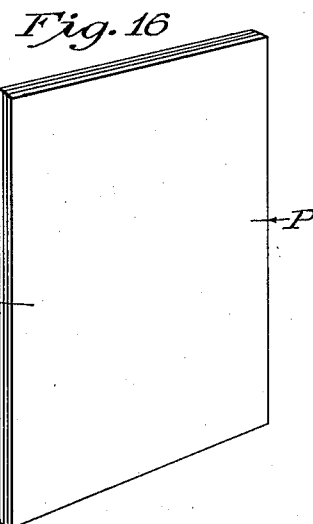
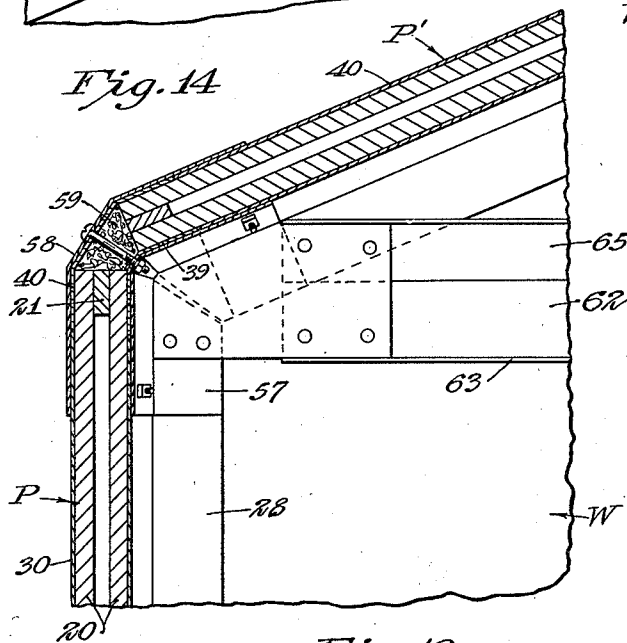
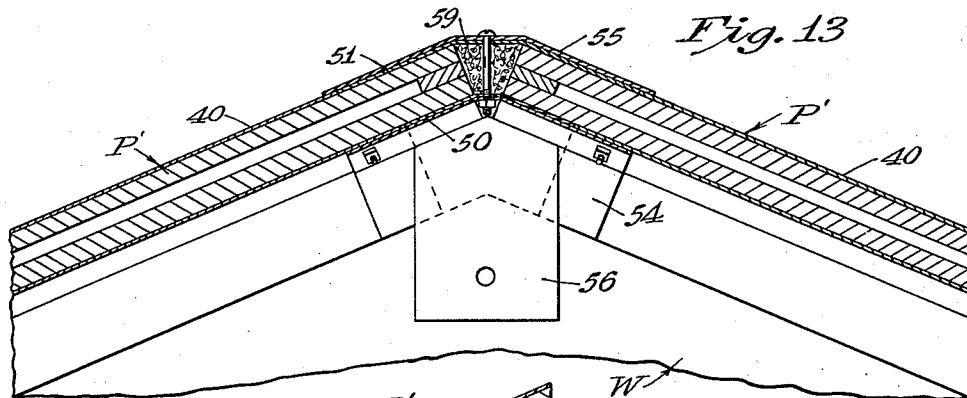
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PORTABLE AND SECTIONAL BUILDING
CONSTRUCTION

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5 Claims. (Cl. 20—2)

This invention relates to portable and sectional building structure and particularly to a construction adapted for compact, rugged cabins, housings for work crews, filling stations, garages, rural taverns and the like.

It is an object of my invention to provide a simple, comparatively light but exceedingly strong and rigid building construction which adapts itself particularly well to the construction of portable and sectional cabins, garages, armory barracks, filling stations and the like, and which can be erected or dismantled in a comparatively short time and which may be very compactly arranged when dismantled for transportation and shipping.

It is a further object to provide a portable and sectional building structure wherein a plurality of sectional wall panels are utilized and reinforced and secured in place by exterior and interior skeleton frames, which frames are sectionally built but are very strong and rigid when operatively set up and associated with the sectional panels.

It is a further object to provide a structure of the class described with efficient means associated with the panels and members of the inner and outer supporting and reinforcing frames which facilitate doors and windows of efficient structure to be utilized.

Another object is the provision of portable and sectional building structure which may be added to from time to time when erected with the least amount of effort and inconvenience.

A further object is the provision in such a building construction of sectional flooring as well as sectional roofing and, if desired, also ceiling construction which co-operates with and is connected with the inner and outer skeleton framework previously described.

These and other objects and advantages of my invention will be more fully set forth in the following description made in connection with the accompanying drawings, in which like reference characters refer to similar parts throughout the several views, and, in which:

Fig. 1 is a front end elevation of a cabin embodying my invention;

Fig. 2 is a side elevation of the same;

Fig. 3 is a partial vertical section taken approximately on the line 3—3 of Fig. 2 and showing the manner in which the roof peak, the sectional wall, roof and ceiling panels are secured and associated with parts of the inner and outer frame structures;

Fig. 4 is a section taken approximately on the line 4—4 of Fig. 2, showing relationship between

the side wall and partition member, corner construction and typical side wall connection without partition;

Fig. 5 is a vertical section taken along the line 5—5 of Fig. 1;

Fig. 6 is a vertical section taken along the line 6—6 of Fig. 3;

Fig. 7 is a vertical window section taken along the line 7—7 of Fig. 2;

Fig. 8 is a horizontal window section taken along the line 8—8 of Fig. 2;

Fig. 9 is a bottom view of a typical floor section;

Fig. 10 is a vertical section through two floor sections showing connection between the same;

Fig. 11 is an elevation showing my invention applied to the five panel cabin;

Fig. 12 is a vertical section along the line 12—12 of Fig. 1 showing the construction at the roof hip between the end wall and one of the intermediate cross beams or construction plates;

Fig. 13 is a vertical section taken along the line 13—13 of Fig. 2;

Fig. 14 is a continuation of the sectional view in Fig. 13;

Fig. 15 is a detail perspective of the outside corner plate; and

Fig. 16 is a detail perspective view showing one of the insulated sectional wall panels detached.

In the form of my construction illustrated, a series of sectional wall panels, each indicated as an entirety by the letter P are provided and, as shown, each of these wall panels is made up of two sheets 20 of suitable wall material, such as fibrous wall board spaced apart and secured together by top and bottom horizontal spacing members 21 and side spacing members 22 which form a rectangular frame between the two sheets and which help to define the edges of the panel. In addition horizontal and vertical spacing and reinforcing members 22b and 23 may be provided, if desirable, said spacing members being constructed of suitable material, such as wood.

The sectional panels P referred to are for the purpose of forming the vertical side and end walls of a cabin or other building construction and as will later be described special panels are provided with windows and doors therein and which are interchangeable with the panels P as may be desired in the construction of the building.

The building is preferably mounted on a suitable foundation which, as shown, comprises a series of heavy spaced floor joists 24, preferably extending longitudinally of the building structure and being suitably mounted in parallel and hori-

zontal relation. Floor sections, each indicated as an entirety by F, are supported upon said joists, one of said floor sections being illustrated in bottom plan view in Fig. 9. Said floor sections are preferably of the same width as the width of the sectional wall panels P. The floor sections, as shown, have the upper flooring elements 25 and the floor insulating sheets 26 spaced from the floor elements by suitable spacing and reinforcing means in the form of crossed wooden elements. The flooring elements of floor sections F have their ends extending beyond the undermost portions of the floor sections and overlies the upper sections of the floor joists 24, as clearly shown in Fig. 3.

I provide sectional interior and exterior skeleton frames for reinforcing the building structure and supporting and securing the wall panels P, as well as for supporting and securing the roof sections later to be described. The said skeleton frames are preferably made from light structural steel and the two skeleton frames are so related that the wall panels, as well as the roof panels, will be clamped between said frames and supported by and secured thereto.

Referring to the interior skeleton frame construction, I provide interior vertical corner posts 28, as clearly shown in Fig. 4, having a pair of flanges related to each other at an angle of preferably 90 degrees, and having intermediate webs through which securing bolts 29 clamp the inner and outer corner posts together with the side edges of wall panels P clamped therebetween.

The outer corner posts 30 are also preferably constructed from light sheet steel of substantially similar shape in cross section to the inner post 28 but having a wider central web to enable the side webs or flanges to be disposed in parallel relation with the flanges of posts 28 and to efficiently clamp the marginal side portions of the wall panels P, as is clearly shown in Fig. 4. The lower ends of the outer corner posts 30 extend below the level of the floor and overlap the ends of the floor joists and side members of the floor frame and the inner posts are rigidly secured to the floor by bolts 31.

Inner and outer channel studding members 32 and 33 are provided in the skeleton frame structure for each of the joints between a pair of the section panels P on each of the side walls of the building and serve to reinforce and support the overhead portion of the frame structure as well as to clamp the marginal vertical edges of two adjacent panels, as will be clear from Fig. 4. The inner and outer channel studding members 32 and 33 are preferably constructed from sheet steel and the inner members 32, as shown, may be provided with suitable vertical filler strips 34 having rabbeted vertical side edges for engaging the flanges of the channel and such filler strips are secured by any suitable means, such as by adhesively fastening them or by securing the filler strip to the spacing blocks with screws, as shown.

Light steel cross beams 35 span the side walls of the building rigidly connecting the upper ends of a pair of oppositely disposed studding channels 32 of the opposing side walls and serve also as ceiling joists. These cross beams 35, as shown, are of inverted channel shape and may be provided with wood filler strips 36, if desired, to finish off the appearance of the ceiling construction. As shown, the ends of cross beams 35 are provided with attachment plates 37 bolted, spot welded or otherwise secured beneath the middle

web of the channel of each having an upturned panel engaging position 37a and a socket or bolt receiving portion 37b which is apertured to receive an elongated clamping bolt 38 which secures the cross beam to the side walls and which extends only through the inner plate 39.

Figs. 7 and 8 indicate a construction which may be utilized for the window panels. In Fig. 7, the upper frames 41 and lower sill member 41a of the window are shown with vertically projecting extensions 41b at their edges. These extensions are adapted to fit between the inner and outer sections 20 of the wall panels P. As also shown in Fig. 7, the edges of the window frames adjacent the extensions 41b are cut inwardly and the edges of the panel sections are similarly shaped so the frame members will be firmly engaged by the panels. Of course, they may be secured in any suitable manner which will retain the frame member with sufficient rigidity. The window itself is preferably of a little less thickness than the thickness of the panel P and its side members 42 are provided with shoulders 43 which fit into cut out portions in the side frames 41, making a relatively air tight joint. A hinge 44 is provided at the top of the window so that it may be opened. On the inner side of the window and in a recessed portion of the frames is suitably secured a screen 45 which is indicated generally since its particular structure is of no importance in connection with the building structure except that the screen frame members should be made thin enough so that the screen will be flush with the inner wall surface of the panel.

Since the window is adapted to swing outwardly and the screen is positioned inside of the window, any suitable window opening lever may be used, such as that type which is found on all standard outwardly swinging metal sashes. These operating levers or rods may extend either through the sides of the frames 41—41a or through the screen itself. This particular structure is not shown since means for opening the window is not a particular feature of this invention.

Fig. 8 is a transverse section of a portion of the window and a side frame element 46. The joint between the window and the frame element is the same as that shown in Fig. 7, but the side frame member 46 is held in position by clamping between a pair of inner and outer stud elements 32 and 33 in the same manner in which the wall panel elements are secured.

The door, shown generally in Fig. 11, is hinged in a frame 47 which is preferably clamped and held in position by the vertical stud members in the same manner in which the window frames are clamped.

The roof includes inner and outer skeleton frames similar generally to the inner and outer wall frames and is adapted to rigidly and detachably secure a plurality of roof panel elements similar to the wall panels.

As best shown in Figs. 3 and 6, the roof includes a plurality of inner rafter members 48 and outer rafter members 49 which extend from points adjacent the upper edges of the vertical walls to the longitudinal center of the building where they are connected to the upper ends of similar rafters extending from the opposite side walls. The rafters are of channel shape similar to the vertical stud members which make up part of the side wall frame of the structure and adapted to clamp the roof panels P' in the same manner in which the vertical side wall panels are clamped. The upper adjacent edges of the roof panels are

secured detachably by inner and outer ridge plates 50 and 51 respectively. These ridge plates are preferably of a length equal to the width of the roof panels and wall panels. The connection between the lower edges of the roof and the upper edges of the wall panels is generally similar as was pointed out in a detailed description thereof above.

The end panels between the top of the normal wall panels and the slanting roof are indicated generally by the numeral 52 in Fig. 11. The panels themselves are of the same spaced sectional type shown in the detailed views of the wall panels and roof panels and are clamped rigidly and detachably in the same general manner as the other panels in the building construction.

Figs. 12, 13 and 14 show the connector plates used in securing portions of the roof frame and panels to the irregularly shaped end panels 52. In Fig. 12 is shown the upper edge of a roof panel in section, as indicated by the letter P'. A broken away portion of a complementary panel section on the opposite side of the ridge line of the roof is also indicated in Fig. 12. The ridge plates 50 and 51, described in connection with Fig. 3, are also shown, the interior and exterior ridge plates being indicated by the same numerals in Fig. 12. It will be noted that the connector plates (a perspective view of one being shown in Fig. 15) are of similar construction to the connector plates used at the sides of the building. However, it is readily seen that these connector plates used on the corners of the building are of substantially the same peculiar construction with the interior connector plate 54 having a narrower corner face than the exterior plate or cap 55. This same relative difference in size was mentioned in describing the connector plates 39 and 40 in Fig. 3.

In Fig. 13, there is shown in cross section portions of roof panels P' with the ridge plate 50 as in Fig. 3 and with a roof end cap 55 which is also generally indicated in Fig. 1. This roof end cap is similar to the connector plates or caps described in connection with Figs. 12 and 14, except as its angle is different to conform with the angularity of the pitch of the roof. A metal tongue 56 is preferably connected to the roof end cap 55 to provide means for connecting with a vertical stud member at that portion of the frame. This plate may be provided with an aperture so a bolt may be inserted therethrough and through a similar aperture in one of the radially formed studs of channel shape. It will be noted that the inner and outer corner cap connector plates 57 and 58, respectively, in Fig. 14, are also of the same general construction but their angle is determined by the angle between the vertical straight and vertical front wall and the slanting roof. The vertical front wall is indicated generally in this view by the letter W.

Fig. 16 is a perspective view of one of the panel elements which is used for wall or roof construction. It will be noted that the panel is of regular rectangular shape and, of course, will be furnished in a standard size with all metallic elements used to construct the framework formed in sizes which will adapt them for use with these panel elements without any fitting or trimming when the building is erected.

It will be noted particularly in Figs. 3, 4, 12, 13 and 14 that there are spaces left between the adjacent edges of the panel elements between the various types of connector plates and connector

caps. In order to improve the insulation of the building construction it is preferred that a suitable insulating material, preferably of a fibrous type, will be placed in the opening between the edges of said panels. This fibrous filling is indicated at 59 in Figs. 3 and 4. While this spacing is filled with an insulating material as set forth, I also find that electric wires can be run in these open spaces between the edges of adjacent panels, giving protection to the wire and also concealing it from view. The wires, however, may be run between the spaced sections of the wall panels, as well as in the spaces indicated above, and it is also possible to utilize space behind the filler strips 34 which are inserted in the channels formed by the interior stud members 32.

In Fig. 5 there is shown the connection between the upper edge of a wall panel in the end of the building and the lower edge of one of the irregularly shaped upper end panels of the wall. The upper end section is shown provided with a metallic element formed as an upwardly open channel member 61, and an angular strip 62 is secured on the upper edge of the lower panel section. The channeled element 62 is provided with a horizontal projection 63 which supports the edges of the ceiling panels 64. Then, between the abutting edges of the end panel members is placed a flashing element 65, as shown, to prevent moisture and dust from entering the joint from outside the building. A similar flashing 65a is shown in Fig. 3 where the lower edges of the wall panels meet the edges of the floor 25. A molding 66 may be suitably secured in any well known manner at the junction of the ceiling and floor panels with the wall panels, as shown in Figs. 3 and 5.

From the foregoing description, it will be seen that I have provided a sectional building construction which can be completely finished insofar as cutting and fitting is concerned at the factory. All of the vertical panels are of the same width and height, except for the specially cut panels used at the ends of the building, and the roof panels are also of the same width as the wall panels. The studding is the same throughout the entire building and the parts need not be marked individually, since any stud ridge plate, rafter, etc., which is used on either the inner or outer framework can be placed in any one of the number of positions where an article of this type is needed. In other words, the person who assembles a building of this type need only familiarize himself of the few different shapes of assembling units and once he has installed one of these units, the others are placed in exactly the same relative positions with a minimum amount of difficulty.

A building of this type can be constructed at any desired length, depending upon the number of side wall panels used. A wall panel with a window in it may be placed at any desired spot, and, as a matter of fact, if a change in window location is desired, after the building has been constructed, it is not a difficult job to shift the window panel to another location.

Buildings constructed along the lines of my invention may be completely assembled by an unskilled person in a few hours. There is no permanent foundation necessary, and if desired, the building can be dismantled and moved from one location to another with a minimum of difficulty. It is contemplated that when the building is to be transported, a special trailer may be provided for carrying the parts in a compact condition. However, it is, of course, not necessary to provide any

special conveying means for the parts making up the building.

Because of its insulated construction, the building is adaptable as a year around habitation. It is, of course, primarily for use as a vacation home and its insulation will make it much more comfortable than an uninsulated structure both in summer and in winter. It is a structure which is sufficiently rigid that it can be assembled and left permanently to provide comfortable living quarters, but if it is desired to utilize the building for short periods, as for vacations, it may be assembled upon a rented property and then removed conveniently at any desired time.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What is claimed is:

1. In a portable and sectional building structure, a plurality of vertical wall panels, a sectional inner reinforcing skeleton frame and a sectional exterior reinforcing frame, said interior and exterior frames including oppositely disposed spaced interconnected interior and exterior stud members and cross members connecting adjacent pairs of inner stud members and adjacent pair of outer stud members, said panels being rigidly and detachably clamped between said stud members, and said frames including spanning members connecting and reinforcing the opposite sides of said frames adjacent the top of the building.

2. In a portable and sectional building structure, a plurality of vertical wall panels, a sectional inner reinforcing skeleton frame and a sectional exterior reinforcing frame, said panels being clamped at their side and top edges between said inner and outer frames, said clamp means including interior and exterior stud members adapted to engage the side edges of said panels, and stud connecting elements positioned between the edges of adjacent panels and adapted to rigidly and detachably secure said stud members and the adjacent edges of said panel members.

3. In a portable and sectional building struc-

ture, a plurality of vertical wall panels, a sectional inner reinforcing skeleton frame and a sectional exterior reinforcing frame, a plurality of slanting roof panels, a sectional inner reinforcing roof frame and a sectional exterior reinforcing roof frame, said wall panels and roof panels being rigidly and detachably secured between said inner and outer frames, and rafter plates rigidly and detachably connecting said inner and outer wall frames and panels with said inner and outer roof frames and panels.

4. In a portable and sectional building structure, a plurality of vertical wall panels, a sectional inner reinforcing skeleton frame and a sectional exterior reinforcing frame, said wall panels being rigidly and detachably secured between said inner and outer frames, a sectional inner reinforcing roof frame and a sectional outer reinforcing roof frame, said roof frames including inner and outer rafter members, roof panels rigidly and detachably secured between said inner and outer roof frames and said rafter members being connected to said wall frames by rafter plates extending along the top edges of said wall frame members and rigidly and detachably connecting the upper edges of said wall frame members with the lower edges of said roof frame members, and top plate members rigidly and detachably securing the adjacent upper edges of said roof frame members.

5. In a portable and sectional building structure, a plurality of vertical wall panels, a sectional inner reinforcing skeleton frame and a sectional outer reinforcing frame, said panels being rigidly and detachably secured between said inner and outer frames, said frames including inner and outer vertical stud members, a floor whose edges are positioned beneath said wall panels, joists supporting said floor, flashing elements extending between the lower edges of said wall panels and the edges of said floor, and said outer stud members extending downwardly below the bottoms of said wall panels and below said flashing elements to points adjacent the bottom edges of said floor supporting joists.

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