

Feb. 18, 1936.

W. H. MASON

2,031,568

BUILDING CONSTRUCTION

Filed Nov. 28, 1933

2 Sheets—Sheet 1

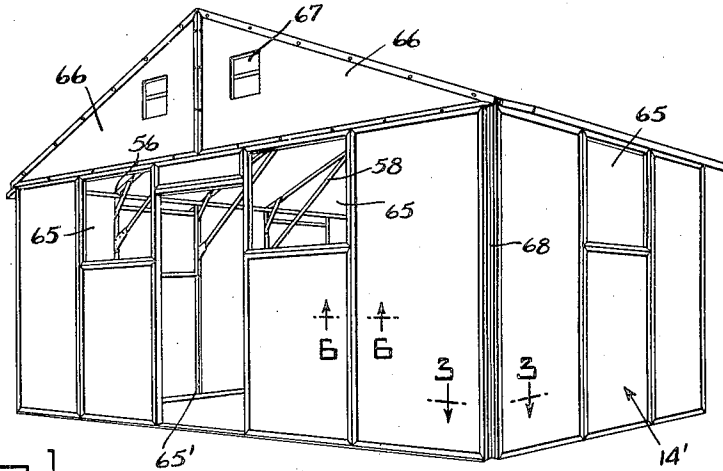


Fig. 1.

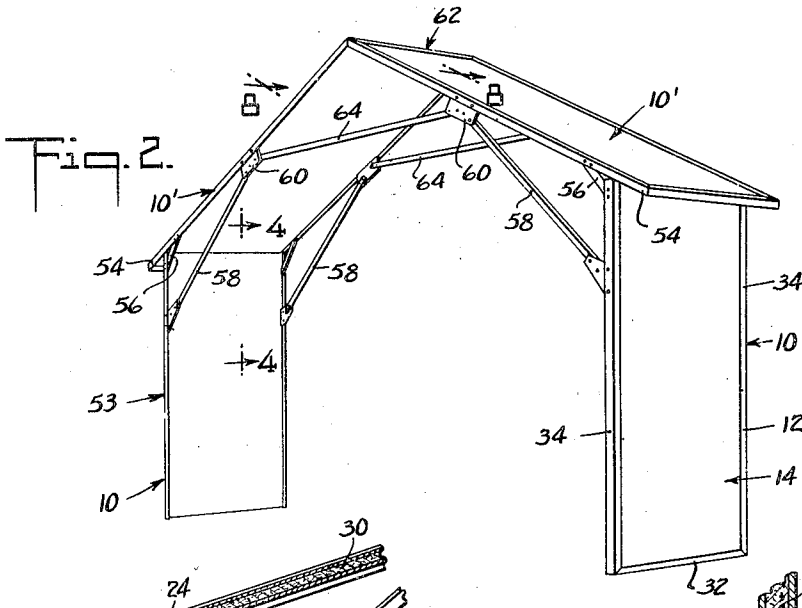


Fig. 2.

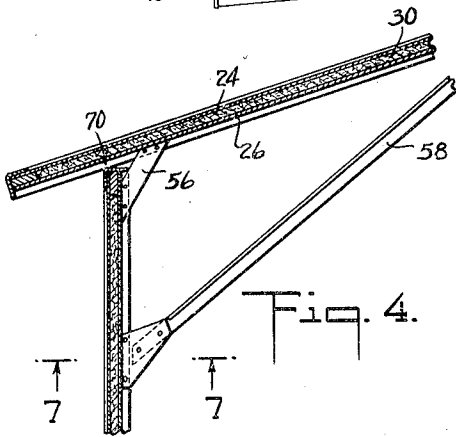


Fig. 4.

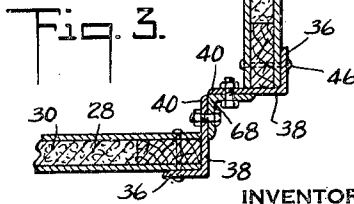


Fig. 3.

INVENTOR
William H. Mason
BY
Dyke and Schaines
ATTORNEYS

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W. H. MASON

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2 Sheets-Sheet 2

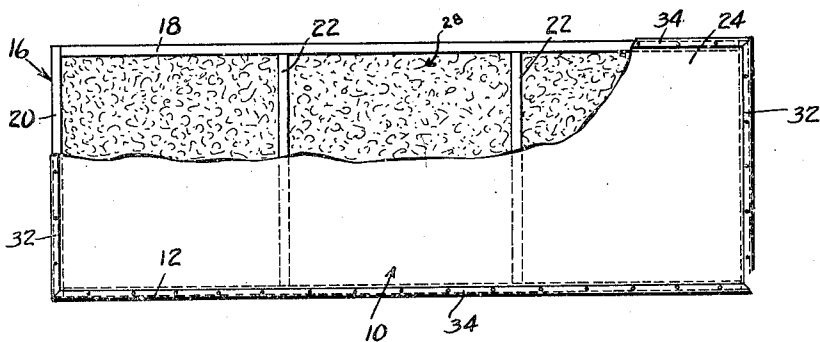


Fig. 5.

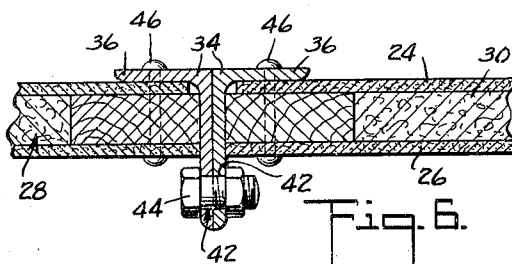


Fig. 6.

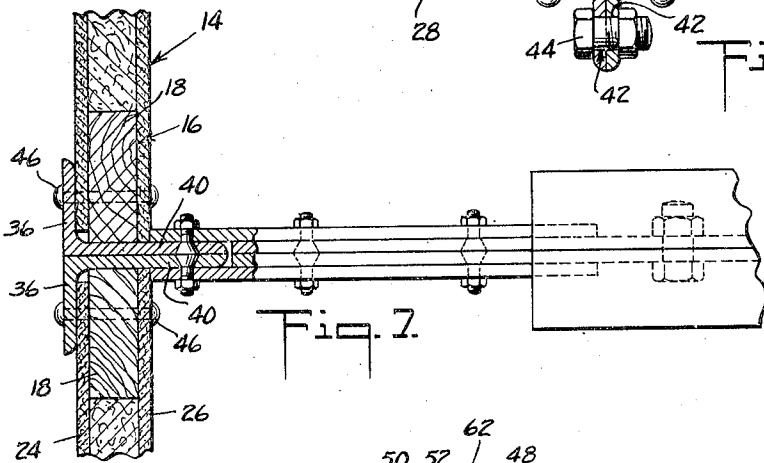


Fig. 7.

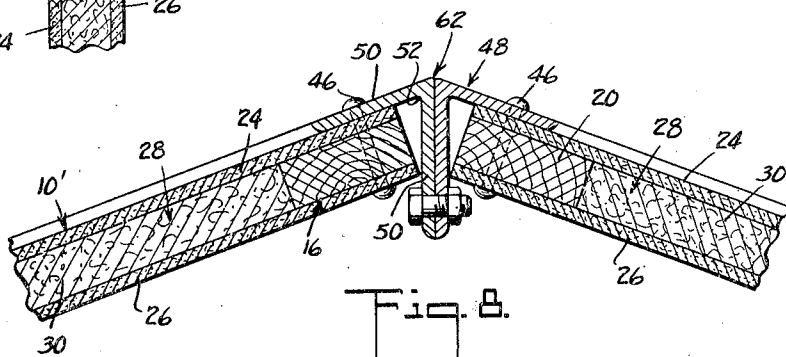


Fig. 8.

INVENTOR
William H. Mason
BY
Dyke and Schaines
ATTORNEYS

UNITED STATES PATENT OFFICE

2,031,568

BUILDING CONSTRUCTION

William H. Mason, Laurel, Miss., assignor to Masonite Corporation, Laurel, Miss., a corporation of Delaware

Application November 23, 1933, Serial No. 700,032

1 Claim. (Cl. 189—34)

My invention relates to building construction, and particularly to interchangeable prefabricated panel units which can be readily assembled, and taken down, and reassembled when desired.

Among the objects of the invention is the provision of preferably insulated panel units faced on each side with large sheets of vegetable fiber board, and edged with angle bars of iron or steel in the making in the factory, the edgings serving to protect such prefabricated panels during handling and shipment, and also forming the columns and trusses of the completed building.

Another object consists in the provision of building bays or sections formed of such panel units, and which bays are like the completed building, except much shorter, being of length equal to the panel width, as for example, 4 feet long in the case of using panel sheets 4 feet wide, and said bays or sections being adapted to make a building of any desired length when assembled end to end.

Another object consists in providing a new mode or process of building construction and assembly adapted to be carried out on the ground at the building site in two separate stages, namely: a first stage in which the prefabricated panels are assembled into bays, like the completed building except much shorter, each of such sections or bays being sufficiently strong and stiff to be self-supporting and readily stood on end and handled by a few men; this being followed by the second stage of assembly, wherein such bays or sections are secured together progressively as the building construction advances to form the completed building, which is of the same dimensions as the bays except that it is longer, and can be of any desired length.

Other objects of the invention will be pointed out or will be obvious from the following description of an embodiment of the invention.

In the accompanying drawings, Figure 1 is a perspective view of a completed building 3 bays in length and embodying the invention.

Fig. 2 is a perspective view of a building bay or section made of prefabricated panels and braces bolted together.

Fig. 3 is a horizontal section through a corner of the building, as on line 3—3, Fig. 1.

Fig. 4 is a fragmentary vertical section, as on the line 4—4, Fig. 2.

Fig. 5 is a plan view of a single panel with parts broken away to show the constructional features.

Fig. 6 is a horizontal sectional view showing

the joint between adjacent sidewall sections, as on the line 6—6, Fig. 1.

Fig. 7 is a section on line 7—7, Fig. 4, and showing a roof brace; and

Fig. 8 is a section at the comb of the roof, as on line 8—8, Fig. 2.

The individual panels 10 comprise a frame 12 of angle iron or steel bars and a panel filler 14 fitting in the frame 12.

Panel fillers 14 consist of an interior skeleton frame 16 made up of preferably wooden side-bars 18, and end-bars 20, with preferably one or more cross-bars 22, particularly in the case of extra long panels, such interior frame 16 being received between the large facing sheets 24, 26 of any suitable material available in sheets of desired length and breadth. Hard board sheets made of hot pressed ligno-cellulose fiber, in accordance with my Patent Number 1,663,505, are preferably used for facings, being available in large sizes, as 4 feet by 8 to 12 feet, water-resistant and practically non-warping and of nearly as high strength when wet as when dry, and so well adapted for exterior surfaces which are exposed to the weather, or for interior facing.

The spaces 28 defined by the wooden bar members 18, 20, 22 of the interior frame and between the facing sheets 24, 26 are preferably filled with loose fiber 30, as for example, fiber of wood made by explosion of wood chips in accordance with my Patent No. 1,578,609, or insulating material inserted in sheet or other form may be used.

The panels 10 are edged, preferably all-around, with the exterior frame 12, comprising end-bars 32 and side-bars 34 of angle iron or steel, preferably mitered and welded together at the corners, and forming an exterior frame 12 into which the panel-fillers 14 comprising the skeleton interior wooden frame and sheet facings therefor can be inserted.

The angle members 32, 34 of the exterior frame so provided are arranged with the web portions 36 thereof on what will ultimately be the outer faces of the panels, and the preferably wider web portions 38 thereof about the edges of the panel fillers, with part thereof projecting to form a flange 40 extending inwardly beyond what is to be the inner faces of the panel fillers. Such projecting flange portion 40 is provided with holes 42 for attachment of the panels together or for attachment of braces or brace plates thereto or the like, as by means of the bolts 44.

The exterior frame 12 of angle iron or steel so provided about the edges of the panel fillers is permanently secured to the panel fillers 14

about the edges thereof, as by means of rivets 46 passing through the web portion 36 of the angle bars and through the interior skeleton frame member 16 and through both the facing sheets 24, 26.

5 These metal-bound and flanged panels 10 are constructed complete at the factory and can be arranged very compactly for shipping, and are thoroughly protected from injury about the edges during shipment and handling.

10 While the panels as so preconstructed may be used in many other ways, I preferably arrange and provide same so that they are adapted to be secured together on the building site to form the desired building by first assembling the panels
15 into bays or sections which are of the same form as the completed building, except that the length is greatly reduced as compared therewith, and these bays or sections then assembled in such
20 relation that the edgings form wall columns and roof trusses and the braces for the bays become braces of the building.

For side-walls, ordinary square angle iron sections are well suited, but for panels 10' which
25 are to form the roof of the building, such angle bar portions as are to come together at the comb of the roof are preferably acute angle bars 48 with the outer web portions 50 making an acute angle at 52 with the web portions 50, as indicated
30 in Fig. 8 of the drawings.

To make a bay or short section 53 of the building length, two panels 10 are arranged parallel to one another to form the side-walls at a distance
35 apart equal to the width of the completed building. Two other panels 10' adapted to form such a similarly short portion of the roof are brought into proper relation with the side-wall portions, and same secured together preferably by means of bolts and braces.

40 For example, roof panels 10' may extend somewhat beyond the side-wall panels 10, the projecting part 54 forming an eave or cornice, and the wall panel 10 and roof panel 10' being secured together by means of angle plates 56, which
45 are bolted in holes provided therefor in the flanges 40 during fabrication.

The side-wall panels 10 and roof panels 10' are further secured together and braced by longer
50 braces 58 which terminate in the plates 60, and such plates 60 are in turn bolted to flanges 40 in holes provided therein at suitable distances from the eave angle plates 56.

The comb 62 of the roof is formed in assembling the panels into bays by bolting together the
55 meeting ends of the roof panels 10', same being acutely angled at 52 for this purpose, as already stated.

The joints may be made water-tight by means of mastic or roof putty and/or by means of rubber tubing or other gasket material being inserted
60 between the angle bars before being bolted together.

The bracing between the two panels 10' of the roof may be provided by means of brace members
65 64 secured to the plates 60, 60 which serve for attachment of the corner braces 58 already referred to, and these brace members 64 will extend substantially parallel to the ground in the completed building. Braces 58, 64 may be duplicated for each bay as shown in Fig. 2, or may
70 be disposed on one side of each bay only as indicated in Fig. 1.

Having suitable sills or other ground supports prepared for reception of short bays or sections
75 53 so constructed and assembled, a building of

any desired length can be erected from the panel members, which had been fabricated at the factory, in a very rapid fashion. The panels and braces are first secured together in bays by means
5 of bolts. The bays, if bolted up when lying on their sides as is most convenient, can then be stood up into erect position, and each bay bolted to the preceding bay in the series by bolts passing through the meeting flanges 40 of the angle side-bars 34.

10 Where windows are desired, the panel fillers can be made shorter than usual, as indicated at 14' in Fig. 1, leaving room above it, as at 65, within the exterior angle iron frame 12, which is of the same size in case of each panel, for insertion
15 of the window.

In the case of the doors, the lower portion of the angle bar frame 12 may be left open, as at
20 65', providing a space for insertion of the door frame and door, the assembly proceeding with the open frame 12, as if full-size panel fillers had been inserted in each of said frames 12. Gable-end panels 66 of triangular shape may be provided for filling in the gable-ends by being bolted
25 into place in the same manner, and may be made with ventilators 67. At the corners of the building an extra angle bar 68 is interposed, and the respective webs thereof bolted on each side to the flanges 40 of the side-bar members 34, making a simple corner column of great strength and
30 rigidity.

It will be plain that a building so constructed can be of any desired length and that the width, height, etc. may be prearranged as desired, and that the doors and windows can be inserted at any
35 desired point by the use of short length panel fillers, and that with the frame composed of the edge members of angle iron forming the panel edgings, the take-down of the building can be carried out with the same or greater rapidity as
40 the erection thereof.

A building of steel frame and panel construction such as described, and braced and made rigid in the manner described, is capable of withstanding
45 severe storm and wind. Because of the relative lightness of construction, the base angles of the side-wall members should be fastened down, as by bolting to sills, or securing to the floor or other base on which the building is to stand.

In warm climates the opening 70 between the roof portions and the side-wall portions can be left without closing (except, perhaps, with screen wire) for ventilation purposes, and in colder climates, can be closed during the winter by the
55 insertion of insulation strips of suitable thickness and length, which strips can be of uniform size because the openings to be closed are of uniform size. Such openings can be avoided by suitably notching the flanges 40 of the roof panel members 10'.

The panels for any given building are preferably interchangeable, all of the side-wall panels being of the same dimensions, and the roof panels, which are ordinarily longer than the side-wall panels, being of the same uniform dimensions with one another, so that there is no need for numbering or otherwise marking the panels for particular inter-relation in assembly, and the panels may be assembled and taken down and
70 used over and over as many times as may be desired.

While buildings embodying my invention find their greatest utility in temporary structures such as barracks, dormitories, and the like, they are 75

not confined to such uses but being strong and substantial can be put to use as permanent buildings are garages, warehouses, and the like.

I claim:

5 A panel for building construction comprising an outer frame and a panel filler, said panel filler being made up of two facing members of strong sheet material and a frame skeleton interposed therebetween, said outer frame being formed of
10 angle iron having one web disposed against a face

of the panel filler and the other web along the edge thereof and extending beyond the opposite face to form a projecting flange, whereby it may be secured as by bolts to a similar member of an adjacent panel, and fastening means extending 5 through the first named web and through the facing sheets and skeleton frame members constituting the panel filler.

WILLIAM H. MASON. 10