Sept. 29, 1953 M. O. BRANNON 2,653,356

BUILDING CONSTRUCTION

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Fig-1

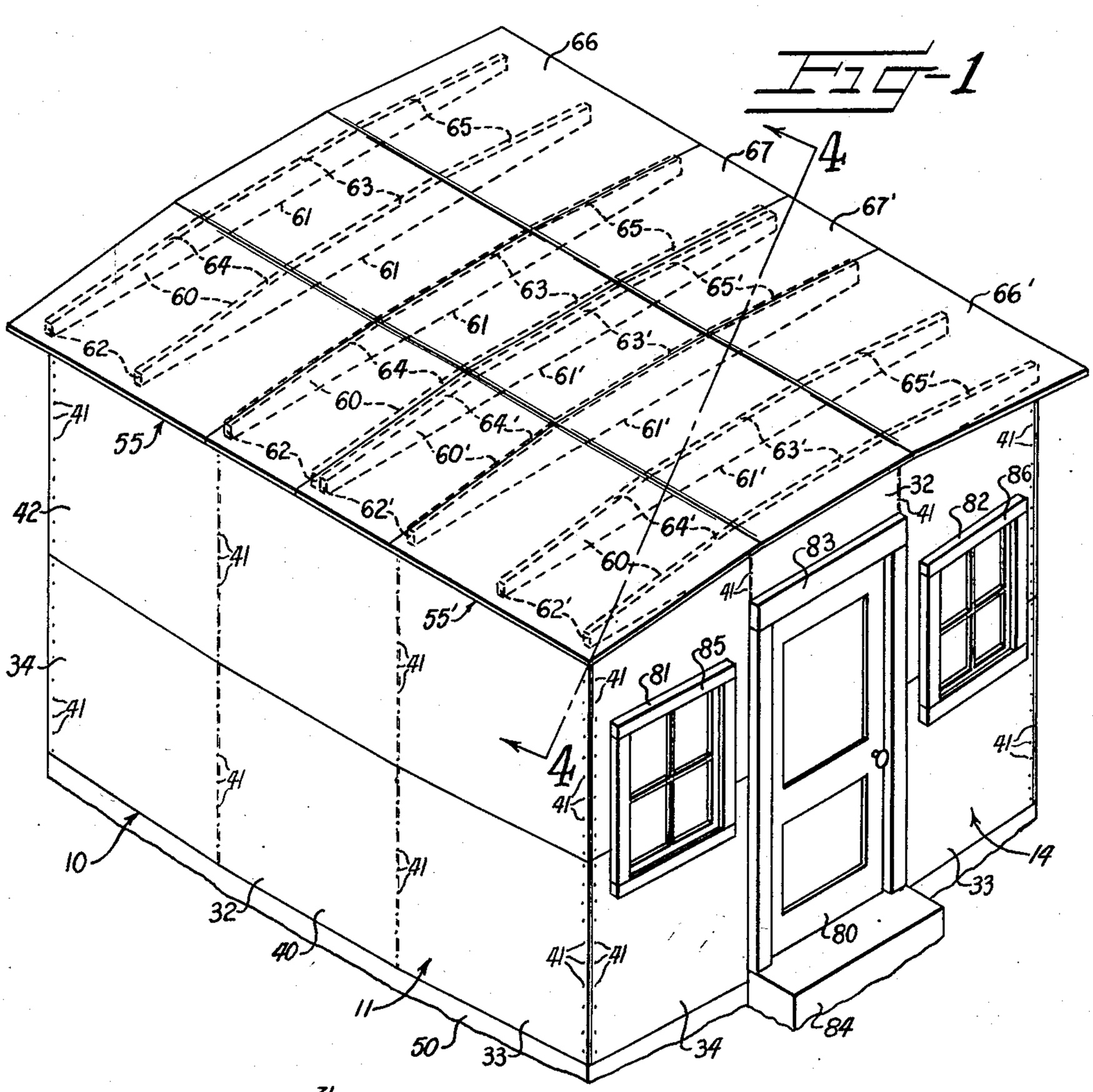

Fig-2

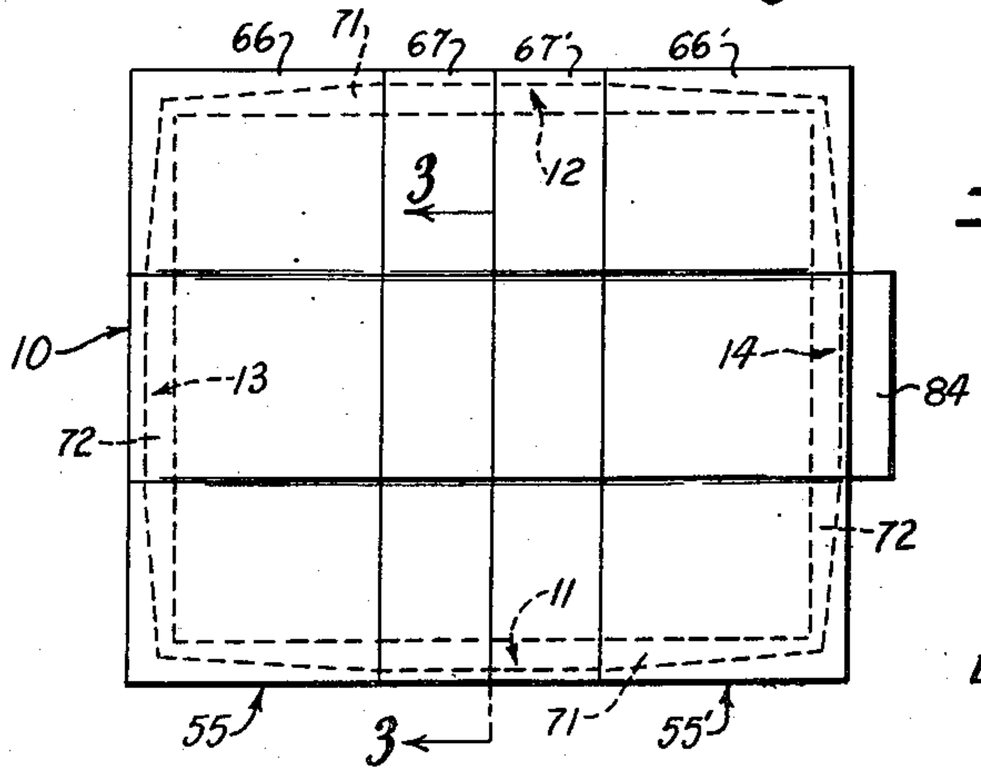

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Fig. 3

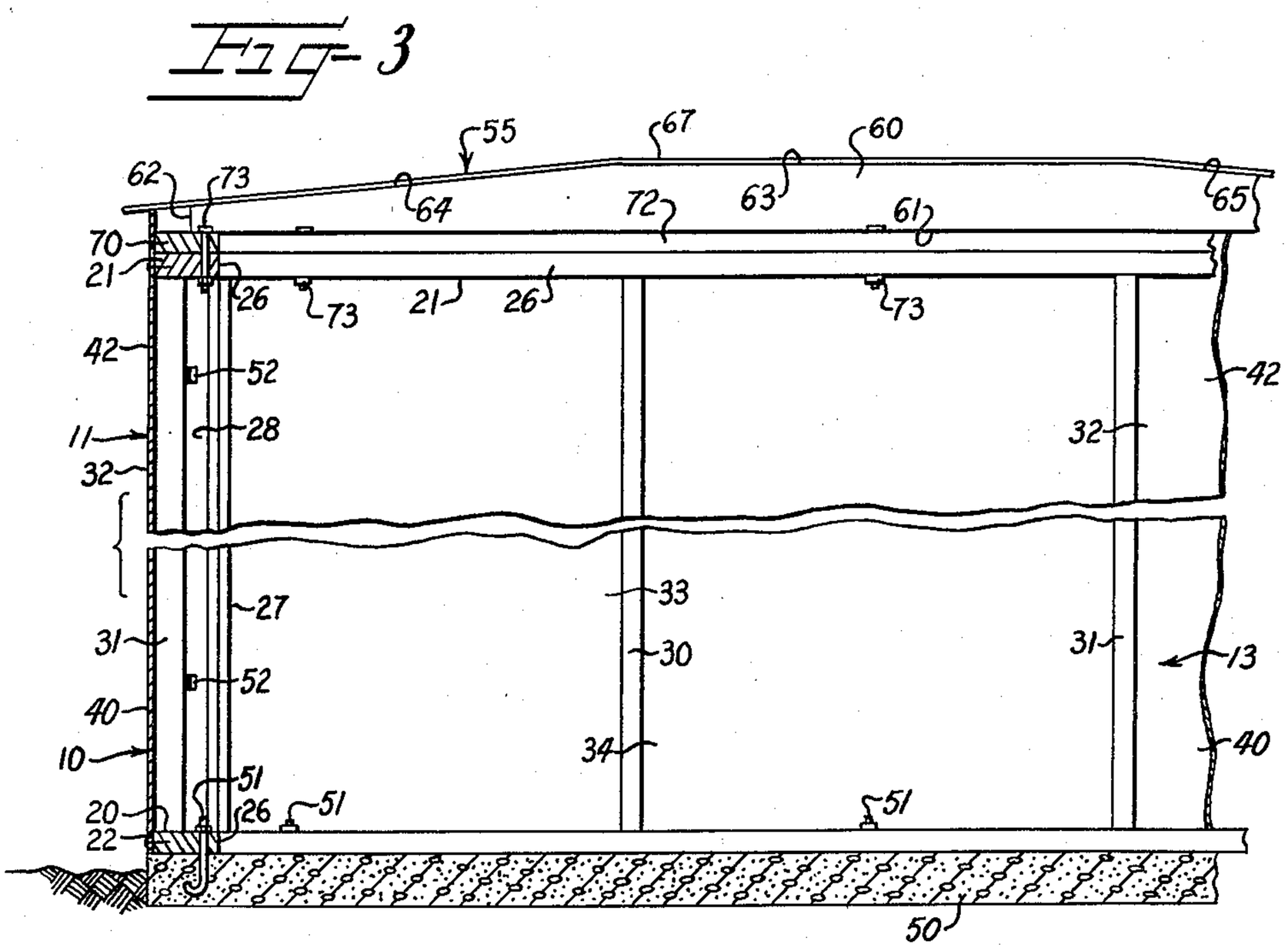
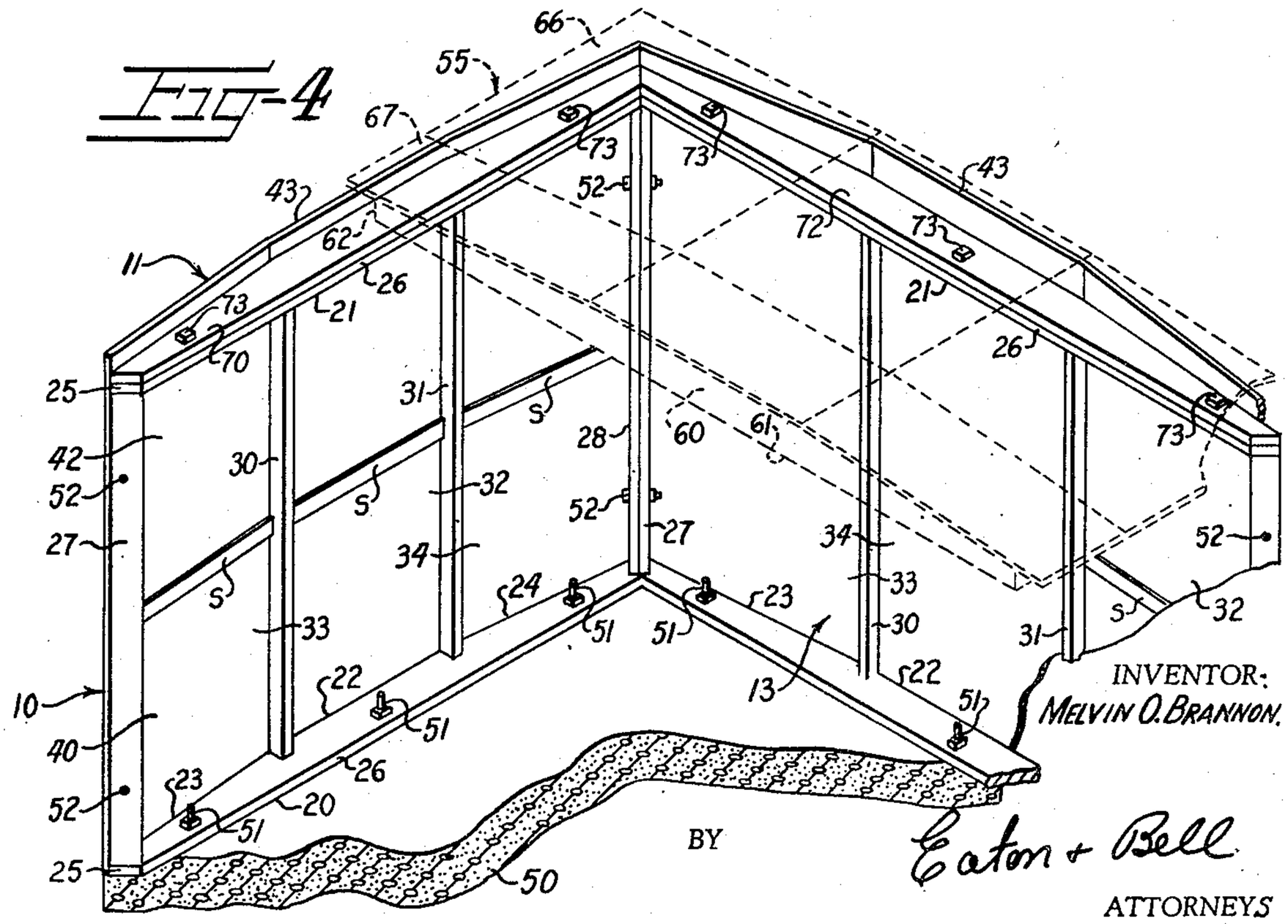


Fig. 4



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BUILDING CONSTRUCTION

Melvin O. Brannon, Waynesville, N. C.

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3 Claims. (Cl. 20—2)

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This invention relates to building construction and more especially to an improved building construction embodying the use of a plurality of prefabricated panel assemblies and to the novel construction of said panel assemblies.

It is an object of this invention to provide means whereby buildings may be constructed quickly and at low cost with a minimum amount of materials. Buildings of this type are particularly useful as so-called temporary buildings in defense or Government projects and also may be used for many other purposes where a building of light weight construction is practical and desirable.

It is an object of this invention to provide a building formed from a plurality of prefabricated panel assemblies, each of said panel assemblies having an upper and lower beam and a plurality of horizontally spaced vertically disposed studs connecting said upper and lower beams. The studs are positioned out of horizontal alinement with each other and panels, such as wall board, are secured to the studs. The fact that the studs are out of horizontal alinement causes the wall board to assume a bowed or irregular shape which serves to increase the strength of the panels and the resulting panel assembly. A plurality of these panel assemblies may be interconnected and extended at substantially right angles to each other to form the walls of a building and panel assemblies of similar construction may be secured over the upper edges of said walls to form a roof.

It is another object of this invention to provide a wall unit or panel assembly for building construction, which panel assembly is easily and economically constructed and wherein maximum strength is afforded in light weight construction. The wall unit or panel assembly comprises an upper and lower beam, the centermost outer edges of the upper and lower beams being substantially flat and the opposite endmost outer edges of the upper and lower beams being cut at an angle to incline inwardly away from the flat centermost outer edge so that each of the upper and lower beams will have three substantially flat edge surfaces, which surfaces are not in alinement with each other. A plurality of studs are provided extending between the upper and lower beams and having their outer edges in alinement with the outer edges of the upper and lower beams, with the centermost studs being positioned outwardly from the endmost studs. A suitable panel, such as wall board, is secured to these studs and to the upper and lower beams

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by extending a horizontally disposed panel across the frame formed from the studs and beams to cause the panel to be bent at at least two points intermediate its ends to conform to the configuration of the skeleton frame formed from the beams and studs. The completed panel assembly will thus comprise at least three sections which are substantially flat and which extend at slight angles to each other so that the overall panel assembly or wall unit will have an outwardly bowed appearance. By bowing the wall unit in this manner, additional structural strength is added to the same and, each of the sections thereof being flat, permits the insertion of windows, doors or the like with a minimum amount of difficulty.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

Figure 1 is an isometric view of a building of the type which may be formed with the improved panel assemblies;

Figure 2 is a top plan view of the building shown in Figure 1 on a reduced scale;

Figure 3 is an enlarged vertical sectional view taken substantially along the line 3—3 in Figure 2;

Figure 4 is a fragmentary isometric view with parts broken away and parts shown in dotted lines looking at one inside corner of the building shown in Figure 1 and looking substantially along the line 4—4 in Figure 1.

Referring more specifically to the drawings, there will be observed a building broadly designated at 10 which is formed from a plurality of panel assemblies or wall units made according to the present invention. Each of these panel assemblies is made as a separate unit and may be prefabricated before being moved to the site of the building or may be fabricated at the site of the building before the building is erected. The building 10 is shown for purposes of illustration only and it will be readily observed that the panel assemblies may, according to this invention, be utilized to form buildings of varying dimensions and character.

The building 10 has side walls 11 and 12, a rear wall 13 and a front wall 14. In this illustration, each of the walls 11, 12, 13 and 14 comprises a single panel assembly or wall unit made according to the invention. The panel assemblies or wall units 11, 12, 13 and 14 are of substantially identical construction and, therefore, only the panel assembly 11 will be described in detail, and like parts of the panel assemblies 12, 13 and 14

will bear like reference characters and, where minor changes are present, these will be specifically described.

It will thus be observed that the frame of the panel assembly or wall unit 11 comprises a bottom beam or shoe 20 and a top beam or plate 21, each having the same configuration. The beams 20 and 21 are wider at the centermost portions thereof than at each end and the centermost outer edges thereof are flat and substantially parallel with the opposite edges thereof, as at 22. These flat edge medial portions 22 preferably extend substantially one-third of the entire length of the respective beams 20 and 21. Each of the opposite endmost outer edges of the beams 20 and 21 are cut at an angle relative to the inner edges or longitudinal axis thereof, as at 23 and 24, and the edges 23 and 24 extend inwardly so that the beams 20 and 21 are of lesser width at opposite ends thereof than at the center portions thereof. The opposite end edges of the beams 20 and 21 are mitred or beveled, as at 25, for connecting the same to similar beams of adjacent panels extending at an angle thereto. The innermost edge of each of the beams 20 and 21 is preferably straight throughout its length, as will be observed at 26.

The beams 20 and 21 are connected at their opposite ends by vertical studs 27 and 28. The studs 27 and 28 are disposed at an angle so the outer surfaces thereof are in alinement with the mitred surfaces 25 at the ends of the beams 20 and 21 and whereby the vertical studs 27 and 28 will fit flush with similar vertical studs on the adjacent panel assemblies 14 and 13.

The vertical studs 27 and 28 are secured at their opposite ends to the beams 20 and 21 by any suitable means such as nails, not shown. Disposed intermediate the ends of the beams 21 and 22 are a pair of horizontally spaced intermediate vertical studs 30 and 31. The studs 30 and 31 connect the beams 21 and 20 and span the distance therebetween and are suitably connected thereto at their opposite ends, by any suitable means such as nails, not shown. The stud 30 is positioned at the juncture of the edges 22 and 23 and the stud 31 is positioned at the juncture of the edges 22 and 24. It is thus seen that the studs 27, 28, 30 and 31 divide each of the panel assemblies or wall units 11, 12, 13 and 14 into three portions or sections, namely, a center section 32, and end sections 33 and 34, each of said sections being substantially flat and disposed in angular relation to the other of said sections.

Now, panels or sheets of wall board, such as plywood or any other suitable wall board, are suitably secured to the outermost surface of the frame comprising the studs 27, 28, 30 and 31 and the beams 20 and 21. A first or lower sheet of wall board 40 has its opposite end edges secured to the studs 27 and 28, as by nails 41, and the lowermost edge of the wall board 40 is preferably substantially flush with the lowermost edge of the shoe 20, although it is evident that the panel 40 may extend below the shoe 20. This sheet of wall board 40 normally extends substantially half the height of the panel assembly 11. A second or upper panel or sheet of wall board 42 is suitably secured to the upper portion of the frame comprising studs 27, 28, 30 and 31 and plate 21, the opposite ends of the panel 42 being suitably secured to the studs 27 and 28, as by additional nails 41. The panels or sheets of wall board 40 and 42 extend over the outer edges of the studs 30 and 31 and are suitably secured thereto, as by additional nails 41. The upper edge of the upper panel or sheet of wall board 42 extends substantially above the upper edge of the beam or plate 21 and this upper edge is slightly lower in the centermost portion thereof, as at 43, than at the outermost end portions thereof for purposes to be described.

It is preferred that the proximate edges of the panels 40 and 42 be beveled downwardly and outwardly and relatively thin sealing strips S be suitably secured to the inner surfaces of the panels 40 and 42 at their junctures (Figure 4). The sealing strips extend between the studs and assist in sealing the joint formed at the juncture of adjacent panels.

A particular advantage of a panel assembly of this type is that wall board of standard dimensions may be used with a minimum amount of cutting. It will be observed that the wall board when secured to the studs 27, 28, 30 and 31, defining the sections 32, 33 and 34, provided a flat outer surface for each of the sections 32, 33 and 34. The sheets of wall board or panels 40, 42 are thus bent intermediate their ends at the points at which they are secured to the studs 30 and 31 and this bending lends additional strength to the completed panel assembly. Wall board is usually sold in convenient sizes of approximately four feet wide and eight, ten or twelve feet long. It will thus be seen that by using panels of wall board of these dimensions, a panel assembly, such as the panel assembly 11, will be approximately eight feet high and would be from eight to twelve feet long. Thus, a plurality of such panel assemblies will readily facilitate constructing a building of the type described.

It should be understood, however, that the particular dimensions of the panels or sheets of wall board are not critical and these dimensions are given for purposes of illustration only in order to indicate the manner in which panels or sheets of wall board of sizes readily available on the market may be conveniently used in constructing these improved wall units or panel assemblies.

Now, in erecting a building from a plurality of panel assemblies, such as the panel assemblies 11, 12, 13 and 14, a suitable slab 50 or other flooring of conventional or other type is provided, and the lower beam or shoe 20 of each of the panel assemblies 11, 12, 13 and 14 is suitably secured to the upper surface, of the slab 50, at one edge thereof, as by anchor bolts 51, which are embedded in the slab 50. The mitred ends 25 of the beam or shoe 20 will, thus, be positioned at the corners of the slab 50 and will extend inwardly from said corners bisecting the same (Figure 4). With the panel assemblies 11 and 12 in position, the panel assemblies 13 and 14 may be secured to the rear and front edges of the slab 50 in a like manner so that the endmost studs 27 and 28 of the panel assemblies or wall units 14 and 13 will be positioned flush with the corresponding endmost studs 27 and 28 of the panel assemblies 11 and 12. These proximate endmost studs may then be secured together as by bolts 52 (Figures 3 and 4). It will thus be observed that the substantially rectangularly arranged side walls are formed for the building 10.

Now, the roof for the building 10 is formed from a single panel assembly or a plurality of panel assemblies of similar construction to that of the wall units. The roof, as illustrated, is formed from two roof panel assemblies 55 and

55', the panel assembly 55' being positioned at the front of the building 10 and extending transversely thereof and the panel assembly 55 covering the rearmost portion of the building.

Since the roof panel assemblies 55 and 55' are identical, except opposite hand, only the panel assembly 55 will be described and like reference characters will apply to the panel assembly 55' with the prime notation added. The roof panel assembly 55 comprises a plurality of transversely extending ribs 60, which may also be termed as rafters. The lower edge of each of the ribs 60 is preferably straight, as at 61, and opposite ends thereof are cut perpendicular to the lower edge, as at 62. The upper edge of each of the ribs 60 is cut to substantially the same configuration as the outer edges of the beams 20 and 21 so that a flat or horizontally disposed center section 63 is formed with two slanting end sections 64 and 65, respectively.

Secured to the upper surfaces of the ribs 60 are panels or sheets of wall board 66 and 77. The panels or sheets of wall board may be plywood or of any other suitable material and are secured to the ribs or rafters 60, as by nails which are omitted from the drawings for purposes of clarity. It will be observed that, in a building of the size illustrated in Figure 1, the panel 66 extends outwardly beyond the outermost rib 60 and also extends from the rearmost or outermost rib 60 to the third rib 60 and the panel 67, which is of lesser width than the panel 66, spans the distance between the third rib 60 and the foremost or innermost rib 60 of the section 55. It will be observed that the panels 66 and 67 are bent intermediate their ends at the junctures of the surfaces 63, 64 and 65 on the ribs 60 to form three substantially flat surfaces to the roof, including a center horizontally disposed surface and slanting surfaces extending from each side of the center horizontally disposed surface.

The opposite ends of the ribs 60 of the panel assemblies 55 and 55' are suitably secured to the upper surfaces of beams 70 which extend the entire length of the side panels 11 and 12. The beams 70 are of identical configuration to the beams 20 and 21 and the ribs 60 are preferably secured thereto, as by nails 71. It will thus be observed that the roof panel assemblies 55 and 55' are secured together, to form a composite roof, by means of the beams 70.

A similar beam 72 is secured to the lower surface of the rearmost rib 60 of the roof section 55 and to the foremost rib 60' of the roof section 55'. These beams 72 are of the same configuration as the beams or plates 21 and are adapted to rest upon the plates 21 of the corresponding rear and front panels 13 and 14. The beams 70 and 72 may be secured to the upper beams 21 of the panel assemblies 11, 12, 13 and 14, as by bolts 73 (Figures 3 and 4). It will thus be observed that the entire building 10 is secured together to form a compact unit from panel assemblies made according to this novel construction.

Now, it will be observed that the rear panel assembly 13 and the front panel assembly 14 are slightly different from the side panel assemblies 11 and 12. This difference lies in the configuration of the uppermost edges of the panels 42 thereof. In order to have the uppermost portions of the front and rear walls conform to the configuration of the panels 66 and 66' of the roof panel assemblies 55 and 55', it is necessary that these walls extend upwardly a substantial distance beyond the upper surfaces of the corresponding beams 21 and the upper edges thereof be cut to conform to the configuration of the roof line.

The side walls 11 and 12 must also conform to the roof line and, since these walls are bowed outwardly, the panels 66 and 66' contact the outermost upper edges at the center thereof at different elevations than the points at which they contact the endmost upper edges thereof. Consequently, the panels of the side panel assemblies 11 and 12 must be cut so that the centermost portions 43 thereof are slightly lower than the end portions thereof. It will thus be observed that the panels 66, 67, 66' and 67' of the roof panel assemblies 55 and 55' fit closely against the upper edges of the panels 42 on the wall units or panel assemblies 11, 12, 13 and 14 and a small overhang or eaves portion is provided around the entire building 10.

Now, one of the features of this building construction is the simplicity with which doors or windows may be installed, if desired. This is due to the fact that each of the sections 32, 33 and 34 of the wall units or panel assemblies is flat and is not bowed between the studs. For purposes of illustration only, the front wall unit 14 of the building 10 is shown as being provided with a door 80 and windows 81 and 82. The door 80 may be provided by cutting a suitable opening in the section 32 of the front panel assembly 14 and facing the same with framing 83 to form a door jamb and, if desired, a suitable stop 84 may be provided. The window 81 is provided by cutting an opening in the section 34 of the front panel assembly 14 and facing the same with framing 85. The window 82 may be formed in a like manner by cutting an opening in the section 33 of the panel assembly 14 and facing the same with framing 86. Windows or doors may be provided in the other sections of the building as desired.

It will thus be observed that there is provided an improved form of building construction which comprises a panel assembly having a pair of horizontal beams spanned by a plurality of studs to form at least three flat sections to said panel assembly wherein said sections extend at an angle to each other to give the panel assembly a bowed appearance for adding strength thereto and whereby a plurality of said panel assemblies may be readily connected to each other to form a building.

In the drawings and specification, there has been set forth a preferred embodiment of the invention and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A structural unit for building construction comprising upper and lower beams, the inner edges of said beams being straight, the outer edges of said beams each being cut to define at least three straight edges the centermost of which is parallel to the inner edge of said beam and the endmost of which extend inwardly toward said inner edge of said beam, a plurality of studs having their opposite ends secured to said beams to hold said beams in spaced relation to each other, the outer edges of said studs being flush with the outer edges of said beams, sheets of wall board connected to the outer edges of said studs and said beams and conform-

ing in curvature to the outer edges of said beams to form three substantially flat panels to said unit, the opposite ends of each of said beams being beveled and the endmost studs connecting said beams being positioned at an angle to conform to said bevel, whereby a plurality of said units may be connected to each other in rightangular relation to each other to form the walls of a building.

2. A building formed from a plurality of prefabricated wall panels secured to each other to form the walls of said building and a plurality of prefabricated roof panels secured to the upper edges of said wall panels forming the roof of said building wherein each of said wall panels is formed from at least one pair of longitudinally extending structural sheets positioned in superposed edge to edge relation and having upper and lower beams secured thereto and defining the upper and lower edges of said walls and a plurality of studs connecting said beams, said studs being so positioned as to define a plurality of panel areas and said structural sheets being bent intermediate their ends at each of said studs to cause said wall to be bowed outwardly in a plurality of substantially flat areas, and wherein said roof panels are provided with a plurality of ribs, the upper edges of which are cut to define a plurality of flat areas, additional structural sheets secured to the ribs and being bent intermediate their ends at the juncture of said flat areas of said ribs to cause said roof to be bowed upwardly in a plurality of flat areas of the same configuration as said walls.

3. A building formed from a plurality of prefabricated wall panels secured to each other to form the walls of said building and a plurality of prefabricated roof panels secured to the upper edges of said wall panels forming the roof of said building wherein each of said wall panels is formed from at least one pair of longitudinally extending structural sheets positioned in superposed edge to edge relation and having upper and lower beams secured thereto and defining the upper and lower edges of said walls and a plurality of studs connecting said beams, said studs being so positioned as to define three panel areas and said structural sheets being bent intermediate their ends at each of said studs to cause said wall to be bowed outwardly in three substantially flat areas, and wherein said roof panels are provided with a plurality of ribs, the upper edges of which are cut to define three flat areas, additional structural sheets secured to the ribs and being bent intermediate their ends at the juncture of said flat areas of said ribs to cause said roof to be bowed upwardly in three flat areas of the same configuration as said walls.

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