J. R. ASHLEY.

PORTABLE STEEL BUILDING.

APPLICATION FILED DEC. 12, 1914.

1,178,288.

Patented Apr. 4, 1916.

2 SHEETS—SHEET 1.

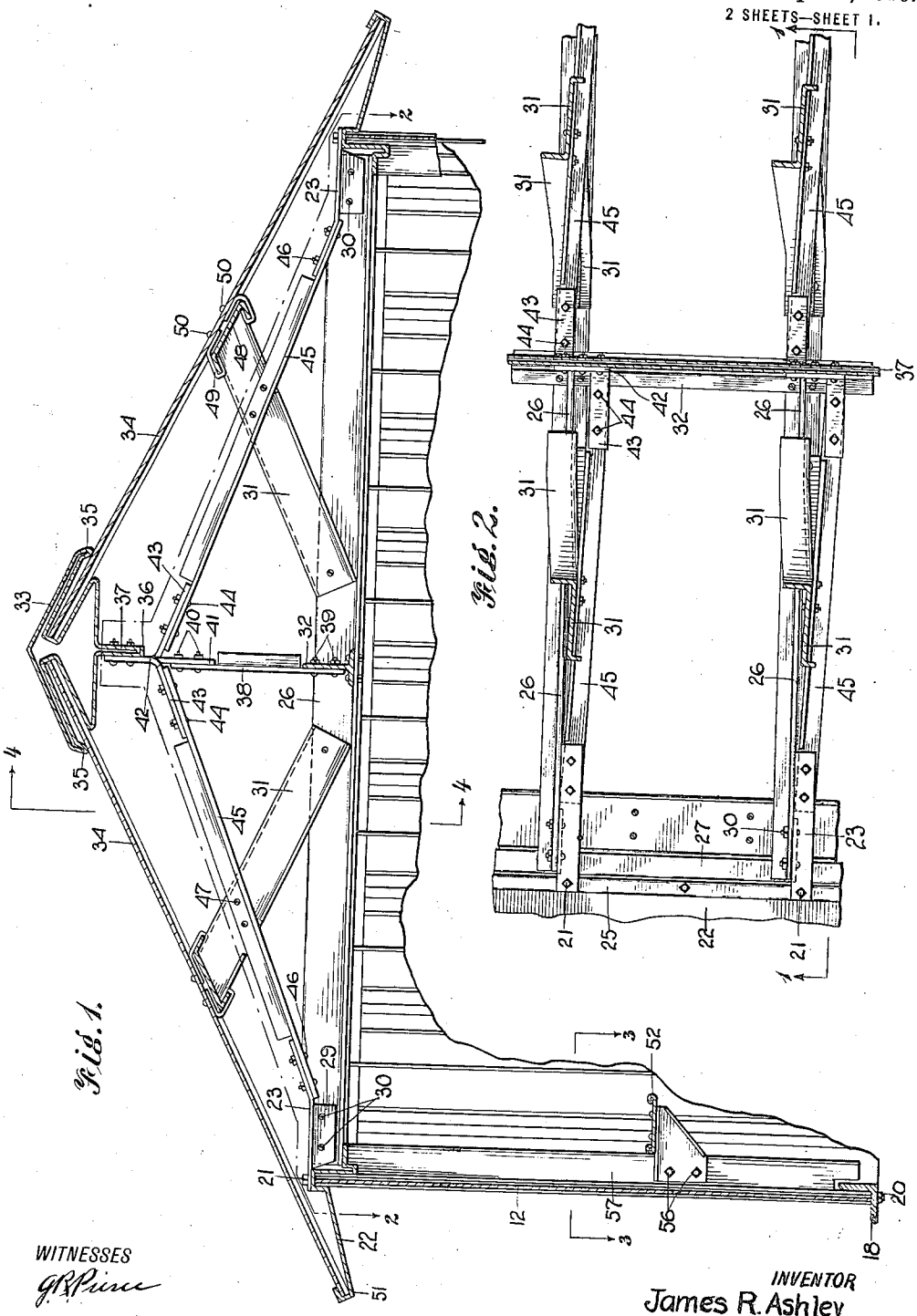


Fig. 1.

Fig. 2.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

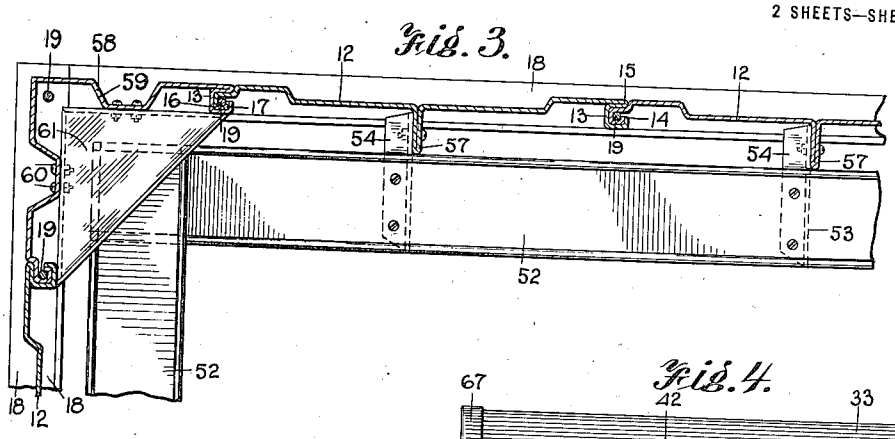


Fig. 4.

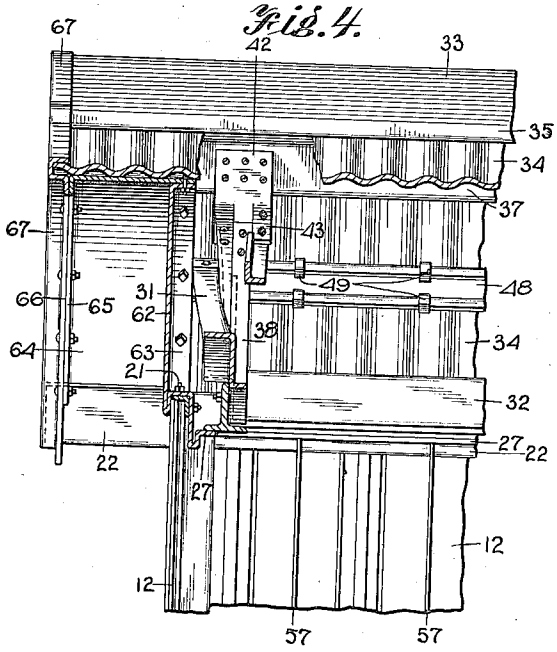


Fig. 5.

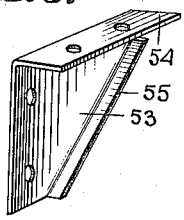


Fig. 6.

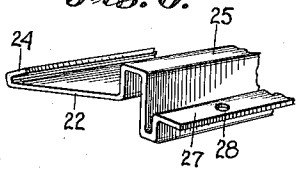
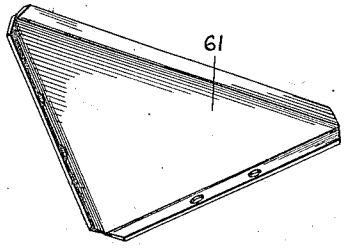


Fig. 7.



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JAMES R. ASHLEY, OF NEW YORK, N. Y.

PORTABLE STEEL BUILDING.

1,178,288. Specification of Letters Patent. Patented Apr. 4, 1916.

Application filed December 12, 1914. Serial No. 876,820.

To all whom it may concern:

Be it known that I, JAMES R. ASHLEY, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Portable Steel Building, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to reinforce a structure of the character mentioned; to balance the load carried by the roof; to stiffen the side wall construction of the building without materially augmenting the weight thereof; to cheapen the cost of construction; and to simplify the labor of assembling the parts of which said building is composed.

Drawings.—Figure 1 is a vertical cross section of a building constructed and arranged in accordance with the present invention; Fig. 2 is a horizontal section taken as on the line 2—2 in Fig. 1; Fig. 3 is a detail view, on an enlarged scale, showing in horizontal section a corner fragment of a building, the section being taken on the line 3—3 in Fig. 1; Fig. 4 is a detail view, on an enlarged scale, showing a roof fragment, the section being taken on the line 4—4 in Fig. 1; Fig. 5 is a detail view in perspective, of a reinforcing shelf bracket; Fig. 6 is a detail view in perspective, of a fragment of the eaves plate; Fig. 7 is a detail view in perspective, showing a corner plate for stiffening the structure at the corners thereof.

Description.—As shown in the drawings, the side walls of the building are formed principally of thin metal plates 12, which are suitably stamped to resist buckling. At their opposite vertical edges the plates 12 are shaped to form relatively large and small rectangular channels opening outward and inward, respectively. The channel member 13 with which each plate is provided is bent to a rectangular shape in cross section, having a relatively narrow edge 14 spaced apart from the folded edge 15 of the plate to form an entrance opening to the channel of the member 13. A channel member 16 is shaped to fit within the channel of the member 13. An edge 17 is also provided for the member 16, similar in shape and function to the edge 14 which is provided for the member 13. The edge 17 is separated from the body of the plate 12 to form an opening adapted to receive the edge 14 when different plates are being connected. The joint ultimately formed is what is known in the art as a "rolling-hook" joint, heretofore made in circular sections. Greater rigidity of structure is obtained when the members 13 and 16 are shaped to the rectangular cross section herein shown and described.

The plates 12, as shown best in Fig. 1 of the drawings, are supported by angle irons or mud-sills 18. The sills 18 are constructed of rolled metal, and may be mounted on wooden or cement foundations, as called for. The plates 12 are held rigidly in position on the sills 18 by tie rods 19, the lower ends of which protrude through a flange of each sill 18, to receive a nut 20. The rods 19 are each provided at the opposite end with a head 21 to rest in service above the eaves plate 22 and the end of a connection bracket 23, perforations being provided in said plate and bracket to hold said rod. In this manner the roof structure and side wall structure of the completed house is bound together.

When installing the plates 12, each plate is turned relative to the adjacent plate until the opening between the edge 17 and the body of the plate adjacent the channel member 16 registers with the edge 14 of the channel member 13. In this position, the rectangular member 16 will be found to be partially extended within the channel member 13. When the plates are straightened, as shown in Fig. 3, the member 16 rolls within the member 13 to form a solid and close joint therewith. The rods 19 extend through the center of the channel formed in the member 13, being so placed after the plates 12 have been joined, as above described, and the eaves plates 22, with the connecting brackets, have been set.

The plates 22 are each provided at the outer edge thereof with an upwardly turned flange 24. The plates 22 are shaped adjacent their inner edges to form an upwardly-extending channel member 25, the channel formed thereby being wide enough to receive and hold the plates 12 while being set and preliminary to the installation of the rods 19. It will also be understood that prior to the installation of the rods 19 the connection brackets 23 are disposed in place

to have said rods pass through the perforated end thereof.

When the various rods 19 have been installed, the brackets 23 having been placed to receive the same, the side wall structure is tightened or made fast to the sills 18 by manipulation of the nuts 20, which draw the sills 18 and the plates 22 firmly upon the plates 12. The side walls are now ready to receive the roof structure. As a preliminary to this, the strings 26 are placed in position, the lower flange resting on the benches 27 with which the plates 22 are provided, as best seen in Fig. 6 of the drawings. Suitable holes formed in the ends of the flanges of the strings 26 register with perforations 28 formed in the benches 27. Suitable bolts are now employed to unite the strings 26 and benches 27. The perforations 28 are so disposed in the benches 27 that the upstanding flange of each string 26 rests against the subtended rib 29 of one of the brackets 23. Boltholes are suitably provided in said flanges and ribs to receive bolts 30, as seen best in Figs. 1 and 2 of the drawings.

The strings 26 are preferably constructed from T-beams of suitable weight. When installed, the T-beams are inverted, the webs being extended upward from the flanges to operate as attachment members for the braces 31. The standing webs of the strings 26 are preferably sawed and routed centrally to receive a cross tie beam 32. The cross tie beam 32 is extended parallel with and beneath the ridge member of the roof, and is suitably anchored to the end trusses or pediments of the building. When the cross tie beam 32 is installed the flanges of the strings 26 pass under the flange of the tie beam, while the standing webs of the strings 26 bear against the sides of the standing web of the tie beam, as best seen in Fig. 1 of the drawings. The ridge member above referred to in the present construction is constructed from sheet metal bent to form a seamless ridge cap 33. The cap 33 is doubled upon itself, that the metal may be returned from both edges of the cap to form recesses, into which are introduced the upper edges of the roof plates 34. The lateral edges of the cap 33 are bent down to form drainage lips 35. The drainage lips 35 form a sharply inclined wall at the under and inner side thereof, to prevent the accumulation of water at this point, the lodgment of which would permit the wind to drive the water upward along the pitch of the roof plates 34 and beyond the upper edge thereof, thereby gaining admittance to the interior of the building structure.

The material of which the cap and lips are constructed is turned inward from each side toward the center, where the metal forming the edges of the plate is bent to form parallel sections, each having an outwardly-turned lip edge 36. The combined parallel sections form a box-like member, which in the present structure forms the ridge-pole 37. The ridge-pole 37 is connected with the tie beam 32 at suitable intervals by tie beams 38. The tie beams 38 are constructed from angle iron, one flange of which is eliminated at the ends to form extension members, one of which is secured by bolts 39 to the beam 32, while the other is secured by bolts 40 to the subtended arm 41 of a union 42. Each of the unions 42 is preferably constructed from a metal plate, the lower section of which is split to form the subtended arm 41 and laterally-extended arms 43. The body of the union 42, or the portion of the plate from which it is constructed extending above the arms 41 and 43, equal in length the width of the arms 41, 43 and 43. The laterally-extended arms 43 are secured by bolts 44, to truss members 45. The members 45 are united at their lower ends, by bolts 46, with the brackets 23. It is with the upturned flanges of the members 45 that the braces 31 are secured, rivets or bolts 47 being employed for this purpose.

The ends of the braces 31 are disposed in channels 48. The channels 48 are constructed from sheet or light plate metal, and are extended lengthwise of the roof, at the under side thereof. The channels 48 are suspended from the under sides of the plates 34 by straps 49, the ends whereof are overturned on the edges of said channels, said straps being secured to the plates 34 by rivets 50.

The braces 31, the ridge cap 33 and the eaves plates 22 primarily support the roofing plates 34 and load carried thereon, the upper ends of the braces 31 being sufficiently extended to bear on the under sides of said plates.

The plates 34 are corrugated to provide gutter-like channels, down which the moisture flows to the gutter formed by the flange 24 of the plates 22. To provide for the escape of the water thus accumulated in the plates 22, said plates may have edge perforations 51 or a leader of conventional type. When the plates 34 have been arranged as shown, it will be found that the trusses carry the full weight of the roof, and that the stresses imposed primarily on the plates 34 are sustained in part by the members 45. The side walls of the structure are further reinforced by a shelf 52, with which the walls are each furnished. These shelves are mounted on brackets 53, which brackets are provided with a carrying member 54 and a reinforcing edge 55, as shown best in Fig. 5 of the drawings. The brackets 53 are mounted, by means of bolts 56, on vertical folds 57. The folds 57, as best shown in Fig. 3 of the drawings, are formed by doubling the center section

of each of the plates 12. The folds 57, when structurally united by shelves 52, increase the rigidity of the building.

The corners 58 of the present building are preferably constructed from a single sheet of metal. Said corners are vertically reinforced by having inset portions 59, which are secured by bolts 60 to triangular shelves or braces 61, as best seen in Figs. 3 and 7 of the drawings. When the shelves or braces 61 are secured in service in the manner set forth, the corners 58 are found to be very substantial and rigid.

The pediments to which reference has been above made, are faced with a triangular plate 62. The plate 62 is furnished with an internal flange 63, which registers with the inner edge of the pediment eaves plate 64. The eaves plate 64 is externally provided with a flange 65, which is bolted to a flange 66 on a cover edge 67, as best shown in Fig. 4 of the drawings.

The various members above described and shown in the accompanying drawings are assembled in the manner and in the order found most convenient to the designer or contractor. When assembled, it will be found that the stresses, such as imposed by roof loads or wind pressure, are thoroughly and conveniently provided for.

I claim:

1. A portable building comprising a plurality of eaves plates, each embodying upwardly curled external edges forming roof plate supporting members, an internal horizontal bench, and a downwardly-opening channel intermediate said bench and edge; a plurality of roof trusses, the ends of each resting upon for support by said benches; a ridge cap constructed from sheet metal and embodying laterally-opening channels; a plurality of roofing plates, the ends whereof extend into the channels in said ridge cap and at the outer edge of said eaves plates; a plurality of braces mounted upon and connecting the members of the trusses, said braces extending beyond the upper members of said trusses; a plurality of channel members operatively connected with said braces and connecting the ends of the same; means for supporting said ridge cap to aline the channels therein with said channel member and the curled edges of said eaves plates to hold the said roof plates in position; and means for connecting said roof plates and the channel member on said braces.

2. A portable building comprising a plurality of eaves plates, each embodying upwardly curled external edges forming roof plate supporting members, an internal horizontal bench, and a downwardly-opening channel intermediate said bench and edge; a plurality of roof trusses, the ends of each resting upon for support by said benches; a ridge cap constructed from sheet metal and embodying laterally-opening channels; a plurality of roofing plates, the ends whereof extend into the channels in said ridge cap and at the outer edge of said eaves plates; a plurality of braces mounted upon and connecting the members of the trusses, said braces extending beyond the upper members of said trusses; a plurality of channel members operatively connected with said braces and connecting the ends of the same; means for supporting said ridge cap to aline the channels therein with said channel member and the curled edges of said eaves plates to hold the said roof plates in position; and a plurality of straps rigidly mounted on said roof plates for bending on said channel member, for supporting said roof plates.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES R. ASHLEY.

Witnesses:
E. B. MURDOCK,
PHILIP D. ROLLHAUS.