

April 7, 1925.

W. C. HARTING ET AL

1,532,695

METAL BUILDING

Filed Feb. 27, 1920

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Fig. 1

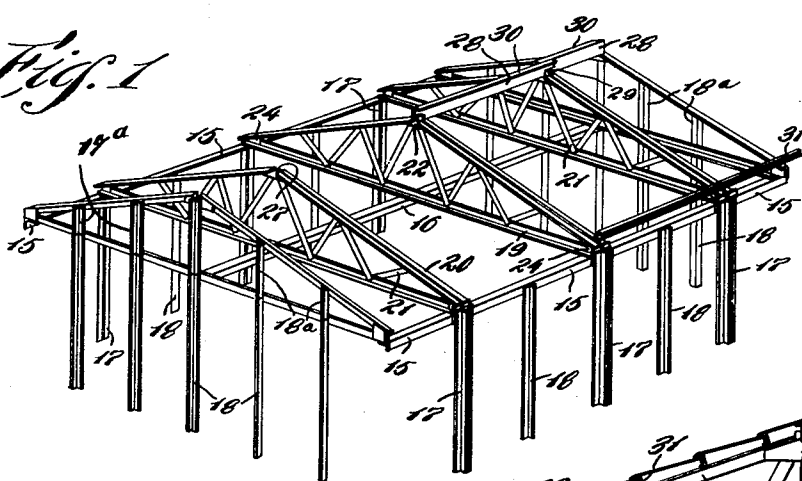


Fig. 2

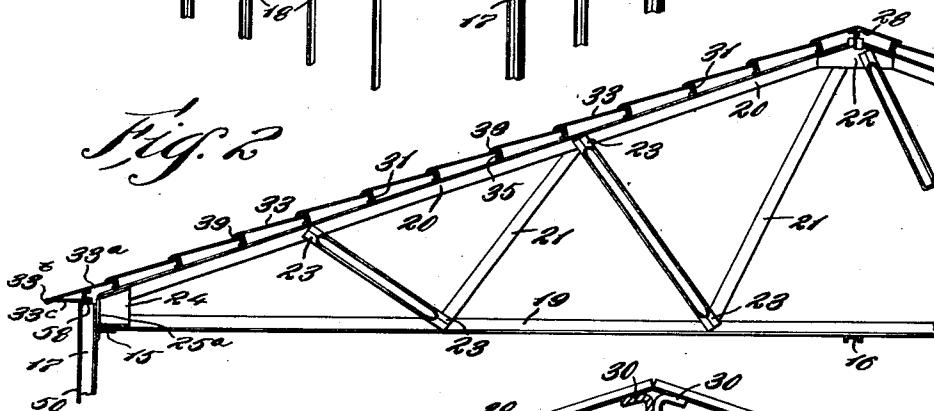


Fig. 5

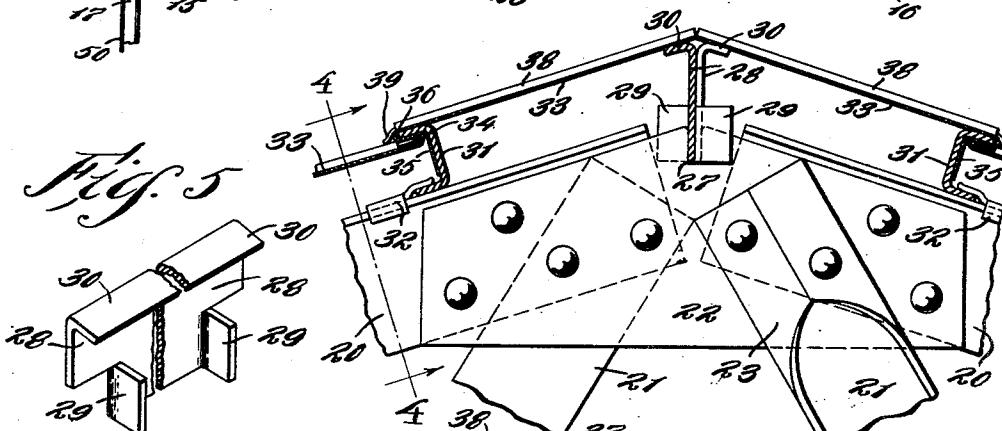
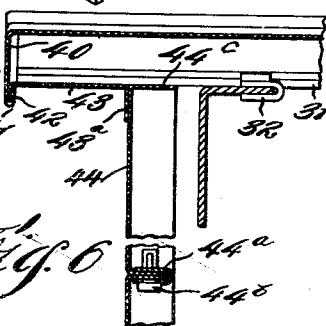
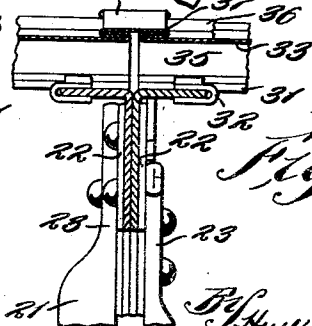


Fig. 3

Fig. 4

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Fig. 6



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UNITED STATES PATENT OFFICE.

WALTER C. HARTING, THOMAS A. SINDELAR, AND CARL E. DAVID, OF CLEVELAND, OHIO, ASSIGNORS TO HYDRAULIC PRESSED STEEL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

METAL BUILDING.

Application filed February 27, 1920. Serial No. 361,786.

To all whom it may concern:

Be it known that we, WALTER C. HARTING, THOMAS A. SINDELAR, and CARL E. DAVID, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Metal Buildings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates generally to metal buildings and more particularly to a novel construction of supporting frame, also the novel manner of connecting the roof and sides of said metal building to said frame.

The object of the invention is to provide a metal building which can be fabricated at one point, shipped in compact and convenient form, and then quickly and easily assembled at any desired point without the aid of highly skilled labor. In other words, the sheet metal building as constructed, is so simply and easily put together, that ordinary structural iron workers can quickly and easily erect the same.

Another object of the invention is to provide a sheet metal building in which great strength will be combined with simplicity, and a still further object is to provide weather tight joints at all points thereby avoiding the laborious and expensive operation of packing or weatherstripping.

With these objects in view, and certain other objects which will become apparent as the description proceeds, the invention consists in the novel features of construction and in the novel manner of combining or arranging the same, all of which will be fully described hereinafter and set forth in the appended claims.

In the drawings forming a part of this specification Fig. 1 is a perspective view of the frame composed of uprights and trusses, certain parts being omitted for clearness of illustration; Fig. 2 is a detail side elevation showing one-half of truss with roof arranged thereon; Fig. 3 is an enlarged elevation partly in section showing the ridge gusset, portions of the truss, ridge plate and strips; Fig. 4 is a detail sectional view on the line 4-4 of Fig. 3; Fig. 5 is a detail perspective view showing the portions of the

ridge angle strip, the intermediate portion of said strip being broken away; Fig. 6 is a detail sectional view showing the end of gable construction; Fig. 7 is a detail view partly in section and partly in elevation showing the eave construction.

In carrying out our invention we employ a frame of angle iron comprising side and end members connected together in any suitable manner, the size of said frame being dependent upon the size of the structure to be produced. If desired, a central brace member may be used for said frame.

This frame is supported at a suitable height upon the double angle iron columns 17, and the single angle iron columns 18, said columns 17 and 18 being riveted or otherwise secured to the frame, the flat faces of the columns contacting with the flat faces of the angle members of the frame.

The double columns 17 are arranged with their parallel members spaced slightly apart in order to receive therebetween the flanges of the side wall plates and sealing strips as hereinafter set forth.

The upper ends of the columns 17 and 18 extend slightly above the frame members 15 as most clearly shown in Figs. 2 and 7; and resting upon the side members of the frame are the ends of the trusses, each consisting of a lower or horizontal chord 19 and an upper or inclined chord 20 and the intervening braces 21.

The upper or inclined chord of each truss is composed of two angle irons with their vertical flanges depending and contacting, and the bottom or horizontal chords are also each composed of two angle irons arranged with their vertical members extending upwardly and in contact. The upper chords 20 are united at their inner ends by means of gusset plates 22, the vertical flanges of the angle iron chords being arranged between the gusset plates and riveted thereto, and the upper ends of the central braces are also connected to said gusset and chords.

The braces 21 are preferably made of channel irons and at their ends have the sides folded over and pressed down as shown at 23 providing a double thickness at the ends

and through which the fastening rivets are passed.

By this construction we are able to use lighter material for the braces and at the same time provide reinforced end portions having ample thickness for riveting.

The outer ends of the upper and lower chords are connected by gusset plates 24, said gusset plates being shaped to fit snugly between the horizontal flanges of the chord members, and each gusset plate at its outer end is provided with a lateral flange 25^a which is securely riveted to the laterally extending flanges of the double columns as shown at 26, and in this manner the ends of the trusses are rigidly connected to the double columns while the ends of said trusses are also supported upon the frame members 15, which as previously stated, are rigidly connected to the double and single columns 17 and 18.

Each central gusset 22 is provided with a central slot 27 into which fit the vertical members of the ridge angle strips 28, each end of each of said strips 28 being slotted and turned laterally as shown at 29 in order to engage the central gusset plates and hold the angled ridge strip against longitudinal movement, and it will be noted that each pair of trusses is connected by means of an angled ridge strip, and that the ridge strips are arranged with their ends overlapping as most clearly shown in Fig. 1 and vertical members contacting as shown and their angled members 30 extending in reverse directions while the lateral extensions 29 serve to position these ridge strips in connection with gusset plates and trusses.

Roof purlins 31 are arranged longitudinally upon the upper chords of the trusses and are preferably connected thereto by means of clips 32, each clip being folded around the horizontal flange of the truss member and rigidly connected thereto, and also having a finger extending over the bottom flange of the purlin and determining the exact position of said purlins.

Roof sheets 33 are then laid upon the roof purlins, the upper end of each roof sheet being bent slightly upward as shown at 34 and then downward as shown at 35, said end thus bent being adapted to fit into the channel of the purlin; and at the lower end, the roof sheet is bent back upon itself as shown at 36 which bend is adapted to fit under flange of the purlin and then against the upturned portion 34 of the next lower roof sheet, and thus serve to hold the parts in their proper relative positions.

The vertical edges of the roof sheets are turned back, as shown at 37, and when two roof sheets are brought together a connecting strip 38, is forced over the oppositely disposed ends 37 connecting them together and providing a tight joint, and the lower

end of each connecting strip 38 is formed with an extending portion 39 which extends down and contacts with the next lower end of each connecting strip 38.

At the ridge, a double width roof plate is employed, this roof plate having its center resting upon the ridge angle strip and having its ends connected to the oppositely disposed purlins nearest the ridge of the roof as most clearly shown in Fig. 3.

The roof purlins project beyond the ends of the building as most clearly shown in Fig. 6 and the end roof sheets are carried down as shown at 40 and bent back at their lower edges as shown at 41 in order to engage the depending edge 42 of the sealing plate 43 which is united to the adjacent end gable sheet 44 hereinafter referred to.

As previously stated the columns 17 project a short distance above the frame members 15, and it will be understood that the side wall plates extend up even with the tops of the columns and are preferably turned inwardly at their upper ends as shown at 57 and the eave purlins 58 are supported above the columns as shown and support the eave roof plates 33^a the extreme lower end being bent back as shown at 33^b in order to engage the outer end of the eave sealing plate 33^c, the inner end of said plate being bent around the upper end of the side wall plate as shown at 33^d and held in place by the T-bolt 33^e as most clearly shown in Fig. 7.

At the end of the building, the columns 17 and 18 do not extend to the upper chords of the trusses but stop about median horizontal line of the frame member 15, and supplemental members 17^a and 18^a abutting the lower members 17 and 18 extend to upper chords of the trusses. This arrangement is for manufacturing and shipping convenience.

The side wall plates at the ends also extend up only as far as the ends of the columns and the gable end portions are closed by means of the gable end plates 44 shown in Fig. 6 the lower ends of the gable end plates being turned inwardly as shown at 44^a and resting upon the inturned end of the end wall plate and secured by means of T-bolts 44^b.

The upper ends of the gable end plates 44 are turned inwardly as shown at 44^c and serve to support the projecting portion of the purlin 31, and the sealing plate 43 is flanged and rigidly connected to the gable end plate 44 as most clearly shown at 43^a in Fig. 6. From the above description taken in connection with the accompanying illustration it will be seen that we provide a strong and simple form of frame which can be quickly and easily set up and to which the roof sheets and side walls can be quickly and easily attached. It will also be noted

that the roof sheet joints are all securely covered, and that the end gables and eave spaces are also securely closed, providing a sheet metal building in which all spaces are
5 neatly and securely closed.

Having thus described our invention, what we claim is:

1. In a metallic building, the combination with a plurality of trusses, each having a
10 centrally slotted ridge gusset plate, of ridge angle strips, having body portions adapted to fit said slots, the ends of said body portions being bent laterally to hold said ridge strips against longitudinal movement.

15 2. In a metallic building, the combination with an upright and side wall sheet, of an eave purlin arranged horizontally upon the upper ends of said upright and sheet, an eave roof sheet resting upon said purlin, an
20 eave sealing sheet connected at its inner end to said eave purlin, upright and side wall sheet, the outer ends of said eave sealing sheet and eave roof sheet being united by a fold at the edge of one of said sheets.

25 3. In a metallic building, the combination with the trusses and channeled roof purlins of the roof sheets, one edge of each sheet being adapted to fit into the channel of one purlin, the opposite edge being turned
30 back to engage the next lower purlin and roof sheet.

4. In a metallic building, the combination with the trusses and channeled roof purlins, of the roof sheets, the upper edge of each sheet being shaped to fit into the
35 channel of the purlin, the lower edge of said sheet being bent back to engage the next lower purlin and roof sheet, the ends of said sheets being bent back upon themselves, and roof sealing strips fitting upon
40 said bent back edges, said sealing strip having an extension at its lower end, adapted to extend down and contact with the next lower strip.

5. The combination with the channeled
45 roof purlins of the roof sheets, each sheet having its upper end bent slightly upward and then downward to fit into the channel of the purlin, the lower end of the roof sheet being bent back upon itself to fit under
50 the channel of the purlin and then against the upturned portion of the next lower roof sheets to hold said parts in their proper relative positions.

In testimony whereof, we hereunto affix
55 our signatures.

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THOMAS A. SINDELAR.
CARL E. DAVID.