

C. D. PRUDEN.
PORTABLE SHEET METAL HOUSE.
APPLICATION FILED JULY 19, 1911.

1,016,032.

Patented Jan. 30, 1912.

4 SHEETS—SHEET 1.

Fig. 1.

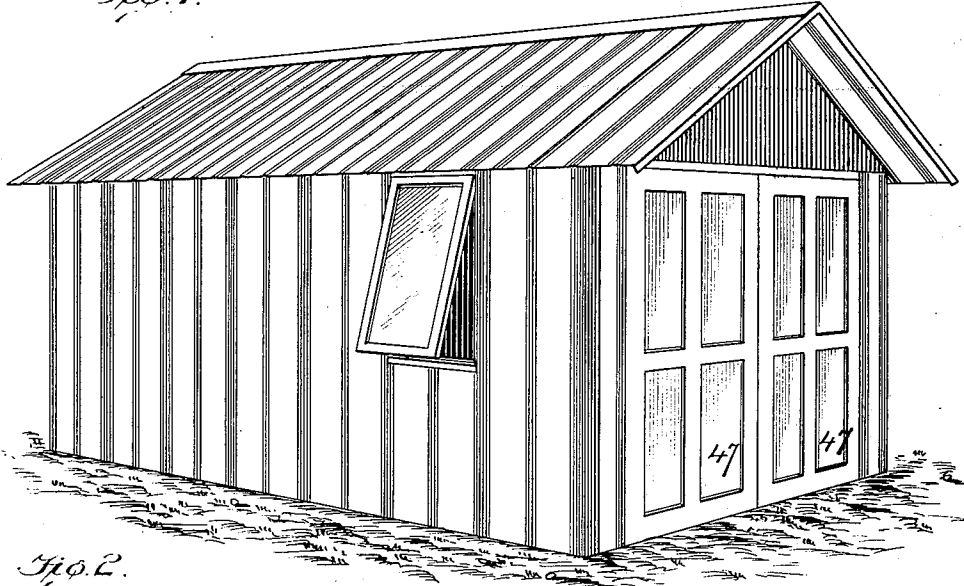
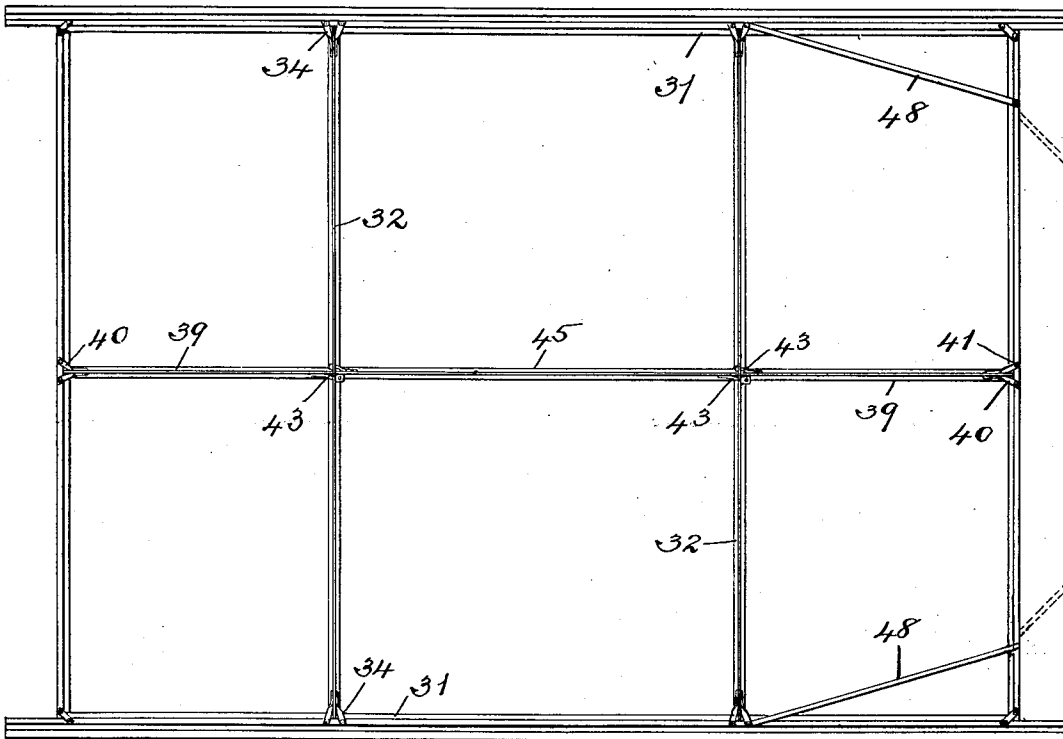


Fig. 2.



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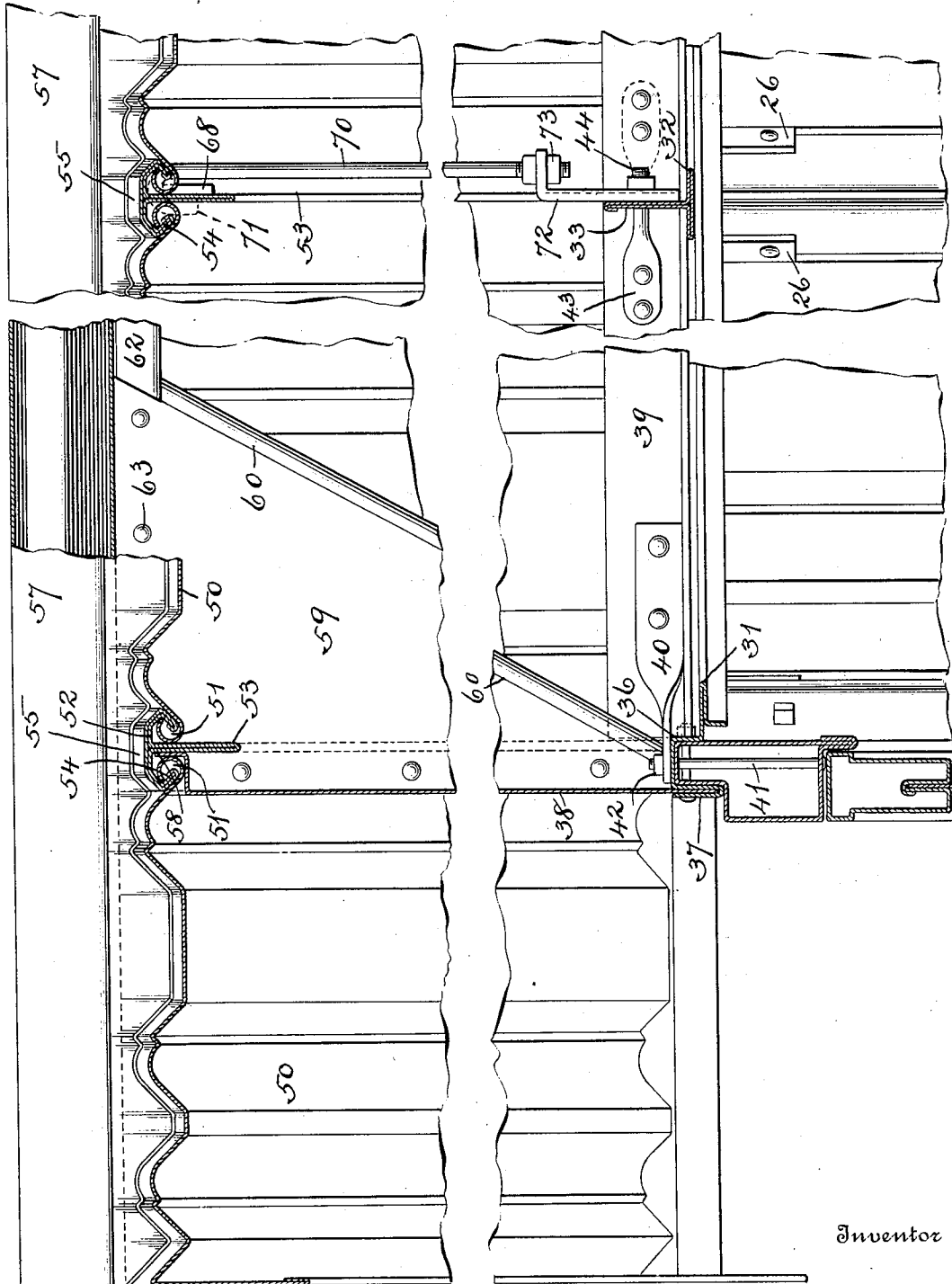
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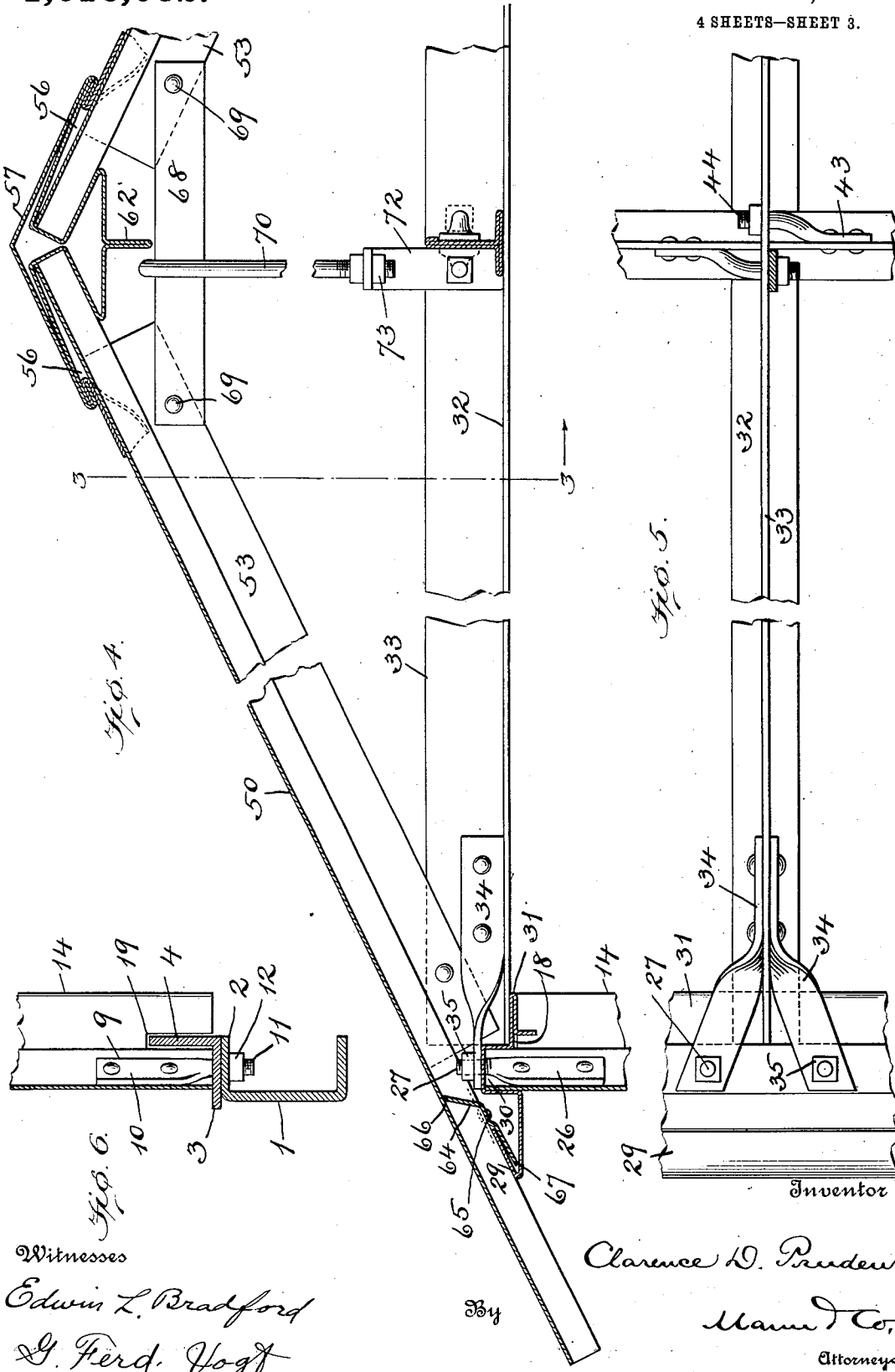
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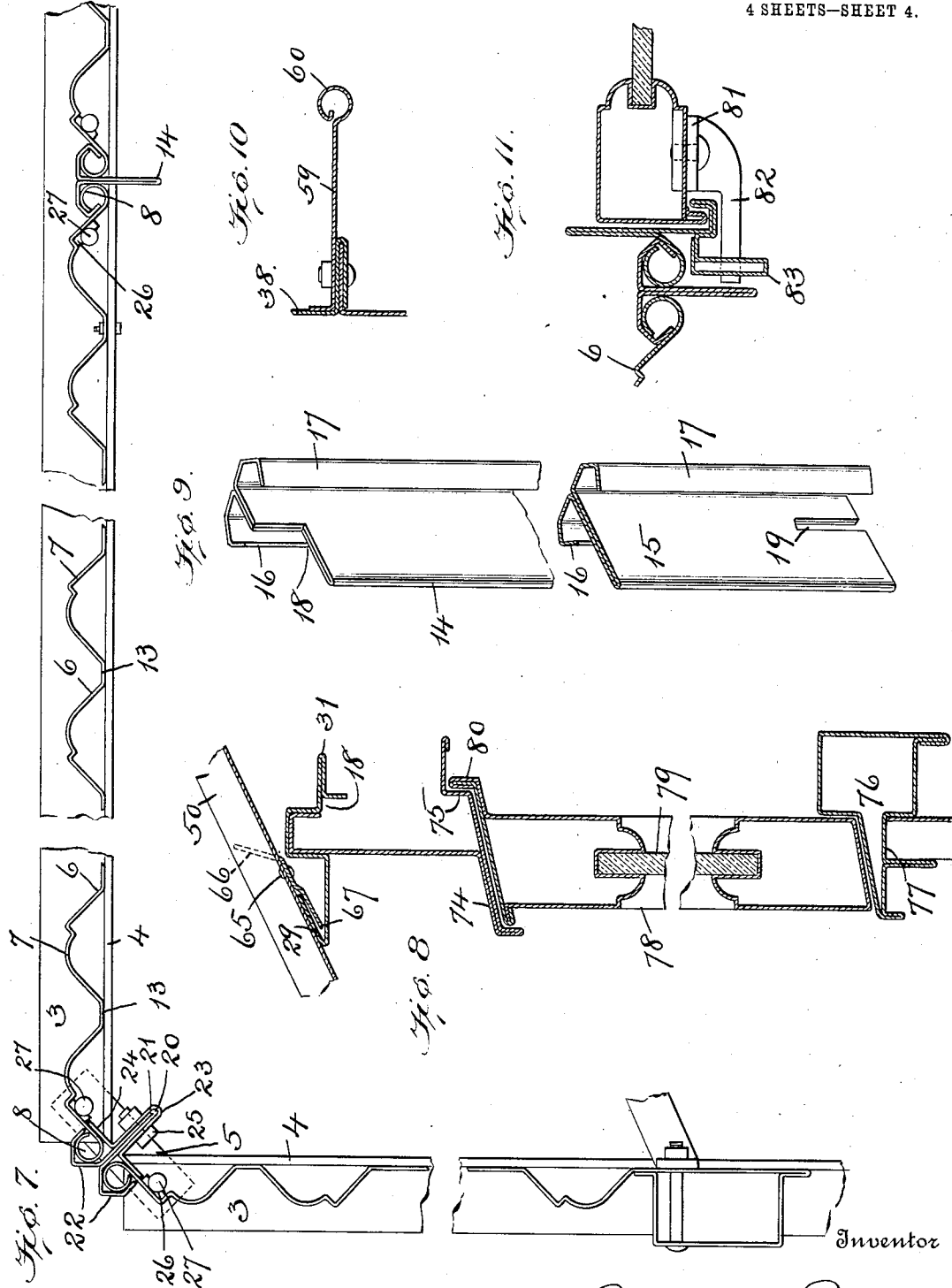
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UNITED STATES PATENT OFFICE.

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PORTABLE SHEET-METAL HOUSE.

1,016,032.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLARENCE D. PRUDEN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Portable Sheet-Metal Houses, of which the following is a specification.

This invention relates to an improved construction of portable sheet-metal houses.

One object of the present invention is to provide an improved construction of sectional sheet metal house, the sections of which are united in an improved manner that will enable the erection to be accomplished with facility.

Another object is to provide an improved union between the sections which will permit and care for the expansion and contractions and which will be strong, durable and tight against wind and weather.

A further object is to provide an improved construction whereby the roof will be securely tied down on the wall sections.

With these and other objects in view, the invention is illustrated in the accompanying drawings, in which,

Figure 1, is an exterior perspective view of a sheet-metal house constructed in accordance with my invention. Fig. 2, is a top plan view of the side and end walls and the angle bars which connect the same. Fig. 3, is a vertical sectional elevation through the front wall and the roof,—the section being taken on the line 3—3 of Fig. 4. Fig. 4, is a vertical cross-sectional elevation through the ridge and roof and shows the connection between the latter and the upper edge of the wall sections and it also shows the horizontal bar connection that extends from one side wall to another. Fig. 5, is a top plan view of the angle bars that connect the upper edges of the side wall sections. Fig. 6 is a vertical sectional detail through the lower portion of a wall section and shows the construction employed to anchor the same to the ground. Fig. 7, is a top plan view of a portion of two walls showing one corner union and a union of adjoining sections. Fig. 8, is a vertical sectional detail through a wall section which is provided with a window opening and window. Fig. 9, is a perspective detail of one of the union members. Fig. 10, is a horizontal section through the gable end wall and the ridge supporting bracket, and Fig. 11, is a horizontal sectional

plan view through the window frame,—showing the pivot support therefor.

Referring particularly to Figs. 6 and 7 the numeral, 1, designates the channel bars which are preferably so secured in the ground that one flange, 2, thereof may form a horizontal support to sustain an angle bar, 3. In case a substantial anchorage is desired the lower part of the channel bar may be embedded in a cement or concrete foundation so as to securely anchor the same in place. The angle bars are seated on the flange, 2, of the bar, 1, so that one flange, 4, thereof will extend vertically, for a purpose presently to be explained. In order to connect the adjoining ends of angle bars, such for example as at the corners where one bar extends at an angle with respect to another, I provide a coupling plate, 5, which I interpose between the channel and angle bars and which I secure in place by means that is carried on the wall sections as will presently be described. The walls of the house are formed of sheet-metal sections of a size that will permit of handling with facility, and said sections may be either plain or corrugated as desired. In the present instance the sections, 6, are provided with vertical corrugations, 7, which serve to both ornament as well as stiffen the sections. The opposite vertical edge of each wall section is formed into a vertical outward roll or tube, 8, and while in the present instance these rolls or tubes are of a circular form in cross-section they may readily be of an angular or other shape. The inner side of each wall section carries a plurality of securing plates, 9, which have a flat portion, 10, that is rigidly secured to the wall near the lower horizontal edge and a threaded stem portion, 11, that projects below said edge, as clearly shown in Fig. 6 of the drawings. The threaded stem portions, 11, of these securing plates are slightly off-set with respect to the flat portions, 10, so they will set away from the wall sections but project vertically below the same in order that they may be inserted in suitable perforations in the angle bars, 3, and then projected through registering perforations in the horizontal flange, 2, of the channel bars. The lower projecting ends of the threaded stems are then secured to the channel bars by means of nuts, 12. From the foregoing explanation it will be seen that the securing plates,

9, not only serve to hold the lower edge of the wall section in place but also serve to secure the wall sections and angle bar to the channel bar.

5 By referring to Fig. 7, it will be seen that when the wall sections are set up vertically on the angle bars, 3, spaced-apart portions, 13, thereof will seat against the vertical flange 4, thereof which projects upwardly at the inner side and by this means the lower
10 edge of the wall section is supported or braced at the inner side to resist pressure against the outer side.

To facilitate the joinder of one wall section with another I provide a union or coupling member, 14, which is best shown in Fig. 9 of the drawing. This union or coupling member is formed of sheet metal and has a double-walled central web, 15, and parallel side hook members, 16, and, 17, respectively,—one extending laterally from one wall of the central web and the other projecting laterally from the other wall of said central web. The upper end of the double-walled web, 15, is provided with an edge notch, 18, for a purpose presently to be explained, while the lower end of said web, 15, has a vertical notch, 19. This union or coupling member, 14, serves to connect the adjacent vertical edges of the wall sections, 6, by telescopically sliding the hook members, 16, and, 17, respectively into locking engagement with the spaced-apart rolls or tubes, 8, on the wall sections,—the central web, 15, of the coupling member projecting between and separating said rolls or tubes. When the coupling member has been pushed down over the rolls or tubes to the angle bar, 3, on which its lower end seats, the notch, 19, in said lower end will receive the vertical flange, 4, of the angle bar and securely lock the same so that it cannot be moved either inwardly or outwardly.

At the corners or angles where two side walls join a corner union, 20, somewhat similar to the coupling, 14, is employed. This corner union can best be seen in Fig. 7, where it is shown as having a central double-walled web, 21, and a vertical channel member, 22, projecting laterally from each of said walls and having position at opposite sides of the web, 21. In the operation of this corner union the web, 21, extends downwardly in the right-angle joint of the angle plates, 3, while each channel member, 22, engage a roll or tube, 8, on the vertical edges of the side and end wall sections. To reinforce the corner union I provide a U-shape saddle plate, 23, at the inner side which plate straddles the fold of the double-walled web and has laterally-turned vertical flanges, 24, that seat against the inner vertical surfaces of the adjacent, but spaced apart rolls or tubes, 8, at the corner and effectually seals the joint at the inner

side. A series of bolts, 25, are preferably passed through the saddle plate and also through the web, 15, thus rigidly locking the same together without exposing the bolts on the exterior.

From the foregoing explanation of the coupling, 14, and the corner union, 20, it will be understood that these two members are long and narrow,—being of sufficient length to extend from the bottom to the top edge of the wall sections, but light enough in weight to enable ready handling during the assembling operation.

In assembling the wider wall sections may be laid flat on the ground with the adjacent edge rolls or tubes slightly separated but parallel. The coupling member, which is merely a narrow strip, may then have the ends of its hook-members, 16, and, 17, engaged with the ends of the open rolls or tubes on the wall sections; by then sliding the coupling member longitudinally on the rolls or tubes the two wall sections may be joined by the coupling throughout their entire length. If the house is not of too great a length all of the sections may be coupled while lying flat on the ground and then turned vertically and seated on the angle plate, 3, and secured thereon by the nuts, 12, at the lower ends of the securing plates, 9. On the other hand if the house is to be of such length that the entire wall cannot be readily turned vertically, a few sections may be coupled and set up, then a few more coupled and set up and as the coupling member, 14, is narrow and light, it may easily be operated to join the several sections while the latter are in a vertical position.

The upper edge of the wall sections, 6, are also provided with securing plates, 26, having threaded stems, 27, that project above the upper edge, as seen in Fig. 4, of the drawing, which serve a useful function as will now be described. Prior to or after a wall has been set up I lay a channel plate along the upper edge thereof. This channel plate has an upturned inclined horizontal flange, 29, along its outer side; a central channel, 30, to receive the upper edge of the wall sections and a horizontal flange, 31, along its inner side, as clearly seen in Figs. 4 and 5. Perforations are provided in the top wall of the central channel so that the stems, 27, of the plates, 26, may project therethrough. After the channel plates have been laid over the upper edges of the opposite walls, I put into place a plurality of horizontal T-bars, 32, which are sustained by their ends resting upon the horizontal flanges, 31, at the inner sides of the channel plates. These bars are placed with the horizontal part resting on the flanges, 31, and the vertical part, 33, extending upwardly. At the ends, each bar, 32, is pro-

vided with two stay plates, 34, one end of each of which lies against the vertical part, 33, of the T-bar and the other end of each being given a quarter twist and projected beyond the end of the bar, 32, so as to seat on top of the channel plate and be engaged by the stems, 27, of the securing plates on the upper ends of the wall-sections.

From the foregoing explanation it will be seen that the opposite side walls are tied together at their upper ends by the horizontal bars, 32, and also that the channel plates are also secured down on the wall sections by nuts, 35, that engage the stems of the securing plates, 27.

The end walls of the house are constructed very similarly to the side walls with the exception that provision is made for a door frame and door, which however forms no part of the present invention and therefore is not described in detail, and with the further exception that the channel plate, 36, at the upper end of the wall in addition to the horizontal flange, 31, at its inner side has an up-turned exterior flange, 37, which forms a horizontal support for the lower edge of the gable-end plates, 38, as shown in Fig. 3 of the drawing. After the end walls of the house have been set up I place T-bars, 39, between the same and the cross-wise bars, 32, and I connect the outer end of each bar, 39, to an upper edge of an end wall by means of stay plates, 40, which have ends that rest upon the channel plates, 36, and are secured by means of bolts, 41, and nuts, 42. The inner ends of the bars, 39, rest upon the horizontal flange of the bars, 32, and are secured thereon by tie plates, 43, that have stems, 44, which project through perforations in the vertical part, 33, as best shown in Figs. 2 and 5 respectively. In addition to the end T-bars, 39, I provide a similar bar, 45, which extends horizontally between and connects the bars, 32, as clearly shown in Fig. 2, and this bar is also provided with tie-plates, 43.

From the foregoing explanation it will be seen that the upper edges of the wall sections are all tied together by the T-bars which rest upon the inner horizontal flanges, 31, of the channel plates.

As the end wall of the house, in the present instance, is subjected to the additional strains of large swinging doors, 47, I prefer to provide horizontal stay rods, 48, which extend between and connect channel plates on the said walls.

The roof of the house, see Figs. 3 and 4 of the drawings, is formed of sheet-metal sections, 50,—the edges of which that are to be joined being provided with out-turned rolls or hooks, 51. These roof sections are secured together by means of an inner coupling member, 52, which is very similar to that employed in securing the wall sections

together in that it has a central web, 53, and oppositely-turned side hooks, 54, to engage the hooks on the roof sections. In addition to this coupling member, 52, however, I find it expedient to employ an additional outer coupling member, 55, to entirely embrace the inner member, 52, which outer member seals the joint between the side hooks, 54, which joint is formed by folding the inner member so as to produce the central web, 53. It will thus be seen that the outer member effectually seals the joint and at the same time reinforces the inner members and materially stiffens the joint to enable it to withstand the strains brought upon it by the presence of snow on the roof. The upper ends or edges of the roof sections and coupling members fit into a longitudinal recess, 56, in the ridge, 57, and in order to effect a tight joint between the ridge and roof sections I provide a sheet of soft pliable material such as lead which may be pressed close against the roof sections and close the crevices. By reference to Fig. 3, it will be noted that the gable-end wall, 38, has its upper edge, 58, turned inwardly and then upwardly so that the up-turned portion may be inserted and held between the hook, 54, on one roof section and the side of the central web, 53. A ridge bracket, 59, has a roll, 60, at one edge and the opposite edge thereof is seated against the gable-end wall to which it is bolted. The upper horizontal edge of this bracket extends along a depending flange, 62, on the ridge and is secured thereto by bolts, 63. The lower ends of the roof sections rest upon and project over the channel plates on the side walls, and in order to hold these sections in place and prevent them from slipping downwardly and thus becoming disengaged from the ridge, I provide the under surface of the roofing sections with a longitudinal strip of metal, 64, as shown in Fig. 4. This strip is secured to the under side of the roof sections by means of rivets, 65,—the rivets passing through the strip about midway between the upper and lower longitudinal edges, 66, and, 67, respectively leaving both of said edges free. By means of this construction the lower edge, 67, of the strip may be inserted in the channel plate beneath the up-turned flange, 29, which will lock the sections against downward movement, and the upper edge, 66, of the strip is pressed against the under side of the roof sections so as to fill and close the passages that would otherwise be formed by the corrugations. In order to tie the roof down I provide short horizontal plates, 68, which extend crosswise of and beneath the ridge and whose ends are secured by bolts, 69, to the central webs, 53, of the inner coupling members, 52, as shown in Fig. 4. A vertical rod, 70, has a hook, 71, at its upper end

which takes over the horizontal plate, 68, and the lower end of this rod depends to a point immediately over the angle plate, 32, and passes through a perforation in the bracket iron, 72, to which it is secured by means of nuts, 73. The bracket iron, 72, is bolted to the vertical portion, 33, of the angle plate and consequently the roof sections are tied to the angle plates.

In forming a window opening I employ a frame that extends about the same and has a head portion at the lower edge of which I provide an outwardly-projecting overhanging flange, 74, and a stop shoulder, 75, at the inner side. At the bottom of the window-opening I provide a hollow sill, 76, which has a channel, 77, at its under side to receive and fit on the wall. The sash, 78, is of an ordinary hollow construction and has the usual channels to receive the glass, 79, and the upper cross rail of the sash has a stop flange, 80, at its inner upper edge to engage the shoulder, 75, on the wall so as to limit the outward swing of the sash at the upper end. The sash is provided with suitable side brackets, 81, each having a stem, 82, that projects through an opening in a flange, 83, which is carried by the wall at the side of the window opening and as these brackets are attached to the sash slightly above the horizontal center the bottom of the sash may be swung outwardly to effect a so-called opening of the window.

Having thus described my invention what I claim and desire to secure by Letters Patent is,—

1. In a sheet-metal house the combination with a base plate having an up-turned vertical portion, of a plurality of spaced-apart wall sections each having a curled vertical edge; a coupling member having a central web which projects between the spaced-apart curled edges of the wall sections and also having curled edges at each side of the web to telescopically engage the curled edges on the wall sections.—said coupling member also having a vertical slot in its lower edge to receive the up-turned vertical portion of the base plate; a roof sustained above the coupled wall sections and means for securing the roof with respect to the wall sections.

2. In a sheet-metal house the combination with a plurality of spaced-apart wall sections each having a longitudinal engaging device on its vertical edges, of a coupling member interposed between the adjacent wall sections and said coupling member having a central web which projects between the spaced wall sections and also having side hook members on its opposite edges to engage the devices on the edges of the wall sections; a channel plate on the upper edges of both the wall sections and coupling members; means also on the wall sections at

opposite sides of the coupling member to secure the channel plate to the wall section; a roof and means for securing the roof to the channel plate.

3. In a sheet-metal house the combination with the base plate, of a plurality of spaced-apart wall sections each having an engaging member on its opposite longitudinal edges; securing plates at the bottom edge of the wall sections to engage the said base plate; a coupling member projecting between and also coacting with the engaging members on the edges of the spaced-apart wall sections; a channel plate on the upper edges of the said wall sections and coupling member; securing plates at the upper edge of the wall sections to engage the channel plate; a roof, and means coacting between the roof and channel plate to secure the former in place.

4. In a sheet-metal house the combination with a plurality of wall sections, of a coupling member interposed between and securing the adjacent walls together; a corner union member having a central web to project between the vertical edges of the abutting walls and having oppositely-projecting hooks to engage the outer sides of said wall edges; a saddle plate engaging the web of the corner member on the inner side of the walls; channel plates on the walls; a roof, and means for securing the roof to the channel plates.

5. In a sheet-metal house the combination with a plurality of spaced-apart wall sections each having locking means on its vertical edges, of a coupling member having a double-walled central web,—and each wall projecting outwardly and laterally and having an engaging hook at each side of said central web to engage the locking means on the edges of adjacent spaced-apart wall sections; a roof, and means for securing the roof with respect to the wall sections and coupling member.

6. In a sheet-metal house the combination with a plurality of wall sections each having locking means on its vertical edges, of a coupling member interposed between and securing the wall sections together; a channel plate on the upper edges of the wall sections and coupling members,—said channel member having a flange at its inner side; angle bars having their ends seated on the flanges of the channel members; means for securing the wall sections, channel plate and angle bars in position; a roof and means for securing the roof with respect to the wall sections.

7. In a sheet-metal house the combination with a plurality of wall sections each having locking means on its vertical edges, of a coupling member interposed between and securing the wall sections together; a channel plate on the upper edges of the wall sec-

tions and coupling members,—said channel member having a flange at its inner side; angle bars having their ends seated on the flanges of the channel members; means for
5 securing the wall sections, channel plate and angle bars in position; a roof; means for securing the roof to the channel plates and means for connecting the roof and angle bars.

10 8. In a sheet-metal house the combination with a plurality of spaced-apart wall sections of a coupling member interposed between and coupling the sections together; a channel plate on the upper edges of the wall
15 sections and coupling member; a roof also having spaced-apart plates; a coupling member for coupling the plates of the roof together,—said latter coupling member having a web that projects between the spaced
20 roof plates and the lower edge of the said web terminating at the inner edge of the channel plate on the wall sections; angle bars having their ends at the inner side of the said channel plate and also at the lower
25 end of the web of the roof-plate coupling-member,—said angle-bar ends, web, channel plate and side walls being rigidly secured together.

9. In a sheet-metal house the combination

with a plurality of spaced-apart wall sections of a coupling member interposed between and coupling the sections together; a channel plate on the upper edges of the wall sections and coupling member; a roof also having spaced-apart plates; a coupling
30 member for coupling the plates of the roof together,—said latter coupling member having a web that projects between the spaced roof plates and the lower edge of the said web terminating at the inner edge of the
40 channel plate on the wall sections; an outer coupling member embracing the roof-plate coupling and covering the crease in the said latter coupling between the walls of the said web; angle bars connecting the opposite
45 side walls and having their ends at the inner side of the said channel plate and also at the lower end of the web of the roof-plate coupling-member and means for securing the side walls, channel plate and
50 angle bar together.

In testimony whereof I affix my signature in presence of two witnesses.

CLARENCE D. PRUDEN.

Witnesses:

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