H. M. LEONARD.

PORTABLE HOUSE.

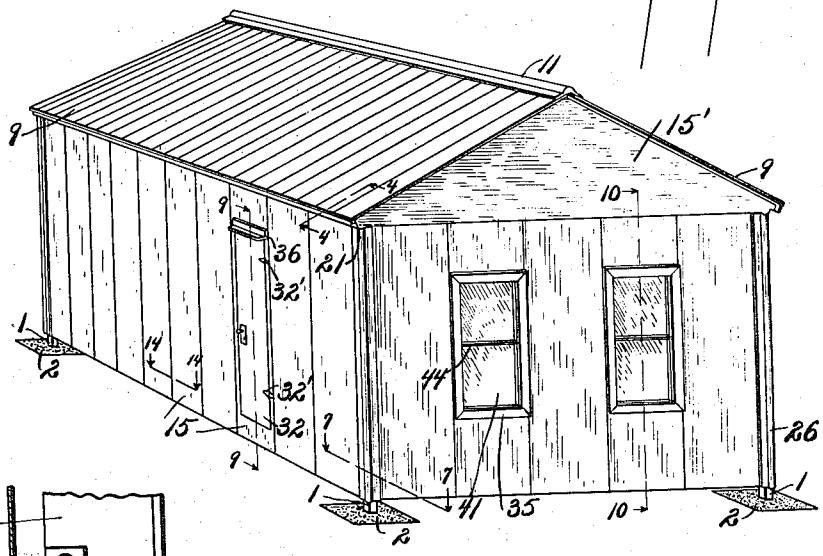
APPLICATION FILED FEB. 26, 1912.

1,230,180.

Patented June 19, 1917.

4 SHEETS—SHEET 1.

Fig. I.



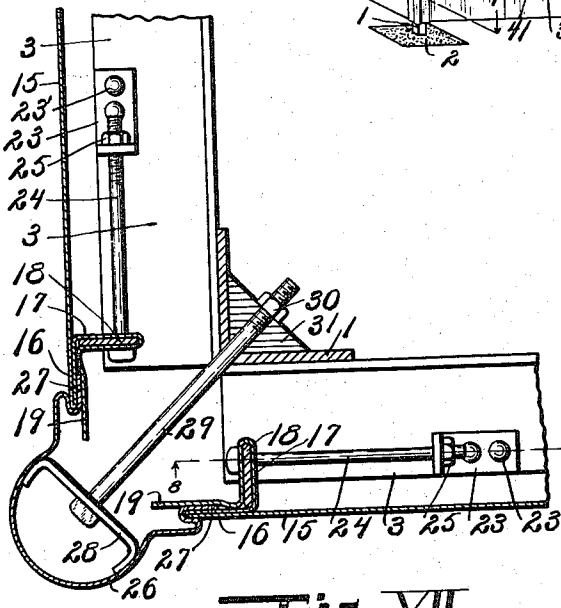


Fig. VII.

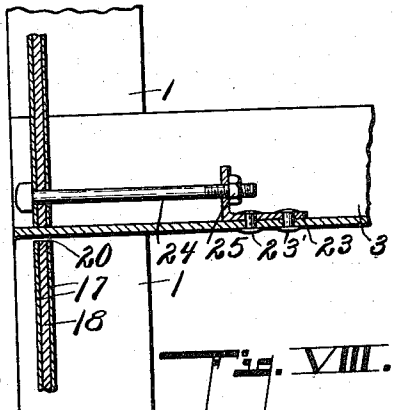


Fig. VIII.

Witnesses

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M. L. Gladgow

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4 SHEETS—SHEET 2.

Fig. VI.

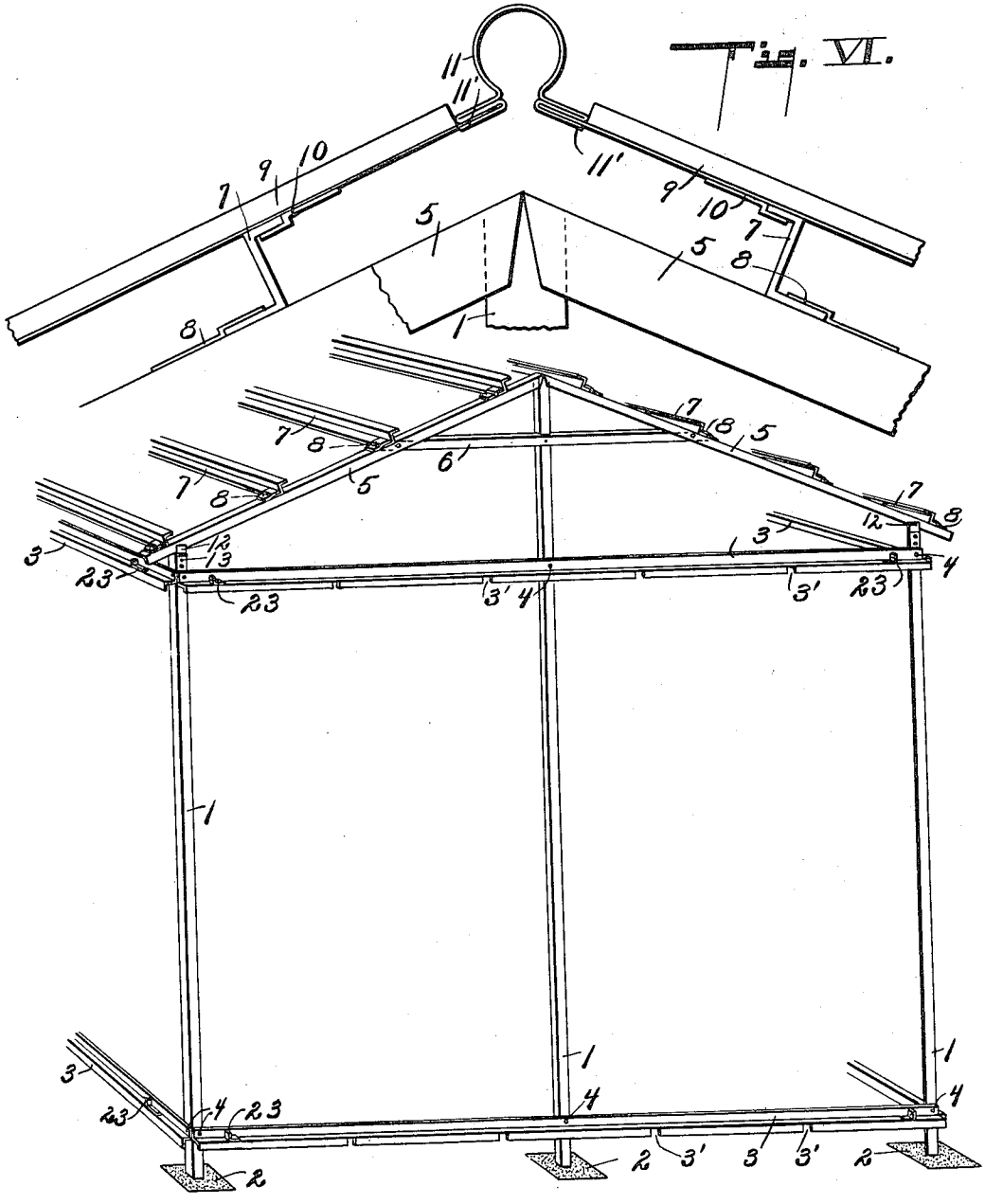


Fig. II.

Witnesses

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4 SHEETS—SHEET 3.

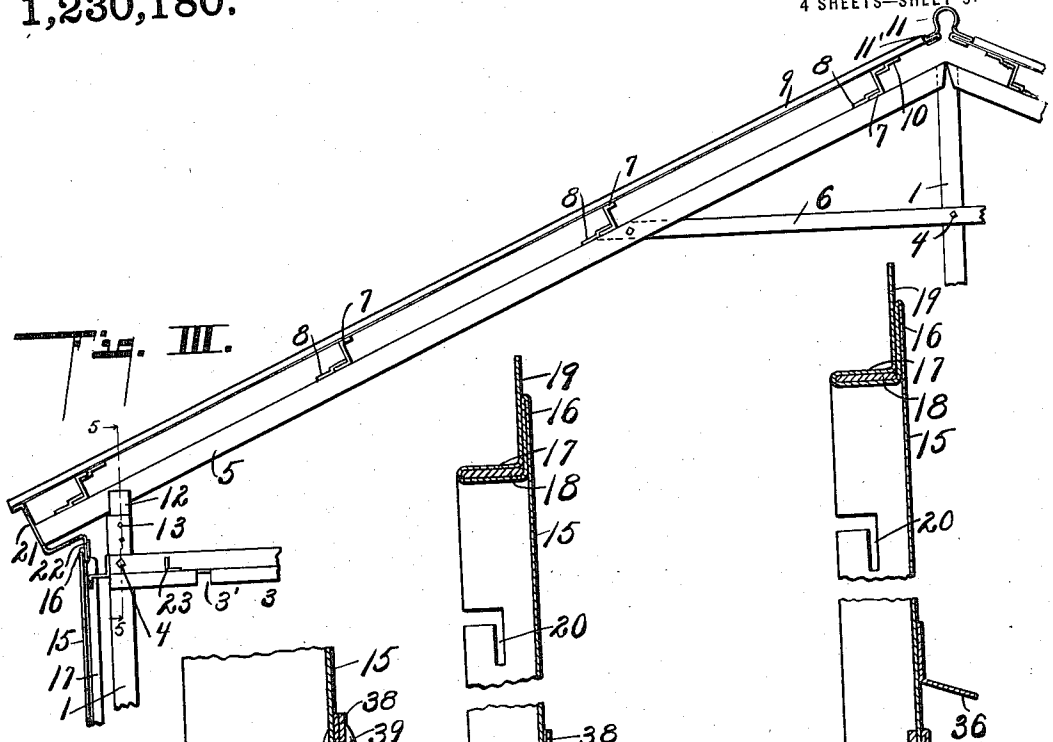


Fig. III.

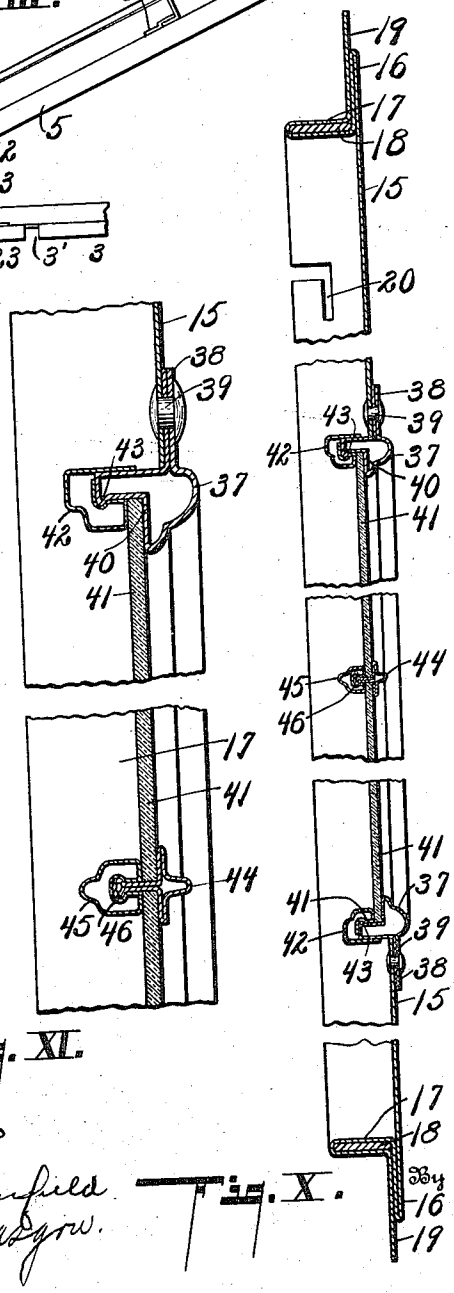


Fig. X.

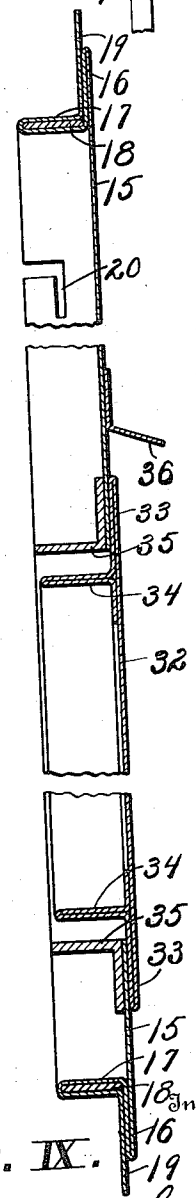


Fig. IX.

Fig. XI.

Witnesses

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M. L. Gladgow.

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4 SHEETS—SHEET 4.

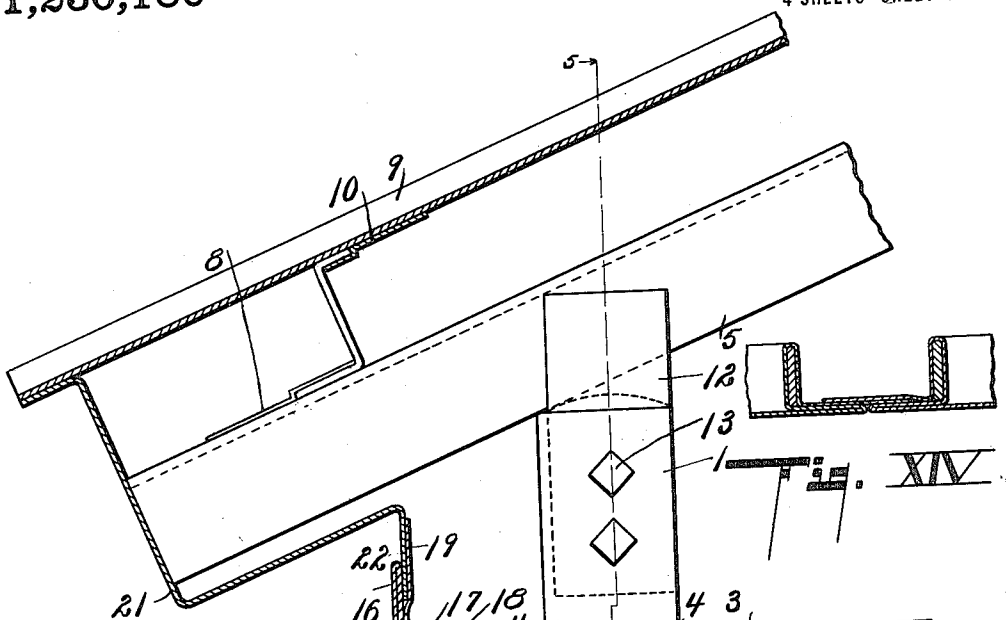


Fig. XIV.

Fig. IV.

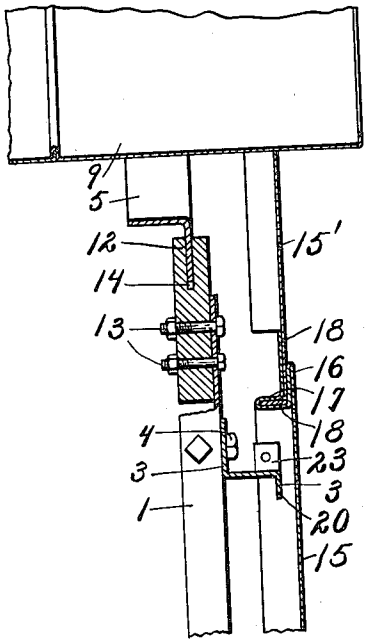


Fig. V.

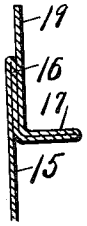


Fig. XII.

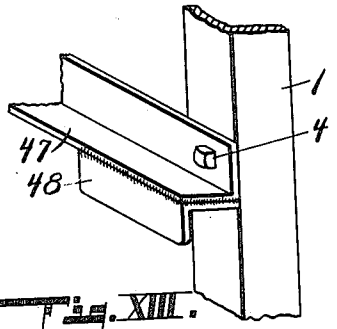


Fig. XIII.

Witnesses

L. G. Greenfield

M. L. Glasgow

Inventor

Howard M. Leonard

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Attorneys

UNITED STATES PATENT OFFICE.

HOWARD M. LEONARD, OF JACKSON, MICHIGAN, ASSIGNOR TO RUBY MANUFACTURING COMPANY, OF JACKSON, MICHIGAN.

PORTABLE HOUSE.

1,230,180. Specification of Letters Patent. Patented June 19, 1917.

Application filed February 26, 1912. Serial No. 680,104.

To all whom it may concern:

Be it known that I, HOWARD M. LEONARD, citizen of the United States, residing at Jackson, Jackson county, Michigan, have invented certain new and useful Improvements in Portable Houses, of which the following is a specification.

This invention relates to improvements in portable houses.

The objects of the invention are:

First, to provide an improved construction of portable house, in which the side walls are made of identical, or substantially identical interchangeable, detachable sheet metal sections, and the roof is made up of substantially identical interchangeable roof sections.

Second, to provide an improved construction of framework for supporting such detachable wall sections and roof section.

Third, to provide an improved construction of wall section or plate.

Fourth, to provide improved construction of joints, whereby the various parts are readily detachable, so that the house can be knocked down and be made readily portable, and, at the same time, be capable of convenient reassembling.

Objects relating to economies and details will definitely appear from the detailed description to follow.

A structure embodying a preferred form of my invention is fully described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure showing a preferred embodiment of my invention is fully illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure I is a perspective view of a portable house, that is of knock-down construction, embodying the features of my invention.

Fig. II is a detail perspective view of the frame work of the house.

Fig. III is an enlarged detail elevation view of a part of the upper portion of the roof.

Fig. IV is an enlarged detail view showing the construction and joints of the stringers, posts, rafters and other parts, partially in section, taken on a line corresponding to line 4—4 of Fig. I.

Fig. V is a vertical detail sectional view taken on a line corresponding to 5—5 of Fig. IV.

Fig. VI is an enlarged detail view of the roof peak structure from the gable end.

Fig. VII is an enlarged detail horizontal sectional view through a corner of the building, taken on a line corresponding to line 7—7 of Fig. I.

Fig. VIII is a detail sectional view taken on a line corresponding to line 8—8 of Fig. VII, showing details of construction as to the method of securing the interchangeable wall plates in place.

Fig. IX is an enlarged detail vertical sectional view, in broken section, through the door structure taken on a line corresponding to line 9—9 of Fig. I.

Fig. X is an enlarged detail sectional view in broken section through a window structure taken on a line corresponding to line 10—10 of Fig. I.

Fig. XI is an enlarged detail view of the metallic sash structure, being on the same section line as that of Fig. X.

Fig. XII shows a detail of construction of one of the interchangeable metal plates in which the bar metal frame is omitted.

Fig. XIII is an enlarged detail perspective view of a modification of the means for securing the interchangeable plates in position on the stringers.

Fig. XIV is an enlarged detail sectional view on line corresponding to line 14—14 of Fig. I, showing the joint between the interchangeable wall section.

In the drawings, the sectional views are taken looking in the direction of the little arrows at the ends of the section lines, and similar numerals of reference refer to similar parts throughout the several views.

Considering the numbered parts of the drawing, the posts 1—1 of angle bar are supported on suitable base blocks or wall 2—2. These posts are connected together near the top and bottom by angle bar stringers 3 of Z-shape in cross section, one limb of which projects outwardly and is vertically disposed, and contains slots or notches 3′ at suitable intervals, to coöperate with the slotted back ribs of the wall sections, for the purpose hereinafter explained. The said stringers are secured to the posts preferably by bolts 4.

To the upper ends of the side posts the rafter bars 5, preferably of angle bars, are

secured, the vertical limb of the bars being notched and the horizontal limb being folded, as indicated in Fig. VI to form the peak. The details of the support for the rafters will be hereinafter pointed out.

Collar beams 6 of angle bars or straight flat bars are provided and are supported at the center by the center posts, which are bolted or otherwise secured thereto.

Purlin plates 7 connect the series of rafters together, the same being detachably supported in position by engaging underneath the hooked clips 8—8 on the upper sides of the rafters, which hooks point toward the peak. The purlin plates 7 are of Z-shaped angle bar. Roof sections 9 are each provided with hook shaped cleats 10 on the under side, which engage the upwardly projecting flanges of the Z-shaped purlin plates 7, and are as a consequence very readily detachable therefrom and are effectively retained in place by the action of gravity.

A sheet metal ridge cap 11 couples the upper edges of the roof sections together. The sheet metal cap 11 is folded upon itself to form engaging flanges 11′—11′ at each side. By this means it will be noted that the roof sections are very readily detachable, and can be stored or packed in very compact form.

The rafters are each secured to the upper ends of the posts 1 at the corners and also at intermediate points along the side by a cast metal block 12, having a vertical groove 14 to receive the vertical limb of the angle bar constituting the rafter. The blocks are secured to the upper ends of the posts 1 by bolts 13. See Fig. V.

Wall sections 15 are of sheet metal. Each section is folded upon itself at the edge to form the doubled folded edge 16, and is then folded inwardly at right angles and upon itself at 17, forming a double loop, within which is preferably embraced a metal bar 18 for strengthening the same. The single thickness of sheet is then extended outwardly in a plane parallel with the face of the wall section, into a thin tongue 19, which is separated slightly from the folded edge 16 to form a groove to receive the tongue of a corresponding wall plate. These sections thus effectively intermesh the one with the other, the tongues overlapping and extending into grooves, thereby forming tight joint between the wall sections.

Through the back ribs thus formed by the folding of the metal around the bar 18, L-shaped notches 20 (see Fig. X) are cut at the right height to receive the projecting portion and vertical limb of the Z-shaped stringer bars at the top and bottom, the same distinctly appearing in Fig. IV and the notches for receiving the said bars distinctly appearing in Figs. IX and X. The interchangeable wall sections are thus very readily put in place, because the notches 3′ in the vertical limbs of the Z-shaped stringer bars permit them readily to be inserted and moved to position.

When they are in position, a sheet metal cornice finishing piece 21 is inserted into the upper groove, the same being conformed around the ends of the rafters and turned to a vertical flange 22 for that purpose. This cornice 21 can be formed in sections of the length of the width of the roof sections, or can be made continuous for the length of the building required. Any suitable fastener can be made use of to secure it detachably to the eaves of the roof section, where it is of the length of the width of the section it can be very satisfactorily soldered in place.

When the interchangeable wall sections have been put in place, they are effectively secured and adjusted by means of the right angle clip pieces 23 projecting upwardly therefrom, secured to the horizontal portions of the stringers by rivets 23′ (see Figs. VII and VIII). Through the vertical portions of the clips 23 bolts 24 are disposed, the same being inserted through perforations in the back ribs 17 and being provided with screw nuts whereby, by tightening the nuts on said bolts, the wall sections can be securely drawn together and the tongues and grooves are crowded the one into the other, making a perfectly light, tight and storm-proof joint between these wall sections.

The gable 15′ is a flat sheet of metal inserted in the top groove of the end walls and suitably secured to the rafters above.

The sheet metal corners 26 are folded upon themselves to form tongues and grooves 27 at each edge for intermeshing with the tongues and grooves at the edges of the wall sections at the corners. These corners are preferably curved as seen in Fig. VII, and cross bars 28 extend diagonally across the corners at intervals, being soldered or riveted thereto, as the case may be. Corner blocks 31 are disposed in the angle of the corner posts, and bolts 29 with screw nuts 30 on the inner ends secure these corners by said cross bars effectively in position, it being only possible to remove the same from the inside of the house, so that it will be seen that when the structure is completed in this way, it is very effective, being impossible to gain entrance except regularly through the door, unless the structure itself be destroyed.

To make this house completely portable and effective, the doors are made within the area of the interchangeable wall section and so that the door sections can be shifted from place to place and the door located wherever

it may be desired in the house, in the side of the house or in the end for that matter. The details of this door construction appear fully in Fig. IX.

The door 32 is similar in construction to one of the wall sections, being provided with inwardly projecting ribs 34 and having a flange 33 extending around the same, being a continuation of the sheets constituting the door. An angle bar frame 35 extends around the opening in the wall section and constitutes the door frame. A strip of sheet metal is turned outwardly into a flange 36, forming a cap over the door.

The window construction, for entire portability, is preferably constructed in one of the wall sections. The window frame 37 (see Figs. X and XI) is extended into a double flange 38 which is riveted to the wall plate 15 by rivets 39, an aperture having been cut in the wall section for that purpose. A seat 40 is made for the panes of glass 41, a retaining flange 42 is provided and engages projection 43 to retain the glass 41 in place. Sash munions 44 are of metal and flanges 45 are provided for clamping the parting ribs 46 to retain the glass securely in place. These parts are not fully described in all details as they do not in detail pertain to my invention but show a good construction for supporting the windows in the interchangeable wall sections.

In Fig. XII, as I have already mentioned, I show a modified form of the interchangeable wall section in which the reinforcing frame strip or bar 18 is omitted from the rib 17. In Fig. XIII, I show a modified form of the stringer 3, there numbered 47, the same being an angle bar of right angle cross section having a downwardly-projecting flange 48 secured thereto by brazing or welding, as clearly appears from an inspection of said Fig. XIII. Other modifications no doubt will readily suggest themselves as to various details of my improved construction.

The notches 3′ might be dispensed with and the wall sections slid onto the ends of the stringers. However, the notches are of considerable advantage as they avoid the sliding of the sections to any great extent. The Z-bars for retaining the wall sections are not of my invention, appearing in a patent application concurrent herewith by Fred W. Ruby, and are claimed by Mr. Fred W. Ruby. The stringers can be of any desired form, with the interchangeable sections that I have produced, although I find these particular means especially effective in house construction, as they enable the complete closing of the joints and making a perfectly tight construction, which is storm proof. I prefer the particular method that I make use of for clamping the parts together, as it does not require that any parts be specially constructed for the purpose, stack bolts 24 serving the purpose fully and stack material is made use of.

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

1. In a portable house, the combination of suitable corner posts; stringers of angle iron detachably secured thereto with a vertical portion of the iron outwardly disposed; interchangeable wall sections of sheet metal with ribs on the backs thereof formed of folds of said metal embracing reinforce bars, with slots conformed to the vertical projecting portions of the said stringers adapted to be disposed thereon, said wall sections being provided with interlocking tongues and grooves formed by the folds of sheet metal at their meeting edges; and means for securing said wall sections on said stringers.

2. In a portable house, the combination of suitable corner posts; stringers of angle iron, detachably secured thereto with a vertical portion of the iron outwardly disposed; wall sections of sheet metal with ribs on the backs thereof embracing reinforce bars, with slots conformed to the vertical projecting portions of the said stringers adapted to be disposed thereon, said wall sections being provided with interlocking tongues and grooves at their meeting edges; and rafters of angle bar, detachably secured to the upper ends of said posts, substantially as described.

3. In a portable house, the combination of suitable corner posts; stringers of angle iron, detachably secured thereto with a vertical portion of the iron outwardly disposed; wall sections of sheet metal with ribs on the backs thereof embracing reinforce bars, with slots conformed to the vertical projecting portions of the said stringers adapted to be disposed thereon, said wall sections being provided with interlocking tongues and grooves at their meeting edges; rafters of angle bar, detachably secured to the upper ends of said posts; and sheet metal cornice secured to said rafters and conformed to engage the grooves on the upper ends of said wall sections, substantially as specified.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

HOWARD M. LEONARD. [L. S.]

Witnesses:
VERNE W. BADGLEY,
MABEL ALLINGTON.