April 19, 1955 A. M. RADMAN 2,706,313

PRE-FABRICATED HOUSES

Filed March 6, 1950 3 Sheets-Sheet 1

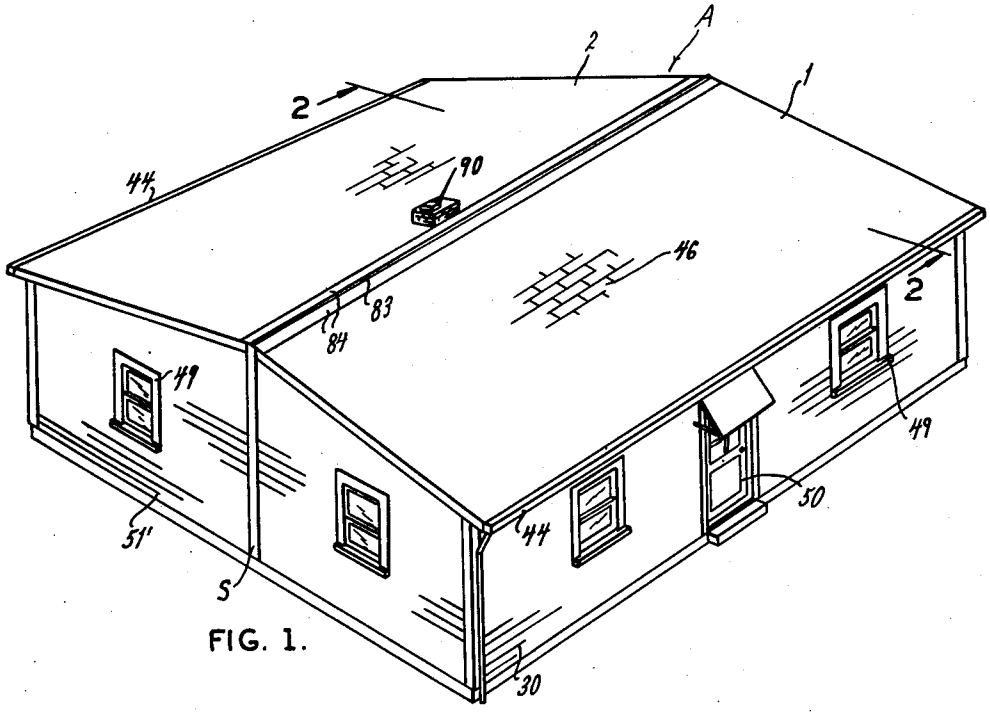


FIG. 1.

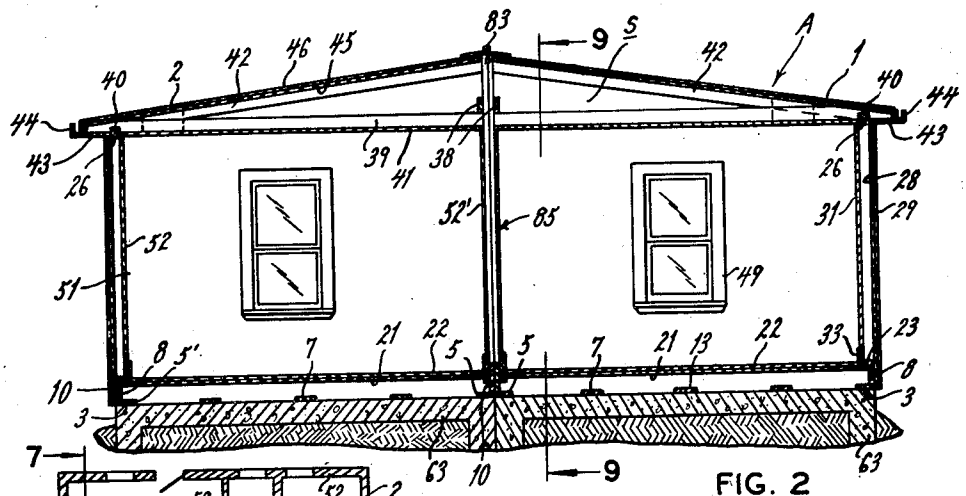


FIG. 2

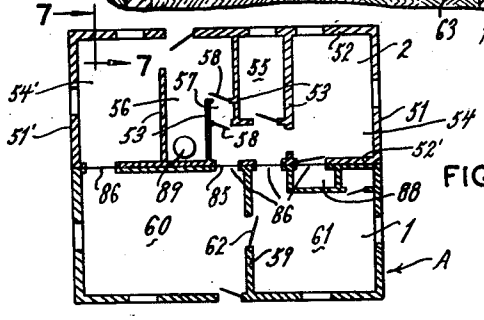


FIG. 3.

INVENTOR
ABRAHAM M. RADMAN
BY Alfred W. Peterkoff
ATTORNEY

April 19, 1955 A. M. RADMAN 2,706,313

PRE-FABRICATED HOUSES

Filed March 6, 1950 3 Sheets-Sheet 2

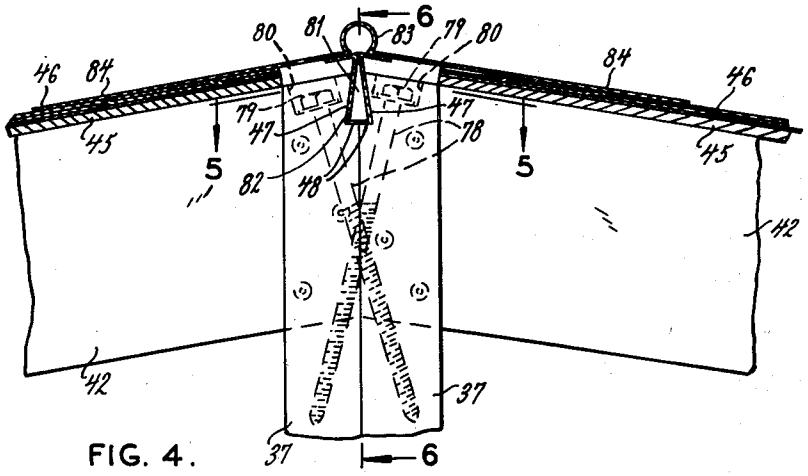


FIG. 4.

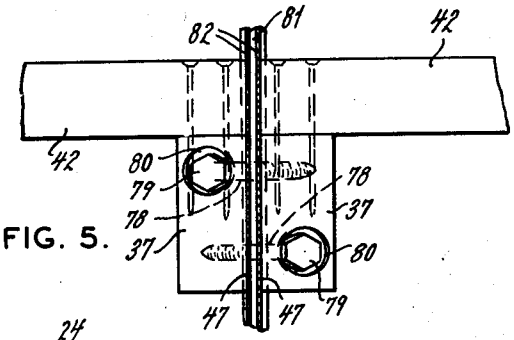


FIG. 5.

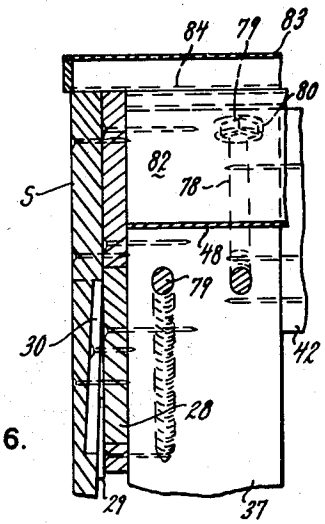


FIG. 6.

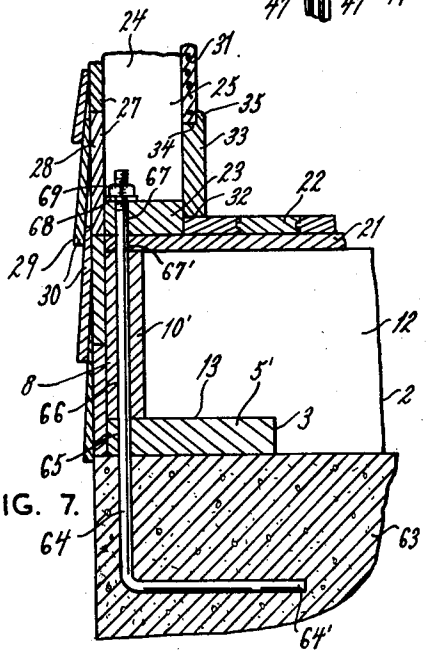


FIG. 7.

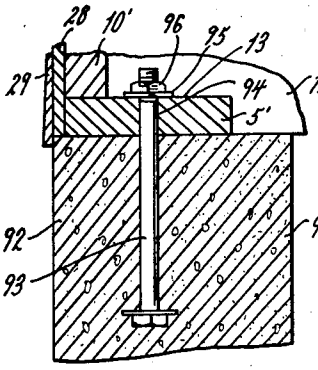


FIG. 8.

INVENTOR

ABRAHAM M. RADMAN

BY Alfred Weissbart

ATTORNEY

April 19, 1955 A. M. RADMAN 2,706,313

PRE-FABRICATED HOUSES

Filed March 6, 1950 3 Sheets-Sheet 3

FIG. 10.

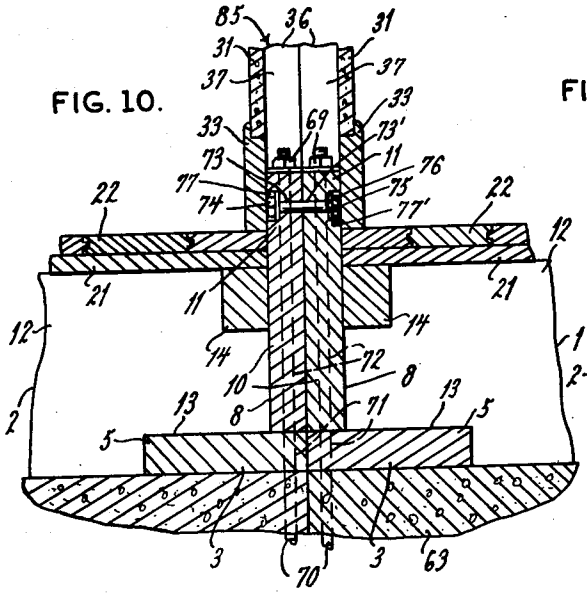


FIG. 13.

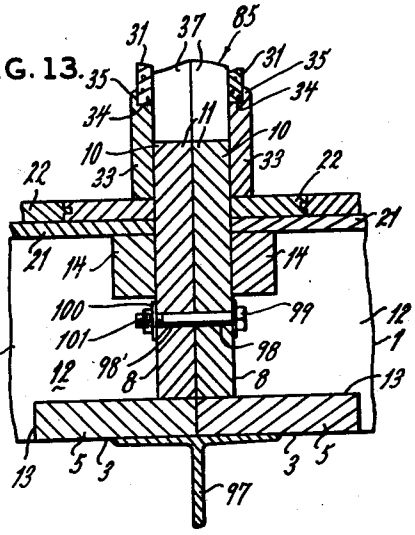


FIG. 9.

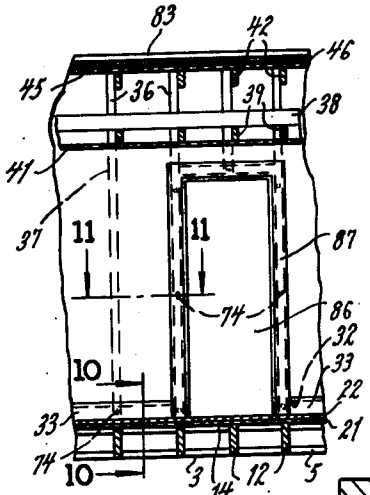
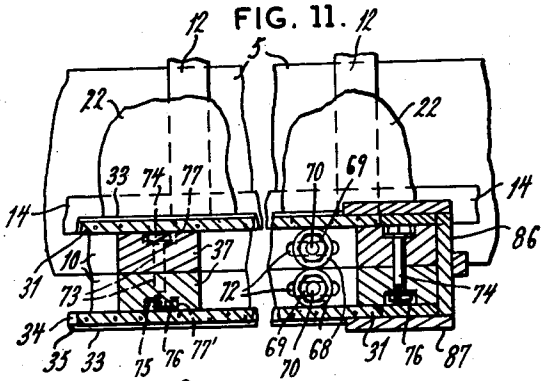


FIG. 11.



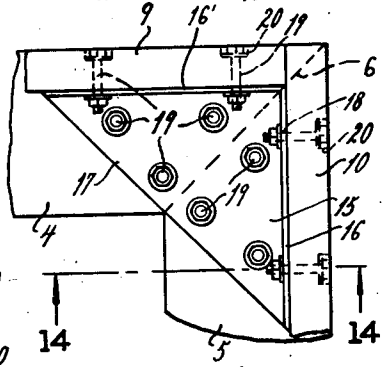


FIG. 12.

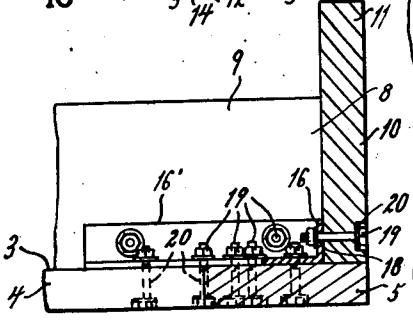


FIG. 14.

INVENTOR

ABRAHAM M. RADMAN

BY alfred w. Letscher

ATTORNEY

United States Patent Office 2,706,313 Patented Apr. 19, 1955

2,706,313

PRE-FABRICATED HOUSES

Abraham M. Radman, University City, Mo.

Application March 6, 1950, Serial No. 147,966

2 Claims. (Cl. 20—2)

This invention relates in general to houses and, more particularly, to certain new and useful improvements in the construction of pre-fabricated houses.

The primary object of this invention is to provide a pre-fabricated house comprised of a plurality of independently constructed sections of compact, transportable size, which may, if desired, be used individually as self-sufficient dwelling units or may be joined to form an enlarged, more commodious residence.

It is a further object of the present invention to provide a pre-fabricated house comprised of a plurality of independently constructed sections which may be joined together in a unique simple manner without requiring the services of skilled, high cost labor.

It is an additional object of the present invention to provide a pre-fabricated house which is adapted to be installed with equal facility upon ground-level foundations or over basement-forming foundation-walls.

It is a further object of the present invention to provide a pre-fabricated house which is economical in fabrication and installation, and which may be readily adapted to provide a variety of interior arrangements.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings (three sheets)—

Figure 1 is a perspective view of a pre-fabricated house constructed in accordance with and embodying the present invention;

Figure 2 is a transverse sectional view taken along line 2—2 of Figure 1;

Figure 3 is a plan view showing interior arrangement;

Figure 4 is a fragmentary, enlarged sectional view illustrating connecting means between the upper portions of the sections;

Figures 5 and 6 are transverse sectional views taken along lines 5—5 and 6—6 of Figure 4, respectively;

Figure 7 is a transverse sectional view taken along line 7—7 of Figure 3;

Figure 8 is a fragmentary sectional view showing means of installation upon an excavated foundation;

Figure 9 is a transverse sectional view taken along line 9—9 of Figure 2;

Figures 10 and 11 are transverse sectional views taken along lines 10—10 and 11—11 respectively, of Figure 9;

Figure 12 is a fragmentary top plan view of the sill corner brace;

Figure 13 is a fragmentary sectional view showing means of connecting the lower portions of sections when installed upon an excavated foundation; and

Figure 14 is a transverse sectional view taken along line 14—14 of Figure 12.

Referring now in more detail and by reference characters to the drawings, which illustrate a preferred embodiment of the present invention, A designates a house of the pre-fabricated type comprising two substantially equal-sized and generally rectangular sections 1, 2, which may be respectively considered normally front and normally rear sections. As will be shown more fully hereinafter, said sections 1, 2, are independently constructed whereby the user has the option of utilizing either singly, as a dwelling, or both in combination to provide maximum living space. In this connection, it is particularly important to note that by virtue of the present invention it is possible to subdivide pre-fabricated houses into

a plurality of readily combinable units, any one of which is a self-sufficient structure, and thus keeps the size of such units within permissible dimensional limit so that the units may be shipped by highway, truck-trailer or by any similar transportation means.

Since the sections 1, 2, are substantially identical in basic construction, the construction of section 2 will be described for purposes of illustration. In its bottom portion, the section 2 is provided with a rectangular frame plate 3 having transverse or end members 4 and longitudinally extending members 5, 5', which are beveled at their ends to form miter joints, as at 6. In parallel relation to the members 5, 5', is a plurality of longitudinal supports 7 suitably affixed at their ends to the end members 4. Mounted upstandingly upon the plate 3 is a rectangular frame 8 of box-sill construction having spaced end sections 9 and longitudinal sections 10, 10', which are preferably of 2" x 8" stock except the longitudinal section 10 which is preferably 2" x 12" in order to provide a portion 11 which projects upwardly beyond the upper faces of the other sections 9, 10'. Extending transversely across the frame 8 in parallel relation to the end sections 9 is a plurality of spaced joists 12 secured at their ends, as by nailing, to the sections 10, 10'. On their downwardly presented faces, the joists 12 are spacedly recessed, as at 13, to permit snug interfitting engagement with the members 5, 5', and the supports 7 of the plate 3. The upper margins of the joists 12 are spaced downwardly a short distance from the upper surfaces of the sections 9, 10'. Nailed to the inwardly presented faces of the longitudinal sections 10, 10', of the frame 8 between, and with their end faces abutting against the joists 12 are wooden blocks 14 having their upwardly presented surfaces in planar alignment with the upper faces of the joists 12. At, and inwardly of, each corner of the frame 8 there is disposed a corner brace 15, fabricated preferably of cast iron, having upstanding walls 16, 16', adapted for supporting disposition against the adjacent sections of the frame 8, and being further integrally provided with a triangular base web 17 seatingly positioned upon the adjacent portion of the upper face of the place 3. The web 17 and walls 16, 16', of the brace 15 are provided with a plurality of apertures 18 aligned with suitable apertures in the place 3 and frame 8 for receiving retaining bolts 19, the heads of which are disposed in countersinks 20 drilled in the outer faces of the sections of the frame 8.

Secured, as by nailing, upon the upper surfaces of the end sections 9 and longitudinal section 10' of the frame 8 and the blocks 14 is a sub-flooring 21 of preferably 1" x 12" rough lumber disposed obliquely in the conventional manner. It is to be particularly noted that the sub-flooring 21 is equivalent in thickness to the distance between the upper surfaces of the joists 12 and the sections 9, 10', of the frame 8 whereby its upper face will be in planar alignment with the upper surfaces of the said sections 9, 10', as may be seen in Figure 7. Referring to Figure 10, it will be noted that the sub-flooring 21 abuts at one of its side margins against the projecting portion 11 of the section 10. Suitably secured upon the sub-flooring 21 is a finished flooring 22 fabricated of preferably 2" x 8" stock of tongue and groove construction for close interfitting engagement. On its inner longitudinal margin the flooring 22 abuts against the projecting portion 11 of the section 10 of the frame 8 and on its outer longitudinal and end margins abuts against lower horizontal studs 23 of frame studdings 24 upstandingly mounted upon the sub-flooring 21 and spaced inwardly from the outer faces of the adjacent sections 9, 10', of the frame 8 a distance substantially equivalent to the thickness of said sections (see Figure 7). The studdings 24 are each provided with a plurality of spaced scantlings or uprights 25 having secured upon their upper end faces upper horizontal studs 26. Nailed to the outwardly presented faces of the horizontal studs 23, 26, and the scantlings 25 of the studdings 24, are boards 27 forming a sub-walling 28 to the outer face of which and to that of the frame sections 9, 10', is secured a finished outer walling 29, preferably comprised of shingles 30. To the inwardly

presented faces of the scantlings 25 and the upper horizontal stud 26 is secured an inner wall 31 of suitable wall board stock, the lower margin of which terminates spaced upward from the flooring 22 to provide an opening 32 through which access is provided to the area between the walls 31 and the sub-walling 28 for purposes more fully appearing hereinafter. Jam fitted in said opening 32 for facile removal is a sectioned base board 33 having an undercut 34 extending downwardly from its upper surface to provide a lip 35 which obscures the line of abutment between said wall 31 and base board 33.

Mounted on the upper face of the projecting portion 11 of the section 10 is a frame studding 36 comprised of a plurality of spaced, parallel scantlings or uprights 37 secured at their lower ends, as by toe-nailing, upon the section 10 and having secured to their inwardly presented faces in downwardly spaced relation to their upper ends, a longitudinally extending stud 38. The scantlings 37 are of substantially greater height than the scantlings 25 of the studdings 24 and hence project upwardly beyond the upper ends thereof. Nailed at one of their ends to one side face of each of said scantlings 37 are transversely extending beams 39, the upper face of which abuts against the underface of the stud 38 (see Figures 2 and 9). At their opposite ends, the beams 39 are recessed, as at 40, for snug interfitting engagement with the stud 26 of the opposed studding 24 (see Figure 2). Supported by the underface of the beams 39 is a ceiling 41 fabricated of any conventional ceiling material. Secured to the inwardly presented faces of the scantlings 37 between the ceiling 41 and the floor 22, in the same manner as to the scantlings 26, is walling 31 and base boards 33. If the section 1 or 2, as the case may be, is to be utilized singly by the occupant, the sub-walling 28 and outer walling 29 are mounted upon the outer faces of the scantlings 37 and the frame sections 10, as shown hereinabove with reference to the studdings 24.

The upper end faces of the scantlings 37 are inclined downwardly and inwardly at any desired angle or slope and are in planar alignment with the upper faces of rafters 42, which are secured at one of their ends, as by nailing or bolting to the side faces of said scantlings 37, and are attached adjacent their other ends to the upper horizontal stud 26 of the opposed frame 24. The outer ends of said rafters project beyond said stud 26 to provide an eave 43 and have mounted on their end faces an eave trough 44. Nailed to the upper faces of the rafters 42 are roof boards 45 upon the upper surfaces of which are mounted weatherproofing 46, such as asphalt shingles and the like. The extension of the scantlings 37 upwardly beyond the ceiling 41 permits the provision of an insulating space *s* between said ceiling 41 and the roof boards 45.

Adjacent their upper ends, upon their outwardly presented faces, the scantlings 37 are each provided with a downwardly and inwardly inclined recess or notch 47 having a bottom face 48 disposed in a plane normal to the longitudinal axis of the scantlings 37 for purposes to be discussed presently.

It is, of course apparent that window and door frames 49, 50, respectively may be conventionally mounted in the studdings 24 and 36, in any preferred arrangement, such as shown in Figure 1.

As thus constructed, the section 2 presents end walls 51, 51', and side walls 52, 52', said wall 52' being the designation of the wall formed upon the scantlings 37 of the studding 36. Interiorly, said section 2 is provided with four spaced wall partitions 53 in parallel relation to the end walls 51, 51', each of which terminates spacedly from one side wall 52, 52', or the other for dividing the interior into end rooms 54, 54', a bathroom 55, a kitchen 56, with a closet 57 disposed between said bathrooms 55 and kitchen 56 and being provided with opposed doors 58, 58', to permit the occupant continuous passage throughout said interior. It will be seen that if the occupant utilized only section 2 as a dwelling the end rooms 54, 54', could be respectively used as a bedroom and living room, dining room combination, thus making said section 2 a self-sufficient unit. The other section, in this instance denoted by the numeral 1, is interiorly divided by a single transversely extending wall partition 59 into two relatively large rooms 60, 61 with access therebetween provided by a door 62 in the partition 59. Thus, said section 1 is not in itself a complete dwelling unit, but is designed solely for annexation in a manner hereinafter shown, to the section 2 to provide enlarged and commodious living space. In this combined form the room 60 of section 1 may be utilized as a drawing or living room, thereby permitting the room 54' of section 2 to serve as a dining room, with the room 61 to be used as a bedroom.

The sections 1, 2, are of such dimensions that they may be easily transported by a truck trailer to the selected site of installation. It should furthermore be noted that the unique construction is adapted to enable the sections 1, 2, to be hauled, pushed, lifted, and otherwise roughly handled without coming apart or shifting out of true shape, and in addition to this, the sections 1, 2, are built up from a minimum number of different components so as to be readily adaptable to assembly-line construction methods.

At the site of installation, the owner or purchaser must provide a concrete or masonry foundation 63, provided adjacent its periphery with a plurality of spaced anchor bolts 64, the upper threaded ends of which project beyond the upper face of said foundation 63. Said anchor bolts 64 are preferably bent at their lower ends to provide transverse sections 64' normal to the vertical axis of the bolts 64, which augments the embedment of the bolts 64 within the foundation 63 (see Figure 7). The bolts 64, adjacent the peripheral portions of the foundation 63 related to the end wall 51, 51', and side wall 52 of the sections 1, 2, extend through aligned apertures 65, 66, 67, 67', provided in the plate 3, frame 8, lower horizontal studs 23, and sub-flooring 21, respectively, having their upper threaded ends projecting beyond the upper face of the studs 23. Engaged therein is a washer 68 and nut 69 (see Figure 8) for firmly securing the sections 1, 2, to the foundation 63. As shown above, the removable character of the baseboards 33 permits ready access for engaging the washer 68 and nut 69 upon the bolt 64, upon the completion of which operation the baseboards 33 are returned to their position within the opening 32 whereby the bolts 64 are totally obscured from view. Provided along the periphery of the foundation 63 relative to the wall 52' of the sections 1, 2, are bolts 70, similar in all respects to the bolts 64 but slightly longer, which extend upwardly through aligned apertures 71, 72, drilled in the plate 3 and the section 10 of the frame 8 respectively, (see Figure 10), said apertures 72 being somewhat elongated, (see Figure 11), as are the apertures 67 in the studs 23, to permit limited shifting of the sections 1, 2, upon the foundation 63, as caused by severe weather conditions. Engaged upon the threaded ends of said bolts 70 are washers 68 and nuts 69 in the same manner as with the bolts 64.

As thus described, the sections 1, 2, may be individually installed upon the foundation 63 in a relatively simple, yet secure manner, without requiring the high priced services of skilled artisans. The engagement of the washers 68 and nuts 69 upon the bolts 64, 70, is the only step involved, and obviously may be effected by unskilled labor.

In the event the occupant of an installed section 2, desires to annex the other section thereto, designated 1 in this instance, the procedure therefor is as follows: The sub-walling 28 and outer walling 29 are removed from the scantlings 37 of the frame studding 36 of each of the sections 1, 2. Section 1 is installed upon its portion of the foundation 63, in the manner above set forth, with its exposed studding 36 presented in abutment against the exposed studding 36 of the section 2, whereby the scantlings 37 and frame sections 10 of each sections 1, 2, are in respective surface engagement throughout their lengths (see Figure 2).

The baseboards 33, provided in the walls 52' of each section 1, 2, are then removed, and a series of aligned apertures 73, 73', are spacedly drilled through the projecting portions 11 of the abutting sections 10 for receiving retaining bolts 74, each of which has engaged upon its threaded end a washer 75 and a nut 76, for maintaining said sections 10 in tight surface engagement. The heads of each bolt 74 and the washers 75 and nuts 76 on the opposite ends thereof, are disposed within countersinks 77, 77', provided in the outer ends of the apertures 73, 73', respectively.

The portions of the roof boards 45 and weather-proofing 46 mounted upon the upper ends of the scantlings 37 are removed, and drilled in the upper end of each scantling 37, is a downwardly extending bore 78 having its axis inclined outwardly and, which projects into, and terminates

in, the adjacent abutting scantling **37**, whereby the axis of the bores **78** of each pair of abutting scantlings **37** will be disposed in angular relation to each other (see Figure 4). It will be seen with reference to Figures 4, 5 and 6, that the bores **78** are in lateral alignment to avoid interference between bolts **79** engaged therein. The heads of said bolts **79** are disposed within countersinks **80** counterbored in the upper ends of the bores **78**. Thus, the bolts **79** provide equal opposed forces which serve to hold each pair of scantlings **37** securely together.

With the described securement of the sections **1, 2** together, the recesses **47** of the abutting pairs of scantlings **37** combine to present a series of aligned, generally triangular shaped apertures **81** into and through which is fitted the lower central portion of a longitudinally extending flashing **82**, fabricated of suitable sheet stock, and being bent to conform to the peripheral contour of the apertures **81**. The upper portion of the flashing **82** is spaced upwardly from the upper end faces of the scantling **37** and suitably secured to the underface of a metallic ridge member **83** having laterally extending portions **84** which are overlappingly disposed on the adjacent section of the weatherproofing **46**. The flashing **82**, and ridge members **84** thereby form a weathertight joint adjacent the upper ends of the abutting scantlings **37** throughout the length of the house A. On the exterior faces of each end of the pairs of scantlings **37**, there is suitably secured a metallic strip member S for weatherproofing, as well as decorative purposes.

As thus rigidly fastened together, the studdings **36** of each section **1, 2**, form a central, common wall **85**, into which may be conventionally provided openings **86** for receiving door frames **87**, as may be seen in Figures 9 and 11. The interior floor plan of the house A, illustrated in Figure 3, shows four such door openings **86** provided in the common wall **85** to allow convenient access between the various rooms. To provide storage space, there may be suitably constructed in the room **61**, a closet **88**, communicating with the room **54** through one of the door openings **86** (see Figure 3).

Finally, a heating unit **89** may be installed in the kitchen **56**, having a stack **90** which is led outwardly through a suitable opening in the roof of the section **2** (see Figures 2 and 3). The house A as thus comprised of the sections **1** and **2** is most spacious and comfortable, as well as being easily assembled and economically made.

If desired, the sections **1, 2**, may be installed upon an excavated foundation **91**, the walls **92** of which, are preferably of cement. Embedded in said walls **92** are straight-shanked bolts **93** the threaded ends of which project upwardly beyond the upper surfaces of said walls **92** for extension through apertures **94** drilled in the members **4, 5, 5'**, of the plate **3**. Engaged upon the threaded ends of said bolts **94** are washers **95** and nuts **96** (see Figure 8). It will thus be seen that the sections **1, 2**, are as simply and easily installed upon excavated foundations as upon non-excavated foundations.

When the sections **1, 2**, are to be installed at the same time, as distinguished from subsequent annexation of one of said sections **1, 2**, to the other, the excavated foundation **91** may be provided in a conventional manner with beams **97**, such as T-beams for giving under support to the sections **1, 2**. In order to maintain said sections **1, 2**, securely together along their bottom portion, a series of aligned apertures **98, 98'**, may be drilled in the abutting sections **10, 10'**, of the frame **8**, beneath the blocks **14** for receiving bolts **99** each having a washer **100** and nut **101** engaged on its threaded end (see Figure 13).

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the pre-fabricated house may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

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

1. A pre-fabricated house comprising first and second independently constructed sections, each of said sections having a frame, said frames having vertical members and being disposed in abutting relationship with the vertical members of one in surface engagement with the vertical members of the other, said vertical members being each provided adjacent their upper end with aligned matching recesses having inwardly and downwardly inclined side walls whereby to form a horizontal slot which is open at the top and is wider at the bottom than it is at the top, the slots formed by the several pairs of vertical members being horizontally aligned with each other, and an elongated member extending longitudinally through the aligned slots and being cross-sectionally contoured to fit snugly and retentively against the inner faces defining said slot, said member further having a top element extending across the top of the slot and forming a weathertight joint, and means for maintaining said frames rigidly together.

2. A pre-fabricated house comprising first and second independently constructed sections, each of said sections having a frame, said frames including vertical members having outwardly presented vertical faces and being disposed with the outer faces of the vertical members of one section in surface abutting engagement with the outer faces of the vertical members of the other section, each of said vertical members being provided in its upper end with an angularly downwardly directed recess opening into a bore-hole which extends angularly downwardly and outwardly toward the outer face of said vertical member, a pilot-bore in each vertical member, said pilot-bore being aligned with and serving as a longitudinal continuation of the bore-hole in the companion vertical member, bolts extending angularly through the recesses and bore-holes of each pair of abutting vertical members and being retentively secured in the associated pilot-bores, thereby securing said frames rigidly together, each of said vertical members being furthermore provided adjacent its upper end with an inwardly and downwardly inclined notch adapted, when said vertical members are in abutting relation, to form a horizontal slot which is open at the top and is wider at the bottom than it is at the top, the slots formed by the several pairs of vertical members being horizontally aligned with each other, and an elongated member extending longitudinally through the aligned slots and having downwardly and outwardly flaring resilient flanges for snap-wise retentive disposition within said slots, said elongated member being provided at its upper end above the open top end of said slots with outwardly and downwardly flaring plate-like elements adapted to extend over the upper portions of the roof in the manner of flashing, thereby forming a weather-tight joint thereover.

References Cited in the file of this patent

UNITED STATES PATENTS

1,936,234	Hansen	Nov. 21, 1933
2,115,615	Brunner	Apr. 26, 1938
2,144,700	Barnett	Jan. 24, 1939
2,154,142	Whelan	Apr. 11, 1939
2,287,229	Carpenter	June 23, 1942
2,358,704	Goudy	Sept. 19, 1944
2,362,187	Brunton et al.	Nov. 7, 1944
2,363,259	Penton	Nov. 21, 1944
2,394,147	Brunton et al.	Feb. 5, 1946
2,412,242	Beaud	Dec. 10, 1946
2,453,326	Lambert	Nov. 9, 1948

FOREIGN PATENTS

865,513	France	Feb. 24, 1941

OTHER REFERENCES

American Builder, February 1939, pages 76, 77.
Sheet Metal Worker, December 1945, page 74.