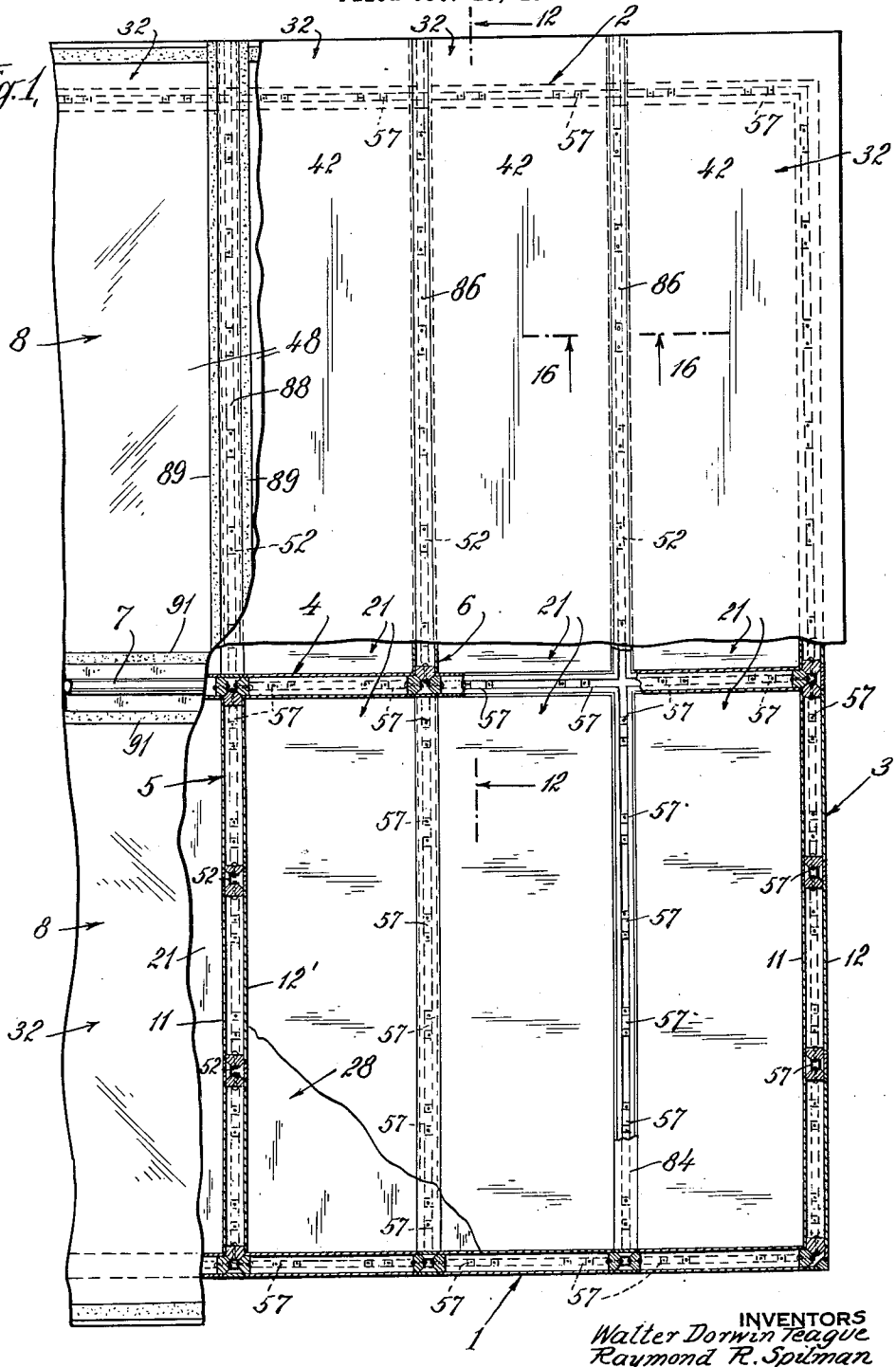
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BUILDING CONSTRUCTION.

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Fig. 1.



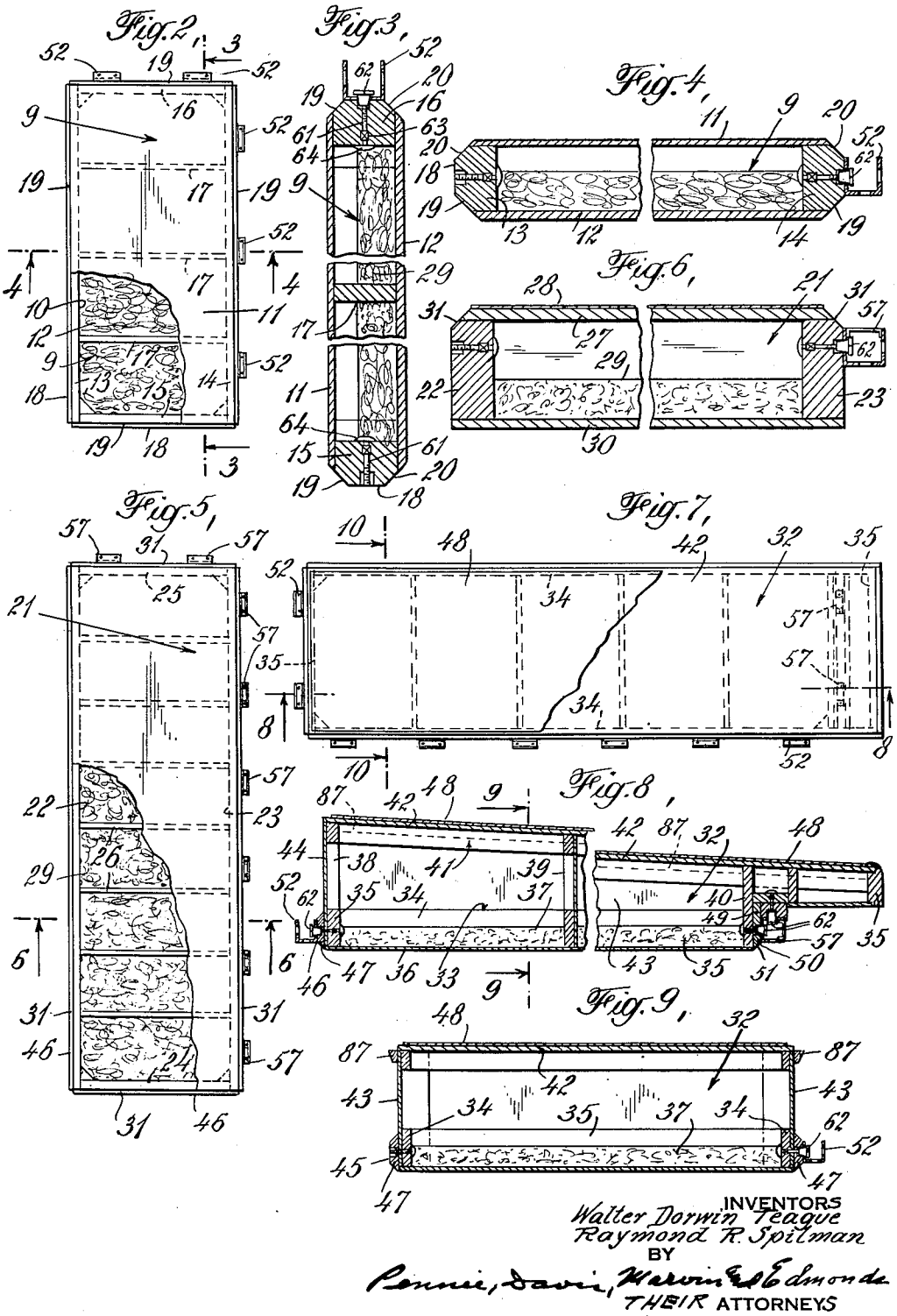
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Fig. 10

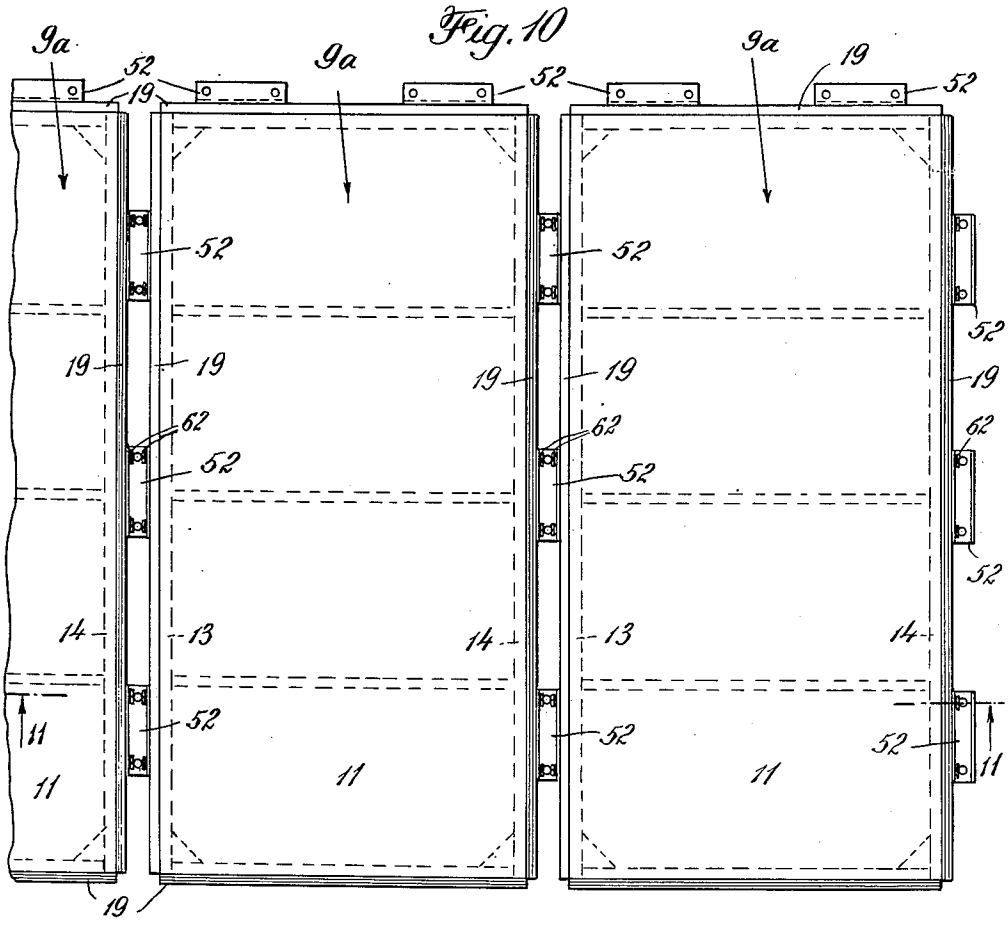
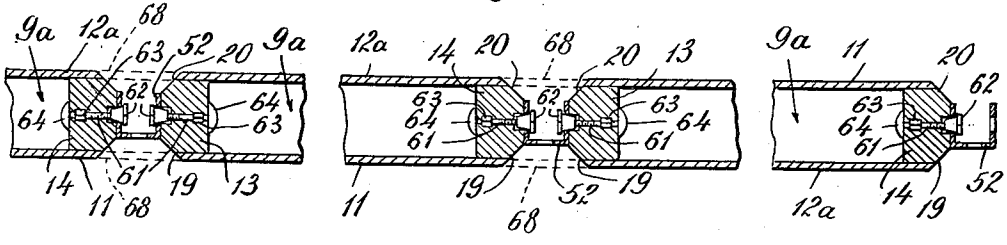


Fig. 11



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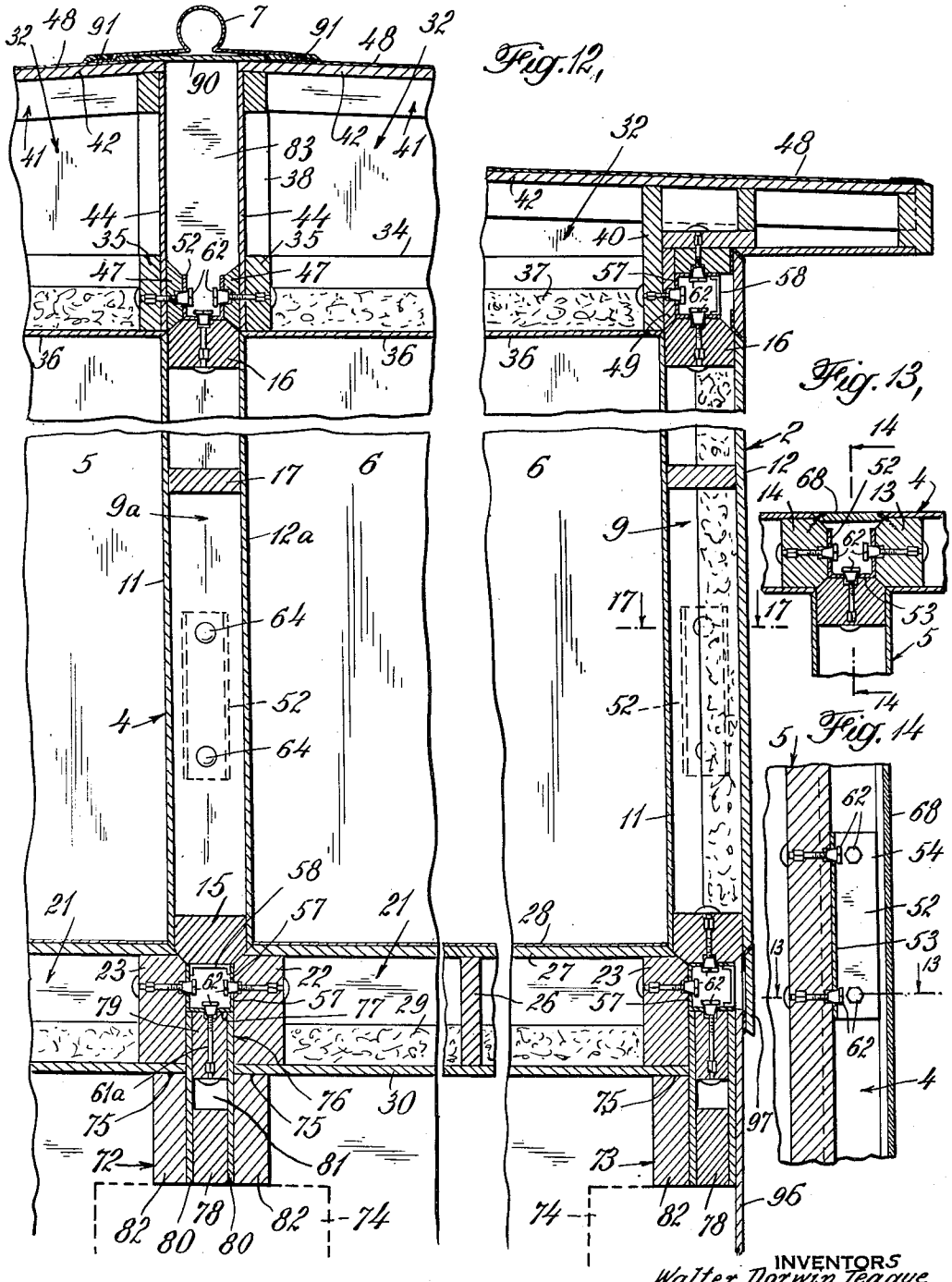


Fig. 12.

Fig. 13.

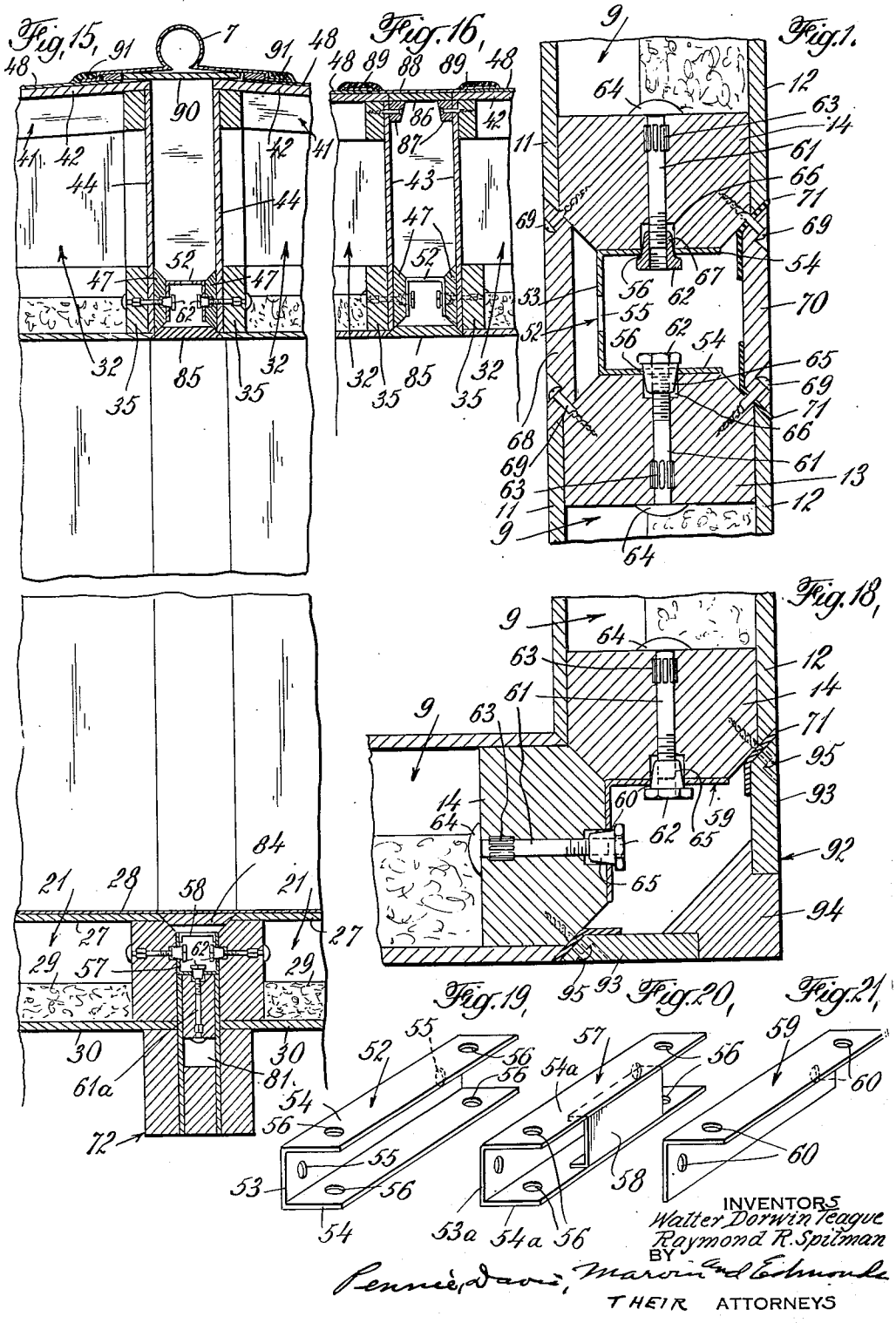
Fig. 14.

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Filed Oct. 13, 1941 5 Sheets-Sheet 5



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Patented Mar. 28, 1944 2,345,018

UNITED STATES PATENT OFFICE

2,345,018

BUILDING CONSTRUCTION

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Application October 13, 1941, Serial No. 414,700

3 Claims. (Cl. 20—4)

This invention relates to prefabricated buildings. In such buildings as heretofore proposed, while some of the parts of the building have been prefabricated, a considerable amount of actual construction or building work has been necessary at the site.

It is the primary object of the present invention to provide a prefabricated building of generally improved arrangement and construction, and especially one in which construction or building work at the site is substantially eliminated, and the work at the site consists substantially entirely of assembling the various units previously manufactured at the factory.

Another object of our invention is the provision of a prefabricated house construction which is so arranged as to permit disassembly of the completed building so that the parts thereof can be re-assembled on the same site in a different arrangement, or removed to a different site and re-assembled.

It is also an object of our invention to provide a section or panel for wall, floor, ceiling or roof of improved construction to facilitate and expedite the assembly and disassembly of such panels.

Another object of our invention is to provide such a panel or unit construction which affords ready interchange of panels, particularly wall panels, so that even after the building is completed, windows and doors can be relocated at will.

An additional object of the invention is to provide an improved coupling or joint for securing together the marginal edges of such panels or sections, either in line with one another or at right angles to one another, as, for example, in forming partition walls or the corners of the building.

Although the improvements of our invention are capable of general application in the constructing of buildings of various kinds, they have been devised for, and the invention will be explained in connection with, a type of dwelling house which is adapted for low cost and rapid production, such as is required in connection with defence housing now being constructed in various parts of the country. The invention will be described in connection with the accompanying drawings which illustrate such a house.

In these drawings:

Fig. 1 is a view looking down on the roof of a portion of a house constructed in accordance with the invention having part of the roof broken away and showing the wall construction in horizontal section;

Fig. 2 is an elevation of an interior wall panel;

Fig. 3 is a vertical longitudinal section through this panel, taken on line 3—3 of Fig. 2 but drawn to a larger scale;

Fig. 4 is a horizontal transverse section of the panel taken on line 4—4 of Fig. 2 drawn to the same scale as Fig. 3;

Fig. 5 is a plan view of a floor panel;

Fig. 6 is a transverse vertical section through the floor panel of Fig. 5 taken on line 6—6 of that figure but drawn to a larger scale;

Fig. 7 is a plan view of a combined roof and ceiling panel;

Fig. 8 is a vertical longitudinal section of the roof and ceiling panel taken on the line 8—8 of Fig 7 but drawn to a larger scale and with the central portion broken away;

Fig. 9 is a transverse section taken on the line 9—9 of Fig. 8 also drawn to an enlarged scale;

Fig. 10 is a view in side elevation of a series of panels such as shown in Fig. 2 joined together to form a typical wall but drawn to an enlarged scale for the purpose of illustrating the joint construction;

Fig. 11 is a cross sectional view taken on the line 11—11 of Fig. 10;

Fig. 12 is a partial vertical section taken on the plane indicated by line 12—12 of Fig. 1 having parts broken away both horizontally and vertically;

Figs. 13 and 14 are somewhat enlarged sectional views of the intersection between the walls shown at the left hand central portion of Fig. 1, Fig. 13 being a horizontal section taken on line 13—13 of Fig. 14, and Fig. 14 being a vertical section taken on line 14—14 of Fig. 13;

Fig. 15 is a partial vertical section of the house, similar to the left hand portion of Fig. 12 but with the partition wall omitted, showing the joints between the ends of two roof panels and two floor panels;

Fig. 16 is a vertical section taken on line 16—16 of Fig. 1 showing a joint between the sides of two adjacent roof and ceiling panels;

Fig. 17 is a horizontal section taken on the line 17—17 of Fig. 12 showing a joint between the sides of two exterior wall panels and corresponding to the joints shown at the lower right hand side of Fig. 1 but drawn to a larger scale;

Fig. 18 is a horizontal section showing the joint between two exterior wall panels at a corner of the house corresponding to the lower right hand corner of Fig. 1 but drawn to a larger scale; and

Figs. 19, 20 and 21 are perspective views illustrating three different forms of panel spacing and connecting members.

Referring now to the accompanying drawings, there is shown diagrammatically in Fig. 1 a house comprising two exterior side walls 1 and 2 and two end walls 3, only one of which is included in the figure. The space within these walls is divided by means of a longitudinal interior wall

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or partition 4 and by two transverse interior walls 5 and 6. The section is taken above the windows and doors so that these do not appear. The house is provided with a flat gable roof which slopes away from a central longitudinal ridge 7 which is directly above the central wall 4. The roof covering 8 has been broken away to show the roof structure in the upper half of Fig. 1 and both the roof covering and the roof structure itself have been broken away in the lower half of the figure so as to show in section the construction of both the interior and exterior walls.

The floors, exterior walls, interior walls and the ceiling and roof are each constructed in prefabricated sections or panels, the panels for roof and ceiling including both roof members and ceiling members in a single structure. All of these panels are rectangular in shape and can be made in any desired dimensions, but for the type of house in question the panels are constructed in a dimensional unit of four feet, that is to say, the panels are all approximately four feet in width and their length is a multiple of four feet. Thus the wall panels are approximately eight feet high, which determines the height of the ceiling, and the floor panels may conveniently be made in substantially twelve foot lengths, with the roof and ceiling panels of the same length.

These panels are arranged side by side and end to end either vertically or horizontally as the case may be to form walls, floors, and roofs and ceilings of any desired extent. For example, the required number of floor panels are arranged side by side and end to end in the same plane to form a desired floor space, while the wall panels are similarly arranged to form the required length of exterior and interior walls. The several panels forming a wall, floor or roof are connected together by the novel spacing and connecting members illustrated in Figs. 19, 20 and 21 which serve both to space the panels apart at least at the central portions of their edges and to connect them together. These spacing and connecting members serve to connect the sides of the panels when they are arranged in the same plane as, for example, to form a flat wall, or to hold the panels at right angles to one another, as, for example, at wall intersections and at the joints between the side walls, floor, and sills or girders and between the side walls and ceilings.

The improved prefabricated house has no frame structure aside from the sills or girders beneath, but the bottoms of the side and interior wall panels rest upon the floor panels and sills, and the roof and ceiling panels are supported entirely by the upper ends of the wall panels. The improved construction includes a releasable fastening means by which the edges of the several kinds of panels are secured to the spacing and connecting members. These fastening means are easily manipulated in assembling the house, and a completed building can be just as readily disassembled should it be desired to make additions thereto or to change the interior room arrangement, or should it be desired to remove the building to a different location. This disassembly can be carried out without defacing the panels or injuring the fastening means so that the same building can be assembled and disassembled as many times as desired.

The several kinds of panels out of which the house is constructed are illustrated in Figs. 2–9, inclusive. The exterior wall panel 9 shown in Figs. 2, 3 and 4 consists of a rectangular marginal framework 10 having a side facing member 11 on the inside and a thicker facing member 12 on the outside. Frame 10 has two side members 13 and 14 which may be of wood preferably 3 inches by 4 inches in cross section as shown in Fig. 3. It also has interconnecting end members 15 and 16 and is preferably provided at the corners with bracing blocks as indicated for stiffening. Also cross members 17 extend between the side bars 13 and 14 to assist in supporting the facings 11 and 12 so that these facings may be made of thin material, such, for example, as plywood approximately ¼ in. thick on the inside and somewhat thicker on the outside. The outside plywood facing 12 is preferably made of fir bonded with a weather-resisting binder such as phenolic resin, for example, while a cheaper grade of plywood may be used for the interior facing 11 such as gum plywood bonded with urea resin. Within these panels heat insulating material such as the rock wool illustrated in Figs. 2, 3 and 4, or aluminum foil or the like, may be provided.

Both the side frame members 13 and 14 and the end frame members 15 and 16 are shaped in cross section, as shown in Figs. 3 and 4, with a flat central edge face 18, the corners on each side of these flat faces being relieved preferably by flat 45° beveled surfaces 19 and 20 on the inside and outside, respectively, for a purpose which will appear later on.

The floor panels 21 are constructed on the same general plan but of heavier materials. The side frame members 22 and 23 and the end frame members 24 and 25 may be made of 3' x 6' wood beams. The cross members 26 are more closely spaced than in the wall panels to give added strength. The top surface 27 of the floor panel may consist of ½ in. urea bond fir plywood and on the outside a linoleum floor covering 28 is preferably cemented so that the floor surface will be complete when the panels are assembled. A layer 29 of heat insulating material, such, for example, as rock wool, aluminum foil, or the like, may be placed on the interior of the floor panel resting on the bottom surface 30 which may be made of ¼ in. phenol bonded fir plywood.

Both the side and the end edges of floor panel 21 are provided with flat outer surfaces or faces corresponding to edge faces 18 of the wall panels 9 but wider on account of the greater depth of the floor panel frame members. The upper corners are relieved in the same way as the corners of wall panel 9 preferably by 45° beveled surfaces 31. The width of these beveled surfaces is the same as the width of beveled surfaces 19 and 20 of the wall panels, and the function of these surfaces will appear in connection with the description of the assembly of the panels.

The combined roof and ceiling panel 32 shown in Figs. 7, 8 and 9 comprises a horizontal marginal frame 33, similar to the frames of the floor and wall panels, and upon which an inclined roof-supporting structure is superposed. The horizontal marginal frame 33 may be constructed in any suitable manner, as, for example, by using 1 in. by 4 in. planks for both the side members 34 and the end members 35. The ceiling 36, consisting of ¼ in. plywood is secured to the bottom of frame 33, and resting on the ceiling a layer 37 of heat insulating material such as rock wool or aluminum foil may be provided.

Suitable upright frame members 38, 39 and 40 secured to the marginal frame 33 support the roof frame structure 41 at any angle desired with relation to frame 33 to give the desired pitch to the roof. The pitch of the roof, preferably, is

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small in order to save material and also to make the individual sections lighter in weight. The roof facing **42** consists of ½ in. plywood covering the area of frame **41**.

The area within the roofing and ceiling panel **32** is entirely enclosed by means of plywood sheathing **43** on the sides and **44** at the end. This is done primarily for strength and stiffening of the panel by the edgewise mounted plywood. It also protects the insulating material **37** within the panel and forms a dead air space above the insulating material to supplement it in conserving heat in the wintertime and excluding heat in the summer. The outer end of the panel near the eaves is closed by the frame member **40**.

A flat edge face **45** at right angles to the ceiling is provided along each side of the panel, and a similar face **46** along the inner end, by applying 1" x 4" wood strips **47** opposite the marginal frame **33** on the outside of sheathing **43**. The lower corner of strip **47** is beveled as shown in Figs. 8 and 9 to correspond with the beveled surface **19** of the wall panels. At the outer end of roof panel **32** a strip **49** is secured to frame member **40** so as to thicken this member and provide the flat edge face **50** at this end of the panel. Strip **49** is beveled at **51** along its bottom edge to correspond with the beveling **19** and **20**. The roof facing **42** is surfaced on the outside with a layer **48** of roofing felt preferably protected with granulated slate.

The panels forming the interior walls or partitions of the building are constructed precisely like panel **9** except that the outside face has the same thickness on both sides and is made of the cheaper gum plywood urea bonded; also the heat insulation is omitted.

So far as the features of my invention are concerned which relate to the connecting together of the panel members **9**, **21** and **32**, their various elements may be secured together in any convenient way, as by the use of nails, screws, or the like. Our invention includes, however, as one of its features a novel panel structure which possesses remarkable strength. This panel structure is desirable, since the house has no frame structure other than the sills, so that the house will be fortified to withstand the wrenching stresses produced by wind pressure, etc. This panel structure involves the utilization of an interior frame structure which extends throughout the entire periphery of the panel and securing the side facing members of laminated wood, such as plywood, to the frame by uniting the margins of the facing members to the frame by a continuous bond extending throughout the entire periphery of the panel. Such a bond may be obtained by uniting these surfaces under heat and pressure, utilizing a bonding material of the phenolic resin type. In this way the strength of the bond between the frame and the side members is substantially equal to the strength of the bond between the layers of the plywood.

In Figs. 10 and 11 there are shown three interior panels, which are indicated by reference numeral **9*a***, assembled in edge to edge relationship to form a part of a typical interior wall. Considering the two right hand panels, the panels are joined together by means of three spacing and connecting members **52** of a channel-shaped type illustrated in Fig. 19 and mounted in spaced end to end relation in the space between the edges of the panels.

Each of these spacing and connecting members comprises a central web portion **53** and two side flanges **54**, a well-known structural steel shape possessing strength and rigidity and obtainable at low cost. The web portion is provided with two spaced fastening nut apertures **55** and each of the flanges **54** has a pair of similar apertures **56**. The flanges **54** and web **53** are of equal width and this width bears a relation to the thickness of the panels and is such as to cause the beveled corners **19** and **20** of adjacent panels to abut against one another when two panels are connected together at right angles to one another to form a corner of the house, or at an intersection of two interior walls, or between a wall panel and a floor panel or between a wall panel and a ceiling panel.

For joints where the greatest strength is required, such as at the ends of the floor panels and at the top and bottom of the exterior wall panels, a slightly modified flanged spacing and connecting member **57** illustrated in Fig. 20 is employed. This is precisely like connecting member **52** except for the presence of a plate **58** parallel with the web **53*a*** which ties together the marginal edges of the flanges **54*a***. Tie plate **58** is secured in place in any suitable manner, as, for example, by spot welding. The length of this plate is such as to leave the end portions of flanges **54*a*** adjacent the fastening apertures **56** freely accessible for the application of the fastening nuts as will appear later.

In Fig. 21 there is illustrated a still further modification of the flanged connecting member **52** which is utilized at all joints between two walls only, either interior or exterior, which are at right angles, such, for example, as at the corners of the building. This member **59** is a steel shape having two flanges at right angles to one another and each provided with apertures **60** for receiving the fastening nuts.

All three of these forms of flanged connecting members are of the same length and are short in comparison with the length of the panels, their length being, for example, approximately 8 inches. The width of the flanges is the same on all three connecting members and the flanges of members **52** and **57** are of the same width as the web portions **53** and **53*a*** so that the end outline of these two members is square. The insertion of the tie plate **58** between the flanges of member **57** makes this member into a box girder which is a shape that possesses great strength.

Returning to the consideration of the two right hand panels **9*a*** of Figs. 10 and 11, each of the flanged spacing and connecting members **52** is held in position between the panels by fastening means consisting of bolts **61** and nuts **62** (Fig. 11). The bolts **61** are placed in the panels **9** at the factory so that the panels are received at the site with these bolts in them. For this reason the bolt holes are bored or drilled in the panel side frame members **13** and **14** to make a snug fit with the bolts. In addition, to insure that the bolts do not get out of place in transit they are preferably provided with longitudinal fluting **63** (Figs. 11 and 17) which projects slightly from the body of the bolt near the bolt head **64**.

When the bolts are driven into their holes this fluting cuts its way into the wood of the frame members and secures the bolts so that there is no danger of their being dislocated during shipment of the panels. These bolts are driven into place before the side facings **11** and

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12 are put on the panels and the heads 64 of the bolts engage the inner surfaces of the side frame members 13 and 14. Similar bolts are provided in a similar way in the end members 15 and 16 of the panels.

The spacing of these bolts is determined to suit the number of flanged spacing and connecting members used and to suit the spacing between the fastening nut apertures. All types of panels 9, 9a, 21 and 32 are provided with these bolts. In making the joints between wall panels, any desired spacing of the connecting members is permissible, and in fact it is not necessary that they be uniformly spaced, whereas the spacing of the connecting members along the side edges and end edges of the floor and ceiling panels and along the end edges of the wall panels must be uniform; also the distance from any corner to the first connecting member must be equal to one-half of the spacing between connecting members. The reason for this is that, in some places, as for example, along the right hand end of the house, as shown in Fig. 1, the ends of the wall panels are connected to the sides of floor and ceiling panels, whereas along the other two sides of the house illustrated, the connection of the wall panels is with the ends of the floor and ceiling panels.

The nuts 62 are provided as shown in Fig. 17 with a head portion for the application of a wrench and with a body portion 65 at one side of the head and preferably in the form of a truncated cone to be forced into the apertures of the flanges 54 to make a snug fit and also prevent the nuts from loosening.

Enlarged recesses 66 (see (Figs. 17, 11 and 3) are provided around the threaded end portions 67 of the bolts of about the same diameter as the apertures 56 in the flanges of the connecting members and for the purpose of receiving the conical body portions 65 of nuts 62. The threaded end portions 67 terminate within these recesses 66 and below the outer surface of the panel frame members. The threads of these bolts are thereby protected from damage during shipment which might otherwise make it difficult to apply the nuts 62. Bolts 61 and nuts 62 are a standard form of carriage bolt and acorn nut and consequently are available without the expense of providing a special type.

In setting up a section of wall, as exemplified in Fig. 10, the first step is to put the appropriate connecting members in place on one of the panels and secure them by applying nuts 62 through the apertures in the flanges of the connecting members and screwing them onto the ends of bolts 61. The next step is to place the adjacent panel in position with the bolts 61 thereof in alinement with the apertures of the connecting member flanges and then apply nuts 62 on that side of the connecting members. These nuts 62 may readily be put in position with the fingers and then tightened by means of a wrench manipulated through the open side of the channel-shaped connecting members 52, as may be seen in Figs. 11 and 17.

After this is done, filler strips 68 are applied on the opposite sides of the connecting members 52 so as to close up the joint space between the two panel members and conceal the connecting members. These filler strips are preferably made of plywood and have their edges beveled to correspond to the beveled surfaces 19 and 20 of the panels. The filler strips have been omitted from Figs. 10 and 11 but are shown in Fig. 17. They are held in place by any suitable fastening means such, for example, as the screws 69. Fig. 17 is a cross section of a vertical joint between two exterior panels but the vertical joints between these panels are exactly the same as the joints between interior panels except that the outside filler strip 70 is made to stand the weather, and suitable packing 71 of rubber, for example, is inserted between the beveled surfaces to assist in excluding moisture.

Utilizing the panel construction and method of panel assembly above described, the house illustrated diagrammatically in Fig. 1 is assembled. The spacing and connecting members for the floor and roof panels are applied and the panels connected following procedure which is similar to that used in assembling the simple flat wall of Figs. 10 and 11. The house is supported upon sills or girders 72 and 73 (Fig. 12) resting upon pillars 74, preferably of concrete, so as to raise the house the desired distance from the surface of the ground. Sill 72 extends centrally of the house beneath the central wall 4 and ridge 7, while one or more sills 73 extend beneath each of the side walls 1 and 2 and each of the end walls 3.

Both sills 72 and 73 are prefabricated in suitable lengths convenient for shipment and handling. Sill 72 is made up of an assemblage of four beam sections so as to provide two side horizontal shoulder supports 75 for the ends of the floor panels and an upwardly extending central portion 76 having a flat edge face 77 on which the connecting members 57 are secured in endwise spaced relation.

In assembling this girder or sill structure the central portion is made first. Two 2" x 4" beams 78 and 79 are secured together by means of two layers 80 of plywood, one secured at each side, leaving a space 81 extending lengthwise between the inside edges of these beams. Before this, the upper member 79 is drilled and recessed for the connecting member bolts 61a and the bolts are put in position. These bolts are like bolts 61 except for their length. After the assembly of these four parts is completed, the side members 82, two 2" x 6" wood beams, are secured to the outside surfaces of the plywood members 80 with the lower edges of members 82 and member 78 in the same plane.

The side sills 73 are constructed in the same way except that only one 2" x 6" member 82 is required.

In assembling the house at the site, the side sill 73 and the central girder 72 are first laid on the foundation blocks 74 in accordance with the plan of the house and the several sections constituting these girders are bolted together at their ends (not shown) so as to provide a unitary foundation structure.

From Figs. 12 and 1 it will be understood that the house in question is approximately 24 ft. wide, which is determined by the placing of the two floor panels 21 end to end. The floor panels 21 are then placed in position with their ends resting on the shoulders 75 as shown in Figs. 12 and 15.

The nuts 62 at the joints between the inner ends of the panels above the central girder 72 are then applied complete and drawn up tight; that is to say, all three sets of these nuts, those on the two opposite side flanges of the connecting members 57 and those at the bottom or web of these members. Members 57 are faced upward at the center joints between the panels and, as the interior partition panels forming wall 4 are not yet in place, the interior of the connecting members is accessible for the insertion of the nuts and

the manipulation of the wrench in tightening them.

At the outside ends of the floor panels 21 the connecting members 57 are placed horizontally so that the openings between their flanges face outwardly. The nuts 62 in the web and lower flange of each of these connecting members 57 are conseqently inserted next and tightened.

After this is done the outside wall panels 9 and the wall panels 9a, forming the central interior partition 4, can be placed in position and the roof and ceiling panels 32 mounted on the tops of the wall panels. In carrying out this assembly the lower edge faces 18 of the vertical panels rest on the upper flanges of the connecting members 57 and the beveled inside edges 19 also rest upon the beveled edges 31 of the floor panels. The same thing is true of the interior wall panels 9a except that here there are beveled surfaces 19 on both edges to rest upon the similar surfaces 1 of the two opposed floor panels. These interior panels are held in place by their weight only.

In placing the roof panels 32 nuts 62 are applied from the outside beneath the eaves, the holding members 57 being horizontal, the same as at the bottoms of the outside wall panels. At the inner ends of the roof and ceiling panels 32 the connecting members 52 are upwardly directed and the nuts 62 are accessible through a space 83 which exists between the opposite plywood facings 44 in the inner ends of the roof and ceiling panels. It will be understood that this space 83 is open at the time the roof panels are applied, since the ridge member 7 is not placed in position until later.

Under the portions of the ridge 7 where there is no central partition wall 4 (Fig. 15) a filler strip 84 is used to fill the spaces between the joints at the inner ends of the floor panels 21. Also the connecting members 52 between the inner ends of the roof and ceiling members 32 are faced downwardly instead of upwardly so that the nuts 62 are accessible from below, that is, from within the house instead of from the roof. A ceiling filler strip 85 is used to close this joint and conceal the connecting members.

A typical joint which extends between two interconnected roof and ceiling members 32 at their sides is illustrated in Fig. 16. The connecting members 52 face downwardly as in Fig. 15 and the ceiling joint is closed by a similar filler strip 85. The roof joint consists of a filler strip 86 which is supported on nailing strips 87 provided along the both sides of the roof panels at the roof line.

The roofing felt 48 does not extend flush with the edges of the roofing panels, but an uncovered margin of about ½ inch of the plywood surface 42 is left exposed. In this way the edges of the roofing material are protected to a considerable extent from being damaged or separated from the surface of the plywood during shipment.

After the roofing panels are in place and the filler strips 85 have been installed, strips 88 of roofing material are laid lengthwise of the joints between the sides of the roof panels. Strip 88 is made to overlap the margins of the roofing material 48 as shown in Fig. 16 and then mastic 89 such as asphaltum is applied over these overlapping edges.

Along the peaks of the roof panels at the center of the house a plywood strip 90 is placed and on top of this the ridge 7, which, as illustrated, has a central roll portion and margins wide enough to make a substantial overlap with the margins of the roofing material 48. The ridge member is held in place by means of nails, if desired, and by mastic 91 which is applied along the margins.

At the corners of the building the exterior wall panels 9 are joined together as illustrated in Fig. 18 utilizing the connecting members 59 (Fig. 21) which are mounted in endwise spaced relation, as in the other panel joints, and to which both of the panels are secured by means of nuts 62 and bolts 61. The beveled edges 19 and 20 (Fig. 3) of these panels are drawn tightly together when the nuts 62 are set up so as to form a tight joint extending vertically from floor to ceiling.

The corners of the building are completed by means of a filler strip 92 constructed as shown in Fig. 18 and comprising two strips of plywood 93 which are mounted at right angles to one another on a wooden corner member 94, which is given a cross section as shown on a routing machine to receive the side strips 93. These filler strips 92 may be secured in place by means of wood screws 95 and preferably rubber sealing strips 71 are inserted the same as in the joints shown in Fig. 17.

In Figs. 13 and 14 there are shown enlarged views of a joint between two interior walls or partitions, as, for example, either of the two such joints shown near the center of Fig. 1. The connecting members 52 are mounted with their web portions 53 on the edge face of the panel which forms the intersecting wall 5, so that the open side of the connecting member faces the side of central wall 4 opposite to the partition wall 5. In this way the nuts 62 are made accessible either for insertion and tightening or for removal. The joint is closed by means of a filler strip 68 (Fig. 17).

In order to finish off the lower portion of the exterior of the house and protect the outside girders 73 from the weather, sheets 96 of material such as "Transite" are placed along the outside surfaces of these girders. The upper edges of sheets 96 preferably terminate as shown at the lower edge of the horizontal joint spaces between the side wall panels 9 and the floor panels 21. These joints are covered by an exterior filler strip 97.

By means of our invention we have provided a house structure which may be entirely fabricated in a factory by modern mass-production methods and which requires only a few hours for assembly on the site. All craft work at the site is eliminated. The panels of each of the three types are interchangeable within their own group so that no particular panel has to be placed at any particular location in the structure. The windows and doors are built into wall panels (not shown) which are exactly similar in dimensions and in frame arrangement as the exterior and interior panels 9 and 9a. All of these exterior panels are interchangeable and all of the interior panels are interchangeable, permitting an unusual flexibility of plan, fenestration and arrangement of rooms.

Even after a house has been completely assembled, any of the exterior wall panels can be interchanged at any time. Thus, for example, if a window or door is desired to be located in a different position, one of the blank wall panels can be removed and a panel containing the window or door substituted. This can be done from the outside of the house without disturbing either the foundation or the roof structure in any way.

It will be understood that although the inven-

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tion has been illustrated and described in connection with a house, the same features of construction and assembly can be employed in connection with other buildings. It will also be understood that changes can be made without departing from the spirit of the invention, the scope of which is set forth in the appended claims.

We claim:

1. As an article of manufacture, a panel for a prefabricated building having in the edges thereof a plurality of spaced preformed recesses, fastening members mounted in the panel and having threaded ends terminating within said recesses, and protected by the walls thereof.

2. As an article of manufacture, a panel for a prefabricated building comprising a marginal frame having at least one side facing member mounted thereon, said frame having bolt holes arranged therein in a predetermined spacing and terminating in preformed nut-receiving recesses in the edge of the frame, and bolts secured in said holes having their threaded ends terminating within said recesses.

3. As an article of manufacture, a panel for a prefabricated building comprising a marginal frame having at least one side facing member mounted thereon, said frame in cross section having an edge face substantially perpendicular to the side facing and having bolt holes arranged therein in a predetermined spacing and terminating in preformed nut-receiving recesses in said edge face, bolts secured in said holes having their threaded ends terminating within the said recesses, and at least one of the corners adjacent said edge face and one side of the panel being relieved to form a seat on which a member may be placed when the panel is assembled in a building.

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