J. E. WILSON.

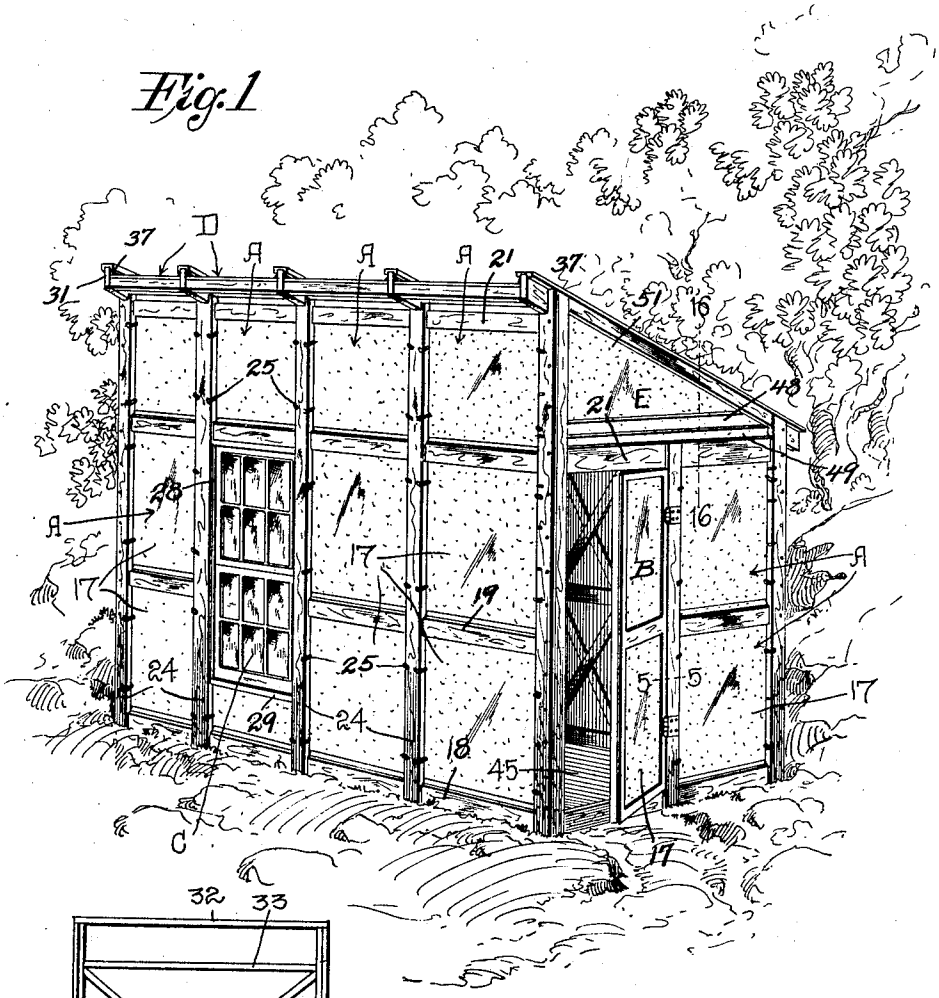
PORTABLE KNOCKDOWN BUILDING STRUCTURE.

APPLICATION FILED JUNE 14, 1919.

1,363,379. **Patented Dec. 28, 1920.**

5 SHEETS—SHEET 1.

Fig. 1



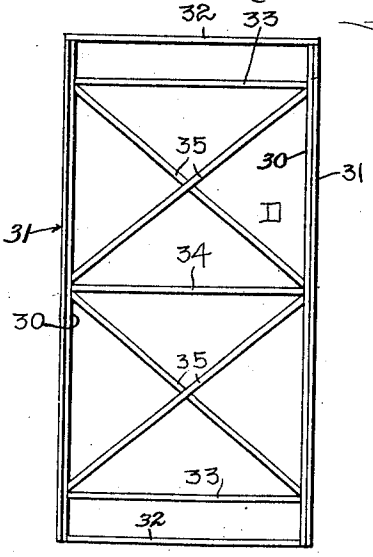


Fig. 10

Inventor

John E. Wilson

By Watson E. Coleman

Attorney

J. E. WILSON.

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5 SHEETS—SHEET 2.

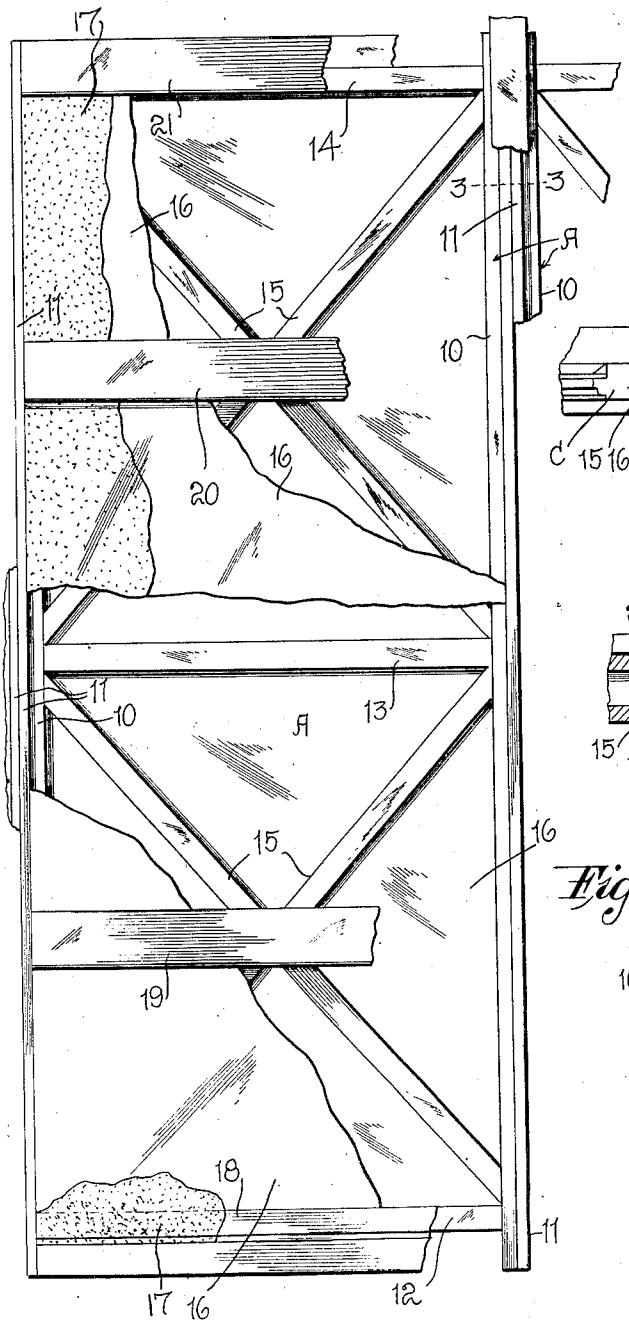


Fig. 2

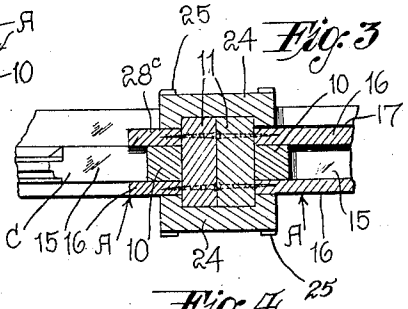


Fig. 3

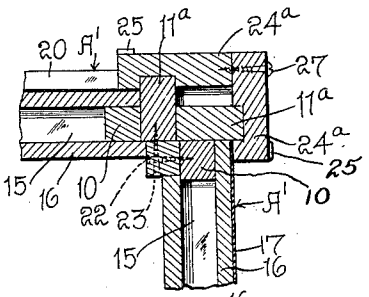


Fig. 4

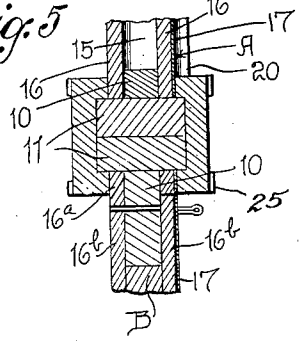


Fig. 5

Inventor

John E. Wilson

By Watson E. Coleman

Attorney

J. E. WILSON.

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5 SHEETS—SHEET 3.

Fig. 6

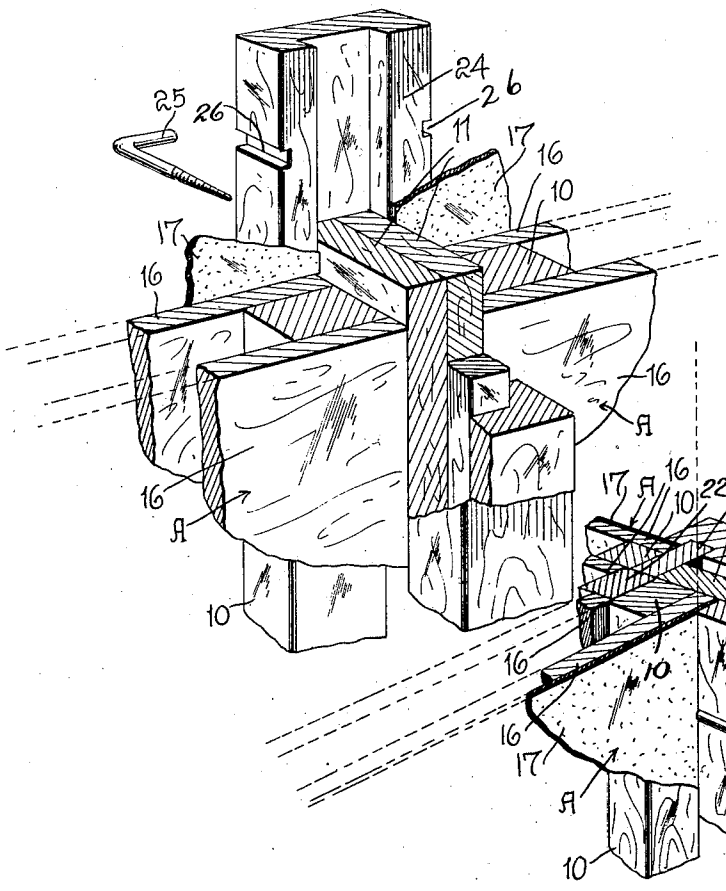


Fig. 7

Inventor

John E. Wilson

By Watson E. Coleman

Attorney

J. E. WILSON.

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5 SHEETS—SHEET 4.

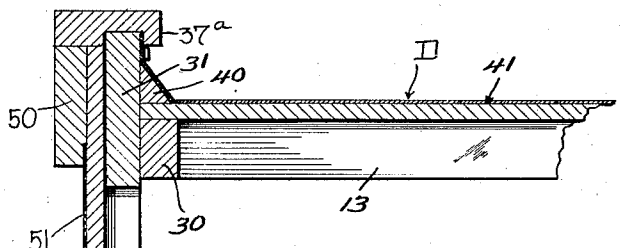


Fig. 9

Fig. 16

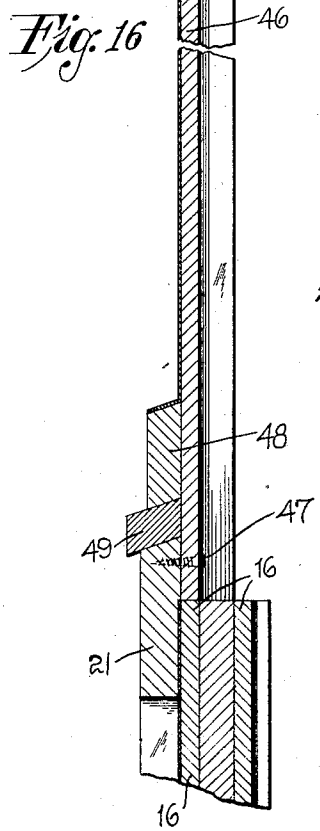
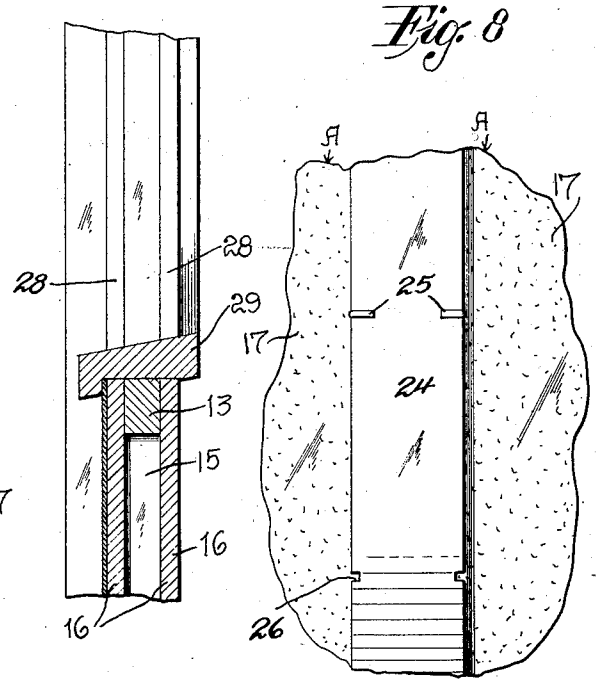


Fig. 8



Inventor

John E. Wilson

By Watson E. Coleman

Attorney

J. E. WILSON.

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5 SHEETS—SHEET 5.

Fig. 15

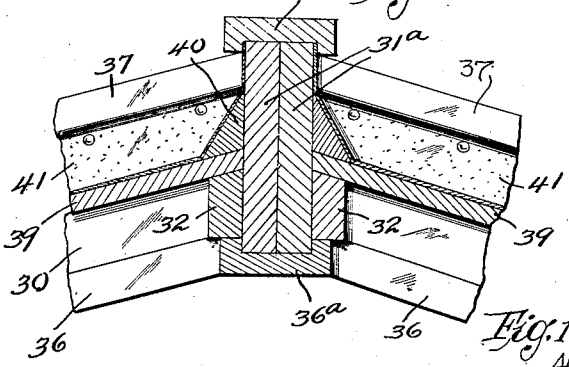


Fig. 12

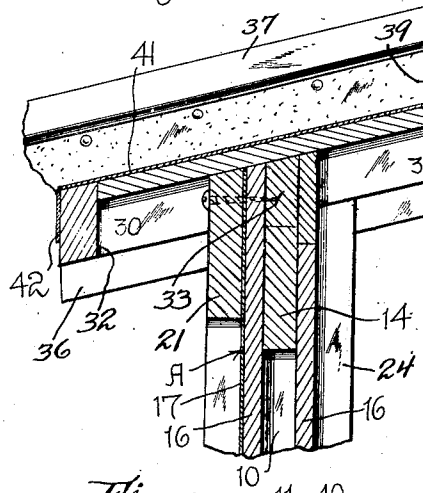


Fig. 13

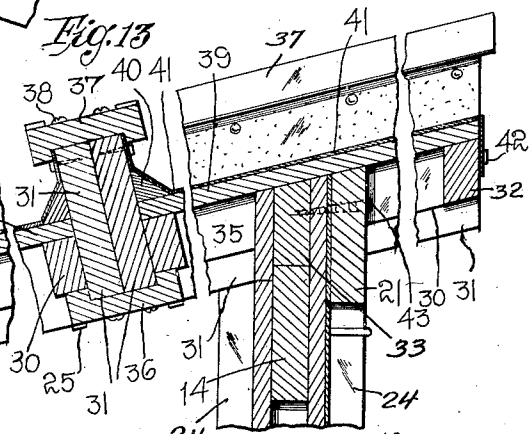


Fig. 11

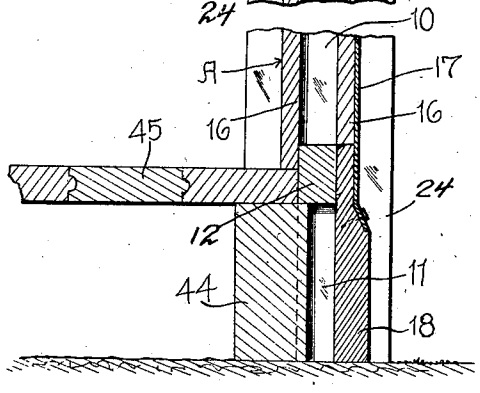
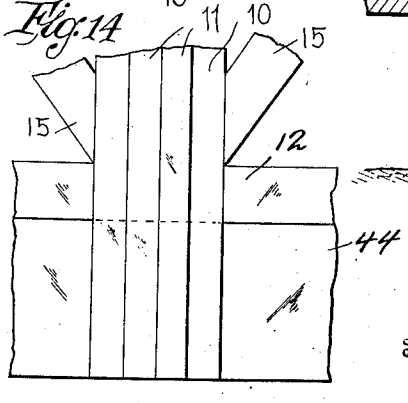


Fig. 14



Inventor

John E. Wilson

By Watson E. Coleman

Attorney

UNITED STATES PATENT OFFICE.

JOHN ELWOOD WILSON, OF MOUNT CARMEL, PENNSYLVANIA, ASSIGNOR TO EDGAR R. BASTRESS, OF MOUNT CARMEL, PENNSYLVANIA.

PORTABLE KNOCKDOWN BUILDING STRUCTURE.

1,363,379. Specification of Letters Patent. Patented Dec. 28, 1920.

Application filed June 14, 1919. Serial No. 304,218.

To all whom it may concern:

Be it known that I, JOHN E. WILSON, a citizen of the United States, residing at Mount Carmel, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Portable Knockdown Building Structures, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to portable or knock-down houses, and particularly to houses or other buildings composed of a plurality of units or sections adapted to be disposed in conjunction with each other to form a house of any desired character, the sections being so connected to each other that they may be readily engaged with or disengaged from each other.

A further object is to so construct the sections of which the house is composed that the sections are very strong and when joined provide a very stable and firm wall or roof structure.

A further object is to provide improved means whereby the sections may be engaged with each other, either at right angles or in alinement, and whereby the joints between the sections may be covered, and in this connection to provide channel-shaped members fitting over these joints and binding the adjacent sections to each other, and provide very simple means whereby these channel-shaped members may be locked in place.

Another object is to provide a roof formed of sections joined in substantially the same manner as the wall sections, the sections being adapted either for a double pitched roof or for a roof pitched in one direction only, these roof sections being further so connected as to make a water-proof and highly durable roof whereby the sections may be disconnected at any time, either for the purpose of transporting the building or for inserting additional sections to increase the size of the building.

A further object is to provide a construction of this character whereby from time to time the building may be readily increased in size by the insertion of additional sections.

Other objects will appear in connection with the detailed construction as will be hereinafter explained.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a perspective view of a structure formed in accordance with my invention;

Fig. 2 is an exterior face view of one of the wall sections, partly broken away;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a horizontal section through a corner of the building;

Fig. 5 is a section on the line 5—5 of Fig. 1;

Fig. 6 is a fragmentary perspective view of the construction shown in Fig. 3;

Fig. 7 is a fragmentary perspective view of the construction shown in Fig. 4;

Fig. 8 is a fragmentary face view of two sections and the connecting battens;

Fig. 9 is a fragmentary vertical section through a window opening;

Fig. 10 is an inside face view of one of the roof sections D;

Fig. 11 is a fragmentary vertical section through the highest wall of the structure shown in Fig. 1;

Fig. 12 is a fragmentary vertical section through the upper portion of the lowest wall of the structure shown in Fig. 1;

Fig. 13 is a transverse section of the roof structure shown in Figs. 11 and 12;

Fig. 14 is a face view of a sill 44;

Fig. 15 is a section through a hip roof;

Fig. 16 is a vertical fragmentary section on the line 16—16 of Fig. 1.

As before stated, this building is made up of a plurality of standard sized sections, certain of the sections being regular in form, certain of the sections being necessarily somewhat irregular in form, and these two sets of sections being used to form the side walls of the building and a third set of sections is used for forming the roof. One of the first set of sections is illustrated in Figs. 2 and 7. These sections, which are designated generally A, are approximately 32″ in width, for instance, and any desired length, depending upon the height of the building. They are designed to extend from the floor to the roof of the building. Each section is composed of two longitudinally extending, laterally spaced, members or strips 10, which are approximately ⅞″ by ⅞″ and extend the entire length of the section. Out-

ward of these strips 10, there are disposed the longitudinally extending pieces or strips 11 which also extend the full height of the section but project outward and inward of the strips 10, these strips 11 being approximately $\frac{7}{8}''$ thick by $2\frac{1}{8}''$. These strips 10 are nailed to the strips 11. Extending between the strips 10 are cross braces 12, 13 and 14 which are nailed to these strips, the brace 14 being disposed below the upper ends of the strips 10, and extending diagonally between the braces 13 and 14 and 12 and 13 and between the strips 10 are the "buck braces" or cross braces 15, which are $\frac{7}{8}''$ by $1\frac{1}{2}''$ more or less and which are "halved" together where they cross at the center, or in other words formed with coacting notches in an obvious manner. Their ends are nailed to the strips 10. These buck braces are one of the important features of this panel or section, inasmuch as they render the panel or section absolutely rigid and prevent any deformation of the panel or section or any warping thereof, while at the same time the section is relatively light.

The frame above described is covered with light sheathing 16 which may be about $\frac{3}{8}''$ in thickness and which extends from the upper ends of the strips 10 and terminates short of the lower ends of these strips 10. In other words, coincident with the lower edge of the transverse brace 12, as shown in Fig. 11, and is nailed to the strips 10 and the braces 12, 13 and 14 and to the buck braces. This sheathing may be made of any suitable material, as for instance thin wood or composition sheathing board. Over the sheathing is laid prepared roofing paper 17 or fire-proof or water-proof material of similar character. It will be noticed that the brace 12 is disposed above the lower ends of the pieces 10 and 11, but that the sheathing extends to the lower edge of this brace, and the roofing paper 17 is held in place upon the sheathing by transverse battens 19, 20 and 21. These battens are nailed to the sheathing and to the buck braces or to the transverse braces 12 and 14, and these battens prevent the prepared roofing sheet or other covering from bulging or otherwise getting out of shape. The batten 21 is approximately $3\frac{3}{4}''$ wide and $7''$ thick, and as illustrated in Fig. 12, forms a joint which securely joins a side section to a roof section, as will be more fully pointed out later.

The batten 18 constitutes a baseboard, as illustrated in Fig. 11, and over the upper margin of which the roofing paper 17 or other fabric extends, this baseboard being relatively thick, and the sheathing 16 on the outside of the sections terminating at the upper edge of this batten or baseboard 18 and resting thereon, as shown most clearly in Fig. 11.

I have above described the sections A which are to be used for forming the side walls, but these sections are slightly modified, however, where the sections are to be used at the corners. Thus, as illustrated in Fig. 4, the member 11^a on the edge of a frame which is to be used at the corner of a building, does not extend inward beyond the strip 10, but terminates at its inner end approximately flush with this strip or projecting but a slight distance beyond the strip. Thus, these sections A′ may be disposed in right angular relation with the end of one strip 11^a abutted against the face of the other strip 11^a, and the two sections held in this conjoined relation on their inside faces by means of a corner post of relatively light material, designated 22, through which screws 23, extending at right angles, pass into one of the members 11^a and into one of members 10.

As illustrated in Fig. 3, the sections A, except at the corners, are to be connected by vertical channeled members 24. These channeled members or vertical battens are channeled on their inner faces to engage over the projecting ends of the strips 11 where these strips are abutted against each other, and thus hold the two wall sections in abutted, alined relation. These channeled battens are used upon the exterior of the wall in all cases and may be used upon the interior of the wall, as illustrated in Fig. 3, and these battens are held in position by means of screw hooks 25 (see Figs. 7 and 8) having angular heads which pass through notches 26 in the battens. These screw hooks are inserted through the sheathing boards 16 and, on the exterior of the section, through the roofing paper 17 and into the sheathing boards 16. When these hooks are turned in one direction, their heads will lock over the channeled battens and lock the channeled battens in position from any movement relative to the sections. When the heads are turned outward, however, the channeled battens may be readily removed and the sections be taken apart. As illustrated in Fig. 6, the outer battens 24 extend over the side margins of the sheet of roofing paper or other material 17 disposed against the outer faces of the sections A.

At the corners of the building, as shown in Fig. 4, a slightly different construction is used. In this case, the battens 24^a are formed with a channel or groove on their inner faces, disposed nearer one edge of the batten than the other so as to engage over the projecting end of the strip 11^a. When the battens are disposed in position, as illustrated in Fig. 4, at the corners of the building, the outer margin of the inner face of one batten will overlap the end face of the batten at right angles thereof, and these battens at their juncture are held in engagement with each other by screws 27, the op-

posite margins of the battens being held in place against the panels by means of the screw hooks 25, as previously described.

It will be seen that by the construction above described the joints between two sections are made highly durable and substantial. Such joints I have found in actual practice have extraordinary strength and stability. It will be seen that the battens may be readily applied and removed both on the inside or outside of the house or structure, and that when so removed, the sections may be immediately disjoined without any trouble. This is due very largely to the use of the engaging screws 25 with their angular head which, when turned in one direction, extend over the battens and which, when turned in the opposite direction, permit the battens to be readily removed.

Doors and windows are to be made on the same principle as the sections A, except that as far as the doors are concerned a section having therein a door (see Fig. 5) will be made to provide an outer frame comprising the members 10 and 11 with narrow strips of sheathing 16^a applied thereto, while the door B will be formed of a rectangular frame having outer and inner layers of sheathing 16^b applied thereto, and the door will be hinged in any suitable manner to the strip 10 of the frame on one side and be adapted to latch against the strip 10 on the other side. It is obvious that the door, however, might be hinged to one of the battens or that the door may be constructed in any suitable manner to fill the space ordinarily occupied by one of the sections A.

In forming a window, (see Fig. 9) stiles 28 are attached to the strip 10 so as to form a sash channel for a window sash C. The window frame will, of course, be provided with a sill 29 which will extend across one of the transverse braces of the section to which the window sash is applied, as for instance, the transverse brace 13.

The roof is constructed of sections D. (See Fig. 10.) These sections are made on the same plan as the sections A, and consist of the longitudinally extending strips 30 and the outer, longitudinally extending strips 31, which constitute rafters, which are wider than the strips 30 and extend in opposite directions beyond these strips, the strips being nailed together and connected by upper and lower transverse braces 32 and 33, a medially disposed brace 34, and cross or buck braces 35, interlocked at their intersections and nailed at their extremities. As will be seen from Fig. 13, the strips 30 are disposed nearer one edge of the strips 31 than they are the other edge so that when the roofing sections are in place, these strips 31 project upward a relatively considerable distance above the strips 30 and project downward only a short distance below the strip 30. Battens 36 engage over the inner abutted edges of the strips 31 and are held in place by the hooks 25 previously described. Battens 37 are connected over the outer abutted edges of the brace 31 and are held in place thereon by screws 38. These battens 36 and 37 are, of course, applied after the roofing sections are put in place upon the walls of the house. Attached to the outer face of the frame formed by the members 30, 32, 33, 34 and 35 is the sheathing 39 which is nailed to these members, and disposed at the lateral margins of each roofing section D are the triangular corner pieces 40 which rest upon the margins of the sheathing 39. Extending over the outer face of the sheathing is a sheet of prepared roofing material 41, which may be tar paper or other suitable material, the lateral edges of this sheet extending up over the faces of the corner pieces and being nailed to the outer margins of the strip 31. The outer or cap battens 37 extend over the margins of these roofing sheets. Each roofing sheet at its upper and lower ends is brought over the braces 32 and fastened thereto by nails or in any other suitable manner, as at 42. Of course, it will be understood that the battens 36 and 37 run transversely of the length of the roof, that is extend upward from the eaves to the ridge of the roof.

It is to be noted by reference to Figs. 2 and 12 that the cross brace 14 is disposed below the upper extremities of the members 10 and 11, but that the sheathing 16 extends up to the full height of the members 10 and 11 so that a space is left into which one of the cross braces 33 of the roof section is adapted to be disposed, thereby locking the roof to the side walls. The cross piece 21, however, is disposed with its upper edge on approximately the same level as the upper ends of the strips 10 and 11 and a screw 43 is disposed through the cross piece 21, the outer sheating 16, and into this cross piece 32, as illustrated clearly in Figs. 11 and 12. Of course, the upper ends of the sections are beveled to conform to the pitch of the roof. It will be noted from Figs. 11 and 12 that the roof will overhang the side walls a distance equal to the distance between the braces 21 and the braces 32, thus providing eaves. By simply removing the screws 43, the roofing sections may be lifted bodily off the walls, or by removing the screws 43 and the battens 36 and 37 and their screws 38, the roof sections may be taken off section by section.

It will be noticed from Fig. 11 that the batten 18 extends below the brace 12 and that at its upper edge this batten is thinned down or beveled so as to have a thickness equal to that of the sheathing 16. The sill

44, which is of the same length as the desired building, is disposed behind this batten 18 and is cut away at intervals to a depth of ⅜″ to receive the pieces 10 and 11 of the several sections, which therefore extend to the bottom edge of the sill. This cut away (see Fig. 14) occurs, of course, wherever two sections join, thus allowing the battens 24 and 24ª to extend to the bottom of the sills. Flooring 45 is laid, of course, upon these sills. While, in Fig. 11, I show the roof as having a pitch in one direction, in Fig. 15 I show a double pitched roof, that is a comb roof, but it will be seen that the construction is precisely the same as that shown in Fig. 11, except that two sets of roof sections are used, one on each side of a central ridge. These sections are constructed in the same manner as the sections shown in Figs. 11, 12 and 13, but at their abutting ends they are attached to ridge beams 31ª whose upper and lower edges are embraced by the battens 36ª and 37ᵇ, these beams 31ª being attached to the transverse braces 32 of the roof frame and there being filling 40 disposed at the junction between the sheathing 39 and the beams 31ª, the tar paper 41 or other fabric being extended up over this filling 40 and carried up the outer faces of the beams 31ª and held in place by the batten 37ᵇ.

As shown in Fig. 1, there are certain irregularly shaped sections which must be used to fill in the space between the end sections of the building and the inclined roof. Sections of this character, which are designated E, are more or less triangular in form and are adapted to be connected to relatively short end sections and the roof. This section (see Fig. 16) consists of a piece of sheathing 46 which is adapted to be rested upon the upper edge of the outer sheathing 16 of section A and disposed against the batten 21 and held thereto by screws 47. The upper edge of the batten 21 is beveled and the sheathing has applied to it a transversely extending strip 48 beveled on its upper face and a transversely extending strip 49 wider than the strip 48 and the batten 21 and extending out beyond it to form a water shed for the joint. The battens 37ª for the ends of the roof are grooved to fit over the upper end of the adjacent rafter beam 31, and this batten 37ª has attached to it the downwardly extending strip or member 50 so that this strip 50 will extend over the upper end of the sheathing 46 and hold the sheathing in close contact with the rafter 31. It will be seen that by this construction a recess is left between the beam 31 and the member 50 in which the upper end of the wall section formed by the sheathing 46 is disposed. A sheet of waterproof fabric or sheet of light material 51 is disposed against the face of the sheathing 46 and at its lower end is extended down over the beveled upper edge of the strip 48 and is attached thereto in any suitable manner, and the member 50 extends over the upper edge or margin of this sheet 51, thus forming a water-proof joint between the roof and the irregular section E, and obviously a water-proof joint is also formed between this section E and the sections A immediately beneath. Of course, the shape of these sections E will depend upon the shape of the house.

I have illustrated in Fig. 1 a building constructed in accordance with my invention, but this is merely an example of how a small portable building may be erected out of the sections heretofore described. It is obvious that a building of this character may be made in any desired plan and that the height of the building will be determined by the height of the sections, and that the building may either have a roof which is pitched in one direction entirely or a double pitched roof. The weight of the roof is practically entirely supported by the upright framing brace 11 and the battens 24 and 24ª. In other words, these members constitute main supporting elements of the frames of which the sections are composed. A structure of this kind may be put up very quickly or as quickly detached. I have found in actual practice that such a structure is very strong and rigid, that it will resist wind pressure to a very great extent, that it may be made thoroughly water-proof and wind-proof, and a structure of this character is susceptible to being readily altered to increase or decrease its dimensions whenever desired. Inasmuch as it is made up of units, the units may be readily turned out at a factory and readily shipped in a knocked-down condition to be later on erected. The erection requires no skilled labor, and the sections are so light that they may be readily handled by one man.

While I have illustrated certain details of construction and arrangement of parts which I believe to be particularly effective, yet I do not wish to be limited to this, as it is obvious that many changes might be made therein without departing in any essential respect from the spirit of my invention as embodied in the appended claims.

I claim:—

1. A structure made up of sections, each comprising a rectangular frame formed of spaced, longitudinally extending members, transversely extending braces attached to the members, sheathing attached to one face of the frame, longitudinally extending beams disposed flat against the outside faces of the longitudinal members and attached thereto and projecting laterally beyond the longitudinal members, and battens grooved on their inside faces to receive

and embrace two abutted beams, and means detachably holding said battens in place and extending into the longitudinal members.

2. A structure made up of sections, each comprising a rectangular frame formed of spaced, longitudinally extending members, transversely extending braces attached to the members, sheathing attached to one face of the frame, longitudinally extending beams disposed flat against the outside faces of the longitudinal members and attached thereto and projecting laterally beyond the longitudinal members, battens grooved on their inside faces to receive and embrace two abutted beams, and rotatable fasteners disposed adjacent the margins of the sections and having laterally projecting heads, the battens being formed with notches to receive said fasteners, the fasteners being rotatable to carry the heads over the battens when the battens embrace the beams.

3. In a structure of the character described, a plurality of rectangular frames each consisting of longitudinal members and transverse braces attached thereto, beams equal in length to the longitudinal members and attached to the outside faces thereof but projecting laterally beyond said longitudinal members, sheathing disposed upon the frame and extending to said beams, an outer layer of composition disposed upon said sheathing and extending to the lateral edges thereof, battens extending over the sheathing and attached to said frame but terminating short of the edges of the frame, and grooved battens embracing two abutted beams of the adjacent sections and holding the beams together and bearing at its edges against the sheathing to hold the sheathing in place, and means for detachably holding said grooved battens to the frame.

4. In a structure of the character described, two adjacent sections disposed at right angles to each other, each section comprising a rectangular frame comprising longitudinal members and transverse bracing members, beams attached to said longitudinal members and extending longitudinally thereof but projecting outward beyond the longitudinal members, sheathing attached to said frame inward of the beams and abutting against the latter, battens disposed at right angles to each other and engaged with each other, each batten having a groove to receive the projecting edge of one of the beams whereby said battens embrace the beams and hold them in rectangular relation, and a corner strip disposed at the junction of the frame on the inside faces thereof and detachably connected thereto.

5. A sectional structure of the character described, the sections of which are each formed of rectangular frames comprising longitudinally extending strips, a transverse strip adjacent the upper end of the frame disposed below the upper ends of said strips, a transverse brace at the lower portion of the frame disposed above the lower ends of said longitudinal strips, sheathing boards attached to said frame and extending to the outer faces of the strips, said sheathing extending to the upper ends of the strips but the lower edges of the sheathing being disposed above the lower ends of the strips, a transverse batten disposed at the upper end of the frame upon one face thereof and upon the sheathing and extending to the upper end thereof, a transverse batten disposed at the lower end of the frame below the lower edge of the sheathing and extending to the lower ends of said longitudinal strips, and beams attached to the outer faces of the longitudinal strips and having the same length to said strips, said beams being wider than the strips.

6. In a structure of the character described, wall sections consisting of rectangular frames detachably engaged with each other, a roof composed of sectional frames detachably engaged with each other, the wall section frames having a batten on the exterior face of each frame extending above the frame, a superposed wall section disposed upon the upper end of the wall section frame and bearing against the inner face of the batten and detachably engaged therewith, said superposed wall section having a transverse batten, a portion whereof projects outward beyond the first named batten and forms a water shed, the roof section immediately above the superposed wall section being formed with a recess in which the upper end of said wall is received whereby to lock the roof section to said superposed wall.

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

JOHN ELWOOD WILSON.

Witnesses:
RAY E. CANNON,
CHARLES H. REITZ.