June 4, 1946. W. C. SMITH 2,401,588

BUILDING STRUCTURE

Filed April 19, 1943 3 Sheets-Sheet 1

FIG.1.

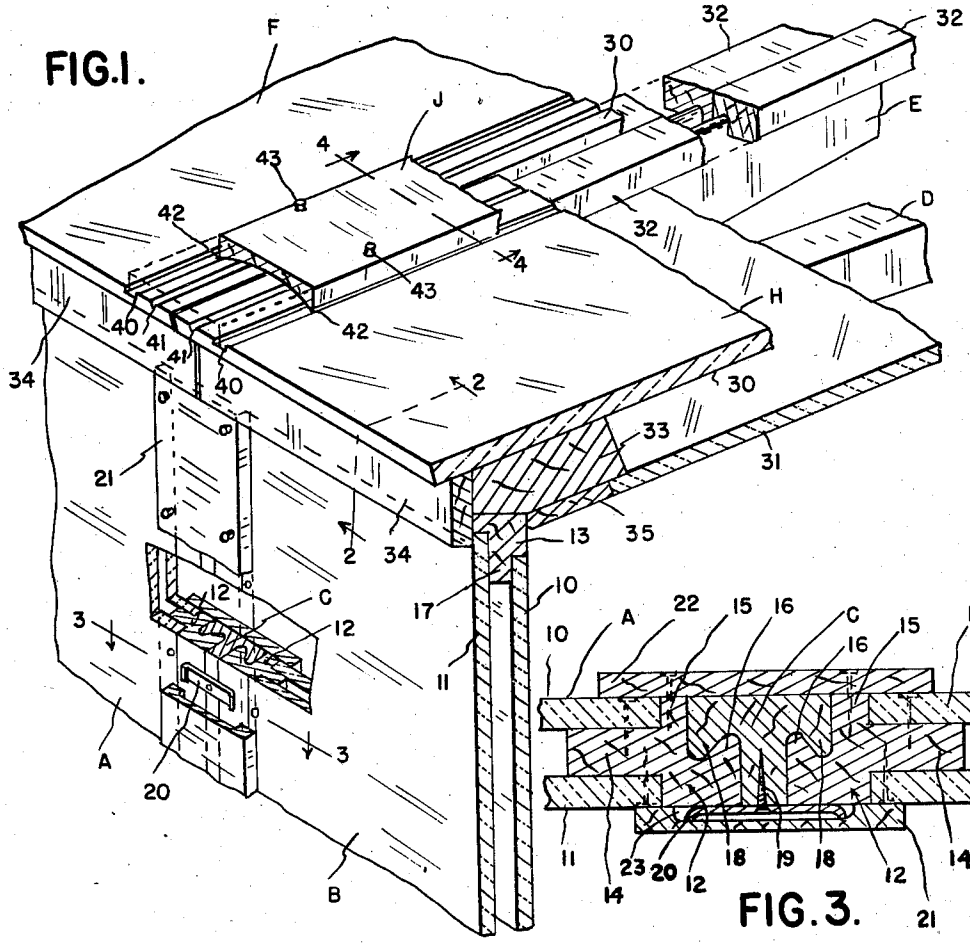
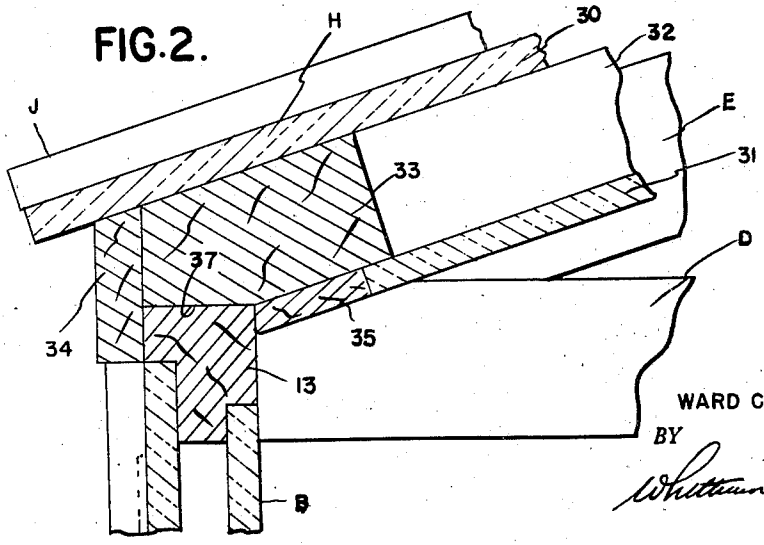


FIG.3.

FIG.2.



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BUILDING STRUCTURE

Filed April 19, 1943 3 Sheets-Sheet 2

FIG.4.

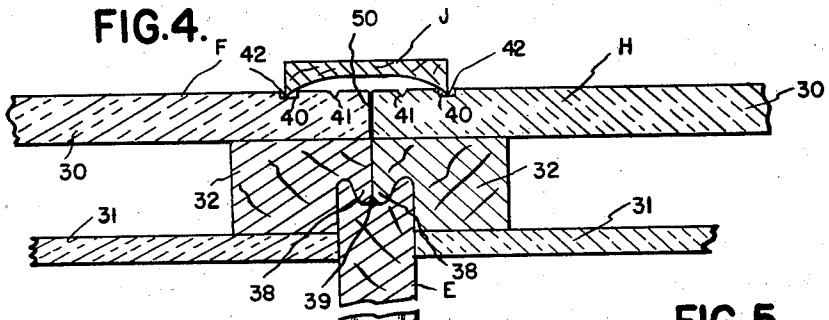
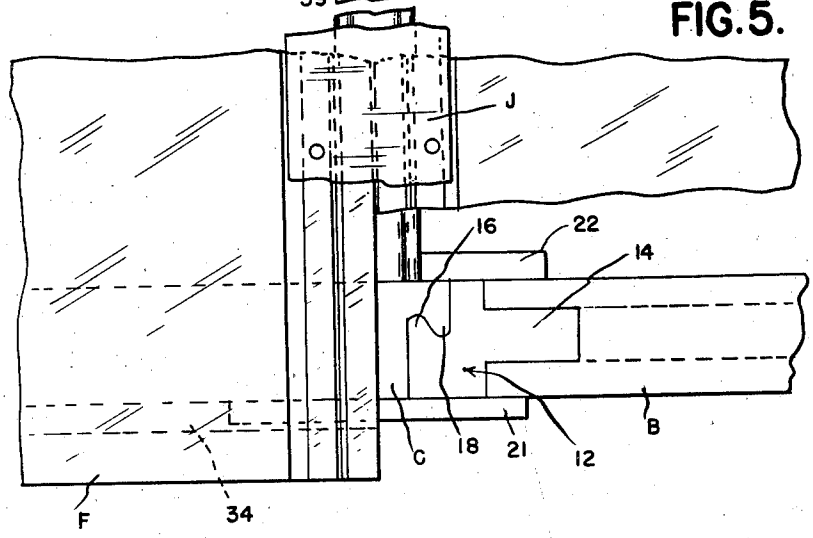


FIG.5.



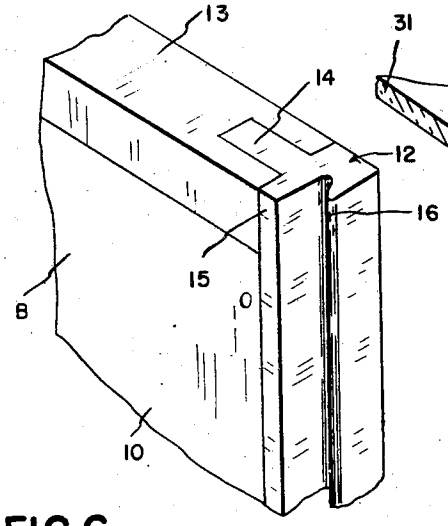


FIG.6.

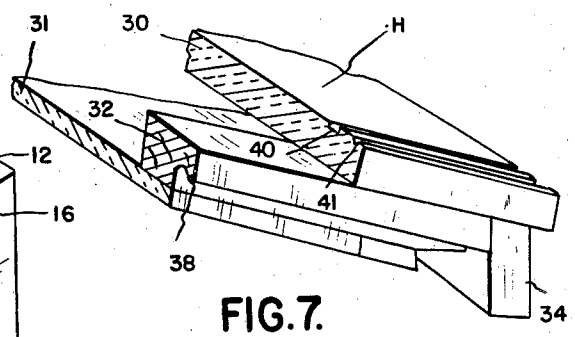


FIG.7.

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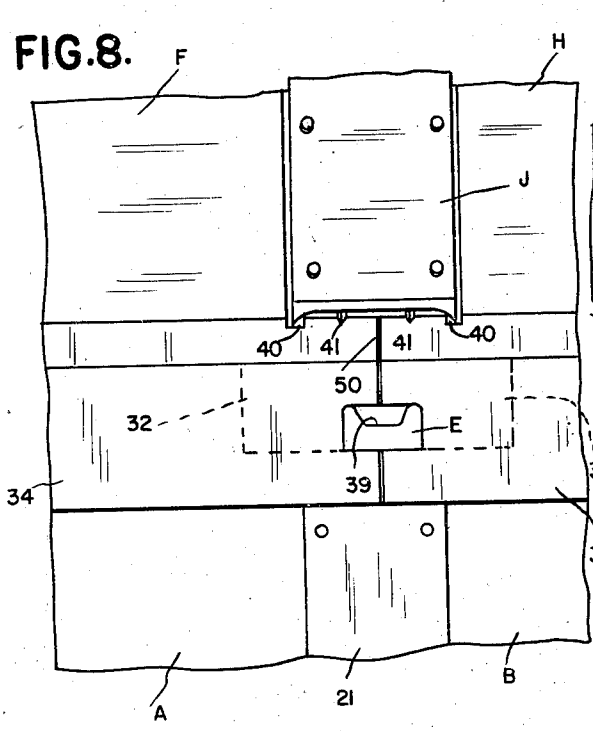
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June 4, 1946. W. C. SMITH 2,401,588

BUILDING STRUCTURE

Filed April 19, 1943 3 Sheets-Sheet 3

FIG.8.



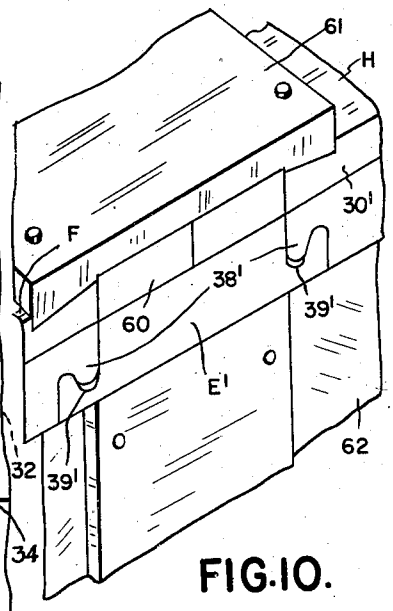
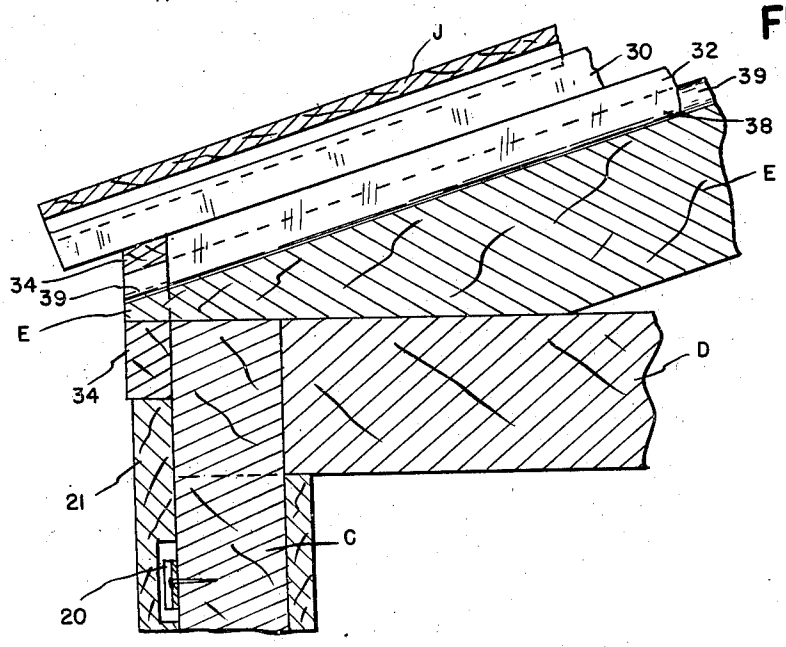


FIG.10.

FIG.9.



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Patented June 4, 1946 2,401,588

UNITED STATES PATENT OFFICE

2,401,588

BUILDING STRUCTURE

Ward Clinton Smith, Detroit, Mich., assignor to Stout Houses, Incorporated, Detroit, Mich., a corporation of Michigan

Application April 19, 1943, Serial No. 483,636

5 Claims. (Cl. 108—1)

1

This invention relates generally to building structures of the type that may be transported or shipped by the manufacturer in unassembled or knockdown condition and may be readily and quickly assembled by unskilled labor wherever they are to be erected or used, and refers more particularly to leakproof joints between adjacent roof sections of such structures.

This application is related to my copending application Serial No. 520,491, filed January 31, 1944.

One of the essential objects of the invention is to provide a structure of the type described wherein tongues or other suitable portions of adjacent roof sections cooperate with a groove in a common support for said sections to position the sections close together to provide a relatively tight joint.

Another object is to provide a roof structure wherein a batten or protecting strip covers the joint mentioned and cooperates with the roof board or sheathing to protect the joint from the weather elements.

Another object is to provide a roof structure wherein the roof board or sheathing upon opposite sides of the joint between the roof sections is provided with primary and secondary grooves to catch and drain off water and thereby prevent it from reaching the joint between the batten or cover strip aforesaid.

Another object is to provide a roof structure wherein the battens or cover strips are arched on the undersides thereof so that they straddle or span the joint between the roof sections and the secondary grooves in the roof board of said sections, and have relatively sharp edges at opposite sides of the arches that are received within and are adapted to bite into the bottoms of the primary grooves, preferably midway between the side edges thereof, to provide tight joints between the parts.

Another object is to provide a roof structure wherein suitable screws, double-headed nails and the like may be employed to hold the battens or cover strips in proper assembled position upon the roof boards of the sections.

Another object is to provide a structure that is simple in construction, economical to manufacture, easy to erect and efficient in use.

Other objects, advantages and novel details of construction of this invention will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawings, wherein:

Figure 1 is a fragmentary perspective view of a building structure embodying my invention, with parts broken away and in section;

2

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1;

Figure 3 is a sectional view taken substantially on the line 3—3 of Figure 1;

Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 1;

Figure 5 is a fragmentary top plan view of the structure illustrated in Figure 1, with parts broken away;

Figure 6 is a fragmentary perspective view of one of the upright wall sections;

Figure 7 is a perspective view of one of the roof sections, with parts broken away and in section;

Figure 8 is a fragmentary front elevational view of a slight modification;

Figure 9 is a vertical longitudinal sectional view through the structure illustrated in Figure 8;

Figure 10 is a fragmentary perspective view of another modification.

Referring now to the drawings, A and B respectively are adjacent upright side panel sections, C is an upright post or frame member between the upright sections A and B, D and E respectively are rafters or truss members, F and H respectively are adjacent roof sections of a building structure embodying my invention.

As shown, the upright panel sections A and B respectively have spaced substantially parallel sheets 10 and 11 respectively of insulating material, upright edge members 12, and horizontal edge members 13. The sheets 10 and 11 may be of any suitable size and thickness to provide a sturdy weather-tight siding, while the edge members 12 and 13 may be formed of any suitable material such as wood and are rigidly secured to said sheets.

Preferably, portions 14 of the upright edge members 12 extend between and constitute spacers for the sheets 10 and 11, while other portions 15 extend transversely across the upright edges of the sheets and are provided throughout their upright outer edges with hook-shaped attaching portions 16. Likewise, a portion 17 of the horizontal edge members 13 extends between and constitutes a spacer for the sheets 10 and 11.

The upright post C is between the edge members 12 of the adjacent panel sections A and B and is provided throughout opposite upright edges thereof with hook-shaped portions 18 with which the hook-shaped portions 16 of the edge members 12 of the adjacent panel sections have an interlocking or dovetail connection. Screws

19 are carried by the post C at vertically spaced points thereof and are engaged at their outer ends by suitable latch members in the form of elongated plates 20 which are adapted to overlap the outer surfaces of the edge members 12 of the panel sections A and B to maintain the parts in assembled relation, as illustrated in Figures 1 and 3 respectively.

Preferably the plates 20 are substantially equal in width to the outer surface of the post C and are adapted to be turned on the screws 19 so that such plates may register with the outer surface of the post C and thus be out of the way during assembly or disassembly of the side sections A and B with the post. However, when the hook-shaped portions 16 of the edge members 12 of the panel sections have been interlocked with the hook-shaped portions 18 of the post, the plates 20 may then be turned on the screws 19 from the upright inoperative position in registry with the outer surface of said post to a substantially horizontal position as illustrated in Figures 1 and 3 to overlap the outer surfaces of the edge members 12 of the side sections to thereby hold the parts in interlocked relation.

If desired, suitable strips 21 and 22 respectively may be employed upon the outer and inner sides of the post C to cover the connections or joints between said post and the adjacent panel sections A and B. Preferably such strips 21 and 22 are secured by nails or other suitable fastening elements to the edge members 12 of the panel sections and are sufficiently wide to overlap adjacent upright edges of the insulating sheets 10 and 11 of said panel sections.

The outer strip 21 has elongated recesses 23 for the plates 20 and such recesses extend transversely of the strip 21 so as to hold the plates 20 from accidentally turning on the screws 19 after being arranged in overlapping relation to the panel sections A and B. If desired, the inner strips 22 may be nailed or glued to the post C so as to form a rigid part thereof. Also the outer strips 21 may be fastened to the post C by means of screws or other suitable securing elements which preferably engage the post at points between the vertically spaced plates 20.

The rafters or truss members D and E are carried by the post C and support the roof sections F and H. Preferably the lower truss member D extends substantially horizontally between and is rigidly secured to the post C at opposite sides of the building, while the upper truss members E incline downwardly from a central ridge member (not shown) to opposite ends of the horizontal truss member D and are rigidly secured thereto.

The roof sections F and H are supported in inclined position upon and project laterally in opposite directions from the uppermost truss member E and overhang the upright side panel sections A and B.

Preferably each roof section has upper and lower panels 30 and 31 of insulating material, longitudinally extending spacer strips or frame members 32 between and rigid with said panels at opposite side edges thereof, transversely extending spacer strips or frame members 33 between and rigid with the panels at opposite ends thereof, and a facing board 34 rigid with and depending from the upper panel 30 in advance of the lower transversely extending member 33.

To provide a firm joint between the roof sections F and H and upright side panel sections A and B, the lower transversely extending members 33 of the roof sections are provided in spaced relation to the depending facing boards 34 with depending enlargements 35 that are preferably equal in thickness to and form continuations of the lower panels 31 of the roof sections and cooperate with the facing boards 34 to provide inverted channels 37 for receiving the upper edges of the upright side panel sections A and B and intermediate post C.

In the present instance the longitudinally extending frame members 32 of the roof sections A and B are provided throughout their outer edges with hook-shaped tongues 38 that are received in and urged together by opposite side walls of a longitudinally extending groove 39 in the upper edge of the upper truss member E so that a relatively tight joint is provided between the roof sections.

A batten or strip J covers the joint between the roof sections F and H and cooperates with the upper panels 30 of said sections to protect the joint between said sections from the weather elements. Preferably the upper panels 30 of the roof sections are provided upon opposite sides of the joint beneath the batten J with primary and secondary grooves 40 and 41 respectively to catch and drain off water and thereby prevent it from reaching the joint between the sections F and H. Also, the underside of the batten J is arched so that it straddles the joint between the roof sections and the secondary grooves 41 in the roof panels 30 and has relatively sharp edges 42 at opposite sides of the arch that are received within and are adapted to bite into the bottoms of the primary grooves 40, preferably midway between the side edges thereof, to provide a tight joint between the parts. Any suitable means such as screws 43, double-headed nails or the like may be used to hold the batten J in proper assembled position on the roof panels 30 of the roof sections.

Thus, from the foregoing, it will be apparent that the upright panel sections A and B, roof panel sections F and H, and other units or subassemblies of my structure may be made to proper specifications in one place and then shipped in knockdown or unassembled condition to another place where they can be easily and quickly set up and erected by unskilled labor. By using the dovetail connections between the panel sections A and B and post C it is possible to hold the perimeter of the structure to exact dimensions without the use of a separate fixed frame and without the need of any extra horizontal members within or upon the outer sides of the panel sections.

Due to the dovetail connections between the upright panel sections A and B and post C, and the connections between the truss members E and the roof panel sections F and H, the respective panel sections will be held closely together so that the joints are tight and self-sealing. In this connection it will be noted that the interlocked or dovetail connections between adjacent upright sections A and B and the post C effectively prevent the weather elements from entering the structure through such connections. Also, the interlocked or dovetail connections between adjacent roof sections F and H and truss member E insure a tight joint between said roof sections. The batten J covers the joint between the roof sections F and H and fits into the primary grooves 40 in the roof panels 30. Hence the batten effectively protects the joint between the roof sections from the weather elements. Any water or moisture on the roof sections F and H would be caught

by and would drain off in either the primary or the secondary grooves 40 and 41 respectively and therefore would be effectively prevented from reaching the joint between the roof sections.

The present construction is primarily intended for the erection of relatively small and inexpensive buildings, dwellings and the like, such as those now being used by the government for housing soldiers and workmen. However, it is apparent that many of the features of my construction may be employed inside large buildings such as factories during the erection of temporary or permanent rooms, offices and the like. Moreover, buildings of various sizes embodying the features of my construction may be erected inasmuch as the over-all number of upright side sections such as A and B and inclined roof sections such as F and H may be varied according to the size of the buildings desired.

It will also be noted that the structure has a high insulation value due to the double insulating sheet construction of the panel sections and to the tight joints between the parts. Hence, constructions embodying these features may be used very satisfactorily in either warm or cold climates.

If desired, the inclined truss members E may extend outwardly through the upright side panel sections A and B and facing board 34, as illustrated in Figures 8 and 9, so that the groove 39 in the truss members may receive and carry to the outside of the building any water or moisture that might seep downwardly through the joint 50 between the roof sections F and H. Thus, the truss members not only serve as structural elements for supporting the roof sections but also as supplemental drainage means for water on the roof, in case it should overflow the drainage grooves 40 and 41 and seep downwardly between the sections, as aforesaid.

In Figure 10 I have illustrated another modification wherein the supporting truss E' for the adjacent roof sections F and H is provided at opposite side edges instead of at the center thereof with grooves 39' for receiving the tongues 38' of the roof sections. In this construction a laminated batten 60 is secured to the truss E' between the upper panels 30' of the roof sections, and the joints between said panels and batten are covered by a suitable strip 61.

If desired, the upper surfaces of the panels 30' may be provided adjacent the batten 60 with drainage grooves such as 40 and 41 respectively illustrated in Figure 1, or may be plain. In either event, any moisture or water leaking between the roof sections and batten 60 will be caught by the underlying grooves 39' and directed thereby to the exterior of the adjacent upright wall 62 of the building.

What I claim as my invention is:

1. In a roof structure, a pair of adjacent panel type roof sections, a solid supporting rafter beneath said sections at the adjacent edges thereof and having an upwardly opening substantially V-shaped groove within and extending substantially throughout the length of its upper edge, each section having spaced top and bottom panels and spacer strips at the several edges thereof, the bottom panel of each roof section being of smaller area than the top panel thereof, the spacer strips at the adjacent edges of said sections having grooves receiving the adjacent side walls of the V-shaped groove in said rafter and having depending wedge-shaped tongues disposed in abutting face to face relation within the V-shaped groove in said rafter, the cross sectional construction of said V-shaped groove and engaging tongues being such as to maintain the adjacent edges of the top panels of said sections in edge to edge relation and to maintain the adjacent edges of the bottom panels of said sections in abutting relation against opposite sides of said rafter to reinforce the same and to conceal the tongue and groove connections between the adjacent spacer strips and rafters.

2. In a roof structure, a pair of panel type roof sections arranged in edge to edge relation, a solid supporting rafter beneath said sections at the meeting edges thereof and having an upwardly opening groove within and extending substantially throughout the length of its upper edge, each section having spaced top and bottom panels and spacer strips at the several edges thereof, the bottom panel of each roof section being of smaller area than the top panel thereof, the spacer strips at the meeting edges of said sections having grooves receiving the adjacent side walls of the groove in said rafter and having depending tongues disposed in abutting face to face relation within the groove in said rafter, the cross sectional formation of said groove and engaging tongues being such as to maintain said sections in edge to edge relation and to maintain the adjacent edges of the bottom panels of said sections in abutting relation against opposite sides of said rafter to conceal the tongue and groove connections between the adjacent spacer strips and rafter.

3. In a roof structure, a pair of adjacent panel type roof sections, a solid supporting rafter beneath said sections at the adjacent edges thereof and having an upwardly opening substantially V-shaped groove within and extending substantially throughout the length of its upper edge, each section having spaced top and bottom panels and spacer strips at the several edges thereof, the bottom panel of each roof section being of smaller area than the top panel thereof, the spacer strips at the adjacent edges of said sections resting on the upper edges of the adjacent side walls of the V-shaped groove in said rafter and having depending wedge-shaped tongues arranged side by side within and substantially filling the V-shaped groove in said rafter, the cross sectional construction of said V-shaped groove and engaging tongues being such as to maintain the adjacent edges of the top panels of said sections in edge to edge relation and to maintain the adjacent edges of the bottom panels of said sections in abutting relation against opposite sides of said rafter to conceal the tongue and groove connections between the adjacent spacer strips and rafter.

4. In a roof structure, a pair of panel type roof sections arranged in edge to edge relation, a solid supporting rafter beneath said sections at the meeting edges thereof and having an upwardly opening groove within and extending substantially throughout the length of its upper edge, each section having spaced top and bottom panels and spacer strips at the several edges thereof, the bottom panel of each roof section being of smaller area than the top panel thereof, the spacer strips at the meeting edges of said sections resting on the upper edges of the adjacent side walls of the groove in said rafter and having depending tongues arranged side by side within and substantially filling the groove in said rafter, the cross sectonal formation of said groove and engaging tongues being such as to maintain said sections in edge to edge relation and to maintain

the adjacent edges of the bottom panels of said sections in abutting relation against opposite sides of said rafter to conceal the tongue and groove connections between the adjacent spacer strips and rafter.

5. In a building structure, a pair of substantially flat panels arranged edge to edge, each panel having spaced top and bottom plate-like portions and spacer strips at the several edges thereof, the bottom portion of each panel being of smaller area than the top portion thereof, a separate supporting frame member for said panels located at the meeting edges thereof between said bottom portions and having an upwardly opening substantially V-shaped groove within and extending substantially throughout the length of its upper edge, the spacer strips at the

meeting edges of said panels resting on the upper edges of the adjacent side walls of the V-shaped groove in said frame member and having depending tongues arranged side by side within and substantially filling the V-shaped groove in said frame member, the cross sectional formation of said V-shaped groove and engaging tongues being such as to maintain the top portions of said panels in edge to edge relation over the adjacent spacer strips and to maintain the adjacent edges of the bottom portions of said panels in abutting relation against opposite sides of said frame member, whereby the tongue and groove connections between the adjacent spacer strips and frame member are reinforced and concealed.

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