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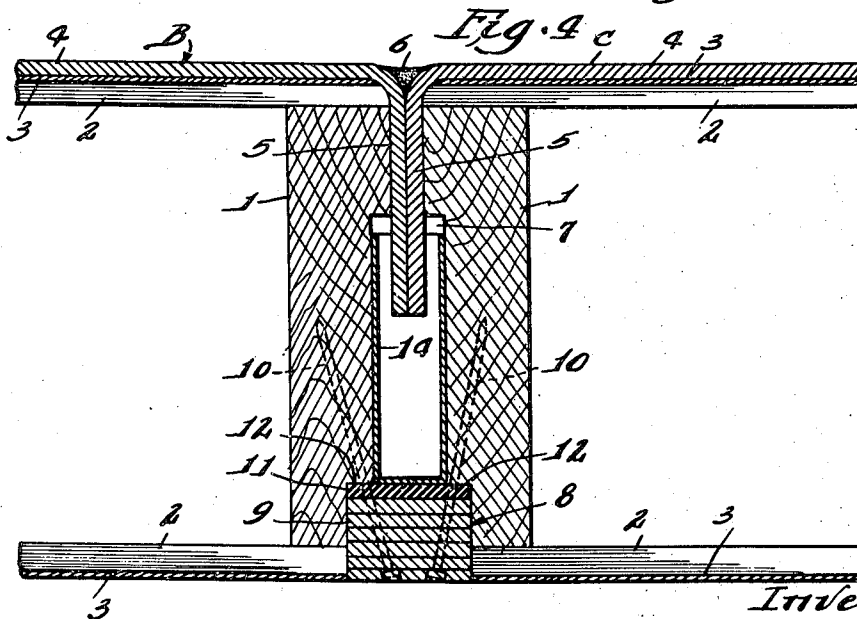
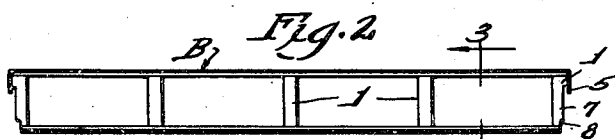
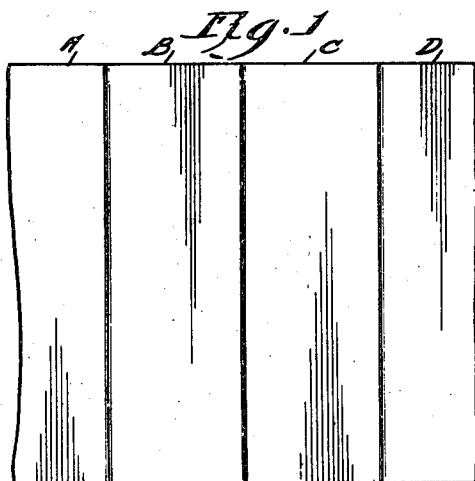
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2,452,640

ROOF AND WALL STRUCTURE

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3 Sheets-Sheet 1



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Fig. 5.

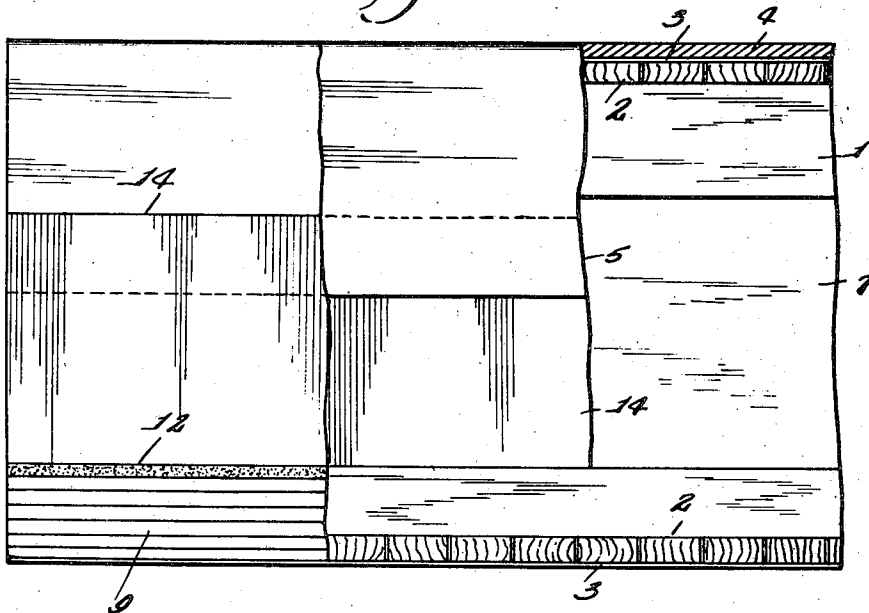
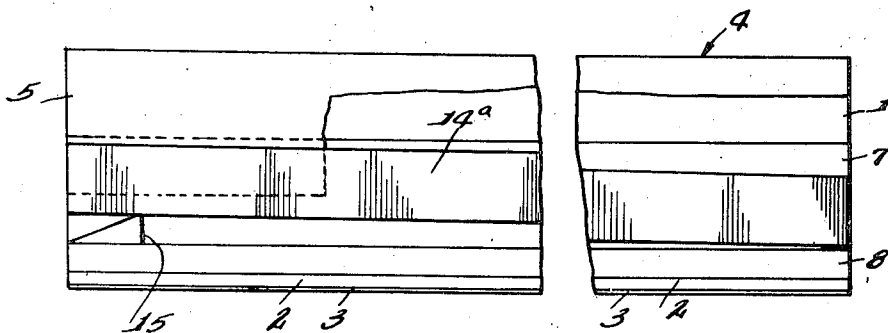


Fig. 6



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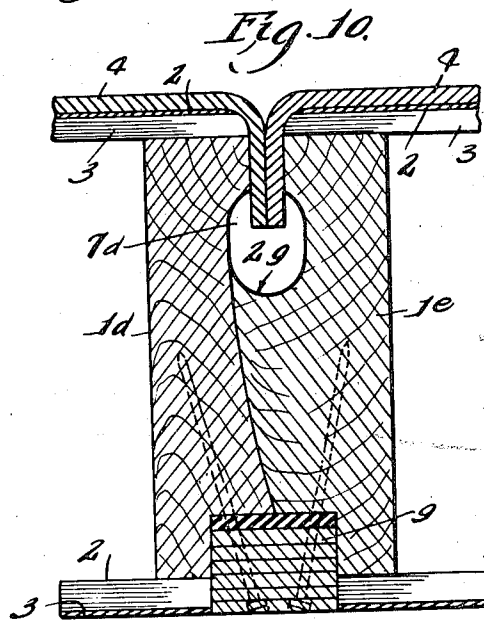
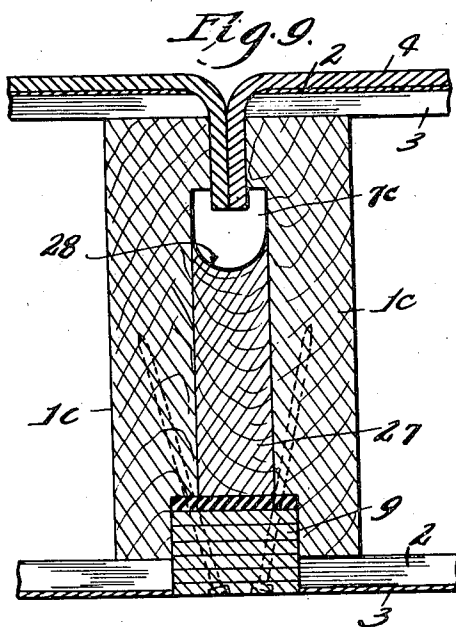
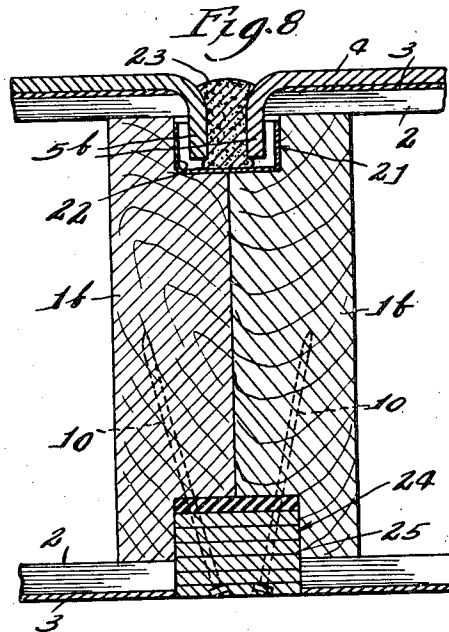
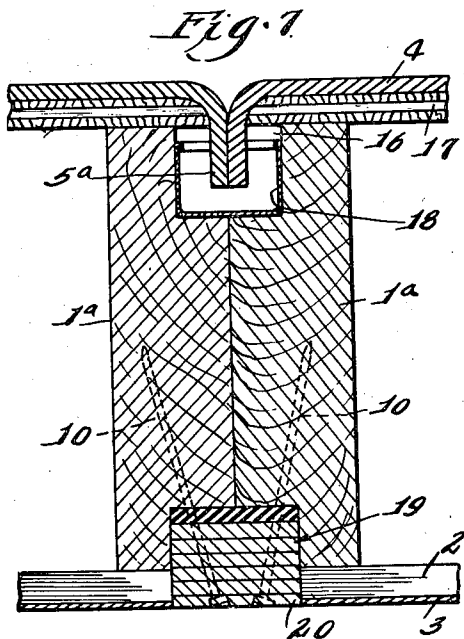
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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ROOF AND WALL STRUCTURE

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Application May 1, 1946, Serial No. 666,300

4 Claims. (Cl. 108—1)

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The present invention is intended primarily for use in the construction of prefabricated houses and the like, although it is also useful for building roofs or walls in structures of other kinds.

The main object of the invention is to make it possible quickly and easily to erect a wall or a roof which, although composed of a plurality of pre-formed panels, shall be leak proof regardless of whether it be horizontal, vertical or inclined.

A common method by which it is sought to create tight joints between panels in a wall or roof is to cover them with battens. These are unsightly, are apt to come loose and are seldom satisfactory. One of the objects of the invention is to produce joints that cannot leak, without the use of such battens.

In carrying out my invention I so construct panels that they are light, strong, adequately sheathed on the weather side, and can not only be manufactured at a reasonable cost but be installed with but little expenditure of labor. Viewed in one of its aspects, therefore, the invention may be regarded as having for its object to produce a simple and novel panel possessing those characteristics and advantages.

For simplicity in construction and ease in installation it is desirable that the panels be formed so that they need only abut, edge to edge, in their final positions of use. However, with conventional wall panels of that type, it has been found necessary to cover the joints with battens to prevent rain from driving through the joints. Viewed in one of its aspects, the invention may be said to have for its object to cause any water entering a joint between two panels to drain to the outside instead of passing through the joint to the inner side.

For the control of water leaking into a joint I provide in the latter a trough or gutter that forms a satisfactory barrier against the passage of water through the joint as well as a channel to carry the water to the outside again. Therefore, viewed in another of its objects, the present invention may be said to have for its object to produce a simple and novel construction and arrangement that permits quick and easy assembly of two preformed panels and a simple trough or gutter located and concealed in the joint between them, in the building of a wall or roof.

The various features of novelty whereby the present invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of the invention and of its various objects and advantages, reference may be had to the following detailed description

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taken in connection with the accompanying drawings, wherein:

Figure 1 is a view of the outside face of a section of a wall or roof composed of panels embodying the present invention; Fig. 2 is an end view of one of the panels, on a larger scale than Fig. 1; Fig. 3 is in part an edge view, showing one of the long edges of the panel of Fig. 2, and partly a longitudinal section on line 3—3 of Fig. 2; Fig. 4 is an end elevation, on a much larger scale, illustrating fragments of two panels at the joint between them; Fig. 5 is a view of one of the edges that meet in Fig. 4, with the gutter or trough and the nailing strip in place, and parts being broken away to expose details in several planes, one behind the other; Fig. 6 is a view, on a smaller scale than Fig. 5, of one long edge of a panel with a trough or gutter set into the same so as to have a slight inclination when the panel is horizontal as, for example, in a flat roof; Figs. 7 and 8 are views similar to Fig. 4, showing two slight modifications; and Figs. 9 and 10 are views similar to Fig. 4, showing two additional modifications in which the separate trough is omitted.

In Fig. 1 of the drawings A, B, C and D are like panels assembled edge to edge to form part of a wall or roof, flat or inclined. Although the details of construction of the panels may be varied in many ways, I shall confine the description to the preferred form illustrated. This particular panel is composed of what may be termed plates of wood spaced apart by beams interposed between them and rigidly fastened thereto by nailing or bonding; producing what is known as a "stressed skin" panel. The side of the panel that is to be exposed to the weather is covered with any usual or suitable sheathing material, bonded thereto, when possible. The opposite face of the panel may have thereon a paper liner.

A typical panel may be about thirty two inches wide and as long as the length of a roof or the height of a wall of which it is to form a part. The beams I may conveniently be one inch stock of a width determined by the thickness of panel desired. For walls the panels may be thinner than in the case of roofs, because the beam elements serve as columns in walls instead of as beams which they must do in roofs. For most purposes the beams may be about two and a half inches wide or deep in wall panels; the spacing in each instance being about eight inches between centers. The wood plates or faces may be plywood about one quarter of an inch thick, or a single layer of wood, slit so as to be divided into narrow strips and faced with tough paper,

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bonded thereto, may be used. In Figs. 1 to 5 the wood faces 2 are of slit wood, that may be Douglas fir, three sixteenths of an inch thick, for example; the paper 3 being thirty point Kraft. The paper is shown as being on the exterior on both sides of the panel. The side of the panel that is to be exposed to the weather, although it may be sheathed with metal, is shown as having a sheathing of saturated felt, mineral surfaced roofing material 4; the felt being about one eighth inch thick. The sheathing on each panel is extended beyond both long edges and is bent down to form flanges 5 lying snugly against the edge faces of the panel.

When two panels are placed side by side, with adjacent long edges meeting, the corresponding flanges are caused to contact each other throughout their entire lengths and widths. However, even though the joint be caulked, as at 6 in Fig. 4, a little moisture may trickle in between the flanges, particularly in the case of a flat roof. I therefore provide means within the structure for collecting such moisture and conducting it to one outer edge of a roof, for example, and there discharging it. Such means consists, primarily, of a tunnel 7 in and running lengthwise of the joint with at least that part that constitutes the top thereof, in the case of a flat roof construction, lying sufficiently close to the sheathed face to permit the flanges to project into the tunnel. Furthermore, the tunnel is wider than the combined thicknesses of the flanges, so as to leave space in the tunnel beside the flanges to serve as channels for carrying the moisture away. In the preferred form the tunnel is of such height or depth that the flanges do not bottom therein, thus presenting drip edges within the tunnel. The tunnels are conveniently formed by recessing both of the meeting edge faces of each pair of meeting panels. In a preferred construction the tunnel is deep enough to merge at the bottom into a groove 8 that is substantially wider than the tunnel and opens out through the bottom or back side of the panel assembly. When a sturdy strip of wood 9 is fitted in the groove between two panels, and nails 10 are driven through the strip and into both panels, the panels become firmly united. The strip is preferably a piece of thick plywood to provide strength and insure against splitting and change of shape.

The bottom of the tunnel may be sealed by a piece 11 of rubber or other suitable packing material, interposed between strip 9 and the shoulders 12 beside the bottom of the tunnel to make the joint vaporproof. By thoroughly waterproofing the sides of the tunnel, as by means of paint or varnish containing aluminum powder and using an elastic waterproof seal, such as the packing 11, the tunnel itself may be used to drain away the few drops that may seep through the joint 6. However, what I regard as being the surest means for drainage is a trough or gutter of metal or other satisfactory material extending throughout the length of the tunnel and spanning the distance between the sides of the latter. The trough or gutter is preferably so located with respect to the flanges of the sheathing that they project into the same, whereby any drippings from the flanges, in a roof structure, for example, will fall directly into the trough or gutter, without wetting the wood of the proximate beams. In the arrangement shown in Figs. 4 and 5 the trough or gutter 14 has flat sides and a flat bottom and is so proportioned that it substantially fills the tunnel, being only of slightly less height than

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the tunnel. Therefore the trough or gutter may be inserted through an end of the tunnel after the panels have been installed, or through the open bottom of the tunnel before the nailing strip has been put in place. Experience has shown that inserting the trough from below before placing the nailing strip is the most practical method of bringing it into position; and this is my preferred method. Also, the trough or gutter may be inserted sidewise into that half tunnel in the first of the two panels to be placed in position and then received in the other half of the tunnel when the second panel is installed. If the trough or gutter be formed from spring metal, it may be preformed to cause the sides to diverge a little from bottom to top, so that they must be sprung a little to fit the trough or gutter into the tunnel.

A separate trough is particularly useful for draining the possible seepage through the joints of perfectly level or flat roof. While the drainage end of the trough is preferably slightly below the opposite end, a great difference in elevation is not necessary on account of the relatively large volume of water that the trough will accommodate. Where the height of a tunnel is greater than that of the trough or gutter and the latter is so shaped out of spring metal that it must be sprung into the tunnel, it can be placed in an inclined position and be held there by the spring action of its sides. Or, as shown in Fig. 6, wherein the trough 14^a is relatively not as deep as the trough in Fig. 5, a little block 15 may be set under one end of the trough to hold it raised.

In the construction shown in Fig. 7 the tunnel 16 takes shape as a wide groove that is relatively shallow and opens out through the upper edges of beams 1^a, 1^b, directly below plywood faces 17. These faces overhang the tunnel, but only so far as to leave between them a gap through which the flanges 5^a on the sheathings 4 may extend. In this tunnel is a trough or gutter 18, similar to that in the first form, but much shallower. In this construction the meeting beams may be in engagement with each other throughout their lengths and the greater portions of their widths. The groove 19 and the nailing strip 20 may be the same as the corresponding elements in the first form, except that they may be narrower due to the fact that the beams in which the groove is cut are close together at the bottom of the groove, instead of being separated by the width of the tunnel. It will be seen that the flanges on the sheathing do not touch either the sides or the bottom of the trough or gutter, so that any moisture that enters between these flanges must drip into the trough in the case of a flat or inclined roof.

In Fig. 8 the tunnel 21 is similar, in location, to the tunnel in Fig. 7 and contains a low trough or gutter 22. The flanges 5^b, however, are spaced apart from each other and the gap between them is filled with calking 23. The beams 1^b are like beams 1^a, except to the extent that the tunnel and the groove 24 may differ in size from the corresponding elements in Fig. 7. The strip 25, through which nails are driven to secure the meeting panels together, is like those previously described and has the proper cross section to be a fit in its groove.

Panels embodying the present invention may be manufactured in various lengths. If a user desires a length shorter than the standard lengths he need only saw off a piece from the nearest longer size, because each panel is of uni-

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form cross section throughout. So far as the appearance of the panels is concerned, the only change in panels of a given type that need be made is in the sheathing. Since the sheathing will ordinarily be the last thing that is applied in the making of a panel, some panels may be left without sheathing so that any desired sheathing can be applied on demand. Such sheathing is preferably bonded in the factory to the supporting plywood with a waterproof cement.

Having brought together the proper panels for that purpose, the walls and roof of a prefabricated house, for example, very little time and effort are required to set up and secure together the panels to create such walls and roof. As heretofore explained, it is a simple matter to insert the troughs or gutters. In the matter of vertical walls or inclined roofs, it is enough that the troughs or gutters are in their tunnels, because they will compel moisture to flow out of either end of a panel which happens to be the low one. In the case of a flat roof, on the other hand, wherein the panels are horizontal, it is preferable to incline the troughs in the tunnels in the proper direction to cause moisture in the same to flow to the edge at which it is to be discharged.

No battens are needed on the outer side of a wall or roof, and, by setting the nailing strips in grooves on the inner side, batten-free ceilings and vertical inner wall surfaces are also obtained. Such batten-free walls, roofs and ceilings are greatly preferred by the building industry.

Because the wood faces of a panel constitute upper and lower chords or flanges for the wood beams between them, they absorb a considerable portion of the stresses set up within the panel when it is serving as a loaded beam or column. For this reason walls and roofs constructed in accordance with the present invention, although light in weight, are very sturdy and no additional material is required on the outside to provide a ridge at the joint for preventing drainage through the joint.

In Fig. 9 the structure is very similar to that of Fig. 4, the tunnel in beams 1^a, 1^b being partially closed by a filling strip 27, so that only the upper part 7^c remains. The upper edge of the filler strip has a groove 28 extending through the length thereof and forming the trough. The interior of this tunnel is waterproofed in the manner previously described, so that no separate trough is needed.

In the construction shown in Fig. 10, the meeting beams 1^d and 1^e are so shaped that the bottom of the tunnel 1^d is a groove, similar to groove 28 in Fig. 9, contained wholly in one of these beams. Thus the trough is simply the jointless bottom of the tunnel. When the interior of this tunnel,

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and particularly the trough member, is waterproofed, as aforesaid, any seepage into the tunnel is effectively carried away without danger of having a leaky joint.

I claim:

1. A wall or roof structure including two panels placed edge to edge, each panel having on one side a sheathing, the sheathings on both panels being extended in the form of flanges into the joint between the panels, the meeting edges of the panels being shaped to create a tunnel into which the flanges project, a separate trough extending lengthwise through the tunnel with said flanges extending into the same, the trough being of such a width that free space is left in the trough beside the flange, the panels being further shaped at said edges to produce on the second side thereof, a wide, deep, open groove following the joint, a strip in said groove, and fastenings passing through said strip into both panels.

2. A structure as set forth in claim 1, wherein the flanges extend a substantial distance into and stand clear at their lower edges of the sides and also the bottom of the trough.

3. A structure as set forth in claim 1, wherein the tunnel opens out into the groove on the second side of the structure, and wherein the groove is wider than the tunnel.

4. A wall or roof structure including two panels meeting edge to edge, each panel comprising two parallel wood facings and a group of parallel beams interposed and fixed to the same, one of the beams in each panel being at the edge that meets the other panel, and each panel having on one side a sheathing that is extended into the joint in the form of a flange, the meeting beams being cut away to form between them a tunnel that extends throughout the length of the beams and into which said flanges project facing each other and to provide on the side of the structure opposite that on which the sheathings are located a groove located partly in each panel, and a strip fitting into the groove and fastened to each panel.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,249,001	Bossert	Dec. 4, 1917
1,266,822	Knack	May 21, 1918
2,180,904	Jorgensen	Nov. 21, 1939

FOREIGN PATENTS

Number	Country	Date
9,223	Great Britain	1907