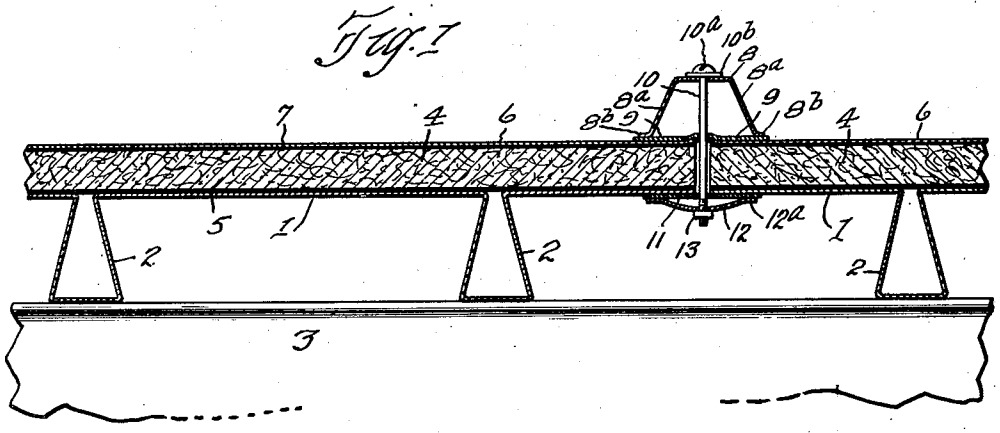
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ROOF CONSTRUCTION

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Fig. 1



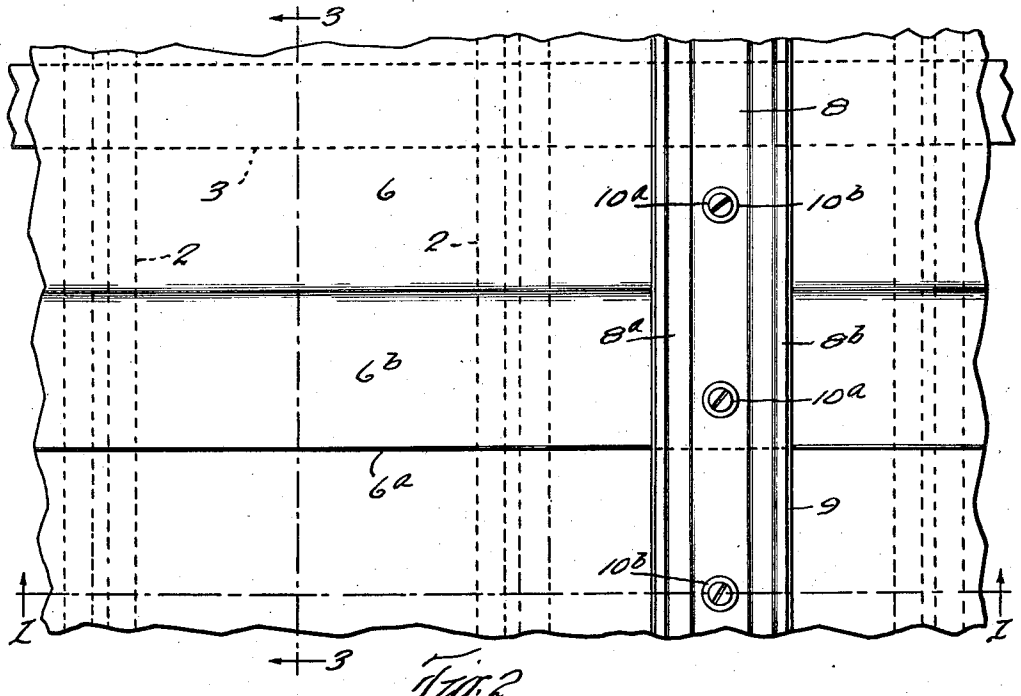


Fig. 2

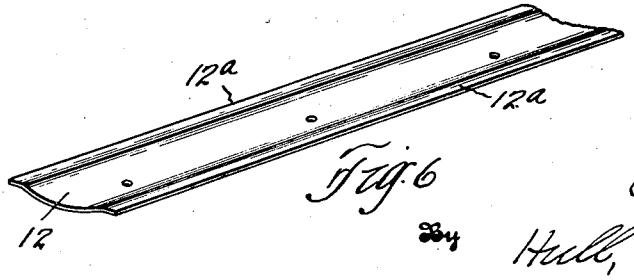


Fig. 6

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ROOF CONSTRUCTION

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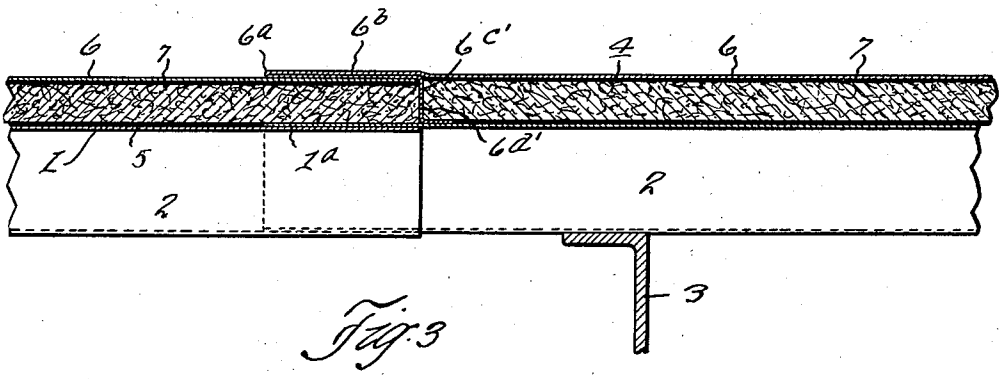


Fig. 3

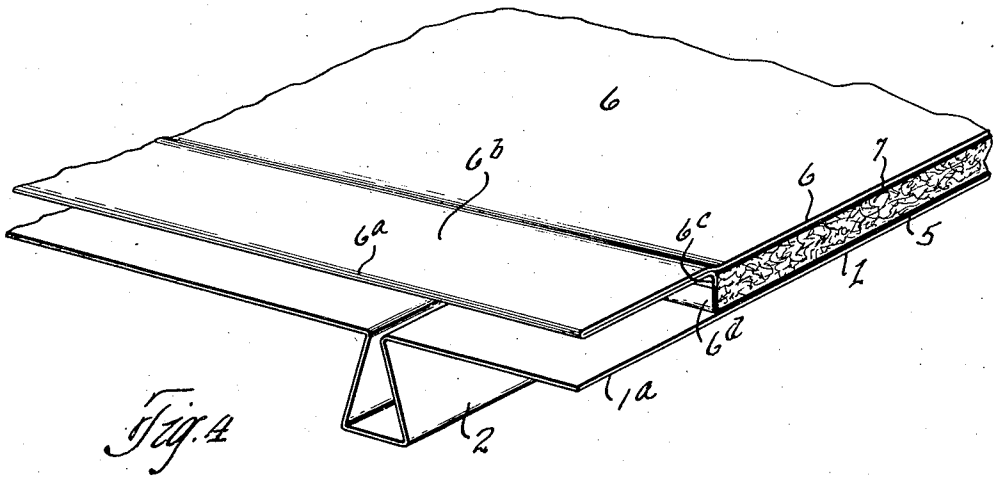


Fig. 4

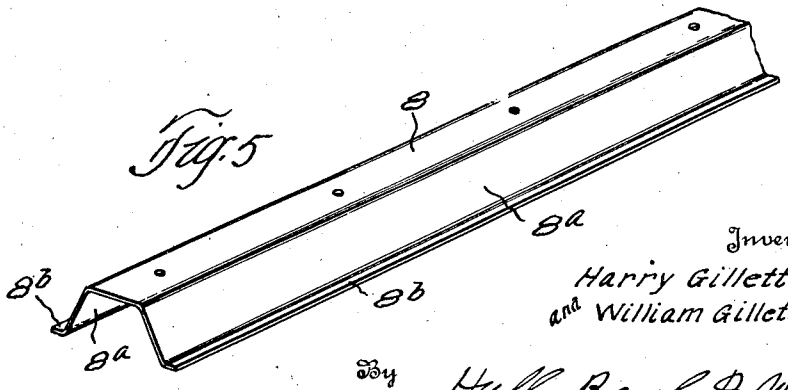


Fig. 5

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Patented Oct. 9, 1934 1,975,842

UNITED STATES PATENT OFFICE

1,975,842

ROOF CONSTRUCTION

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Application December 20, 1929, Serial No. 415,389

8 Claims. (Cl. 108—13)

This invention relates to building constructions, and more particularly to the production of insulated roofs. Heretofore it has been proposed to construct roofs by forming sheet-metal foundation units, each provided with supporting and reinforcing ribs projecting therefrom and adapted to support the units upon the roof beams or purlins, the units being so constructed as to permit their convenient assembly side-by-side thereby to provide longitudinal courses of units as well as to enable them to be assembled in shingled relation at their adjacent upper and lower ends or edges. The units having been so assembled upon the roof purlins, an insulated roof has been produced by adhesively securing a layer of fibrous insulating material upon the upper surfaces of the assembled units, after which a waterproof coating has been adhesively secured to the upper surface of the insulating layer.

One of the objects of our invention is to produce insulated waterproofed units of the general character referred to, each of which is complete in itself, so that, when shipped to a point of use, it is necessary only to assemble the units and secure them in place, whereupon a complete insulated and waterproofed roof will be produced, the roof so produced comprising a metal (preferably steel) base having thereupon a layer of insulating material and a waterproof coating.

A further object of our invention is to produce units as above described which are so constructed as to enable them to be quickly and conveniently assembled into an insulated and waterproofed roof structure.

A still further object of our invention is to provide a novel manner of assembling the units into a roof structure as well as to produce from an assembly of such units a roof which is light in weight, while possessing ample strength and insulating and waterproofing qualities.

Further and more limited objects of our invention will appear hereinafter and will be realized in and through the construction and arrangement of the parts shown in the drawings, wherein Fig. 1 represents a sectional view through a portion of a roof constructed in accordance with our invention, a part of one of the roof beams or purlins being shown in elevation; Fig. 2 a detail in plan of a portion of such roof; Fig. 3 a detail in section corresponding to the line 3—3 of Fig. 2; Fig. 4 a detail in perspective of the lower corner of one of our units showing a slightly modified form; Fig. 5 a detail in perspective of one of the ribs which cover the butt joints between the sides of adjacent units; and Fig. 6 a similar view of the flexible bar which cooperates with the bolts for securing the aforesaid ribs in place.

Describing the parts by reference characters, 1 represents the base or foundation of one of our units, the said base consisting of a metal sheet of suitable dimensions (preferably steel) having hollow triangular ribs 2 projecting from the bottom thereof, the said ribs being adapted to support the unit on top of a beam or purlin 3.

Secured on top of each such base or foundation is a layer 4 of suitable fibrous insulating material, the same being adhesively united to the top of the sheet 1, as by means of an asphalt coating 5; and secured to the top of the layer 4 is a waterproof covering 6, preferably of aluminum and adhesively united to the top of such layer by an asphalt coating 7.

The lateral edges of each aluminum sheet 6 are return bent, as indicated at 6^a, providing short flanges which, when the units are assembled side-by-side, as shown in Figure 2, will prevent moisture from entering the joint formed at and between such sides.

It will be understood that the units will be laid side-by-side to provide a longitudinal course of the desired length, with their side edges substantially abutting; and the joints between such side edges are each closed and the abutting edges secured together by the following means:— 8 denotes the top and 8^a the downwardly and outwardly extending sides of a hollow metal rib which is applied to and covers the joints between the side edges of two adjacent vertical courses of units. Where such units form a roof, or one side of a roof, the rib will be of sufficient length to cover the joint to the full height of the roof or roof side. The bottom of each side 8^a is provided with a horizontal flange 8^b, and these flanges engage each the outer edge of a strip 9, preferably of fibrous material, such as felt, and constituting a pad.

In order to secure the rib 8 in place and to hold the side edges of the units in proper relation to one another, I clamp the rib to such units by means of bolts 10 having their heads 10^a resting on washers 10^b on top of the rib 8, the bodies of the bolts extending through the space between the sides of the units, through a pad 11 (preferably of felt) applied to the bottoms of the metal sheets 1, the bolts extending also through a lower flexible arched cover bar 12, the flanges 12^a whereof bear against the lateral edges of the pad 11. By setting up the nuts 13 on the bottoms of the bolts, the side edges of adjacent units are clamped securely; and the yieldable nature of the bar 12 accommodates at the same time any expansion and contraction in the roof, due to temperature changes.

In order to enable the longitudinal courses to overlap each other in shingled relation, we have constructed the lower end of each unit in the manner shown in Figs. 3 and 4. As will appear from these views, the metallic cover sheet 6

extends a considerable distance beyond the bottom of the insulating layer 4, where it is bent upon itself at 6^a, providing an extension 6^b of doubled metal projecting from the lower end of such insulation, the end of the metal being bent at right angles partly across the lower end of the insulating layer 4, as shown at 6^c', the remainder of the lower end of such layer being covered with asphalt or other cementitious material, as indicated at 6^d'.

In Figure 3 we have shown the part 6^d consisting of a continuation of the member 6 instead of being asphalt. It is to be understood that either construction may be employed.

The sheet metal foundation 1 is also extended beyond the end of the insulating layer 4 a distance preferably equal to the distance of the projection 6^b, as shown at 1^a, and the ribs 2 extend the full length of the sheet 1, 1^a.

Each unit in the lower course is assembled within the lower end of the corresponding unit of an upper course by inserting the upper end of each lower unit within the U-shaped space provided between the projections 1^a and 6^b, at the same time inserting the ends of the ribs of the upper unit into the ends of the ribs of the lower unit, or vice versa, it being possible to make this insertion by contracting slightly the ends of the ribs to be inserted.

Our construction possesses the following advantages over any other construction for roofing or analogous surface with which we are familiar:

A roof may be made up from complete units, which units are made up at the factory and are shipped to the point of use, ready for assembly, each unit comprising a metallic support or deck having applied thereto a layer of insulating material, suitably waterproofed, as by means of the aluminum cover 4.

Due to the manner of constructing the units, they may be readily assembled on the job and the adjacent series of vertical courses may be quickly, conveniently and effectively secured together by means of the ribs 8—8^b, bolts 10, and spring bars 12, 12^a.

The roof or similar structure produced by the assemblage of the units is light and strong; but will provide an adequate protection for the structure to which it is applied.

Having thus described our invention, what we claim is:

1. A unit for building construction comprising a sheet metal foundation having ribs projecting from one surface thereof, a layer of insulating material secured to the opposite surface of such sheet, and a sheet metal cover secured upon the top of such insulating layer, the metal cover and the metal foundation of each such unit extending beyond the insulating layer at one edge of such unit thereby to provide between such projecting portions of the cover and foundation a pocket for the reception of an edge of an adjacent unit.

2. A unit for building construction comprising a sheet metal foundation having ribs projecting from one surface thereof, a layer of insulating material secured to the opposite surface of such sheet, and a sheet metal cover secured upon the top of such insulating layer, the metal cover at one edge of such unit extending beyond the insulating layer and being bent upon itself to form an extension of doubled metal, with the end of the metal so extended and doubled extending backward to and partly across the insulating layer, and the metal foundation and the ribs at such edge also extending beyond the insulating layer to provide with the doubled-metal edge of the cover a U-shaped pocket for the reception of an edge of an adjacent unit.

3. A unit for building construction comprising a sheet metal foundation, a layer of insulating material secured to the upper surface of such sheet, and a sheet metal cover secured upon the top of such insulating layer, the metal cover at one edge of such unit extending beyond the insulating layer and being bent upon itself to form an extension of doubled metal, with the end of the metal so extended and doubled extending across the insulating layer.

4. A unit for building construction comprising a sheet metal base, a layer of insulating material secured to the upper surface of such base, a sheet metal cover secured upon the layer of insulating material, the side edges of the said cover being provided each with an upwardly extending flange, and the bottom edge of each unit being provided with a U-shaped pocket formed by extensions of the top and bottom sheets beyond the insulating layer.

5. A unit for building construction comprising a sheet metal foundation, a layer of insulating material secured to the upper surface of such sheet, and a sheet metal cover secured upon the top of such insulating layer, the metal cover at one edge of such unit extending beyond the insulating layer and being bent upon itself to form an extension of doubled metal, with the end of the metal so extended and doubled extending entirely across the insulating layer and bent to underlie a portion thereof.

6. A unit for building construction comprising, a metallic foundation sheet having a layer of insulating material supported thereby and having portions projecting beyond the insulating material, a sheet cooperating with the sheet aforesaid to substantially enclose the insulating material and having portions extending beyond the latter cooperating with the portions aforesaid of the first mentioned sheet to form a recess for receiving an edge of an adjacent unit.

7. A unit for building construction comprising, a metallic foundation sheet having a layer of insulating material supported upon the top surface thereof and having a portion projecting beyond the insulating material, a sheet metal cover extending over the top of the insulating material and having a portion projecting beyond the latter cooperating with the portion aforesaid of said first mentioned sheet to form a substantially channel-shaped recess for receiving an edge of an adjacent unit.

8. A unit for building construction comprising a sheet metal foundation having supporting ribs projecting from one surface thereof, a layer of insulating material secured to the opposite surface of said sheet, and a layer of sheet metal secured to the upper surface of said insulating material and having an edge portion extending beyond the insulating material, said edge portion being adapted to overlap an edge of an adjacent unit to permit the insulating material of said units to be engaged.

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WILLIAM GILLETT.