

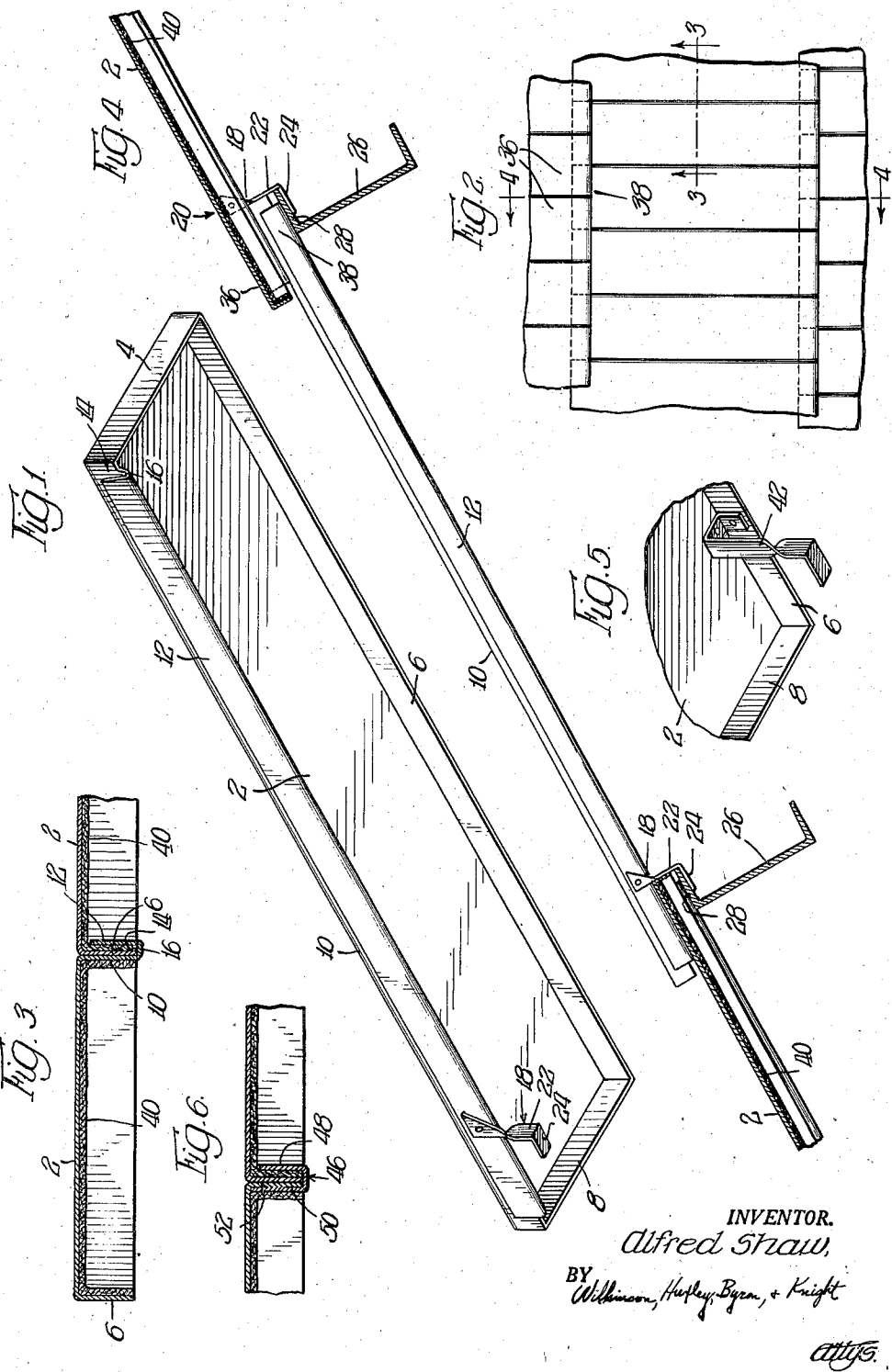
Sept. 14, 1948.

A. SHAW

2,449,330

ROOF STRUCTURE

Filed Feb. 15, 1946



INVENTOR.
Alfred Shaw,
BY *Williamson, Hurley, Byers, & Knight*

attys.

UNITED STATES PATENT OFFICE

2,449,330

ROOF STRUCTURE

Alfred Shaw, Chicago, Ill.

Application February 15, 1946, Serial No. 647,754

3 Claims. (Cl. 108-13)

1

This invention relates to a roof structure comprising panel sections made preferably of aluminum or other light metal or alloy, and associated supports of suitable shape such as channel purlins.

It is an object of this invention to provide an inexpensive and easily manufactured roofing structure, light in weight but of a durable quality and great strength.

Another object is to provide roofing sections or units which can be permanently applied with a relatively small expenditure of time and labor.

Another object is to provide roofing sections or units which have associated with each, as an integral part thereof, means of applying said section to the roofing supports, thus eliminating the need for separate holding devices such as nails, screws, or the like, and the labor required to install such holding devices.

Another object is to provide fastening means forming an integral part of each section, which utilizes the weight and disposition of the sections to increase the holding action of the fastening means.

Another object is to provide a roof structure which, in addition to the advantages mentioned, is completely incombustible.

Another object is to provide roofing sections or units which are not only easily installed but also can be removed, without damage, entirely or in small sections if the need should arise.

Another object is to provide a roof structure which is of a prefabricated construction and can be supplied in units of any desired size, thus eliminating the need for cutting or changing the size or shape to fit any particular roof area.

Another object is to provide a roof structure which has a series of gutters which act as drainage channels for any water falling on the roof at the longitudinal junctures of adjacent sections or flowing to such junctures. Each of the gutters is an integral part of each section of roofing.

With these and various other objects in view, the invention consists of certain novel features of construction and operation which will be more fully described and particularly pointed out in the specification, drawings, and claims appended hereto.

In the drawings, which illustrate embodiments of this invention and wherein like reference characters are used to designate like parts—

Figure 1 is a perspective view, as seen from below, of a roofing panel section made in accordance with this invention.

Figure 2 is a plan view of a number of panel

2

sections of roofing material showing their relative positions after the same are placed to constitute a roof.

Figure 3 is a transverse sectional view, taken substantially along the line 3—3 of Figure 2, showing two adjacent panel sections of the type illustrated in Figure 1 and one means of interlocking adjacent sections.

Figure 4 is a vertical sectional view, taken substantially along the line 4—4 of Figure 2, illustrating the relative location of the panel sections, fastening devices, and roofing supports.

Figure 5 is a fragmentary perspective view similar to Figure 1, showing an alternative form of fastening means for the panel sections; and

Figure 6 is a transverse sectional view of two adjacent sections showing an alternative method of interlocking adjacent sections.

Referring now to Figure 1, the panel section 20 may be formed of aluminum or a similar light metal or alloy, having a rectangular, flat surface 2 and depending side walls 4, 6, and 8 on three sides thereof, and a side wall 10 and flange 12 on the fourth side thereof. The flange 12 doubles back upon the side wall 10 so as to form a narrow channel 14 therebetween. The channel has a base 16 which is of a width sufficient to accommodate the adjacent side wall 6 of a similar section when the side wall 6 is inserted in the channel 14 of the first-named section. The bottom edge of the side wall 6 rests in the channel in contact with the base 16, as shown in Figure 3. The flange 12 extends upwardly to a line just below and parallel to the plane of the flat surface 2 and may be slightly shorter at both ends than the side 10 from which it extends.

A holding means 18 is secured to the flange 12, and may be located in the manner shown in Figures 1 and 4. The holding means is preferably formed as a rigid or integral part of the panel section. The holding means has a portion 22 extending downwardly in the direction of and parallel to the side wall 10 a distance equal to the height of side wall 4 plus the thickness of the upper flange 23 of the channel purlin 26, as shown in Figure 4. The holding means 18 has an additional portion 24 extending at an angle to the portion 22 and toward the side 8 of the section of which it is an integral part.

As shown particularly in Figure 4, the supporting framework of the roof to be used in carrying out this invention is made up of spaced channel purlins 26—26. These channel purlins are spaced a uniform distance from and parallel to each other. As shown in the drawings, the

panel sections are of a length slightly greater than the distance between adjacent purlins 26—26, and the holding means 18 is secured to each section at a point which is spaced from the upper end 4 of the section a distance substantially equal to the distance between adjacent purlins.

Accordingly, when the sections are disposed in relation to the purlins and to each other, as shown in Figures 2, 3, and 4, each section is secured in place by the holding means 18 at the point 20 where the holding means is secured to the section. Each section is further secured in place by the portions 36—36 of the two adjacent sections disposed immediately above it, which overlap and rest on the upper end 38 of the first-mentioned section, as shown in Figure 2. The flanged edge of each section is also held in place by the side 6 of the next adjacent section which rides within the narrow channel 14 formed by the flange 12 and side wall 10 of the section, as described above.

The position of each section, when disposed as shown in Figures 2, 3 and 4, is such that one component of the force of gravity exerted on each section is parallel to the plane of the top 2 of each section, and this component therefore tends to wedge the holding means 18 into tighter alignment with the upper edge 38 of the next lower section and the flange of the channel purlin 26. This arrangement can be characterized as a self-locking feature.

This self-locking feature is further enhanced by the fact that any force exerted in the aforesaid direction on the upper edge 38 of a section by the holding means of the next higher section, tends to displace the lower section in the same direction, which in turn results in a tighter engagement between the holding device 18 on the said lower section and the upper flange 28 of the channel purlin and upper portion 38 of the section below that.

This self-locking action, as shown above, is cumulative so that the larger the number of sections that are placed in a position above a particular section, the more tightly will be secured the holding device 18 of the first-named section.

The inside surface of each section may be covered with a sound and heat insulating material 40, as shown in Figure 3, by spraying with asphalt or similar material, with or without other materials admixed therewith. The same or similar material may be employed as a packing for the juncture of the side 6 of one section and the channel 14 of an adjacent section, whereby to insure a tighter fit.

An alternative design of holding means 42 is that shown in Figure 5. This means is so shaped that it can be secured to the inside or underside of the section adjacent to the wall 6 rather than the side having the flange 12 extending therefrom. In this case the holding means is so shaped that it will avoid interference with the flange 12 of the next adjacent section. This may be accomplished by having the holding means extend upwardly and thence downwardly as shown in Fig. 5. However, the holding means may be attached directly to the underside of the section at a point sufficiently inwardly from the edge to avoid all interference with the flange 12 of the next section.

If desired, two such holding devices of the type last described may be placed symmetrically on the underside of the section at the lower edge

thereof and spaced a short distance in from the respective sides.

Also, one of the holding devices 18 of the first type described, designed to be secured to the flange 12, could be used in conjunction with one of the second described holding means 42 designed to be secured to the side 6 without the flange. Both holding means could be provided for each section in the afore-mentioned manner so that they would engage the upper portion 38 of two lower sections and the upper flange 28 of the channel purlin 26.

Figure 6 illustrates an alternative method of forming the channel 46, the flange 48 being an element of U-shape cross-section, formed separately from the panel section and having one of its sides 50 secured by welding or similar means to the inside surface of the side 52 of the panel section.

It is to be understood that this application is not to be limited by the particular embodiments of the invention shown, as these are given merely by way of illustration and not limitation. Various and other forms of the invention will, of course, be apparent to those skilled in the art without departing from the spirit of the invention, and the claims are to be given the broadest possible scope permitted by the prior art.

What is claimed is:

1. A roof structure, comprising panel sections of aluminum or a similar light metal or alloy, each section being a long, rectangular, flat surface with narrow vertical sides, one of the longer sides having a flange extending from said side, said flange doubling back parallel to the side of which it is an extension and forming a narrow channel, between said flange and said side, wide enough to accommodate the unflanged side of a similar section, said flange extending upwardly to a line immediately below the plane of the aforementioned flat surface, said flange being slightly shorter than the side from which it extends, a holding means secured to the said panel section and forming an integral part thereof, extending downwardly in the direction of the aforementioned sides and parallel to them, and of sufficient length to securely clamp the said section and the upper end of an identical section, overlapped by and directly beneath the bottom end of the first-mentioned section, to the upper flange of a roof supporting member.

2. A roof structure, comprising panel sections of aluminum or a similar light metal or alloy, each section being a long, rectangular, flat surface with narrow vertical sides, one of the longer sides having a flange extending from said side, said flange doubling back parallel to the side of which it is an extension and forming a narrow channel, between said flange and said side, wide enough to accommodate the unflanged side of a similar section, said flange extending upwardly to a line immediately below the plane of the aforementioned flat surface, said flange being slightly shorter than the side from which it extends, a holding means secured to the said panel section and forming an integral part thereof, extending downwardly in the direction of the aforementioned sides and parallel to them, and of sufficient length to securely clamp the said section and the upper end of an identical section, overlapped by and directly beneath the bottom end of the first-mentioned section, to the upper flange of a roof-supporting member, said roof-supporting member being one of equally spaced channel purlins, and the spacing of the holding means on said panel sections being

5

such that the said sections will overlap the next lower panel sections from the holding means to the bottom ends of the overlapping sections.

3. A roofing member adapted to be supported with other similarly constructed roofing members in an inclined position in a manner to bridge the space between spaced purlins of a roof-structure, said roofing member comprising a rectangular panel of relatively thin, light material having narrow side walls depending therefrom, an extension on one of said side walls extending backwardly to form therewith a substantially U-shaped channel member, said extension being of slightly less length than the opposite side wall of said roofing member so that the channel member may receive and accommodate the side wall of a roofing member of similar construction placed adjacent to and to one side thereof, said roofing member having holding means extending downwardly therefrom having a portion adapted to engage the lower of the associated purlins and to maintain by such engagement, said roofing member in position bridging the space between adjacent purlins and with its lower edge resting on and overlapping the

6

upper edge of a similarly constructed roofing member placed adjacent thereto but below the same, said holding member further serving to hold said roofing member against downward movement in the direction of the incline of said roofing member and at the same time anchor said roofing member and the underlying upper edge of the adjacent roofing member against the supporting purlin common thereto.

ALFRED SHAW.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
414,069	Murphy -----	Oct. 29, 1889
2,004,198	Fall -----	June 11, 1935
2,150,217	Gettleman -----	Mar. 14, 1939

FOREIGN PATENTS

Number	Country	Date
98,758	Australia -----	1924