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Herman

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[54] **ROOF CONSTRUCTION**

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[52] **U.S. Cl.** **52/465,** 52/520

[51] **Int. Cl.** **E04d 3/366,** E04d 3/40

[58] **Field of Search** 52/465, 32, 57, 470, 52/493, 519, 520, 545, 549

[56] **References Cited**

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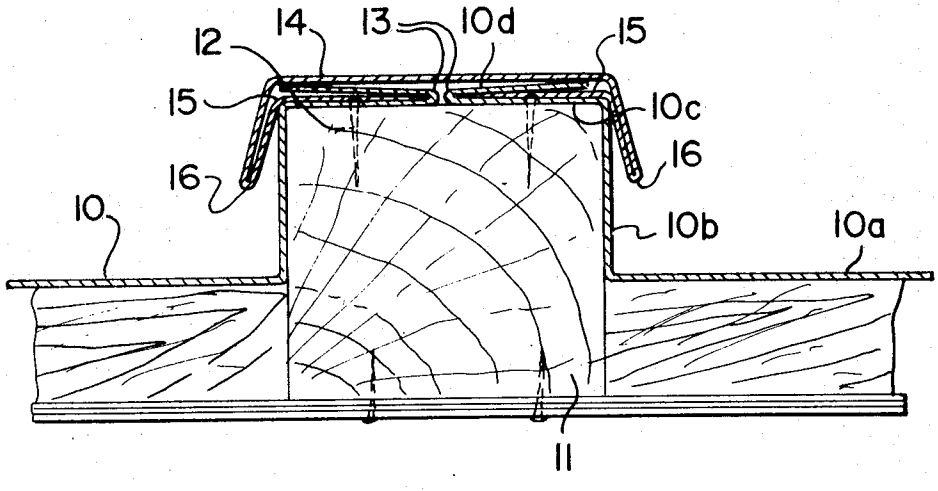
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[57] **ABSTRACT**

A roof structure comprises an assembly of sheet metal panels secured to a rafter by securing means extending through the panels, and has a waterproof panel joint in which the adjacent marginal edges of a pair of panels are folded back to overlie the securing means. The pair of panels thus provide a pair of generally parallel adjacent fold edges, and these fold edges are shrouded by a sheet metal cap having a pair of retroflex marginal edge portions interleaved with the folded marginal edge of the panels and retained thereby. The panels are each stepped adjacent to their marginal edges to conform to the shape of the rafter to which they are secured, and the marginal edge portions of the cap provide a pair of fold edges which project downwardly and outwardly from the tops of the steps formed by the panels.

4 Claims, 7 Drawing Figures



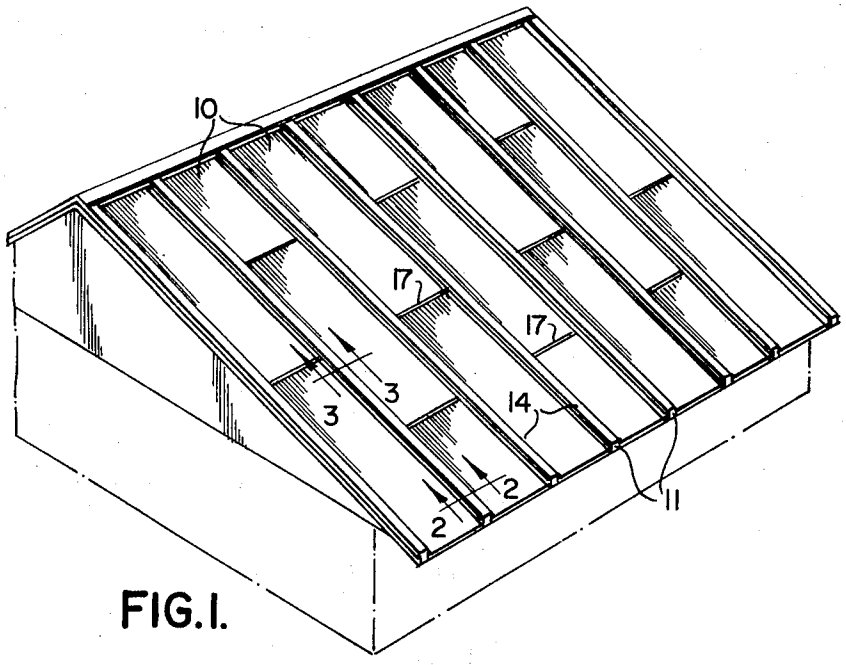


FIG.1.

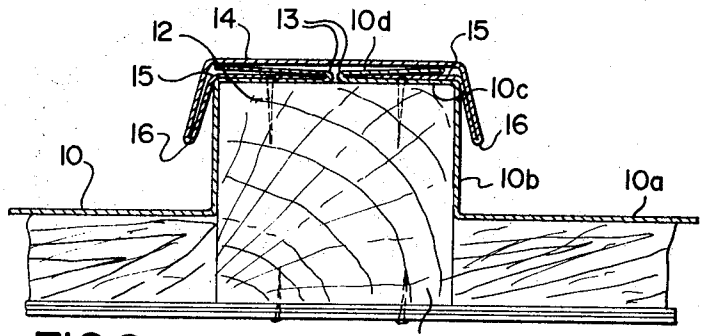


FIG.2.

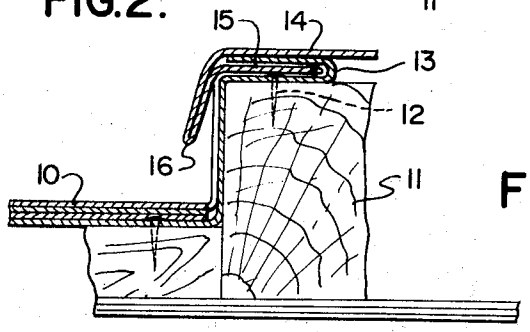


FIG.3.

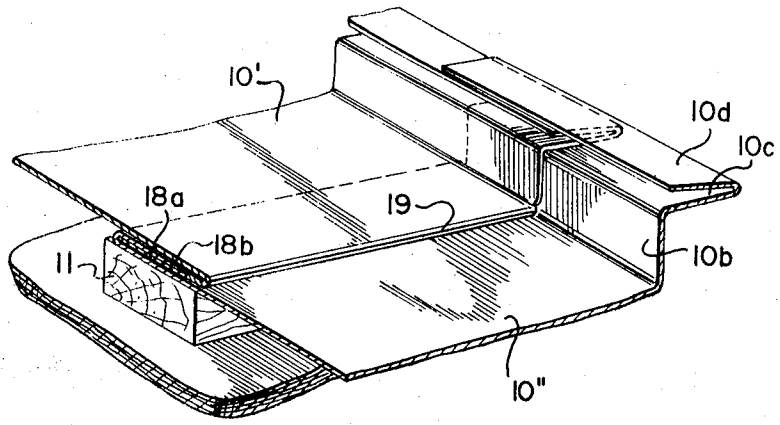


FIG. 4.

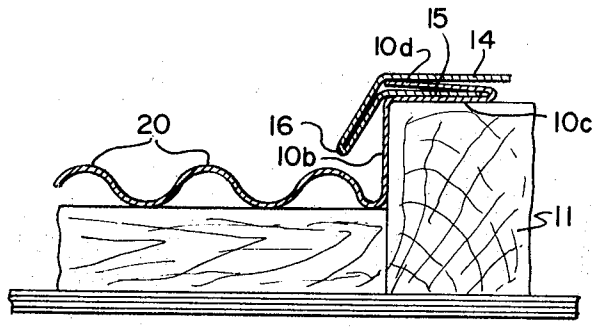


FIG. 5.

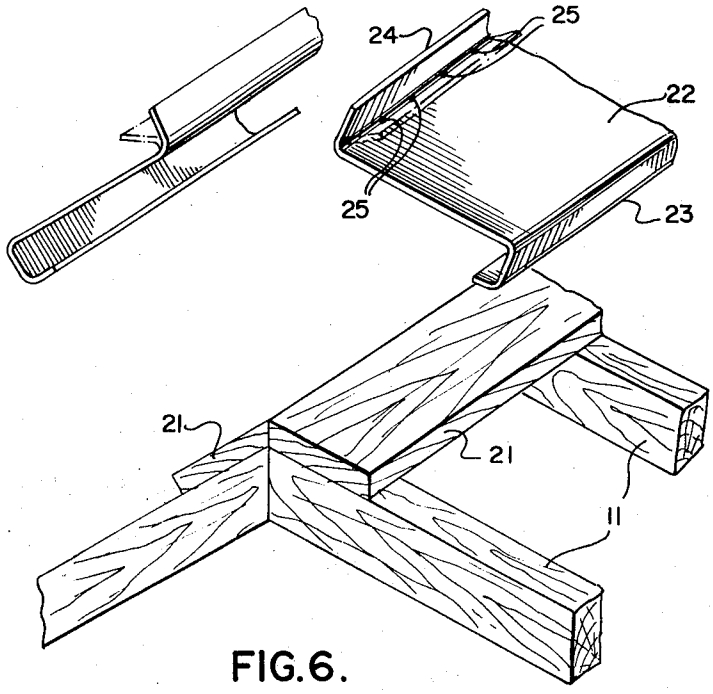


FIG. 6.

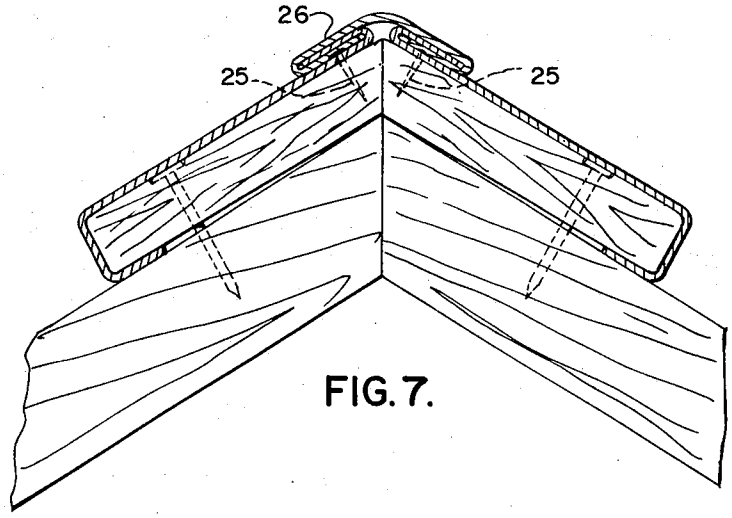


FIG. 7.

ROOF CONSTRUCTION

This invention relates to sheet metal roof structures, and particularly to panel joints therefor.

One form of metal roofing, which is very widely used on account of its being relatively inexpensive and easy to install, comprises an assembly of corrugated sheet metal panels secured to rafters, the corrugations lying parallel to the rafters and the edges of adjacent panels overlapping. The panels are secured to the rafters by securing means such as roofing nails which necessarily extend through the panels.

Despite the convenience and cheapness of this form of roofing, it is generally unsatisfactory because of leakage at the edges of the panels, and because the roofing nails rust with the results that the panels secured by them become loose. Alternative sheet metal roofing is presently available, but its cost is prohibitive for many applications where it could be used.

The present invention provides a relatively inexpensive sheet metal roofing in which the more serious disadvantages of presently available corrugated roofing are overcome.

According to the invention there is provided, in a roof structure comprising an assembly of sheet metal panels secured to rafters by securing means, such as roofing nails, extending through the panels, a weatherproof panel joint in which the adjacent marginal edges of a pair of panels are folded back to overlie the securing means, the pair of panels thus providing a pair of generally parallel adjacent fold edges, in which the adjacent fold edges are shrouded by a sheet metal cap having a pair of retroflex marginal edge portions, which are interleaved with the folded marginal edges of the panels and retained thereby, and in which the panels are each stepped adjacent to their marginal edges to conform to the shape of the rafter to which they are secured, the marginal edge portions of the cap providing a pair of fold edges which project downwardly and outwardly from the tops of the steps formed by the panels.

In order that the invention may be readily understood, one embodiment thereof will now be described by way of example with reference to the accompanying drawings, in which:

FIG. 1 is a perspective view from above of a roof structure in accordance with the invention;

FIG. 2 is a section on line 2—2 in FIG. 1;

FIG. 3 is a section on line 3—3 in FIG. 1;

FIG. 4 shows a detail of a joint at the longitudinal edges of a pair of adjacent panels;

FIG. 5 is a sectional view similar to FIG. 2 of a detail of a structure employing corrugated sheet metal panels;

FIG. 6 illustrates the manner in which a weatherproof joint is formed at the roof peak; and

FIG. 7 is a cross-sectional view of the finished roof peak.

Referring to FIGS. 1 to 4 there is illustrated a roof structure comprising an assembly of rectangular sheet metal panels **10**, which are nailed to the rafters **11** of a roof frame by roofing nails **12**, which extend through the panels. FIG. 1 shows the panels **10** to be arranged in a staggered array, but they need not be so; indeed a single panel may cover the space between each pair of rafters.

The rafters **11** in the illustrated embodiment project above the general plane of the roofing defined by the panels, as best shown in FIGS. **2** and **3**. Each panel has

a generally flat covering portion **10***a* (FIG. **2**) which lies in the plane of the roofing and extends longitudinally from one rafter to the next, the covering portion **10***a* being bounded by a pair of parallel upstanding wall portions **10***b*, which define steps. The wall portions **10***b* conform to the cross-sectional shape of the rafters and are folded over the upper surfaces of the rafters to provide securing portions **10***c*, the securing portions **10***c* being secured to the rafters **11** by the nails **12.** The adjacent marginal edges **10***d* of each pair of panels are folded back to overlie the heads of the nails **12.** Thus, the pair of panels provide a pair of generally parallel adjacent fold edges **13.**

The fold edges **13** are shrouded by a sheet metal cap **14** which is designed to prevent leakage of the panel joint. The cap **14** has a pair of retroflex marginal edge portions **15,** constituting a pair of inwardly directed lips, which are interleaved with the folded marginal edges **10***d* of the panels **10** so as to be retained thereby. The caps **14** thus form leakproof shrouds or covers for the lateral marginal edges of the panels, and for the securing nails **12.** It will be noted that the edge portions of the caps are folded so as to form a pair of fold edges **16,** which project downwardly and outwardly from the tops of the steps **10***b* of the panels.

The structure of the longitudinal joints **17** between adjacent panels **10** of the illustrated embodiment is illustrated in FIG. **4.** As illustrated in this Figure, the adjacent longitudinal marginal edges **18***a*, **18***b* of the adjacent panels **10'**, **10''** are folded back and interleaved so as to form a downwardly facing step **19,** that is to say a step formed by a fold edge of the upper panel **10'** which faces the lower panel **10''**.

Instead of there being a plurality of panels between adjacent rafters as shown in FIG. **1,** there may be a single corrugated panel of the form shown in FIG. **5,** the corrugations **20** of which extend parallel to the rafters **11.** In other respects this alternative construction is similar to the construction illustrated in FIG. **2,** and the same reference numerals are used to denote corresponding parts.

FIGS. **6** and **7** illustrate how a weatherproof joint is formed at the ridge of the roof. A pair of beams **21** are nailed to the rafters **11** to form a longitudinal ridge of A-section. To each of the beams are nailed a plurality of panels **22,** each panel **22** extending for the distance between a pair of rafters. Each panel **22** has a flange portion **23** which fits round the lower edge of the respective beam **21,** and a marginal edge portion **24** which is folded back so as to overlie the nails **25** by which the panel is nailed to the beam. Finally, a cap **26** extending for the full length of the ridge is formed with a pair of inwardly directed marginal edge portions which are interleaved with, and retained by, the marginal edge portions **24** of the panels **22.** In the event that a number of panels **22** are required to form the full length of the ridge of the roof, the individual panels may be joined longitudinally by the same general arrangement of folding and interleaving as has been illustrated at **18***a*, **18***b* and **19** in FIG. **4.**

It is clear that the foregoing represents a distinct advance in the art of roof construction which could prove of decided benefit to the public generally.

I Claim:

1. In a roof structure comprising an assembly of sheet metal panels secured to a rafter by securing means extending through the panels, a weatherproof panel joint

in which the adjacent marginal edges of a pair of panels are folded back to overlie the securing means, the pair of panels thus providing a pair of generally parallel adjacent fold edges, in which the adjacent fold edges are shrouded by a sheet metal cap having a pair of retroflex marginal edge portions which are interleaved with the folded marginal edges of the panels and retained thereby, and in which the panels are each stepped adjacent to their marginal edges to conform to the shape of the rafter to which they are secured, the marginal edge portions of the cap providing a pair of fold edges which project downwardly and outwardly from the tops of the steps formed by the panels.

2. A roof structure according to claim 1, wherein each panel provides a corrugated surface, the corrugations of which extend parallel to the rafters.

3. A roof structure comprising an array of rectangular sheet metal panels supported by a roof frame, each panel extending between a pair of adjacent rafters of the roof frame and being secured thereto by nails,

wherein the lateral marginal edges of the panels are folded back to overlie the nails, the adjacent marginal edges of each pair of panels thus providing a pair of generally parallel adjacent fold edges, wherein each pair of adjacent fold edges is shrouded by a sheet metal cap having a pair of retroflex marginal edge portions which are interleaved with the folded marginal edges of the panels and retained thereby, and wherein the panels are each stepped adjacent to their marginal edges to conform to the shape of the rafter to which they are secured, the marginal edge portions of the cap providing a pair of fold edges which project downwardly and outwardly from the tops of the steps formed by the panels.

4. A roof structure according to claim 3, including a plurality of panels between each pair of rafters, wherein the adjacent longitudinal marginal edges of the panels are folded back and interleaved so as to define a downwardly facing step.

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