Aug. 10, 1954 K. GÖDEL 2,685,852

ROOF COVERING

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Fig. 1.

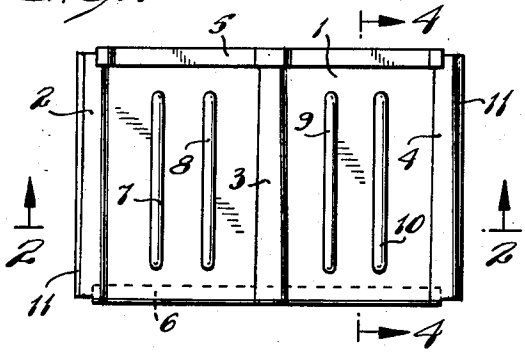
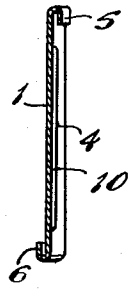


Fig. 4.



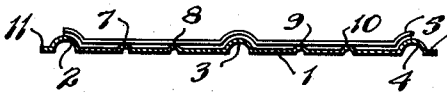


Fig. 2.

Fig. 3.

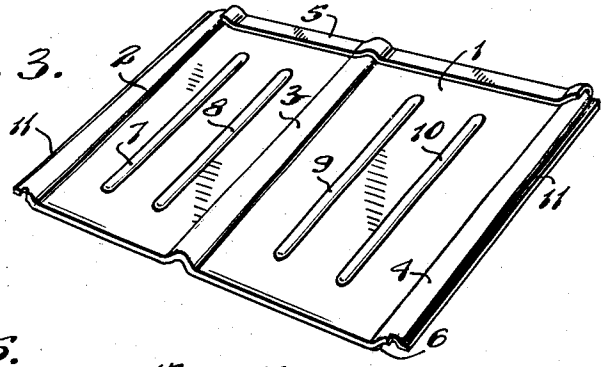


Fig. 5.

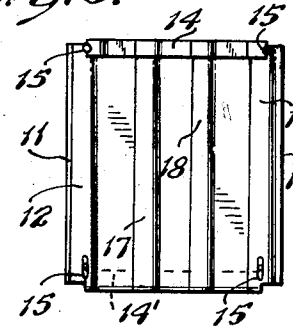


Fig. 7.

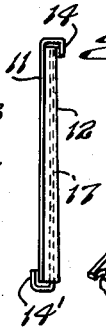
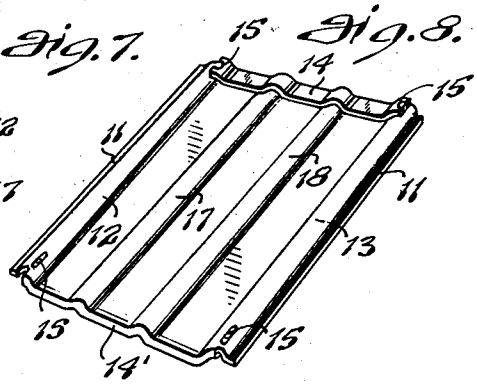


Fig. 8.



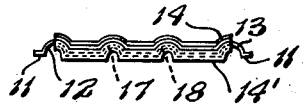


Fig. 6.

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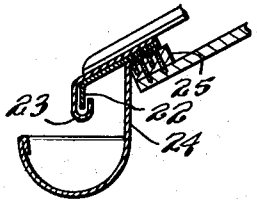


Fig. 9.

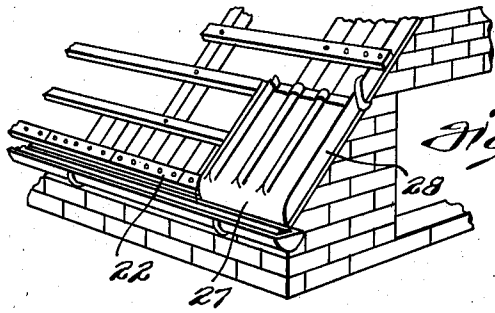


Fig. 10.

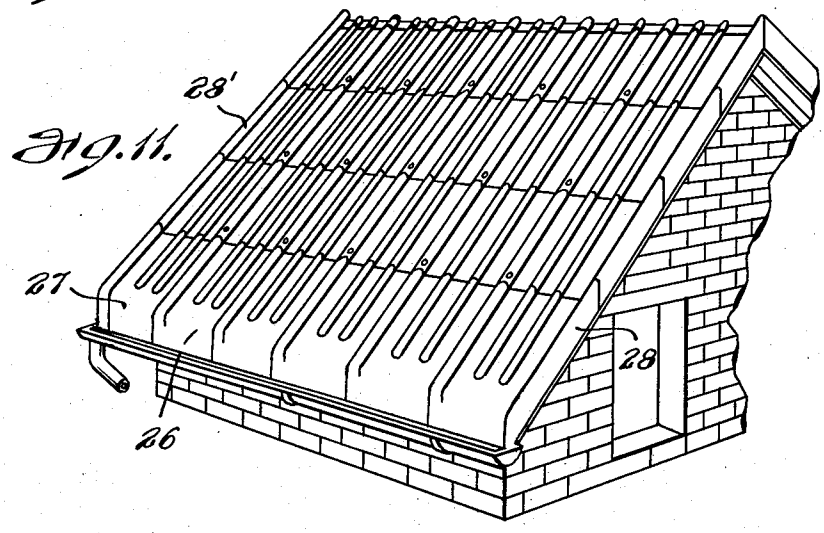


Fig. 11.

Fig. 12.



Fig. 14.

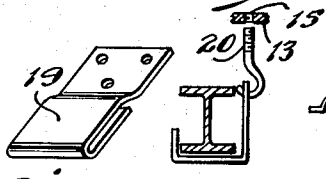


Fig. 13.

Fig. 15.





Fig. 16.

Fig. 18.



Fig. 17.

Fig. 19.

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ROOF COVERING

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Application January 30, 1952, Serial No. 268,993

Claims priority, application Austria
August 30, 1951

8 Claims. (Cl. 108—17)

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This invention relates to a roof covering, preferably of metal, plastic or other suitable material.

Roof coverings of sheet metal are known and also light metal elements similar to roof tiles and roof coverings composed of all the necessary elements of that type.

It is one object of the present invention to provide a roof covering which is simple, inexpensive, light, quickly fitted, and machine-made and which forms a cohesive, storm-proof and rain-proof whole.

It is another object of the present invention to provide a roof covering comprising plates which may be hung on to one another by means of transverse folded portions at the opposite sides of their upper and lower edges, in the direction of the height of the roof, and which may be well and tightly joined at the side edges, in the direction of the length of the roof through the alternating action of the transverse folded-over portions and of hollow beads.

With these and other objects in view, which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, in which:

Figure 1 is a plan view of a normal roof plate,

Fig. 2 is a section along the lines 2—2 of Fig. 1,

Fig. 3 a perspective view of the plate, and

Fig. 4 a section along the lines 4—4 of Fig. 1;

Fig. 5 is a plan view of another form of construction of the roof plate;

Fig. 6 is an elevation of the lower edge;

Fig. 7 is a side view, and

Fig. 8 is a perspective view of this form of construction;

Fig. 9 is a cross-section through the lower edge of the roof with the eave piece of the roof covering and the eaves;

Fig. 10 shows a perspective view of the roof framing with the eave pieces and an edge plate;

Fig. 11 shows a perspective view of a finished roof with the roof covering;

Fig. 12 shows an end view of one embodiment of the fastening means;

Fig. 13 shows a perspective view of the means shown in Fig. 12;

Fig. 14 shows an end view of another embodiment of the fastening means;

Fig. 15 shows a roof plate in the form of a corrugated sheet;

Fig. 16 is a section along the lines 16—16 of Fig. 15; and

Figs. 17, 18 and 19 show three examples of the beads of the roof plate in cross-section.

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The plate 1 (Fig. 1) may have its longer side in the transverse direction (conveniently 70 x 50 cm., for example) or in the vertical direction (Figs. 5 to 8), and according to the invention in the standard size is provided with three parallel hollow beads 2, 3, 4, extending in its vertical direction and in known manner increasing in width and height from top to bottom. The upper end of the similarly located bead of the next lower plate is in each case inserted into the bottom end of the similarly located bead of the next higher plate. Two of these three beads, namely 2 and 4, are situated at the two outer vertical edges of the plate 1, while the third bead 3 lies at about the center of its width. Each of the two outer beads 2, 4 have on the outside a narrow flange 11. The latter has the effect that the rounded portion of the rib, on which the flange 11 is formed, cannot so easily be bent during transportation, while this flange 11 also furnishes the plate 1 with considerable stiffening.

The plate 1 of the present invention is also characterized by the arrangement of flanges or transverse folded portions 5 and 6 respectively at the upper and lower edges. These folded portions, as can be seen from Fig. 4, are bent back in opposite direction over the plate, the upper folded portion 5 being bent over forwards and the bottom folded portion 6 being bent over to the back. The portions 5 and 6 follow accurately the profile of the longitudinal section (Fig. 2) of the roof plate resulting from the beads 2, 3, and 4. The purpose of the transverse folded portions 5, 6, which constitute a main feature of the invention, is to permit the superimposed roof plates to be hooked into one another, in order thus to obtain a cohesive roof covering and to render the latter entirely rain and storm proof.

Due to the construction of the plate with beads, flanges, pressed-out hollow ribs 7, 8, 9, and 10 and flanged-over portions 5, 6, such stiffening is obtained that even when thin sheet metal is used (for example 0.5 mm.) the roof will support the weight of a man, even if laid on battens.

The lateral jointing of the roof plates of each course is effected by placing the upper end of the left-hand side bead 2 of the plate 1 next to the right beneath the right-hand end of the top fold 5 of the preceding plate on the left, and simultaneously pushing the right-hand bead of the plate preceding on the left beneath the left end of the bottom fold 6 of the plate following on the right. For this purpose, the horizontal length of each of the folds 5 and 6 is such that it extends only to the width symmetry plane of the

beads. This not only permits the interlocking of the neighbouring hollow beads 2 and 4 of two adjoining plates 1 in the same course, but in addition the ends of the neighbouring folds 5, 5 and 6, 6 are placed suitably and with a flush fit side by side. The above-mentioned edge flange of each of the two superimposed hollow beads 2, 4 then engages beneath or over the flat part of the other plate 1 adjoining on the opposite side at the other hollow bead. This ensures mutual supporting of the two adjoining plates in respect of twisting about the axis of the superimposed hollow beads. Each course of roof plates consequently forms a band over the entire length of the part of the roof in question.

Figs. 5 to 8 show another embodiment of the roof plate illustrated in Fig. 1, namely the vertical size corresponding thereto. This is intended for use on metal roof frames, for example in the case of aircraft hangars, steep factory roofs, and the like. This embodiment also has the hollow beads and the flanged-over portions according to the invention, which however here are designated by 14, 14'. The hollow beads 12, 13 at the vertical side edges are here provided at the ends with slotted apertures 15, which are intended for the passage of screw-bolts 20 (Fig. 14) for fastening the plates to the metal roof frame. They are in the form of slots in order to permit a certain expansion of the plates and in order to have a little latitude in fitting. The plates illustrated in Figs. 5 to 8 are particularly well stiffened by hollow beads 17, 18 over their full height.

The normal roof plates 1 (Fig. 1) are fastened by pairs of hook-shaped clasps 19 (Fig. 12), which engage in the upper fold 5 of the plate 1 to be fastened and are nailed on to the battens or the frame of the roof. The form of construction illustrated in Figs. 5 to 8, on the other hand, is secured by means of screw bolts which, as already mentioned, are pushed through the holes 15. They are pivoted to hooks 21 (Fig. 14) which engage beneath in section-irons which replace the roof battens. Nuts (not shown) screwed on to the bolts 20 enable the hooks to be tightened as required and at the same time, by means of washers (not shown) placed therebeneath, enable water-tightness of this fastening means and hence of the plates to be obtained dependably.

For the lower roof edge 23, eave pieces 22 (Figs. 9 and 10), with a front edge bent downwards and inward flanging-over of the roof edge, are provided, which eave pieces 22 are preferably fastened jointly with the gutter hooks 24 on posts 25 at the bottom edge of the framework or on the lowermost battens. The lower edges of the lowermost course of plates engage over them. The adjoining eave pieces may also overlap. However, whole plates 26 (Fig. 11) may also be bent forwards and downwards at the bottom or front edge.

In addition, the construction of gable edge plates 27 (Figs. 10 and 11) with unilateral raised edge beads 28 and 28' provide a gable closure of the covering.

Instead of being equipped with individual beads, the whole plate may be in the form of corrugated sheeting (Figs. 15, 16), in which case however the transverse folds 14, 14' which can be seen only in Fig. 15, are the principal feature.

In the case of the manufacture of plates from non-rusting material or of synthetic material, the rusting away of the folded over portions need not be feared, and these provide the plates according to the present invention with the advantage that they have no welds.

Manufacture by means of a stamping operation ensures a particularly low cost of these roof plates. Transport is also inexpensive, because the plates are very light. This also has an advantageous effect on the price of the roof framing.

When the plates are made of plastics or pressed material, they may be provided with a metal coating by means of a spray-gun, metal foil, or by a galvanic process, the protective coating making the plate particularly weatherproof.

The plates in question also permit the offset laying of two successive courses of plates, if one half of the following plate half overlaps the preceding plate, whereby there is obtained not only a fully covered joint arrangement but also a great strengthening and double tightness of the roof.

While I have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by example only and not in a limiting sense, the scope of the invention being determined by the objects and the claims.

I claim:

1. A covering for a roof comprising a plurality of rectangular plates disposed in parallel superposed rows, each of the said plates having a hollow bead at both vertical side edges and a third hollow bead disposed in the center of each of the said plates and parallel to the said end hollow beads, all the said hollow beads extending over the entire height of the said plates and the end hollow beads including means for connection of each pair of adjacent plates in each of the said rows, each of the said plates having a top and bottom flange at its top and its bottom edge, respectively, the said flanges extending substantially over the entire width of the said plates, the said top flange of each plate being formed with rearward overlapping to hang the said plate on the bottom flange of the next upper of the said plates, and the said bottom flange of each plate being formed with forward overlapping to receive the top flange of the next lower of the said plates, the said flanges following the said hollow bead formations in order to fortify each other, and means for securing the said plates to the said roof.

2. The covering, as set forth in claim 1, in which the outer edge of each of the said end hollow beads has a flange in order to reinforce the said end hollow beads and to avoid a turning of one of a pair of adjacent plates relative to the other of the said plates upon the longitudinal axis of the said connecting end hollow bead by forces operating perpendicularly to the plane of the said plate.

3. The covering, as set forth in claim 1, in which the said top and bottom flanges of the said plates terminate at the center of the height of the said end hollow beads, the end faces of the said flanges of two adjacent plates engaging each other, thereby increasing the rigidity of the said flanges.

4. The covering, as set forth in claim 1, which includes a seam plate for the lower roof seam and an eaves gutter disposed there below, the lower portion of the said seam plate being bent down in vertical direction and terminating about above the center of the said eaves gutter, an eaves lead, adapted for supporting the said seam plate, the lower edge of the said seam plate being bor-

dered over the said eaves lead, means for securing the said eaves lead to the said roof, and the said seam plate being disposed in the plane of the said roof.

5. The covering, as set forth in claim 4, in which the said seam plate has on the gable-side a bead of substantially triangular cross-section.

6. The covering, as set forth in claim 1, in which the said hollow beads are of triangular cross-section.

7. The covering, as set forth in claim 1, in which the said hollow beads are of trapezoidal cross-section.

8. The covering, as set forth in claim 1, in

which the said hollow beads are of polyagonal cross-section.

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