

E. C. HEGELER & F. W. MATTHIESSEN.

Sheet-Metal Roofing.

No. 141,929.

Patented August 19, 1873.

Fig. 1.

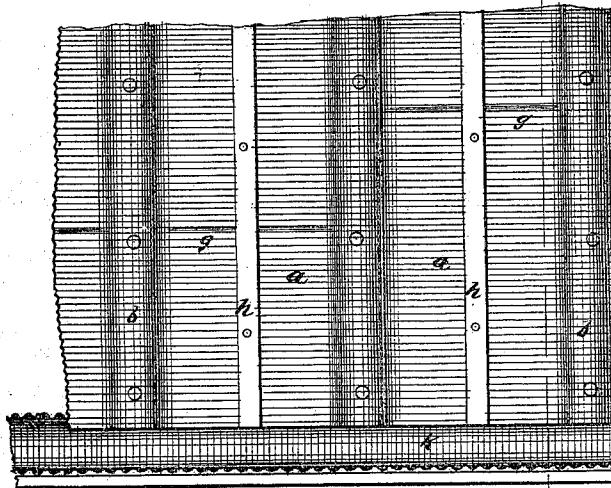


Fig. 2.

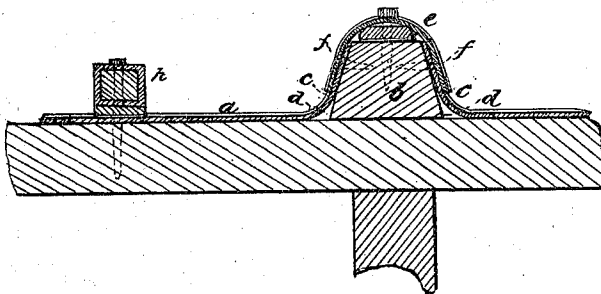
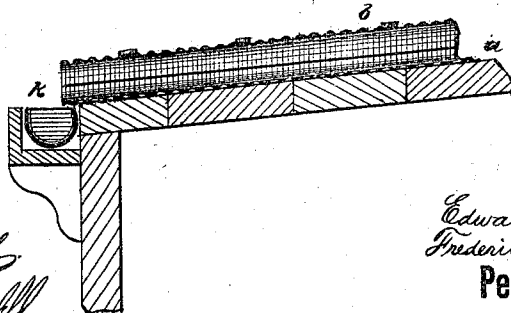


Fig. 3.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN SHEET-METAL ROOFINGS.

Specification forming part of Letters Patent No. **141,929**, dated August 19, 1873; application filed July 26, 1873.

To all whom it may concern:

Be it known that we, EDWARD C. HEGELER and FREDERIC WILLIAM MATTHIESSEN, of La Salle, in the county of La Salle and State of Illinois, have invented a new and Improved Sheet-Metal Roofing, of which the following is a specification:

The object of this invention is to overcome the difficulties in the use of sheet metal, and especially of sheet-zinc, arising from their expansion and contraction by the changes of temperature in their use for roofing and for other purposes. The invention consists in the employment of fine corrugations of the metallic sheets used in the construction of roofs, eaves-troughs, gutters, and for similar purposes, and the arrangement of the corrugations in the direction crosswise to the pitch of the roof, also crosswise to the length direction of the gutters, eaves-troughs, or similar articles. This fine corrugation may be made one-eighth of an inch deep by half an inch in width, or in other proportions. It can be very fine and still allow by its curvings the expansion and contraction of the metallic sheet in the direction crosswise to the corrugation—that is, in the direction of the pitch of the roof and the length of the gutter—and thus allow of the bending of the sheets transversely to the corrugation sufficiently to permit the use of the various modes of uniting the sheets of roofing now practiced, whether for flat or non-corrugated zinc sheets, or sheets coarsely corrugated in the direction of the pitch of the roof.

The expansion and contraction of the metallic sheets have heretofore prevented a firm and immovable, and at the same time smooth and perfectly water-tight, fastening of the same on the roof, or an immovable fastening of the gutters of sheet-zinc to the roof or wall. If firmly nailed down at the edges, the sheet-zinc would warp in the heat, and tear or loosen its fastenings by contraction under the effects of cold. By the fine corrugations of our invention crosswise to the pitch of the roof, a solid and immovable fastening of the metallic sheets to the roof becomes feasible, and the joints can, moreover, be tightened with rubber, white-lead, or any other calking material in such a manner that the roof be-

comes perfectly water-tight and impervious to snow, &c.

In this example we represent a roof covered with the finely-corrugated sheet metal of our invention in a manner similar to the French mode of covering roofs with smooth sheets of zinc.

Figure 1 is a plan view of the roof and gutter. Fig. 2 is a section transverse to the pitch of the roof, showing the manner in which the sheets of metal may be fastened and calked; and Fig. 3 is a section in the direction of the pitch.

Similar letters of reference indicate corresponding parts.

a a are the sheets of zinc finely corrugated according to our invention crosswise to the pitch of the roof. *b* are strips of wood fastened to the roof in the direction of its pitch, between the rows of sheets of metal, corresponding to the strips used in the French mode of zinc-roofing. *c c* are the curved sides of the metallic sheets fitted on the beveled sides of the strips *b*. In the ordinary modes of zinc-roofing, these upturned edges are indirectly and movably secured to the strips *b*, in order to allow to the sheet a certain play for its expansion and contraction with the changing temperatures. When the finely-corrugated zinc of our invention is used for the construction of the roof, the sheets can be securely and immovably fastened to the strip *b*, along the upper edge of the upturned edge *c*, by nails or otherwise, because the expansion or contraction of the metallic sheets *a* in the direction of the pitch of the roof is entirely taken up in the curvings of the fine corrugation, while the expansion or contraction of the sheets crosswise to the pitch of the roof is taken up in the curvature *c* of the sides. Between the curvature *c* and the foot of the strip *b* remains an open space, *d*, affording free play to the increase or decrease of the curving caused by the expansion or contraction of the metallic sheets in this direction. As the edges of the metallic sheets can thus be screwed fast to the strip, the joint between the sheet and the strip *b* can be made perfectly water-tight with a strip of rubber, white-lead, or with any other calking material. The strips *b* and the

joints between the upturned edges of the metallic sheets *c* are covered with a cap, *e*, of the finely-corrugated sheet metal, the corrugations of which run parallel to those of the sheets. The corrugations taken up in the curving, the expansion or contraction of this cap *e* allows the solid fastening of the cap *e* on the strip *b* by nails. A packing, *f*, of rubber, white-lead, or other material, can be applied under the cap *e*, between it and the strip *b*, and the edges of the metallic sheet *c*. The joints *g*, between the single sheets of metal crosswise to the direction of the pitch of the roof, are secured by letting the upper sheet lap over the lower one, and by soldering the joint, or else by the insertion of rubber, white-lead, or other packing material in the overlapping joint.

If it is desired to make the roof still more solid, and to further secure the metallic covering against being shaken and raised by the force of the wind, we fasten a rod, *h*, also covered with the sheet metal, over the roof-plates in the center, between and parallel to the strips *b*, which is a neutral line in regard to expansion and contraction, by a sufficient number of nails or screws, and further tighten these rods against the metallic roof-covering with a calking, by which the perforation of the sheet metal from the nails is rendered harmless. All nail-heads exposed to humidity on zinc roofs must be covered with solder. The eaves-troughs or gutters *k*, which, when made of plain sheet-zinc, required to be fastened in such a manner that they might expand and contract lengthwise, can, if made according to our invention, of sheet metal corrugated

finely crosswise to their length direction, be nailed firmly to the roof or immovably fastened, as all expansion and contraction resulting from the changing temperatures will be taken up by the curvings of the corrugations, and not affect the length of the gutter, and their joint against the roof or wall may then likewise be packed water-tight.

It will be seen that the fine corrugations of sheet-zinc or other sheet metal in the direction crosswise to the direction of the pitch of the roof, and crosswise to the length direction of the eaves-trough or gutter, enables us to secure the metallic sheets immovably on the roof, and to fasten the gutter firmly, and to make all the joints of the roof and gutter perfectly tight and water-proof, which has heretofore not been accomplished. This invention renders it thus possible to decrease the pitch of the roofs to any desired extent, or to make them flat, and yet perfectly water-tight under all circumstances, which has not been possible heretofore.

What we claim as our invention is—

The fine corrugation of sheet-zinc and other sheet metal used in the construction of roofs, eaves-troughs, gutters, and similar articles, arranged in the direction crosswise to the pitch of the roof, also crosswise to the length direction of the gutter, substantially in the manner and for the purpose specified.

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