(No Model.)

J. WALTER.

SHEET METAL ROOFING PLATE.

No. 309,113. Patented Dec. 9, 1884.

Fig. 1.

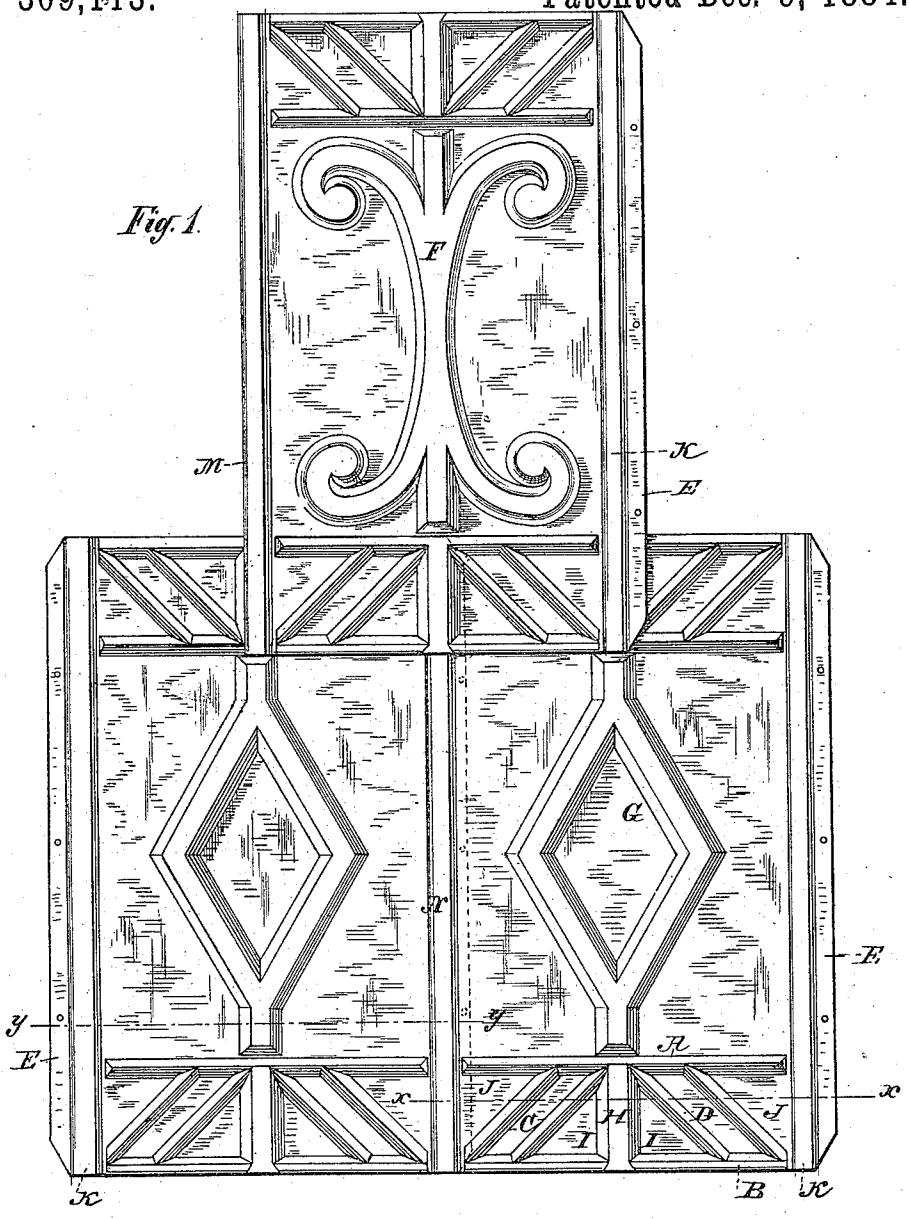


Fig. 2.

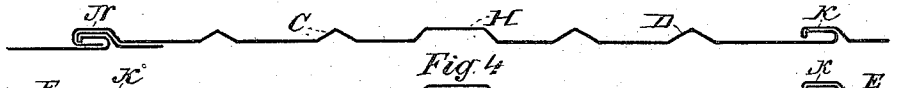


Fig. 4.

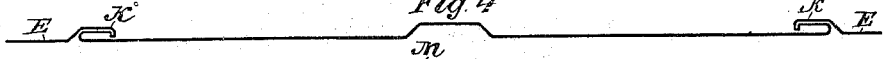
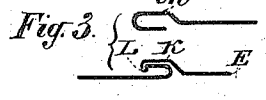


Fig. 3.



Witnesses:
Henry Eichling.
R. F. Gaylord.

Inventor
John Walter
by Paul A. Duncan
Atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN WALTER, OF NASHVILLE, TENNESSEE.

SHEET-METAL ROOFING-PLATE.

SPECIFICATION forming part of Letters Patent No. 309,113, dated December 9, 1884.

Application filed June 11, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN WALTER, of Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Sheet-Metal Roofing-Plates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

The present invention relates to plates having the following features of construction: corrugations for stiffening the plates or directing the flow of water; catches at their lateral edges, which form the interlocking parts of hollow or tubular seams by which the plates of continuous layers are united, and flanges at their underlying edges, by which they are nailed to the building; and it consists in certain improvements relating to these various parts. Heretofore the corrugations of these plates have been made with reference to the plates always being laid with only one of their ends adapted to overlapping and the other to underlying, and hence they had always to be laid in one direction—generally from left to right. It is often desirable, however, to be able to lay the plates in either direction, and this is particularly so where two roofs sloping in different directions join each other, to form what is known in the art as a "valley"—as where the L-roof of a building joins the main roof. In such case the plates of the respective roofs that meet at their junction are fastened to a metal sheathing covering the valley, and hence it is desirable to lay the plates toward the valley, so that the courses may end with the fastening-flanges of their end plates upon the covering of the valley, and ready to be fastened thereto. With the plates heretofore used those of one slope had to be laid from the valley, which necessitated fastening down the edges not designed to be so fastened—that is, the overlapping edges, which are intended to overlie and surround the catches upon the flange-edges—and as the fastening of these overlapping edges to the valley had often to be done by soldering this order of laying was at times very inconvenient.

The first feature of invention, therefore, consists in making the end corrugations of the plates of such duplicate form that the plates may be reversed end for end, thereby enabling them to be laid in either direction along a course.

Figure 1 of the accompanying drawings shows three roofing-plates arranged relatively as upon a building, and provided with corrugations A, B, C, and D, formed upon their ends, which at each end of the same plate are so arranged that when either of the ends of the plates are used as the lower edge of one course or layer, and as lapped over the upper ends of the plates of an adjoining layer, in the well-known break-joint manner, the corrugations of the overlapping plates correspond to those of the underlying plates. Arranging the corrugations at the ends of the plates in this manner makes the plates reversible and renders it possible to lay the first plate of a course with either end uppermost, and hence, also, to lay it so that its fastening-flange E may come upon the right or left hand side, thus determining in which direction the laying shall take place. In the case of a valley the laying would take place in both directions toward the valley, as and for the reasons already indicated. Whatever other corrugations might be struck in the plates, for stiffening them or for any other purpose, should preferably be of a shape that would give duplicate forms to the opposite halves of the plates, such as are seen at F or G. It has been found that the free overlapping ends of the laid roofing-plates tend to bow upward, and thereby produce openings between them and the underlying ends, through which water may be blown under the plates and upon the sheathing. To prevent the plates from this bowing or warping, the overlapping ends have been provided with bracing or stiffening corrugations, so struck up as to resist any bowing or warping action.

The second feature of invention has reference to a special arrangement of such corrugations that causes them to act more effectively than those heretofore used to keep the free ends of the plates down snug upon the underlying ends, and prevent their upward bowing or warping. This particular arrangement is shown in the first figure of drawings, where A and B are corrugations extending laterally nearly across the plates. C are corruga-

tions extending angularly from A to B on one side of the plates, and D are like corrugations on the other side of the plates, but inclined in a direction at right angles to the corrugations C. These corrugations, extending crosswise to each other, have a bracing resistance that is sufficient to prevent the free ends of the plates from bowing upwardly and keep them in the flat shape desired, and at the same time they act to prevent capillary action between the lapping ends and as dams to prevent water being forced under the plates by the force of the wind. The central corrugation, H, is designed to fit over the seam between the plates, so that the lapping ends of the plates may come in close contact. To effect this still more certainly, the spaces I between the central corrugations and the nearest angle-corrugations are made a trifle smaller in area than the spaces J, into which they fit, which insures the close fitting together of the corrugations of the lapping parts, particularly at the middle of the free ends of the plates; and this also causes these corrugations to re-enforce and strengthen one another, and so make it possible to walk over them and to build scaffolding upon or against them without breaking them down, as would be the case with the form of these corrugations that have been in use, and which were not thus strengthened. It has been usual to construct the catches at the sides of the plates, which interlock and hold the plates together, so that the seams that they form shall be hollow for the purpose of admitting air under the plates and ventilating the roof and for draining off any water that may get into the seam or under the plates.

The third feature of invention relates to these seams, and consists of an improved form of tubular catch, whereby the seams, as compared with those heretofore in use, shall be tighter to exclude water, and stronger, so that—being the highest parts of the plates—they may be walked on or house-scaffolding built on or against them without having their tubular form injured.

In Figs. 2 and 3, which are respectively an enlarged view of the cross-section on *x x*, and a detail view of the catches at both edges of the plates, K represents the inner catch, which is at the underlying edge of the plate. It is constructed by forming a fold in the metal and turning such fold back over the upper face of the plate, and practically parallel therewith, such fold being made far enough from the extreme edge of the plate so that a flange will be left by which to nail the plate to the building. The edge of this catch is turned down at right angles thereto, so as to form a supporting-lip, L, which is to prevent the catch being bent down upon the plate.

M represents the outer catch, which is at the overlapping edge of the plate. It is formed by bending this edge back under the plate and parallel thereto, in substantially the same form as the inner catch is bent over the top face of the plate, except that it is slightly raised above the plane of the plate, so as to closely fit around the inner catch when they are brought together, as seen at N, which is the seam formed by interlocking these catches. The inner catch, forming as it does nearly the whole inner surface of the tube, makes the seams water-tight in a superior way, particularly to prevent water working between the plates beyond the interior of the tube, the tube of course draining off any water that may work between the edges of the plate into it, or that may be forced between the lapping parts of separate layers, and by reason of this catch extending back over the plate and its supporting-lip a threefold thickness and corresponding rigidity are given to the top and sides of the seam. Seams made in this way are sufficiently strong to preserve their tubular form, so as to give free ventilation to the parts of the structure beneath them, and yet support any weight that may ordinarily be put upon them.

In laying plates of this kind, and particularly when there are long courses, it is desirable to be able to lay them in both directions along the courses, so that two or more men may work on the same course. To do this it is necessary to arrange some two plates of a course so that their nailing-flanges will be one on the right and the other on the left hand side, and lay from these in both directions; but this arrangement brings the outer catches of the two plates opposite each other, and as they cannot be interlocked to form a seam, some means for uniting the two plates by said catches is requisite; and my fourth feature of invention relates to such means, and consists of a supplemental plate having an inner catch and nailing-flange of the character already described constructed at both of its side edges. This construction is seen in Fig. 1, and also in Fig. 4, which is an enlarged cross-section on plane *y y*, K being the catches, and E the flanges, as in the other figures. This supplemental plate is in other respects made like the other reversible plates, having the same corrugations and corresponding with them in size. When it is desired to lay a course in both directions, a supplemental plate is first laid at the middle of the course, and then two of the other plates are attached by their outer catches engaging with its inner catches, and the course is thus started in both directions.

What is claimed as new is—

1. A sheet-metal roofing-plate provided with end corrugations which are substantially alike on both ends of the plates, whereby the plates are made reversible, as and for the purpose set forth.

2. A sheet-metal roofing-plate provided with end corrugations, A, B, C, and D, arranged substantially as shown, and for the purpose set forth.

3. A sheet-metal roofing-plate provided at both ends with corrugations A, B, C, D, and

H, and having the spaces I smaller than the spaces J, substantially as and for the purpose set forth.

4. A sheet-metal roofing-plate provided at one side with a tubular catch, K, formed parallel to the plate, as described, and with the lip E, and at its other side with an outer or overlapping catch constructed to engage with the tubular catch of a similar adjacent plate, substantially as set forth.

5. A sheet-metal roofing-plate provided with a tubular catch, K, a flange, E, and a catch, M, substantially as set forth.

6. In combination with a reversible metal roofing-plate having an inner catch and a nailing-flange at one side and an outer catch at the other side, a supplemental plate provided at both of its sides with an inner catch as and for the purpose set forth.

7. In combination with a reversible metal roofing-plate having an inner catch and a nailing-flange at one side and an outer catch at the other side, a supplemental plate provided at both of its sides with an inner catch and a nailing-flange, as and for the purpose set forth.

JOHN WALTER.

Witnesses:
FRANK I. BENNETT,
LEWIS D. CORTRIGHT.