FIP7902 OR 356,393

(No Model.) 2 Sheets—Sheet 1.

T. W. HELLIWELL.

METALLIC ROOFING.

No. 356,393. Patented Jan. 18, 1887.

FIG. 1.

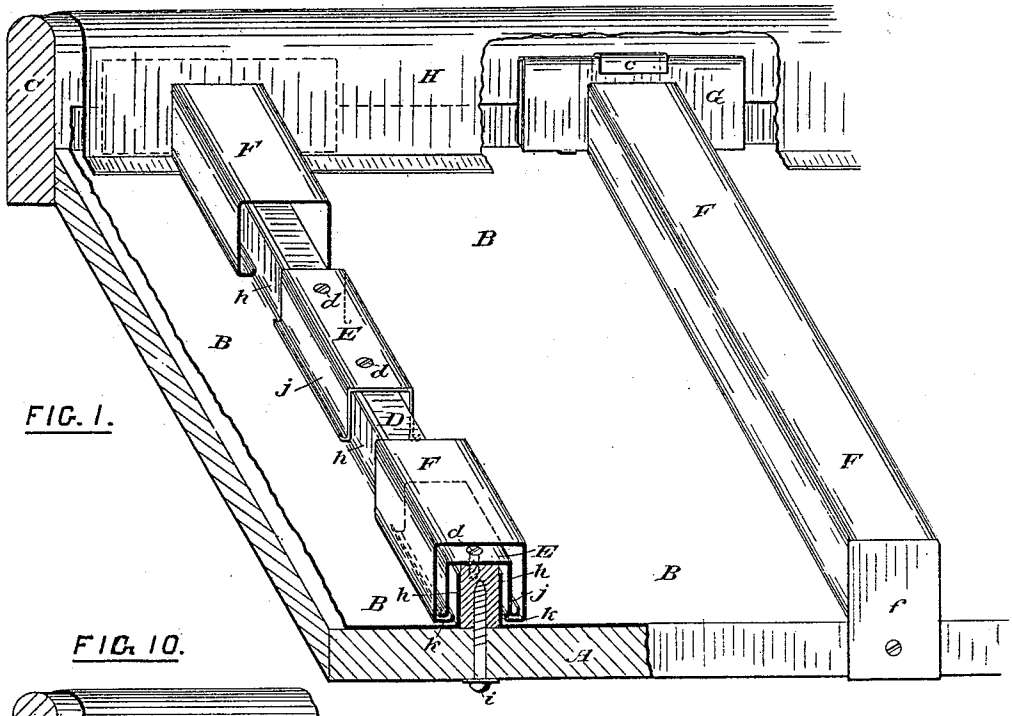


FIG. 10.

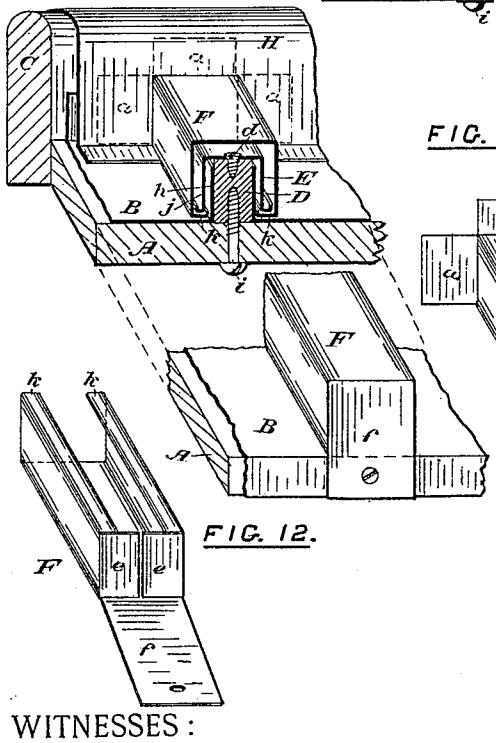


FIG. 11.

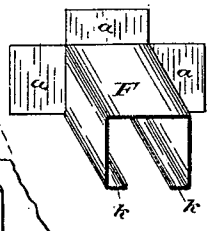


FIG. 13.

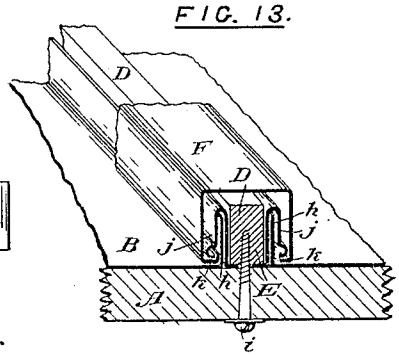


FIG. 12.

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Chas. B. Barber.

INVENTOR:

Thomas W. Helliwell.
By his Attorneys,
Arthur G. Fraser & Co.

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

Metallic,
Rib Seam,
Capped.

(No Model.) 2 Sheets—Sheet 2.

T. W. HELLIWELL.

METALLIC ROOFING.

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FIG. 4a.

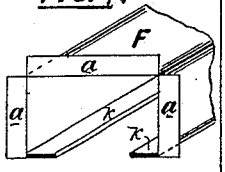


FIG. 2.

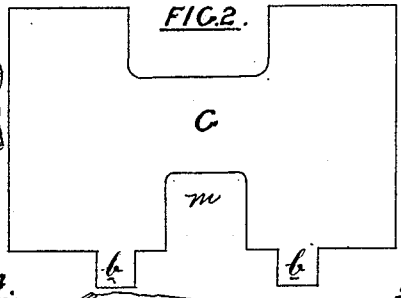


FIG. 3.

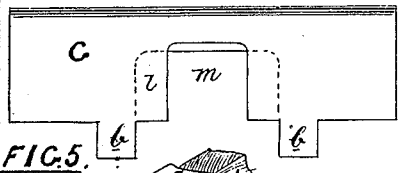


FIG. 4.

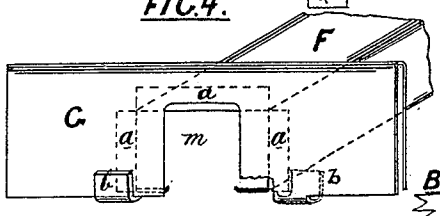


FIG. 5.

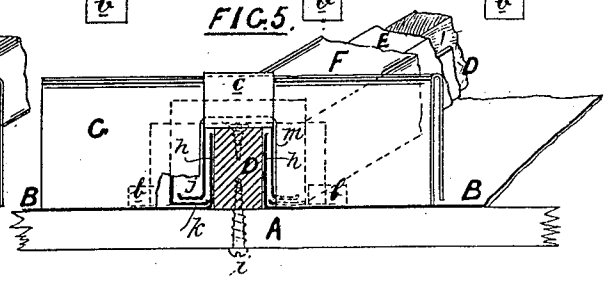


FIG. 6.

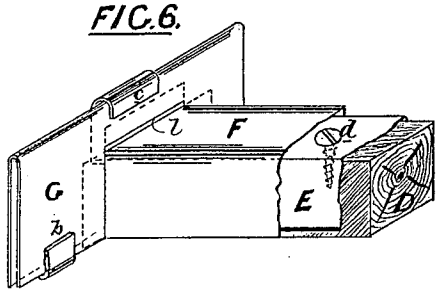


FIG. 7.

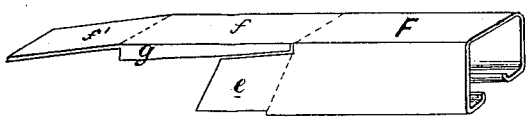


FIG. 8.

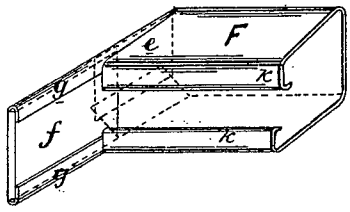
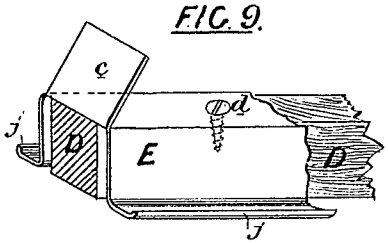


FIG. 9.



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UNITED STATES PATENT OFFICE.

THOMAS W. HELLIWELL, OF BRIGHOUSE, COUNTY OF YORK, ENGLAND.

METALLIC ROOFING.

SPECIFICATION forming part of Letters Patent No. 356,393, dated January 18, 1887.

Application filed May 15, 1886. Serial No. 202,268. (No model.) Patented in England March 7, 1882, No. 1,109, and April 30, 1884, No. 7,015.

To all whom it may concern:

Be it known that I, THOMAS WILLIAM HELLIWELL, a subject of the Queen of Great Britain, residing in Brighouse, county of York, England, have invented certain new and useful Improvements in Sheet-Metal Roofing, of which the following is a specification.

This invention is patented in Great Britain by Patents No. 1,109, dated March 7, 1882, and No. 7,015, dated April 30, 1884.

My invention pertains to the covering of roofs with sheet zinc, copper, or other suitable metal or material.

It relates to roofs which have metal caps or hoods covering the upturned edges of the metal roofing-sheets. Such roofs have been constructed with raised bars or ribs extending down the pitch from the ridge to the eaves, with the metal sheets laid on the roof between these bars and having their lateral edges turned up against the sides of the bars. Over the bars and turned-up edges are placed the metal hoods or caps by which the joints are made tight.

My invention comprehends certain improvements in the construction of these metal caps and their fastenings and in the connections with the ridge-piece and the constructions at the eaves.

The object of my invention is to provide a construction of sheet-metal roofing by which all necessity for making holes in the roofing plates and caps shall be obviated, while at the same time the construction is rendered strong, durable, thoroughly water-tight, and easy to lay.

My invention in its preferred form is shown in Figures 1 to 9 of the accompanying drawings. Fig. 1 is a perspective view of part of a roof constructed according to my invention, being partly broken away and in section to show the construction more clearly. Figs. 2 and 3 are detached views showing the formation of the ridge-flange. Fig. 4 is a perspective showing the ridge-flange and cap attached together. Fig. 4ª is a perspective view of the ridge end of the cap. Figs. 5 and 6 are sectional perspective views of a fragment of the upper part of the roof next the ridge-piece, looking from different directions. Fig. 7 is a perspective view of the lower or eaves end of the cap before being folded down, and Fig. 8 is a view of the same, looking from underneath after the eaves end has been folded down; and Fig. 9 is a perspective of the ridge end of the wooden roof-strip and the upper fastening-piece. The remaining views illustrate modifications. Fig. 10 is a perspective view of a fragment of a roof. Fig. 11 is a perspective of the ridge end of the cap; and Fig. 12 is an inverted perspective of the eaves end of the cap, all showing one of the modifications of my invention. Fig. 13 is a perspective of another modification.

Referring to the several figures of the drawings, I will first describe the general construction, which is nearly the same in the three modifications.

Let A designate the roof or roof sheathing or boarding, made usually of wood; B B, the roofing plates or sheets, of zinc or other suitable material; C, the ridge-piece, and D D the raised strips, laths, or bars, usually of wood, which are fastened on the sheathing A at intervals and extend down the slope of the roof from the ridge to the eaves. F F are the metal caps or hoods which cover the joints.

The sheets of zinc are placed side by side upon the sheathing, their side edges being turned up at right angles at *h h*, and sufficient space being left between the sheets to admit the wooden bars D D between these turned-up edges and provide for expansion and contraction. At the ridge the upper edges of the several sheets are turned up against the ridge-piece, and at the eaves their lower edges are turned down against the lower edge of the sheathing. The wooden bars D D are placed in the spaces between the sheets with their upper ends against the ridge-piece and their lower ends extending to the eaves. These bars are fastened by screws *i i*, inserted from underneath, or by any other equivalent fastening, by which they may be drawn down from underneath.

To the bars D are fastened saddles E E at intervals, (or one continuous saddle might be used.) These saddles may pass over the top

of the bar, as shown in Fig. 1, or under its bottom, as shown in Fig. 13. In either case they terminate in flanges *j j* on opposite sides, extending down nearly to the sheets B B and outside of the turned-up edges *h h*. The saddles are preferably bent from a piece of sheet metal, with the middle portion fastened on the top of the bar D by screws *d*, and extending thence down on opposite sides of the bar and terminating at the flanges *j j*. The metal caps or hoods F F are made of sheet metal, bent into the form of a gutter or channel, with their edges turned in toward each other, forming flanges *k k*, which are preferably slightly hooked by the turning up of their inner edges.

The saddles are fastened to the bars D D, and the bars are placed on the roof, but are not drawn down close thereon. The metal caps or hoods F F are then placed over the bars with their flanges *k k* underneath the flanges *j j* of the saddles. This is done either by slipping the cap over the bar lengthwise or by spreading its sides apart laterally wide enough for its flanges *k k* to clear the flanges *j j*, and then closing them together. The cap F thus has its flanges brought into contact with the surface of the sheets B B. After the caps are in place, the bars D D are drawn down tight upon the roof by tightening the screws *i i*, or other fastening, thus drawing down the saddles, and causing them to press down the caps and bring their flanges into close contact with the roofing-sheets, consequently clamping said sheets firmly in position and absolutely preventing their removal, and at the same time making the roof-covering water-tight. The caps F F are preferably made the full length of the roofing-sheets.

I will now proceed to describe the preferred construction at the ridge and eaves, with reference to Figs. 1 to 9, inclusive. This construction is designed to avoid the necessity for soldering the joints where the cap F terminates at the ridge-piece and at the eaves.

The ridge end of the cap F is cut and has wings *a a* bent outwardly from it, as shown in Fig. 4ª. A flange-plate, G, is made by cutting a piece of sheet metal to the shape shown in Fig. 2, and then doubling it down the middle, as shown in Fig. 3. This folded plate is then slid over the end of the cap, so that the wings *a a* are confined between the two thicknesses of the plate, as shown in Fig. 4. The end of the cap thus enters and fits into the notch or opening *l*. The parts are held together by bending under the bars *b b*, as shown in Figs. 4 and 6. The plate G is formed opposite to the opening *l* with another notch or opening, *m*, of such size as to admit the bar D and fit over the saddle E next the ridge. This saddle differs from the others in that it is made with a wing, *c*, as best shown in Fig. 9. When the plate G and cap F are in place, this wing *c* is turned down over the plate G, as shown in Figs. 5 and 6, thereby holding the latter down in place. As the saddle is screwed down to the bar D, it cannot lift, and it is consequently impossible for the parts to move or become detached. When the bars D D, caps F F, and plates G G are all in position, the ridge-capping H is applied, as shown in Fig. 1.

The lower end of the cap F, at the eaves, is constructed as follows: It is first cut in the manner shown in Fig. 7, leaving a tongue, *f*, flanges *g g*, and wings *e e*. These wings are folded in to come against the end of the bar D, the end *f'* of the tongue *f* is turned up flat against the under side of the tongue, and the flanges *g g* are doubled down over it, covering its side edges and holding it firmly in place. Then the tongue *f*, thus stiffened, is turned down over the end of the cap, so that it covers the same and projects beyond it, all as shown in Fig. 8. Fig. 1 shows the eaves end of the cap as applied to the roof, the tongue *f* being fastened by a nail or screw driven through it into the sheathing A.

It will be observed that the constructions described with reference to Figs. 2 to 9 are made both strong and water-tight without the use of solder.

I will now describe a modified construction wherein solder is used in completing the joints, referring to Figs. 10 to 12.

The upper end of the cap F is cut to form wings *a a*, as shown in Fig. 11. These are placed against the ridge-piece C, and the ridge-capping H is placed over them and soldered around its junction with the cap F. This makes a tight joint at the ridge. At the lower end the cap F is cut to form a tongue, *f*, and two wings, *e e*. These wings are turned in, as shown in Fig. 12, and the tongue is turned down, as shown in Fig. 10, after which the joints are soldered.

Fig. 13 illustrates a slight modification. The saddle E passes under the bar D, instead of over it, and consequently does not need any fastening-screws. It extends up each side of the bar, between the bar and turned-up edge *h*, high enough to clear this edge, and then down on each side, outside the edge *h*, and terminates in flanges *j j* in contact with the flanges *k k* of the cap F. When the screws *i* are tightened, the bar is drawn down against the roof-sheathing, and the cap is thus pressed into close contact with the roofing-plates.

My invention is susceptible of various other modifications. It is not essential, for example, that the bars D be made of wood, nor that they be distinct from the caps F, since the bars and caps might be identical. Neither is the use of the saddles E essential, as their function is simply to afford a connection between the bars and the caps, so that by drawing down the bars from beneath the caps will be forced down upon the roofing-plates.

Although I have shown only screws as the fastening or tightening devices, it will be understood that many other means of fastening may be substituted for them—such, for instance, as are generally understood to be their mechanical equivalents.

I am aware that various constructions of

sheet-metal roofing have been patented wherein a cap or grooved bar of wood or metal covers the upturned edges of the roofing-sheets, and is fastened down by screws passed through it from above and screwing into the sheathing. These constructions are objectionable, as leakage is apt to occur through the screw-holes in the cap. My invention dispenses with such holes and avoids all sources of leakage by passing the screws through the sheathing, tightening them from beneath.

I claim as my invention—

1. A roofing consisting of roofing-sheets laid parallel with upturned edges, a hollow cap arranged over said edges and extending down on both sides to the roofing-sheets, a longitudinal bar attached to said cap and arranged inside thereof and between said edges, and screws for drawing down said cap, extending through the sheathing, engaging said bar, and adapted to be tightened from beneath, combined substantially as described.

2. A roofing consisting of roofing-sheets laid parallel with upturned edges, a hollow cap arranged over said edges, a bar arranged inside said cap and between said edges, one or more saddles within said cap for attaching the cap to said bar, and fastening devices extending through the sheathing, engaging said bar, and adapted to be tightened from beneath, combined substantially as described.

3. A roofing consisting of roofing-sheets with upturned edges laid parallel, a bar arranged between said edges, fastening devices for securing said bar to the sheathing, one or more saddles secured to said bar and extending down outside the upturned edges, and a hollow cap arranged to inclose said bar, saddle, and upturned edges, and having flanges entering beneath the sides of said saddle, combined substantially as described.

4. A roofing consisting of roofing-sheets with upturned edges laid parallel, a bar arranged between said edges, fastening devices for securing said bar to the sheathing, one or more saddles fastened to the top of said bar and extending down on opposite sides thereof, outside of said upturned edges, and a hollow cap arranged to inclose said bar, saddle, and upturned edges, and having flanges turned inwardly beneath the sides of said saddle, combined substantially as described.

5. In a roofing, the combination, with the sheathing and ridge-piece, of roofing-sheets laid parallel with upturned edges, and with their upper edges turned up against the ridge-piece, of a hollow cap fastened over said upturned edges, extending to the ridge-piece, and formed with wings or flanges turned outwardly, and the ridge-capping extending over the ridge-piece and down around said cap and outside of said wings, and having a recess receiving the cap, substantially as described.

6. In a roofing, the combination, with the sheathing and ridge-piece, of roofing-sheets laid parallel with upturned edges, of a hollow cap fastened over said edges and extending to the ridge-piece, a flange-plate secured to the ridge end of said cap, and the ridge-capping extending down around said cap and covering said flange-plate, substantially as described.

7. In a roofing, the cap for covering the upturned edges of the roofing-sheets, constructed at its ridge end with wings turned outwardly, combined with a flange consisting of a doubled plate cut away on one side to admit the cap and applied thereto with the wings between its folds, substantially as described.

8. In a roofing, the combination, with the roofing-sheets having upturned edges, of the bar fastened between said edges, the saddle fastened to said bar and having an upturned wing at the ridge end, the cap for covering said bar and upturned edges, and the doubled plate applied to the ridge end of said cap and held down by said wing being folded over its top, substantially as described.

9. In a roofing, the inverted-trough-shaped cap for covering the upturned edges of the roofing-sheets, constructed at its eaves end with lateral wings cut from its sides and folded inward, and with a tongue cut from its top and folded downward over said wings, substantially as described.

10. In a roofing, the inverted-trough-shaped cap for covering the upturned edges of the roofing-sheets, constructed at its eaves end with lateral wings cut from its sides and folded inward, and with a tongue cut from its top, with its end doubled under, its side flanges turned in to cover the edges thereof, and the tongue thus formed turned downward over said wings, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

THOS. W. HELLIWELL.

Witnesses:
GODFREY RHODES,
A. B. CROSSBY,
Commercial Street, Halifax.