(No Model.) 2 Sheets—Sheet 1.

C. B. COOPER.

SHINGLE.

No. 422,571. Patented Mar. 4, 1890.

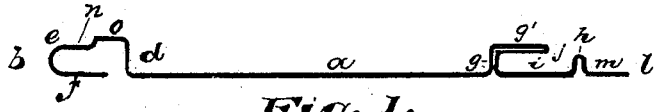

Fig. 1.

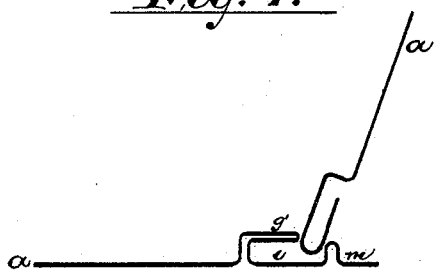

Fig. 2

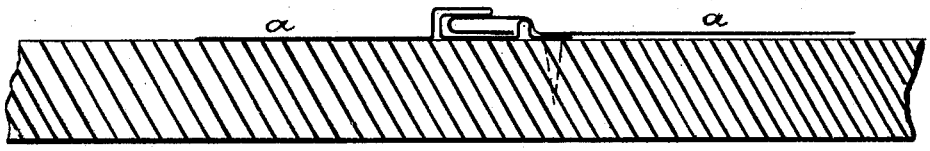

Fig. 3.

Fig. 4.

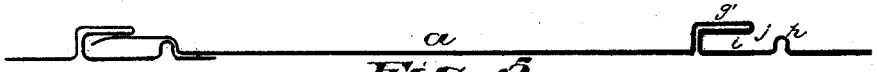

Fig. 5.

WITNESSES:

C. R. Bennett
H. E. Rice

INVENTOR

Charles B. Cooper;

BY Drake & G., ATTY'S

(No Model.) 2 Sheets—Sheet 2.

C. B. COOPER.

SHINGLE.

No. 422,571. Patented Mar. 4, 1890.

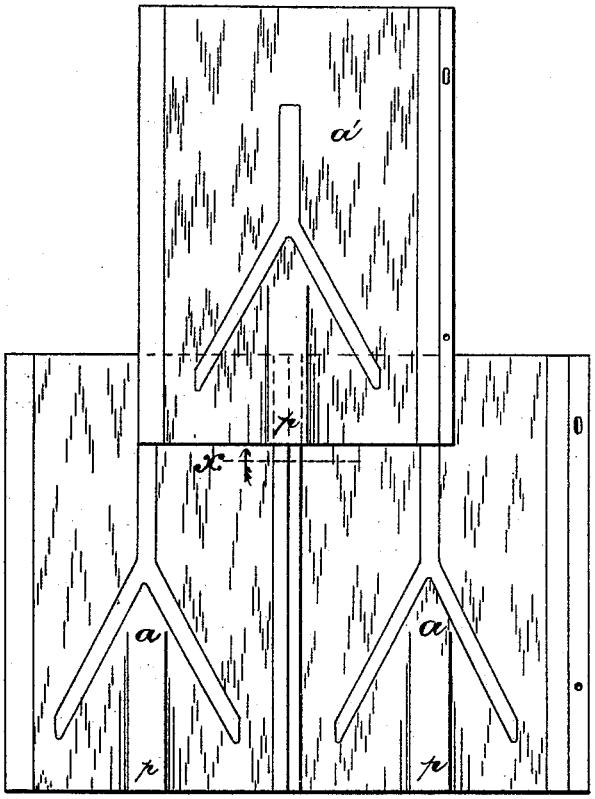

Fig. 6.

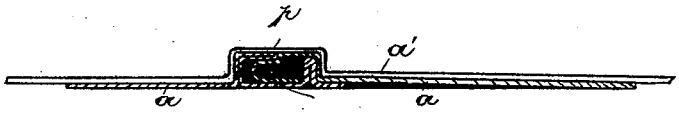

Fig. 7.

WITNESSES: INVENTOR:

C. R. Bennett
H. E. Rice

Charles B. Cooper,

BY Dodger & Co., ATTY'S.

UNITED STATES PATENT OFFICE.

CHARLES B. COOPER, OF NEW YORK, N. Y.

SHINGLE.

SPECIFICATION forming part of Letters Patent No. 422,571, dated March 4, 1890.

Application filed June 16, 1887. Serial No. 241,486. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. COOPER, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Shingles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to facilitate the process of arranging metallic plates or shingles upon the roof of a house or other building for the purpose of protection from the weather, to render the operation more convenient for the roofer, and to secure a joint that will be stiffer or stronger to resist pressure from the outer surface and one that will be more impervious to the action of the weather.

The invention consists in the improved shingle or roofing-plate and in the arrangement and combination of parts thereof, substantially as will be hereinafter set forth, and finally embodied in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures of the two sheets, Figure 1 is an edge view of one form of my improved shingle. Fig. 2 is an edge view illustrating the mode of arranging one shingle into operative relation with the lateral adjacent shingle. Fig. 3 is an edge view showing the arrangement of two shingles together when said shingles are upon the roof, and Figs. 4 and 5 are edge views showing modifications of construction. Figs. 6 and 7, Sheet 2, are respectively a plan and section taken on line *x*.

In carrying out the invention I form at the lateral edges of a shingle or sheet-metal plate *a* certain corrugations, forming at one edge what may be termed a "tongue" *b*, and at the opposite edge a longitudinal groove or socket to receive the corresponding tongue of the plate next adjacent thereto. Said tongues and sockets or grooves are of peculiar shape, as will be hereinafter described. In forming the tongue the plate is bent back from the edge thereof, as at *d* in Fig. 1, to raise the edge portion slightly from the roof or from the plane of the plate *a*, as shown, to provide a support for a cover or holding portion of the adjacent plate. The outer edge *e* is or may be bent downward in return or reverse directions to form a drip, or, should the said edge be continued downward to the plane of the body of the plate, to secure a support or standard to stiffen the cover and provide a substantial or firm rib, and, finally, the tongue or edge of the plate *a* may be bent inward, as at *f*, to form a limiting tongue or stop by which lateral movement of the shingle is prevented and the roofer is kept from allowing the shingles to be secured to the roofing in a partially-separated relation. The edge of the plate is thus given a shape resembling an angular bead.

The socket at the opposite edge of the plate is formed, preferably, as indicated in Figs. 2 and 3, in which *g g'* indicate a flanged rib running longitudinally along the plate back from the edge thereof and formed by doubling the metal and then giving the outer edge of the same a lateral bend or turn toward the edge, as at *g'*, so that the outer portions of the flange lie in a plane parallel or approximately parallel with the body of the plate, thus forming a cover or holding plate to lie upon and secure the tongue of the next adjacent plate in place. Between said flanged rib *g g'* and the extreme edge of the plate is another projecting rib *h*, also formed by doubling the plate, which acts as a stop to engage the limiting tongue or stop *f* and also serving to support and strengthen the raised portion of the tongue of the adjacent plate. Formed between the ribs *g*, *g'*, and *h* is a chamber or partially-formed gutter *i*, which opens toward the edge of the plate. The extreme edge of the plate lies in a plane with the body metal, forming a perforated flange *m*, adapted to receive a tack or nail or other fastening *k*, whereby said plate is secured to the roof. By having the chamber *i* open toward the edge, as indicated, the same is more clearly apparent to the roofer, so that he may ordinarily insert the tongue of the next plate therein more readily. When the tongue is in operative engagement with the socket of the next adjacent plate, an angular rib of one plate is formed at the junction, having the opposite edges or sides disposed uniformly at right an-

gles to the plane of the body-plates, presenting an appearance peculiarly neat and desirable, and adapted to form a tight joint with the plate in the next course above.

When the parts are together, the flange g' lies upon the outer face of the tongue b, so that a close joint is formed, allowing little water to enter therethrough. Below this joint, however, the chamber above referred to is so formed that water driven by the force of the storm or by capillary attraction may enter and run downward over the drip into a gutter formed between the projecting ribs g h. The outer rib h prevents the water passing by capillary attraction between the plate a and its co-operating-plate to the roof-boards. By turning the tongue edge so that the portion e extends to the bottom of the chamber i the flange or cover g' is held up in position more securely, and the rib as a whole is thus given greater strength to resist bending should undue pressure be brought to bear thereon. By turning the edge f inward toward the bend d the said turn f serves as a stop-flange to engage the projection h and prevent the plate from being withdrawn by a straight lateral draft before the edge e of the upper portion of said tongue b is brought to a point coinciding with the edge of the downwardly-bent tongue g', so that the parts are held together more perfectly. The ribs or projections g h are formed at right angles to the body of the plate a, so that they will present a positive stop or lateral draft on the co-operating plate, as distinguished from an obstruction such as would be formed by an incline such as is shown in prior patents. It will be observed that the downwardly-bent flange g' is comparatively of considerable length. It thus has inhering in it the qualities of a spring, so that when the bead is thrust into the socket thereunder the said flange gives slightly to allow the tongue to be thrust into the plate. When the tongue having a bead-like configuration is forced to spring into the socket, the edge of the flange f presents a bearing to the rib h, so that the workman becomes aware by his touch that the parts are in their proper relative position and there is no danger that the adjacent plates will be inadvertently left apart.

Should I desire to dispense with the inward projection f, I would prefer still to have the edge e bent down, as indicated and shown in Figs. 4 and 5, so that a drip is formed which would prevent the water from working along the bottom of the under side of the tongue and between it and the upper edge of the rib h to the roof, the said drip causing the water to pass into the gutter, where it cannot get over the projection h by capillary attraction or otherwise. The flange g' serves as a step or guard adapted to hold the co-operating tongue down in place in the chamber below, in addition to the functions already described. The rib thus formed at the juncture of the two plates is given not only great strength and impermeability, but is also given a simple right-angular outline particularly pleasing and desirable, and one that can be readily covered by the plate a', Figs. 6 and 7, without forming openings through which the snow or water can be forced upward by wind to the roof, as in cases when the rib is given an irregular shape with overhanging lateral ledges or brinks.

To secure greater regularity of square outline in the rib f, I prefer to form in the upper face of the bead b a recess n, Fig. 1, of about the depth of the flange g', so that the upper surface of the said flange portion o of the bead will be flush with flange g', and the cap p, formed at the lower edge of the plate lying in the next upper course, will lie close down upon the rib along its whole top face, and no openings will be formed.

I am aware that changes may be made in the relation of parts other than as herein provided for without departing from the spirit of this invention.

Having thus described the invention, what I claim as new is—

1. The combination of a shingle or plate a doubled and bent as at g g', and again doubled, as at h, and at a point between the said doubled and bent portion and the edge of the plate, and a suitable plate having a tongue adapted to enter beneath said doubled and bent portion, a chamber i being formed beneath said tongue where it engages the flange g' adapted to carry off the water and prevent capillary attraction, substantially as set forth.

2. The improved shingle, having a bead or tongue with a drip projection e formed at one edge, and at its opposite edge having two projections formed by doubling the body metal, one of said projections being bent to form a partial covering or holding flange g', and a chamber being formed below and adapted to receive the tongue of the next adjacent plate, substantially as set forth.

3. In combination, the plates a a, having a flange g' and a tongue v, with a recess n to receive said flange, said flange and tongue forming a right-angular rib at the joint or union of said plates, and a plate a', having a right-angular cap corresponding in shape transversely to said rib, substantially as set forth.

4. In combination, a plate having the raised flange g' lying in a plane parallel with the plane of the body-plate, and a co-operating plate having a tongue bent, as at d, and downwardly turned, as at e, and adapted to enter beneath said flange g', substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 7th day of June, 1887.

CHARLES B. COOPER.

Witnesses:
CHARLES H. PELL,
OSCAR A. MICHEL.