(No Model.)

# L. L. SAGENDORPH.

## METAL ROOFING.

No. 417,947. Patented Dec. 24, 1889.

Fig. 1.

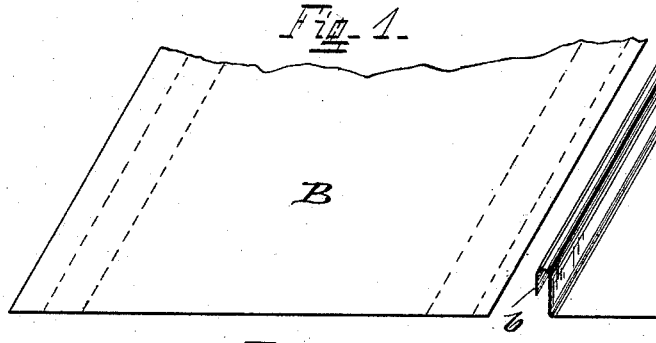



Fig. 2.

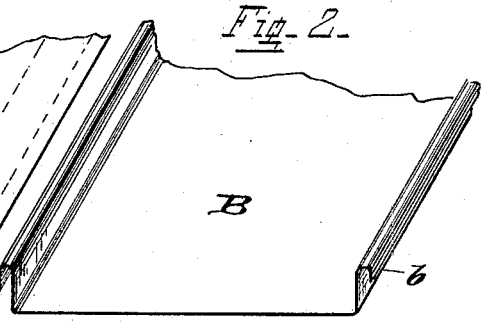



Fig. 3.

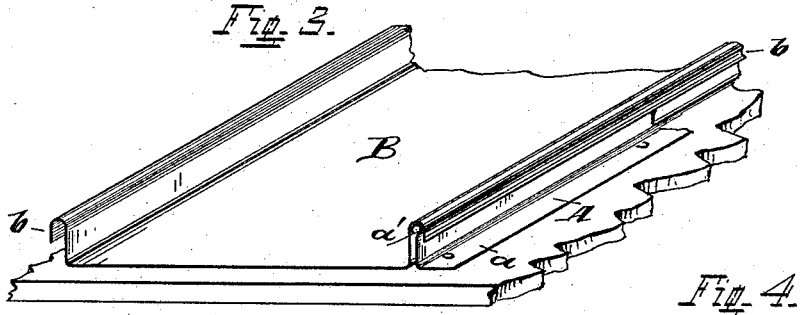



Fig. 4.

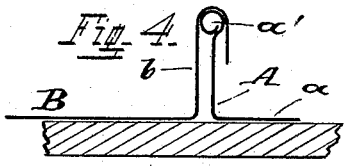



Fig. 5.

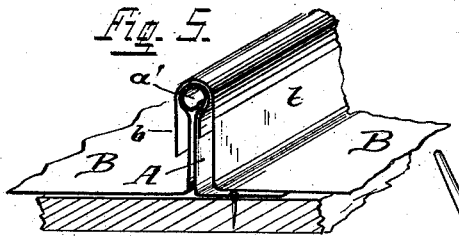



Fig. 8.

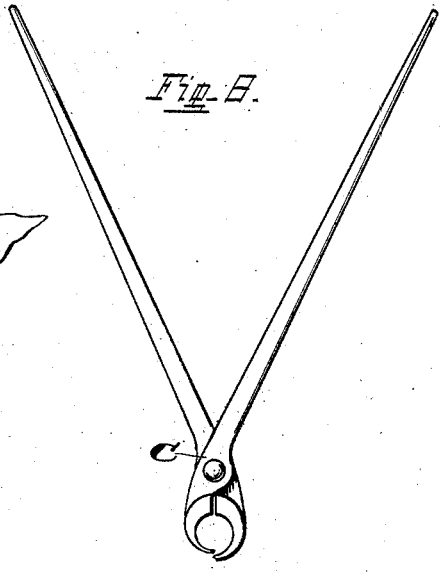



Fig. 6.

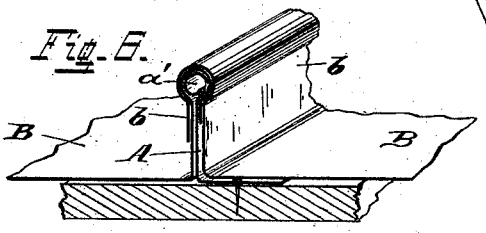
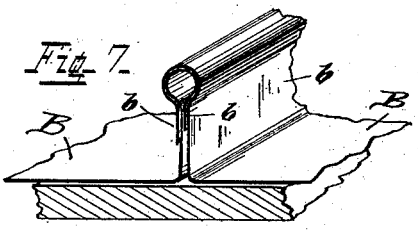



Fig. 7.

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# UNITED STATES PATENT OFFICE.

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## METAL ROOFING.

SPECIFICATION forming part of Letters Patent No. 417,947, dated December 24, 1889.

Application filed July 11, 1889. Serial No. 317,213. (No model.)

*To all whom it may concern:*

Be it known that I, LONGLEY LEWIS SAGENDORPH, a citizen of the United States, residing at Cincinnati, in the county of Hamilton, State of Ohio, have invented certain new and useful Improvements in Standing-Seam Joints for Metal Roofing, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of one end of a roofing-sheet before forming the side hooked flanges, and Fig. 2 is a view of same after said flanges are formed. Fig. 3 is a perspective view of a portion of one roofing-sheet in position over the tubular cleat before being locked thereto; and Fig. 4 is a vertical cross-section, on an enlarged scale, through the hooked flange and cleat shown in Fig. 3. Fig. 5 is a perspective view of the standing seam, showing the lower roofing-flange compressed or locked around the tubular portion of the cleat, the overlapping flange of the adjacent sheet not having been locked to place; and Fig. 6 is a view similar to Fig. 5, showing the seam complete in a locked position. Fig. 7 is a view similar to Fig. 6 with the cleat removed. Fig. 8 is an end view of preferred form of tongs for compressing and locking the flanges of the roofing-sheets around the tubular portion of the cleat.

My improved standing seam is made up of an anchor-cleat A, having a nailing-flange *a*, the top of the upturned portion of said cleat being bent in such a manner as to form the tubular portion *a'* the entire length of said cleat, around which the overlapping flanges *b* of the sheets B are compressed and locked by means of a suitable tool, as tongs C.

The cleat A is first cut of the desired width, after which the tubular portion *a'* is shaped in a suitable form. The metal employed in the make-up of the cleat is preferably heavier than that used in the sheets, in order to strengthen the tubular anchor portion thereof. The nailing-flange *a* of the cleat is next bent to position and the requisite number of nail-openings punched therein.

The overlapping side flanges *b* of the roofing-sheets preferably extend down and around the tubular portion of the cleat when locked to place and slightly below the curvilinear line of said tubular portion, in order to form an angle in said flanges directly beneath the same, as shown. The forming of the angles in the side flanges at each side of the cleat and directly beneath its tubular portion serves to securely lock the sheets thereto, affording a standing seam free of all nail-hole exposures and overlapping cleats, and one which will permit of ample expansion and contraction.

The tongs C for locking the side flanges of the sheets around the tubular portion of the cleat are preferably formed as shown, the one jaw being below the plane of the opposing jaw, in order to more firmly compress said flanges around said tubular portion of the cleat.

The tongs herein shown form the subject-matter for a separate application for Letters Patent filed September 21, 1889, Serial No. 324,671.

The roofing-sheets are applied and the standing seam formed in the following manner: Having properly secured the outer edge of the first row of sheets to the sheeting, the cleat is inserted beneath the overlapping flange on the opposite side of the sheet, as shown at right hand in Fig. 3 and by section in Fig. 4, said cleat extending the full length of the seam, after which the flange is compressed and locked around the tubular portion of the cleat, as shown at center in Fig. 5. Having locked the one flange to the cleat, as afore described, the latter is nailed to the sheeting, after which the overlapping flange of the adjacent sheet is placed over the first flange and cleat, as shown in Fig. 5, when the latter flange is compressed around the tubular portion formed in the first flange, as shown in Figs. 6 and 7, when the seam is complete. Each succeeding row of roofing-sheets is secured together and locked to the cleat in the manner above described.

The advantages of my improved standing-seamed roof are that said seam is perfectly water-tight, free of all overlapping cleats, and is ornamental in appearance. The construction is such as that said seam will admit of expansion and contraction, and at the same time is a saving of material, as the side flanges need extend only a slight distance below the

curvilinear line of the tubular portion of the cleat in order to form the lock-angle in said flanges, as aforementioned.

What I claim as new, and desire to secure by Letters Patent, is—

1. The standing-seam joint for metal roofing-sheets herein shown and described, consisting of a cleat extending the full length of said seam, said cleat having the top tubular portion and a nailing-flange, the side flanges of the roofing-sheets being compressed and locked over and around the tubular portion of said cleat, substantially as set forth.

2. In a standing-seamed roof, the cleat A, having the tubular portion $a'$ and nailing-flange $a$, in combination with the overlapping side flanges $b$ of the roofing-sheets, said flanges being compressed over and around the tubular portion of the cleat, an angle being formed in the said flanges at each side of the cleat and directly beneath its tubular portion, as and for the purposes specified.

LONGLEY LEWIS SAGENDORPH.

Witnesses:
GEO. M. VERITY,
RAYMOND LLOYD.