

J. Diehl,

Metal Roofing.

No. 99656.

Patented Feb. 8. 1870.

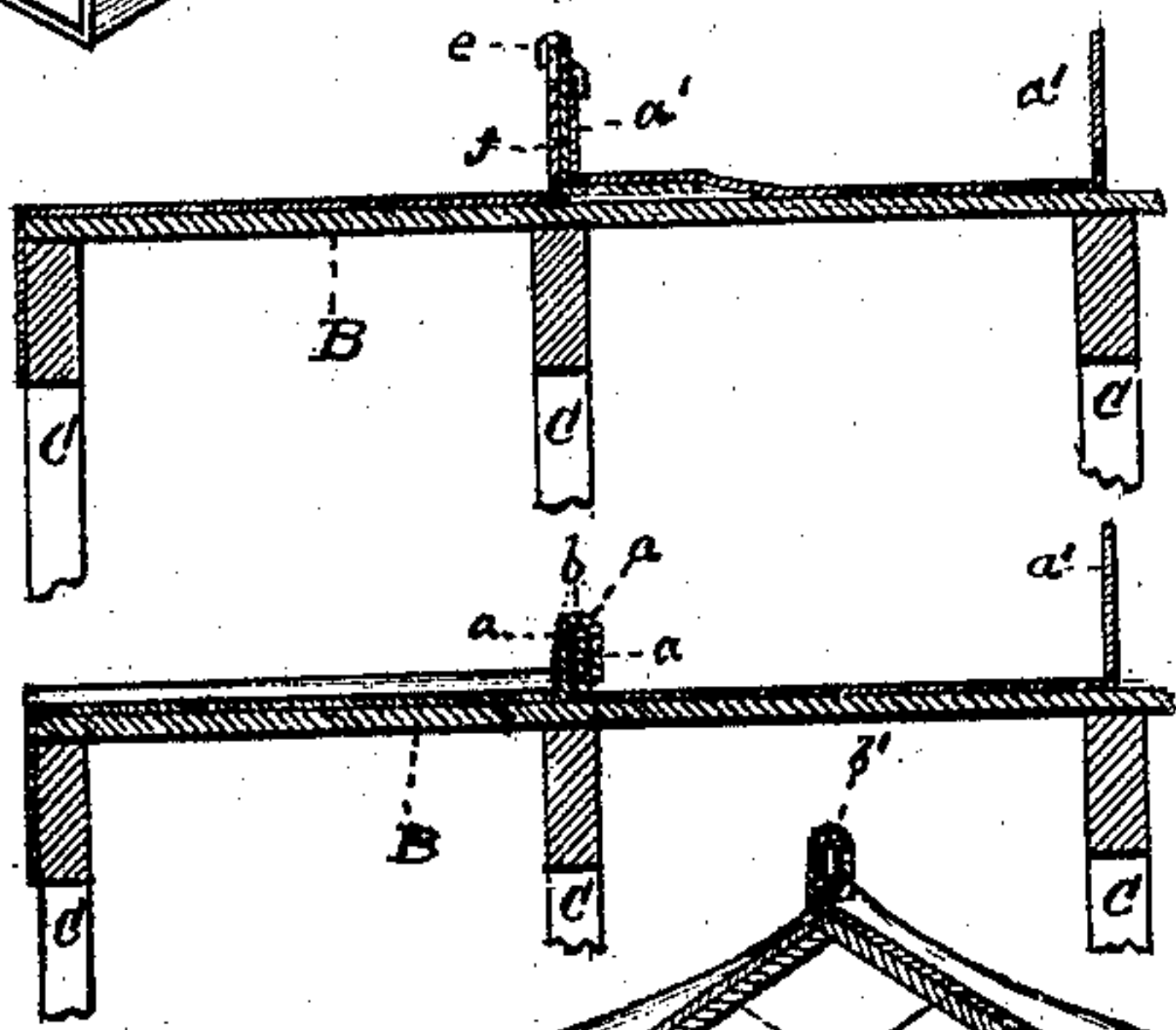
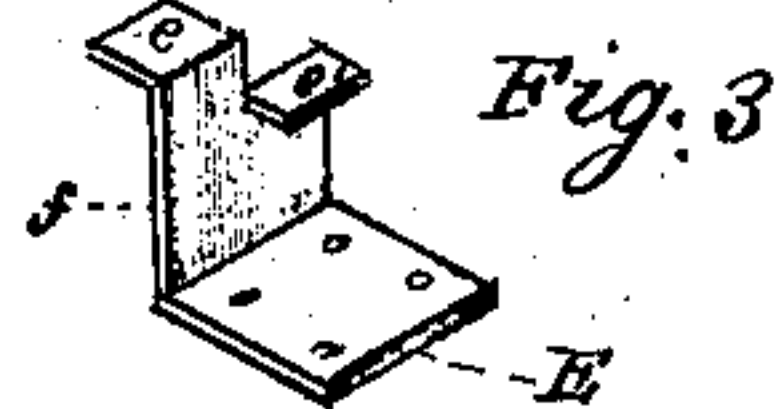
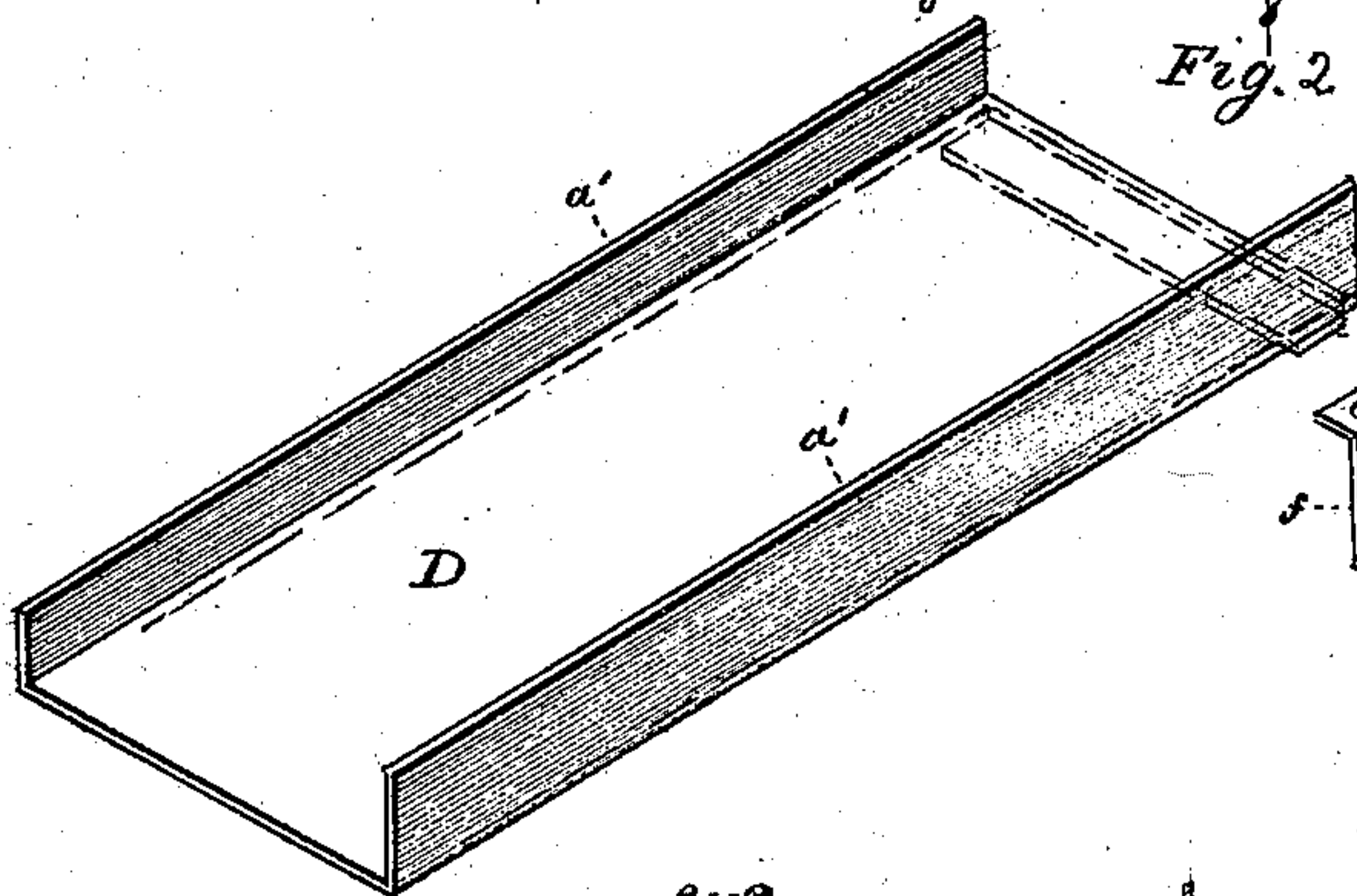
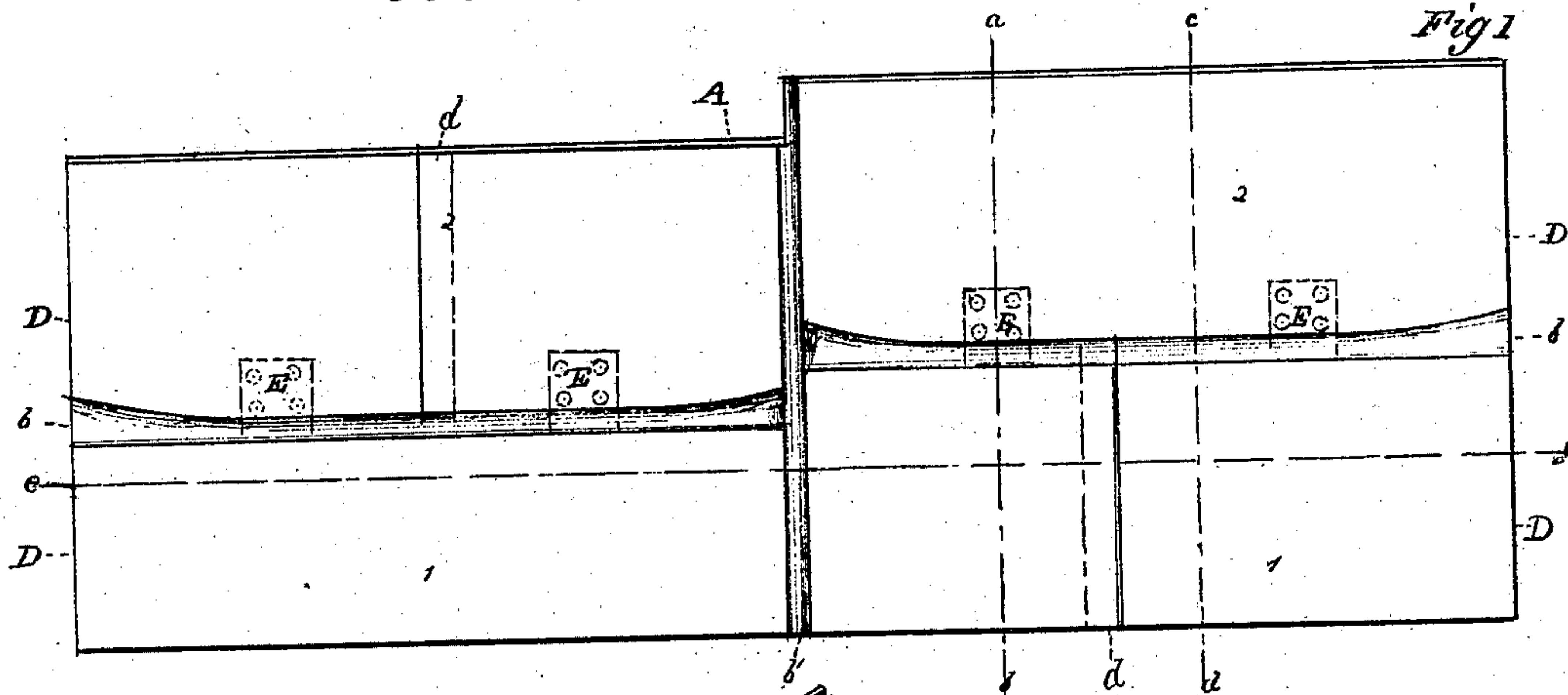
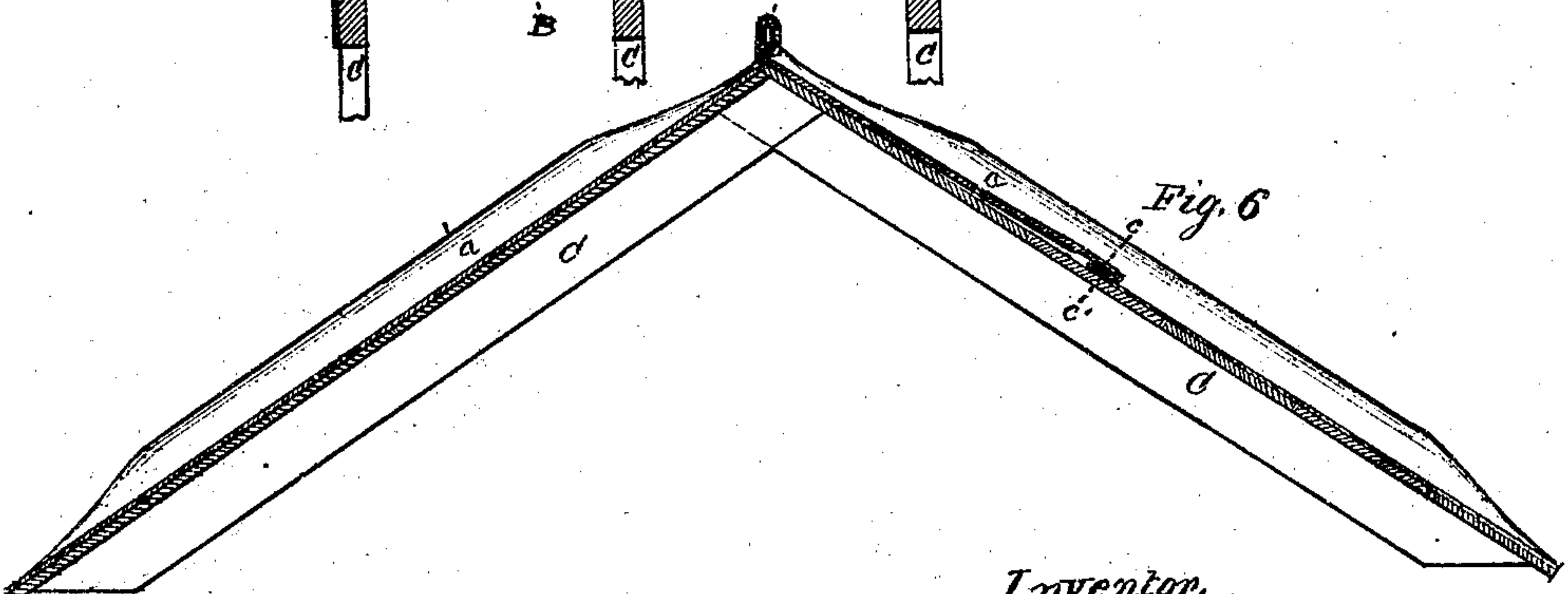


Fig. 5



Inventor.

Witnesses.
Jos. S. Chatham.
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Joseph Diehl.
Stephen Ustick Atty.

United States Patent Office.

JOSEPH DIEHL, OF CLAYTON, PENNSYLVANIA.

Letters Patent No. 99,656, dated February 8, 1870.

IMPROVEMENT IN SHEET-METAL ROOFING.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOSEPH DIEHL, of Clayton, in the county of Berks, and State of Pennsylvania, have invented a new and useful Improvement in Sheet-Metal Roofs; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object of the invention is the construction of the roof with perfectly water-tight joints, and, at the same time, the fastening of the sheets to the lining, by means of knee-plates beneath the sheets, in such a manner as to dispense with nailing the latter, thereby having no nail-heads exposed to the action of the weather, as ordinarily; which, as is well known, is a great objection, as the corrosion of the heads when thus exposed weakens them, and frequently causes a leakage.

The use of the knee-plates at the joints of the sheets also gives greater security to the roof, to prevent the sheets being raised or torn off by high winds.

To enable others skilled in the art to which my improvement appertains, to make a practical application of the same, I will now give a detailed description thereof.

In the accompanying drawings, which make a part of this specification—

Figure 1 is a top view or plan of the improved roof.

Figure 2 is an isometrical view of one of the metal sheets D.

Figure 3 is a like view of one of the holding-down knee-plates E.

Figure 4 is a longitudinal section, at the line *a b* of fig. 1, before the turned-up edges *a a'* of the sheets D are bent over.

Figure 5 is a like view, at the line *c d* of fig. 1, which illustrates the double bend of the sheets.

Figure 6 is a cross-section of the roof, at the line *e f* of fig. 1.

Like letters in all the figures indicate the same parts.

A is a portion of the roof, having lining B, on the rafters C, to receive the sheets D, which form the covering.

These sheets are constructed with turned-up edges *a* and *a'*, at their side edges, for the construction of the vertical joints *b*, and with flat bends *c c'*, at their ends, for forming the horizontal joints *d*. One of the plates is represented in detail in fig. 2.

The ends of the sheets, by which the comb of the roof is constructed, have not the flat bends *c*, but have turned-up flanges *a* and *a'*, for forming double bends like those of the vertical joints *b*, which are seen in detail in fig. 5.

The comb-joint *b'* is shown in detail in fig. 6, as also the flat lapping joints *b''*, which connect the ends of the sheet D.

The first bend above mentioned is merely the bending of the edge of the flange *a* over the edge of the

flange *a'*, the former being made higher than the latter for that purpose.

In the second bend, both flanges are bent together, and the prongs *e* and *e'* of the knees E in connection therewith.

The contiguous edges of the sheets D are confined to the lining B, by means of the holding-down knee-plates E, shown in detail in fig. 3. These pieces are formed of strips of metal bifurcated at one end, to form the prongs *e* and *e'*.

In laying the sheets D, I first confine a bent-down edge or flange of the first to the end rafter, by means of nails which are placed in appropriate holes in the flanges of said sheets, in the usual manner. Then, at suitable distances apart, I place holding-down knee-plates E, against the upturned flanges *a* of the plates or sheets D, and bend the prongs *e* over the same, and nail the bottom part of knee to the lining B. Then, a course, *r*, is laid with the turned-up edge *a'* against the upright portion, *f*, of the knee-plates E, and the prongs *e'* bent over the said edge *a'* to confine the same to the edge *a*, and to hold the contiguous edges of the sheets D firmly to the lining B. The arrangement of the several parts is shown in detail in fig. 4.

The end joints *d* of the sheets are formed by flat interlocks, as seen in fig. 6.

After the flanges *a* and *a'* are connected, by means of the knee-plates E, as above described, a double bend is given them to make perfectly water-tight joints, as represented in fig. 5.

The laying of the sheets forming the remaining courses of the first side of the roof is continued in the same manner, to connect their vertical edges, and confine them to the lining B. Then, the other side of the roof is laid in the same manner.

The comb-joint *b'* of the roof is made, and the sheets confined to the lining B, beneath it, in the same manner as the vertical joints *b*, the formation of the joint being carried along as each succeeding course of the sheets D is laid.

When the sheets are laid on both sides of the roof, as above described, the vertical joints *a* are hammered down at their connection with the comb *b'*, and at the eaves of the roof, to make a finish, as seen in fig. 6, and also to tighten the joints at those places.

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

The combination and arrangements of the holding-down knee-plates E, having two flanges *e e'* with the lining B and sheets D, substantially in the manner and for the purpose above set forth.

In testimony that the above is my invention, I have hereunto set my hand and affixed my seal, this 24th day of August, 1869.

JOSEPH DIEHL. [L. s.]

Witnesses:

STEPHEN USTICK,
JOHN WHITE.