

No. 622,417.

Patented Apr. 4, 1899.

A. J. COHEN.
METALLIC ROOFING PLATE.

(Application filed Aug. 6, 1898.)

(No Model.)

FIG. 1.

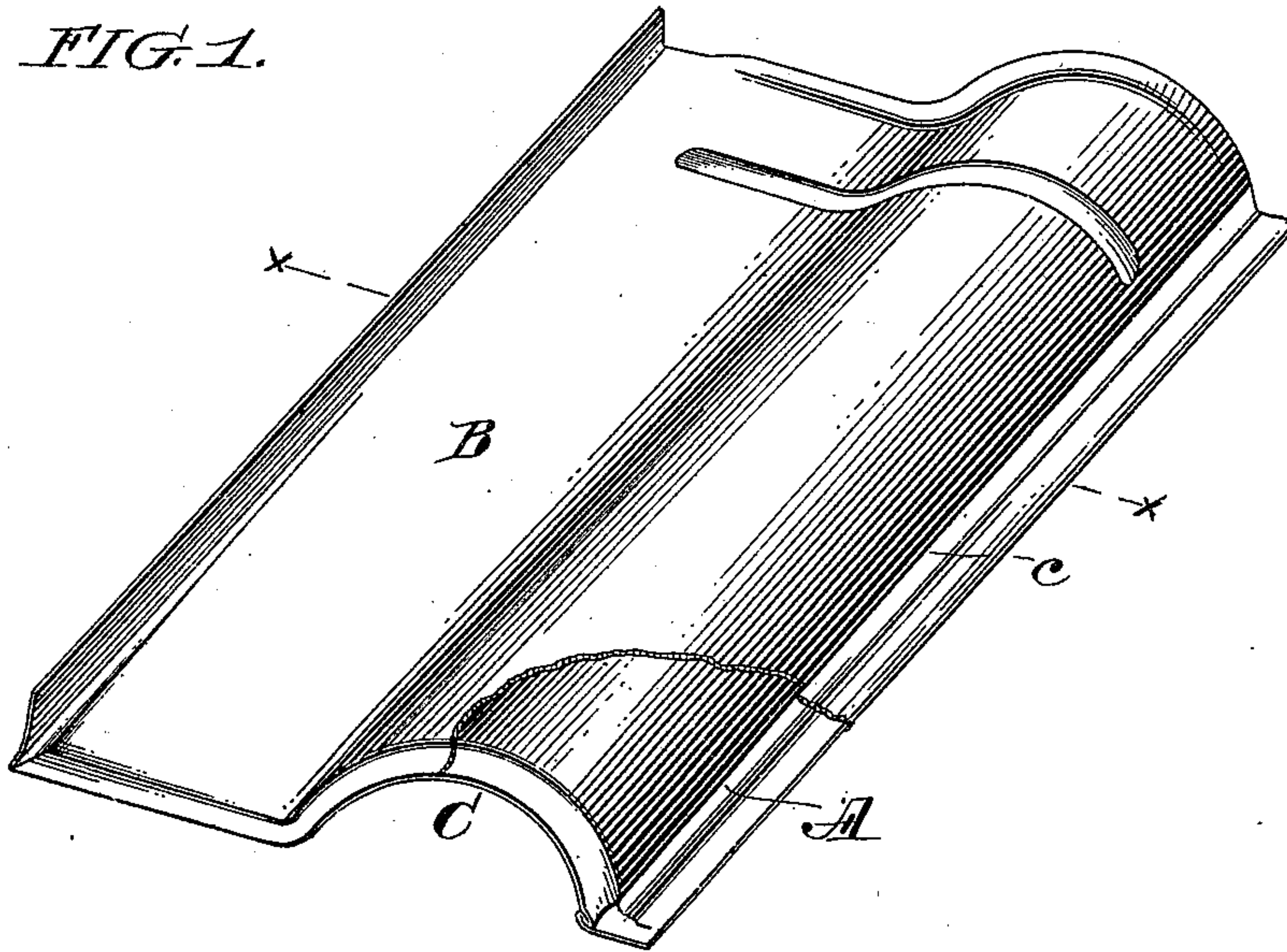


FIG. 2.

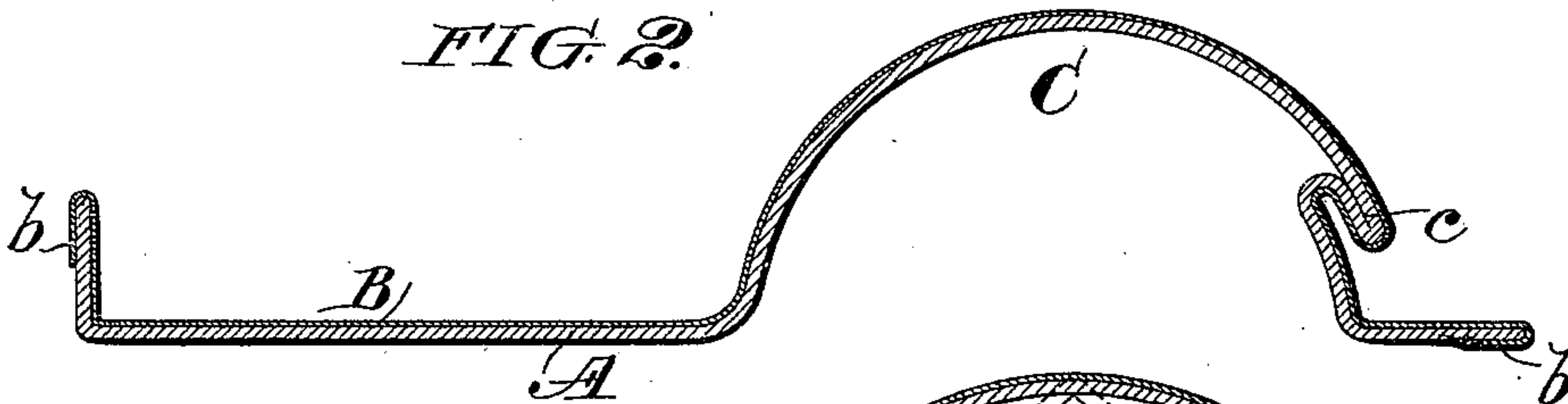


FIG. 3.

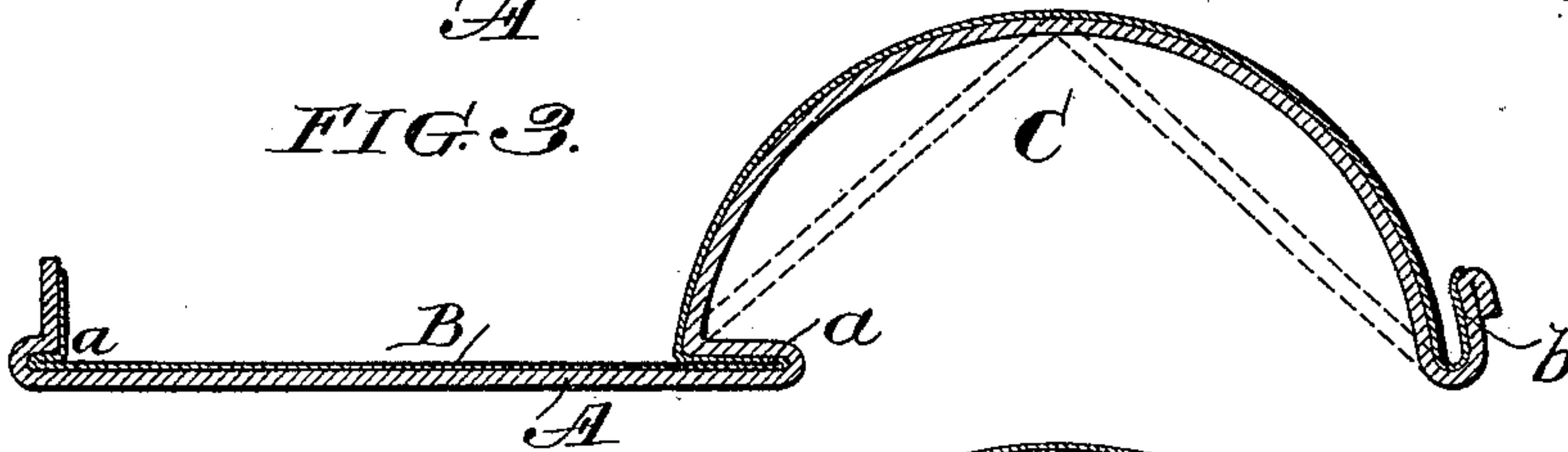


FIG. 4.

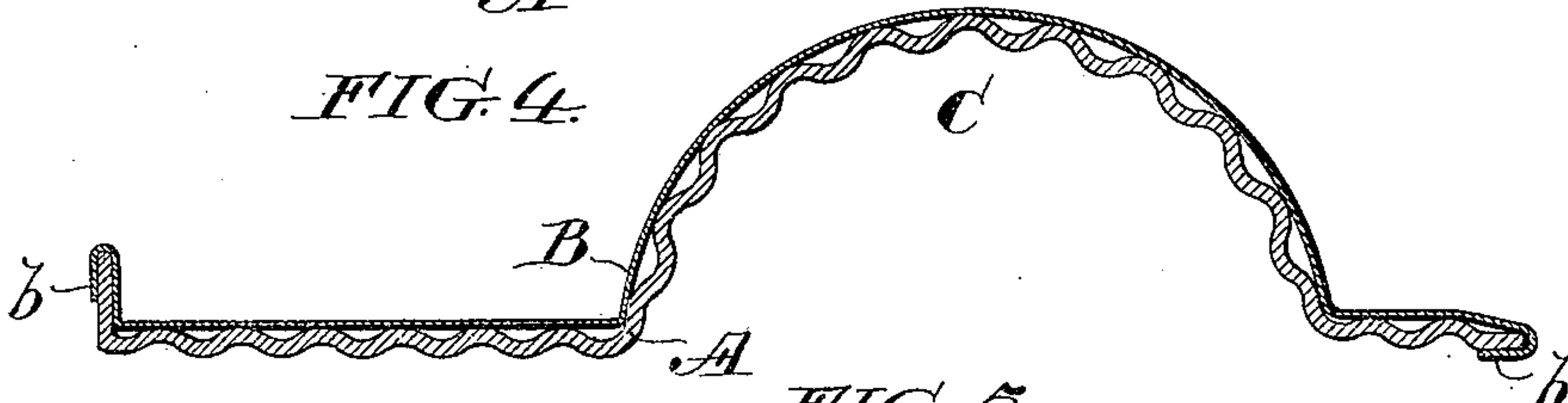
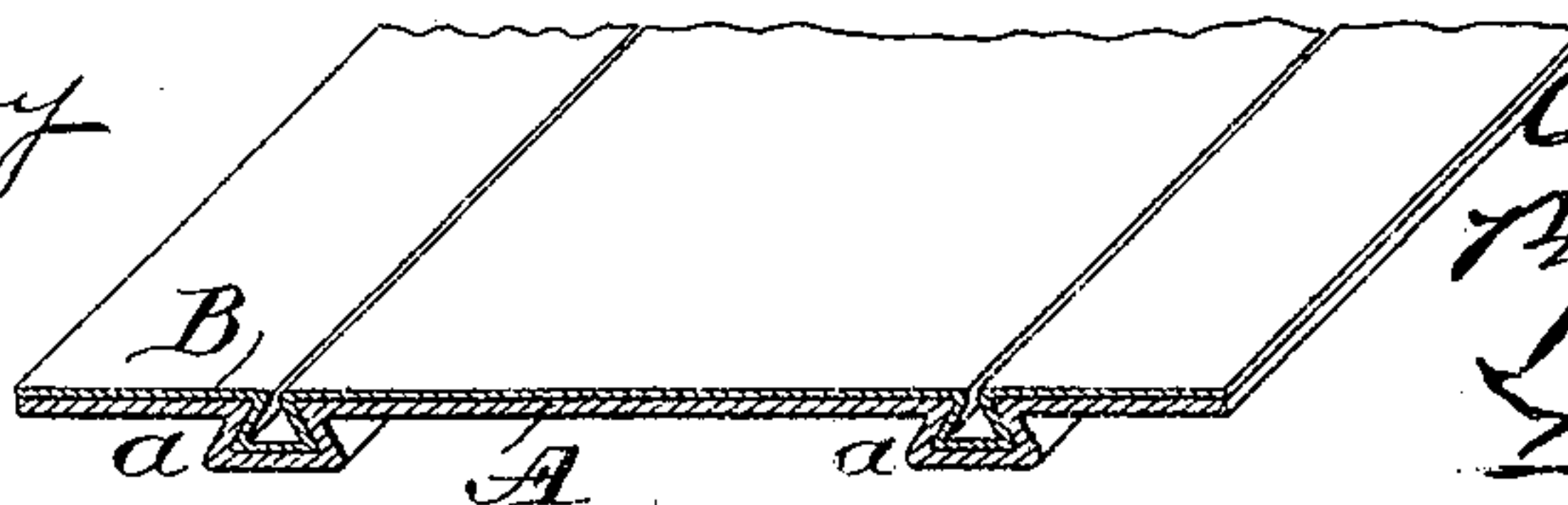


FIG. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

ANDREW J. COHEN, OF PHILADELPHIA, PENNSYLVANIA.

METALLIC ROOFING-PLATE.

SPECIFICATION forming part of Letters Patent No. 622,417, dated April 4, 1899.

Application filed August 6, 1898. Serial No. 687,891. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. COHEN, of the city and county of Philadelphia, in the State of Pennsylvania, have invented an Improvement in Metallic Roofing-Plates, of which the following is a specification.

My invention relates to metallic roofing-plates; and it consists of the improvements which are fully set forth in the following specification and are shown in the accompanying drawings.

The general use of copper, zinc, aluminium, and kindred metals (which are comparatively non-corrodible or unaffected by atmospheric conditions) for roofing purposes is not possible, owing to the expensiveness of the metals, although such plates are used to a limited extent.

It has been proposed heretofore to form roofing-plates of steel or tinned plates coated with a layer of copper or non-corrodible metal, adhering throughout its entire surface, but considerable difficulty from distortion of the plates in use has been experienced owing to the difference in the expansibilities of the two metals of which such compound plates are composed, the coefficient of expansion of copper, for example, being much greater than that of iron or sheet-steel.

It is the object of my invention to provide a metallic plate having a body formed of sheet steel or iron or other suitable metal having the requisite strength, rigidity, and cheapness with its face covered by a thin sheet of copper or other non-corrodible metal extending over the surface of the body-sheet, but not adherent thereto over its surface, so as to allow for the inequality of the expansion and contraction of the two metals. In my preferred construction the thin outer sheet extends over the surface of the body-sheet in close contact therewith, but non-adherent to the surface thereof, and is secured by lapping and compressing its edges over the edges of the body-plate, and in a plate of extended area the thin outer sheet may be further secured at one or more places of very limited area by clamping it in folds or laps in the surface of the body-plate or by any other mechanical expedient for making such attachment.

By these means I obtain a cheap plate having the advantages of a solid plate of copper or kindred metal while employing only a thin sheet of the non-corrodible metal and entirely avoiding the difficulties arising from the inequalities in the expansion and contraction of the two metals.

As the upper surface of the plate only is exposed and subjected to atmospheric conditions it is ordinarily necessary to extend the non-corrodible sheet over the upper face only, but it may, if desired, be extended over both faces.

As the thin outer sheet only is exposed, I am able to employ a body-plate of corrugated sheet metal or of irregular conformation without destroying the smooth exposed surface of the tile.

In the accompanying drawings, Figure 1 is a perspective view of a "Spanish" roofing-tile embodying my invention. Fig. 2 is a transverse sectional view of the same, enlarged, taken on the line *xx* of Fig. 1. Fig. 3 is a similar view illustrating a modification. Fig. 4 is a similar view illustrating a further modification, and Fig. 5 is a similar view showing my improvements applied to a flat tile.

While I have shown my invention embodied in a roofing-plate of the general shape of a Spanish tile, it will be understood that the invention is not limited thereto, but may be embodied in tiles of flat or other shape.

A is the body of the tile and consists of a metal plate having the general shape and form of the desired tile and composed of metal (usually sheet-steel, tinned or untinned) having the proper weight and thickness to give the requisite strength and rigidity to the tile.

B is the surface covering and consists of a thin sheet of non-corrodible metal—such as copper, zinc, or aluminium—stretched over the outer surface of the body A, but not adherent to the surface thereof and secured only at the edges or other suitable points, so as to be held firmly upon the surface of the body-sheet. In the drawings I have shown the surface sheet B with its edges *b* lapped over the edges of the body-plate A and secured thereto by compression.

In a Spanish tile, owing to the extended

surface, it is desirable that the outer sheet should be secured to the body at one or more points intermediate of the edges, and for this purpose the body-sheet may be formed with
 5 one or more longitudinal folds or creases *a* on its outer side, in which the outer sheet B may be clamped or held by friction. (See Fig. 3.) When the tile is formed with a longitudinal locking-rib *c* on its inner side, as
 10 in Figs. 1 and 2, the bending of the surface sheet about this rib serves to secure the outer copper sheet to the plate. It is not necessary that the copper sheet B shall be bent over or about the edges of the plate A, as will be evi-
 15 dent from an examination of Fig. 3. In this case the copper covering-sheet is held in place by clamp-bends wholly intermediate of the edges of the iron body-plate.

The compression of the edges of the outer
 20 sheet about the edges of the body-plate will ordinarily be sufficient to secure the outer sheet in place, and hence in many cases the clamping-bends *a* need not be employed, though, if desired, they may be used in addi-
 25 tion to or in lieu of the clamping of the copper over the edges of the body-plate.

The body-plate and outer sheet may be simultaneously shaped and clamped together between dies, or the body-plate may be made
 30 separately and the surface sheet may be subsequently applied as may be found most convenient.

As the outer sheet is non-adherent through its surface to the body-sheet except by me-
 35 chanical connections at definite places, there is provision for the independent movement of each sheet with respect to the other, thus permitting the unequal expansion and contraction, due to the difference in the coeffi-
 40 cients of expansion of the two metals, to take place without any liability of injury. The connection between the outer surface sheet and body-plate by lapping and compression or otherwise at or intermediate of the edges while
 45 serving to hold the surface sheet firmly in place will not prevent the necessary movement under the unequal expansion and contraction. While the outer sheet may in some cases be brazed or soldered to the plate or
 50 otherwise positively mechanically connected with it at the edges or other points or places of limited area, the surfaces being otherwise non-adherent, I prefer to rely upon lapping and compression, so as to permit perfect free-
 55 dom of expansion and contraction.

The body-plate A serves to give the shape, strength, and rigidity to the tile, and may be made as heavy as may be desired or of any satisfactory material. The outer sheet B
 60 serves merely as a protecting covering for the surface of the body A and may therefore be made as light and thin as may be found practical or desired.

As the outer sheet or covering B only is ex-
 65 posed to view when the tile is in place, it is not necessary that the body A should have

the exact surface conformation of the surface of the tile, as the irregularities or raised portions on the surface may be formed in the sur-
 face sheet B only. Thus in a Spanish tile, 70 with its curved raised portion C, this part may be omitted in the body, which may be made flat or angular, as shown in dotted lines in Fig. 3, thus saving materially in the amount of metal used and cheapening the cost of the
 75 tile. In such cases, however, it would be advisable that the surface sheet B should be made somewhat heavier than would otherwise be necessary to possess sufficient rigidity to
 80 maintain the shape of the raised portion.

My invention also enables a body-plate of corrugated sheet metal, as shown in Fig. 4, to be used, thus giving greater strength in the
 tile without destroying the smooth surface.

In the tile or sheet shown in Fig. 5 the
 85 sheets A and B are flat, and the connection is made in the dovetailed portions or bends *a*. The particular shape of the tile or sheet is immaterial.

It is immaterial to my invention what the
 90 mode of connection between the body and surface or covering sheet may be so long as it is only connected at intervals and permits the necessary independent expansion and
 95 contraction.

The details of construction may be otherwise varied in many ways without departing from the invention.

What I claim as new, and desire to secure by Letters Patent, is as follows: 100

1. A metallic roofing-plate consisting of a body-plate having strength and rigidity, and a thin outer sheet of metal extending over the surface thereof but non-adherent thereto
 105 except at one or more limited points of mechanical connection.

2. A metallic roofing-plate consisting of a body-plate having strength and rigidity, and a thin outer sheet of metal extending over the surface thereof but non-adherent thereto
 110 and secured to said body-plate at the edges.

3. A metallic roofing-plate consisting of a body-plate having strength and rigidity, and a thin outer sheet of metal extending over the surface thereof but non-adherent thereto
 115 and having its edges secured to the edges of the body-plate by lapping and compression.

4. A metallic roofing-plate consisting of a comparatively heavy body-plate, and a thin sheet of copper extending over the surface
 120 thereof and secured mechanically thereto at one or more places of limited area but non-adherent to the general surface thereof intermediate of said places of limited area.

5. A metallic roofing-plate consisting of a
 125 comparatively heavy body-plate, and a thin sheet of non-corrodible metal extending over and in close contact with the surface thereof and mechanically secured at one or more
 130 places thereto intermediate of the edges but non-adherent to the surface thereof throughout the body.

6. A metallic roofing-plate consisting of a
comparatively heavy body-plate formed of
corrugated sheet metal, and a thin smooth
sheet of metal, extending over the surface of
5 said corrugated plate but generally non-ad-
herent thereto, and secured to said plate at
one or more places of very limited area.

In testimony of which invention I hereunto
set my hand.

ANDREW J. COHEN.

Witnesses:

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J. N. KENWORTHY.