

(No Model.)

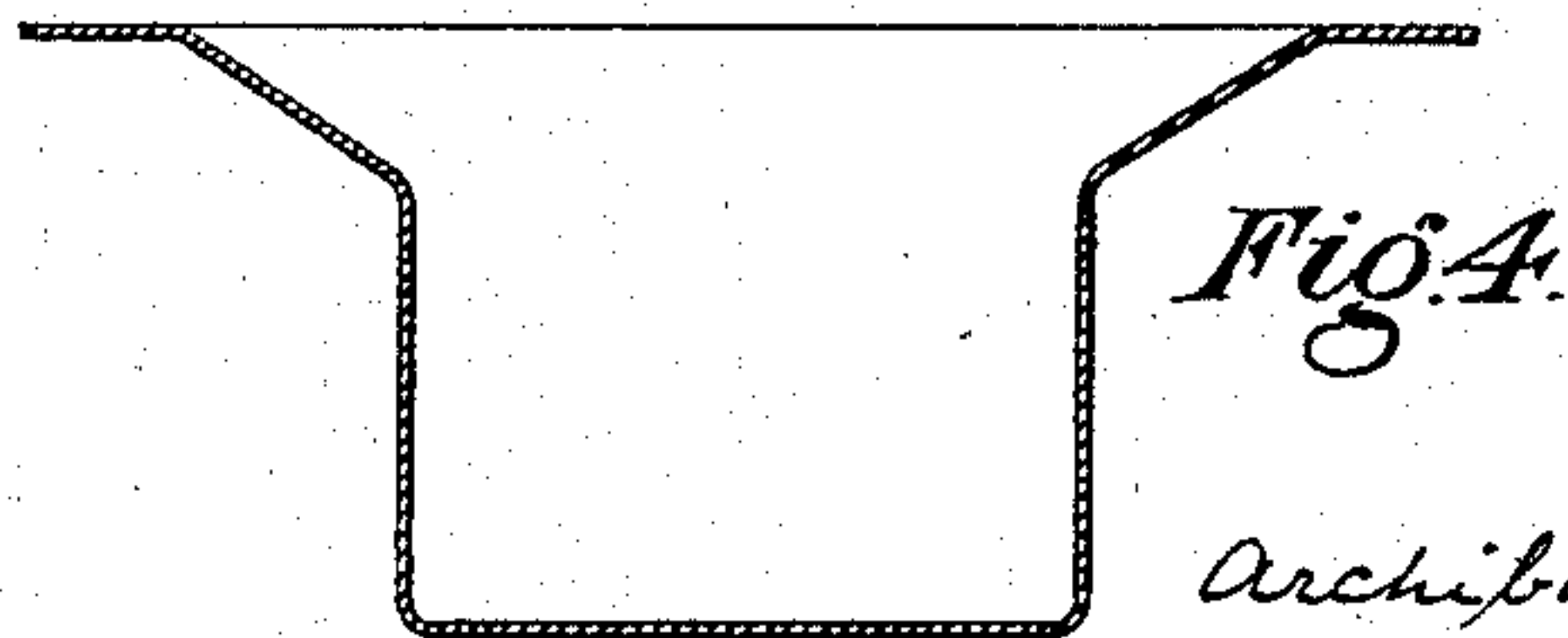
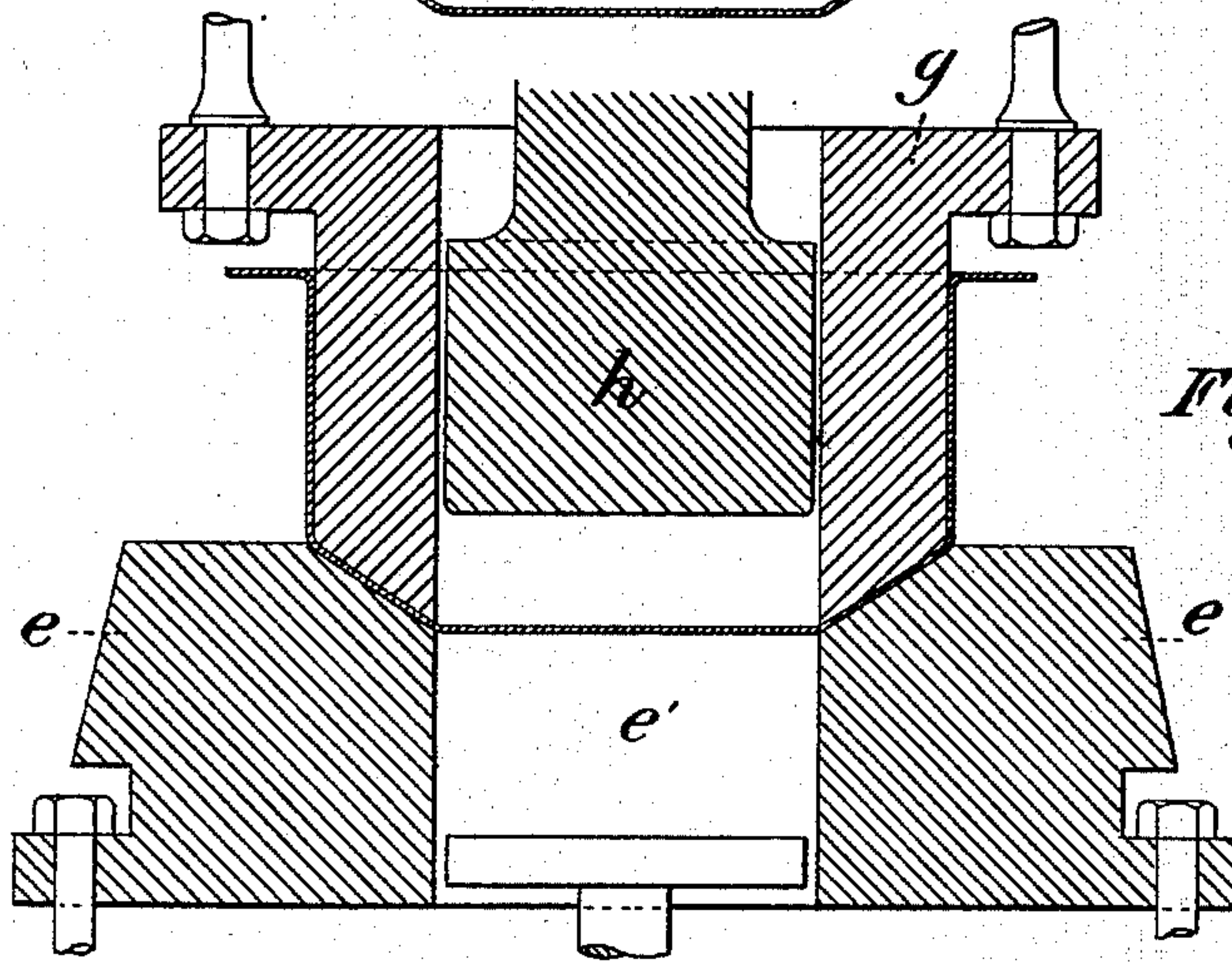
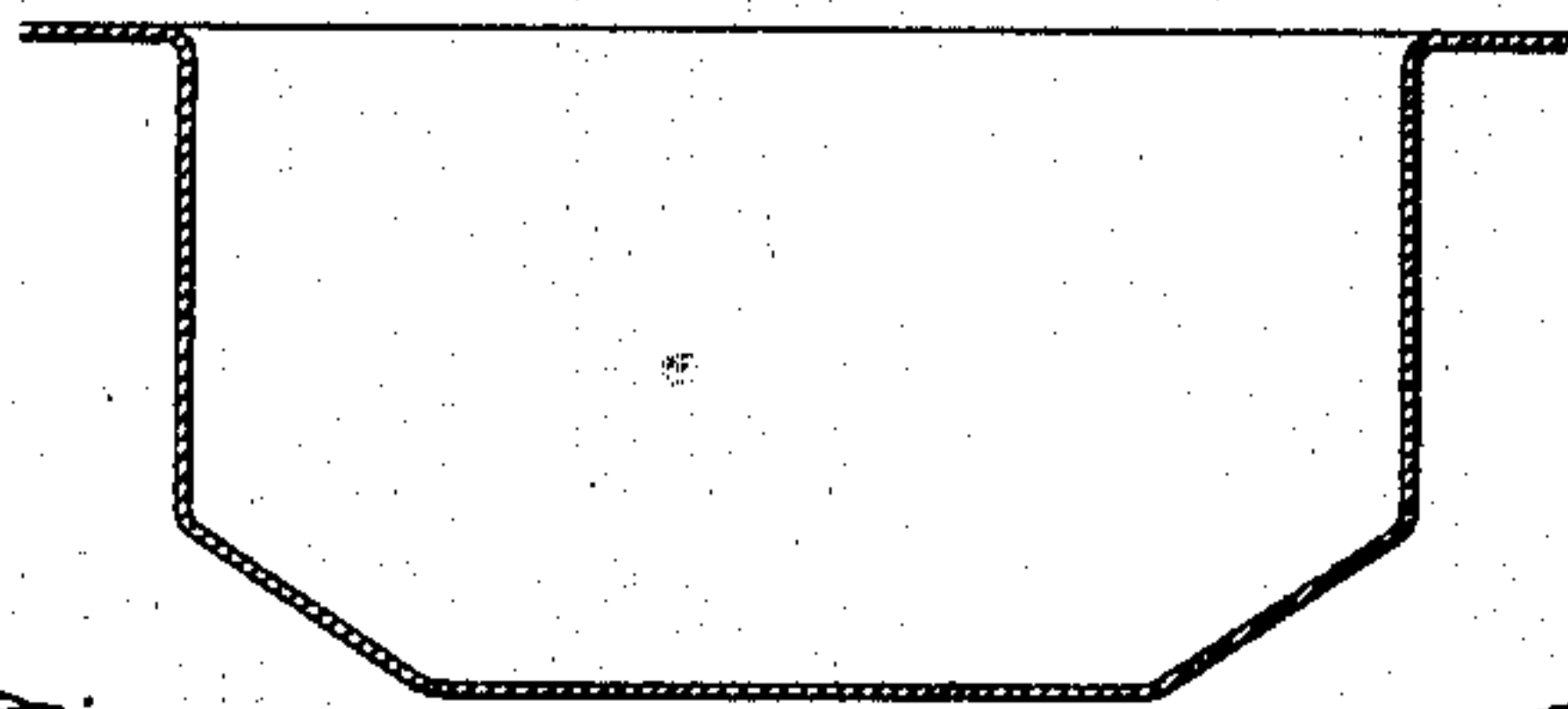
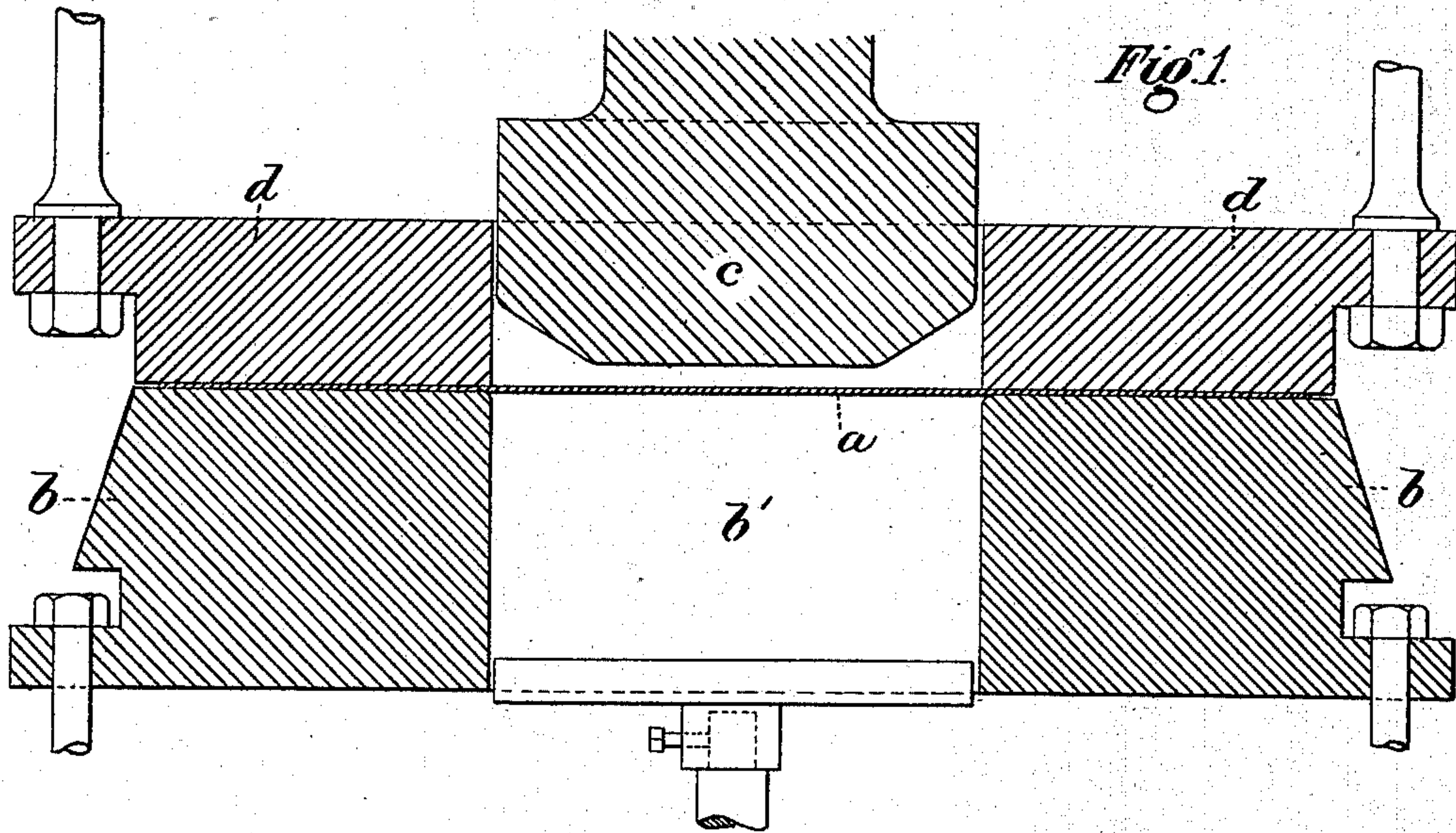
2 Sheets—Sheet 1.

A. W. PAULL.

ART OF MAKING SHEET METAL ARTICLES.

No. 413,372.

Patented Oct. 22, 1889.



WITNESSES.

J. H. Corwin
C. M. Clarke

INVENTOR.

Archibald W. Paull
by H. Bakewell & Sons
his attorneys

(No Model.)

2 Sheets—Sheet 2.

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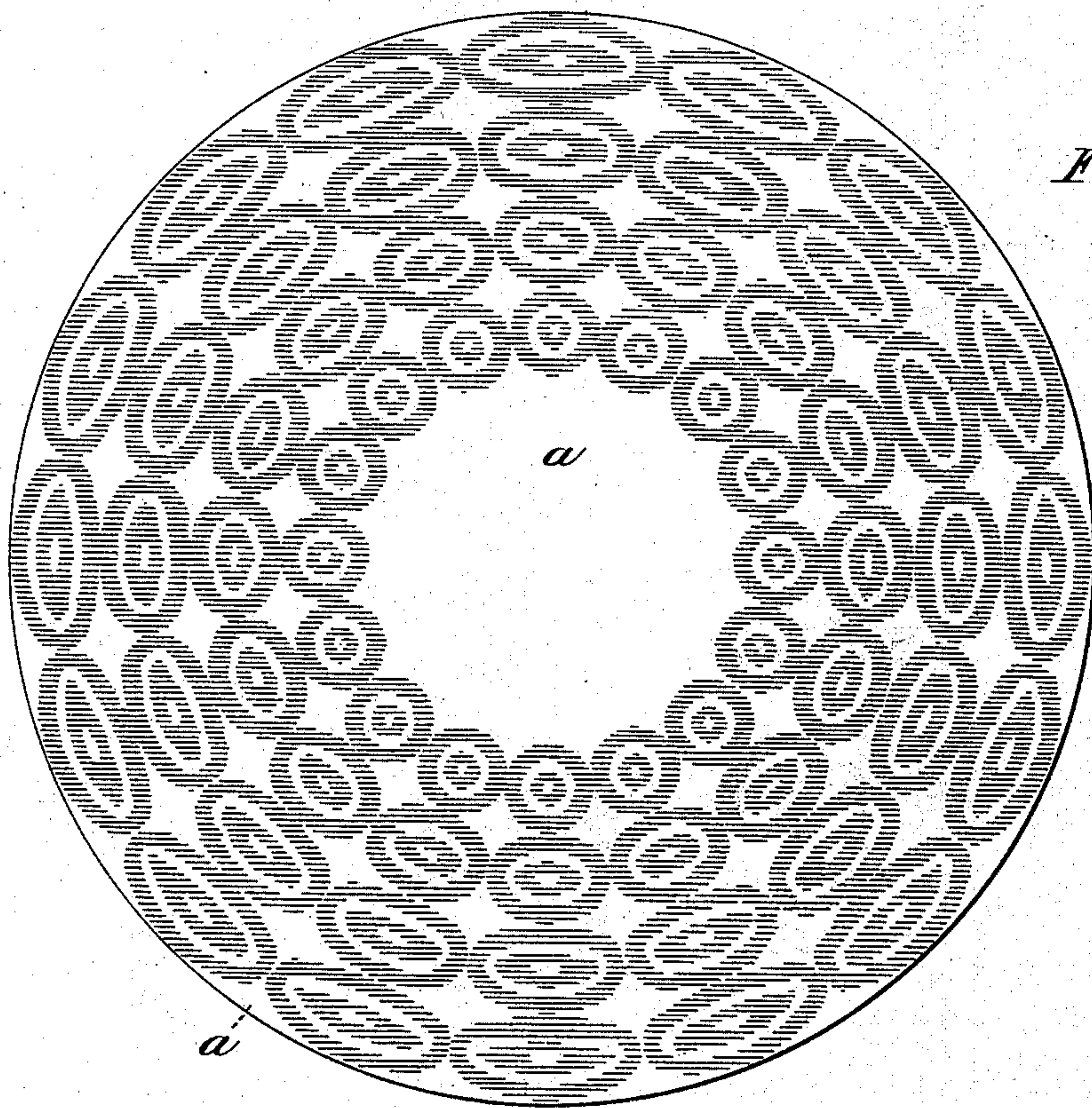


Fig. 5.

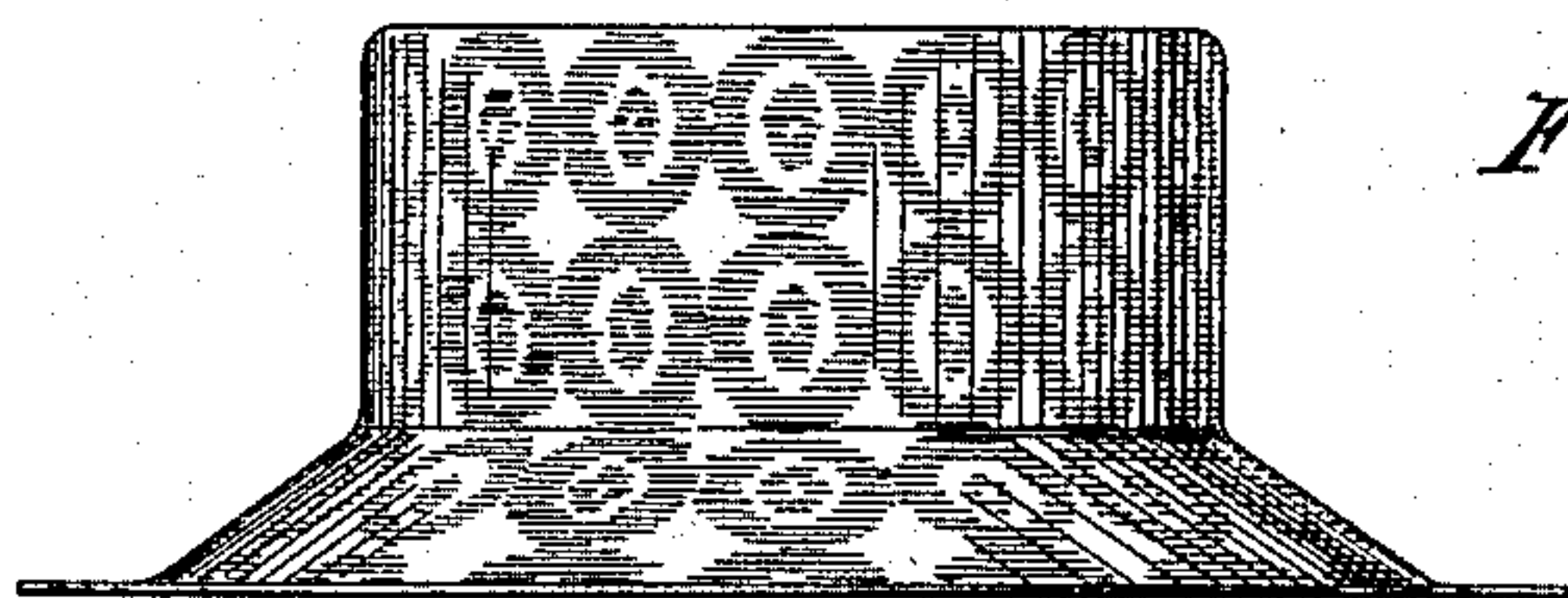


Fig. 6.

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UNITED STATES PATENT OFFICE.

ARCHIBALD W. PAULL, OF WHEELING, WEST VIRGINIA.

ART OF MAKING SHEET-METAL ARTICLES.

SPECIFICATION forming part of Letters Patent No. 413,372, dated October 22, 1889.

Application filed March 29, 1889. Serial No. 306,247. (No model.)

To all whom it may concern:

Be it known that I, ARCHIBALD W. PAULL, of Wheeling, in the county of Ohio and State of West Virginia, have invented a new and useful Improvement in the Art of Making Sheet-Metal Articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of dies adapted to the drawing of the sheet metal. Fig. 2 is a vertical central section of the product thereof. Fig. 3 is a vertical central section of dies used in drawing the product of the dies of Fig. 1 into a different form. Fig. 4 is a vertical central section of the product of the dies of Fig. 3. Fig. 5 is a plan view of a piece of sheet metal which has been embossed preparatory to drawing it in dies. Fig. 6 is a side elevation showing an article drawn from the embossed metal sheet shown in Fig. 5.

Like symbols of reference indicate like parts in each.

My invention relates to a method of ornamenting sheet-metal articles; and it consists, broadly, in providing a piece of sheet metal with a pattern of any outline formed in or on the body of the metal itself, whether in relief or intaglio, (which step I shall designate as "embossing,") and then drawing the metal so embossed in suitable dies which produce the desired article.

My invention is not dependent upon or limited to the use of any peculiar apparatus for drawing the metal or for producing thereon the pattern, nor to any peculiar form or style of pattern, but consists, broadly, in the combination of steps just stated.

Heretofore, so far as I am aware, sheet-metal articles produced by drawing have been made from metal blanks having a plain unpatterned surface, or at least having those portions of the surface which are acted upon by the dies plain and unpatterned, and it has never been thought possible to draw embossed metal through dies and to produce thereby a merchantable article. I have discovered, however, that if the metal blank before being placed in the dies is provided with an embossed pattern such pattern will not be destroyed by the friction and drawing of the dies thereon, but will remain perfectly ap-

parent in the drawn article, and by the polishing action of the dies upon the prominent portions of the pattern will be so modified in appearance as to produce very beautiful effects. In thus drawing the article in the dies the pattern originally produced on the blank is of course changed in outline, because it is drawn and stretched with the drawing of the metal. It is therefore desirable to provide for this by so shaping the pattern originally formed on the blank that when it is elongated by drawing it shall be of the form desired.

I shall now describe the practice of my invention, and for sake of illustration shall describe its use in the manufacture of blanks for lantern-tops—such as shown in Fig. 6 of the drawings—and from such description it will be clear to persons skilled in the art that by mere modifications in the form of the dies any other sheet-metal article can be made in the same way.

Fig. 5 represents the sheet-metal blank *a*, from which the article is to be made. Before placing it in the drawing-dies I produce upon it, by stamping, rolling, pressing, or otherwise, a pattern, which may be of the form illustrated in Fig. 5 or of any other form. I then place the metal sheet on the surface of a die *b*, over the die-cavity *b'*, and hold it by the usual clamp *d*. Then by means of a plunger *c*, which is adapted to enter the cavity *b'*, I draw the sheet of metal into said cavity, producing thereby a cup-shaped article, as shown in Fig. 2. This article is then placed on the surface of a die *e*, on which it is confined by an annular clamp *g*, and by means of the plunger *h* it is drawn into the cavity *e'* into the form shown in Figs. 4 and 6, on the drawn surface of which the pattern will still be present, (see Fig. 6,) though in a somewhat modified form, the individual portions of the pattern being elongated and contracted by drawing, and the elevated or prominent portions being highly polished by frictional contact with the dies.

By a comparison of Figs. 5 and 6 it will be seen how the pattern is originally formed on the sheet, so that after it is drawn it shall be symmetrical in all its parts.

I have described and shown the use of two sets of dies in shaping the sheet-metal article; but it will be understood that, if desired, the metal may be subjected to the drawing action

of one or any greater number of dies, and that after it has been completely drawn it may be further modified in shape by stamping or pressing.

5 The advantages of my invention will be appreciated by those skilled in the art.

By the use of my method I am enabled to produce at trifling cost sheet-metal articles—such as lamps, lanterns, cups of various forms, 10 and a great variety of other articles provided with beautiful patterns—which could not be economically and practically produced in any other way. Indeed, my method often cheapens the manufacture of such articles, because 15 it dispenses with the necessity of burnishing the article after it has come from the last set of dies.

The saving in the cost of producing the pattern by my method will appear when it is 20 considered that after metal has been drawn into an irregular shape it is extremely difficult to be embossed, and that such embossing must then be performed at great cost by hand-work or by the use of specially-constructed 25 and very expensive dies. The cost of embossing the metal before it has been reduced into final shape is small, and my method is therefore inexpensive.

Aside from the advantages which I have 30 already noted, my method possesses a further advantage in that the embossing of the sheet causes the prominent portions alone of the pattern to come into contact with the dies, and thus materially reduces the area of the sheet 35 exposed to frictional contact in drawing.

From this cause the drawing is made easier and articles of greater depth and width can be drawn than is otherwise possible.

My invention is applicable to articles of sheet metal of any kind. 40

In my application for patent filed April 10, 1889, Serial No. 306,733, in which I describe one form of this invention, I claim that improvement in the art of forming articles of sheet metal which consists in impressing a 45 preliminary pattern on the metal sheet by reduction of the substance of the metal on the lines of the pattern between suitable compressing-surfaces and then drawing the metal so compressed between suitable dies, whereby 50 is formed an article of drawn metal having a compressed surface pattern modified in configuration and appearance by the drawing action of the dies.

I claim— 55

An improvement in the art of making sheet-metal articles, which consists in embossing sheet metal and drawing the embossed portion within suitable dies, whereby a sheet-metal article having on its surface a pattern 60 modified by drawing action of the dies is formed, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 28th day of March, A. D. 1889. 65

ARCHIBALD W. PAULL.

Witnesses:

J. K. SMITH,

W. P. POTTER.