

(No Model.)

M. W. DEWEY.
APPARATUS FOR FORMING OR SHAPING SHEET METAL ELECTRICALLY.
No. 438,408.

Patented Oct. 14, 1890.

Fig. 1

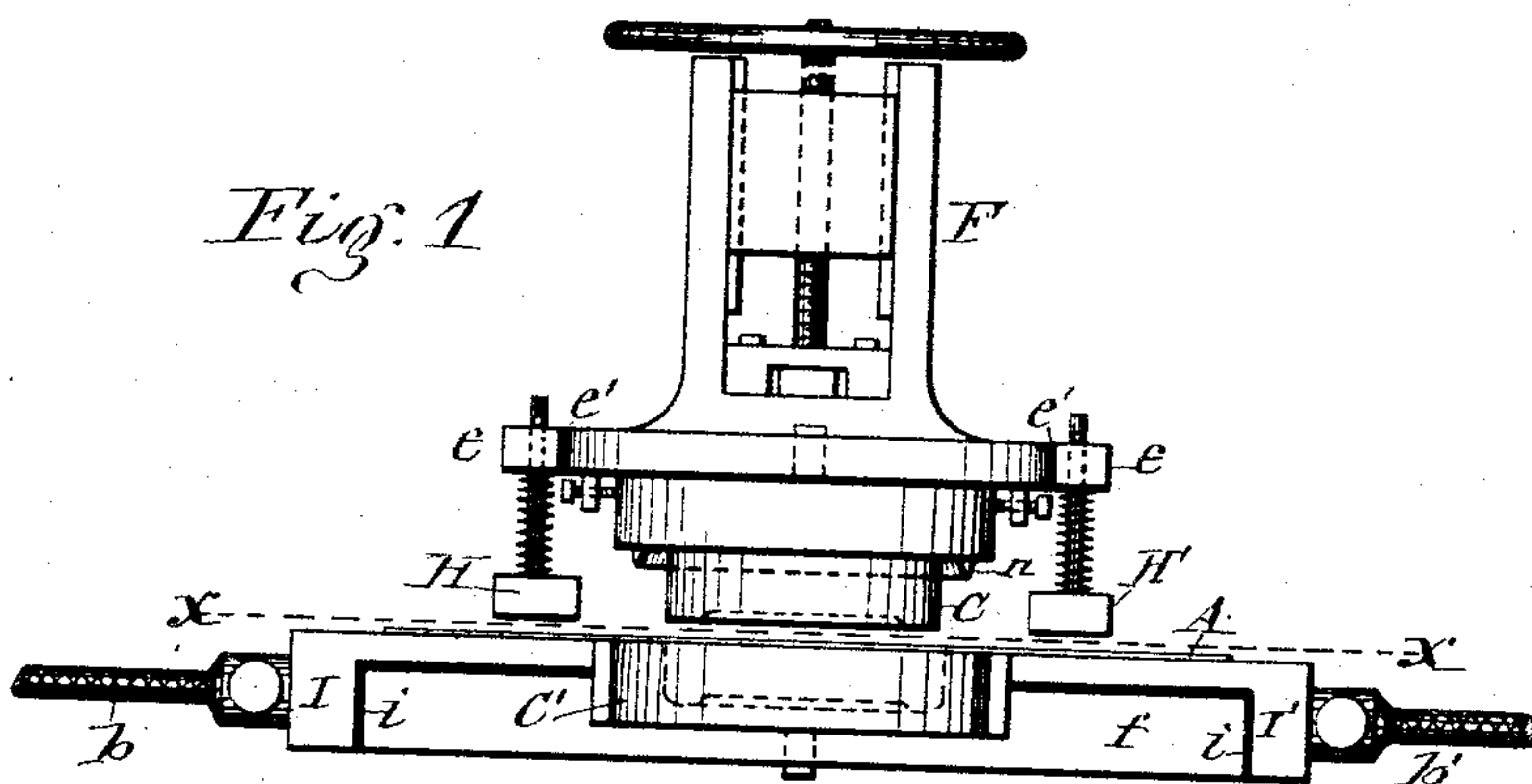


Fig. 2

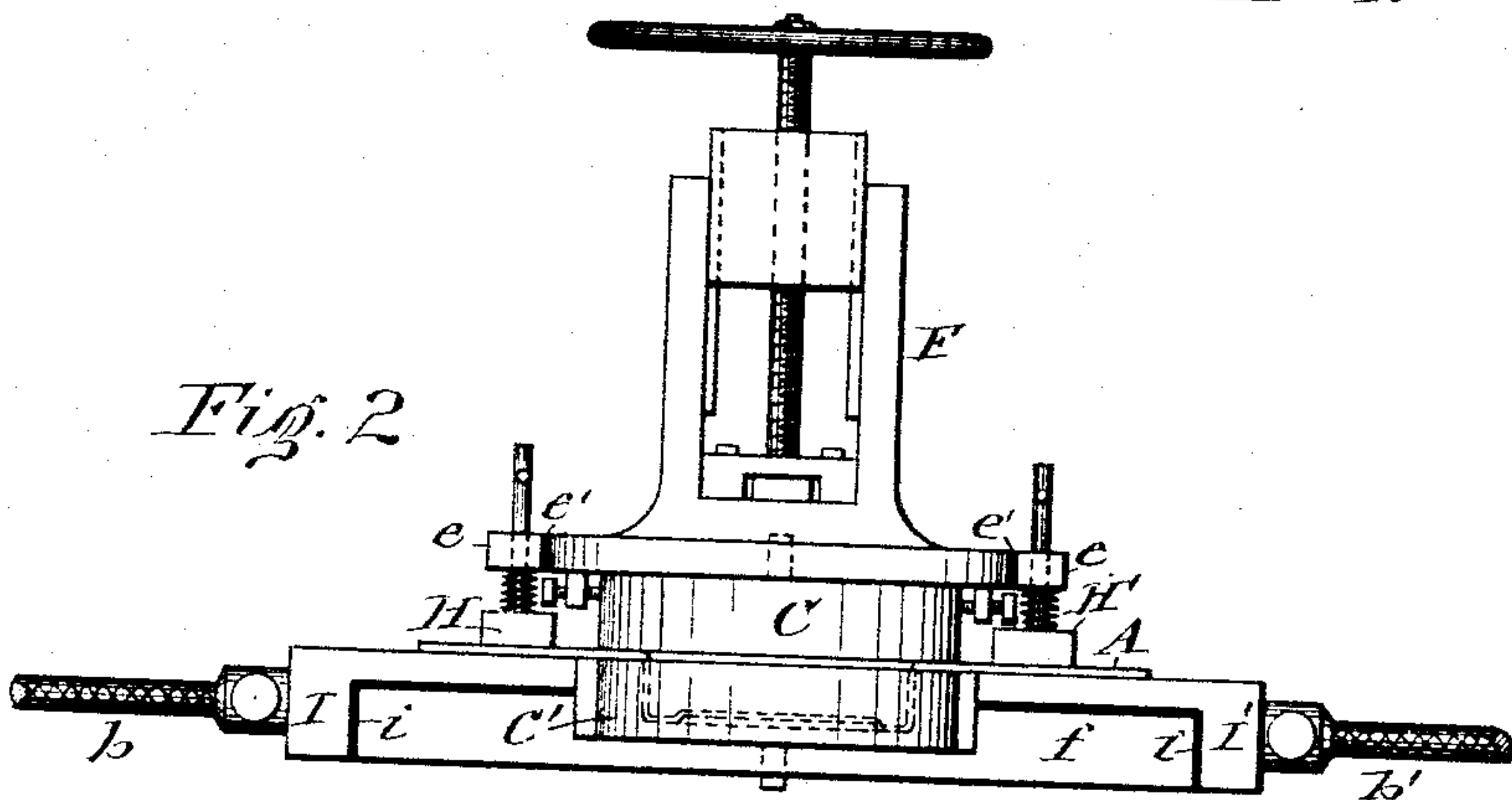


Fig. 3

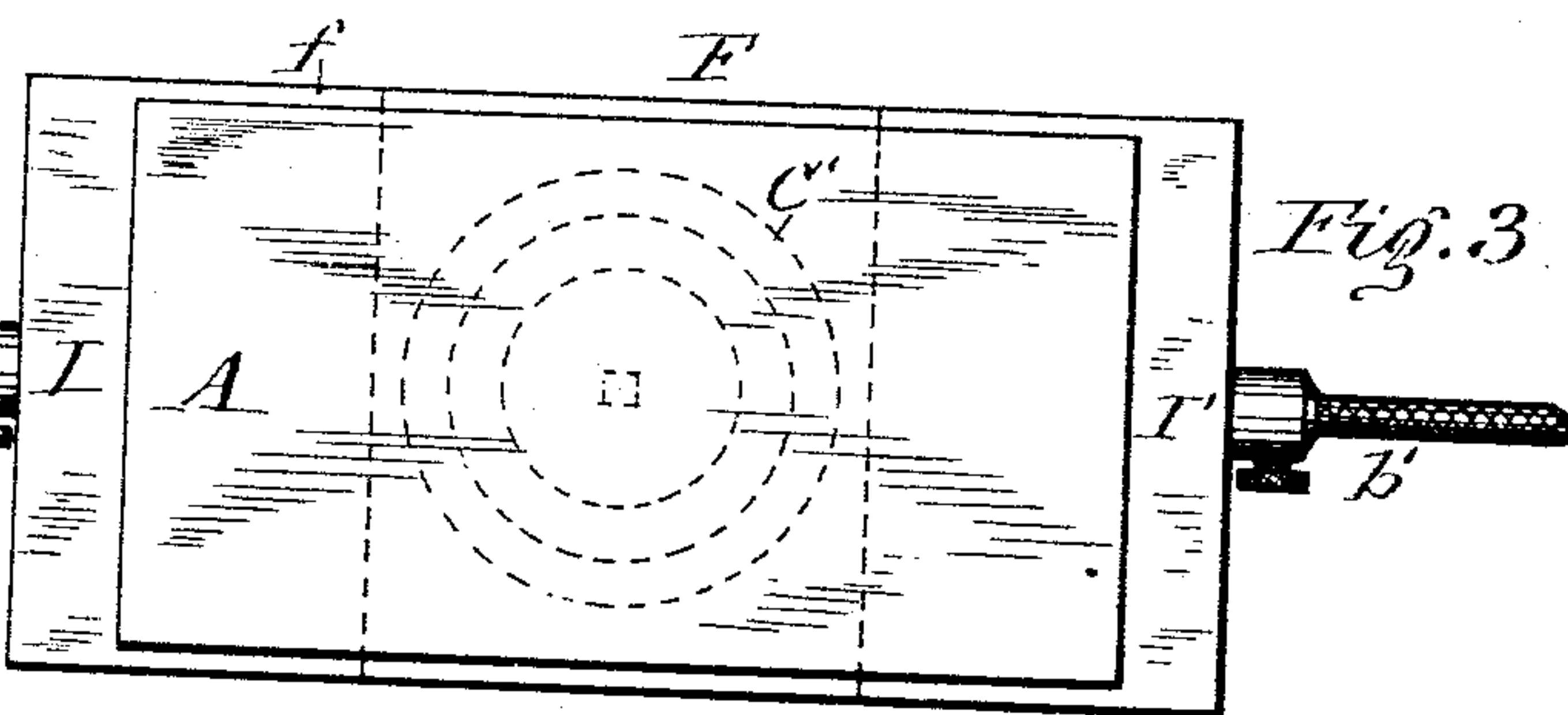


Fig. 4

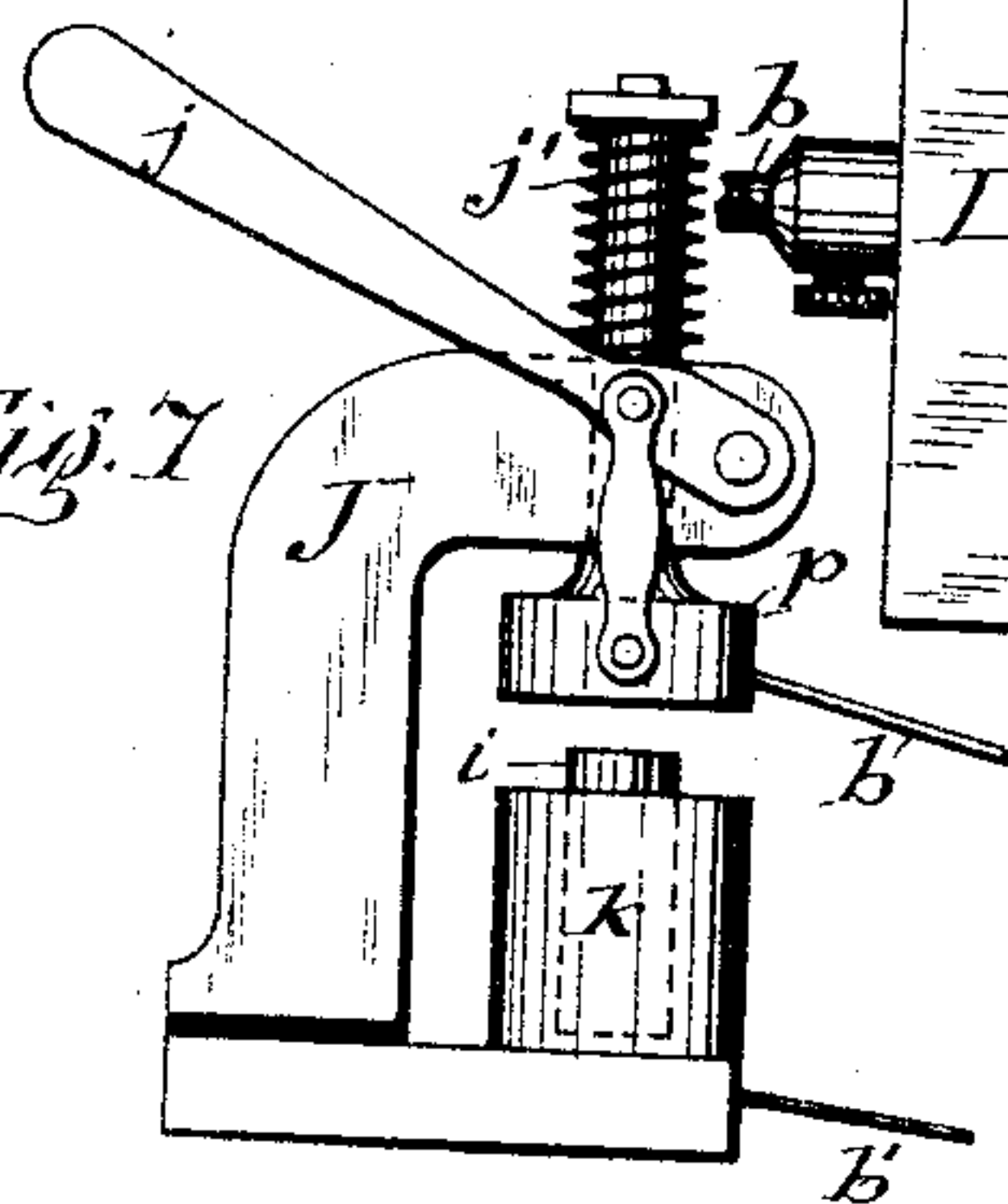


Fig. 5

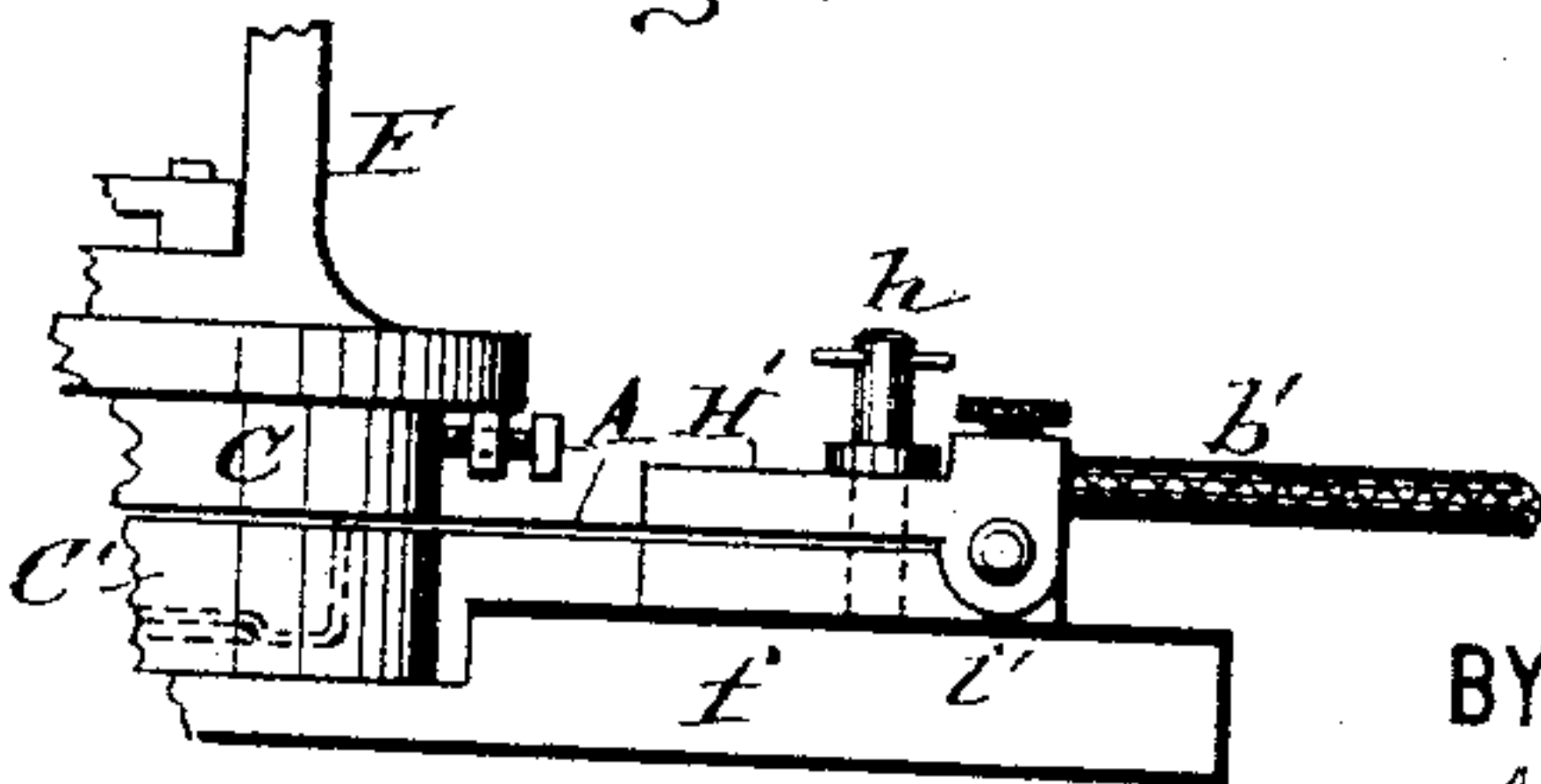
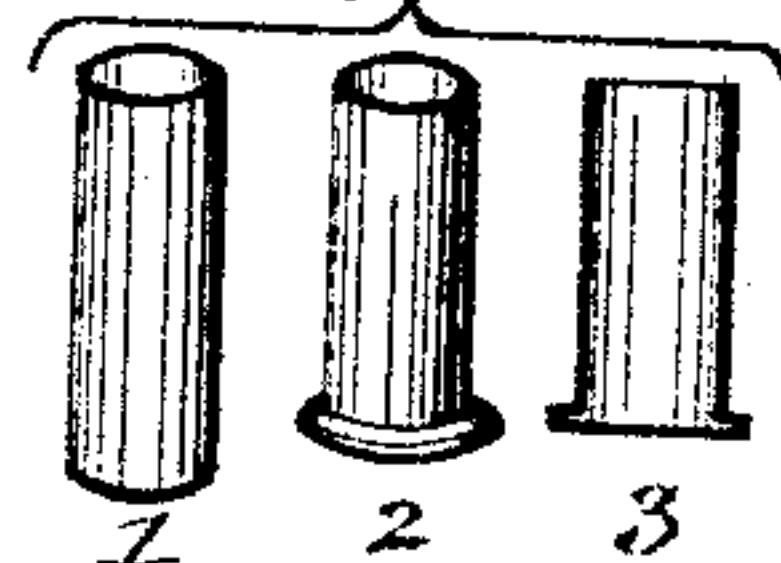


Fig. 6



WITNESSES

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UNITED STATES PATENT OFFICE.

MARK W. DEWEY, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE DEWEY CORPORATION, OF SAME PLACE.

APPARATUS FOR FORMING OR SHAPING SHEET METAL ELECTRICALLY.

SPECIFICATION forming part of Letters Patent No. 438,408, dated October 14, 1890.

Application filed July 28, 1890. Serial No. 360,123. (No model.)

To all whom it may concern:

Be it known that I, MARK W. DEWEY, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Apparatus for Forming or Shaping Sheet Metal Electrically, (Case No. 68,) of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to certain apparatus for use in my process or method of forming sheet-metal articles, which requires the employment of heat to soften or anneal the metal and the application of pressure to gradually conform the sheet to the surface of a suitable die or mold.

Articles have been manufactured from sheet metal heretofore by successive and graduated pressings, depending on the depth of the articles, and in some cases the metal was annealed after each pressing, as such pressing operation rapidly hardened it, which, in turn, caused the metal to tear and crack. Some metals—as German silver—are too brittle to be pressed to a great extent by this method. The process depends for its success upon the malleability of the metal, and it is the purpose of my invention to keep the metal annealed or in a softened condition during a greater part of, if not the entire or complete, formation of the article and to decrease the number of molds as well as the number of pressings usually required in forming or shaping the article and also to save time and handling.

The object of my present invention is to provide apparatus or means for accomplishing my process or method which will produce more durable and superior sheet-metal ware, and allow the formation of articles from thicker sheet metal and from various metals heretofore incapable of being pressed.

My invention consists in certain apparatus and devices hereinafter more particularly described and claimed and useful in practicing the method set forth and claimed in another application for patent filed by me May 17, 1890, Serial No. 352,159; and it consists, es-

entially, in the combination, with a drawing die and punch, of connections to pass an electric current through the sheet while it is operated upon or formed and means for imparting pressure with the said die and punch upon the sheet to conform the latter to the surfaces of the die and punch.

My invention consists, also, in certain other combinations of apparatus hereinafter described, and specifically set forth in the claims.

In the accompanying drawings, Figure 1 is an elevation of an apparatus for effecting my method of forming sheet-metal articles by stamping or drawing, and is a view taken before the operation upon the sheet. Fig. 2 shows the same apparatus after the operation upon the sheet. Fig. 3 is a plan view of a portion of the apparatus, taken below the dotted line *xx* in Fig. 1. Fig. 4 is a sectional view of the article after it is pressed. Fig. 5 represents a modified form of making electric contact with the sheet while in position. Fig. 6 shows several views of a metallic cartridge-case formed by my apparatus. One view shows the case in perspective after it is formed, but prior to the heading operation. Another view shows the same after the heading operation, and another is a sectional view; and Fig. 7 represents a simple cartridge-case-heading machine that may be employed in carrying out my method.

Referring now to Figs. 1, 2, and 3 of the drawings, *F* represents an ordinary screw-stamping press in different positions and having a number of improvements for carrying out my process or method by stamping or drawing. Two molds or dies are employed in this apparatus at a time. The hollow mold *C'* is placed on the bed or base *f*, and upon it is laid a blank of sheet metal *A*, or a pile of blanks when several are to be stamped at once. The under side of the blank or sheet *A* rests upon the flat upper surface of the hollow die. When the upper die or mold *C* descends, (which die fits quite closely into the lower hollow die or mold when at its lowest position,) yielding clamps *H* and *H'*, car-

ried upon the follower or plunger to which the upper die is secured, descend with it and firmly press the sheet A at points on each side of the dies against electric terminals I and I', connected to the conductors b and b' to make good electric contact between the same and the sheet. The electric current is thus permitted to flow through the sheet A between the terminals, the sheet becomes heated and softened or annealed and is expanded into the hollow die, stretching out into a smooth seamless pan or other article without buckling or corrugating. These yielding clamps H and H' serve as holders for the sheet A, and may be located on all sides of the dies, if desired. Said clamps may be faced with non-electric conducting material where they come in contact with the sheet, or the bars e, supporting said clamps, may be insulated from the plunger by insulation e' to prevent short-circuiting of the current through the plunger.

The base f of the press is insulated from the terminals by insulation i i to prevent the current short-circuiting through the base.

I do not limit myself to the form of holders or clamps, as any suitably formed and insulated holders may be used, another form of which is shown in Fig. 5 of the drawings. This clamp H' is fixed to but insulated from the base f by insulation i' and is directly connected with the conductor b'. The pivoted jaws of the clamp firmly grip the edge of the sheet A by means of the screw h, and the said sheet is not only held to make good electric contact but to keep the same smooth while it is pressed or formed.

The molds or dies for my stamping apparatus are also preferably formed entirely of or faced with a suitable non-electric conducting material to prevent the current short-circuiting through them.

The dies C and C' (shown in Figs. 1 and 2) cut the article just before it is completely formed from the sheet by means of the annular knife n; but this is not essential, as it may not be cut until after it is entirely completed or removed from the dies.

In Fig. 4 the article is shown in section as it appears after it is removed from the dies.

I do not limit myself to forming completely an article by a single impression, as it may be necessary or desirable to make several impressions upon the article before it is completed.

In forming a cartridge-case by my method, for instance, I preferably first form the case without a head, as shown at 1 in Fig. 6, making it somewhat longer than the finished case to allow for the formation of a head. Then the case is placed in a suitable countersunk die k, so that the closed end is held projected sufficiently, and the die containing the case is passed in the heading-press J, (shown in Fig. 7.) beneath the heading-punch p thereof, which descends by means of the handle j to

flatten the closed end of the tube or case into the countersink. The surplus length of metal in the case is thus taken up in the formation of the head, as shown at 2 and 3 in Fig. 6. In the heading-press the dies k and p are connected with the conductors b and b', and the current flows from one die to the other through the cartridge-case. The dies are insulated from each other by insulation l to prevent the current short-circuiting through the frame. The die p of the heading-press is returned to its original position by means of the spring j'.

Although the stamping-presses shown in the drawings are designed to be operated by hand, it will be obvious that they may be operated by any suitable and well-known means.

It will be also apparent that the sheet of metal may be by this method maintained in a heated, softened, or annealed condition during the entire formation of the article, if desired, and that with suitable current-regulating devices in circuit the sheet may be kept at any temperature desired without danger of burning or heating the sheet metal too much.

The metal sheets may be fed to the forming apparatuses and the formed articles withdrawn therefrom in any suitable manner and by any suitable and well-known means heretofore used in connection with similar sheet-metal-forming apparatus.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric apparatus for forming sheet-metal articles, the combination, with the drawing die and punch, of connections to pass an electric current through the sheet while it is operated upon or formed and means for imparting pressure with the said die and punch upon the sheet to conform the latter to the surfaces of the die and punch.

2. In an electric apparatus for forming sheet-metal articles, the combination, with a drawing die and punch, of electric connections connected with the blank-holders to pass an electric current through the sheet while it is operated upon or formed and means for imparting pressure with the said die and punch upon the sheet to conform the latter to the surfaces of the die and punch.

3. In an electric apparatus for forming sheet-metal articles, the combination, with a circular drawing die and punch, of connections to pass an electric current through the sheet while it is operated upon or formed and means for imparting pressure with the said die and punch upon the sheet to conform the latter to the surfaces of the die and punch.

4. In an electric apparatus for forming sheet-metal articles, the combination, with an insulated drawing die and punch, of connections to pass an electric current through the sheet while it is operated upon or formed and means for imparting pressure with the said die and punch upon the sheet to conform the latter to the surfaces of the die and punch.

5. In an electric apparatus for forming sheet-metal articles, the combination, with a drawing die and punch, of connections to pass an electric current through the sheet while it is operated upon or formed, means for imparting pressure with the said die and punch upon the sheet to conform the latter to the surfaces of the die and punch, and

means for cutting the formed article from the blank when it is nearly or entirely formed. 10

In testimony whereof I have hereunto signed my name this 26th day of July, 1890.

MARK W. DEWEY. [L. S.]

Witnesses:

C. H. DUELL,

H. M. SEAMANS.