

(No Model.)

M. W. DEWEY.
METHOD OF UTILIZING ELECTRICITY IN THE FORMATION OF
METALLIC CARTRIDGE CASES.

No. 438,409.

Patented Oct. 14, 1890.

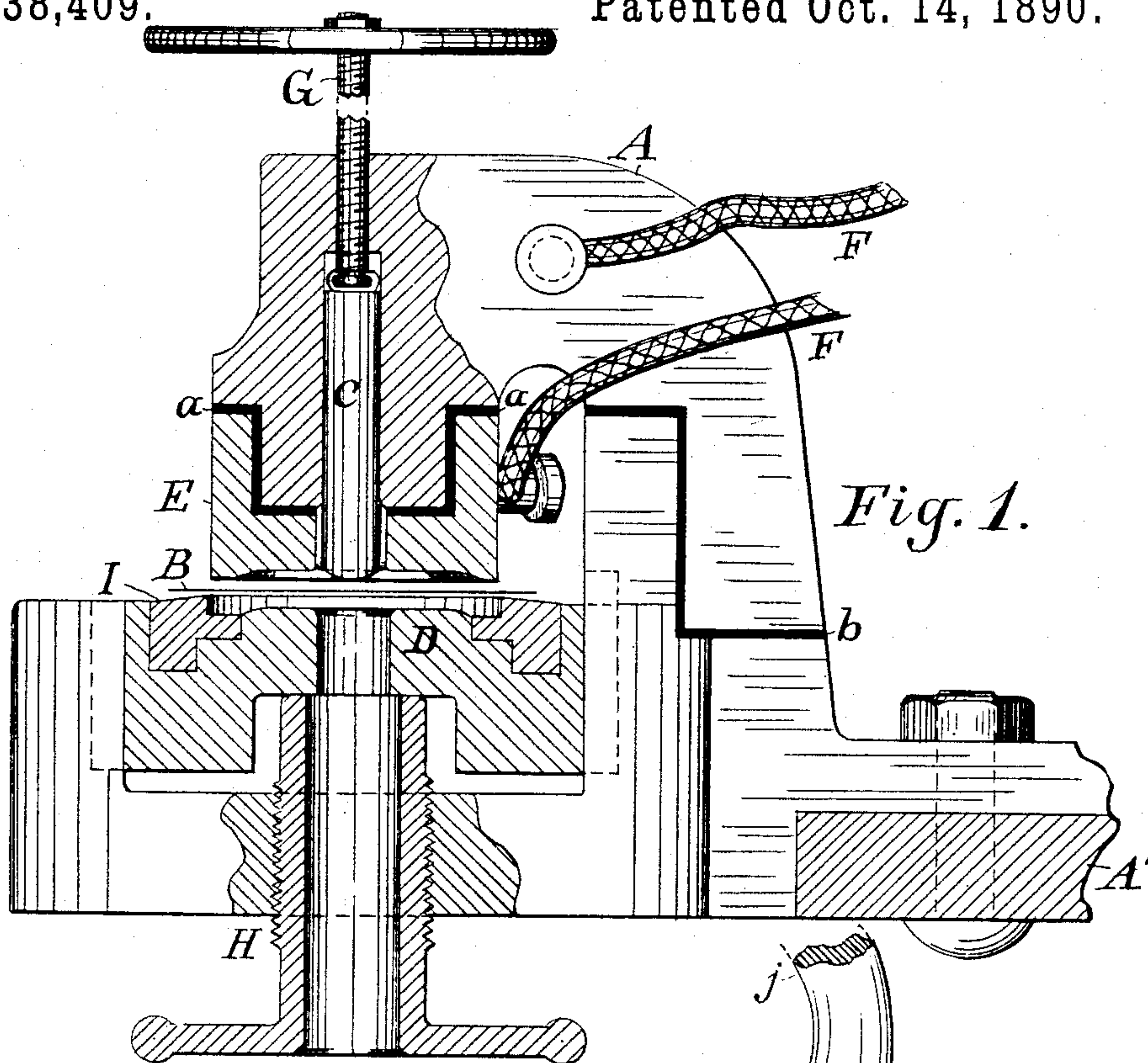


Fig. 1.

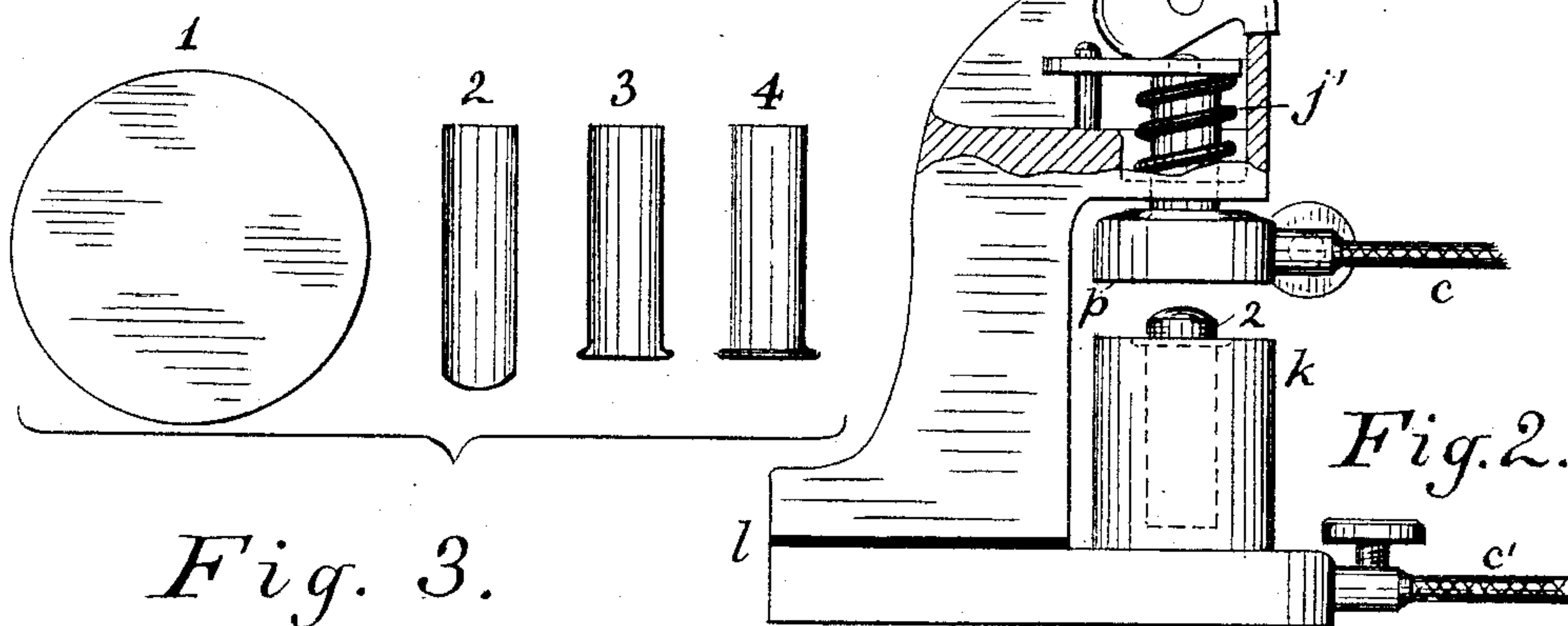


Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

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METHOD OF UTILIZING ELECTRICITY IN THE FORMATION OF METALLIC CARTRIDGE-CASES.

SPECIFICATION forming part of Letters Patent No. 438,409, dated October 14, 1890.

Original application filed May 17, 1890, Serial No. 352,159. Divided and this application filed August 8, 1890. Serial No. 361,413. (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
5 useful Improvements in the Method of Utilizing Electricity in the Formation of Metallic Cartridge-Cases, (Case No. 69,) of which the following, taken in connection with the accompanying drawings, is a full, clear, and
10 exact description.

My invention relates to the process of manufacturing cartridge-cases from sheet metal or thin metal of uniform thickness, and is a division of my prior application, filed May 17,
15 1890, Serial No. 352,159.

The purpose of my invention is to keep the metal annealed or in a softened condition during a part of if not the entire formation of the cartridge-case, and to decrease the
20 number of dies as well as the number of pressings heretofore required in forming or shaping the case, and also to save time and handling.

The object of my invention, also, is to provide a process or method by which stronger and superior cartridge-cases can be produced. The formation of cases from thicker sheet metal is allowed, and various metals can be employed in the manufacture of cases, heretofore incapable of being pressed.
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My invention consists, essentially, in electrically heating the metal to be formed into the case, preferably by passing an electric heating-current through the same before or
35 while the case is formed or before its completion.

My invention consists, also, in electrically heating the metal sheet or disk while it is formed over or within a punch or die by pressure suitably and gradually applied and as hereinafter described.
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My invention consists, also, in certain improved processes involving the application of a heating-current of electricity to the formation of sheet-metal hollow ware, and also in certain apparatus and devices useful in practicing the processes.
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In the accompanying drawings, Figure 1 is

a side elevation, partly in section, of my cartridge-stamping apparatus to be used in practicing my method. Fig. 2 shows a heading-machine for heading the case by my method, and Fig. 3 illustrates the shape the case assumes at different stages of the process.

Referring specifically to the drawings, Fig. 1 represents a screw stamping or drawing press adapted to form the cases according to my method, and it consists of a metal frame A, securely bolted to a table or bench A' and containing or supporting the stamping devices. The press is shown partly in section to more clearly show internal parts of the apparatus and to aid in describing the same.

B is a strip of sheet metal between the punch C and the drawing-die D, and is shown slightly raised above said die, but in practice rests upon the same.

E is a stationary annular cutting-punch encircling the drawing-punch C, but insulated therefrom by insulation *a*. One of the terminals F of the heating-circuit is connected to this cutting-punch, while the other terminal is connected to the punch C through the upper part of the frame A, which is insulated from the lower part of the frame by insulation *b* to prevent the current short-circuiting through the apparatus.
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G is the screw that operates or lowers the punch C, and H is the screw that raises the drawing-die D, with its annular cutting-die I, to cut a disk from the sheet B, and to make electric contact between the center of the disk and the punch C and the circumferential portion of said disk and the cutting-punch E. Electric contact is made as soon as the cutting punch and die press the metal on opposite sides. The metal is then rapidly heated and softened by the current passing through the same from the punch C to the cutting-punch E, which also constitutes the clamp or holder for the circumferential portion of the disk. The cutting-punch E is hollowed out on its under side, so that it cannot come in contact with the sheet immediately except at and near its cutting-edge, and the lower end of the punch C is on a line with or
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slightly below said cutting-edge of the punch, so that contact will be made between both of said parts and the sheet at the same time, and to make the path for the current through the disk as long as possible and to evenly heat the same. When the metal is heated sufficiently, the dies D and I are raised still more to cut the disk from the strip or sheet and clamp the same to hold the metal smooth between E and I D. Then the screw G is used to rapidly force the punch C downward, so that the metal disk is pressed into the die D and made to receive a corresponding form or cup shape. As the sheet or disk is thus forced into the die, its circumferential portions are drawn out from under the clamp, and the strain or tension thus exerted upon the metal effectually insures smoothness in the completed article, and also enables a deeper cup to be produced at a single operation. The current may be interrupted, if desired, during the latter part of the operation, or may not be applied until after the case is partly formed, as the metal may be pressed to a certain extent before it is necessary to heat it; but the operation is so rapid that it is preferably heated at the commencement of the operation, as hereinbefore described.

I do not limit myself, therefore, to electrically heating the metal for the case while it is being pressed, nor while it is in position in the press, as it may be removed therefrom after it is partly formed, electrically heated or softened, and then reinserted in a press and finished.

A cam-press may be employed instead of a screw-press, if desired.

I do not limit myself to forming the case complete by a single impression, as it may be necessary or desirable to make several impressions thereon before it is completed.

It will be apparent from the foregoing description that in forming a cartridge-case by my method I preferably first cut a disk, as shown at 1 in Fig. 3, from a sheet or strip of thin metal, and then form the case while it is electrically heated by a suitable force to press said disk within a die to form a cup 2, somewhat longer than the finished case to allow for the formation of the head. The case is then trimmed, as usual, to remove its rough edge formed by pressing. 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 (shown in Fig. 2) 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 3 and 4 in Fig. 3.

In the heading-press the dies *k* and *p* are connected with the conductors *c* and *c'*, and the current flows from one die to the other through the cartridge-case. The dies are in-

sulated 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 or disk may be by this method maintained in a heated, softened, or annealed condition during the entire formation of the case, 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 sheet metal may be fed to the forming apparatuses and the formed cases withdrawn therefrom in any suitable manner and by any suitable and well-known means heretofore used in connection with similar cartridge-forming apparatus.

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

1. The herein-described improvement in processes of manufacturing cartridge-cases, which consists in forming the case by drawing or stamping the same from thin metal and electrically heating the case during its formation, as and for the purpose described.

2. The herein-described improvement in processes of manufacturing cartridge-cases, which consists in forming the case by drawing or stamping the same from a sheet of thin metal and electrically maintaining the case in a heated condition during its formation.

3. The herein-described improvement in processes of manufacturing cartridge-cases, which consists in forming the case by drawing or stamping the same from a sheet of thin metal and annealing the case during its formation or before its completion by passing a heating-current of electricity through the same.

4. The herein-described improvement in processes of manufacturing cartridge-cases, which consists in forming the case by drawing or stamping the same from a sheet of thin metal and electrically heating the case during its formation by passing a heating-current of electricity through the same and from one die to the other, as and for the purpose described.

5. The herein-described improvement in processes of manufacturing cartridge-cases, consisting in cutting a disk of metal from a sheet, then drawing or stamping the full-length cup from the disk at one operation while the blank is electrically heated, and then heading and finishing the cup, as desired, to complete the case.

6. The herein-described improvement in

processes of manufacturing cartridge-cases,
which consists in forming the case from a
single piece of metal of uniform thickness by
drawing, swaging, or otherwise shaping it, as
5 desired, and electrically heating the metal
during its formation or before the case is com-
pleted.

In testimony whereof I have hereunto signed
my name this 6th day of August, 1890.

MARK W. DEWEY. [L. s.]

Witnesses:

C. H. DUELL,
J. J. LAASS.