

C. D. ROGERS.
 Manufacture of Draw-Plates for Drawing Wire.
 No. 226,883. Patented April 27, 1880.

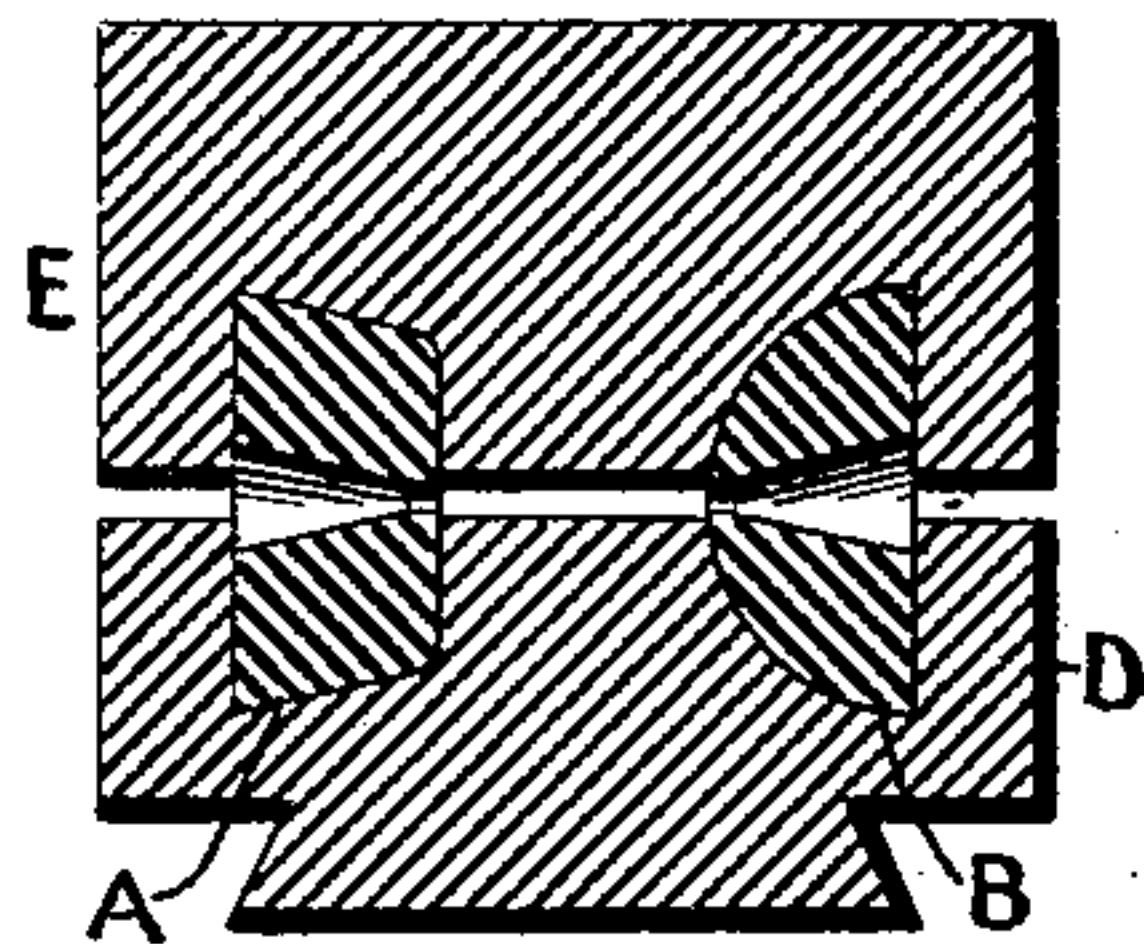


FIG. 1.

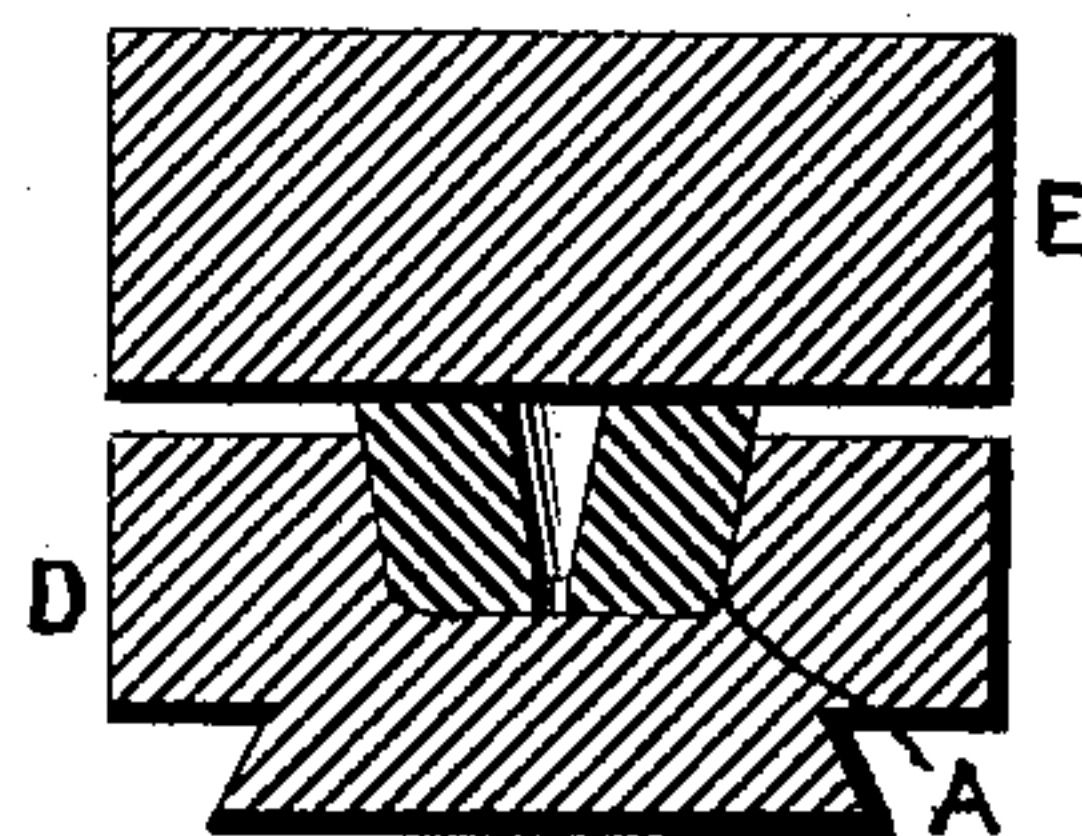


FIG. 3.

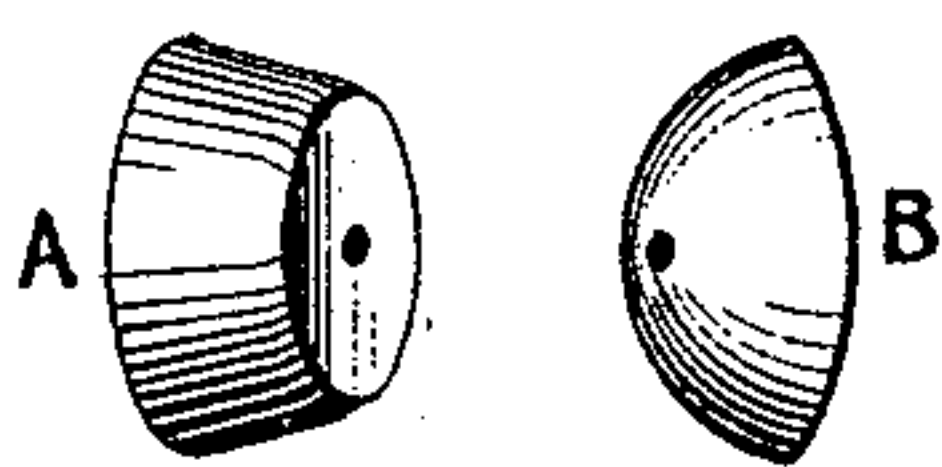


FIG. 2.



FIG. 4.

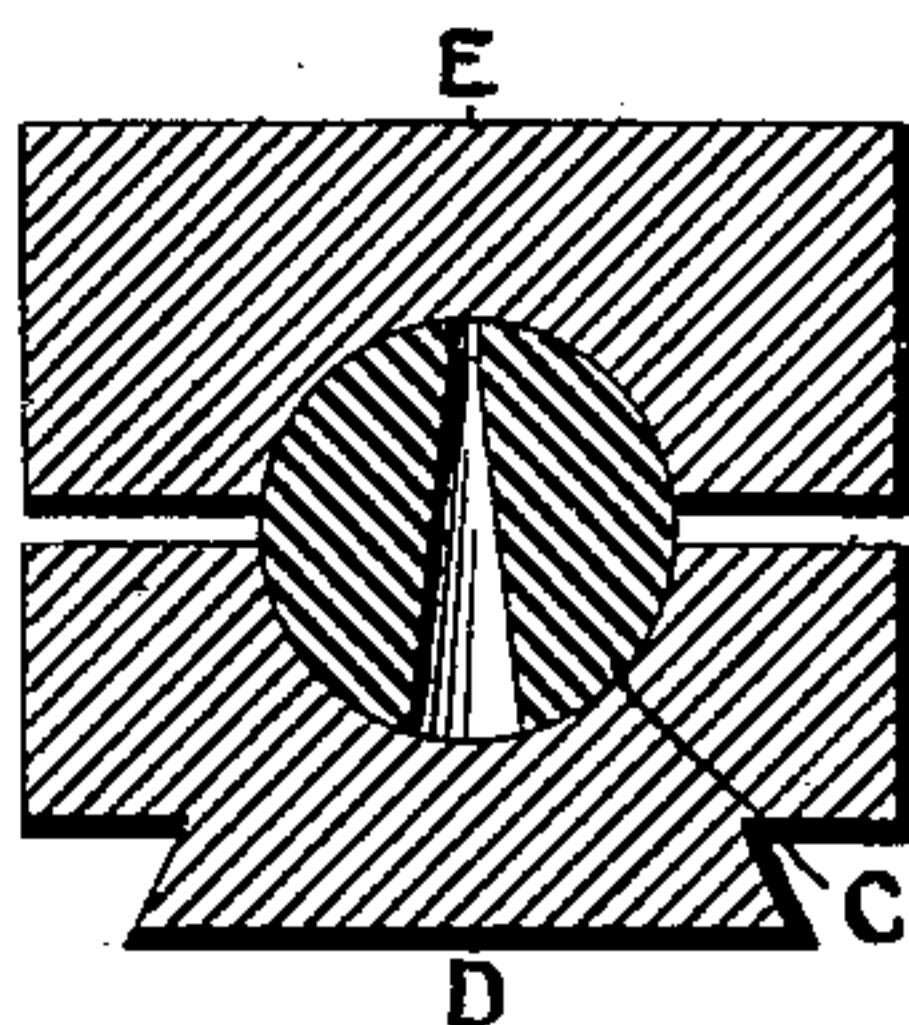


FIG. 5.

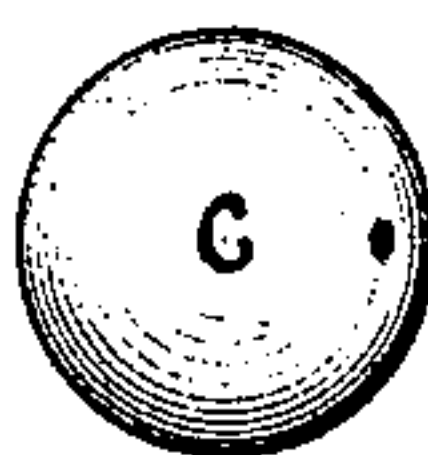


FIG. 6.

WITNESSES.

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CHARLES D. ROGERS, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO THE
AMERICAN SCREW COMPANY, OF SAME PLACE.

MANUFACTURE OF DRAW-PLATES FOR DRAWING WIRE.

SPECIFICATION forming part of Letters Patent No. 226,883, dated April 27, 1880.

Application filed May 16, 1879.

To all whom it may concern:

Be it known that I, CHARLES D. ROGERS, of the city and county of Providence, and State of Rhode Island, have invented a new and useful Improvement in the Manufacture of Draw-Plates for Drawing Wire; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, forming a part of the same, is a full, clear, and exact description thereof.

A draw-plate of the common form consists of a flat rectangular plate of steel or chilled iron which has a series of holes of different gage. These holes soon become worn from use, and it is necessary to contract them to secure the desired diameters or gages.

The operation of reducing the diameter of the holes is a difficult one, and can be performed only by skilled workmen of long experience. It consists in hammering the plate in a series of concentric rings or in a helical line around the hole in such a manner as gradually to draw the metal inward toward the center of the hole, and thereby contract it and temper the plate. The same method is also adopted in securing the desired gage of holes in a new plate.

The invention hereinafter described consists, partly, in giving to the plate a peculiar form, which may be that of a truncated pyramid having many sides, a frustum of a cone, a hemisphere, or a sphere, the plate being provided with a single hole through its central longitudinal axis; and the invention also consists, partly, in the means by which a plate of any of these forms may be condensed so as to impart the necessary temper to the metal, and incidentally contract or bring to the right gage the diameter of the hole through which the wire is to be drawn. The invention, therefore, is an article which is the product of a process, and the process of its production inheres in the manufacture and constitutes an element of the invention.

It will be seen that each of the forms of plate mentioned by me are practically wedge-shaped, in that they have a sectional area which gradually increases from the rear of the plate toward the front, either throughout the

full thickness of the plate, or, as in the spherical or spherical forms, to one-half the thickness of the plate, and that these forms enable such draw-plates to be used with holding bars or plates which are socketed to snugly receive the draw-plates, and that according to the degree of tensile strain on the wire the draw-plates will be firmly bedded in their sockets and so held therein as to render it practically impossible to burst them, as is possible with draw-plates not thus bedded when an unusually heavy draw is attempted.

Rubies and other similar gems drilled for use as draw-plates have heretofore been so shaped as to possess a gradually-increased sectional area, and such have heretofore been firmly embedded or set in metallic holders recessed to receive them; but a metal draw-plate of the form referred to, so far as my knowledge extends, was unknown prior to my invention, and such form is, in itself, of comparatively little consequence unless the draw-plate so formed has been tempered by compression, as herein described, because the hammering process of tempering is conducive to such a change or variation in form as would render it practically impossible to firmly embed them in sockets for securing a binding and supporting function against bursting strain.

This useful shape or form applied to metal draw-plates by me renders the preferred product of my invention readily distinguishable at sight from pre-existing metal draw-plates, and the peculiarities existing in a compressed metal draw-plate are such as would be readily recognized by persons skilled in the working of steel.

Referring to the drawings, Figures 1, 3, and 5 represent central vertical sections of dies and followers, with draw-plates therein, before being compressed; and Figs. 2, 4, and 6 represent, in perspective, draw-plates of various forms illustrative of the invention.

In the manufacture of draw-plates by my improved method a properly-shaped die and follower are secured in any suitable press, and pressure is applied to the draw-plate in a direction radial to the axis of the hole in the

plate, as shown in Fig. 1, or in the direction of the axis of the hole, as shown in Figs. 3 and 5.

The forms of draw-plates which I consider preferable are a frustum of a cone, A, Figs. 1, 2, 3, and 4, a hemisphere, B, Figs. 1 and 2, or a sphere, C, Figs. 5 and 6, although a frustum of a pyramid having many sides and other solids having the geometrical characteristics of those mentioned may be used. These draw-plates are made of steel, and are brought to proper shape by hand or machine forging, or both. A hole is then drilled of larger diameter than the gage required in the finished plate, and the greater portion of said hole reamed out, as shown in the sectional views.

When the plates in any of the forms shown or described, or in the form of a short cylinder, are to be treated by pressure applied in a direction radial to the axis of the hole, the die D and follower E are each properly cupped to receive and act upon nearly one-half of the plate, as shown in Fig. 1. The plate is placed in the die, and, pressure being applied through the follower, the metal is compressed toward the axis of the hole, and the diameter of the hole is consequently reduced. The plate is then turned on its axis in the die ninety degrees, (more or less,) and the operation of compressing it is repeated. After the plate has been subjected to such compressing operation between the dies a sufficient number of times to fully condense the metal—and it is to be turned as many times and to such extent each time as may be necessary to cause the whole metal to be equally condensed and thereby tempered—it is removed from the die, and a punch is driven into the hole, as is usual in the manufacture of draw-plates by other processes, to fix the exact size of the hole.

The desired compression of the metal and

consequent contraction of the hole in the draw-plate may also be obtained by applying pressure in a plane at right angles to the axis of the hole in the draw-plate in case the surface of the die is inclined to the axis, as in the case of the frustum of a cone or of a pyramid, or in case it is curved with reference to the axis, as in the case of a hemisphere, as shown in Figs. 3 and 5. When any form of draw-plate specified other than spherical is to be treated by pressure in this direction the die D is cupped to a depth nearly equal to the thickness of the plate, and a follower having a plain face is used, as shown in Fig. 3.

From the foregoing description it will be readily seen that by my improved method of manufacturing draw-plates I am enabled to dispense with the skilled labor heretofore necessary in making said plates, and can therefore produce a draw-plate at less expense than has heretofore attended their manufacture.

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

1. The improvement in the method of manufacturing draw-plates which consists in first forming the draw-plate into a shape substantially as described, and then subjecting said plate to the action of properly-shaped swaging-dies, to condense and temper the same, substantially as herein set forth.

2. A metal draw-plate condensed and tempered by compression, and having a gradually-increased sectional area from the rear of the plate toward its front throughout the whole or a part of its thickness, substantially as shown and described.

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Witnesses:

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