

C. D. ROGERS.
Machine for Hammering Draw-Plates.
No. 225,238. Patented Mar. 9, 1880.

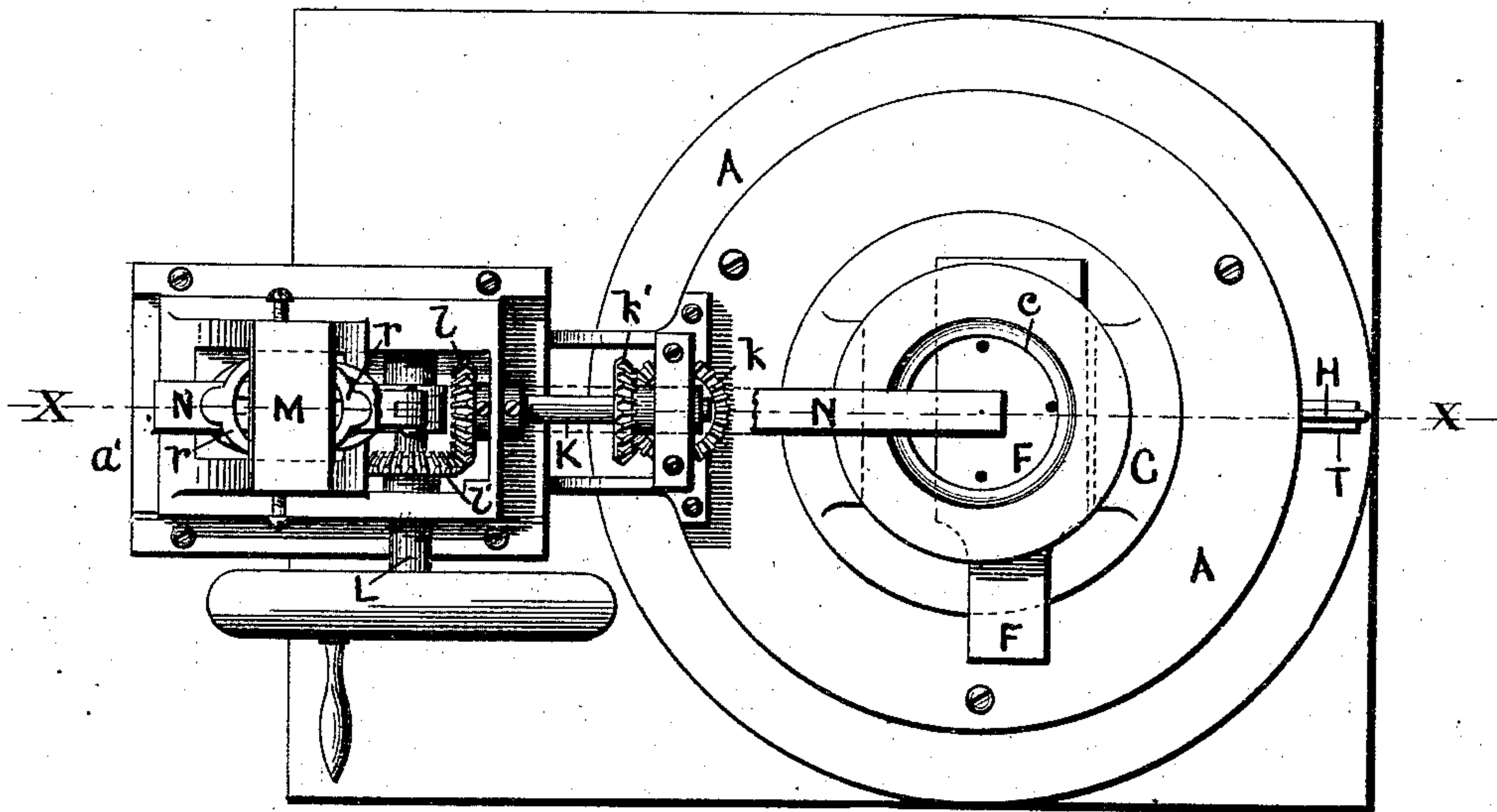


FIG. 1.

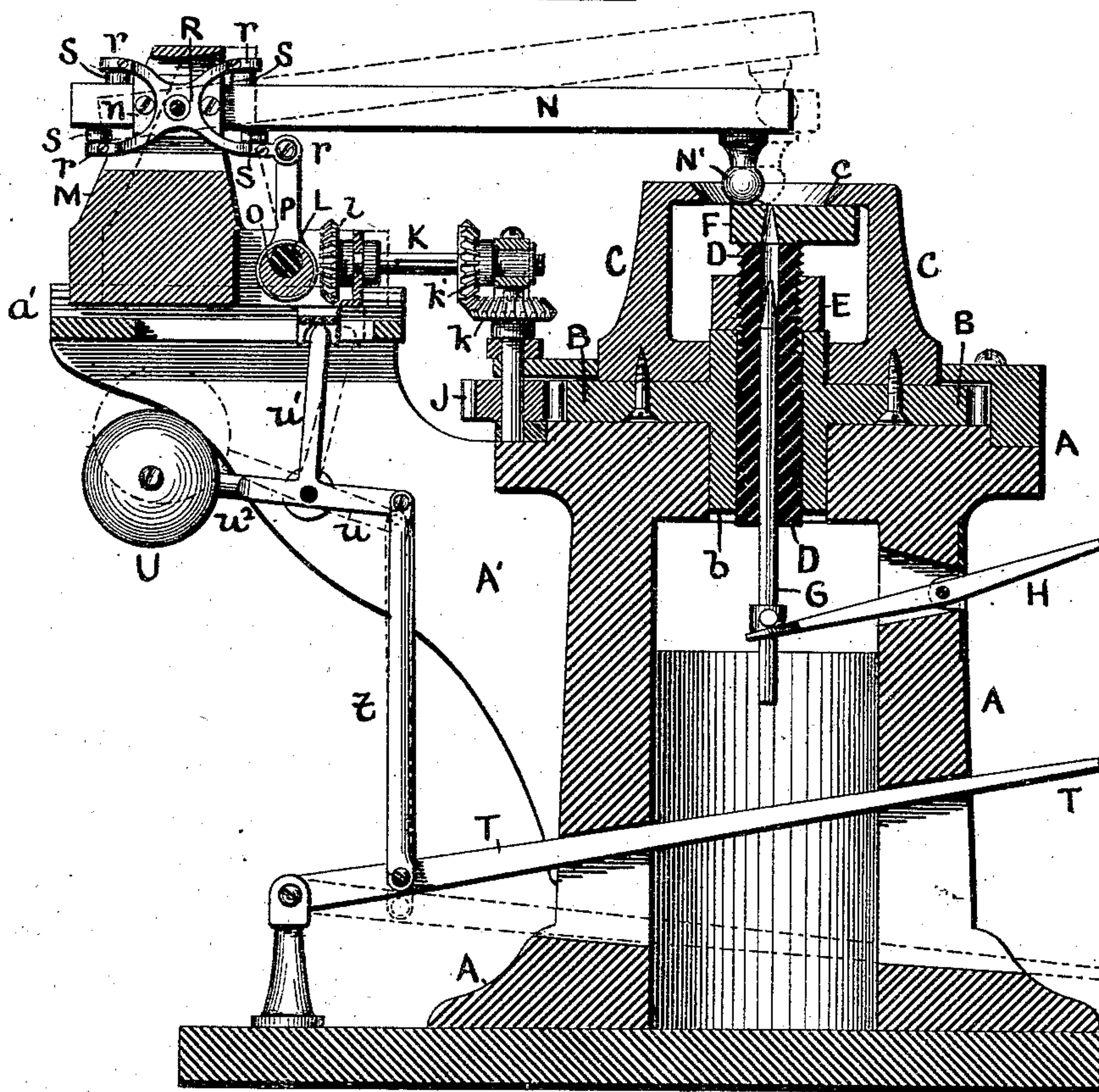


FIG. 2.

WITNESSES.

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MACHINE FOR HAMMERING DRAW-PLATES.

SPECIFICATION forming part of Letters Patent No. 225,238, dated March 9, 1880.

Application filed May 3, 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 Improved Machine for Hammering Draw-Plates; 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.

Prior to my invention a draw-plate for drawing wire (by which is meant a plate having a series of holes of progressively smaller gage, through which holes the wire is drawn to be reduced in diameter) has been made from chilled cast-iron or from cast-steel plates. The better class of draw-plates are those which are made from steel. Such plates are not hardened by the ordinary process of hardening and tempering metals, but by the effect of blows given to the plate in a spiral line or in concentric lines around each hole by a round-faced hammer. The effect of these blows is to condense the metal, impart temper to the plate, and also draw the metal toward the center of the hole, thereby reducing the diameter of the hole. Finally, a punch or gage of the proper size is driven into the hole to give the exact diameter required.

New draw-plates composed of chilled cast-iron or of cast-steel, as well as old steel-plates whose holes have become worn, are treated in the manner described, the object being in the case of a new plate to give it temper, and in the case of an old plate to reduce the diameter of the hole to a proper size. In either case, however, as the hammering operation draws the metal toward the center of the hole, it is necessary to start with a hole whose diameter is greater than the desired gage. Chilled cast-iron draw-plates whose holes have become worn cannot be repaired.

The great superiority in endurance of cast-steel draw-plates has been offset heretofore by the cost incident to the process above described of tempering, reducing, and repairing them, for, although the operation of imparting the temper and drawing the metal toward the center by repeated blows of a hammer is

apparently a simple one, yet it is, in fact, one of great nicety, and requires long practice to attain the necessary skill for the work.

The purpose of my invention, therefore, is to produce a machine which shall perform the above-described operation of drawing and tempering and dispense with the necessity of skilled labor to obtain the desired results.

To this end my invention consists, in a machine for hammering draw-plates, of a revolving anvil and a clamp for confining a draw-plate thereto, in combination with a vibrating hammer whose helve is pivoted to a carriage, to which a movement can be given in a direction radial to the vertical axis of the anvil; and, also, in the combination, with the anvil, of a punch or gage located in the axis of the anvil, the offices of which are to center the holes in the draw-plate, and to determine the size of said holes after the hammering operation has been completed.

Referring to the drawings, Figure 1 shows a top view of my improved machine, and Fig. 2 represents the same in central vertical section on line *x x*.

A denotes the upright frame of the machine, in the head of which is mounted the gear B. To this gear is secured a frame, C, which has a circular opening, *c*, in its top.

Located in the hub *b* of the gear B, as shown in Fig. 2, is the anvil D, the upper portion of which is provided with a screw-thread. This threaded portion is engaged by a nut, E, which bears upon the hub *b*, and furnishes a means for vertically adjusting the anvil D and clamping a draw-plate, as shown at F, between the anvil-head and the top of the frame C, which revolves with the anvil; or the frame C may be so constructed as to be the moving member of the clamp for holding the work, in which case the anvil may be stationary.

Occupying the vertical axis of the anvil D is a punch or gage, G, which is provided with an adjustable collar, that bears upon the forked end of a lever, H, pivoted to the frame A.

The gear B, anvil D, and head C are continuously rotated by a pinion, J, which meshes with said gear. Upon the shaft of this pinion

is mounted a bevel-gear, k , which meshes with the bevel-gear k' , splined to the shaft K, and mounted in a standard secured to the frame A of the machine.

5 The shaft K carries upon its end a bevel-gear, l , which meshes with a bevel-gear, l' , secured to the driving-shaft L, as shown in Fig. 1.

10 To one side of the frame A is secured a bracket, A' , having a head, a' , upon which a sliding carriage, M, is mounted. To the sides of this carriage is pivoted a vibrating box, n , in which is secured the helve N of the round-faced hammer N' .

15 Mounted upon the hubs of the box n is a clasp, R, having four arms, r , two of which extend forward of the helve-pivot and two backward of the same. Between each of these arms and the helve is placed an elastic packing, S, the office of which is to receive the rebound of the hammer-blow, and to impart elasticity to the stroke.

20 A reciprocating vertical movement is imparted to the hammer through the clasp by an eccentric, O, upon the driving-shaft L, which eccentric is surrounded by a ring having an arm, P, connected with one of the clasp-arms r , as shown at Fig. 2.

30 For the purpose of causing the hammer to deliver its blows in concentric circles, or in a helical line upon the surface of the plate, and thus condense the metal toward a central point, a movement may be given to the carriage M and the hammer in a plane radial to the axis of the anvil D. This movement is produced by means of a foot-lever, T, which is pivoted to the base of the machine, and is connected by a rod, t , to one arm, u , of a T-shaped lever pivoted to the bracket A' . The vertical arm u' of this lever engages the carriage M, and the remaining arm u'' carries a weight, U, the office of which is to return the carriage to its rearward position when the foot-lever T is relieved of pressure.

45 The operation of my improved machine is substantially as follows: The anvil D being first lowered to admit of a draw-plate being placed between the anvil-head and the under side of the head of the frame C, the draw-plate is placed upon the anvil-head and one of the holes in said plate centered by means of the punch or gage G. The nut E is then turned and the anvil elevated to clamp the plate in position. Power is now applied to the driving-shaft L, which causes the anvil D, plate F, and head C to revolve and the hammer to deliver its blows upon the plate. So long as the foot-lever T is held in a definite position the indentations produced in the surface of the draw-plate by the blows of the hammer will lie in a line forming the circumference of a circle; but in order that no two blows shall fall on exactly the same spot on the surface of the plate during the continued revolution of the plate and the continuance of the lever T in a definite position, the number of

teeth on the gear B is made more or less than an even multiple of the number of teeth on the pinion J. This secures the full indentation of the circumference of any circle upon which the hammer may be operating. The surface of the plate having been indented to the desired extent in the circumference of any one circle, the foot-lever is depressed and the carriage moved forward, so that the path of the hammer-blows will lie in a circle concentric with the first. By an intermittent depression of the foot-lever, therefore, the whole surface of the plate within a certain area may be hammered in concentric circles, or by a gradual and continued depression of said lever the said area of the plate may be treated in a helical line. It is immaterial which of these methods of moving the foot-lever be adopted, for by either the desired extent of surface may be hammered, and the metal thereby be condensed and the plate tempered. When a proper portion of the area surrounding a hole in the plate has been fully treated the machine is stopped, and the punch G is driven into the hole by a blow upon the lever H, to give to said hole the required size or gage. The plate is then unclamped, a new hole centered upon the anvil, and the operations above described are repeated.

95 Although I have provided the machine with the punch G, for the purposes specified, yet said punch may be dispensed with. In this case the anvil-head would be supplied with a centering-stud, and the operation of securing the required gage of hole would be performed by hand after the plate had been removed from the machine.

100 It is obvious, also, that, if preferred, the radially-moving carriage M may be so combined with the revolving anvil that the rotation of the latter will cause the carriage to be moved radially toward the axis of the anvil. I prefer, however, the arrangement which is shown in the drawings.

110 What I claim as my invention in machines for hammering draw-plates or analogous uses, and desire to secure by Letters Patent, is—

1. The combination of a revolving anvil and clamp for confining the work thereto and a vibratory hammer capable of a movement radial to the vertical axis of the anvil, substantially as described.

2. The combination of a revolving anvil, adjustable vertically, a stationary clamping-plate revolving with the anvil, and a centering punch or rod for fixing the position of the draw-plate upon the anvil, substantially as described.

3. The combination of a revolving anvil, a vibratory hammer, and a sliding carriage, with which the helve of the said hammer is connected, substantially as described.

CHARLES D. ROGERS.

Witnesses:

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I. KNIGHT.