(Model.)

2 Sheets—Sheet 1.

S. DELANO & G. ABEL.

MACHINE FOR MAKING DRILL TEETH.

No. 257,297. Patented May 2, 1882.

Fig. 1.

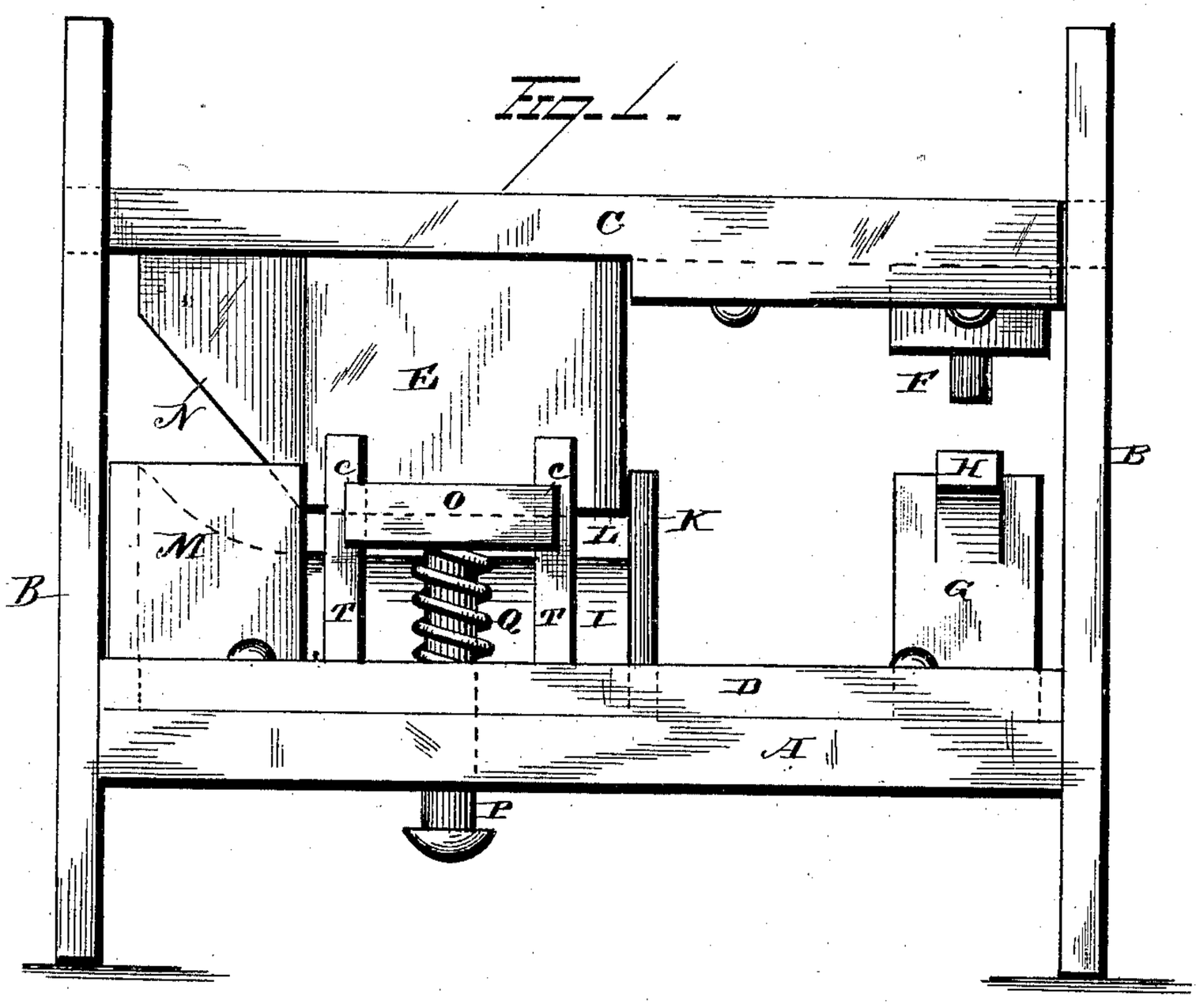
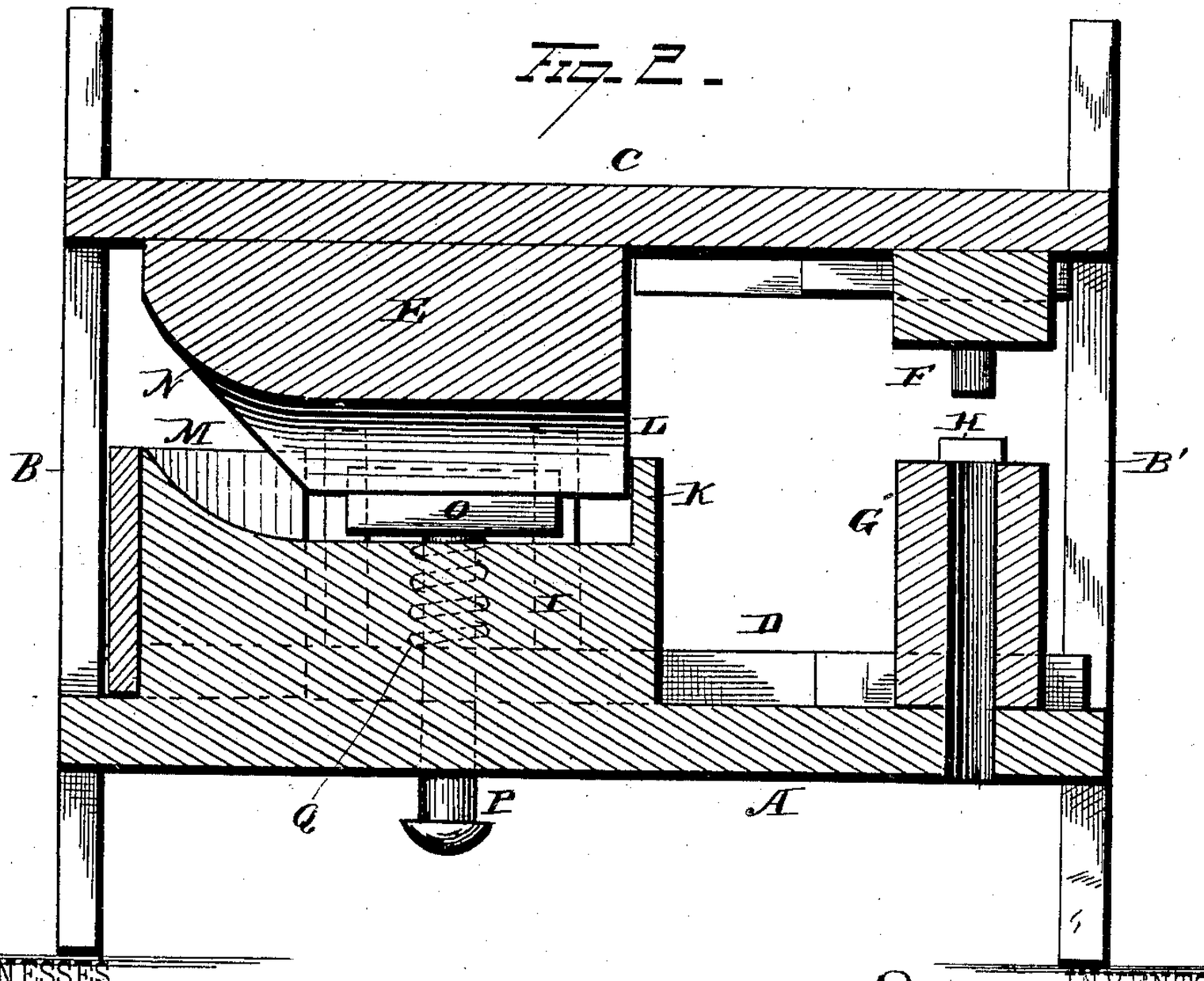


Fig. 2.



WITNESSES.

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(Model.)

2 Sheets—Sheet 2.

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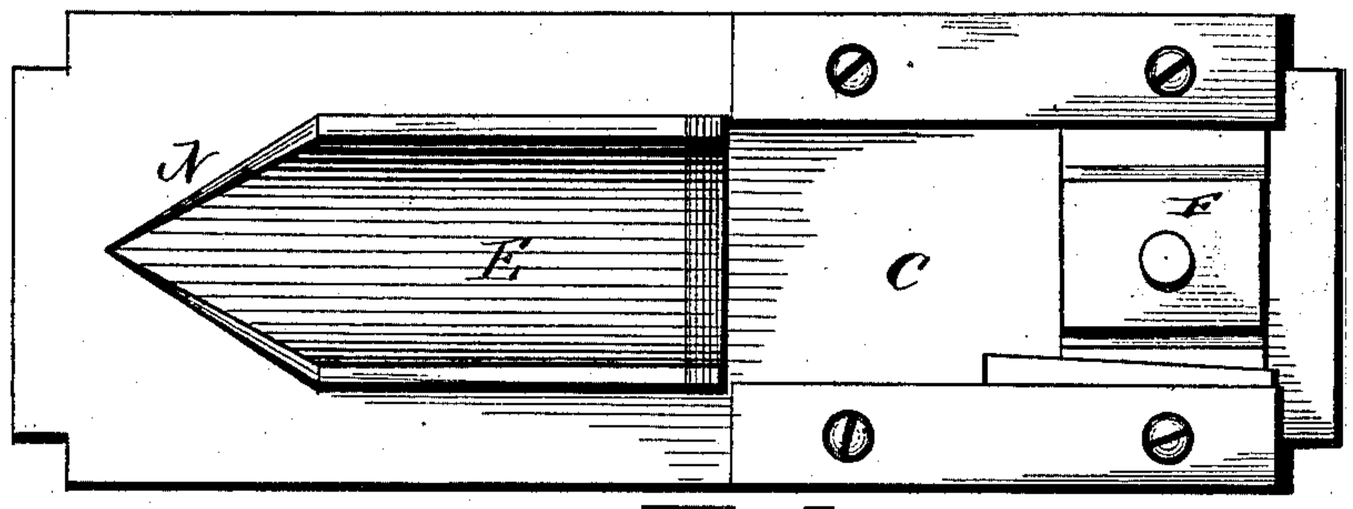

Fig. 3.

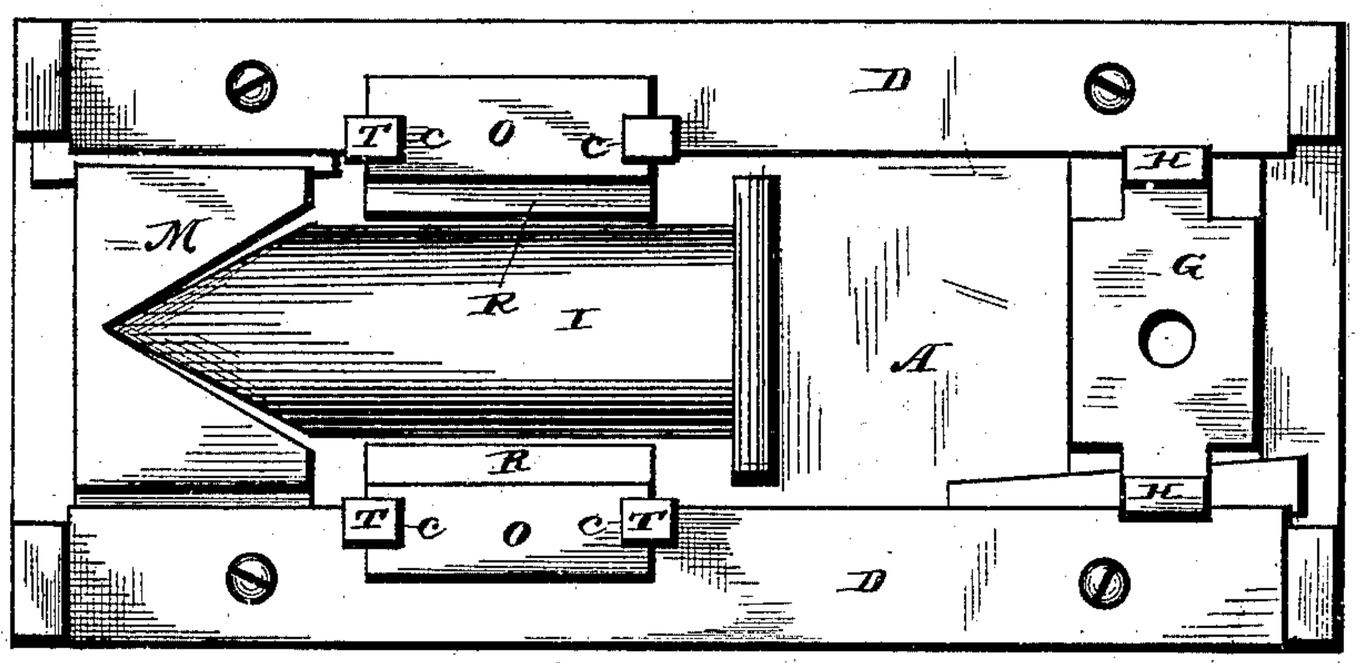

Fig. 4.

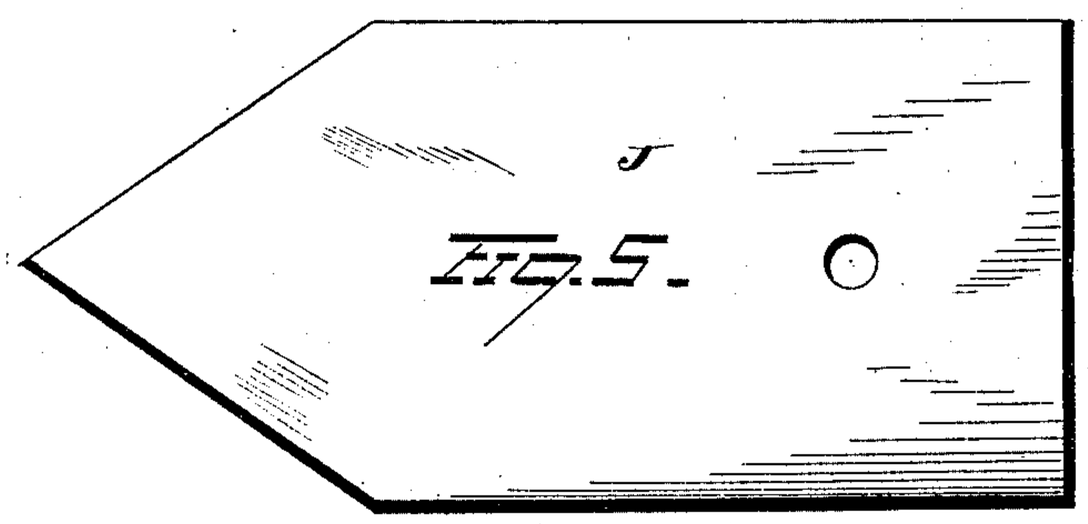

Fig. 5.

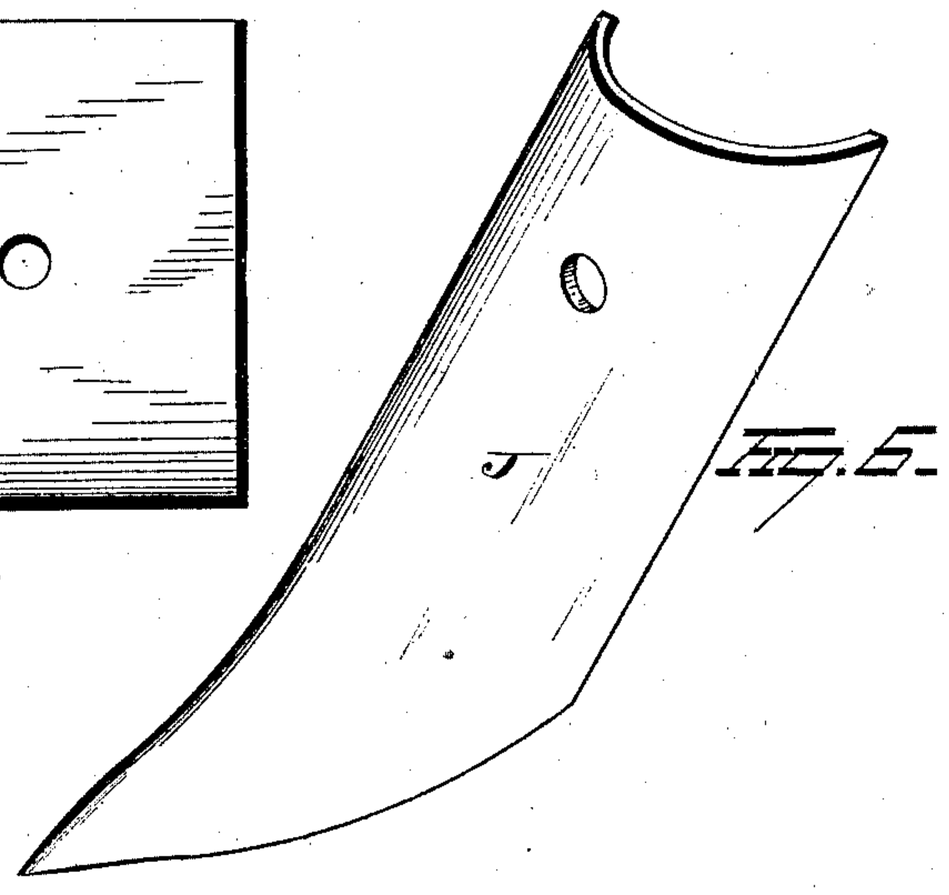

Fig. 6.

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UNITED STATES PATENT OFFICE.

SAMUEL DELANO, OF NEW ORLEANS, LOUISIANA, AND GEORGE ABEL, OF KILLBUCK TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA.

MACHINE FOR MAKING DRILL-TEETH.

SPECIFICATION forming part of Letters Patent No. 257,297, dated May 2, 1882.

Application filed October 7, 1881. (Model.)

To all whom it may concern:

Be it known that we, SAML. DELANO, of New Orleans, in the county of Orleans and State of Louisiana, and GEORGE ABEL, of Killbuck township, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Making Drill-Teeth; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Our invention relates to an improvement in machines for making drill-teeth; and it consists in certain details in construction and combinations of parts, as will be more fully explained, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side view of our improved machine. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a plan view of the counter-die and cutters. Fig. 4 is a plan view of the die-head and cutter. Fig. 5 is a view of the metal blank before bending, and Fig. 6 is a view of the completed tooth.

A represents the rectangular bed of the machine, supported on the four upright standards B B′, which latter extend above the bed and serve as guides for the movable plunger C, having the die-head E and punch F secured thereto.

D are side pieces secured on opposite sides of the bed of the machine between the upright standards B and B′, and are provided on their opposing faces with bevel-edges, between which the movable portions of the machine are adjusted and secured by suitable wedges.

The die G is provided with an opening extending throughout the entire length thereof, or curving in any desired direction and passing out one side thereof for the free exit of the metal disk punched from the blank to form the rivet-hole, by which the tooth is secured to the drill-standard. This die G, together with the punch F, is horizontally adjustable, so as to enable the rivet-holes to be cut at any desired position throughout the length of the blank. The punch F is adjustably secured to the plunger C, and is adapted, when forced down on the die G, to register with the opening therein and form the rivet-hole.

H are guides rigidly secured to the sides of the die G, flush with the upper surface thereof, and are adapted to hold the blank in position, so that the rivet-hole will always be in the transverse center of the blank.

The counter-die I, which is the same length as the drill-tooth J, is secured firmly to the bed of the machine, and is externally shaped precisely like the concave surface of an ordinary drill-tooth, and is provided at its rear end with a straight cutter, K, adapted, in conjunction with the edge L of the die-head E, to sever one perforated tooth-blank from the remaining portion of the blank before it is carried down by the combined die-head and cutter E onto the counter die or former I, and is also provided with, at its front end, the V-shaped cutter M, which, in conjunction with the V-shaped cutting-edges N of the die-head, gradually severs the corners of the blank to form the point as the blank is carried down to the counter-die and former I. The die-head E is the same length as the counter-die I, and is provided with the cutting-edges L and N, already referred to. The under or concave surface of this die, which corresponds to the outer or convex surface of a drill-tooth, is adapted, when pressed down on the counter-die or former I, to bend the prepared blank in the required shape.

To overcome the necessity of withdrawing the tooth from the counter-die after the same has been shaped, and to avoid the delays incident thereto, we have provided automatic spring-gages and followers, situated on opposite sides of the counter-die, adapted to receive the blank as it is moved forward, hold it in proper position as it is carried down to the counter-die, and lift it from off the said counter-die to the level of the cutters M and K as the die-head ascends. These gages O are provided with depending arms P, around which spiral springs Q wind, the said springs bearing constantly on the upper surfaces of the side pieces, D, and the under surfaces of the gage, and they are also provided with the opposing lips

R, adapted to receive and hold the blank as it is moved between the dies, and engage with the side edges of the tooth and lift the same from off the counter-die after it has been shaped.

The gages are provided with grooved ends, *c*, adapted for the reception of the standards T, which hold the gages steady and in proper position. The plunger C can be operated by steam or hand power, as desired.

The operation of our improvement is as follows: After the blank of the right predetermined width and of indefinite length has been prepared it is introduced in the front end of the machine and moved forward until the end thereof rests over the cutter K, when the plunger is caused to descend and punch the rivet-hole. After the plunger ascends the blank is moved farther inward until the extreme end thereof strikes a suitable gage situated on one side of the cutter M, which retards its further progress. The plunger then descends and gradually cuts the blank being pressed from the remaining portion, and points the end of the cut blank. While these dies are cutting and forming the tooth J the punch F and die G are making the rivet-hole in the next blank. As the blank being shaped rests on the gages O, the gages are of necessity carried down therewith by the die-head E, and as the die-head ascends after shaping the blank the spring Q causes the gages to ascend also, and the lips R thereof, engaging with the side edges of the tooth, raise the same to the surface of the counter-die I, where it is held until pushed off by the punched end of the blank being moved inward for pressing.

The cutters secured to the die-head and counter-die are adjustably secured thereto in any desired manner, so as to enable them to be removed for sharpening and repairing. So, also, are the punch F and die G removably secured to the plunger and bed, so as to allow them to be adjusted for different styles of points.

We would have it understood that we do not limit ourselves to the exact forms of dies and formers shown and described, nor exact construction thereof, as our machine is equally well applicable for manufacturing different styles of drill-teeth as well as many forms of cultivator; but we consider ourselves at liberty to make such changes as come within the spirit and scope of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making drill-teeth, the combination, with the counter-die having a straight cutter at one end and a V-shaped cutter at the opposite end, of a plunger having a die-head secured thereto, and provided on one end with a straight cutter and at its opposite end with a V-shaped cutter so inclined as to make a gradual or sawing cut, the straight cutter, at one end of the machine, being adapted to cut one tooth from the blank, while the V-shaped cutters are adapted to form the point of the tooth, substantially as set forth.

2. In a machine for making drill-teeth, the combination, with the bed of the machine, having the die G adjustably secured thereto and the counter-die I rigidly secured thereto, the latter being shaped as shown, and provided on the side near the die G with a straight cutter and on the opposite side with a V-shaped cutter, of a plunger having the punch F adjustably secured thereto, which is adapted to register with the opening in the die G, and a die head, E, rigidly secured thereto, the under surface of the latter being adapted to conform to the shape of the upper surface of the counter-die I, the said die-head being provided with a straight cutter on one end and a V-shaped cutter on the opposite end, substantially as set forth.

3. The combination, with the bed A, die G, having the guides H secured thereto, and the counter-die I, provided with the straight and V-shaped cutters on opposite ends thereof, of a plunger, C, punch F, and die-head E, the latter being provided with straight and V-shaped cutters, which are adapted to engage with the straight and V-shaped cutters on the counter-die I, substantially as set forth.

4. The combination, with the counter-die secured to the bed of the machine, and provided with a straight and V-shaped cutter, respectively, on its opposite ends, and the die-head secured to the plunger, and provided respectively with a straight and V-shaped cutter on its opposite ends, the under surface of the said die-head adapted to conform to the upper surface of the counter-die, of spring-actuated gages situated on opposite sides of the counter-die and adapted to guide the blank to position over the counter-die being forced down with the tooth, and automatically elevate the tooth from off the counter-die to the level of the cutters on the said die after the same has been shaped, substantially as set forth.

5. The combination, with the counter-die I, the cutters K and M, die-head E, and cutters L and N, of the gages O, provided with the arms P and lips R, springs Q, and standards T, substantially as set forth.

In testimony that we claim the foregoing we have hereunto set our hands.

SAMUEL DELANO.
GEORGE ABEL.

Witnesses:
ROBERT ROBB,
WILLIAM F. ROBB.