

(No Model.)

2 Sheets—Sheet 1.

J. WAGNER.  
BOLT MACHINE.

No. 581,144.

Patented Apr. 20, 1897.

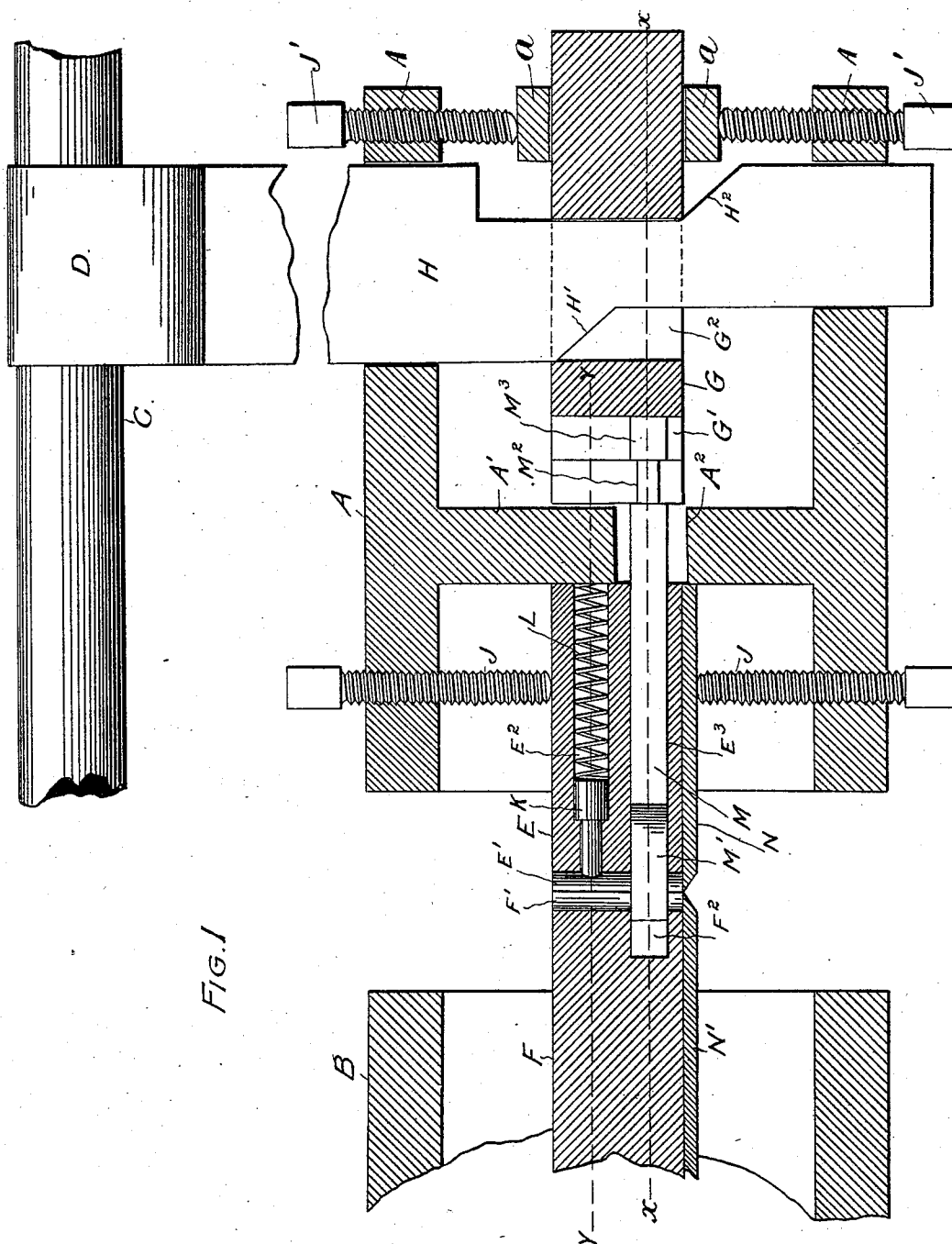


FIG. 1

Witnesses:  
Max Macey  
J. H. Jochem Jr.

John Wagner, Inventor.  
By his Attorneys,  
Collamer & Co., (P) James A. Kitton.

(No Model.)

2 Sheets—Sheet 2.

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BOLT MACHINE.

No. 581,144.

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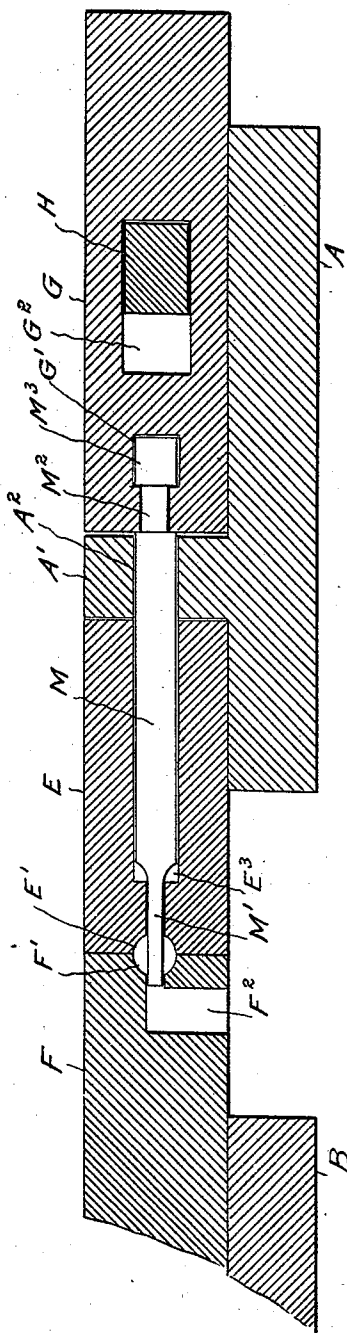


FIG. 1.

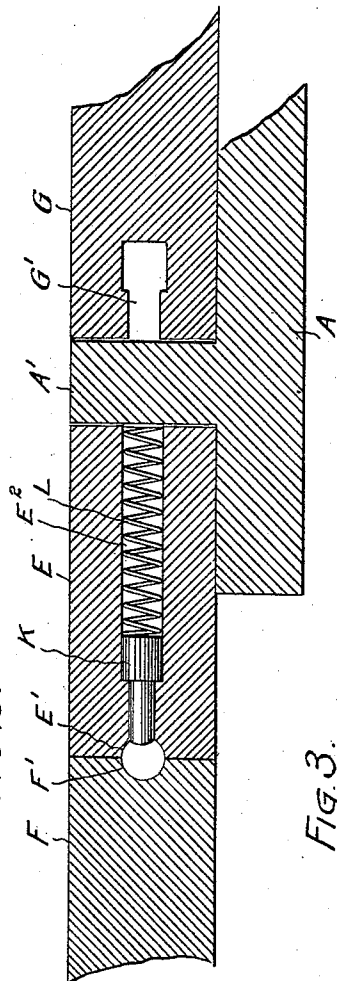


FIG. 2.

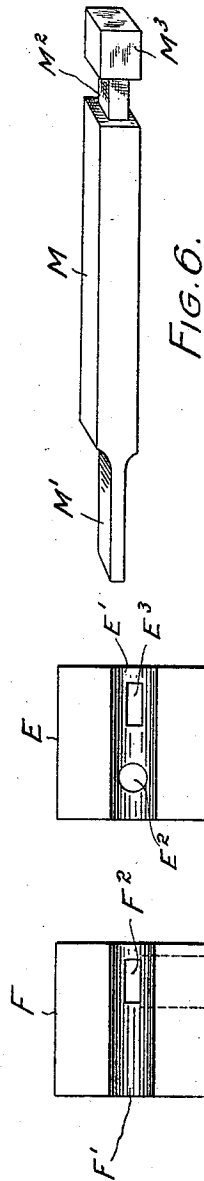


FIG. 3.

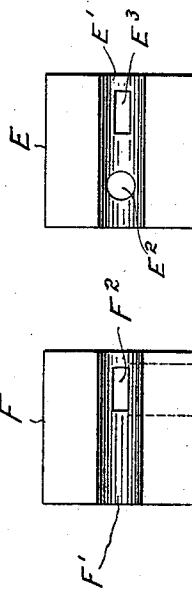


FIG. 4.

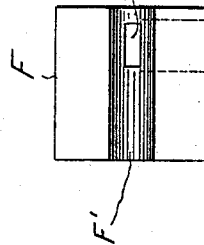


FIG. 5.

Witnesses:  
Mark Marey.  
J. H. Jochnow Jr.

Inventor:  
John Wagner.  
By his Attorneys:  
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# UNITED STATES PATENT OFFICE.

JOHN WAGNER, OF DENVER, COLORADO.

## BOLT-MACHINE.

SPECIFICATION forming part of Letters Patent No. 581,144, dated April 20, 1897.

Application filed July 27, 1896. Serial No. 600,667. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WAGNER, a citizen of the United States, and a resident of the city of Denver, Arapahoe county, State of Colorado, have invented certain new and useful Improvements in Bolt-Machines; and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

This invention relates to the making of bolts, rivets, and the like, and more especially to machines for punching; and the object of the same is to provide the bolt-making machine with a device for punching a keyhole or slot through the body of the bolt at the same time that the latter is made.

To this end the invention consists in the devices fully described and claimed below and illustrated in the accompanying drawings, wherein—

Figure 1 is a horizontal section through the machine, but omitting that portion of the mechanism which causes the reciprocation of the movable die. Fig. 2 is a section on the line *xx* of Fig. 1. Fig. 3 is a section on the line *yy* of Fig. 1. Figs. 4 and 5 are face views, respectively, of the fixed and movable dies; and Fig. 6 is a perspective detail of the punch.

Referring to the drawings by letter, A is the fixed die-bed, wherein is supported in any suitable manner—as, for instance, by resting at its rear end against the web A' and at its sides against the adjusting-screws J—the stationary die E, having a semicircular groove E' in its face, and B is the reciprocating bed carrying the movable die F, whose face is provided with a semicircular groove F', adapted to complement that in the fixed die.

N N' are the fixed and movable shears, respectively, their cutting edges standing across one end of the bolt-opening between the die-faces.

The hot metal to be formed into a bolt is passed across the face of the fixed die E while the two dies are separated, and as they come together the grooves E' and F' shape the body of the bolt and the shears sever it from the unfinished portion of the hot rod. The opposite end of the grooves may have offsets for forming the head of the bolt at the same

operation, if desired, although these are not shown, as they will be clearly understood.

The movable bed is reciprocated toward and away from the fixed bed by mechanism not shown herein, but well known in the art.

The parts thus far described are susceptible of considerable modification and variation so long as the resultant machine is capable of use as below.

The letter M designates the body of a punch, which slides in a longitudinal opening E<sup>3</sup> in the fixed die and has a reduced, flattened, and tempered front end M', capable of being projected through the forward end of said opening E<sup>3</sup> into and across the bolt-forming grooves E' F' and into a discharge-opening F<sup>2</sup>, formed in the bottom of the groove F' and communicating with a runway or discharge that leads downward, as best seen in Fig. 2. Just as the faces of the dies come together to form the bolt, and before the latter has been released or allowed to cool, the punch-moving mechanism throws said punch M forward, and its tip or front end M' is forced completely through the hot bolt, driving the punching into the opening F<sup>2</sup>, whence it falls out the runway, and immediately this punching operation is finished the two dies separate to permit the finished bolt to drop out.

While any approved mechanism may be employed for causing the movement of the punch, I prefer that shown in the drawings and which I will describe in detail.

C is a shaft having an eccentric surrounded by a sleeve D, to which is connected a cam H, which is therefore reciprocated laterally through the die-bed A.

G is the punch-head, which moves longitudinally in suitable guides in the bed A, of which guides only one is here shown, (marked *a*,) and the body of this head is provided with a lateral opening G<sup>2</sup>, operated on by the cam-faces H' and H<sup>2</sup> in a manner which will be clear. The forward end of the head G may be connected in any suitable manner with the rear end of the punch, which passes through an opening A<sup>2</sup> in the web A', but I have shown a detachable connection between them which I prefer. It consists of a T-shaped groove G', formed across the forward

end of the head, and a small stem  $M^2$  at the rear end of the body  $M$  of the punch provided at its rearmost extremity with an enlargement  $M^3$ , the stem and enlargement fitting the groove  $G'$  at any point in its length. This form of connection permits the lateral adjustment of the punch-head  $G$ , which is accomplished by any suitable means, although I have here shown screws  $J'$  for adjusting its guide  $a$  to a considerable extent without removing the punch, and such adjustment is obviously useful for the purpose of properly timing the reciprocation of the head and punch by means of the cam.

15 In addition to the above-described punch for producing a slot in the bolt I prefer to employ means for automatically and forcibly throwing the finished bolt out of its position between the dies or within the groove  $E'$  as soon as the movable die  $F$  recedes, and this I consider highly useful for the reason that the hot bolt will often stick in the groove  $E'$  and not fall out quickly enough to permit the next portion of the rod to be placed in position to be operated on. Within the body of the die  $E$  is a longitudinal cavity  $E^2$ , reduced at its front end, which opens through its grooved face  $E'$  and closed at its rear end by the cross-web  $A'$  of the bed  $A$  or by any other suitable means, and in this cavity is located a pin  $K$ , projected normally forward by an expansive spring  $L$ . The reduced forward end of the pin passes out the reduced front end of the cavity, as seen, and hence as soon as the movable die  $F$  recedes the force of the spring is exerted to throw the finished bolt out. During the operation of forming the bolt the pin of course recedes by the compression of the spring, and hence it forms no impediment to the successful operation of the machine. I consider this throw-out pin a useful detail, even if the keyhole-forming mechanism were not employed, but especially advantageous in connection therewith.

45 What is claimed as new is—

1. In a machine of the character described, the combination with a die-bed, a fixed die therein having a groove in its face, and a longitudinally-reciprocating die also having a groove in its face; of a punch sliding in an opening in the fixed die, the other die being provided with an opening for the punchings, a cam moving laterally through said bed, a punch-head having a transverse opening en-

gaged by the cam-faces, and a detachable connection between said head and the rear end of the punch, as and for the purpose set forth.

2. In a machine of the character described, the combination with a die-bed, a die therein having a longitudinal opening, a second die, both dies having bolt-forming grooves in their meeting faces, and mechanism for bringing said faces into contact; of a punch sliding in said opening, the opposite die having a discharge for the punchings, a **T**-head at the rear end of the punch, a punch-head having a groove across its front end for adjustably receiving said **T**-head, and adjustable guides for said head, as and for the purpose set forth.

3. In a machine of the character described, the combination with a die-bed, a fixed die therein having a groove in its face, screws through the sides of the die-bed against opposite sides of such die, and a moving die also having a groove in its face; of a punch sliding in an opening in the fixed die, the other die being provided with an opening for the punchings, a **T**-head at the rear end of the punch, a punch-head moving longitudinally in laterally-adjustable guides and having a groove in its forward end shaped to loosely receive said **T**-head, and means for moving said punch-head, as and for the purpose set forth.

4. In a machine of the character described, the combination with a die-bed, a die therein having a longitudinal opening, a second die, both dies having bolt-forming grooves in their meeting faces, and mechanism for bringing said faces in contact; of a punch in said opening, the opposite die having a discharge for the punchings, a **T**-head at the rear end of the punch, a punch-head moving in guides and having a groove for receiving said **T**-head and a transverse opening in its body, and a cam moving laterally through the die-bed with its cam-faces engaging said opening in the punch-head, as and for the purpose set forth.

In testimony whereof I have hereunto subscribed my signature on this the 6th day of July, A. D. 1896.

JOHN WAGNER.

Witnesses:

M. H. LLOYD,

JOHN S. GIBONS.