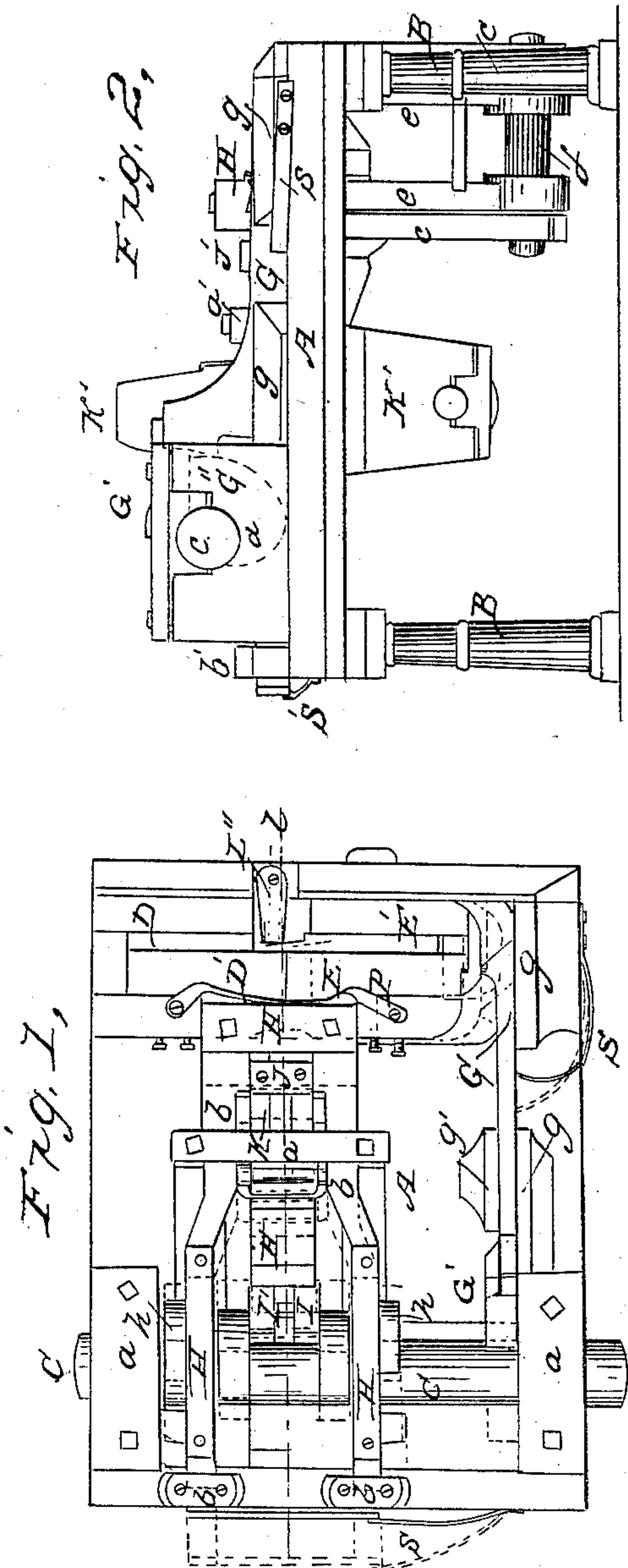


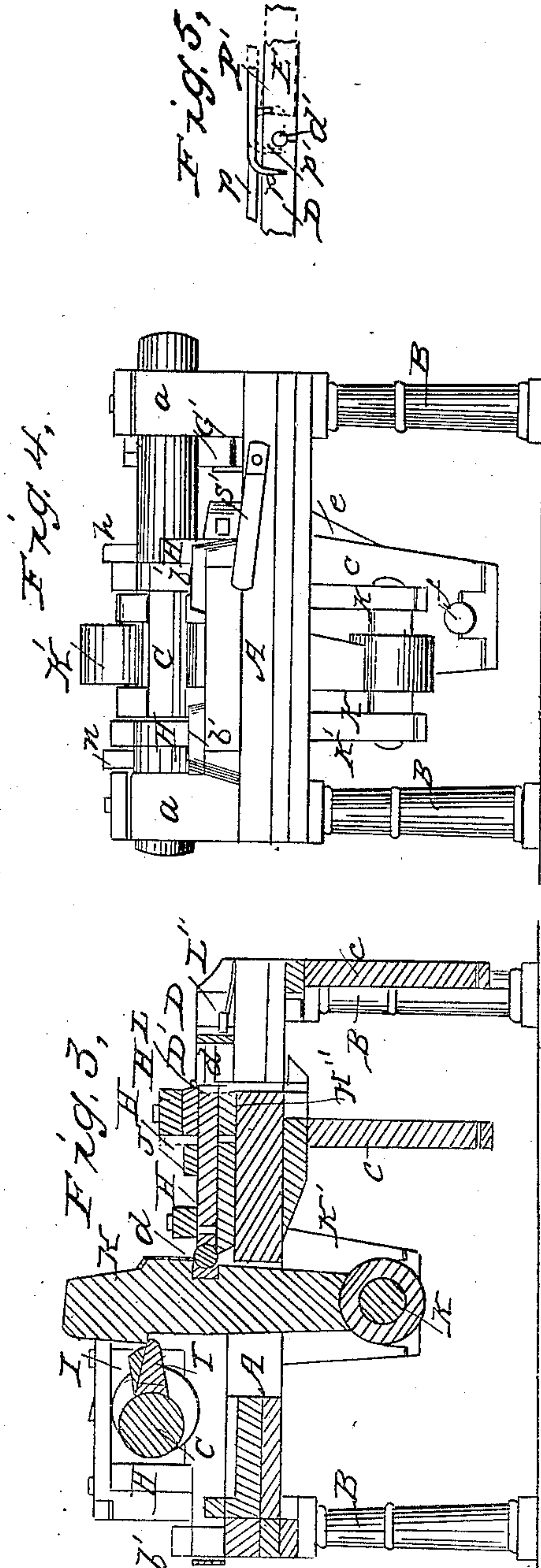
PATON, CAMPBELL & PATON.  
Machine for Making Bolts and Rivets.

No. 45,269.

Patented Nov. 29, 1864



WITNESSES  
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# UNITED STATES PATENT OFFICE.

JAMES PATON, THOMAS CAMPBELL, AND ROBERT PATON, OF NEWBURG, OHIO.

## MACHINE FOR MAKING BOLTS AND RIVETS.

Specification forming part of Letters Patent No. 45,269, dated November 29, 1864.

*To all whom it may concern:*

Be it known that we, J. PATON, T. CAMPBELL, and R. PATON, of Newburg, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Bolt and Rivet Machines; and we do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view of the machine. Fig. 2 is a side view. Fig. 3 is a vertical section in the direction of the line *x x* in Fig. 1. Fig. 4 is an end view. Fig. 5 represents a detached section.

Similar letters of reference refer to like parts in the different views.

My improvement relates to cutting off a piece from a heated bar of iron and swaging the end of the same into a head, so as to form a rivet or bolt, by one continuous automatic operation.

In the drawings, A represents a platform or table, supported by a leg, B, at each corner.

C is the driving-shaft, near one end of the machine, having its bearings in the pillow-blocks *u*. On this shaft are arranged cams that operate the different parts of the machine.

D, Figs. 1 and 3, is a stationary jaw, secured to the table at one corner, that holds the die D'. In a line with this die, and operating in conjunction with it, is the die E in the vibrating jaw E', on one side of which is the cutter F, that extends out beyond the die. This jaw has arms *e*, (seen in Fig. 2,) that extend down underneath the table, through the lower ends of which is the shaft *f*, that has its bearings in the hangers, *c*. By means of these arms vibrating on the shaft *f*, the jaw is allowed to move backward and forward in place. The jaw is moved forward or toward the stationary jaw by the action of the sliding cam G, that moves between the end of the jaw and the piece *g*, secured to the table, there being also a guide, *g'*, on the table to keep the cam in place. This cam is operated by the cam G' on the driving-shaft, moving against the end of it, as indicated by the dotted line G'' in Fig. 2, which is drawn back, when the pressure from the

cam G' is removed, by the spring S, secured to the frame.

H is a head, in which are arranged dies for forming the head of the bolt or rivet. This head is connected by bars *b b* to reciprocating arms H' H', that surround the driving shaft, and which are operated by cams *h h* on the shaft and by the spring S', secured to the end of the table. The frames forming the reciprocating arms H' H' and arms *b b*, in connection with the head, move in suitable depressions in the table, and are kept in place by guides *a'* and *b' b'*, and also by the cams *h* on the driving-shaft.

K is a follower arranged between the bars *b b*, and connected by a toggle-joint, *d*, to the lever K'. In this follower is secured the plunger J, that extends into the head H, forming the end of the die-box L'. (Seen in Fig. 3.) This plunger, with the follower, moves in connection with and also independent of the head, as will be described hereinafter. The lever K' extends down underneath the table, and has its fulcrum on the shaft *k*, the latter shaft being supported by the hangers *k'*. This lever is operated, moving the follower in the desired manner, by the cams I and I' on the shaft.

The movements of the different parts of this machine in forming bolts or rivets will be described as follows: The rod of iron is fed into the machine on the guide L'', as indicated by the red lines *l* in Fig. 1. When the different parts of the machine are in the position indicated by the dotted lines in Fig. 1, the head H, moves back by the action of the cams, produced by turning the shaft, the sliding cam G being also moved back by the spring S, and the jaw E left to open by a spring under the table or by any other suitable means, leaving a space between the dies D' and E. The iron is then inserted between the dies, and is extended through on the other side, so that there will be bulk of iron enough to form the head of a bolt, the rod of iron being gaged for that purpose. By turning the driving-shaft the action of the sliding cam G, as described, moves up the jaw E', cutting off the iron by means of the cutter F and the die E comes in close contact with the die D', thus forming the stem of the bolt. As soon as the dies D' and E are thus closed by the shaft



still turning, the reciprocating bars  $H'$  are released from the action of the cams  $h$ , and the springs  $S'$  move the head  $H$  at once close up to the dies  $D'$  and  $E$ , while the follower, with the plunger  $J$ , remains stationary. The iron projecting beyond the dies  $D'$  and  $E$  extends into the die in the head, when the cam  $I$  comes against the lever  $K'$ , that forces the follower, with the plunger  $J$ , up in the head, upsetting the iron in the die-box  $L'$  and compressing it into a bolt-head, the stem of which has already been formed by the dies  $D'$  and  $E$ . By this process the piece of iron is swaged and compressed into a perfectly formed bolt, which is released from the dies in the following manner: The shaft still turning round, the cams  $h$ , acting upon the arms  $H'$ , cause the head  $H$  to move back on the follower and plunger  $J$ . The lever  $K'$ , moving onto the cam  $I'$ , retains the plunger  $J$  in its position until the head is moved back the depth of the die-box  $L$ , as indicated by the dotted lines  $H''$  in Fig. 3, when it comes against the guide  $J'$ , secured to the follower; then the follower is drawn back with the head by the action of the cams  $h$  and bars  $H$ , as before described. The object of having the head  $H$  move back on the plunger  $J$  in this manner is to push the head of the bolt out

of the die-box; and there are hooks  $p$ , attached to the jaws, that are curved round and bent down on each side of the dies  $D'$  and  $E$ , as represented in Fig. 5, to detach the stem of the bolt from either side of the die-box. should it adhere in any way, when the jaws are opened, the hooks being in the position indicated by the dotted lines  $p' p'$ .

What we claim as our improvement, and desire to secure by Letters Patent, is—

1. The above-described machine, when constructed arranged, and operated substantially as set forth.

2. The use of the hooks  $p p$ , in combination with the vibrating jaw  $E$  and cam  $G$ , substantially as and for the purposes set forth.

3. The special arrangement of the reciprocating head  $H$ , arms  $H' H'$ , followers  $K$ , in combination with the plunger  $J$ , vibrating lever  $K'$ , and cams  $I I'$ , when constructed, operated conjointly, substantially as and for the purpose set forth.

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Witnesses:

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