P. ELEY

improvements in

BOLT-HEADING MACHINE.

117527

PATENTED AUG 1 1871

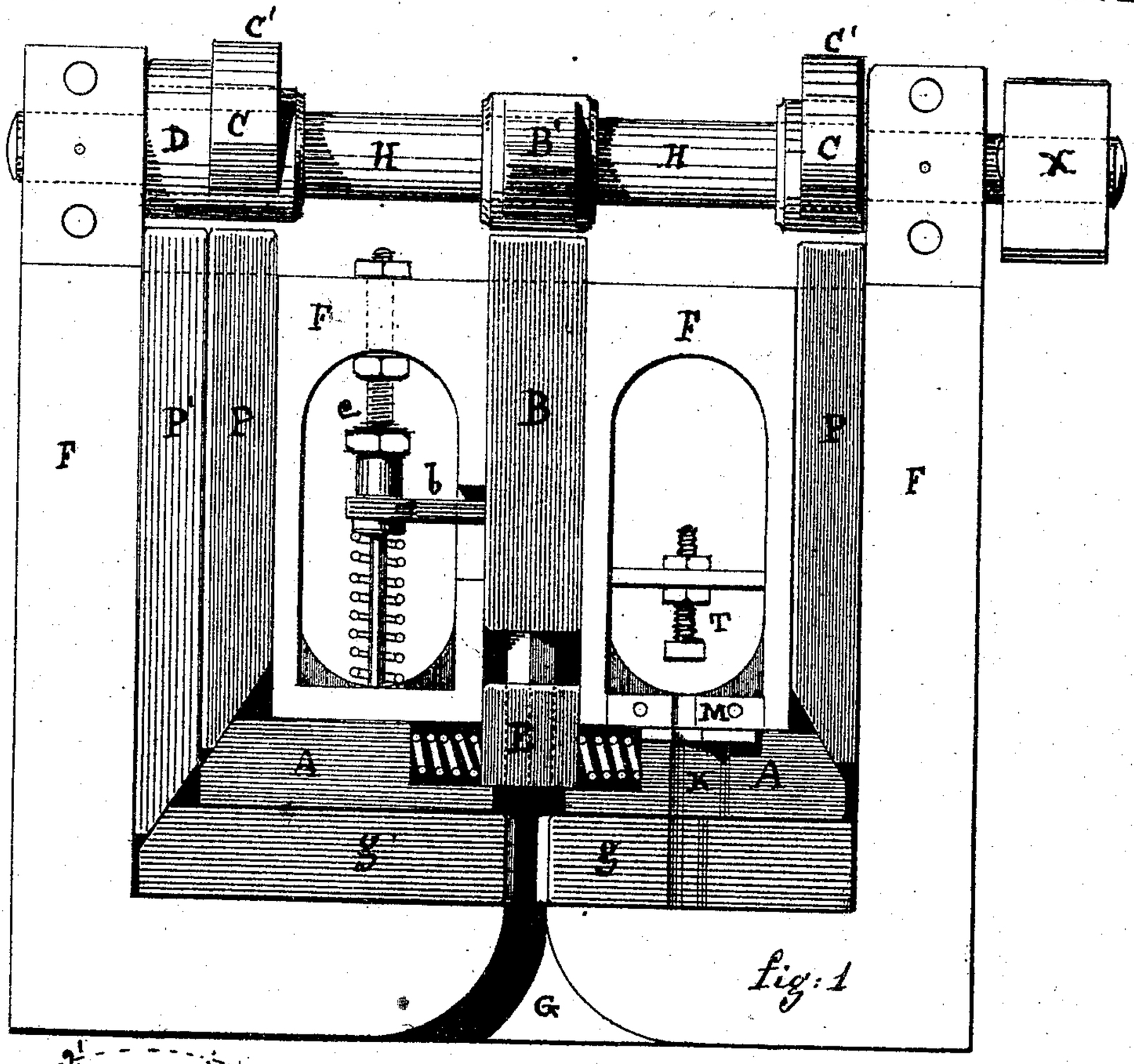

fig: 1

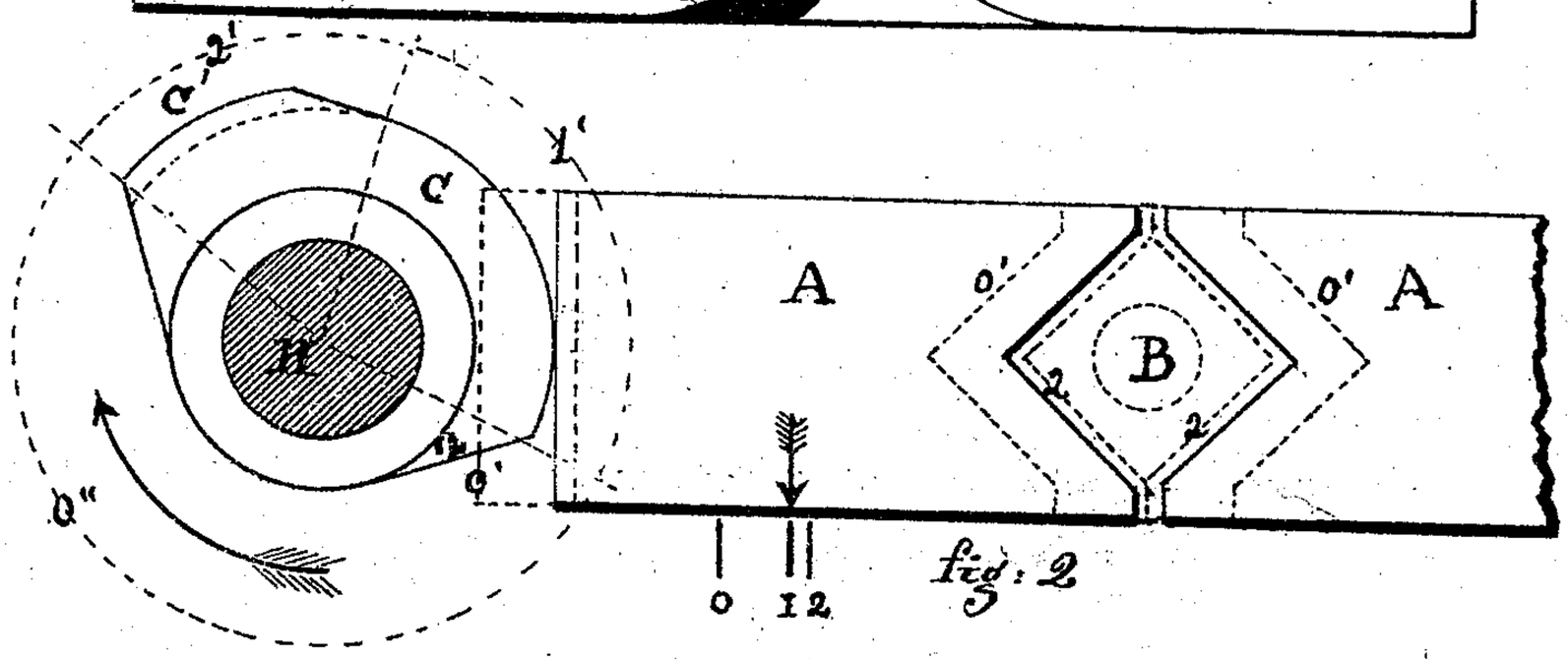

fig: 2

Witnesses.

H. Gengembre Hubert

Thos H. S. Upton

Inventor.

Philip Eley

UNITED STATES PATENT OFFICE.

PHILIP ELEY, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF HIS RIGHT TO THOMAS W. BARTHOLOMEW, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR HEADING BOLTS.

Specification forming part of Letters Patent No. 117,527, dated August 1, 1871.

To all whom it may concern:

Be it known that I, PHILIP ELEY, of the city of New York, in the county and State of New York, have invented certain Improvements in Bolt-Heading Machines, of which the following is a specification:

This invention relates to a machine for heading bolts, or for staving and forging a bolt out of a heated rod of iron; and it consists in having the dies which form the sides of the box or cavity into which the head of the bolt is to be shaped or forged operated in such a manner, in connection with the heading-plunger of the machine, that said dies will first be brought partly near each other to form a box or cavity somewhat larger than the intended size of the head to be made on the bolt, and that after the plunger has acted upon the end of the heated rod of iron and staved or upset it into the said cavity or box, then the said side dies will close entirely and finish the sides of the head of the bolt. By this arrangement of the operations of the side dies and heading-plunger a more perfect head is obtained as the heated bar is first staved into a cavity or matrix slightly larger than the intended head, and the head is afterward compressed laterally by the side dies into its perfect shape. Should the head at the end of the bar not be perfectly shaped, as soon as the griping-dies *g* open the bar may be turned one-quarter and the head submitted again to the rotation of operations; and, finally, the bolt is cut off from the bar by presenting it to the cutting arrangement shown at M K T.

F is the frame of a bolt-heading machine, having the gate G wherein to introduce the heated bar of iron. H is the arbor or shaft, which receives motion from any suitable machinery applied at X. *g* is a stationary, and *g'* a movable griping-die. D is the cam, and P' the wedge-bolt acting upon the griping-dies *g'*. E is a guiding-box for the heading-plunger B, and *b c* is the adjustable mechanism for the same. A A are side dies for forming the head of the bolt. The ends of the dies A A are so shaped that, when the dies are closed or brought near each other, there will remain between them a cavity having the proper shape for forging the head of the bolt intended to be made in the machine. The dies A are kept apart, one from the other, by springs or weights, in any ordinary manner, and when open they occupy the position indicated in Fig. 2 by the dotted line *o;* and they are controlled and operated upon by any suitable mechanism which will, first, move them one step forward, as indicated by the mark 1 in Fig. 2; second, leave them stationary in that position for a certain time; and thirdly, close them entirely, as indicated by mark 2 and dotted line 2, same figure.

The mechanism which will thus control and operate the dies A is connected with the mechanism working the heading-plunger B in such a manner that said plunger B will give its stroke just after the first movement of the dies A A has taken place and before they close entirely. Thus, the plunger B and the dies A A are actuated in a rhythmic combination, substantially as follows: The dies A A making their first throw or movement from 0 to 1, Fig. 2; then the heading-plunger B moving forward to upset the metal in the c v-ity left between the ends of the dies A A, whach keep the metal from spreading, then the secoind throw of the dies closing entirely and finishing the head of the bolt; and lastly, the dies A A opening entirely to allow of the bolt dropping out of the machine.

It is, of course, understood that the griping-die or dies will be made to move at the proper time to operate in connection with the above.

In my drawing, in Fig. 2 I have illustrated on an enlarged scale and in an abstract manner the theory of the movement of my dies A A, the cam C *c'* and the circle divided into the arcs 0' 1' 2'', indicating the forward movements of the dies A from 0 to 1 and from 1 to 2; and in Fig. 1 I show the general arrangement which connects the movements of the dies A A and that of the bolt B so that they will act in the rhythmic manner spoken of. But I neither claim nor confine myself to the mechanical devices for working said dies, as any machinery which will produce this double throw of the side dies in proper rhythmic combination with the motion of the heading-plunger will answer the purpose.

Figure 1 represents a bolt-heading machine in which my improvement is introduced, seen from the top or in bird's-eye view, and with top plates removed to allow of the working parts being seen; and Fig. 2 represents a diagram of the movements of the dies A, one of the dies having a direct-acting cam actuating it. This figure is more particularly intended to explain fully the

exact nature of my invention without regard to the mechanical device which actuates the dies A.

Disclaiming all such arrangement of dies as shown in W. Grant's patent of December 26, 1848, in which a bolt-blank may be partly staved in a cavity having one-half of the proper shape for the finished head, and the other half is somewhat larger,

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

The combination of the two dies A A, plunger B, griping-dies *g g'*, and mechanism for forcing the dies A forward against the blank twice alternately with the movement of the plunger, said combination being substantially as described and shown.

PHILIP ELEY.

Witnesses:
THOS. H. S. UPTON,
H. GENGEMBRE HUBERT.