

Bailey & Knowles,
Bolt Machine,
No 70,939, *Patented Nov. 19, 1867.*

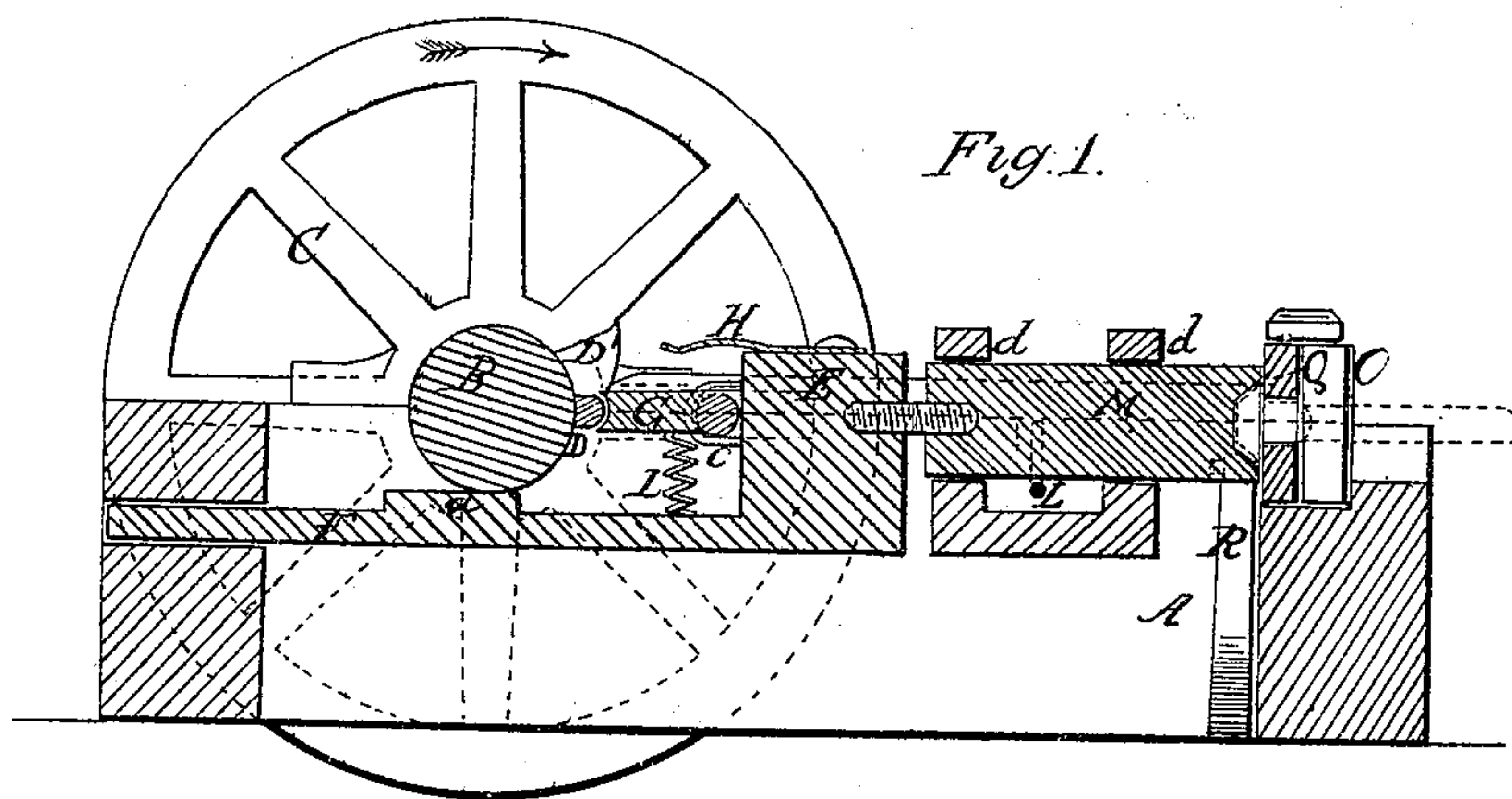


Fig. 1.

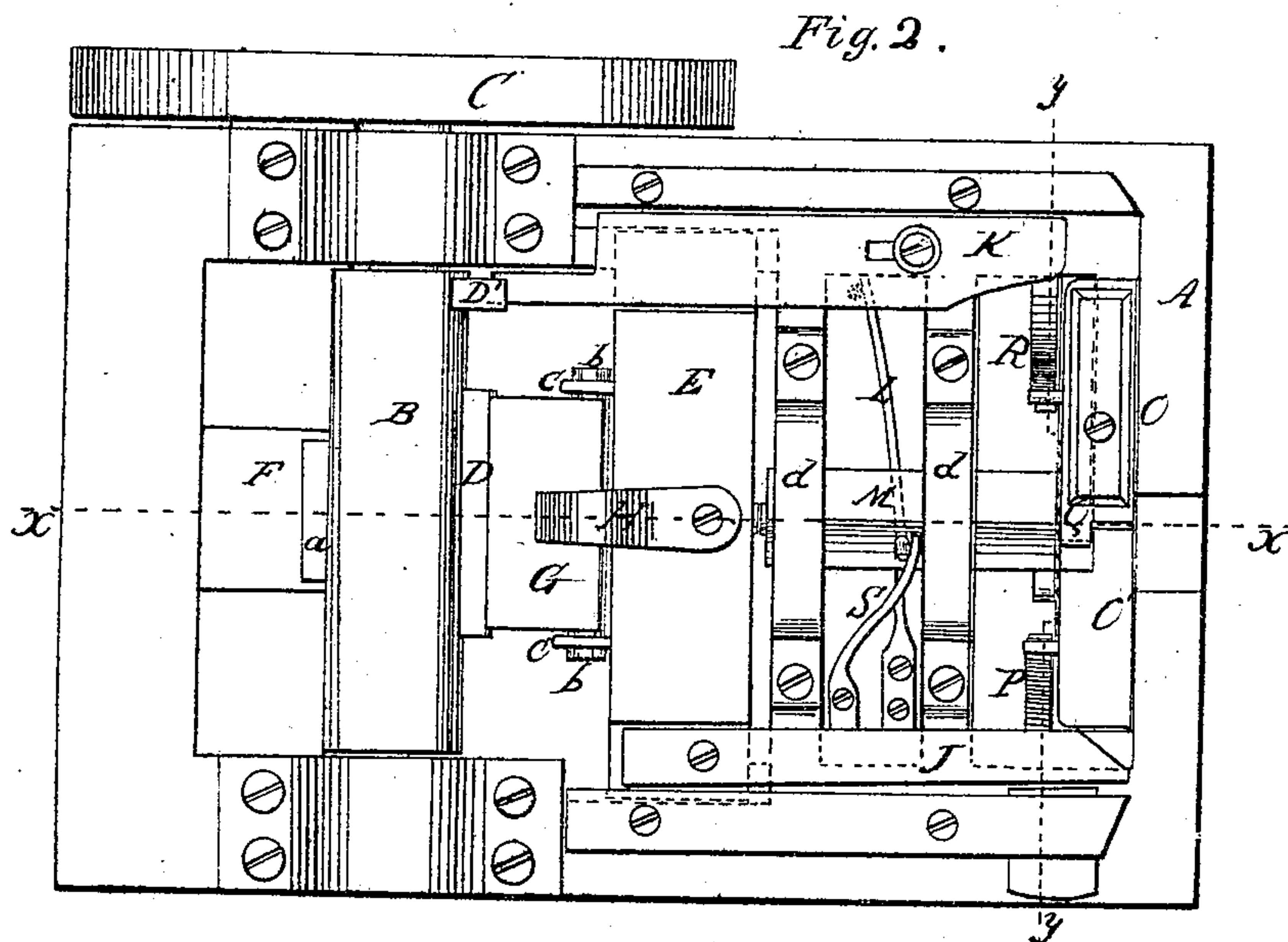


Fig. 2.

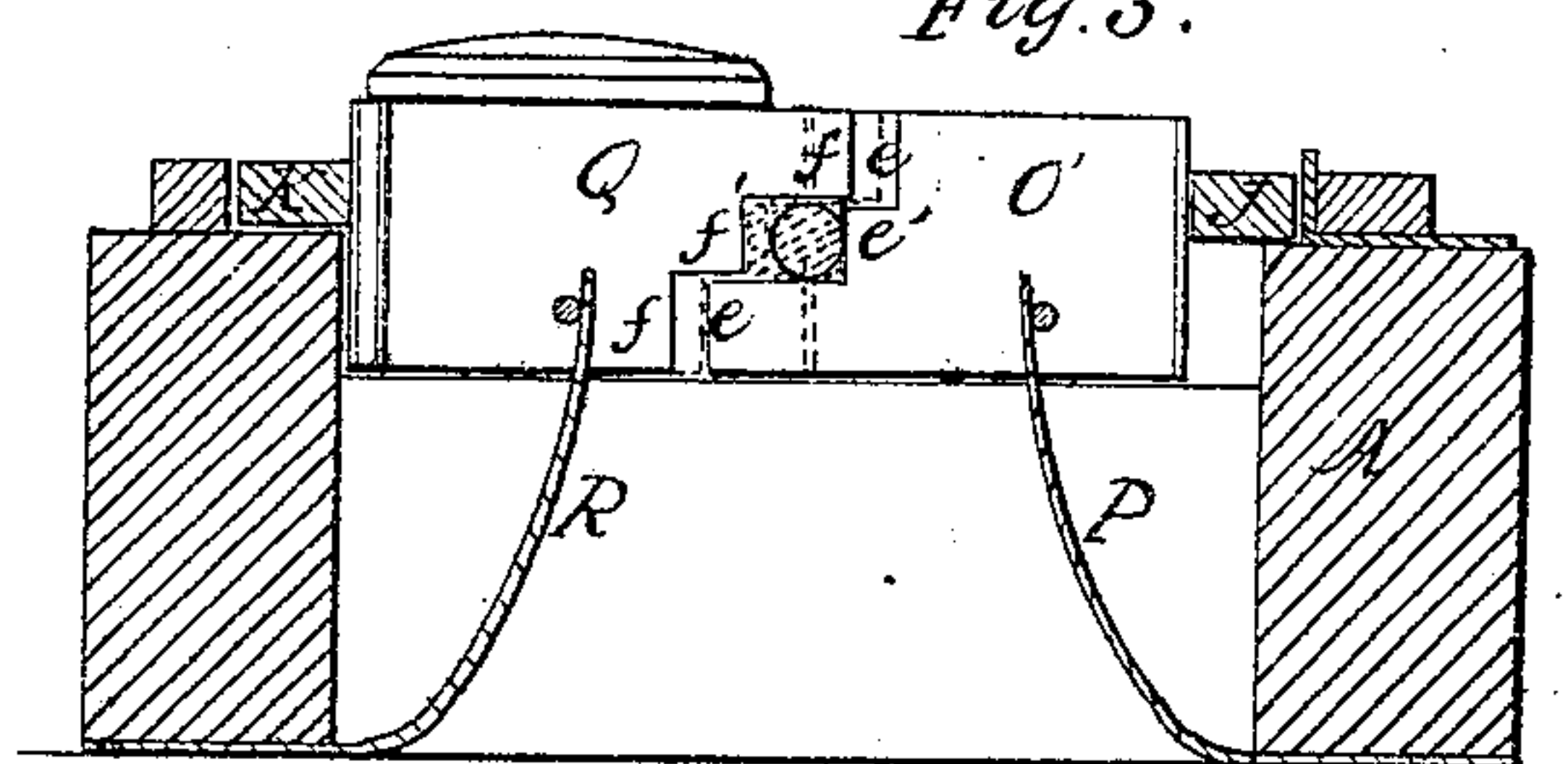


Fig. 3.



Fig. 4.

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ALBERT R. BAILEY, OF NEW HAVEN, AND WILSON W. KNOWLES, OF
PLANTSVILLE, CONNECTICUT.

Letters Patent No. 70,939, dated November 19, 1867.

IMPROVED BOLT MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, ALBERT R. BAILEY, of New Haven, in the county of New Haven, and State of Connecticut, and WILSON W. KNOWLES, of Plantsville, in the county of Hartford, and State of Connecticut, have invented a new and useful Improvement in Machine for Heading and Squaring Bolts; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention relates to a new and improved machine for heading and squaring bolts; and it consists in a novel arrangement of dies and a header, arranged to operate in the manner as hereinafter set forth, whereby a square is formed on a bolt contiguous to its head, of greater thickness than the body or main portion of the bolt, and the head and square formed on the bolt at one operation.

In the manufacture of bolts the great difficulty has been to form a square of sufficient size or thickness—thicker than the body or main portion of the bolt—by a simple and practical means, and hence the bolts which are now made from round iron have their squares formed simply by pressing the round portion of the bolt into a square, the latter not exceeding in thickness the other portion of the bolt.

By my invention, in the process of heading and squaring, the bolt-rod is upset where the square is formed, and the latter therefore made of a requisite size or thickness. In the accompanying sheet of drawings—

Figure 1 is a longitudinal vertical section of my invention, taken in the line *x x*, fig. 2.

Figure 2, a plan or top view of the same.

Figure 3, a transverse vertical section of the same, taken in the line *y y*, fig. 2.

Figure 4, a detached view of a bolt made by my invention.

Similar letters of reference indicate like parts.

A represents the frame or bed-piece of the machine, in which the working parts are placed, and B is a driving-shaft placed transversely on the frame or bed-piece, near one end of the same, and provided at one end with a fly-wheel, C. On this driving-shaft B there are secured two projections, D D', one of which, D, is of considerable length, and has a longitudinal position on the shaft, while the other, D', is simply an arm projecting radially from the shaft, and having one side rounded, as shown in fig. 1. E is a cross-head fitted in the frame or bed-piece A, and having a plate, F, attached to its lower side, said plate having a longitudinal position in the frame or bed-piece. On this plate F there is a transverse ledge or plate, *a*, the use of which will be presently shown. To the rear side of the cross-head E there is fitted a plate, G, the latter being provided at each end with a journal, *b*, which journals are fitted in staples or other suitable bearings, *c*, attached to the cross-head. This plate G is allowed to rise and fall freely, but it is controlled or retained by springs H I, one above and the other below it, as shown clearly in fig. 1. To one end of the cross-head E there is attached a slide, J, which moves with the cross-head at one side of the frame or bed-piece A, and at the opposite side of the latter there is placed a similar slide, K, which is operated by the projection D' on the shaft B, and a spring L. M represents a heading-die, which is fitted in two cross-pieces, *d d*, on the frame or bed-piece A, and is allowed to work or move freely therein. This heading-die has a longitudinal position in the frame or bed-piece, and it is operated by the cross-head E and a spring, N. O is a fixed jaw secured to the frame or bed-piece A, and having a semicircular notch made in its face or inner end. O' is a sliding jaw placed in line with the fixed jaw O, and operated by the slide J of the cross-head and a spring P. The face end of the sliding jaw O' has also a semicircular hole made in it, and these two jaws grasp and hold the bolt-rod while the square and head are being formed upon it. The sliding jaw O' performs also the function of a die, it being notched or recessed out at its rear side, to form three vertical surfaces, *e e e'*, shown clearly in fig. 3, while at the rear of the fixed jaw O there is placed a supplemental die, Q, the inner or face end of which is notched, to form three vertical surfaces, *f f f'*, corresponding to those at the rear side of the sliding jaw O'. This supplemental die Q is operated by the slide K and a spring R.

The operation is as follows: At the commencement of the operation the cross-head E is drawn back to its fullest extent, and the sliding jaw O' is also back from the fixed jaw O. The end of the bolt-rod (properly

heated) is placed between the jaws O O', its end coming in contact with the heading-die M. As the shaft B is rotated the first part moved is the cross-head E, the projection D coming in contact with the plate G, and sliding forward the cross-head, the slide J, of course, moving and shoving the sliding jaw O' towards the fixed die O, the rod being firmly grasped and held between these dies. By the time the rod is thus grasped the cross-head E comes in contact with the heading-die M, and shoves it forward against the end of the bolt-rod, and forms the head of the bolt, and also upsets the portion of the rod included between the head and the point where it is grasped by the jaws O O'. This upset or compressed, and consequently thickened, portion of the bolt-rod is between the vertical parts *e' f'* of the sliding jaw O' and the supplemental die Q, the space between said parts being sufficiently wide to admit of the rod being expanded or upset under the action of the heading-die M, (see fig. 3.) As soon as the heading-die M reaches the termination of its forward movement, and the head of the bolt is formed, the slide K is shoved forward by the projection D', and said slide moves the supplemental die Q, and squares the upset portion of the bolt, rendering said portion true, and sharp or angular at its corners. It will be seen, by referring to fig. 3, that the space between the surfaces *e' f'* is of rectangular form, and of greater length than height, before the supplemental die Q is moved. This allows room for the expansion of the bolt-rod during the upsetting operation, and when the supplemental die is moved the upset portion is made square. In fig. 4 the enlarged square portion of the bolt is designated by *a*'. When the supplemental die Q has completed its movement the spring R throws it back. The spring P throws the jaw O' back, and the spring L throws back the slide K, the heading-die M being thrown back by a spring, S, while the cross-head E and slide J are drawn back by the projection D on shaft B coming in contact with the ledge *a* on plate F.

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

1. The fixed jaw O and the sliding jaw O', in combination with the supplemental die Q and die M, all constructed and arranged to operate substantially in the manner as and for the purpose set forth.
2. The cross-head E, slide J, attached thereto, and independent slide K, arranged substantially as shown, for operating the heading-die M, sliding jaw O', and supplemental die Q, as set forth.

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Witnesses:

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