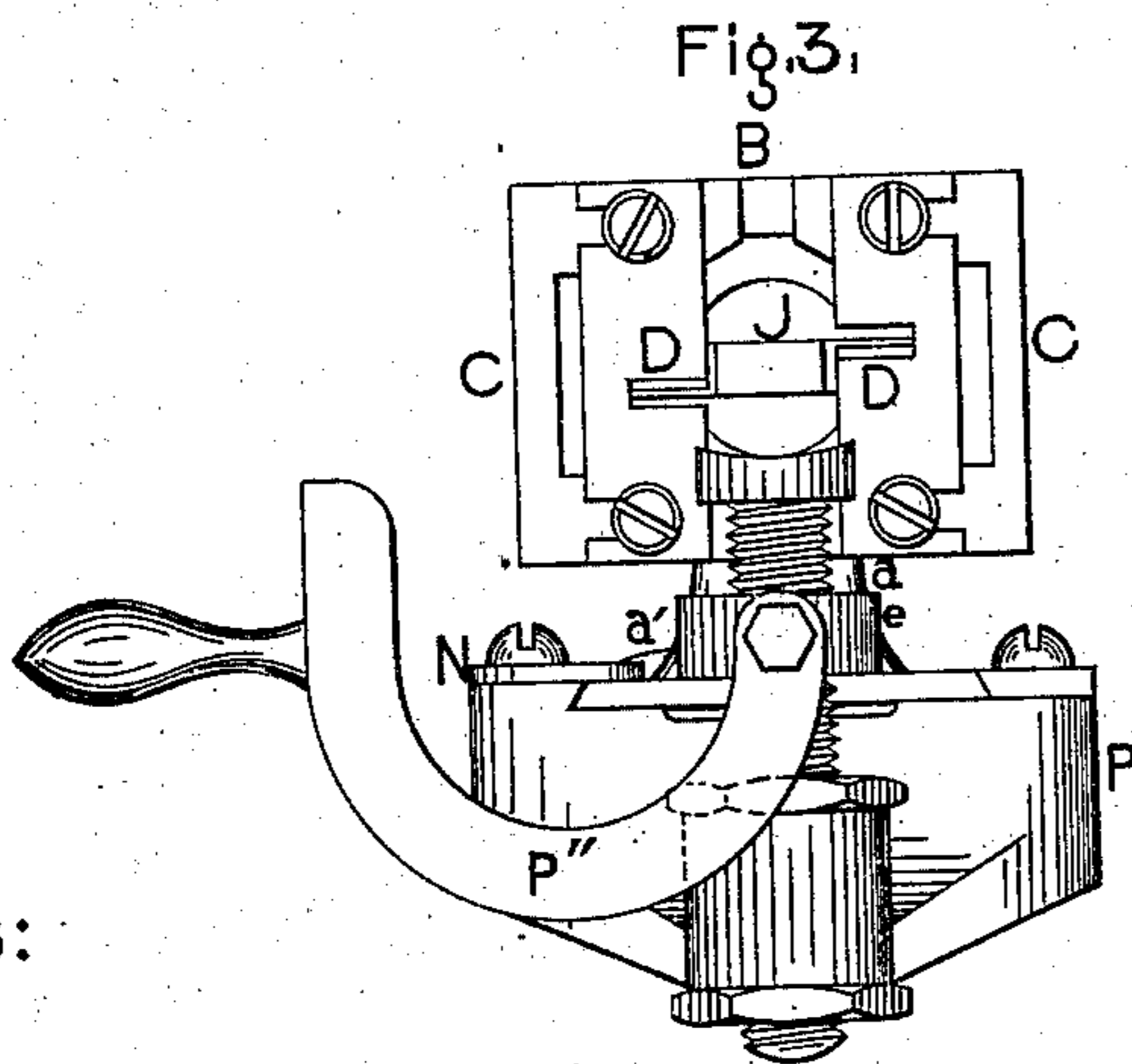
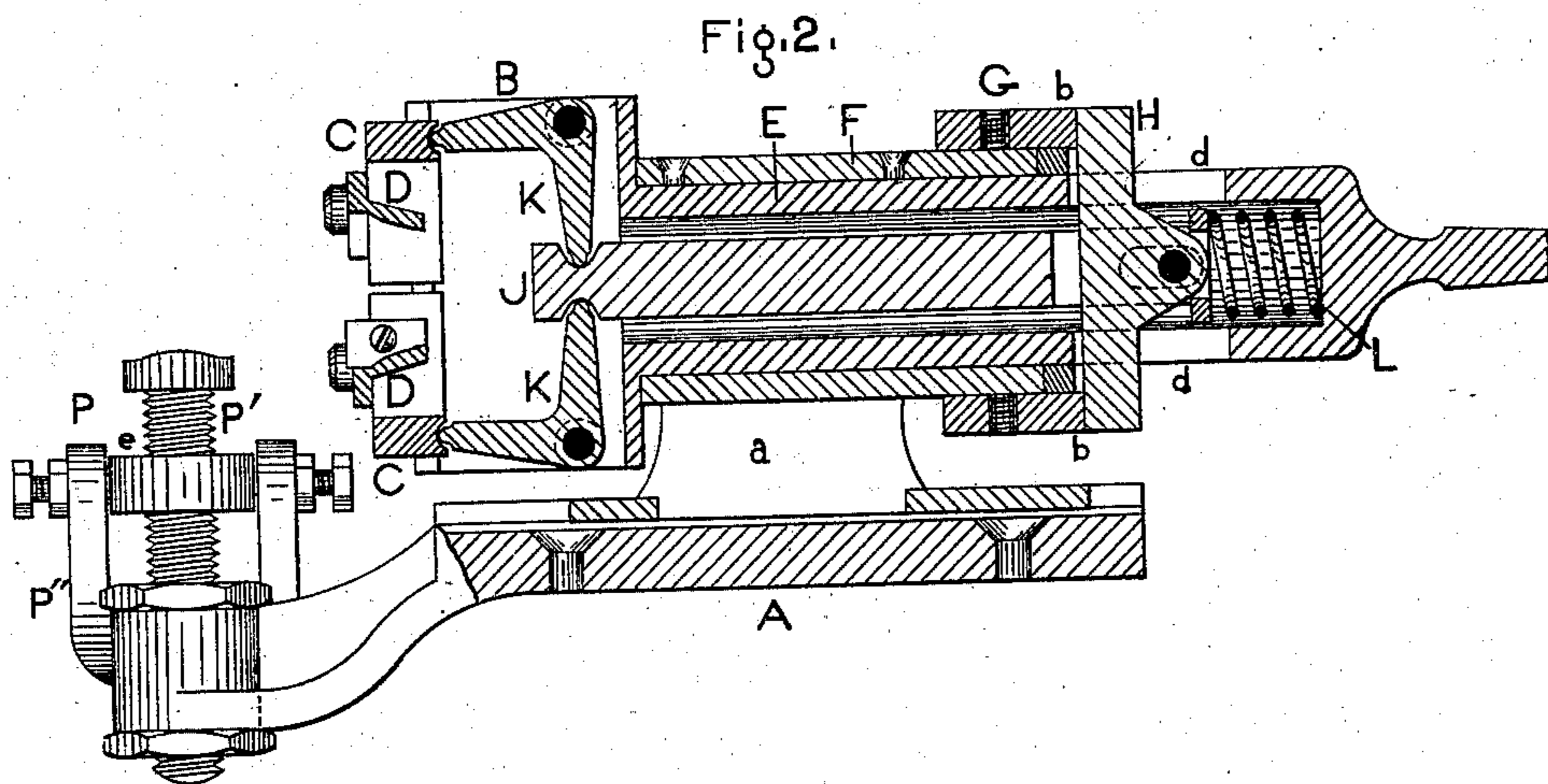
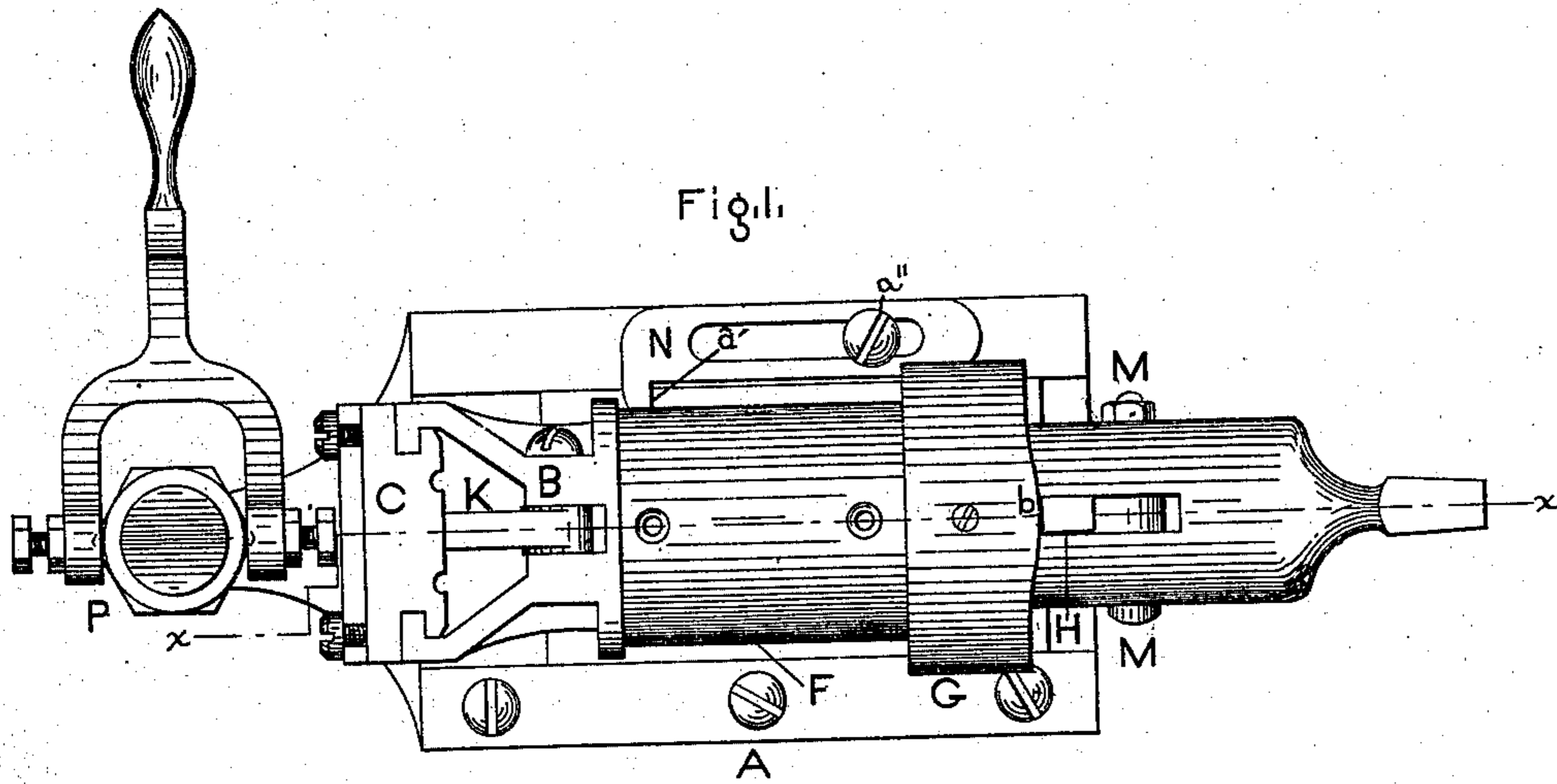


J. J. WHITE & W. S. KELLEY.
Tenoning-Machine.

No. 224,752.

Patented Feb. 17, 1880.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH J. WHITE AND WILLIAM S. KELLEY, OF SMITHVILLE, N. J.

TENONING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 224,752, dated February 17, 1880.

Application filed September 12, 1879.

To all whom it may concern:

Be it known that we, JOSEPH J. WHITE and WILLIAM S. KELLEY, of Smithville, in the county of Burlington and State of New Jersey, have invented a new and useful Improvement in Tenoning-Machines, which improvement is fully set forth in the following specification and accompanying drawings, in which—

10 Figure 1 is a top or plan view of the machine embodying our invention. Fig. 2 is a longitudinal section thereof in line *x x*, Fig. 1. Fig. 3 is a front-end view thereof.

Similar letters of reference indicate corresponding parts in the several figures.

Our invention consists of a machine for producing tenons of elliptical or other variable forms, the same having cutters to which variable motions are imparted by means of a sliding rod operating at a right angle to the line of the sliding motion of the cutter-heads, and a connected cam and a key, by which cam and key the movements of the cutter-heads are controlled and the cutters are caused to advance and recede to and from the piece of wood or bolt to be tenoned.

It also consists of a holder operating conveniently and securely and rendered adjustable to bolts of different thicknesses, said holder being constructed, arranged, and combined with the remainder of the machine substantially as hereinafter set forth.

Referring to the drawings, A represents a bed which is properly supported, and has fitted to it, by a longitudinal sliding joint, the base *a* of the tool-carrier and connected parts.

B represents a stock, to one end of which are fitted heads C, which slide in opposite directions in the same plane and have on their inner sides tenon cutters or knives D, and to said stock is connected a rotary hollow spindle, E, having its bearing in a boss, F, which rises from the base *a* and extends longitudinally.

45 G represents a collar which is secured to or formed with the boss F at the end opposite to the stock B, and its outer face is formed with swells *b* at intervals, or is cam-faced, and against said face bears a key, H, which is passed transversely loosely through slots *d* in the spindle E and secured to a slid-

ing rod or shaft, J, within the hollow spindle E, said shaft extending longitudinally and having connected at its forward end elbow-levers K, having their axes on the stock B, the sliding heads C C of the cutters being jointed to said elbow-levers and having sliding movements at a right angle to those of the shaft J.

L represents a spring which bears against the rear end of the shaft J and adjacent end of the spindle E, and serves to force the cutters apart, and M represents a screw-bolt which is passed through slots in the spindle and forms a sliding connection for the shaft J and key H with the spindle.

The cutters D appear on the faces of the sliding heads C, and are adjustably connected thereto for the purpose of formation of different-sized tenons, and the length of the tenons is adjusted by means of a sliding gage, N, which, being slotted and held in position by means of a screw, *a''*, passing into the bed A, is adapted to engage with a shoulder, *a'*, on the base *a* or boss F, and thus limit the forward movement of the carrier, and consequently of the cutters D.

The operation is as follows: The bolt, spoke, or other article to be tenoned is clamped to a holder, P, in front of the cutters. Rotation is then imparted to the spindle E by means of a crank-handle or other means, and the carrier advanced toward the holder either by hand or the action of weights, springs, or other appliances attached to the base *a*, boss F, or other parts of the carrier.

Owing to the swells *b* or elevated portions of the cam-face of the collar, the key H, and spring L, said swells or portions being in the present case two in number, reciprocating motions are imparted to the shaft J and alternating advancing and receding motions are imparted to the cutters D, whereby, as the latter cut into the bolt, they form thereon an elliptical tenon.

When the tenon is formed the carrier is run back, the bolt removed from the holder P, and another bolt applied ready for the next cutting operation. By varying the number of swells *b* a variable form may be imparted to the tenon.

The holder P consists of an upright screw-

rod, P', having a head at top and supported on the bed A. To the rod is fitted a screw-sleeve, e, having pivoted to it a clamp, P'', which is adapted to be swung over the bolt resting on the head of the screw-rod, and thus securely sustain it in position.

By means of the sleeve e, which may be raised and lowered, the holder is adapted for sustaining bolts of different thickness.

10 The cutter-heads C, owing to their arrangement, are operated by a single shaft, the construction of parts is simplified, and strength thereof increased.

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

1. Two cutter-carrying heads arranged in guides in the same plane, in combination with a reciprocating shaft, a rotating spindle carrying a key, a fixed cam against which said key operates, and levers K K, substantially as and for the purpose set forth.

2. In combination with a rotating spindle,

a key carried thereby, a fixed cam, a spring opposed to the action of said cam, a shaft reciprocated by said cam and spindle, levers operated by said shaft, and cutters opened or closed by the operation of said intermediate levers, substantially as set forth.

3. The sliding cutter-heads C, in combination with the reciprocating shaft J, hollow rotary spindle E, cam-faced collar G, key H, bell-crank levers K, and spring L, substantially as and for the purpose set forth.

4. The hollow holder P, consisting of the screw-rod P', sleeve e, and swinging clamp P'', located in front of the cutters and arranged in such manner as to present thereto the article to be operated upon, substantially as set forth.

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Witnesses:

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