

2 Sheets—Sheet 1.

No. 250,756.

Patented Dec. 13, 1881.

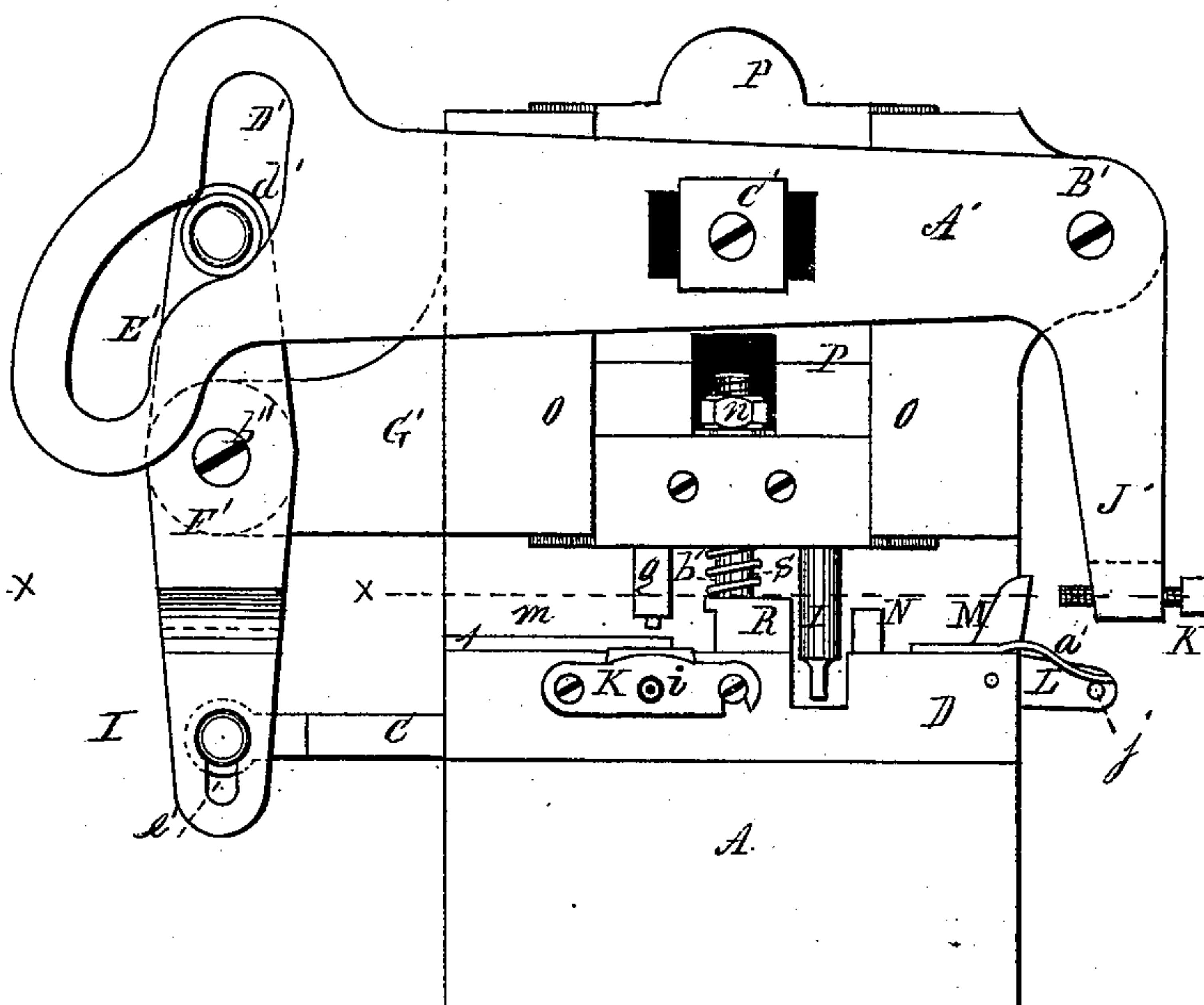


Fig 1

Fig 2

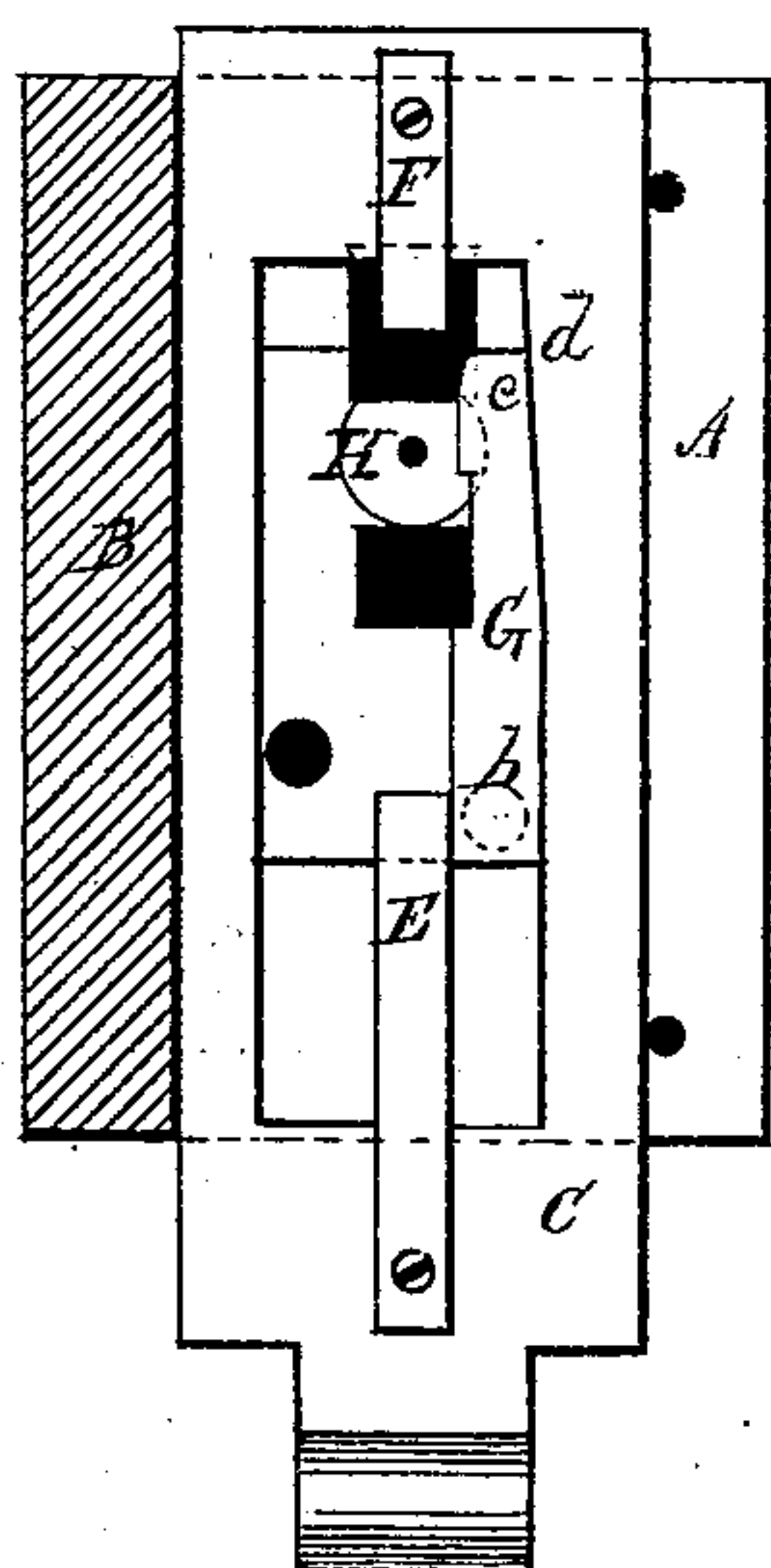


Fig 3

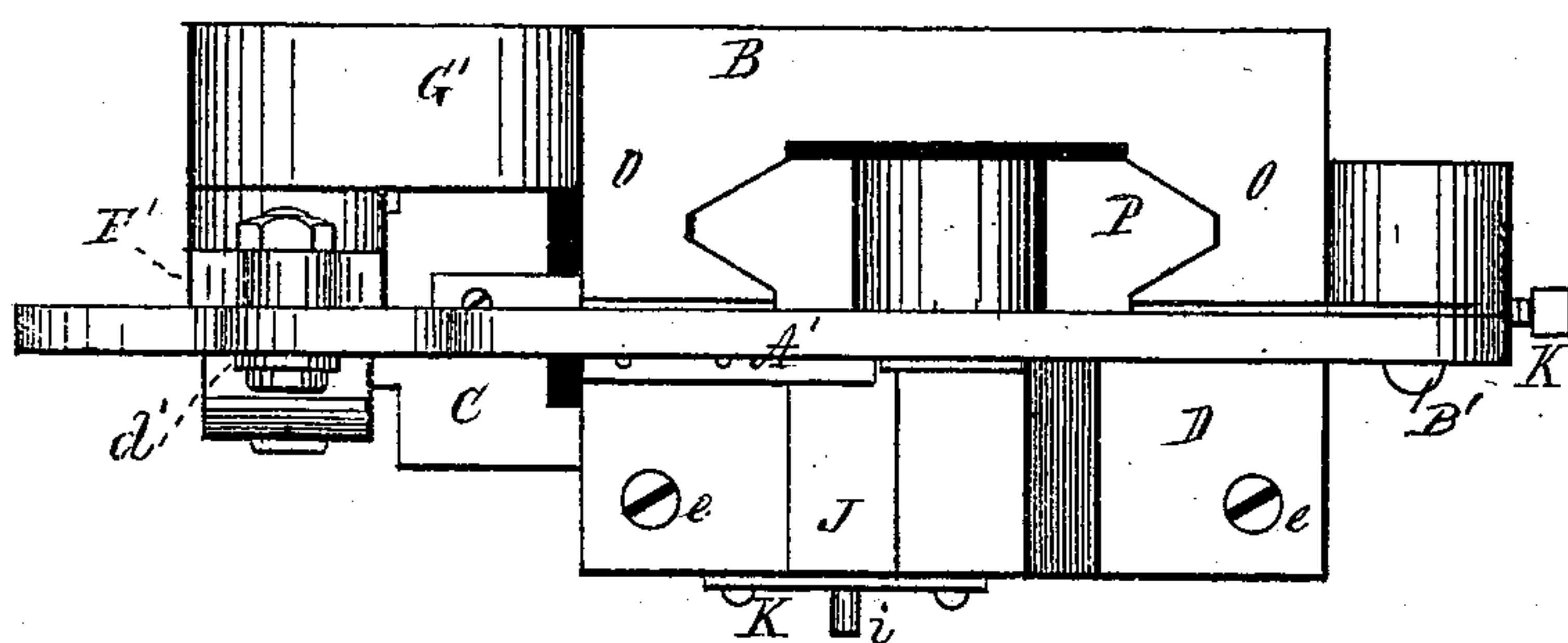


Fig 4

Witnesses.
J. H. Burridge,
R. E. Farnham.

Inventor:
Charles Richards.
Per W. H. Burridge
Atty

(Model.)

2 Sheets—Sheet 2.

C. RICHARDS.

NUT MACHINE.

No. 250,756.

Patented Dec. 13, 1881.

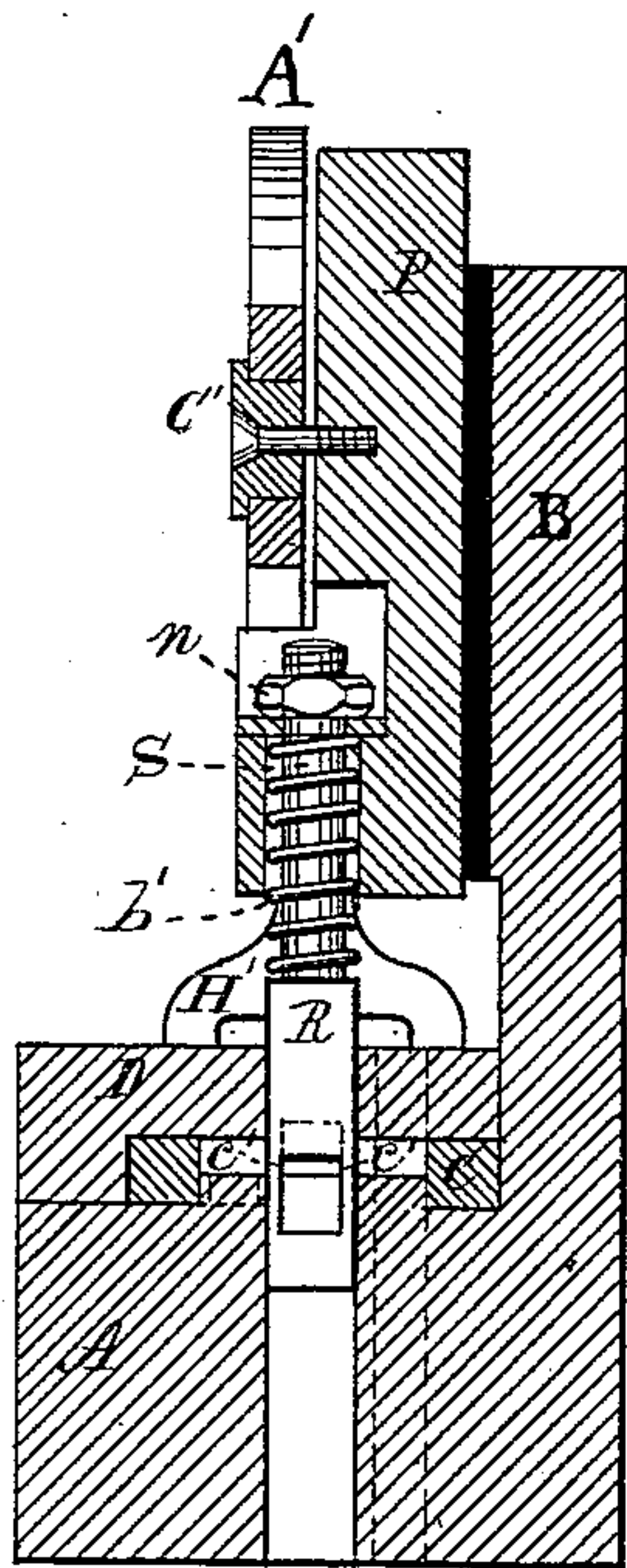


Fig 5

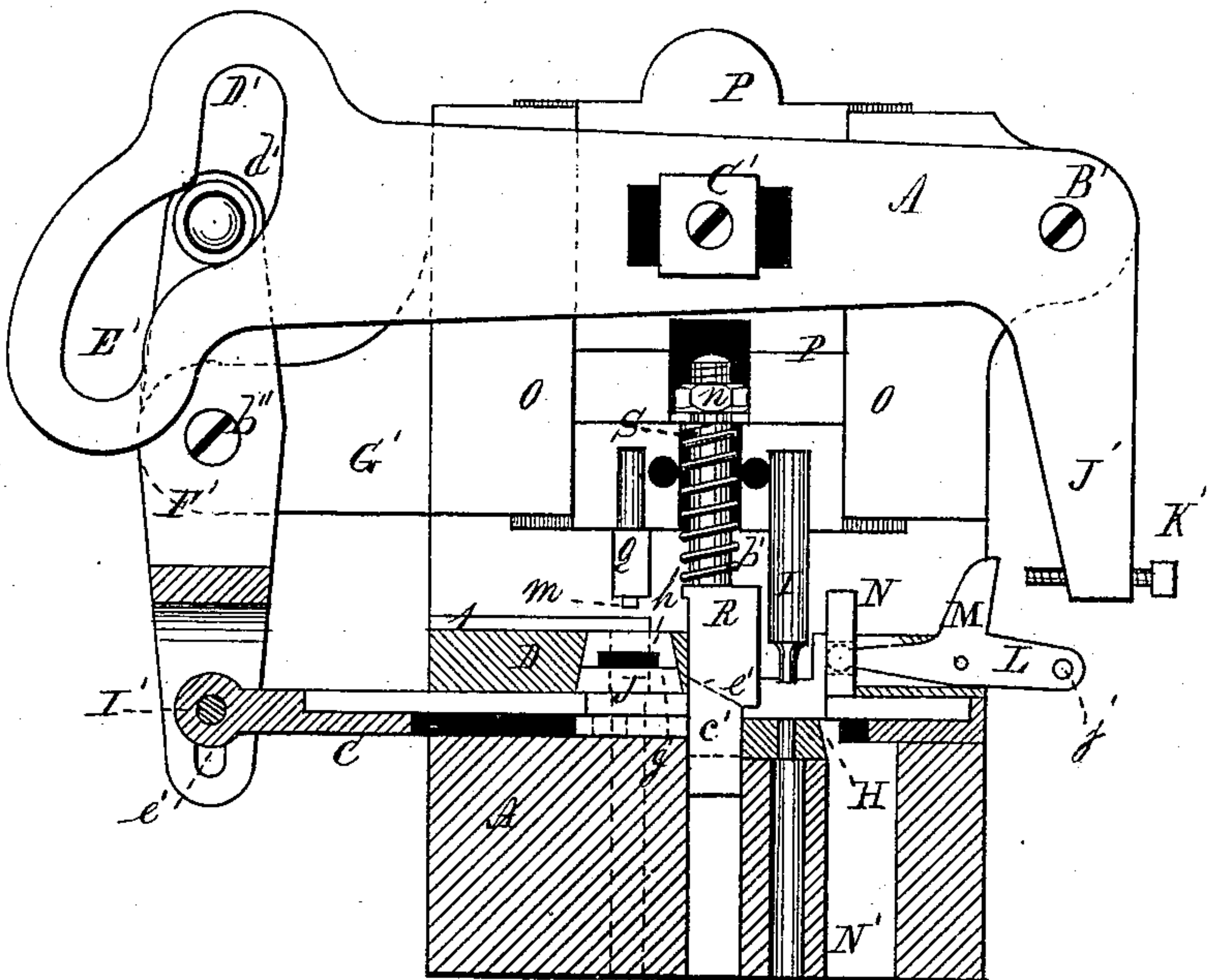


Fig 6

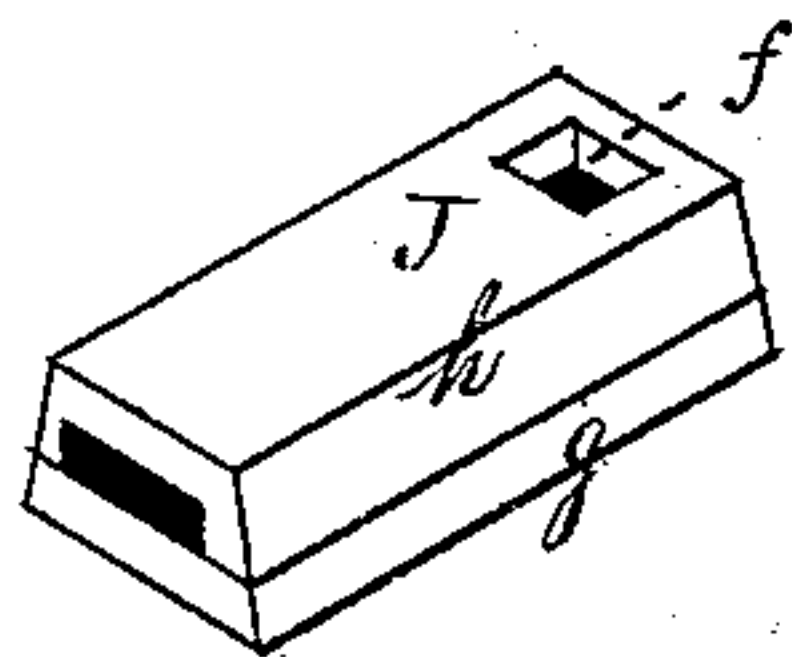


Fig 8

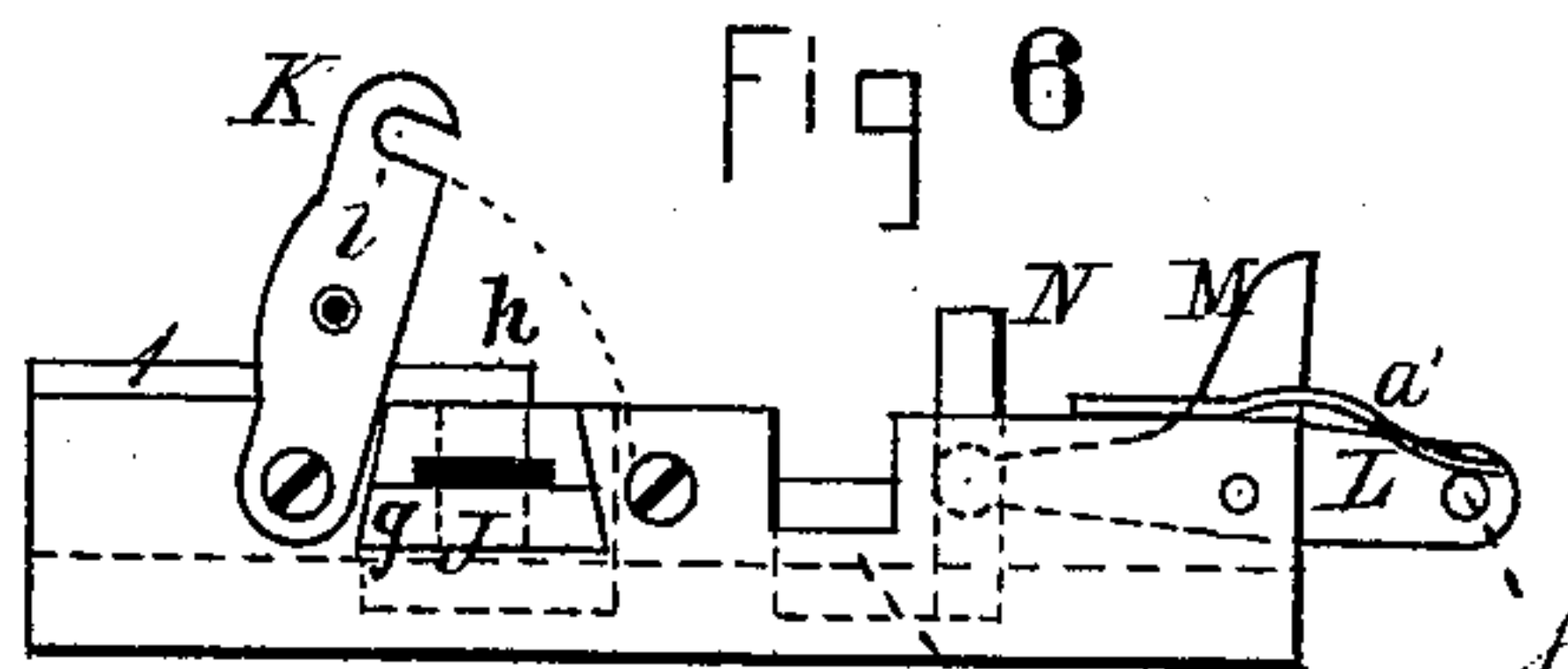


Fig 7

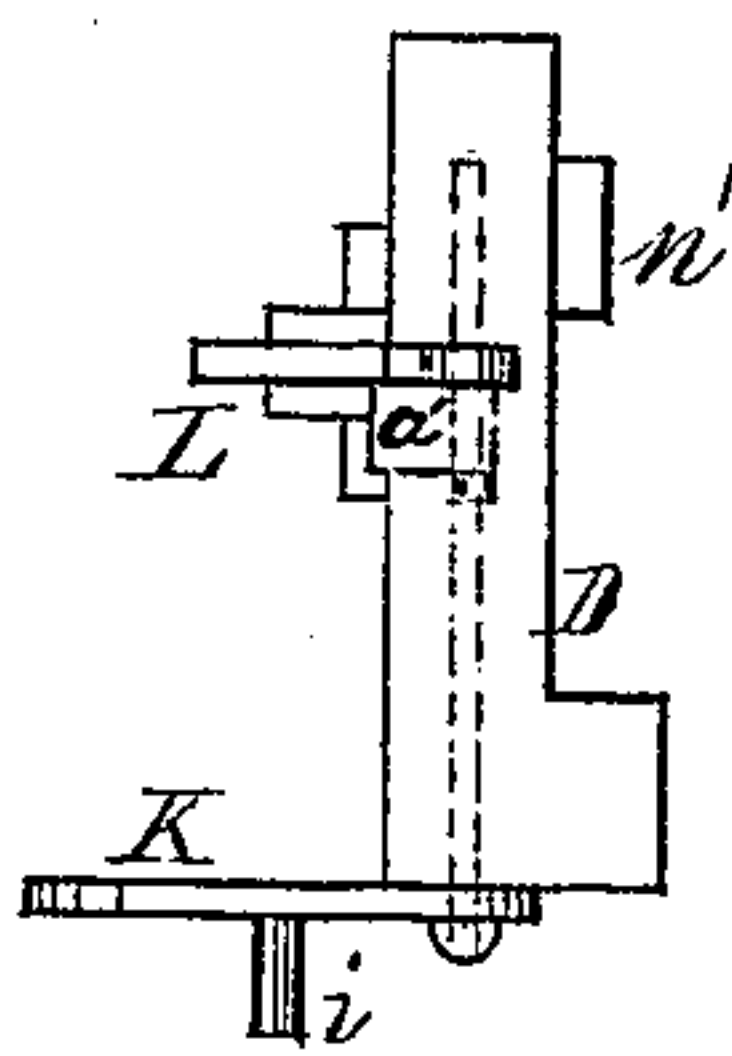


Fig 9

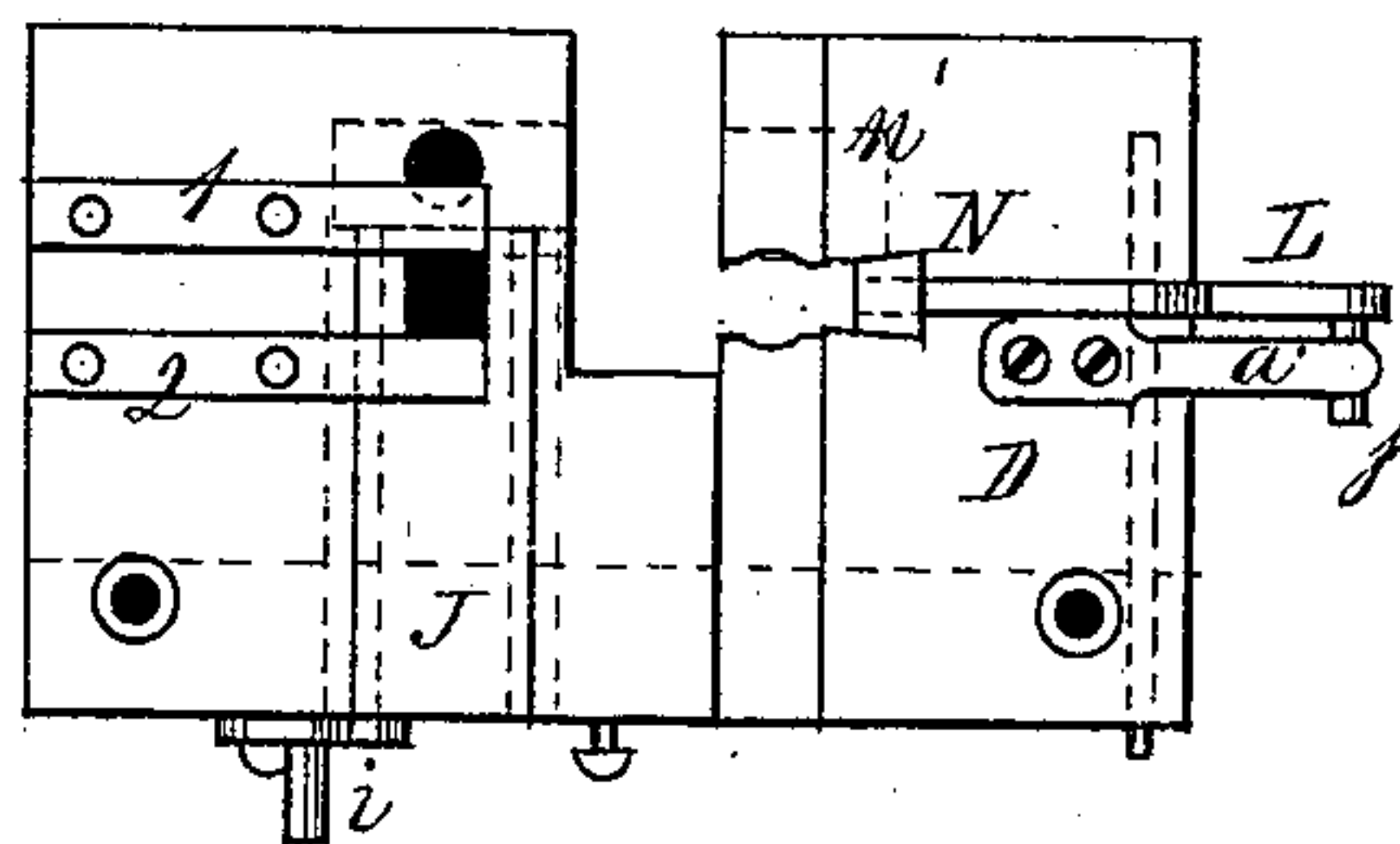


Fig 10

Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES RICHARDS, OF CLEVELAND, OHIO.

NUT-MACHINE.

SPECIFICATION forming part of Letters Patent No. 250,756, dated December 13, 1881.

Application filed June 28, 1881. (Model.)

To all whom it may concern:

Be it known that I, CHARLES RICHARDS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Nut-Machine; and I do hereby declare that the following is a full, clear, and complete description thereof.

The nature of this invention relates to a machine for the manufacture of nuts, said machine being used consecutively and supplementary in relation to a punching-machine, which machine punches a hot bar of iron, at the same time marking the dividing-lines on the bar for the nuts, and also forming a crown thereon.

The purpose of the invention above alluded to is to cut the nuts or blanks from the punched bar when cold, and to clear the scale from the hole in the nut-blank, thereby producing a nut-blank as free from scale as is a cold-punched one.

A detailed description of the construction and operation of the machine is set forth in the following specification and illustrated by the accompanying drawings, making a part of the same, in which—

Figure 1 represents an end elevation of the machine. Fig. 2 is a side elevation. Fig. 3 is a plan view, partially in section. Fig. 4 is a plan view. Fig. 5 is a transverse vertical section. Fig. 6 is a front elevation, partially in section. Figs. 7, 8, 9, and 10 are detached sections.

Like letters of reference refer to like parts in the several views.

As shown in the drawings, A represents the bed of the machine, which may be of the shape shown, or of other suitable form.

B is the back of the machine, to which certain devices hereinafter described are secured. On the block A alluded to is fitted a slide, C, Figs. 3 and 5. Said slide is held in place and slides under the face-plate D, the outer under edge of which is a shoulder, as seen at *a*, Fig. 1, which, together with the side of the back B, form the guides for the movement of the slide C. Said slide, as will be seen in Fig. 3, is an open oblong frame, in one end of which is secured a finger, E, and in the opposite end a corresponding but somewhat shorter finger, F.

The purpose of the fingers will presently be shown.

On the face or top of the block A, and within the slide or frame C, is pivoted at *b* one end of a clamp, G, Fig. 3. It will be observed in said figure that the free end *c* of the clamp is narrower than the pivoted end, caused by the outer side of the clamp being made to slant inward from about half its length, and that the inner edge, *d*, of the slide is made to conform to the slant or incline of the clamp, so that the slant of the clamp and that of the slide form two inclined planes, bearing one upon the other, substantially as seen in said Fig. 3. Future reference will be made to this part of the machine. In the face of the said block A is fixed a die, H, arranged in relation to and adapted to receive the punch I, as shown in Fig. 6. The face-plate D, above referred to, is secured to the block A by screw-bolts *e*, Fig. 4. In the face of said plate is removably fitted a die, J, Figs. 4 and 6. A detached view of the die is shown in Fig. 8, in which it will be seen that the die is hollow from the outer end to the eye *f*. Said die is dovetailed into the face-plate, and prevented from coming out by a button, K, Fig. 7. Projecting from the side of the button is a tube, *i*, in communication with the hollow die, the purpose of which will hereinafter be shown.

The die J above alluded to consists of two sections, *h* and *g*, Figs. 8 and 6. The opening *f* of the die in the upper section is just of a size to admit the passage of a nut-blank, whereas the opening of the die in the lower section, *g*, is a trifle smaller, so that a blank, on being pressed into and through it, will have its sides smoothly shaved off by the edges of the die. From the above it will be seen that the die J is a compound one—that is to say, one superimposed upon the other—the lower one, or the opening therein, being a little less in size than the upper one, and that the two sections, when placed together, are hollow, forming a hollow compound die.

In the end of face-plate D is pivoted a lever, L, Fig. 6, in the outer end of which is a pin, *j*, on which impinges the free end of a spring, *a'*, the opposite end being secured to the face-plate. Projecting upward from the lever is a finger, M, whereby the lever is actuated, as will

presently be shown. The inner end of the lever is loosely jointed to a vertical slide, N, dovetailed in the face-plate.

In the ways O O of the back B is fitted a slide, P, Figs. 2 and 5. At one side, in the lower end of the slide, is secured a square punching-cutter, Q, Figs. 2 and 6. The square of said cutter is of the size of a nut to be cut from a punched bar, and is adapted to fit in the square eye *f* of the die J, above described, and which is arranged in relation thereto as shown in Fig. 6. The end of said punching-cutter is furnished with a point, *m*, adapted to fit in the hole of the nut or blank to be cut from the punched bar.

R, Figs. 5 and 6, is a block secured by a stem, S, loosely in the end of the slide, so that it may move vertically therein. A nut, *n*, prevents the stem from dropping from the slide, and the spring *b'*, coiled around the stem, holds the block down in position for the end of the finger E, above alluded to, to pass through the open end of the block, between the sides *c'* of said opening. The punch I, above referred to, is also secured in the slide P, the point of the punch being arranged to enter the die H, as hereinbefore described.

The vertical slide P and the horizontal slide C are operated by the following devices. The lever A', pivoted at B' to the back of the machine, is connected to the slide P by a pivotal screw-bolt, C', and collar, Fig. 5. The free end of the lever is slotted, as shown in Figs. 2 and 6. The upper portion of the slot is straight and vertical, as seen at D', whereas the lower and major portion of the slot is curved, as seen at E'.

F' is a vibrating link pivoted to an arm, G', at *b''*. The upper end of the link is provided with a pin, on which is a roller, *d'*, adapted to work freely in the slot of the lever A'. The lower end of the link is bifurcated, as seen at H', Fig. 1. In said bifurcated end of the link is connected the end of the slide C, by a bolt, I', passing through slots *e'* in the bifurcated arms of the link. The opposite end of the lever A' is a dependent arm, J', in the end of which is a set-screw, K'.

The construction and arrangement of the machine having been described, the practical working of the same is as follows: A bar of iron of the proper thickness and width for a nut, is by another machine provided with punched holes at certain distances apart. At the same time a mark is made across the bar between the holes, indicating thereby the form of the nut. At the same time the face of the bar between the said lines is made crowning by the peculiar shape of the punch, which at one operation punches the holes, marks the dividing-lines between the holes, and by compression crowns the nut, or, more properly, the nut-blank. The end of such a prepared bar, when cold, is inserted between the guides 1 and 2, Fig. 10, and pushed forward under the cutter Q, Figs. 2 and 6. The slide P, carrying the

said cutter, is given a reciprocating vertical movement by a power suitably connected to the upper end of the said slide. As the cutter Q descends the point *m* enters a hole in the bar of the nut-blanks, which centers the blank under the cutter. As the cutter moves downward it cuts the blank from the bar and pushes it down into the die *f*. The cutter being lifted the bar is again pushed forward and a second blank is cut off. This second blank, being above the first one cut off, pushes the first one through the bottom of the die *f*. At this instant in the movement of the machine the slide C moves forward and the finger E pushes the blank from under the die, through the block R, and under the punch I. The end of the punch is a trifle larger than the hole in the nut-blank, so that on being forced down into the nut by the now downward movement of the slide P the punch cuts out the hard-scale lining of the hole in the blank, which is always present in a hot-punched nut, rendering such nuts objectionable, as the hard scale lining the hole soon dulls and wears out the tap used in cutting a thread therein. In repunching the hole, as above described, by the punch I, said scale is removed, leaving the hole as free of scale as a cold-punched nut.

To hold the nut securely in place, and to prevent it from spreading or bursting while the hole is being repunched, is the purpose of the block R, clamp G, and the vertical slide N, above referred to, the conjoint operation of which, for the purpose specified, is as follows: The nut or blank, when pushed from under the die *f*, through the block R, to and under the dressing-punch I, is prevented from being pushed past the punch by the slide N, which descends in time to retain it under the punch. This movement of the slide N for the purpose specified is effected by the set-screw K', which in the timely movement of the parts of the machine impinges upon the finger M, causing the slide N to move downward in time to check the nut from passing beyond the dressing-punch. As the dressing-punch descends the movement of the lever A' withdraws the set-screw from the finger, which allows the slide to move upward by the resiliency of the spring *a'*. While the slide N is moving upward the slide C, by virtue of the cam-slot in the end of the lever A' and the link connecting said lever with the slide, is moved back, brings the finger F against the side of the blank now under the punch I, and forces it against the block R. At the same time the slide, by virtue of the inclined edge *d* thereof, acting upon the inclined edge of the clamp G, forces said clamp against the side of the nut and crowds it against a lug, *n'*, Figs. 9 and 10, on the under side of face-plate D, thereby binding the nut firmly in place under the dressing-punch I, so that it can neither spread or become displaced while being dress-punched. During the time of the punching of the nut another blank is being cut from the bar by the cutter Q, and the one below it is

pushed from under the die *f* by the finger E upon the next forward movement of the slide C, actuated by the cam-slot. The nut or blank now pushed forward by the finger E pushes the hole-dressed nut from under the punch I over the opening N', Fig. 6, through which it falls to the floor under the machine. In the event the nut or blank should lodge in the opening the slide N, in its descent to check the nut from passing beyond the punch, as above said, will force the nut from its lodgement in the opening N'.

From the above it will be observed that the cutting off of one blank from the bar and re-punching another previously cut off is performed at the same time in the general movement of the machine, and that the pushing forward of the blank from the cutter to the dressing-punch is done while the cutter and punch are being moved upward, and that the clamping of the nut under the punch by the devices described is done during the moving back of the slide C, and released in time to be displaced from under the punch by the finger E.

The power for operating the machine, as above said, is applied directly to the upper end of the slide P by any suitable means.

It will be observed in the operation of the machine that the block R is raised by the slide P while the cutter and punch are lifted, and that it is carried down by its own weight and by the slide pressing upon the spring S until the shoulder *e'*, Fig. 6, of the block strikes upon the die H, which prevents it from moving farther downward. While the cutter and punch continue to move down the block is loose in the slide, and therefore the slide moves over the stem while the block is at rest. The object of the spring is simply to give tension to the stem of the block, that it may not move too freely. The block can be actuated by a cam arranged below it, instead of its being operated by the slide, and it is not essential that the block should be made with a passage through it for the nut to go through, as that part of the block comprising the passage-way may be cut off and the nut pass under the end of the block. The present way, however, is preferred. The sides

of the nuts are shaved off by the sharp edges of the die *f* as they pass down through to the under side. The trimmings shaved from the sides of the blank are washed out from the die, which is kept cool and lubricated by a stream of water passed through the tube *i*, above alluded to.

The machine may be used without having a bar previously punched, marked, and crowned, as above mentioned. An unpunched bar may be fed to the machine and a piece cut off and pushed forward to the punch for punching in the same way as were the punched blanks from a prepared bar.

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

1. The combination of the lever L, having a projecting finger, M, and spring *a'*, the lever A', with an adjustable screw, K', the slide N, and slide C with its finger F, operated by the lever A', and the block R, substantially as and for the purpose described.

2. The combination of the vertical slide N, horizontal slide C, having a finger, E, the operative lever L, and screw K' of lever A', substantially as and for the purpose described.

3. The combination of the punch I, block R, the lug *n'*, slide having finger F, and clamp G, operated by the slide C, substantially as and for the purpose described.

4. The combination of the block R, attached to the slide P, provided with a spring around its stem and retaining-nut *n*, the cutter Q, carried by slide P, at one side of the block R, and the punch I, at the opposite side of said block, and the slide C, having the fingers E F, all arranged substantially as and for the purpose described.

5. In a nut-machine, the block R, loosely secured by a stem in the end of the slide, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES RICHARDS.

Witnesses :

F. X. BYERLY,
J. H. BURRIDGE.