

No. 638,256.

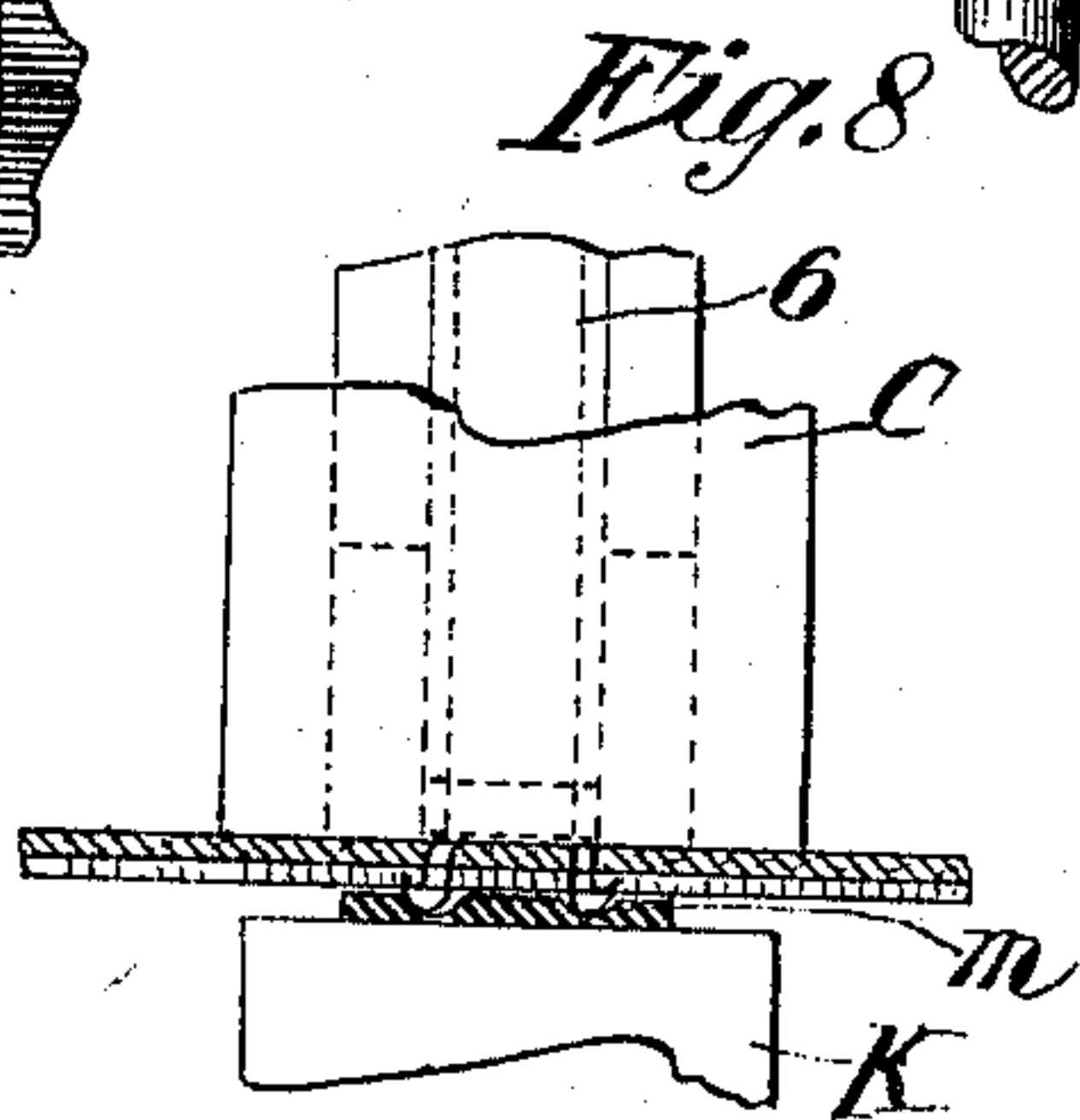
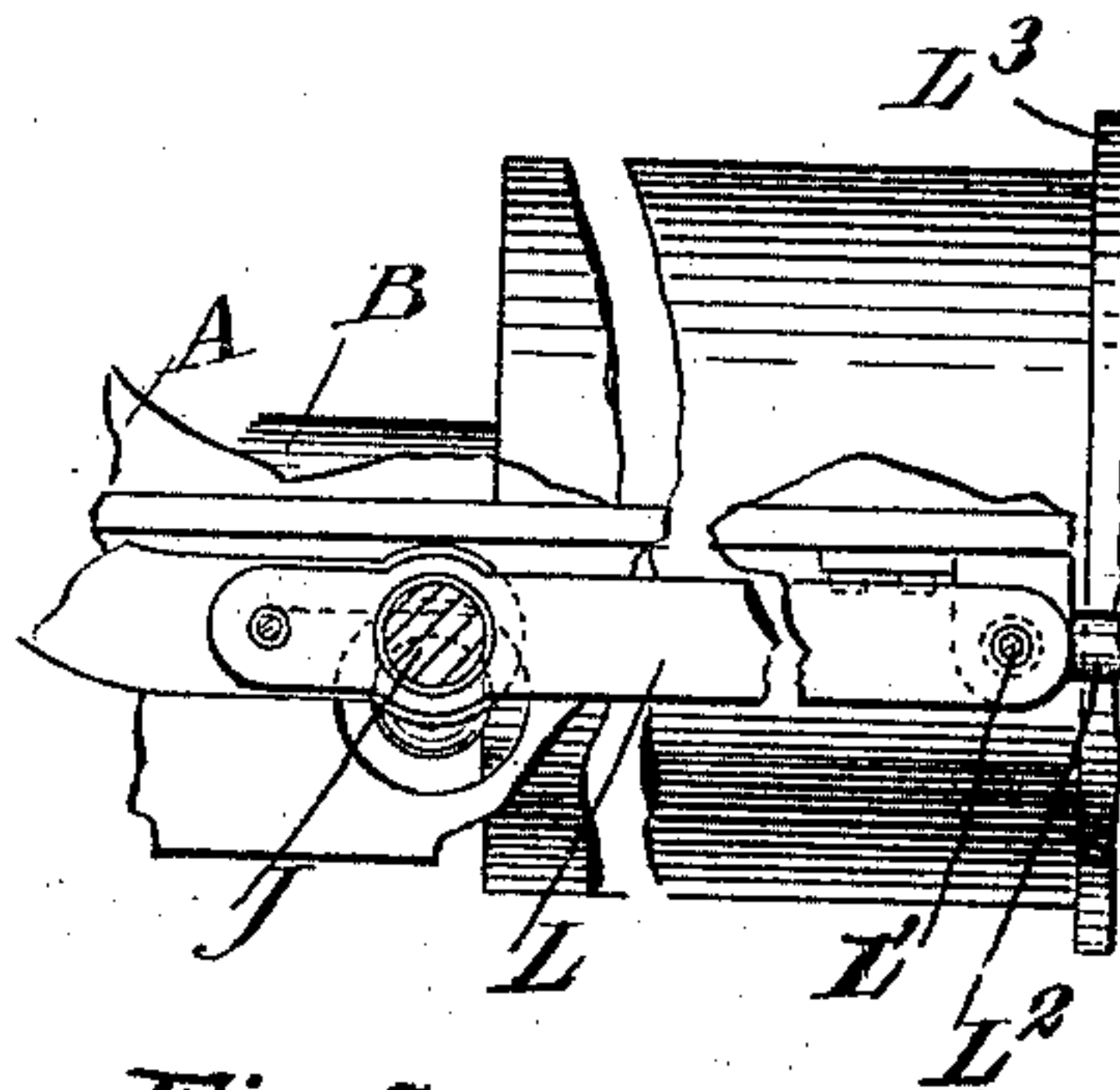
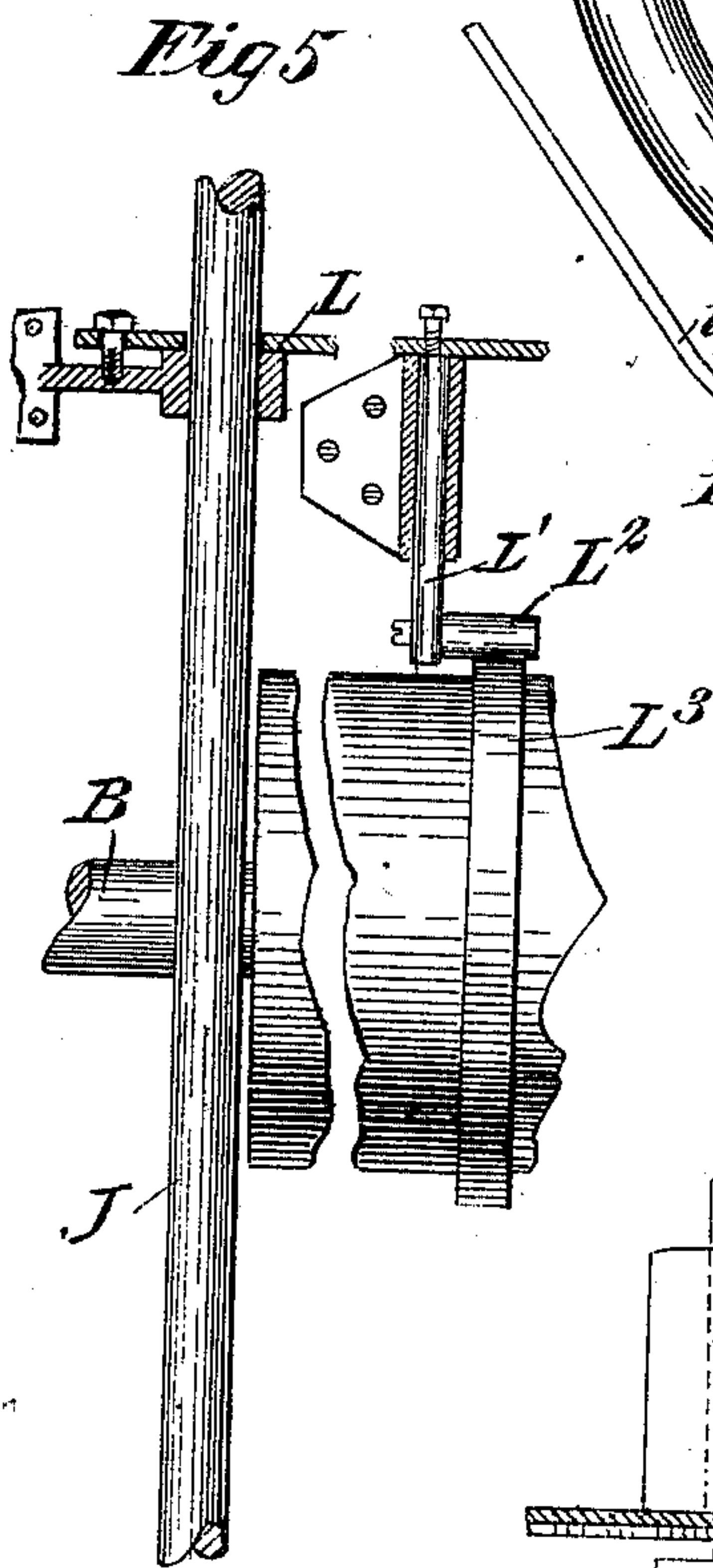
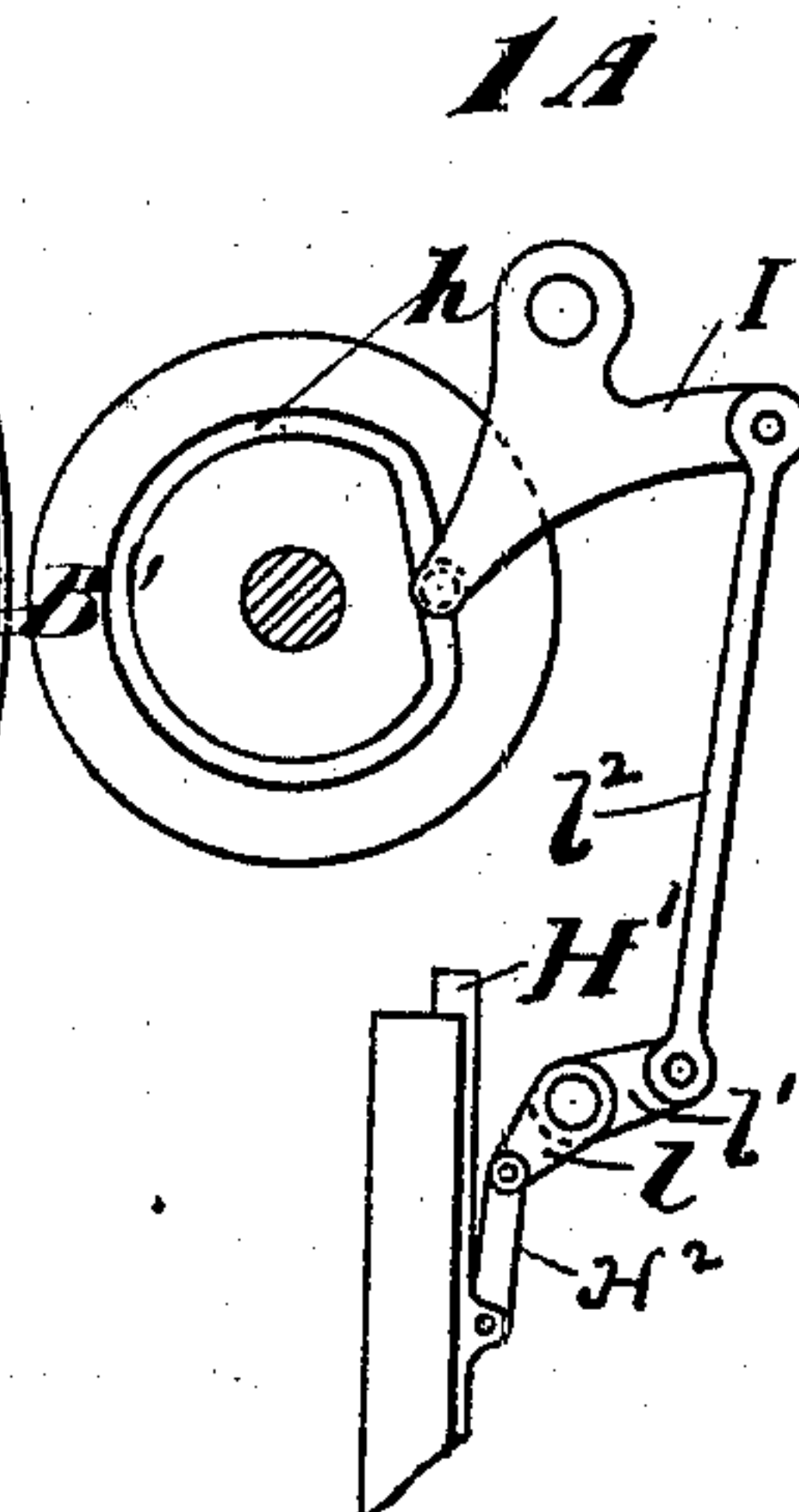
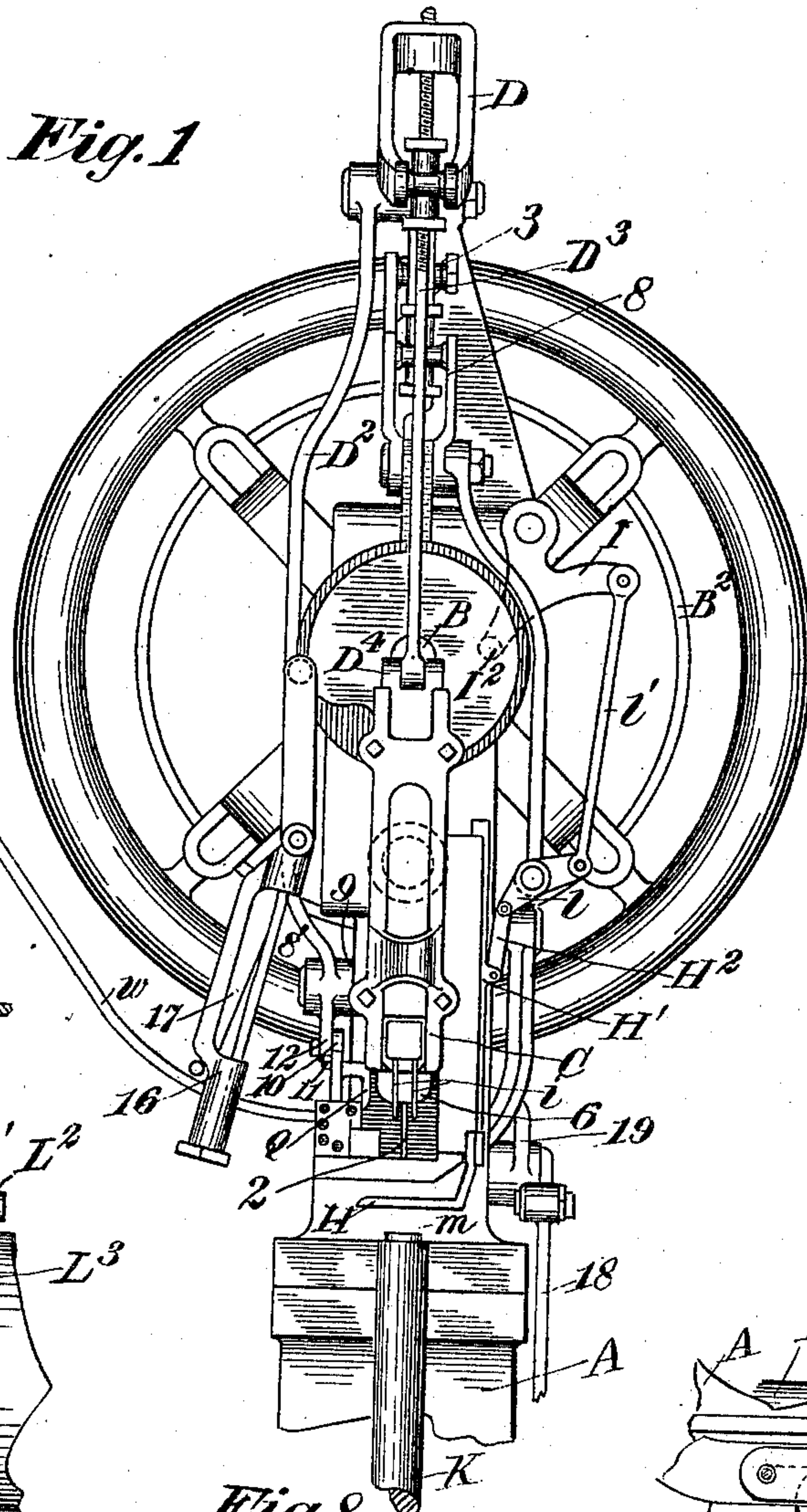
Patented Dec. 5, 1899.

L. L. MILLER.
STAPLING MACHINE.

(Application filed Mar. 29, 1897.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:
Geo. B. Rowley,
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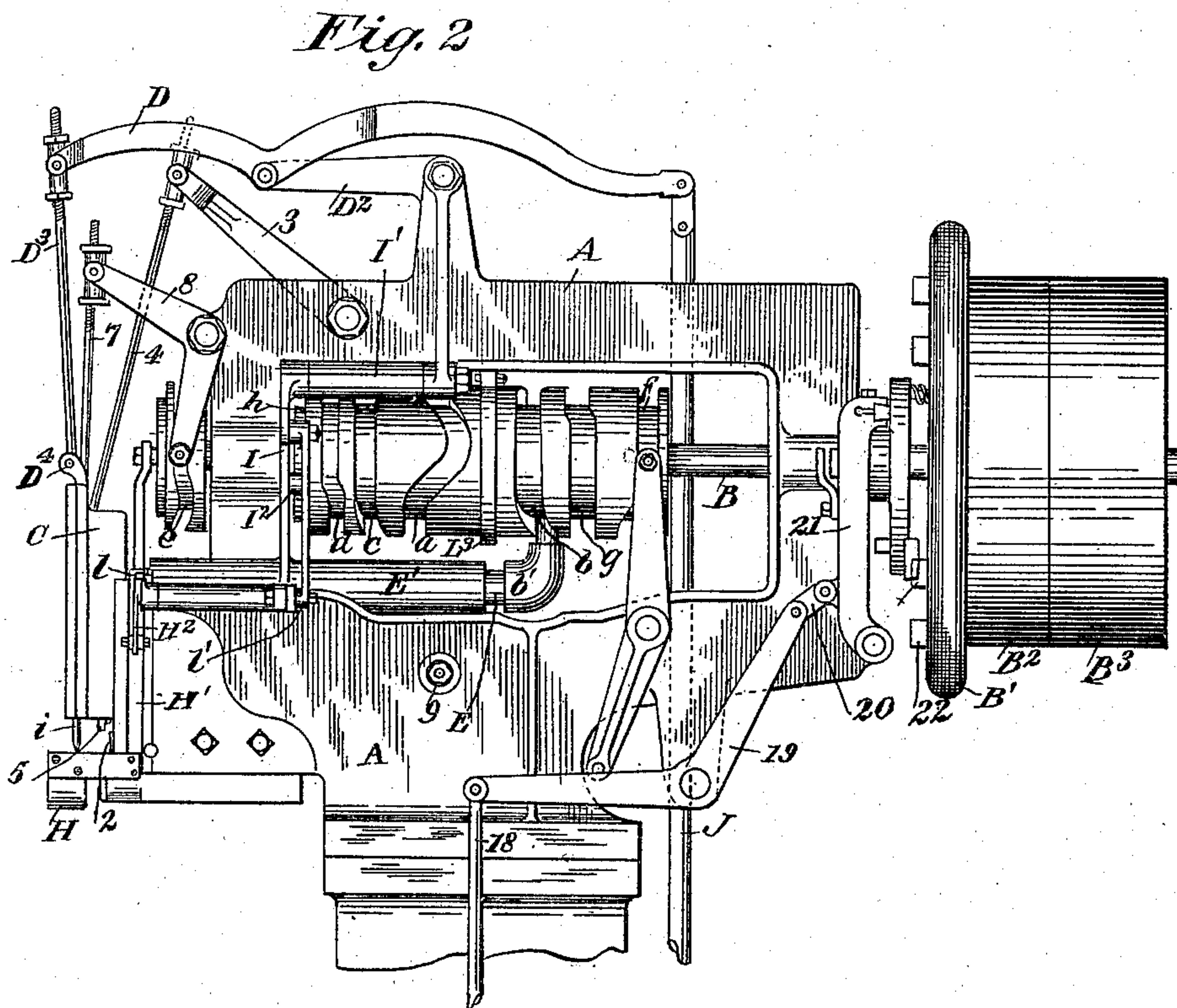
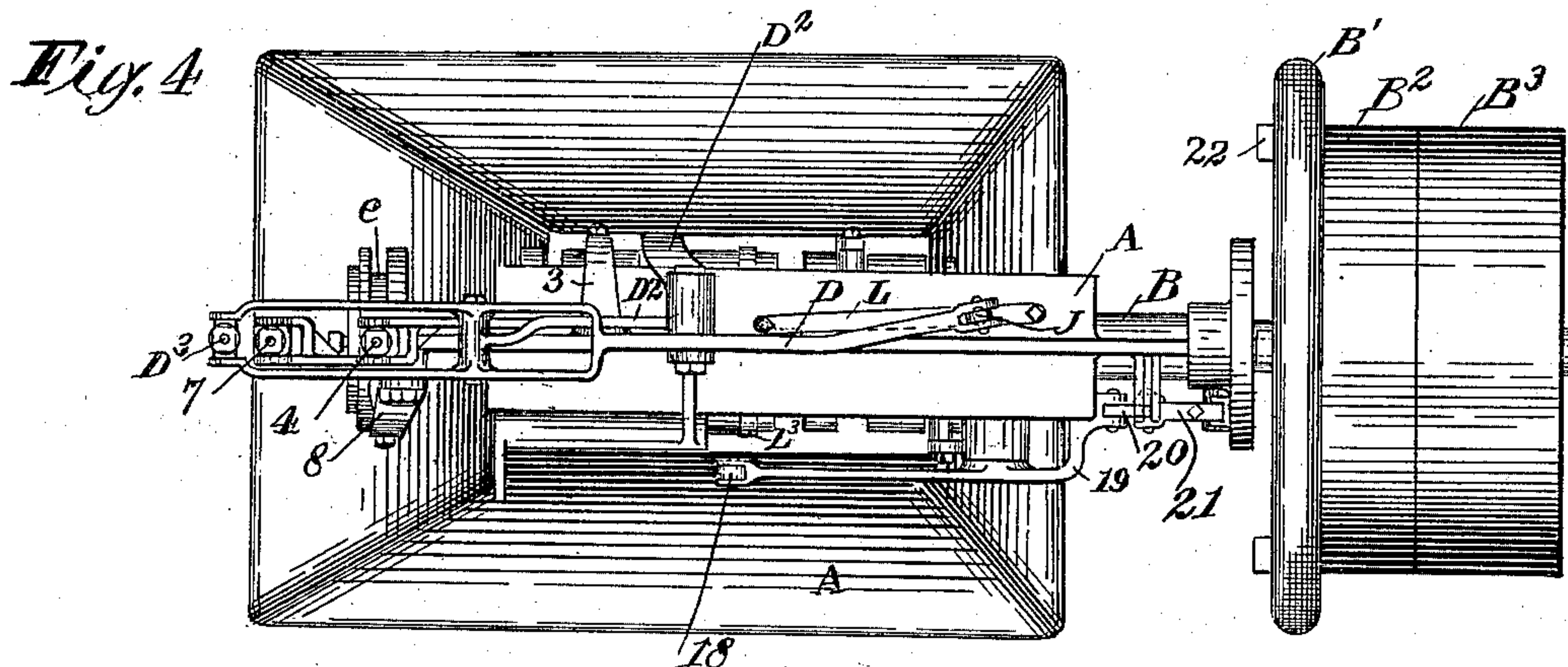
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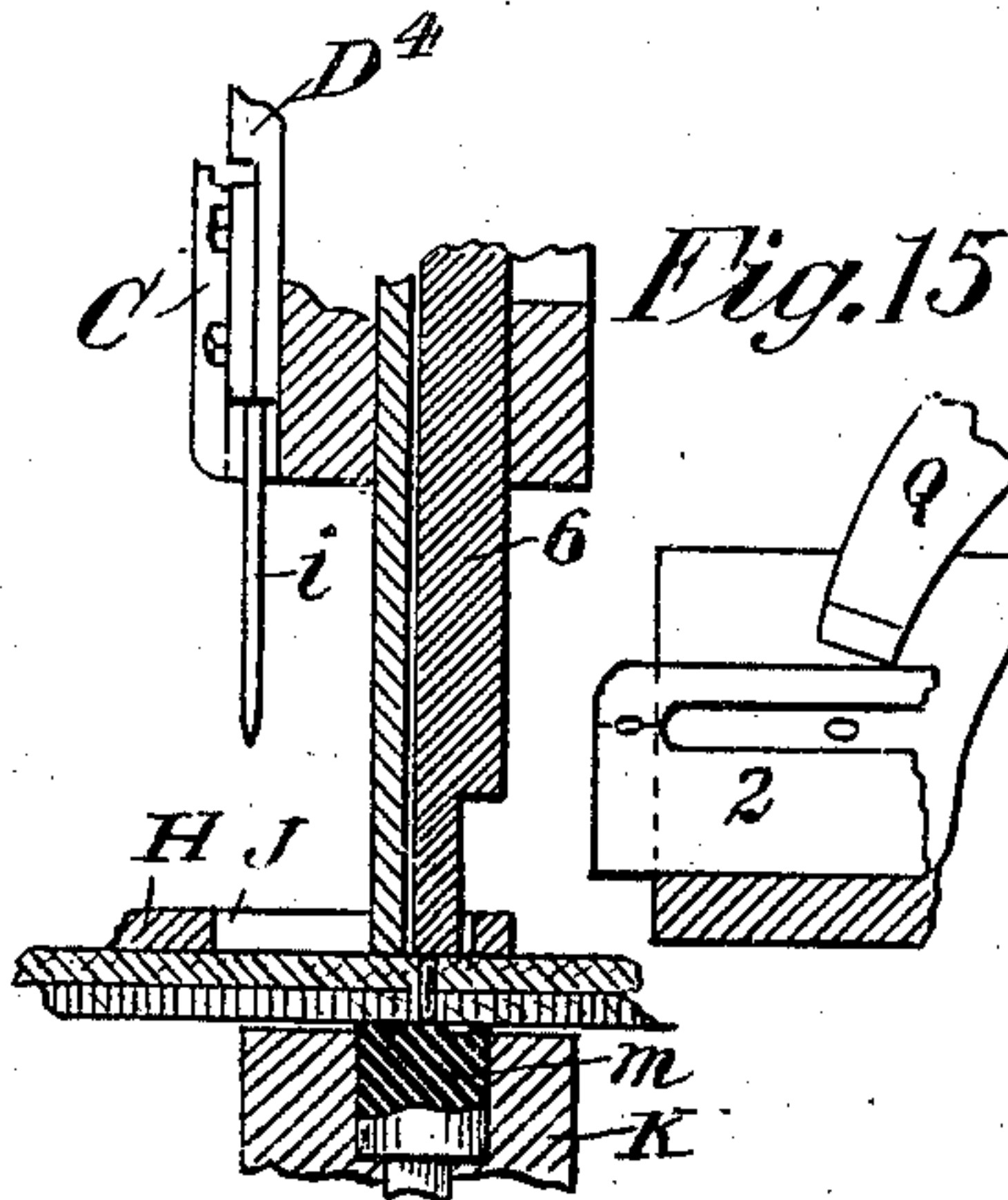
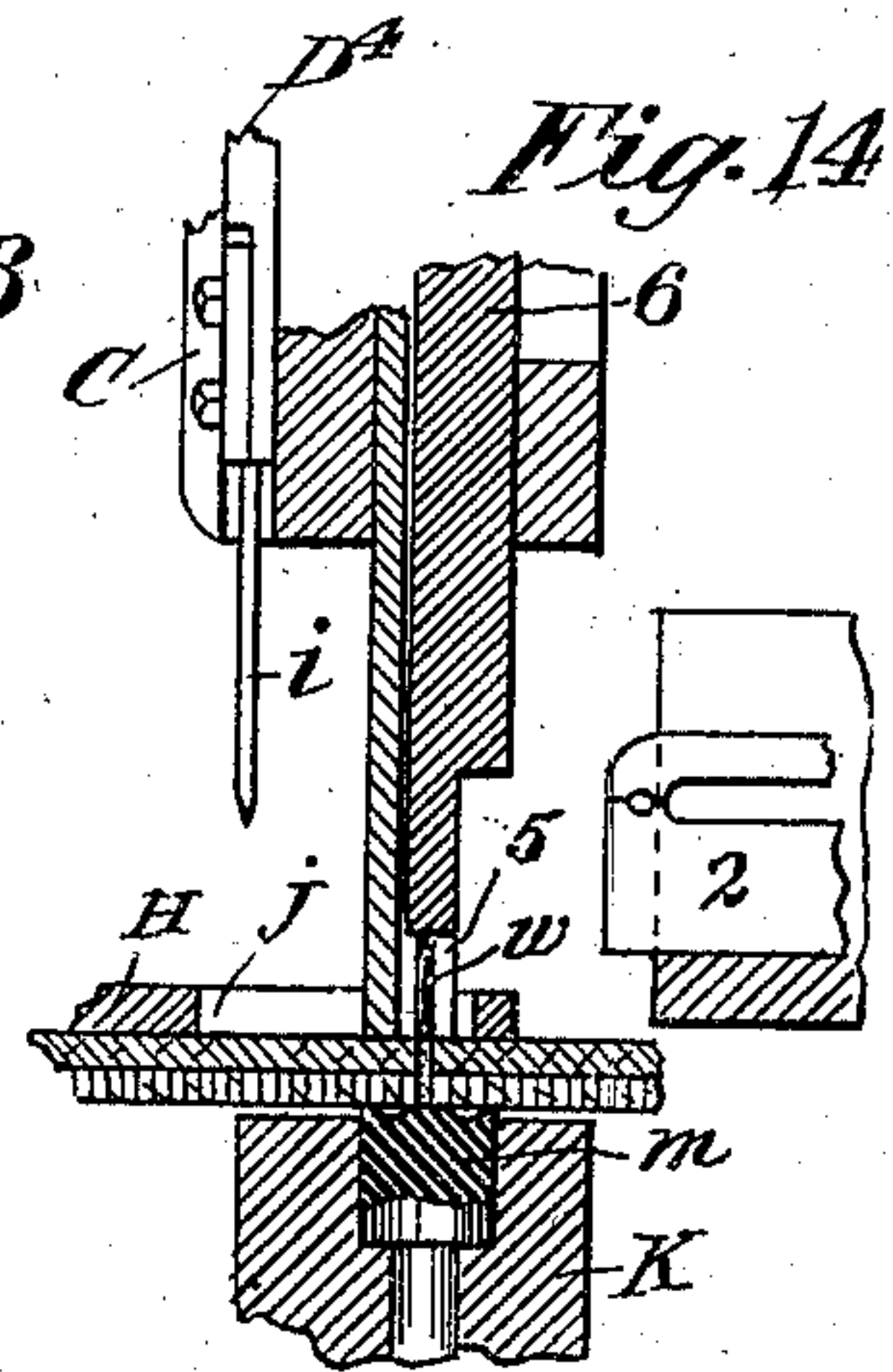
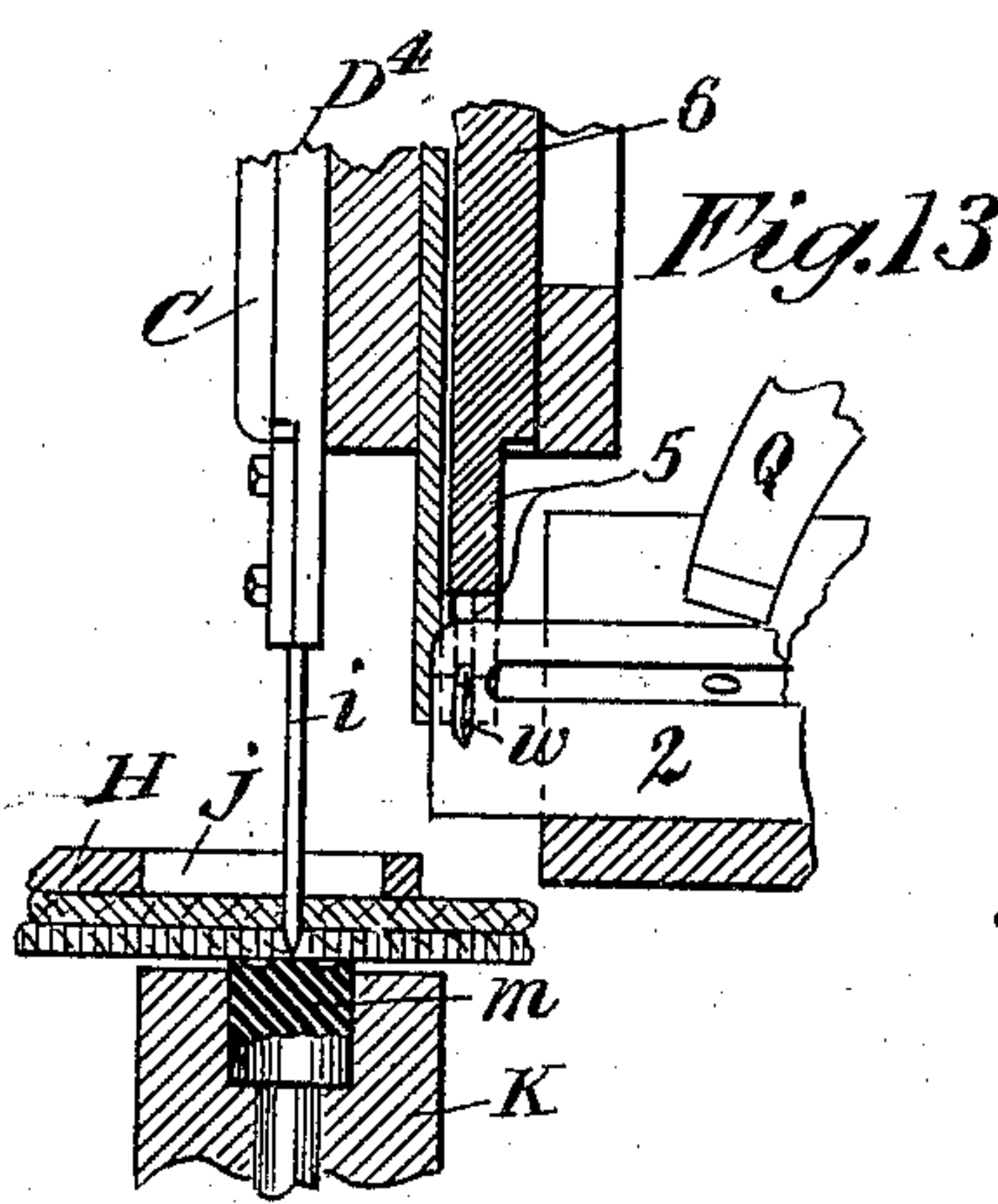
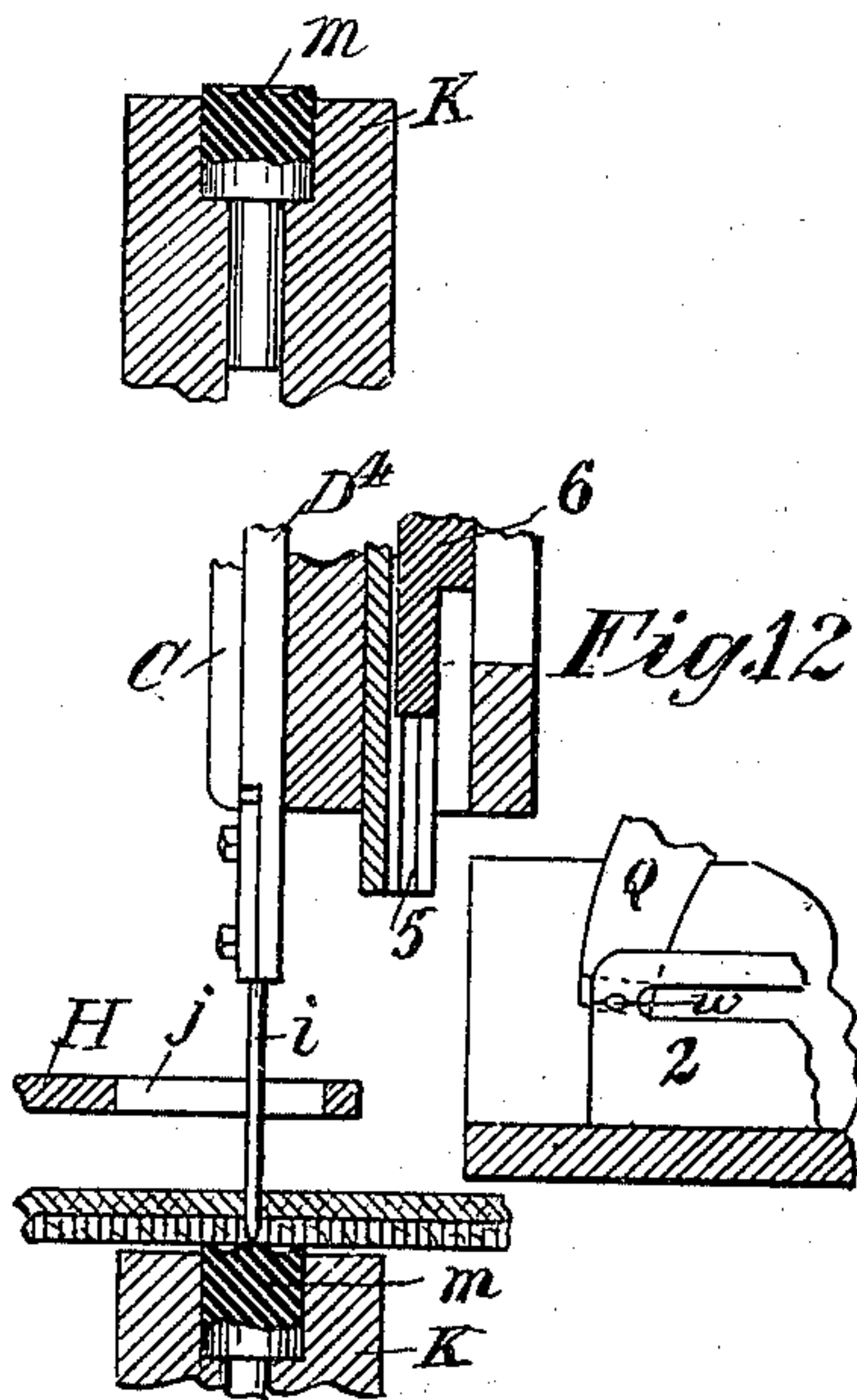
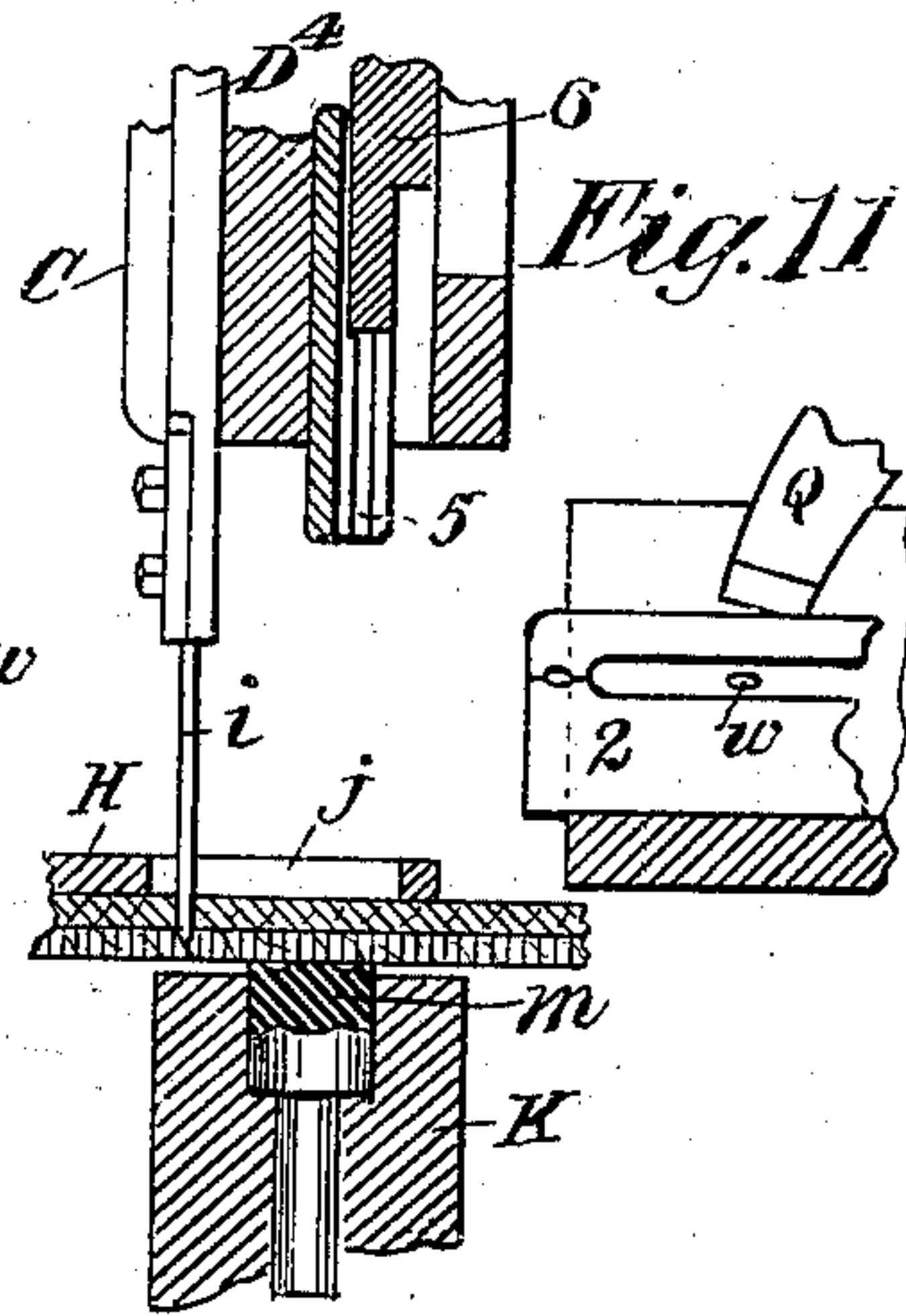
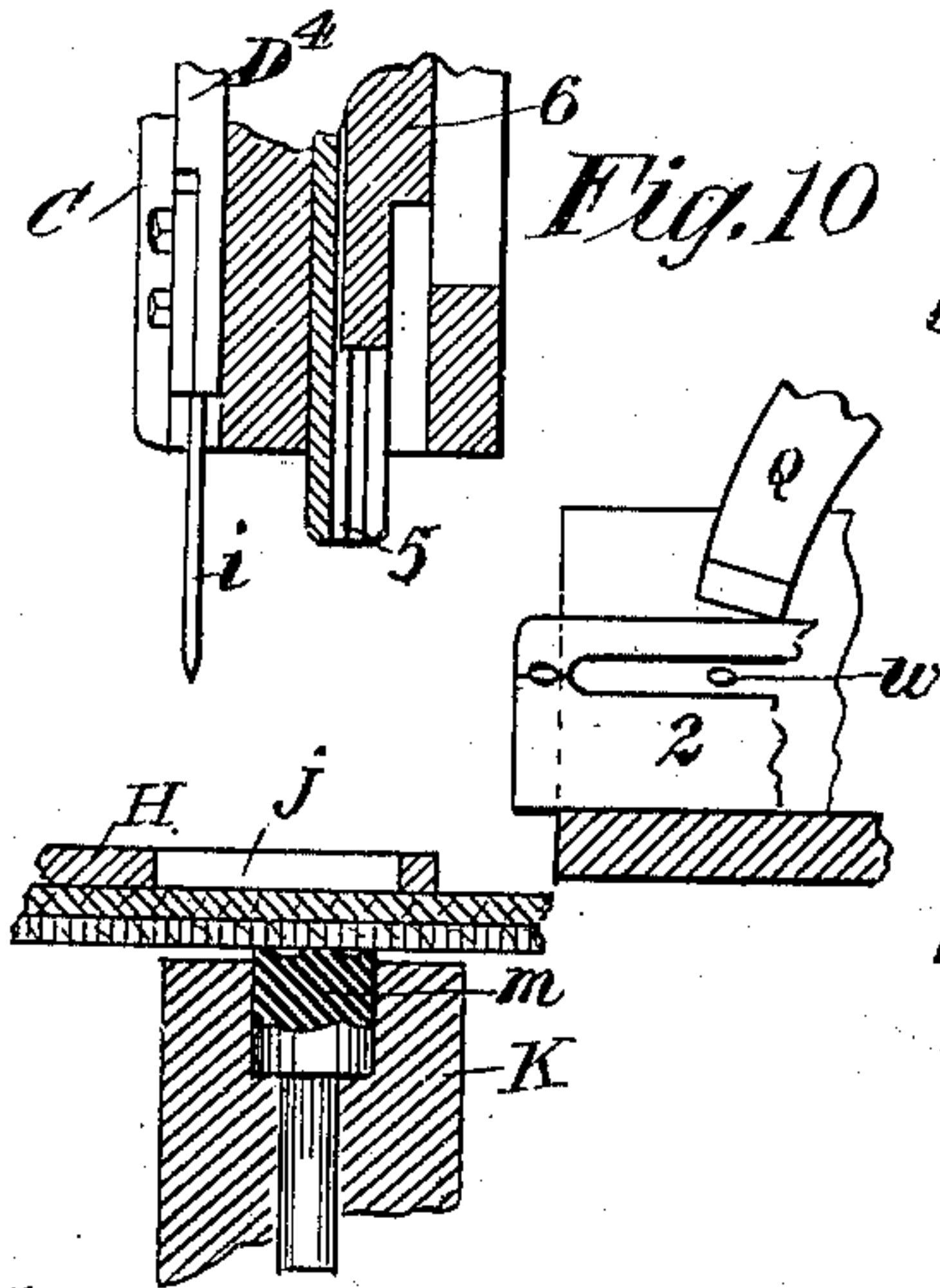
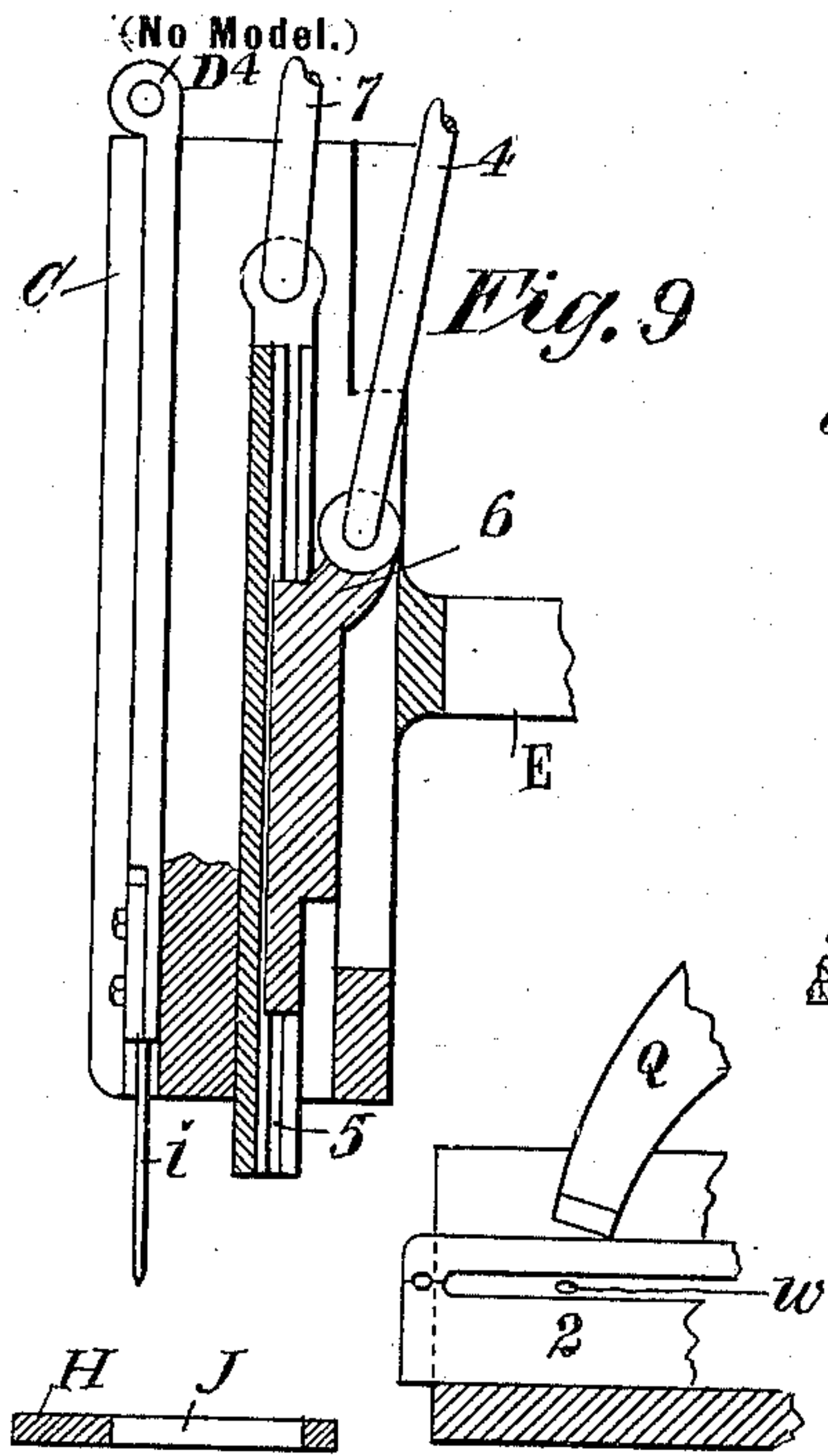
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4 Sheets—Sheet 4.



WITNESSES:
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UNITED STATES PATENT OFFICE.

LOUIS L. MILLER, OF NEWPORT, KENTUCKY.

STAPLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 638,256, dated December 5, 1899.

Application filed March 29, 1897. Serial No. 629,848. (No model.)

To all whom it may concern:

Be it known that I, LOUIS L. MILLER, residing at Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Stapling-Machines, of which the following is a specification.

Figure 1 is a front elevation of my machine. Fig. 2 is a side elevation of the top portion thereof looking from the right of Fig. 1. Fig. 3 is a side elevation looking from the left of Fig. 1. Fig. 4 is a plan view of the machine. Fig. 5 is an elevation showing the locking mechanism for the anvil-bar and its operating device. Fig. 6 is a plan view of the same. Fig. 7 is a detached view of the presser-foot. Fig. 8 is a front elevation of a detail of the stapling mechanism, showing the staple-driver. Figs. 9 to 15, inclusive, are diagrammatic views showing the position of the staple-driver, awls, presser-foot, anvil-bar, and staple-forming mechanism at various points in the operation.

A is the base of the machine. Supported by the framework is a horizontal shaft B, having fast and loose pulleys B² and B³ and a clutch B' of any ordinary or desired type. Pivoted to the base is a treadle-lever K', to one end of which is attached the anvil-bar K, which is properly guided and supported, as shown. This anvil-bar K carries the anvil-piece m. In the drawings this anvil-piece m is shown as extending above the end of the anvil-bar K for the purposes of illustration; but in actual use it would come flush with the end of said bar. The other end of the lever is pivotally attached to the rod J. Surrounding said rod so as to normally elevate the anvil-bar are springs K² and K³. This rod runs through guides on the frame, as shown, and at the upper end is pivotally attached to the lever D, which operates the bar carrying the awls, as will be more fully described.

Mounted on the shaft B are a series of cams for operating the various portions of the mechanism. Sliding in a bearing on the frame is a rod E, at the forward end of which is carried the head C, said head being preferably made in one piece with the sliding rod. This rod E has an upturned portion b', which carries an antifriction-roller which engages with

the cam-groove b, so that on the rotation of the cam the rod will be reciprocated, moving the head backward and forward. Carried by this head is an awl-bar D⁴, to the lower end of which are attached two awls i, as clearly shown. To the upper end of this awl-bar is pivoted a link D³, the upper end of the link being pivoted to the end of the lever D, as clearly shown. Carried also by the head C is a staple-forming die 5, which has pivoted to its upper end a link 7, the other end of the link being pivoted to the arm of a bell-crank 8, which bell-crank is operated by means of a pin thereon engaging in the cam-groove e. Carried also by said head is a staple-driver 6, which by means of a connecting-link similar to the others is operated by the bell-crank 3, said bell-crank being operated by means of a pin thereon engaging in the cam-groove c. The lever D is operated by means of a bell-crank D², said bell-crank being operated by means of a pin thereon engaging in the cam-groove a.

The general type of this machine is old, and the arrangement of cams and cam-levers is the same as that shown in the patent to Moore, trustee of Cummings *et al.*, No. 493,910, dated March 21, 1893, to which I refer for a detailed description.

Mounted on one of the guides for the rod J is a clutch L. This clutch consists of a bar which has therein an orifice somewhat larger than the rod J, which passes through it. This bar is free to rise and fall and is operated by means of the foot L', which carries an antifriction-roller L², said friction-roller bearing on the surface of the cam L³, so that as this said cam revolves the clutch is raised positively and falls by its own weight when the smaller part of the cam-surface bears against the roller. As the bar is raised the rod binds against the sides of the orifice and is thus locked against movement until the bar descends. Carried by the frame of the machine also is a wire feeding and cutting device of any desired type. As shown it is of the same type as is described and illustrated in the patent above mentioned. Generally speaking, it consists of the wire-feeding arm 16 and the wire-regulating arm 17, a cutting-knife Q, and its operating devices, (represented at 9, 10, 11, 12, and 13.)

w represents the wire out of which the staples are formed.

Operated by the cam *g* is a lever shown, which operates in turn the wire-clamping device, of any well-known kind. As all this mechanism is old, as I do not claim the same, and as it is fully described in the patent referred to, a fuller description thereof is not deemed necessary.

Sliding in ways on the frame of the machine (see Fig. 2) is a sliding piece *H'*, at the lower end of which is attached the presser-foot *H*. This slide *H'* is connected by a link *H²* to the rocking arm 1. (See Figs. 2 and 1^a.) Attached to the shaft carrying said rocking arm 1 is a second rocking arm 1'. Attached to the rocking arm 1' is a link 1². The other end of said link is attached to one arm of the cam-lever *I*. This cam-lever is operated by means of a pin supported thereby moving in the cam-groove *h*, so that on the revolution of the cam the presser-foot will be caused to rise and fall, as will be more fully described. The general shape of the presser-foot is shown in Fig. 1, and the same is provided with a slot *j*, which permits the movements of the awls in feeding. (See Fig. 7.) 19 is a crank-arm which operates the clutch 21 for throwing the machine in and out of operation. This crank-arm is preferably operated by means of a treadle, the connecting-rod of the treadle being shown at 18.

The operation of the device is as follows: The anvil-supporting bar *K* is first moved down by means of the treadle and the work placed upon the anvil-bar, the parts then assuming the relative positions shown in Fig. 9. On releasing the treadle the anvil-bar is thrown up, pressing the work against the presser-foot *H*, and by means of the connections heretofore described will regulate the stroke of the awls, the parts then assuming the position shown in Fig. 10. This is an old feature well-known in the art. Further revolution of the shaft now causes the descent of the awl-carrying bar *D⁴*, causing the same to pierce the work, the parts being then in the position shown in Fig. 11. At this point the clutch *L* is operated, locking the anvil-bar in position. The presser-foot is then raised by its actuating mechanism. Locking the anvil-bar prevents the work from being lifted as the presser-foot rises. At the same time the cutter *Q* has come down to cut off a portion of the wire which has been fed in, the parts being then in the position shown in Fig. 12. The head *C* is now caused to move forward by the mechanism heretofore described, and as the awls are in the work it is fed forward a distance equal to the travel of said head. At the same time the wire-carrying device has moved and the staple-forming device 5 has formed the staple. When the head has made its full motion forward, the presser-foot is again brought down upon the work, the parts being then in the position shown in Fig. 13. The awl-carrying head is now caused

to rise and the head is moved back to its original position, thus bringing the staple carrier and driver over the perforation in the work. The staple-carrier is brought down upon the work, the parts being then in the position indicated in Fig. 14. The staple-driver 6 is now caused to make its downward stroke, driving and clenching the staple, the parts being then in the position shown in Fig. 15. As soon as the staple is driven the staple former and driver rise, the anvil-bar is unlocked, and this cycle of operations is again repeated.

It will be seen that the anvil-bar is locked until just before the awl-bar descends to pierce the work, when it is unlocked in order to allow adjustment of the stroke of the awls. When the awls have descended, the anvil-bar is automatically locked, so that as the presser-foot rises the work will not be pushed up, which is a very important feature in this class of work, as the material is very soft and pliant. It will be noted also that the operation of the presser-foot is positive in both directions and that the said presser-foot is always lowered to the same fixed point and held there firmly, forming a fixed support for the work, which is pressed up against it by the spring-pressed anvil-bar.

The sliding head having a reciprocating motion, said head carrying both the awls and the staple-driving mechanism and being reciprocated while the awls are in the work, thus producing an awl-feed in a right line, is an important part of my invention. It insures, among other things, that the staple will always be placed in the awl-holes, no matter what the wear of the operating parts of the machine may be. The feed is also a true one, as the position of the awls in the work while the same is being fed prevents said work from being twisted to one side or the other. This construction also enables me to do away with any separate or specially-constructed feed mechanism.

Another important feature of my invention is the positively-actuated presser-foot. This presser-foot is always brought down to the same fixed position and is held there except during the feed, thus affording a solid support for the work, which is pressed against it by the anvil-bar. During the feed-motion the presser-foot is positively raised, the anvil-bar being locked in position, thus insuring a free and perfect feed for the soft material which is being operated on.

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

1. In a stapling-machine, the combination of the reciprocating head and means for operating the same, a reciprocating awl-carrier having awls attached thereto, and a staple-driver, both carried by said head, the direction of reciprocation of said carrier and driver being at right angles to that of the head, the operating mechanism for said head being so timed as to move the same forward while the

awls are in their lowest position, substantially as described.

2. In a stapling-machine, the combination of a feeding device, stapling mechanism, a
5 spring-pressed anvil-bar, a positively-operated reciprocating presser-foot, and means whereby the anvil-bar is locked when the presser-foot is raised, substantially as described.

10 3. In a stapling-machine, the combination of a feeding device, a presser-foot, means for bringing said presser-foot down to and maintaining it in a fixed position, a spring-pressed anvil-bar, and means whereby said
15 anvil-bar is locked when the presser-foot is raised, substantially as described.

4. In a stapling-machine, the combination of the reciprocating head and means for operating the same, a reciprocating awl-carrier
20 having awls attached thereto, and a staple-driver, both carried by said head, the path of reciprocation of said driver and carrier being at right angles to that of the head, the operating mechanism for the head being so
25 timed as to move the same forward while the awls are in their lowest position, a presser-foot, means for positively operating the same, said presser-foot being slotted to permit the
30 motion of the awls in feeding the work, substantially as described.

5. In a stapling-machine, the combination of a reciprocating head, said head carrying awls and a staple-driver, means for moving said head forward when the awls are in their lowest position, a spring-pressed anvil-bar, a
35 presser-foot and means whereby the anvil-bar is locked when the presser-foot is raised, substantially as described.

6. In a stapling-machine, the combination of a reciprocating awl-carrying head, a yield-
40 ing anvil-supporting bar, a positively-operated presser-foot, means whereby said anvil-bar is automatically locked when the presser-foot is raised, and means for inserting the staples, substantially as described.

7. In a stapling-machine, the combination of piercing and staple-driving mechanism, a
45 presser-foot, means for bringing said presser-foot down to a certain fixed position, a yielding anvil-supporting bar adapted to press the
50 material against said presser-foot when in said fixed position, and means whereby said anvil-bar is locked when the presser-foot is raised, substantially as described.

In testimony whereof I have hereunto set
55 my hand.

LOUIS L. MILLER.

Witnesses:

W. R. WOOD,
OLIVER B. KAISER.