

No. 618,695.

Patented Jan. 31, 1899.

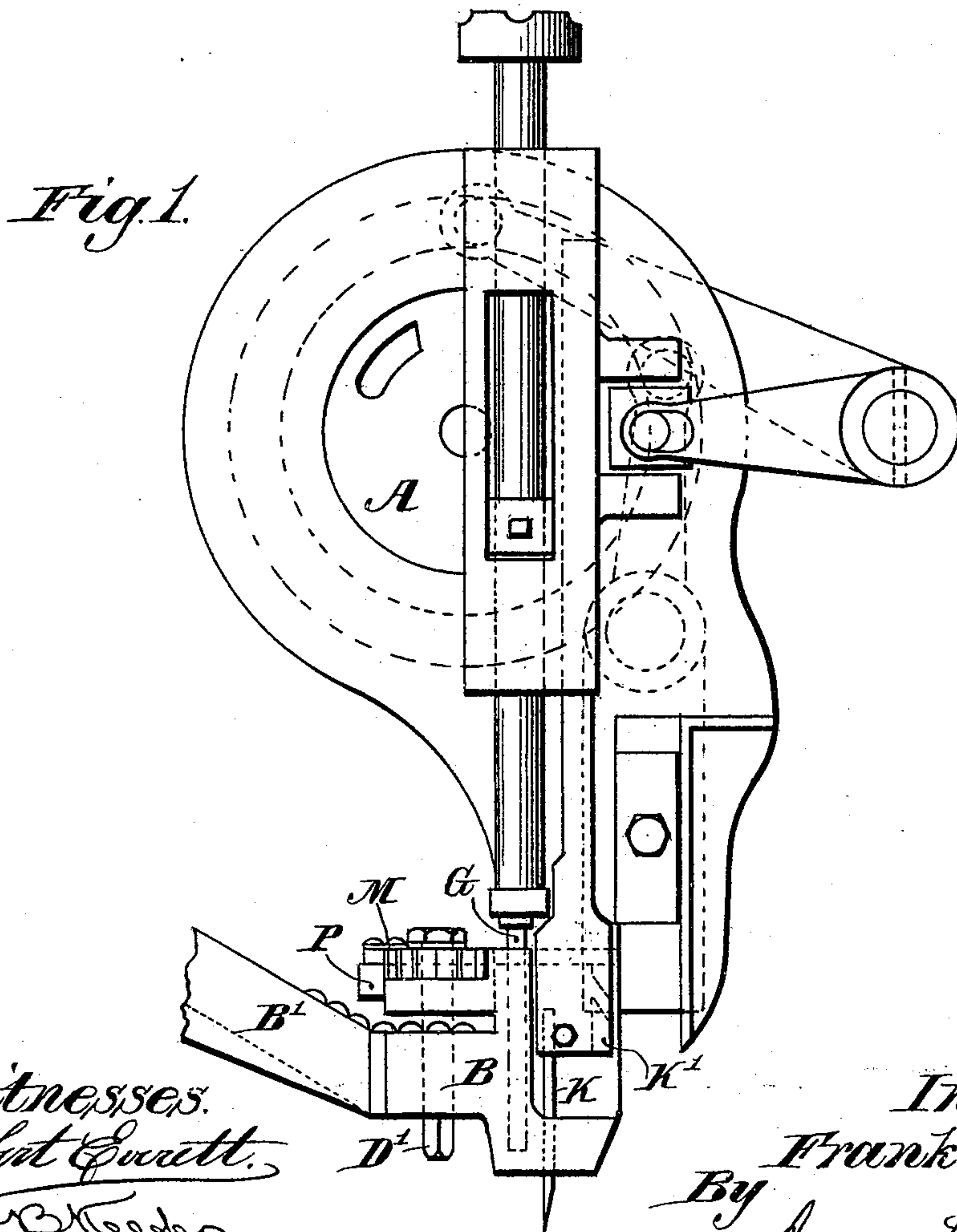
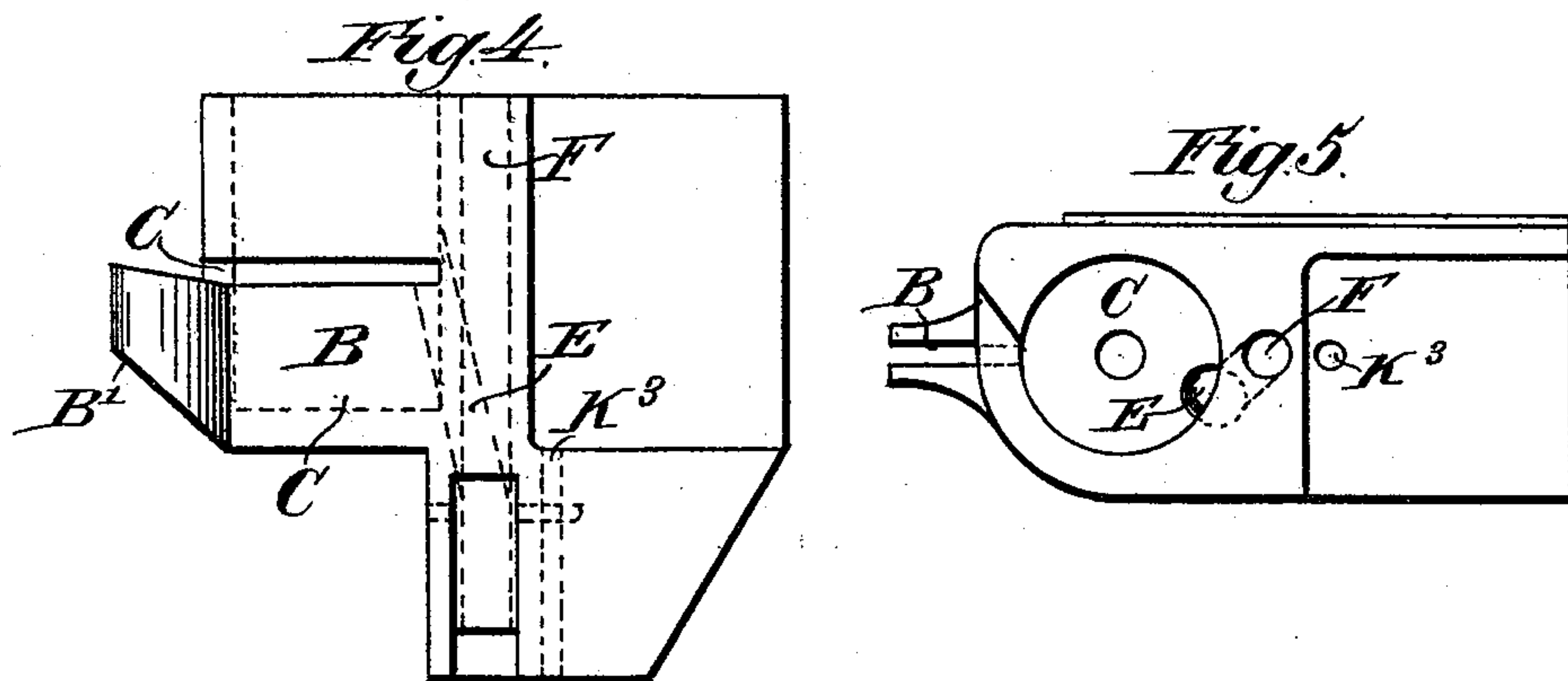
F. LEE.

NAILING MACHINE.

(Application filed Aug. 5, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.
Robert Everett
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2 Sheets—Sheet 2.

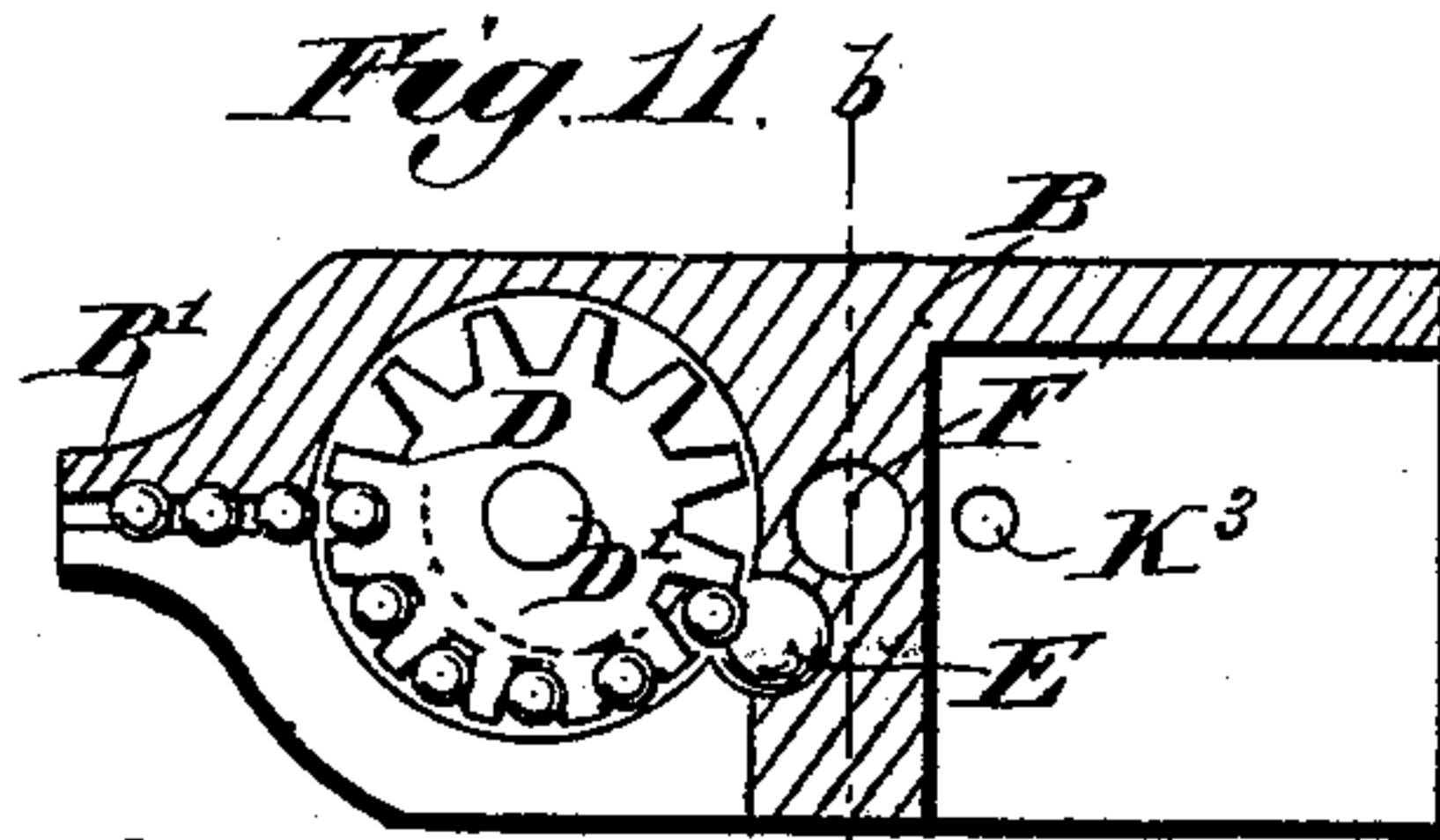
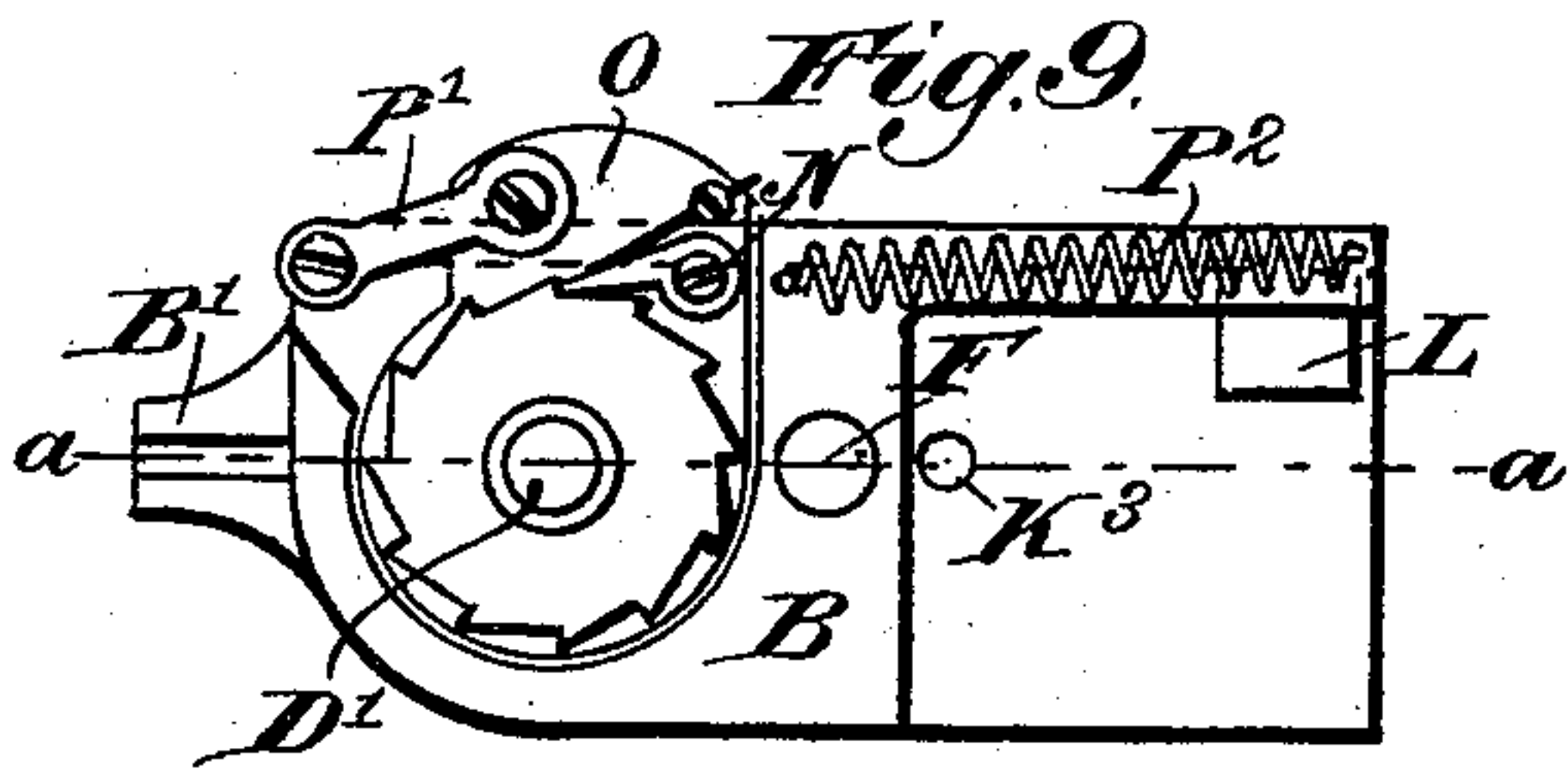


Fig. 6.

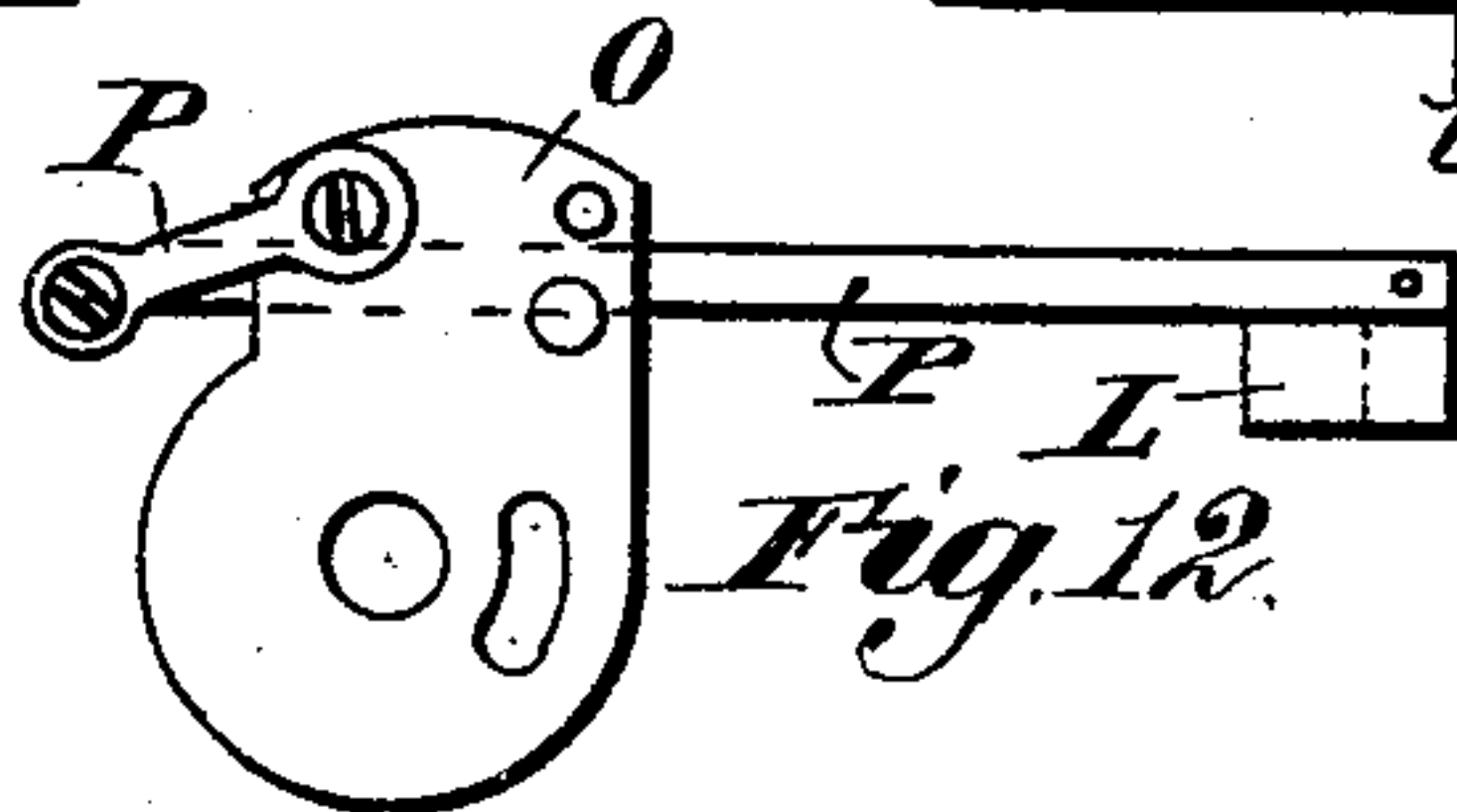
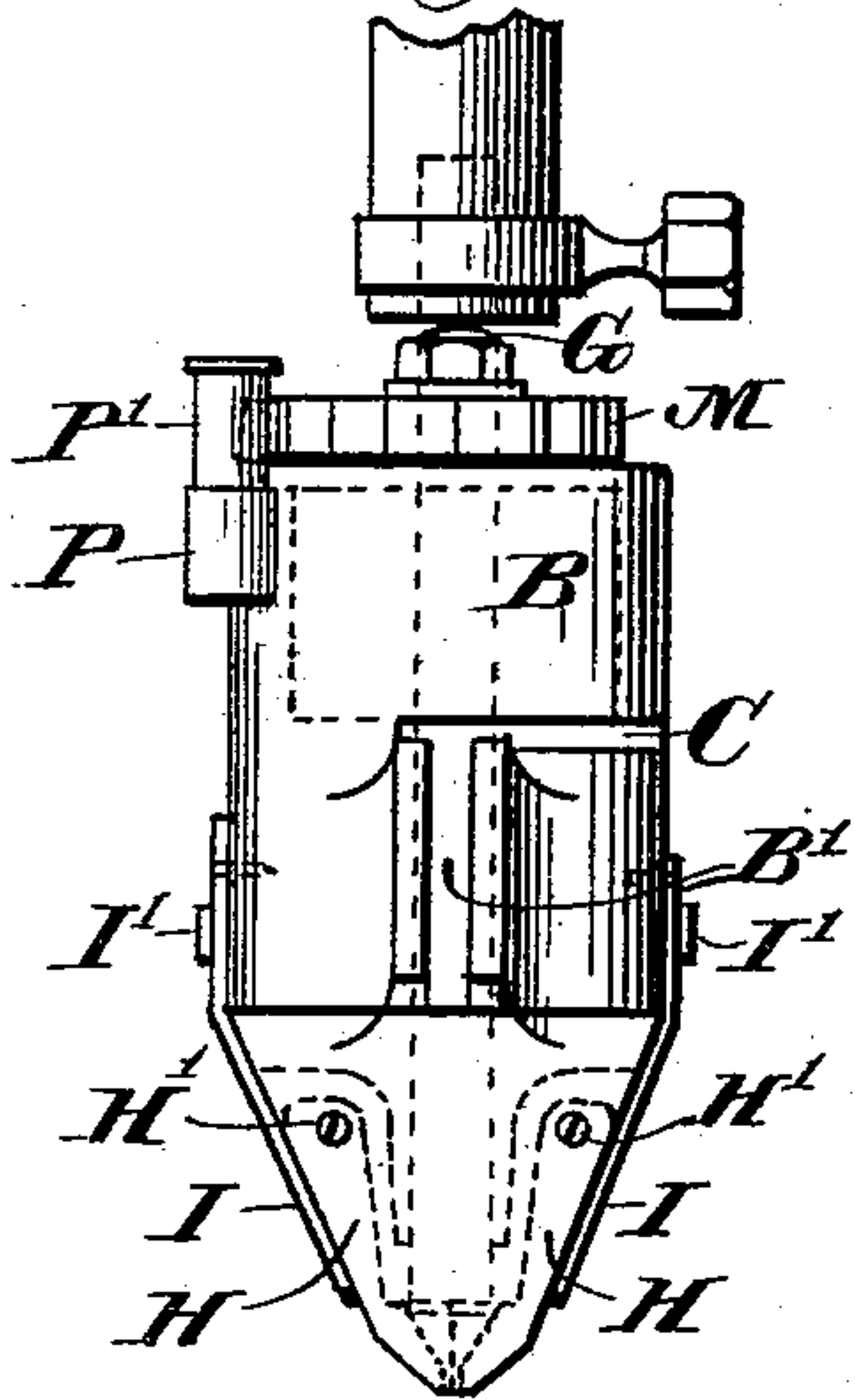


Fig. 10.

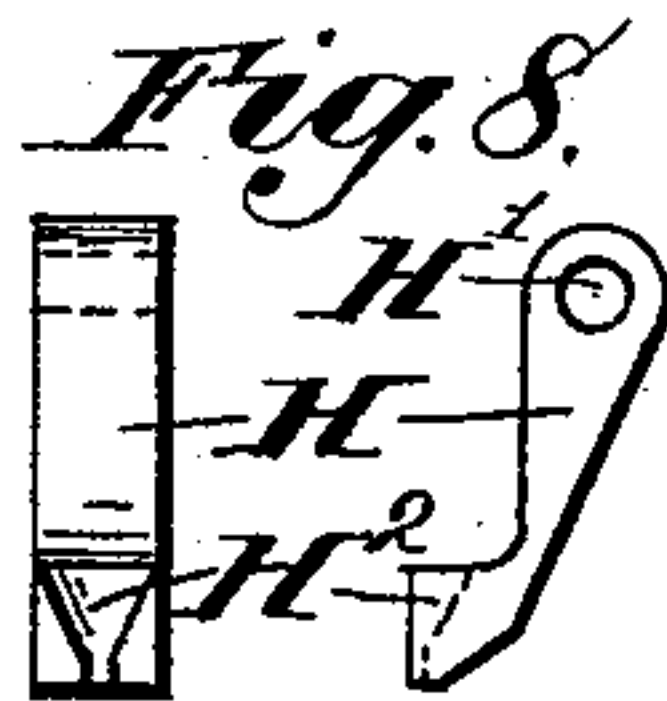
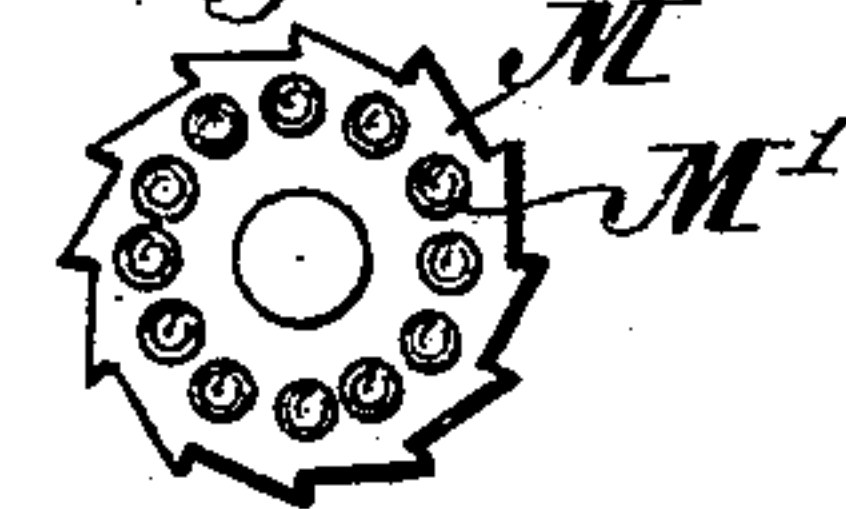
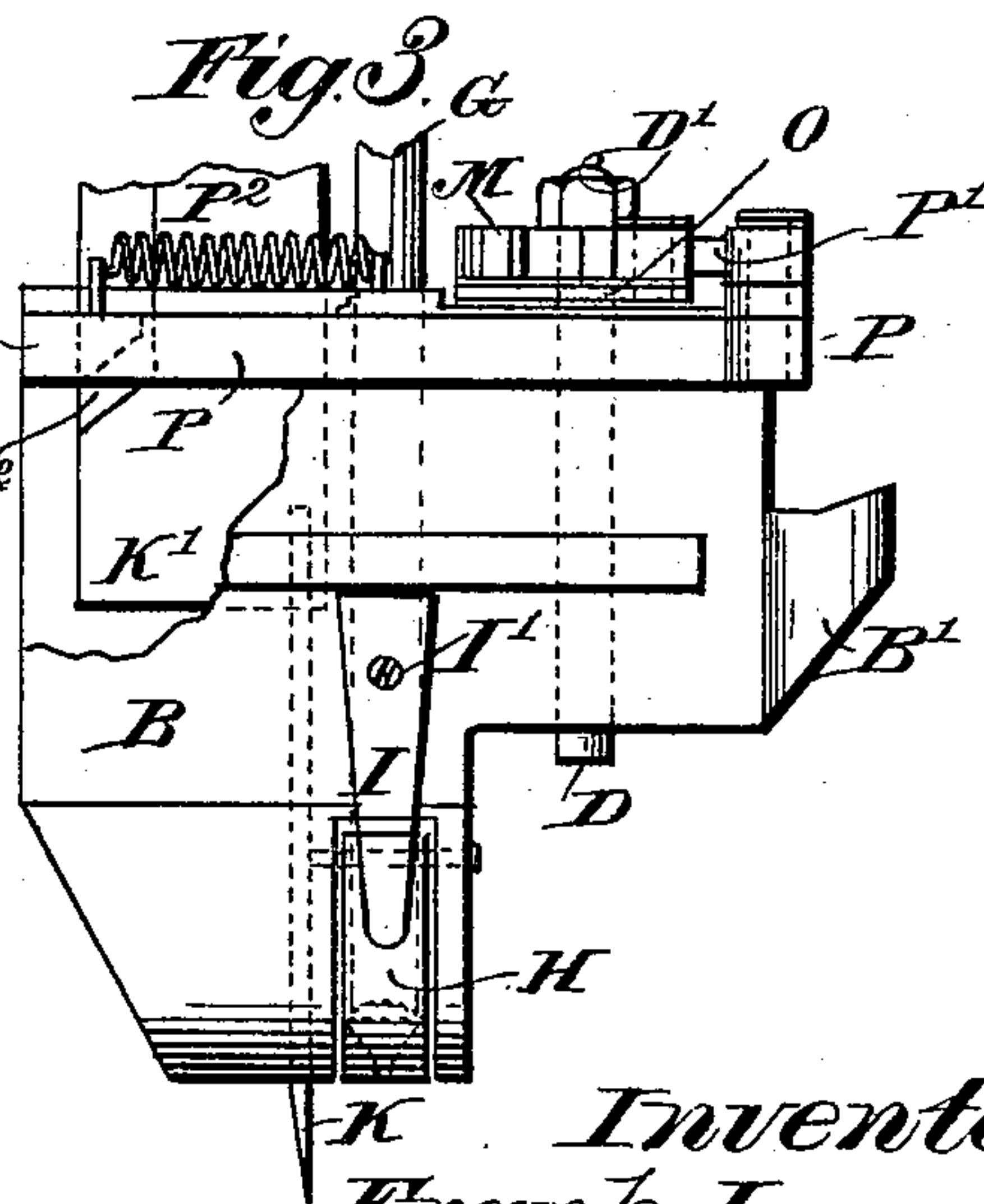
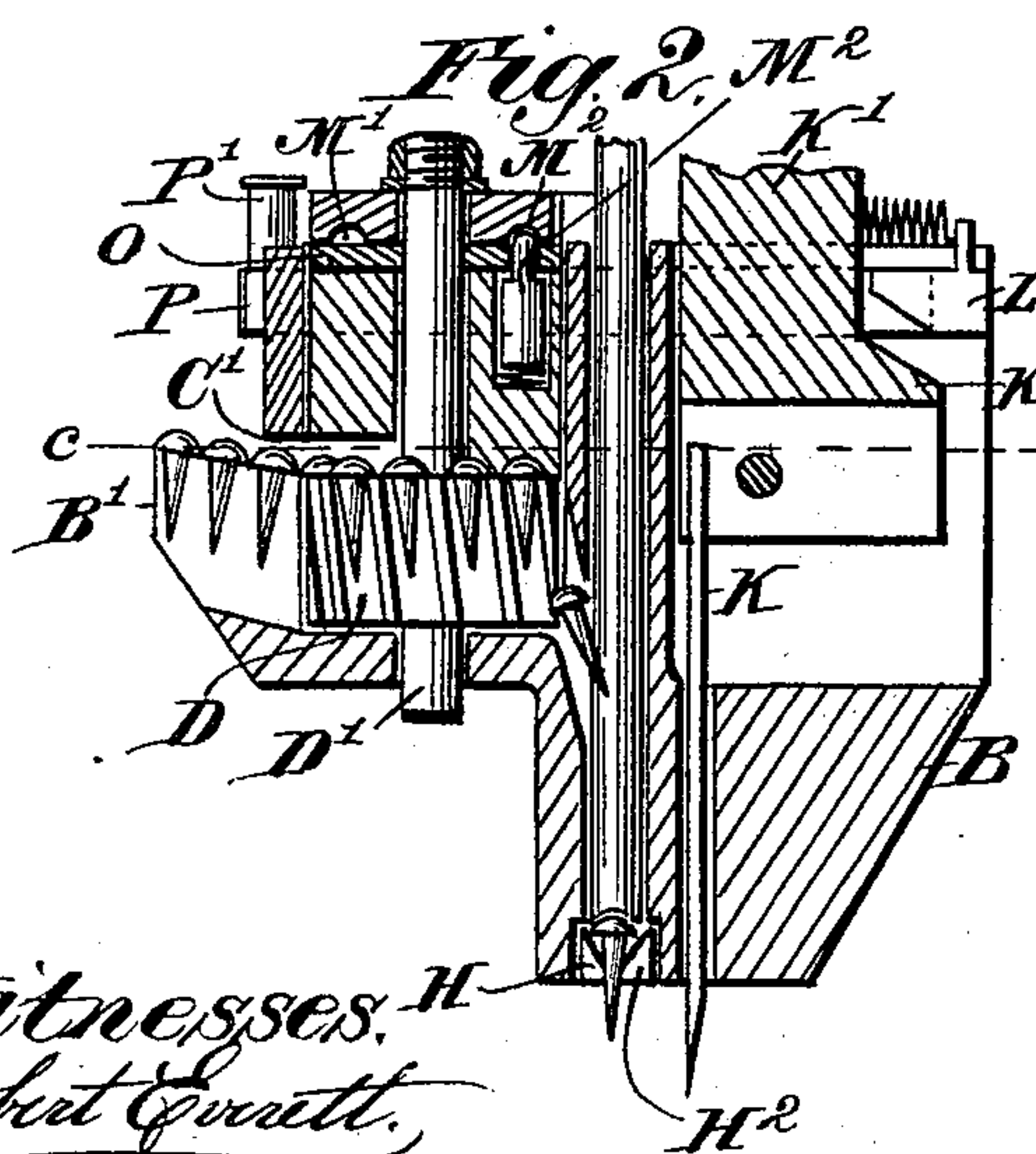
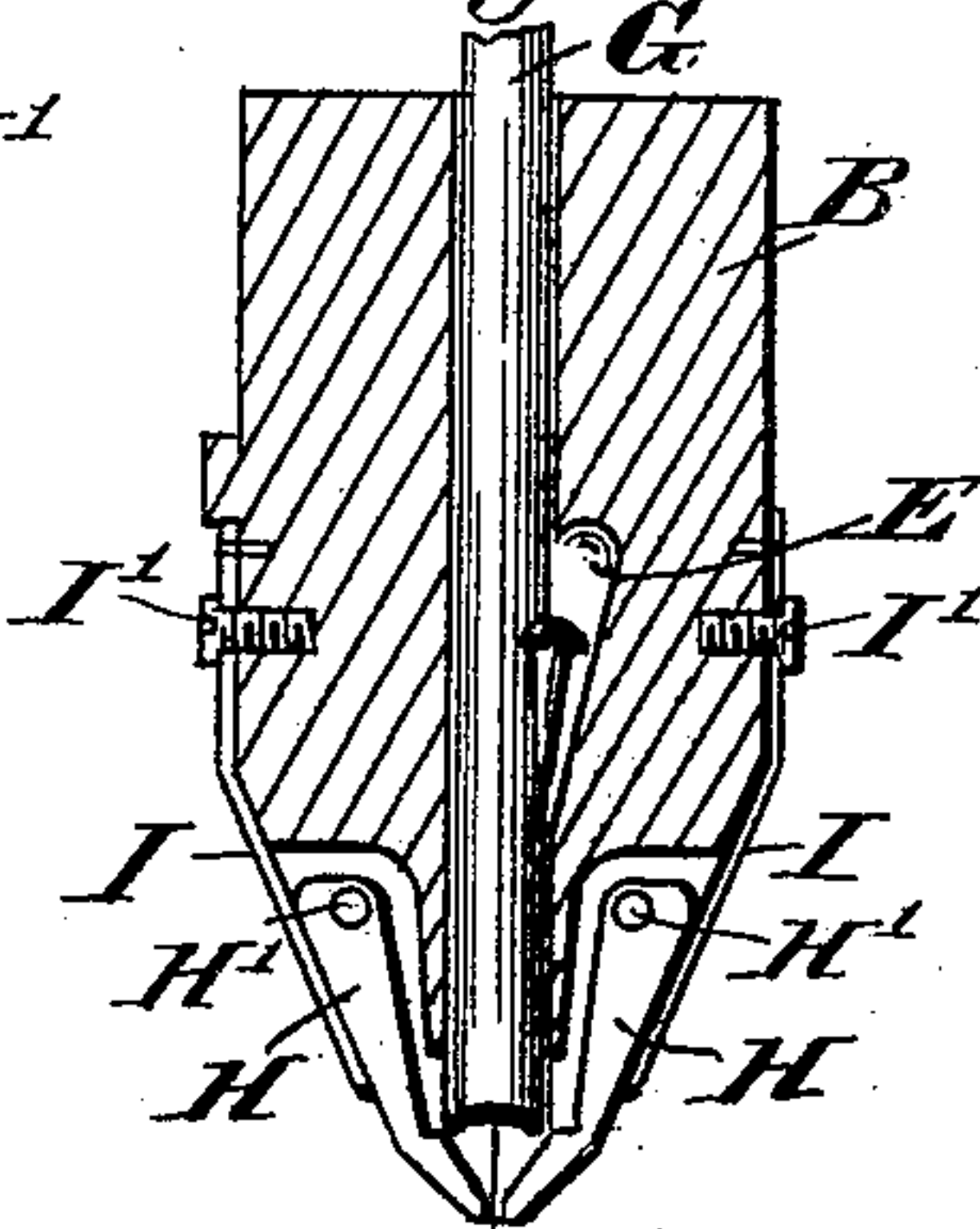


Fig. 7.



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UNITED STATES PATENT OFFICE.

FRANK LEE, OF ADELAIDE, SOUTH AUSTRALIA.

NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 618,695, dated January 31, 1899.

Application filed August 5, 1897. Serial No. 647,255. (No model.)

To all whom it may concern:

Be it known that I, FRANK LEE, engineer, a subject of the Queen of Great Britain, residing at Adelaide, in the Province of South Australia, have invented certain new and useful Improvements in Nailing-Machines, (for which I have obtained Letters Patent in South Australia, No. 3,684, dated June 23, 1897; in Victoria, No. 14,292, dated June 18, 1897; in New South Wales, No. 7,551, dated June 23, 1897; in New Zealand, No. 9,653, dated July 1, 1897, and in Great Britain, No. 17,421, dated July 13, 1897,) of which the following is a full, clear, and exact description.

My invention relates to certain improvements in machines to be used in the manufacture of boots and shoes, and more particularly to a machine for fixing the nails having projecting heads into the outside of the soles of such boots and shoes.

There are already in use in the manufacture of boots and shoes certain machines for driving small nails or tacks during the process of manufacture, and more particularly for fixing the upper to the inner sole. These machines are not suitable for nails having projecting heads, the difficulty being that such nails are top-heavy and are liable to turn over before coming under the driver by which they are driven into the sole of the boot.

The object of my invention is to construct a nailing-machine so arranged that nails having heads of any size, according to the purpose for which the machine is devised, may be continuously driven into the sole of the boot, such machine being so arranged that it is impossible for the nails to turn over during their progress from the source of supply. I accomplish this object by constructing a nailing-machine with special devices, as shown more particularly in the accompanying drawings—i. e., (a) with a device for separating the nails delivered head uppermost from a supply-chute, (b) with a special contrivance by which they are delivered one at a time, head uppermost, to the driver, (c) with a contrivance by which they are retained head uppermost during their passage to the outlet, and (d) with a special device by which, having fallen to the outlet, they are retained upright to receive the blow of the descending driver—in which—

Figure 1 is a side elevation of a nailing-machine having my special improvements; Fig. 2, a longitudinal sectional elevation of the nailing device along a line *a a* in Fig. 9; Fig. 3, a back view of the same; Fig. 4, an elevation of the casing, the movable parts being removed and the internal openings being shown by dotted lines; Fig. 5, a plan of the same; Fig. 6, a side elevation of Fig. 3, the jaws for holding the nails and driver for driving the same being shown by dotted lines; Fig. 7, a transverse sectional elevation along a line *b b* in Fig. 11, showing the driver with a nail in position ready to fall; Fig. 8, a side elevation and front view of the nailer-jaws; Fig. 9, a plan of Fig. 3, showing the ratchet device for controlling the nail-distributor, together with the actuating-lever; Fig. 10, an underneath view of controlling-ratchet; Fig. 11, a transverse section along a line *c c* in Fig. 2, showing the nail-distributor; Fig. 12, a plan of the pawl-piece and actuating-lever.

Referring to the accompanying drawings, in which similar letters refer to similar parts throughout the figures, A is the body of a nailing-machine provided with the usual cam device for raising the driver-bar and with the usual lever attachment for actuating the awl-bar, all of which being well-known constructions and not forming any part of my invention I do not propose to describe. In order to separate the nails, I provide such a nailing-machine with the nose or casing B, having a deep recess C and slot C', to which the nails are delivered in a single row by a chute connected with a supply-drum, as shown more particularly in Figs. 4 and 5. In the casing B is provided a recess C, in which revolves the nail-distributor D, consisting of a toothed wheel fixed to a spindle D', Figs. 2 and 11, and so arranged that its upper face is on a level with the upper edge of the nail-chute. The nail-distributor D is provided with teeth slightly inclined in order to give the nail-point a slight cant forward at an angle corresponding with the line of the discharge-channel. The teeth are placed at such distance apart as to correspond with the body of the nail, so that the head rests upon the upper face of the toothed wheel D, but cannot fall between the teeth. The nail-distributor D is caused to revolve one tooth at a

time in the manner and by the device hereinafter described, whereby the nails as automatically delivered from the nail-supply chute B' are gradually carried around until they one by one reach the nail-discharge channel E, Figs. 2, 4, and 9, when the head of the nail comes in contact with the casing and falls from between the teeth. The nail-channel E is bored at an angle in the casing B to meet the driver-channel F. The working of the parts is so arranged that the driver G is always down before each nail falls from the distributor D, so that the nail in passing down the nail-channel E falls against the side of the driver G, as shown in Figs. 2 and 7, and is by this means retained upright, the passage being not sufficiently large to allow the nail to turn over. As the driver G rises the nail falls into the driver-channel F and drops of its own accord point downward between the jaws H. The casing B is recessed at either side, Fig. 4, and in the recesses so formed are placed two jaws H, each secured to the casing by means of a pin H', on which they swing. The jaws H are provided internally with a cone-shaped recess H², Fig. 8, into which the nail drops, the point passing through, as shown in Fig. 2. The jaws H have their noses held together by means of flat springs I, secured to the body of the casing by means of screws I', so that as the driver falls the jaws H open in order to allow the head of the nail to pass through under the impact of the blow, but afterward immediately close for the reception of another nail under the pressure of the springs I.

The nailing-machine is provided with an awl K, attached to the awl-bar K' and working in a channel K³ within the casing B in the usual way. In my invention the awl-bar is caused to actuate the nail-distributor. For this purpose it is recessed, as shown more particularly in Fig. 2, leaving an inclined projecting piece K², which engages the lug L, Figs. 2 and 3, upon the end of a lever P, actuating the device for controlling the nail-distributor. This controlling device consists of a ratchet M, Figs. 2, 3, 9, and 10, attached to the head of the spindle D' of the nail-distributor D. The underneath surface of the ratchet M is provided with countersunk holes M', engaged by a spring push-piece M², Fig. 2, corresponding to the number of ratchet-teeth. The ratchet M is actuated by a pawl N, Fig. 9, pivoted to a pawl-piece O, loosely attached to the spindle D'. The lever P, carrying the lug L, is attached to the pawl-piece O by means of an arm P'. As the awl-bar K' rises the inclined nose K² engages the lug-piece L, pressing the lever P backward. The lever P by means of the arm P' actuates the lug-piece O upon the spindle D' and causes the pawl N to go back one tooth of the ratchet M. As the awl-bar K' descends it releases the lug L, and the lever P, actuated by the spiral spring P², moves forward, imparting motion to the pawl-piece O. As the

pawl-piece O turns upon the spindle D the pawl N causes the ratchet M to move forward one tooth and the spring-push M² to pass to the next hole M' on the underneath side. The ratchet M being keyed to the spindle of the nail-distributor D, as the ratchet moves forward one tooth at a time the nails fall one by one from the distributor into the discharge-channel, as before described. The connection of the parts is so arranged that the awl K, having made the hole, enters the sole and moves the boot in the usual way. It then rises, allowing the casing to swing back until the nail is over the hole so formed, into which it is then driven by the impact of the driver. The action of the awl-bar K', as before described, by means of the lever P and ratchet M causes the nail-distributor D to feed one nail to the channel E, through which it falls and lies against the side of the driver G. As the awl-bar K' descends the driver rises and allows the nail to fall into position between the jaws H, the driver and awl-bar alternately rising and falling and the awl-bar with each action automatically feeding a fresh nail to the driver G.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a nailing-machine, the combination with a casing having a plunger-opening therein and a plunger moving in said opening with means for operating the plunger, of a vertical spindle journaled in the casing and carrying a horizontal nail-carrying wheel having inclined teeth, said wheel being arranged to rotate in a circular recess in the body of the casing, the side wall of said recess lying close to and surrounding the said toothed wheel, an inclined channel leading from the toothed wheel to the plunger-opening, a ratchet-wheel fixed to the upper end of said spindle, a pawl acting upon said ratchet-wheel, a reciprocating awl-bar arranged adjacent to the plunger and working in a guide in the casing, and means operated by the movement of the awl-bar to actuate the ratchet-wheel and revolve the nail-carrying wheel, substantially as described.

2. In a nailing-machine, the combination with the casing having a plunger-opening, and a plunger moving therein, a spindle journaled in the casing, a toothed wheel fixed on said spindle and arranged to rotate in a recess or opening in the casing, a channel leading from the toothed wheel to the plunger-opening, a ratchet-wheel fixed to said spindle, a pawl acting upon said ratchet-wheel, a reciprocating awl-bar having a projection K², a sliding bar P, having a lug-piece L, with which the said projection on the awl-bar engages in its movement, and a connection between said sliding bar and pawl, substantially as described.

3. In a nailing-machine, the combination with the casing having a plunger-opening and a plunger moving therein, of a spindle

D', journaled in the casing, a toothed wheel D, fixed to said spindle and arranged to rotate in the recess or opening in the casing, a channel leading from the toothed wheel to the plunger-opening, a ratchet-wheel M, fixed to said spindle, a spring-actuated push-pin M², arranged to enter openings in the ratchet-wheel and temporarily hold the same against rotation, a reciprocating awl-bar K', having a projection K², a sliding bar P, having a lug-piece L, with which the said projection on the awl-bar engages in its movement, a rock-

ing plate O, journaled on the spindle D', and having a connection with the said sliding bar, and a pawl N, carried by the plate and engaging the ratchet-wheel to rotate the same when the said plate is actuated. 15

In witness whereof I have hereunto set my hand in presence of two witnesses.

FRANK LEE.

Witnesses:

FRANCIS H. ARON,

CHARLES S. BURGESS.