

(No Model.)

3 Sheets—Sheet 1.

F. F. RAYMOND, 2d.  
HEEL NAILING MACHINE.

No. 318,134.

Patented May 19, 1885.

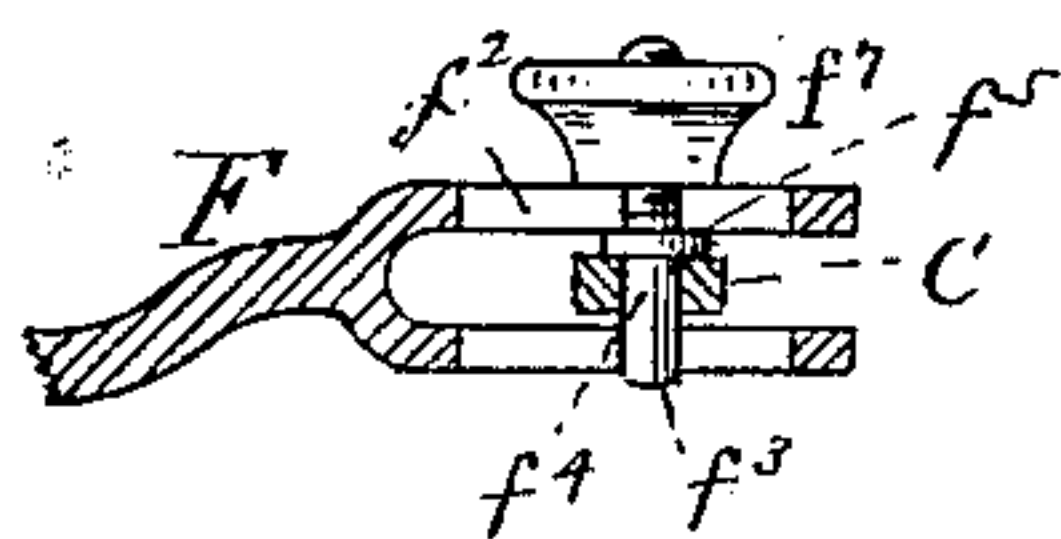


Fig-7-

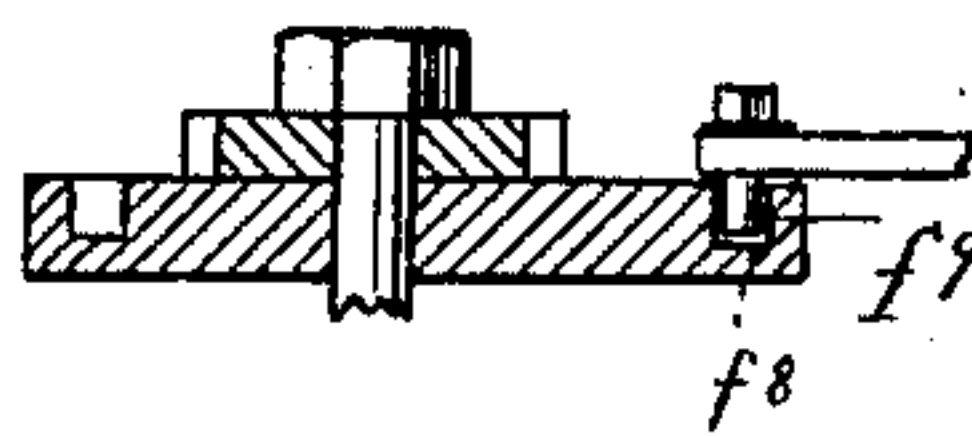


Fig. 1

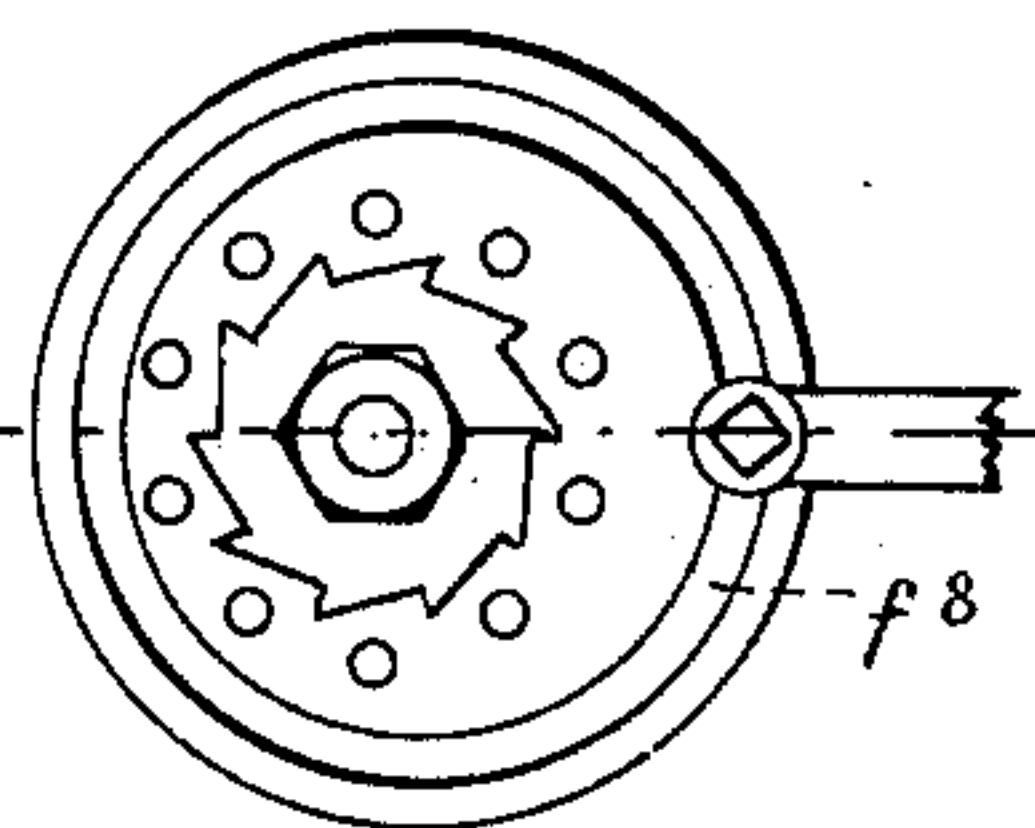


Fig. 9 -

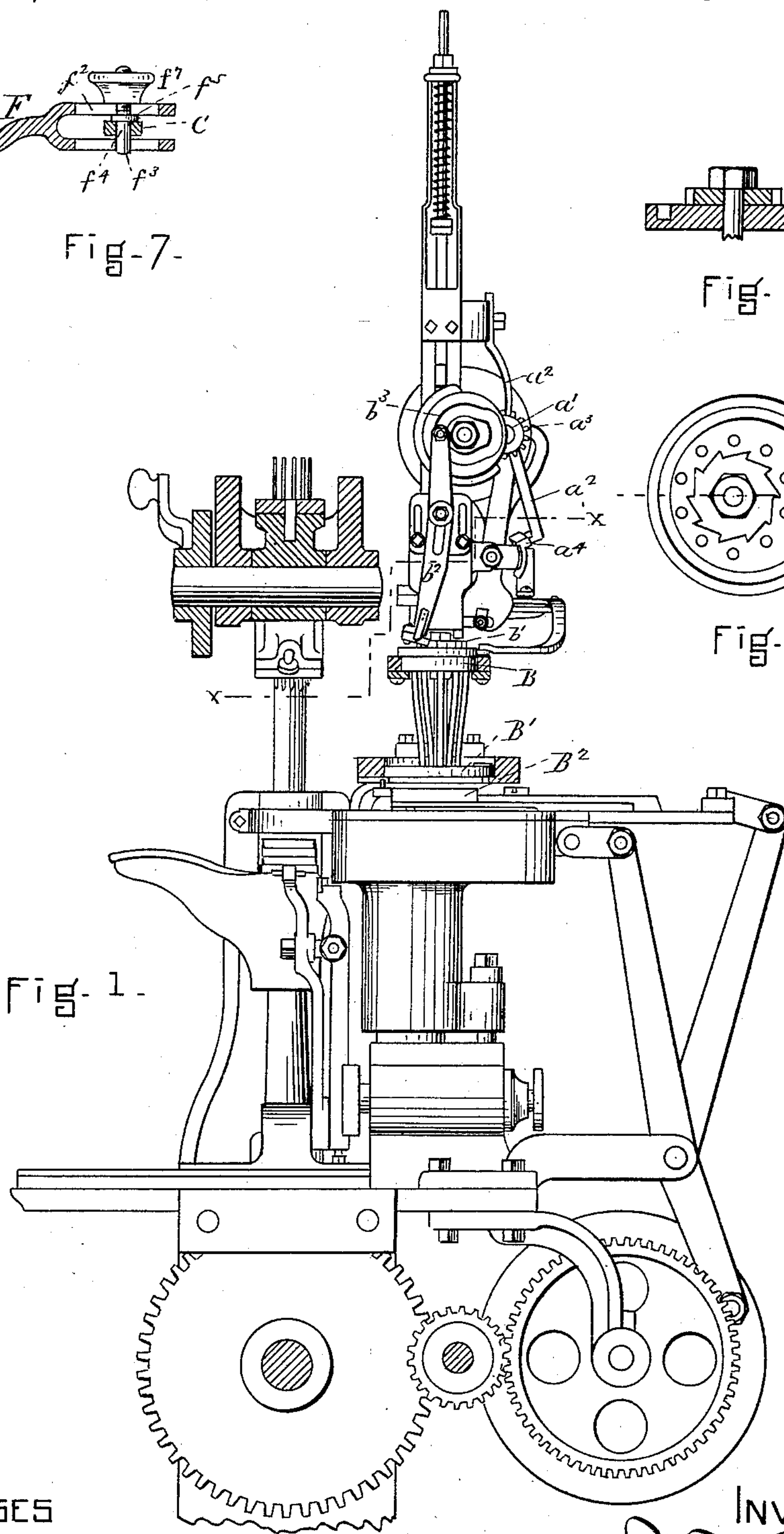


Fig. 1.

WITNESSES

J. M. Dolan.  
Fred B. Dolan.

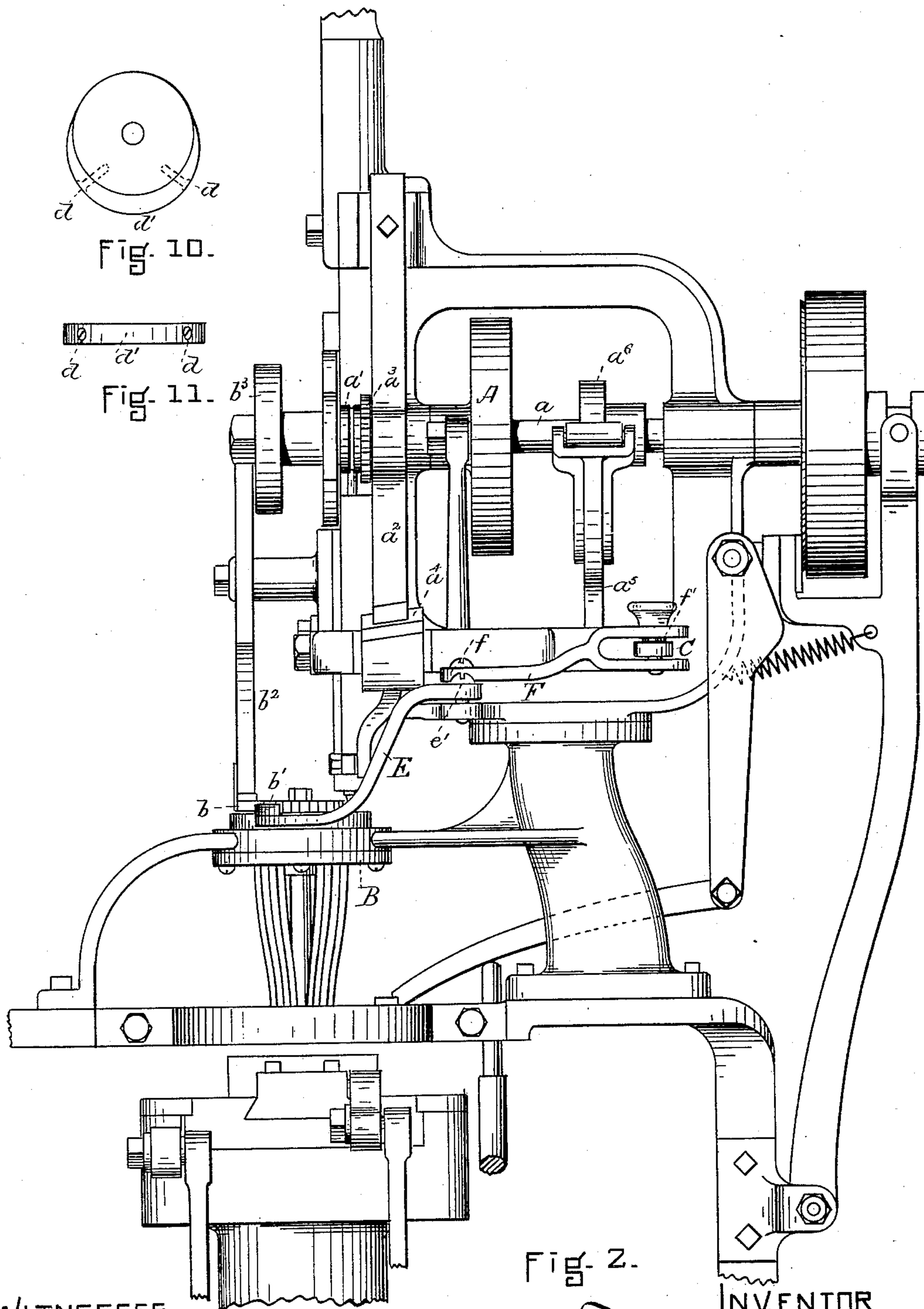
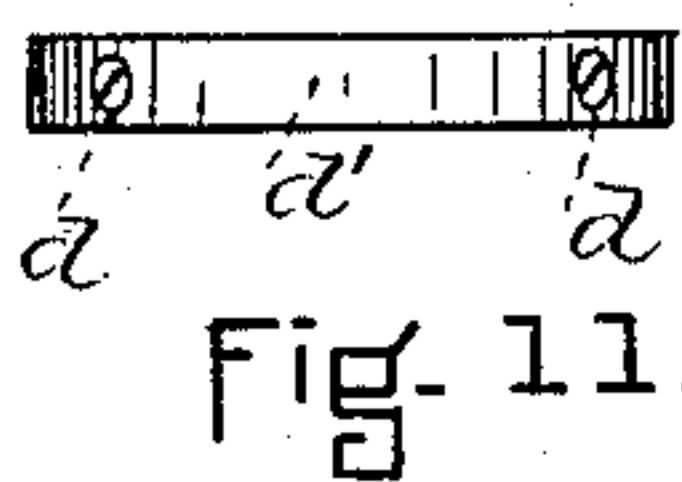
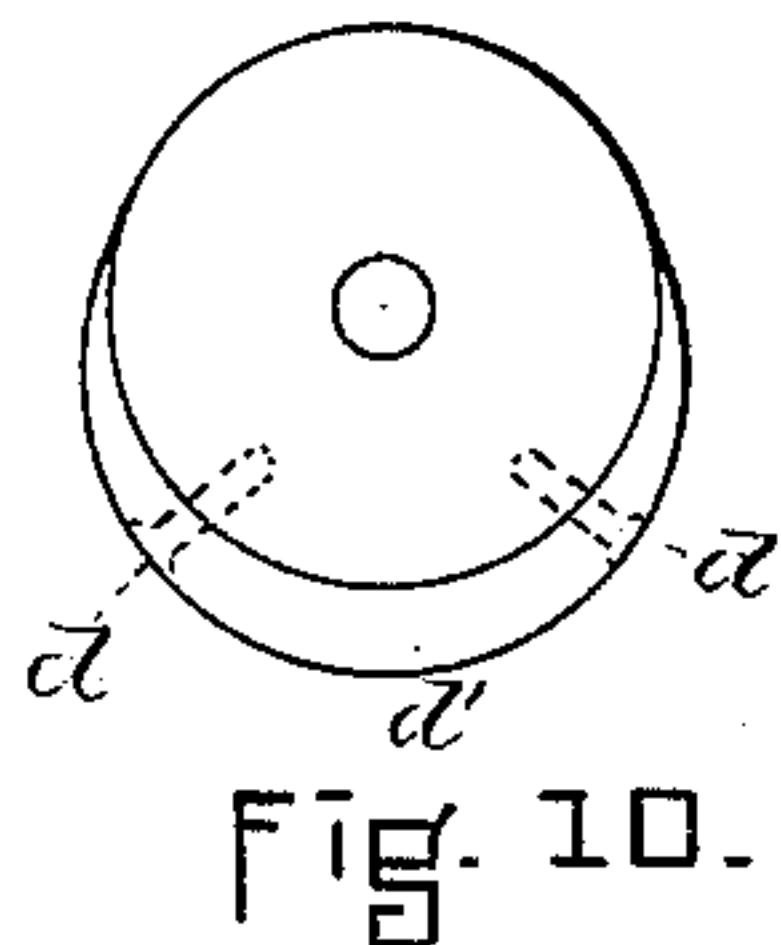
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3 Sheets—Sheet 2.

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Fig. 2.

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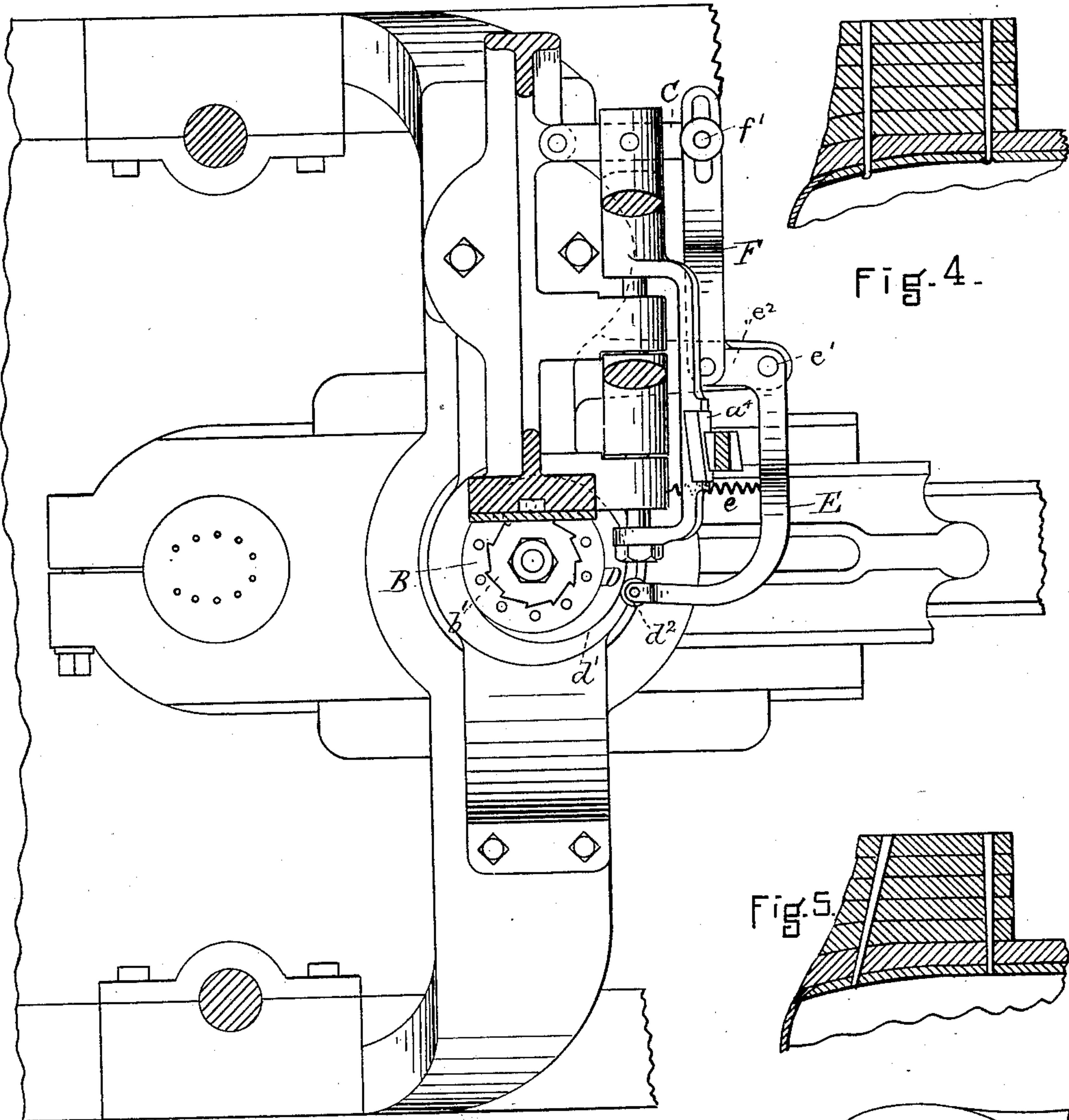


Fig. 3.

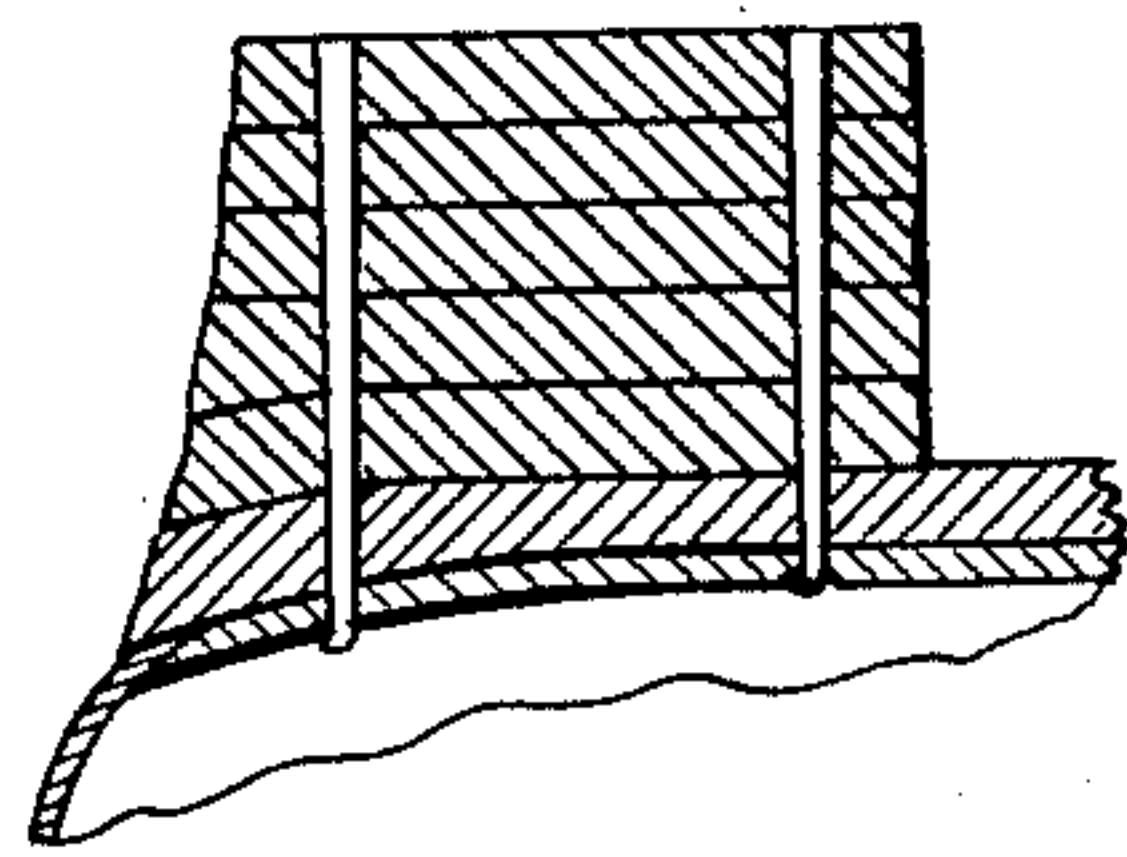


Fig. 4.

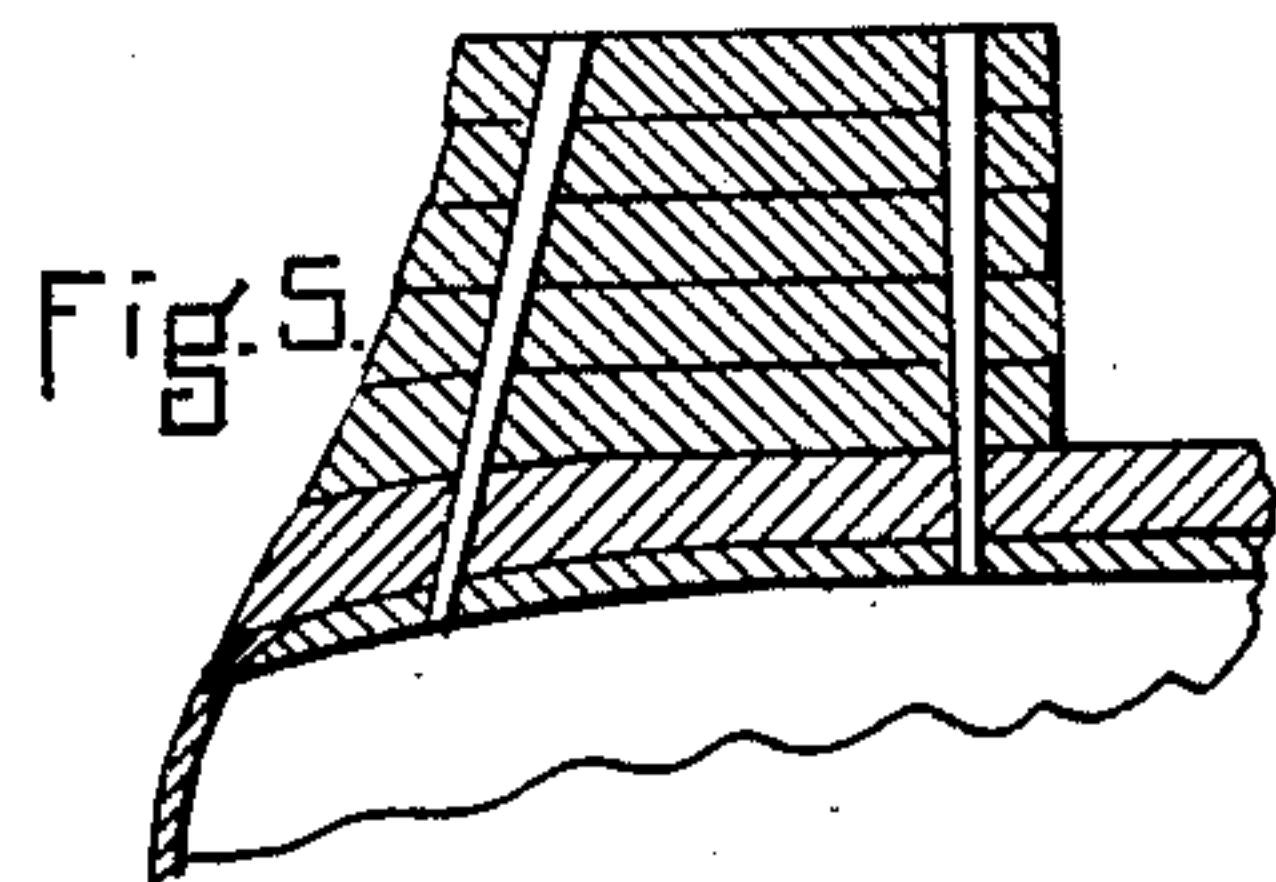


Fig. 5.

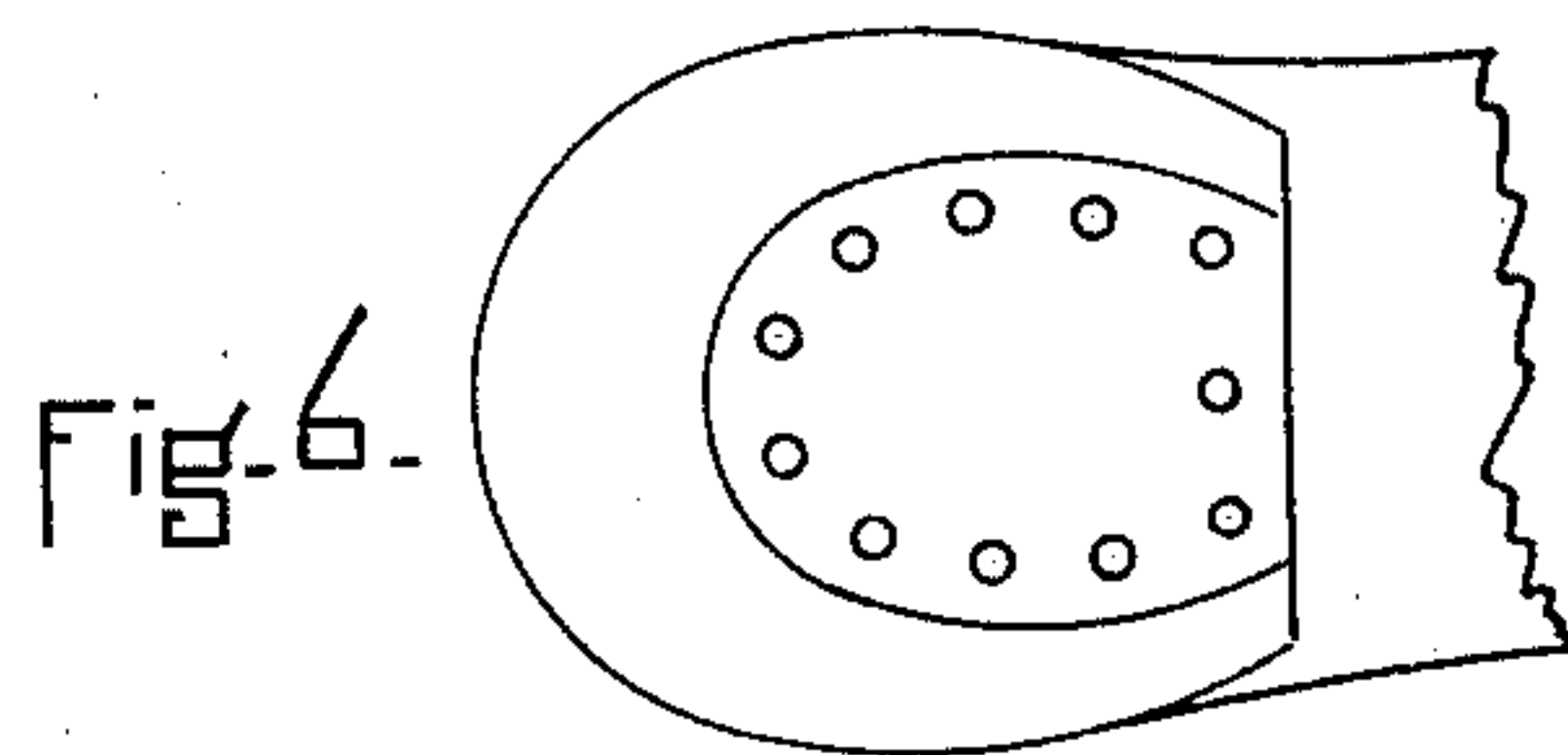


Fig. 6.

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# UNITED STATES PATENT OFFICE.

FREEBORN F. RAYMOND, 2d, OF NEWTON, MASSACHUSETTS.

## HEEL-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 318,134, dated May 19, 1885.

Application filed March 18, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, FREEBORN F. RAYMOND, 2d, of Newton, in the county of Middlesex and Commonwealth of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Heel-Nailing, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention is an improvement upon that described in my application for Letters Patent filed January 13, 1885, Serial No. 152,725, and it relates to means whereby the lengths of the nails made and distributed may be varied automatically while the machine is in operation.

It is desirable for many varieties of heels to use for nailing the back portion of the heel longer nails than are used for the front portion of the heel. This is owing to two reasons—first, because the back portion of the heel from the top lift to the under surface of the insole is thicker than the front portion of the heel, and consequently requires longer nails for properly fastening it, and, second, because it is quite desirable to drive the nails upon an inclination which approximates that of the edge of the heel from top lift to the inner surface of the insole, and when nails are given this inclination it is necessary that those for the back of the heel be longer than those which are used at the extreme front portion of the heel. The very longest nails are those which are used for the extreme back of the heel, and the shortest nails are those which are used at the front, and the nails between these two extremes may vary in length according to the thickness of the heel and the inclination at which they are driven.

Referring to the drawings, Figure 1 is a view of a heel-nailing machine provided with my improvement, the cross-head and revolving head being shown in vertical central section, and the other parts in right elevation. Fig. 2 is a view in rear elevation showing a portion of the heel-nailing machine and the nail making and feeding machine. Fig. 3 is an enlarged view in section and plan below the dotted line *xx* of Fig. 1. Figs. 4 and 5 are vertical sections of an attached heel, show-

ing that the attaching-nails in the back portion of a heel are longer than those used for attaching the portions of the side and front sections thereof. Fig. 6 is a plan view of the heel shown in Fig. 5. Figs. 7, 8, 9, 10, and 11 are detail views.

A is the machine for making nails from wire, and it is in all material respects like that described in my said application.

B is the nail-distributor, or device which receives the nails as they are made and distributes them in the nail-holder in a position to be simultaneously delivered to the nail-carrier. It is intermittently revolved by means of the pawl *b*, ratchet-wheel *b'*, and lever *b''*, operated by the cam *b'''* on the shaft *a*.

The machine described in my said application has a wire-feeding device so constructed that the length or duration of the feed of the wire may be changed or varied by the movement of a lever, and the construction of this device is fully described in Letters Patent No. 301,464, dated July 1, 1884. This variable feed mechanism consists, essentially, of two feed-rolls, one of which is carried by the main shaft *a*, and the other, *a'*, of which is carried by a spring-arm, *a''*, which is movable, so as to engage or disengage the pinion *a'''*, attached to the roll *a'*, in and out at predetermined intervals by means of the wedge-block *a''''*, which is oscillated by the lever *a'''''* and cam *a''''''*, and the wedge-block *a''''* is horizontally movable in relation to the end of the spring-arm *a''*, by means of the lever or arm C, to vary the length of the nail, this movement of the wedge-block causing the contact between the wedge *a''''* and the end of the arm *a''* to be greater or less, according to its position. If it is greater, then the feed-roll *a'* is held from its companion feed-roll a larger part of the revolution of the shaft than when the time of contact is less, so that the feed is shorter. Where the time of contact is less, the feed is of course longer, because there is a longer contact of the rolls. This mechanism, however, is also more fully described in the patent above referred to.

In the drawings, C represents the lever, which is the equivalent of the lever or handle therein described, by the movement of which the extent or duration of the feed is varied.

In order to automatically vary the length of



the nails while the machine A is making them, it is necessary that wedge-block  $a^4$  or this lever C should be moved automatically in one direction or the other, according as it is desired that the length of the nail be varied; and I accomplish this purpose by attaching to or forming on the distributor B a cam, D, which is, when detachable, fastened thereto by screws  $d$ , (see Figs. 10 and 11,) and which has the surface  $d'$ , against which the end  $d^2$  of the lever E is held in contact by means of a spring,  $e$ , or in any other desired way. This lever E is pivoted at  $e'$ , and has an arm,  $e^2$ , which extends backward therefrom, and which is connected with the lever or handle C of the variable feed by means of the connecting arm or link F, which is pivoted at  $f$  to the arm  $e^2$ , and is connected with the end of the handle or lever C at  $f'$ , and preferably in a manner to permit of the adjustment of the handle or lever C in relation thereto before the machine is set in operation, as it is necessary from time to time to vary considerably the length of the nails used, according as the height of the heel may vary; and in setting the feed-regulator it is desirable to arrange the feed for the shortest nail which it will be required to drive for the especial set of heels about to be nailed. I consequently have provided at the end of the lever F the slot  $f^2$ , (see Fig. 7,) through which extends a pin,  $f^3$ , which connects the link F with the end of the lever C. This pin has the part  $f^4$ , which passes through a hole in the end of the arm C, and a shoulder,  $f^5$ , which bears against the under surface of the part of the link F, to serve as a clamp in connection with the screw  $f^7$ , by which the pin  $f^3$  is fastened or locked to the link. By loosening the nut  $f^7$  any relation of the lever or arm C to the link F may be obtained. It is of course desirable that the arm C should be permitted to turn upon the pin  $f^3$ . I do not confine myself to this method of attaching the two parts, but may use any mechanical equivalent therefor.

In lieu of the face-cam D, a cam-groove,  $f^8$ , may be provided, as shown in Figs. 8 and 9, which extends entirely around the edge of the distributor B, and into which a cam-pin,  $f^9$ , extending downward from the end of the lever E, enters, and especially, because more positive, this construction is preferable to that first described. Whichever construction is first employed it is necessary that the cam should bear such relation to the distributor B that the lever or handle C shall be moved or operated to provide a longer feed, or one of greater duration, while the nails which are intended for the back of the heel are being made.

Of course I do not confine myself, so far as the broad feature of the invention is concerned, to its use in connection with the means or devices for varying the length or duration of the wire-feed herein specified, for there are many other ways by which the feed is now changed or varied by the movement of an arm, lever, or block, which can be operated automatic-

ally by a cam and a connecting rod, arm, or lever operated by the cam.

In operation, the lever or arm C is set to provide for the proper feeding of the wire to form nails of the desired length. The machine is then set in operation, and the nails are made and delivered to the distributor B, the shorter nails being made and fed to the holes for the distributor, which supply the front holes of the nail-holder B', and the longer nails being fed to the holes which connect with the holes of the rear holes of the nail-holder, the cam automatically varying the length of the nail as the nail making and feeding progresses. The nails are taken from the nail-holder B' by the nail-carrier B<sup>2</sup>, and by it transferred to a position under the drivers to be driven.

Of course the pattern plate or cam may be changed or varied to make the differences between the lengths of the nails greater or less, according to the thickness of the work nailed.

In the nail-making machine herein described there is employed a driver, a transferring-block, and a pointing and severing device like those described in my application for Letters Patent filed July 17, 1884, Serial No. 137,980.

If desired, the end of the arm  $e^2$  of the operating-lever E may be connected directly with the wedge-block  $h^4$  or the block or piece carrying it.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In combination with a nail-distributor adapted to receive nails singly and to deliver them to a nail-holder, a nail-holder arranged to receive nails singly and hold them in a group for delivery, nail-making devices having a variable wire-feeding mechanism, and a cam or pattern for automatically adjusting or regulating the feeding device, all substantially as and for the purposes described.

2. The combination of a nail-distributor, B, adapted to receive nails singly from a nail-making device, a nail-holder, B, adapted to receive the nails from the distributor and hold them in a group, a nail-making device having a variable wire-feeding mechanism, devices substantially as specified, for setting or regulating the operation of the wire-feeding mechanism, and a cam or pattern connected with the said devices for adjusting the feeding and connecting mechanism, whereby the size of the nail may be predetermined and fixed, and variation from this predetermined length made, all substantially as and for the purposes described.

3. The combination, in a heel-nailing machine, of the nail-distributor adapted to receive nails singly, a nail-holder adapted to receive nails from a distributor singly and to hold them in a group for delivery, a cam or pattern for automatically governing the length of the nails fed to the nail-distributor, and the nail-carrier B and nail-driving devices,



all substantially as and for the purposes described.

4. The combination of the cam or pattern D, the lever E, link F, and the arm C, all substantially as described.

5. The combination of the arm C and the movable arm F for operating it, and devices, substantially as specified, for changing or adjusting the position of the arm C in relation to the arm F, all substantially as described.

6. The combination of the mechanism for

feeding the wire, the devices for varying the feed, the lever C, for operating said devices, the cam or pattern and connecting devices, substantially as specified, for moving the lever C automatically, and the nail-driver, all substantially as described.

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Witnesses:

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