

(No Model.)

2 Sheets—Sheet 1.

H. N. HEMINGWAY.

MACHINE FOR MANUFACTURING BUTTON FASTENERS.

No. 312,121.

Patented Feb. 10, 1885.

Fig:1.

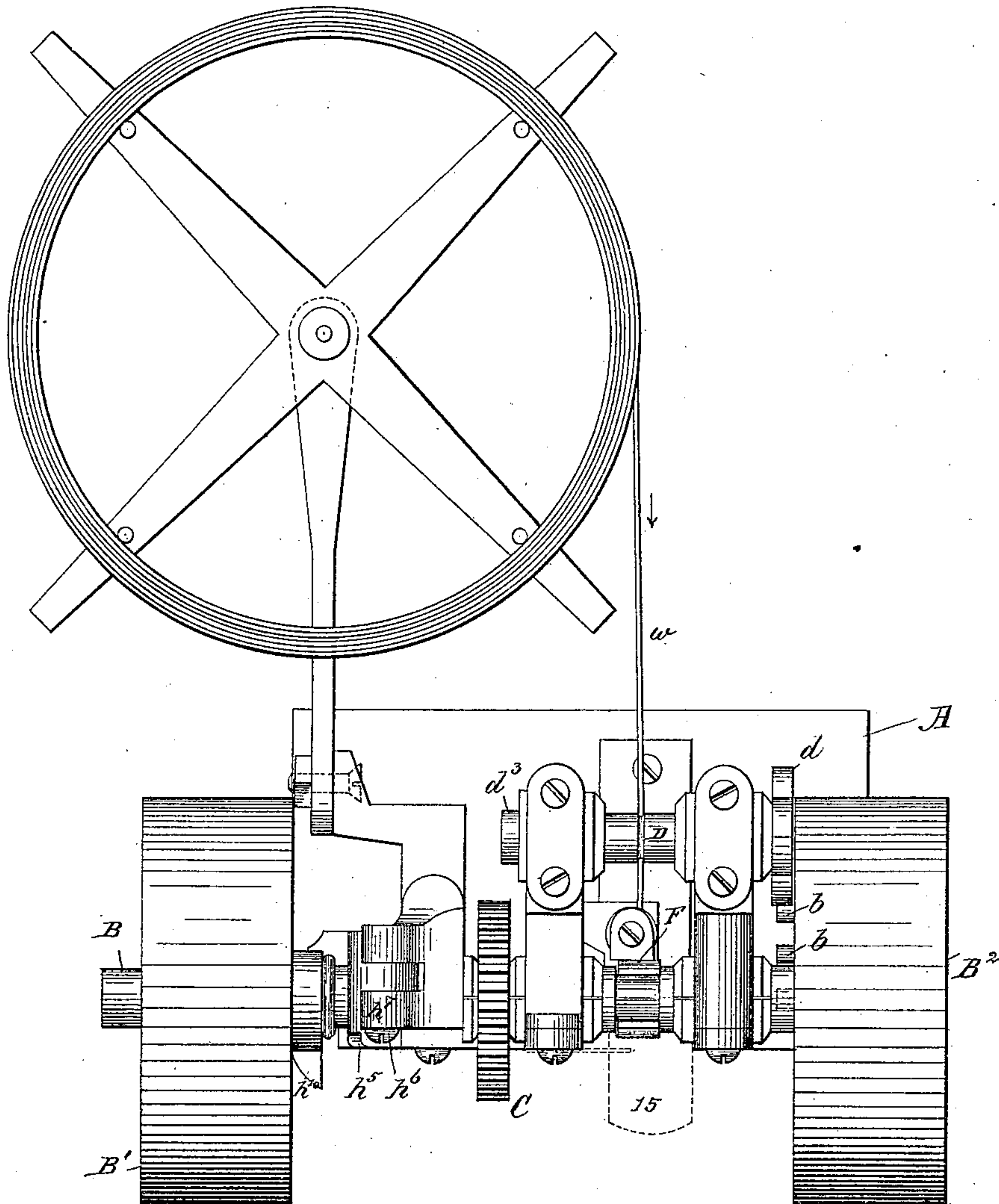
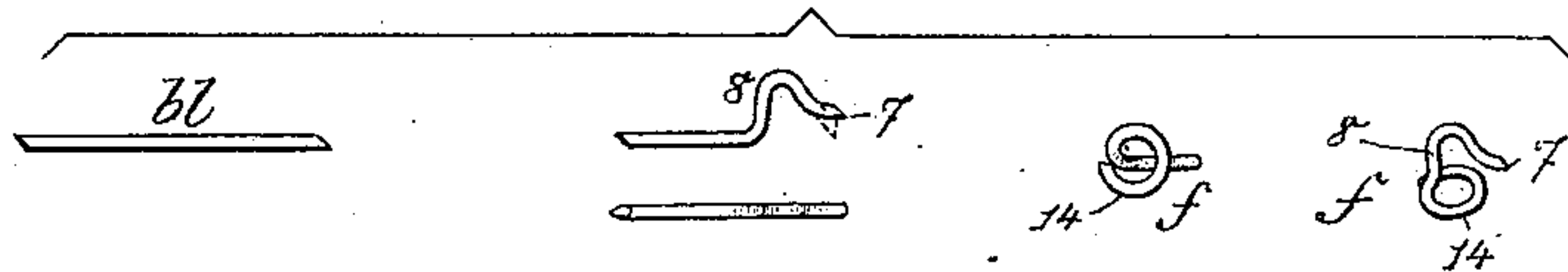


Fig:2.



Witnesses.

*Arthur Lippertson.*

*A. O. Ornd*

Inventor.

*Henry N. Hemingway.*  
*by Crosby & Gregory Atys.*

H. N. HEMINGWAY.

MACHINE FOR MANUFACTURING BUTTON FASTENERS.

No. 312,121.

Patented Feb. 10, 1885.

Fig:3.

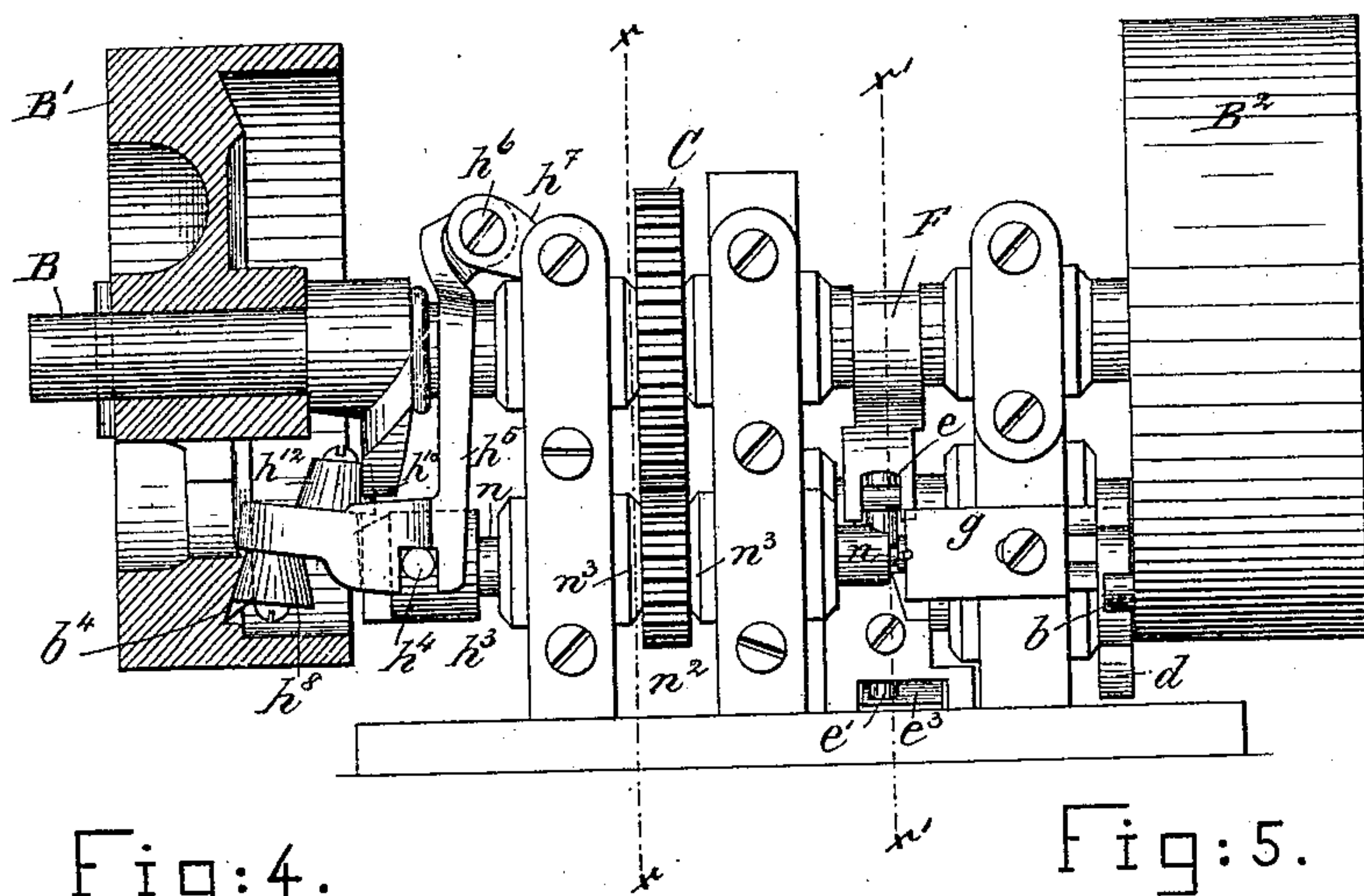


Fig:4.

Fig:5.

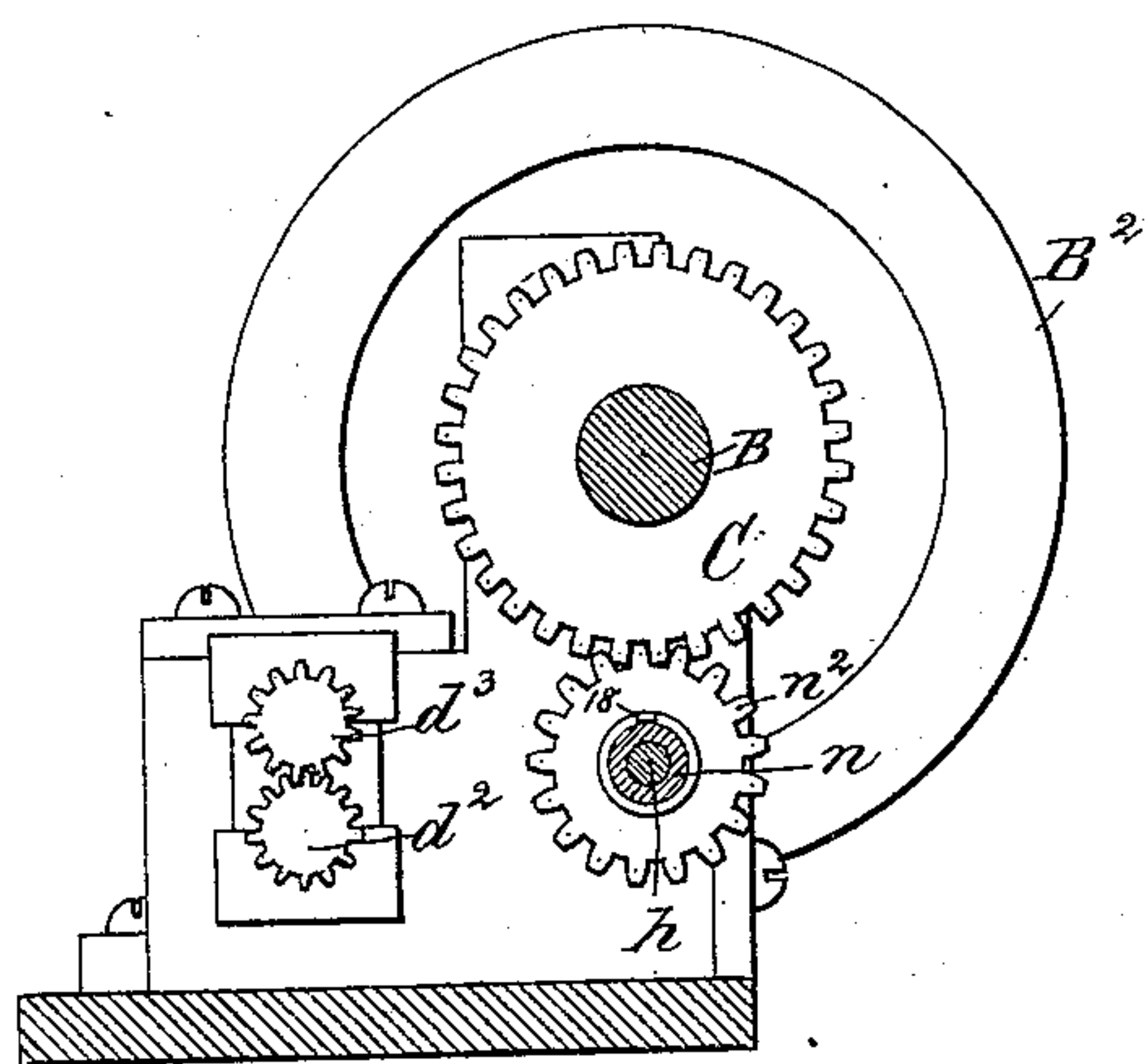


Fig:6.

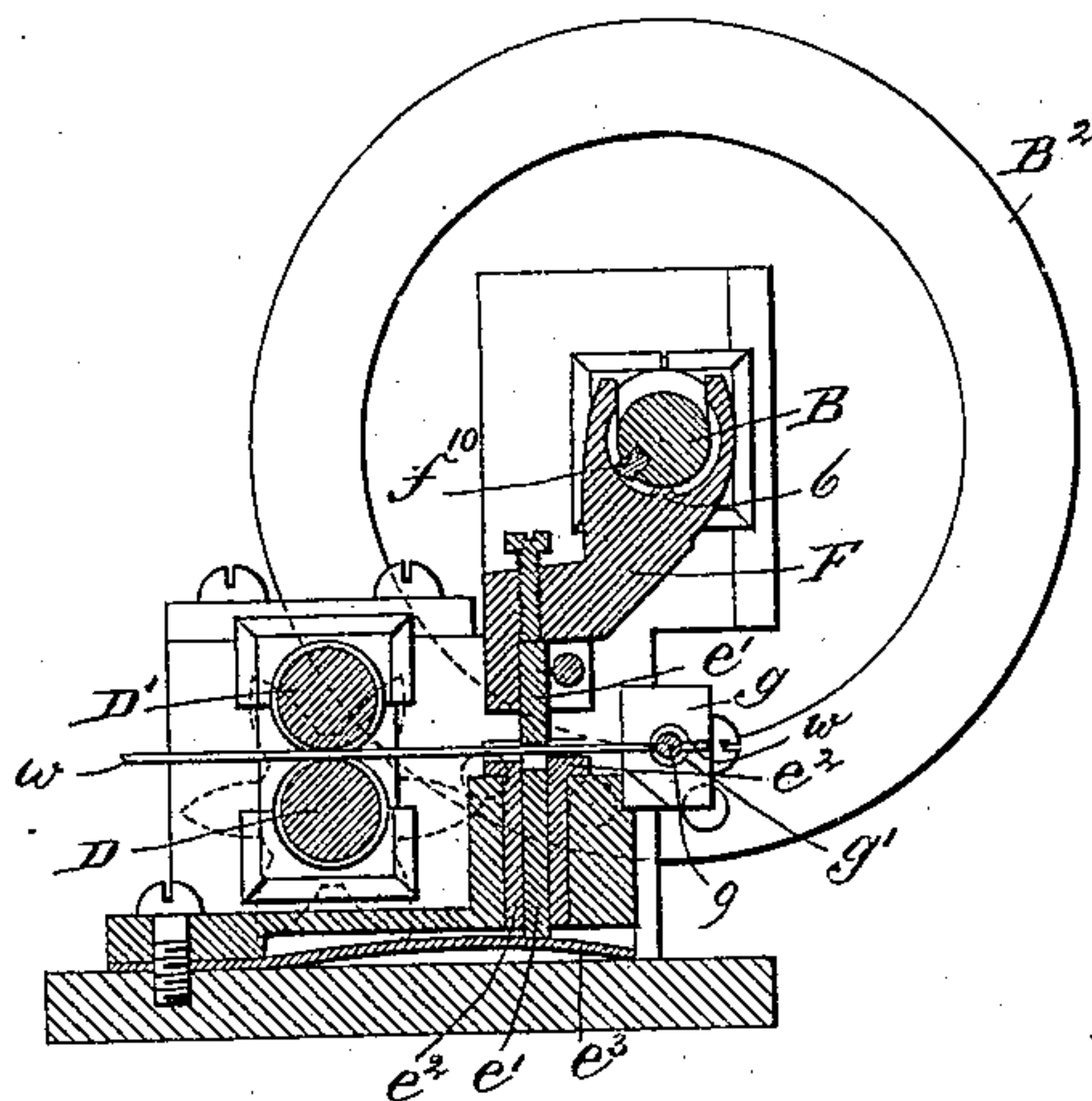


Fig:8.

Fig:9.

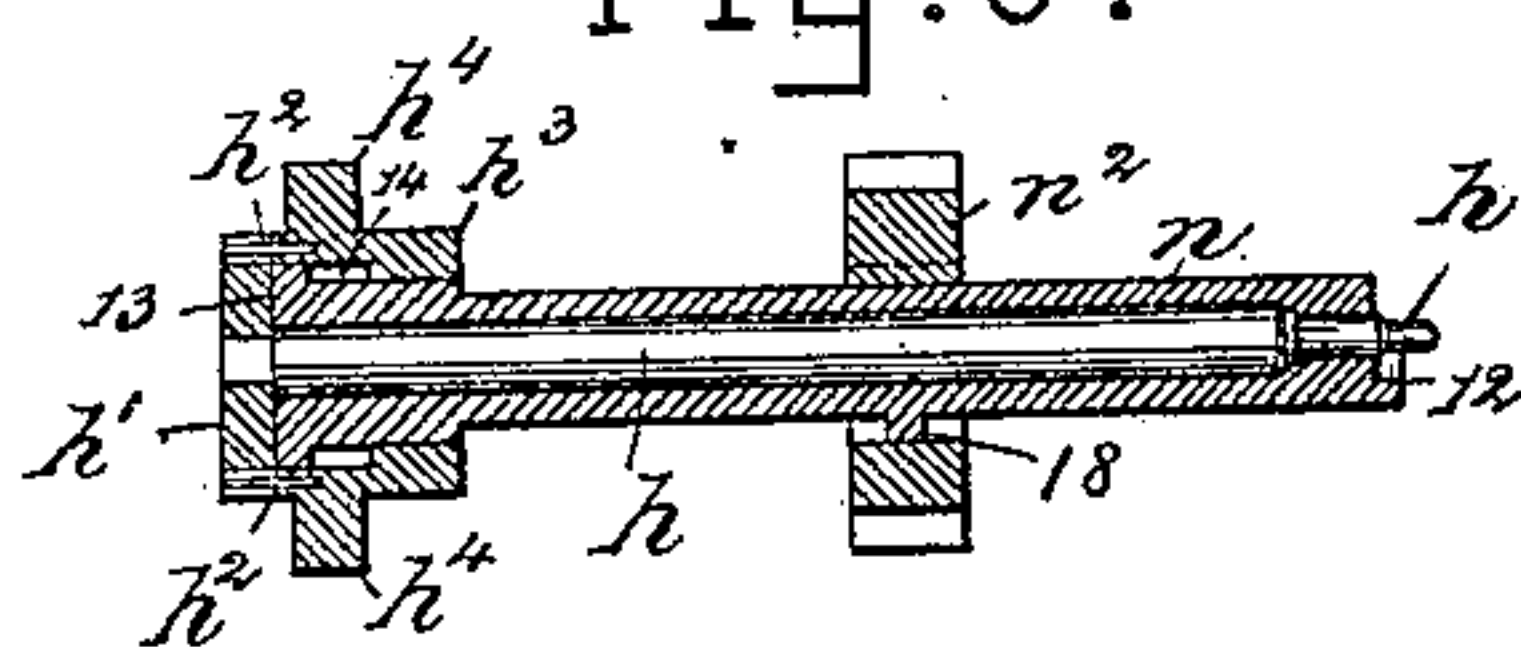


Fig:7.

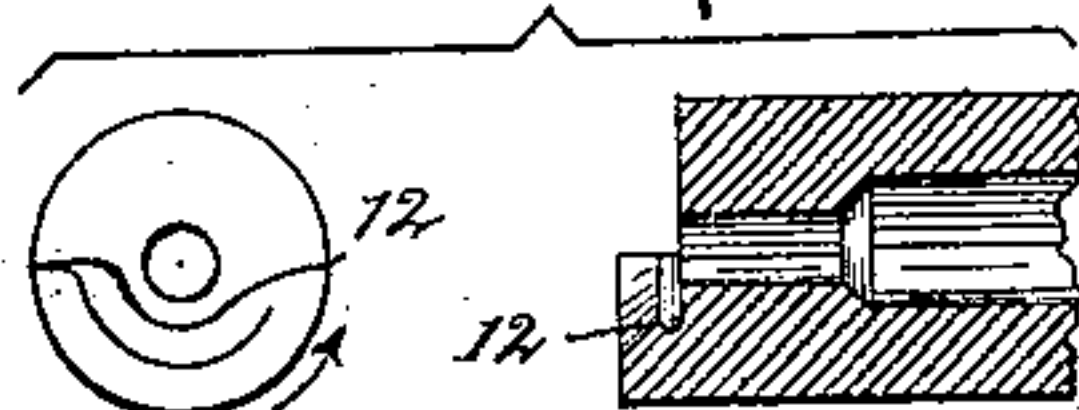


Fig:10.

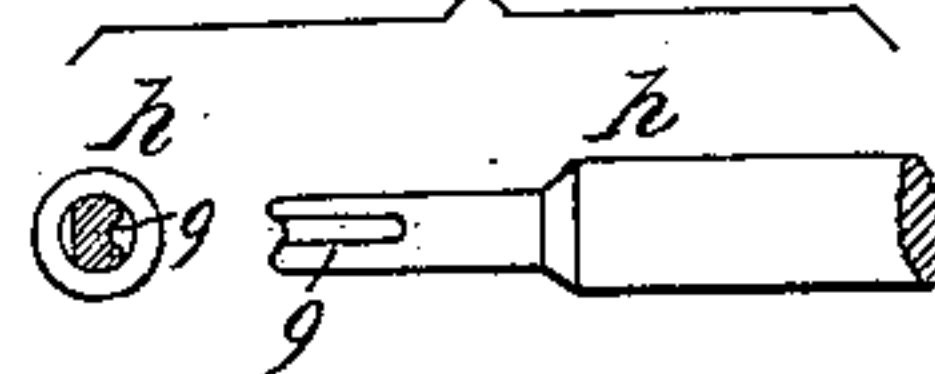
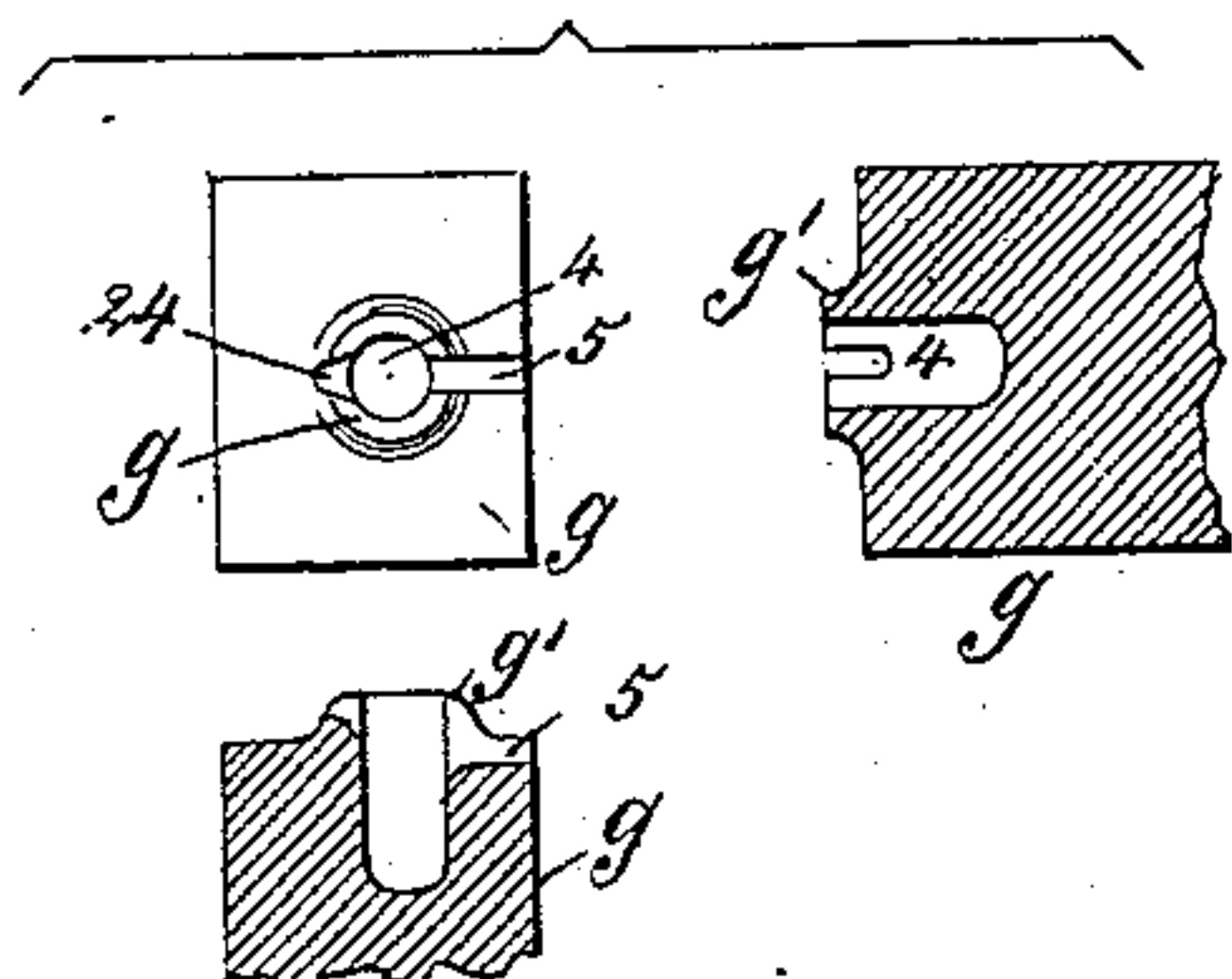


Fig:11.



Witnesses.

Arthur Lippert.

A. O. Orue

Inventor.

Henry N. Hemingway.

by Crosby & Morgan

Atty.



# UNITED STATES PATENT OFFICE.

HENRY N. HEMINGWAY, OF AUBURN, ASSIGNOR TO WM. H. WOOD AND  
DEVALSON G. WEAVER, BOTH OF ROCHESTER, NEW YORK.

## MACHINE FOR MANUFACTURING BUTTON-FASTENERS.

SPECIFICATION forming part of Letters Patent No. 312,121, dated February 10, 1885.

Application filed August 13, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY N. HEMINGWAY, of Auburn, in the county of Cayuga, in the State of New York, have invented an Improvement in Machines for Manufacturing Button-Fasteners, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 The object of this machine is to manufacture button-fasteners such as described in United States Patent No. 295,709, granted to W. H. Wood, to which reference may be had.

15 In this my improved machine the wire taken from a coil by suitable feeding mechanism is fed past wire cutters or shears and across a die, where it is caught by a punch, and the cutting mechanism then cuts off the wire of proper length to constitute a blank for a fastener.  
20 The punch is then moved forward to force the wire into the die to form its hook part, shank, and prong, and a wire-coiler then takes hold of the wire between the punch and die on one side and the cutting mechanism on the other  
25 side and winds the end of the wire blank about the punch to form the base of the fastener.

30 The particular features in which my invention consists will be especially pointed out in the following description, and designated in the claims.

35 Figure 1 is a top or plan view of a machine embodying my invention. Fig. 2 is a diagram showing the blank in the different shapes assumed by it, and the completed fastener. Fig. 3 is a front elevation of Fig. 1, the reel being omitted and the driving-pulley being in section. Fig. 4 is a section of Fig. 3 in the dotted line  $x x$ . Fig. 5 is a section in the dotted line  $x' x'$ ; Fig. 6, a longitudinal section of the punch and wire-coiler removed, showing the grooves therein; Fig. 7, details in top view and section of the die enlarged; Fig. 8, details in end view and section of the wire-coiler enlarged; Fig. 9, details of the punch; Fig. 10, a side elevation of the movable member of the shears or wire-cutting mechanism; Fig. 11, a top view of the stationary co-operating member of the shears or wire-cutting mechanism.  
50 anism.

The base A has suitable uprights contain-

ing boxes to sustain the different shafts and working parts, to be described. The main shaft B has fast upon it a pulley, B', a gear, C, and a pulley or wheel, B<sup>2</sup>, the latter having at one side of it teeth  $b$ , herein shown as three in number. These teeth engage the teeth of a gear,  $d$ , at one end of the lower feed-roller, D, having at its opposite end a gear,  $d^2$ , which engages a gear,  $d^3$ , on the shaft of the upper feed-roller, D', the said rollers constituting a wire-feeding mechanism. These rollers, grooved annularly for the reception of the wire, and having their bearings in adjustable boxes, whereby the rollers are adapted to the diameter of the wire  $w$  being used, are moved intermittently by the teeth  $b$ , brought at intervals into engagement with the teeth of the wheel  $d$ , thus feeding forward a sufficient length of wire for the production of a fastening. The wire, after passing beyond the feeding-rollers, is fed into a groove,  $e$ , made in the movable member  $e'$  of the wire-cutting mechanism, the lower member being marked  $e^2$ . The section, Fig. 5, showing the cutting mechanism is taken at one side of the center line of the cutting member  $e^2$ , as will be noticed by reference to the dotted section-line, Fig. 3. The groove  $e$  is preferably made annular, so that the member  $e'$  may be turned or adjusted about its center to bring into operative position a new edge, to thus compensate for wear. The lower member,  $e^2$ , is made as a sleeve having, preferably, a head, as shown clearly in Fig. 5, by which to support it in the frame-work, the said head at its top or face having a cross-groove, 2, which intersects the central opening, 3, of the said sleeve, as shown in Fig. 11. The movable cutter member  $e'$ , extended through the opening 3 (see Fig. 5) of the sleeve, rests upon a spring,  $e^3$ , which normally acts to keep the member  $e'$  elevated, as in Fig. 5, so that the wire  $w$ , taken from a suitable reel, may be fed by the rollers D D' into and through the grooves 2 and  $e$ , referred to, and the wire having reached the position indicated in Fig. 5, the said wire having been fed past the opening 4 of the die  $g$ , the movable member  $e'$  of the cutter is depressed or forced down by the follower F, the latter being thrown down quickly by the projection  $f^{10}$  on the main rotating shaft B, the



said projection striking against a toe, 6, on the follower. The die *g* has a tubular hub or projection, *g'*, (shown best in Fig. 7,) which is slotted or cut away, as therein shown at 5, to receive the wire, the latter being fed into position to stand diametrically across the die-opening 4. Just before the cutter member *e'* is forced down to sever the wire located in its groove *e* and in the groove 2 of the member *e'*, the said wire, so laid and held across the said die-opening, is caught and held in place by the end of the punch *h*, to be described. The wire having been cut off to form a blank, *ll*, of sufficient length for the production of a fastener, *f*, the punch is further moved forward by its actuating devices, and is made to force a part of the said wire-blank into the die-opening 4, thus forming the shank 8, (see Fig. 2,) leaving beyond it and in the groove at the right of the die-opening, Fig. 7, a portion of wire to form the point 7 for the fastener, a portion of the wire of the blank between the punch and die on one side and the cutting mechanism on the other side being thereafter coiled about the punch, as will be described, to form the base 14. (See Fig. 2.) The punch *h*, made as a rod reduced at its front end and grooved at 9, (see Fig. 9,) has a collar, *h'*, fastened to its rear end. (See Fig. 6.) This collar has two small holes or openings, which receive two pins, *h<sup>2</sup>*, fixed in a second collar or sleeve, *h<sup>3</sup>*, having spanner-like projections *h<sup>4</sup>*, which are embraced by a notched part of the punch-moving lever, *h<sup>5</sup>*, pivoted at *h<sup>6</sup>* on an ear, *h<sup>7</sup>*, and having a roller or other stud, *h<sup>8</sup>*, which at the proper time is acted upon by the cam-surface *b<sup>4</sup>* of the pulley *B'*. The cam-surface *b<sup>4</sup>*, when operative, moves the punch forward to force the blank into the die-opening 4, and when the punch is to be withdrawn therefrom to permit the discharge of the fastener the cam or wiper *h<sup>10</sup>*, fast on the shaft *B*, becomes operative and strikes the roller or other stud, *h<sup>12</sup>*, also carried by the said lever *h<sup>5</sup>*. The punch has only a movement of reciprocation, but the wire-coiler *n* thereon is rotated continuously in one direction. The wire-coiler *n*, made as a sleeve and receiving the punch within it, has at its front end a shoulder or projection, 12, about one hundred and eighty degrees in length, and the rear end of the said wire-coiler, having a flange, 13, is extended through and takes its bearing in the sleeve *h<sup>3</sup>*, referred to, the said sleeve being chambered, as shown at 14, to receive the flange 13 of the wire-coiler *n*, such construction enabling the punch to be reciprocated within the wire-coiler without carrying the latter with it, and also permitting the wire-coiler to be rotated continuously about the punch.

The wire-coiler has splined upon it a gear, *n<sup>2</sup>*, which is driven by the gear *C*. The gear *n<sup>2</sup>* is restrained from lateral motion by the ends of the bearings *n<sup>3</sup>* *n<sup>3</sup>* for the wire-coiler. During the first part of the forward movement of the punch by the lever *h<sup>5</sup>* the punch is moved through the wire-coiler; but before the

punch reaches the end of its stroke in the die the collar *h'* meets the outer end of the wire-coiler, and it and the punch are moved forward together until the face of the projection 12, near its heel, acts upon the end of the wire at the right of the die-opening 4, and forces the same into the slot 5 of the hub *g'*, thus giving the proper set and direction to the point 7 of the fastener. The punch having forced the wire into the die, as stated, the end of the projection or shoulder 12 of the wire-coiler, in the rotation of the latter in the direction of the arrow thereon, Fig. 8, strikes the portion of the blank at the left of the die-opening and coils the wire of the blank about the punch, between the end of the wire-coiler and the end of the hub *g'* of the die *g*, the part of the blank so coiled forming the base 14 of the fastener, (see Fig. 2,) and then the wire-coiler and punch are retracted together by the lever *h<sup>5</sup>* until the punch is withdrawn from the die, and thereafter the punch is drawn back into the wire-coiler, thus discharging the fastener from the punch, it falling therefrom, preferably into a spout, 15. (Shown by dotted lines, Fig. 1.) At the commencement of the backward movement of the punch and wire-coiler the said parts are in the relation to each other shown in Fig. 6. The lever *h<sup>5</sup>*, embracing the projections *h<sup>4</sup>* of the sleeve *h<sup>3</sup>*, starts the punch backward, and the wire-coiler moves with it, owing to the friction between the two; but as soon as the spline 18, connected with the wire-coiler, meets the end of one of the bearings *n<sup>3</sup>* at the side of the gear *n<sup>2</sup>* the said wire-coiler is stopped, but the backward movement of the punch by the lever *h<sup>5</sup>* is continued until the punch is withdrawn or retracted into the wire-coiler far enough to effect the discharge of the fastener from the punch, the fastener dropping into a chute, as described.

I do not desire to limit my invention to the exact form of wire feeding and cutting mechanism, and instead of the said parts I may use any well-known equivalents; but in practice I prefer the particular parts herein shown. The groove 9 is made in but one side of the punch *b*, and in practice it falls opposite the recess 24 made in the hub *g'* of the die *g* opposite the groove 5. The wall of the said hub at this point forms a rest for that part of the wire of the blank at the junction of the base 14 and shank 8. The hub *g'* not being cut through at 24 to the same depth as at 5 enables the bend between the base and shank to be made in one plane, and the bend between the point and shank to be made in another plane, so as to enable the point 7 to project laterally above the base.

The cutting mechanism, when severing the wire, cuts the same at an inclination, thus sharpening or bending the point 7.

I claim—

1. The die provided with the hub *g'*, and the longitudinal reciprocating punch, in combination with a wire-coiling device having a



rotary movement to bend the wire into a coil to form the base of the fastener, as shown and described.

2. The die *g*, provided with the hub or projection *g'*, slotted, as shown, in combination with the punch and concentric wire-coiler, and means to operate the same, substantially as described.

3. The die and the punch and its connected sleeve and collar, in combination with the wire-coiler having a head at one end and placed between the said sleeve and collar, substantially as described.

4. The cutter member *e*<sup>2</sup>, provided with a central opening and a cross-groove, 2, combined with a reciprocating cutter member, *e'*, pro-

vided with an annular groove, *e*, and with means, substantially as described, to operate the said parts to sever the wire placed in position between them.

5. The die having the hub provided with the groove 5 and recess 24, combined with the punch grooved at 9, to operate substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY N. HEMINGWAY.

Witnesses:

G. W. GREGORY,

B. J. NOYES.