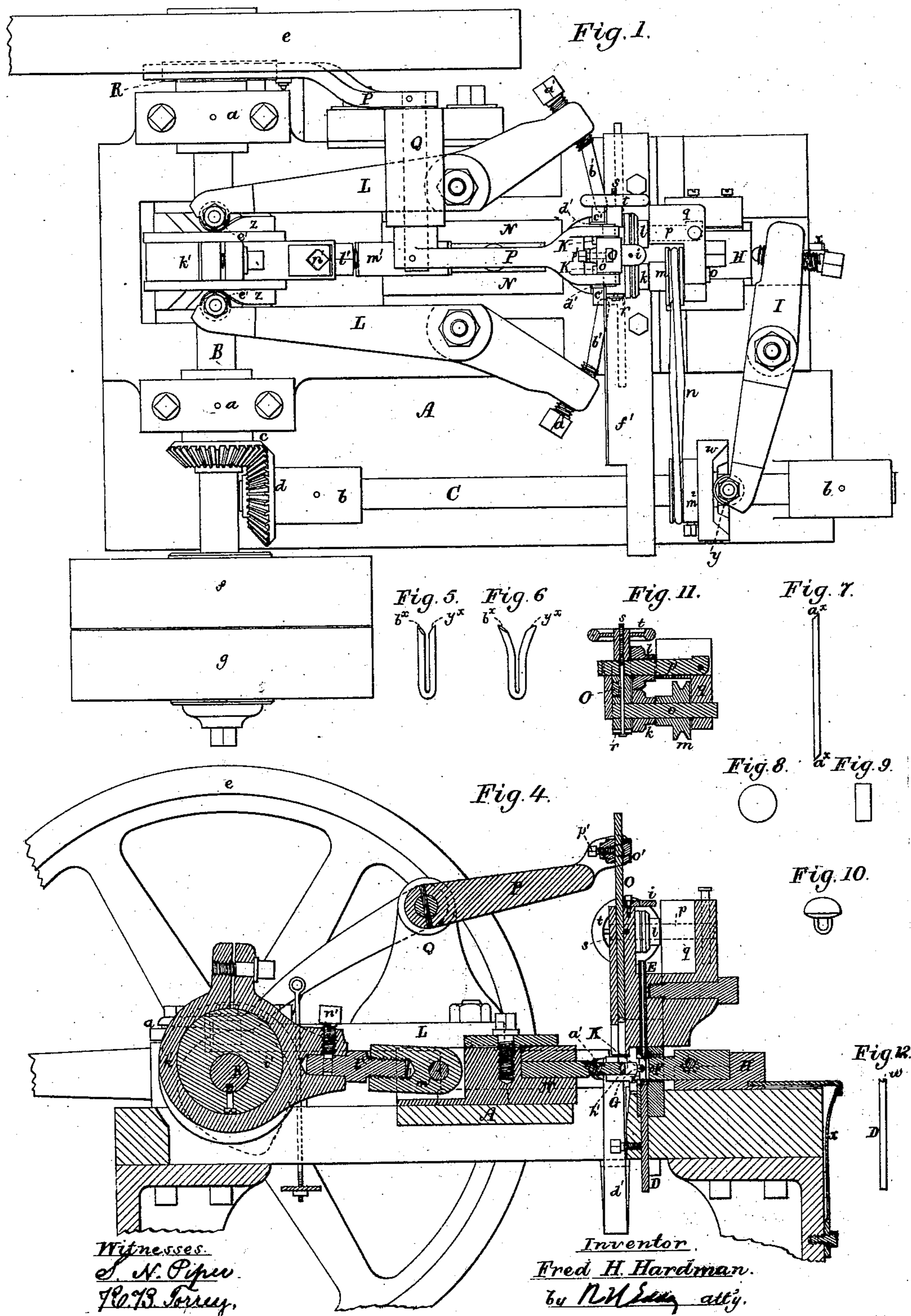


3 Sheets—Sheet 1

MACHINE FOR MAKING SHOE BUTTONS.

Patented Dec. 7, 1886.



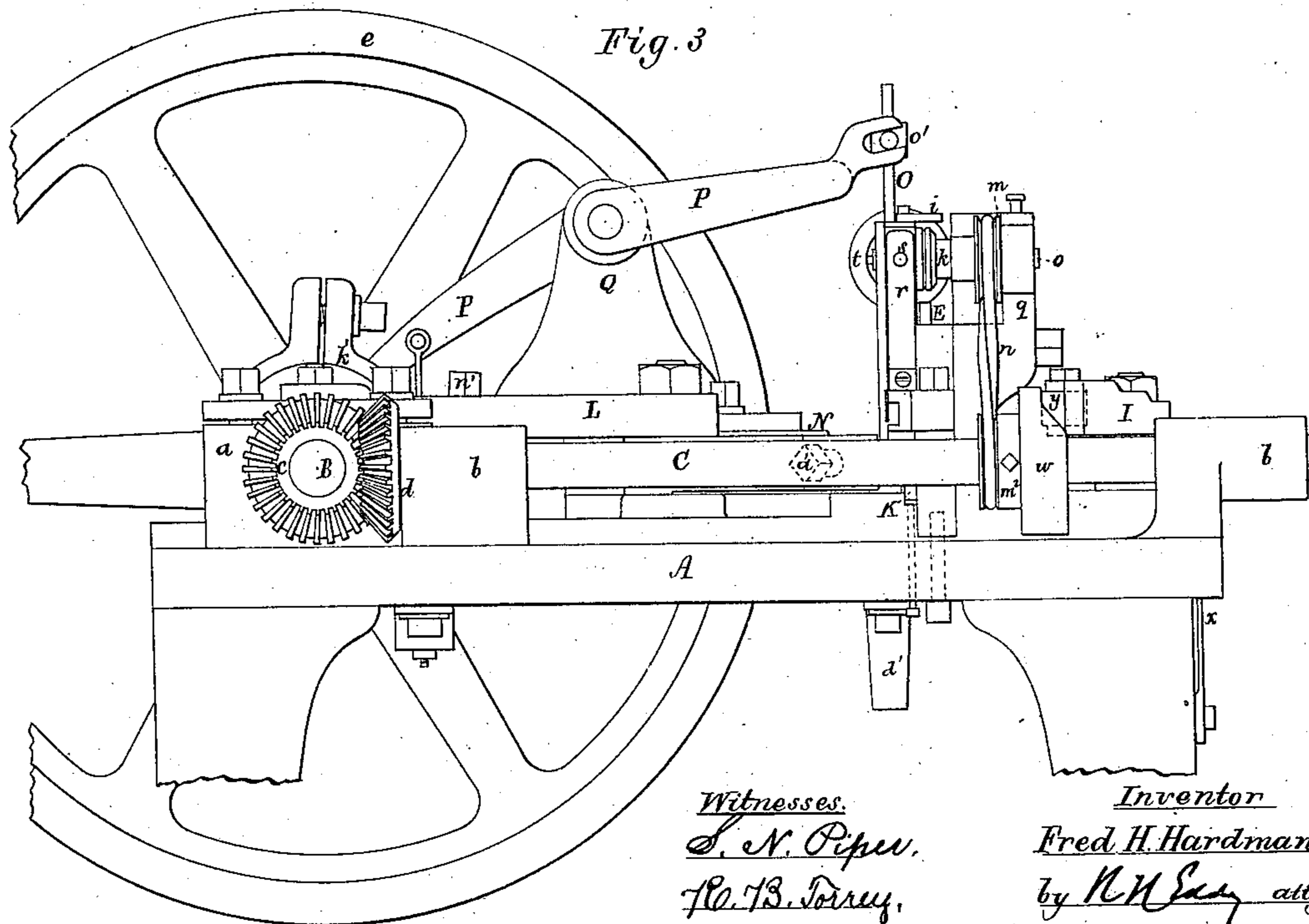
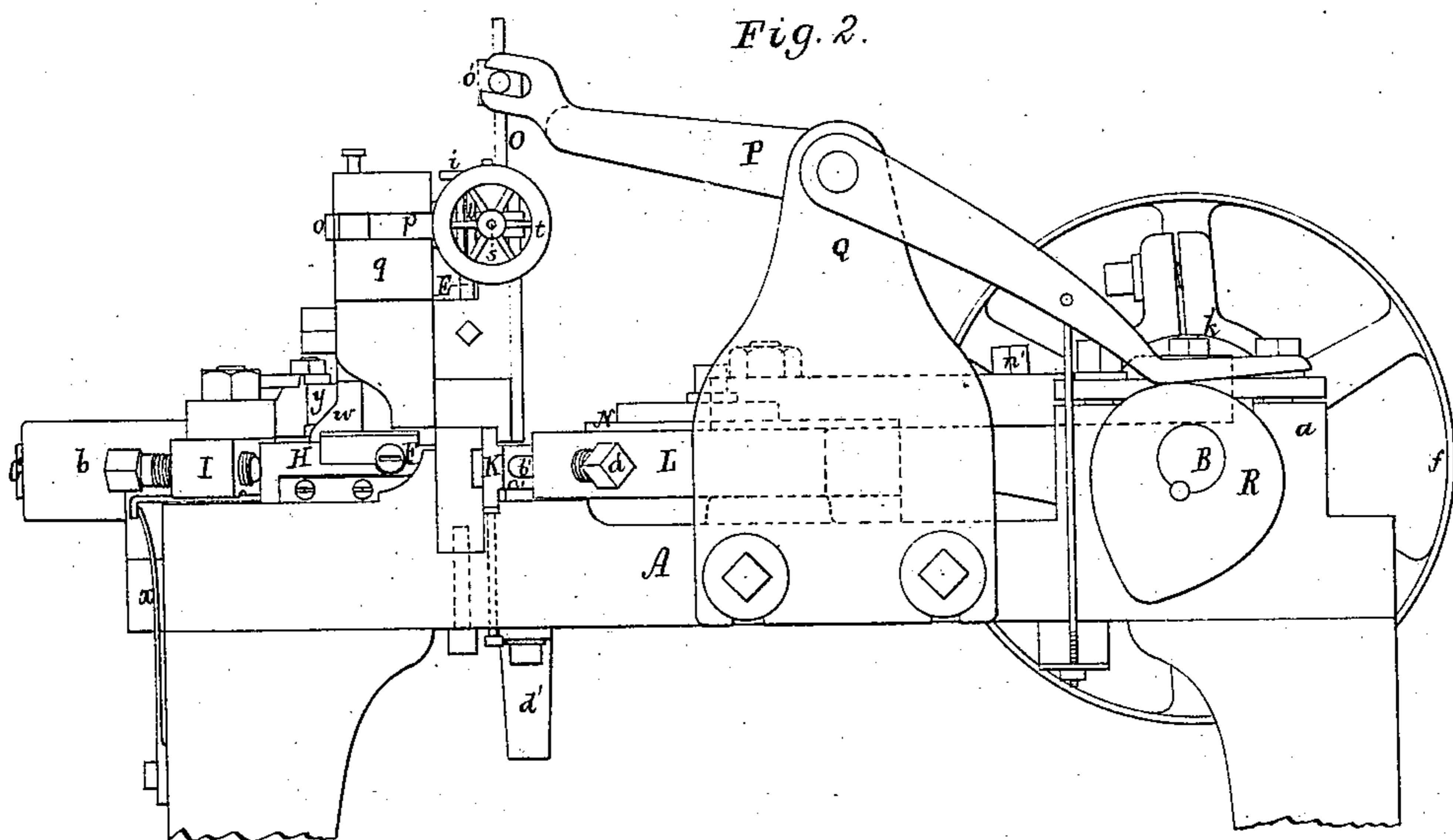
(No Model.)

3 Sheets—Sheet 2.

F. H. HARDMAN.
MACHINE FOR MAKING SHOE BUTTONS.

No. 353,677.

Patented Dec. 7, 1886.



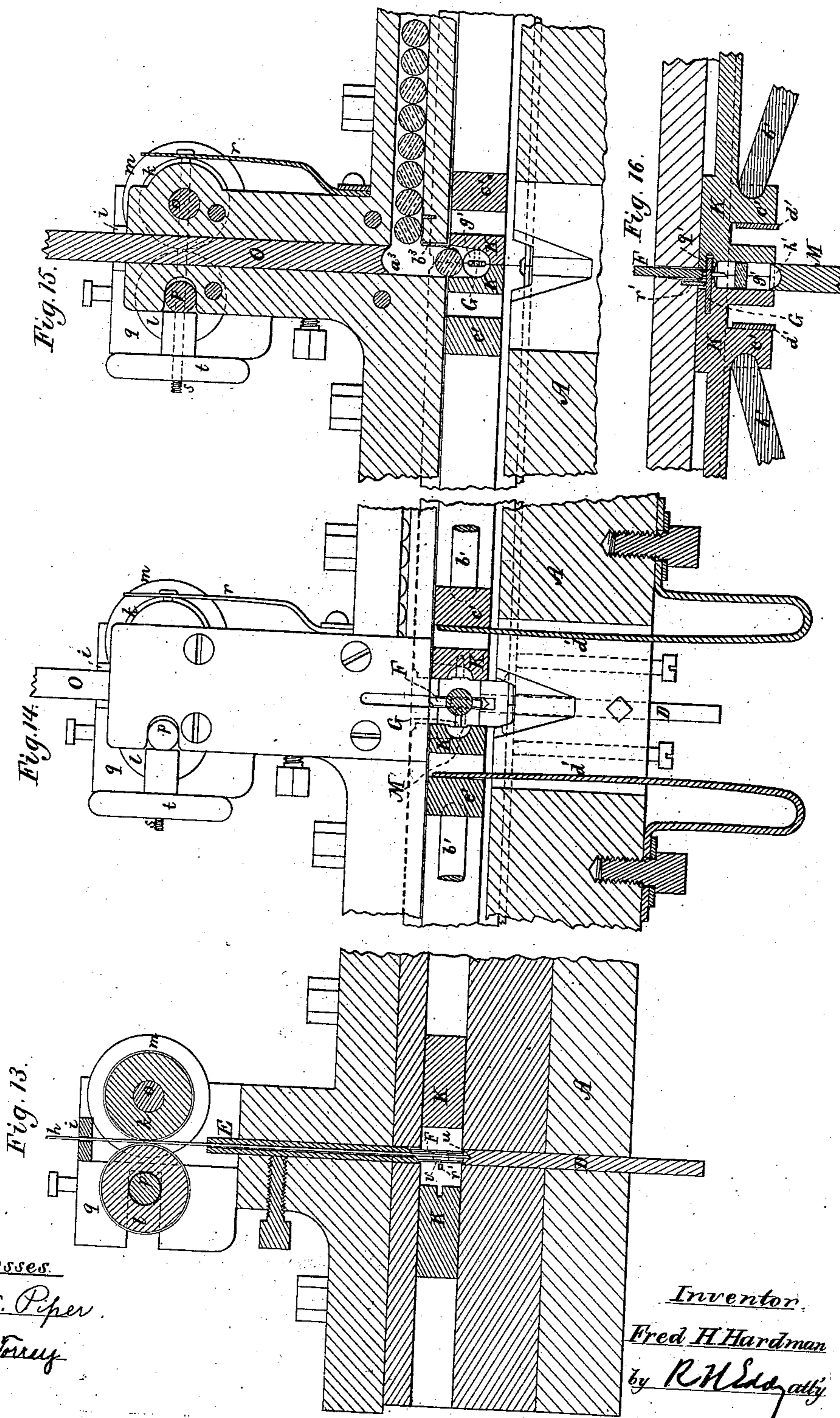
Witnesses:
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Inventor
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(No Model.)

3 Sheets—Sheet 3.

F. H. HARDMAN.
MACHINE FOR MAKING SHOE BUTTONS.
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UNITED STATES PATENT OFFICE.

FRED HOLKER HARDMAN, OF TAUNTON, MASSACHUSETTS.

MACHINE FOR MAKING SHOE-BUTTONS.

SPECIFICATION forming part of Letters Patent No. 353,677, dated December 7, 1886.

Application filed August 30, 1886. Serial No. 212,156. (No model.)

To all whom it may concern:

Be it known that I, FRED HOLKER HARDMAN, of Taunton, in the county of Bristol, of the Commonwealth of Massachusetts, have invented a new and useful Improvement in Machinery for Making Shoe-Buttons; and I do hereby declare the same to be described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a top view, and Figs. 2 and 3 opposite end elevations, of a machine embodying my invention, the nature of which is defined in the claims hereinafter presented. Fig. 4 is a longitudinal and vertical section of it, taken through the button-head former. Fig. 5 is a perspective view, on an enlarged scale, of a button-eye as formed by this machine, while Fig. 6 is a similar perspective view of it, showing the form it takes while in the head of the button. Fig. 7 is a side view of a piece of the wire, showing the manner in which it is cut obliquely to form, on being subsequently bent in the shape of a staple, each button-eye with its legs wedge-shaped at their ends and with the slant or obliquity of one standing in a direction opposite to that of the other. Fig. 8 is a side view, and Fig. 9 an edge view, of a button-head blank, of leather-board or other suitable material. Fig. 10 is a side view of a finished button. Fig. 11 is a horizontal section of the feed-rollers and parts immediately adjacent thereto. Fig. 12 is a side view of the abutment D, into which the wire descends. Fig. 13 is a transverse section of the machine, taken through the feed-rollers. Fig. 14 is a vertical and transverse section of the machine, taken through the springs that force apart the jaws K, hereinafter described, such section showing such jaws. Fig. 15 is another such section taken through the button-head, blank passage or raceway, and the plunger thereof. Fig. 16 is a horizontal section of the jaws K, it being taken through the pin G.

The machine on which my improvement or invention is based is for reducing wire into button-eyes in the form of a staple, and for pressing each into a head, and at the same time imparting form to such head. The main characteristics of such a machine are mechanism for intermittently feeding the wire to a

stop or abutment, mechanism for separating from the strip of wire a piece of it of sufficient length for an eye, mechanism for bending such eye into the form of a staple, mechanism for grasping and holding the eye after such formation of it, mechanism for guiding and feeding the head-blanks into the machine, and mechanism for forcing each of such blanks upon an eye, so as to give form to the blank, and at the same time effect the passage of the legs of the eye into it, the said blank.

Before proceeding to a further explanation of my improved or new machine, it may be remarked that one distinguishing feature of it is its mechanism for cutting the wire obliquely to its axis rather than square thereto, and bending it in the plane of the conjugate axes of its terminal ellipses, such oblique cuts being shown at a^x in Fig. 7. On each piece or eye-blank being subsequently bent around in the form of a staple, the obliquity of one end of it will stand the opposite way of that of the other, as will be seen by inspection of Fig. 5, wherein the obliquities or faces of cut are shown at b^x and y^x . While the button-head is being forced upon the two legs of the eye, the said obliquities cause the said legs to turn or be bent or to diverge opposite ways, as shown in Fig. 6, whereby each leg becomes, to a certain extent, hooked within the head, and as a consequence the eye is held with great firmness within such head.

The obliquity at each end of the eye is elliptical in shape, and the wire composing the eye is bent by the machine in the plane of the conjugate axes of the two ellipses. Were the wire bent in the plane of the transverse axes of the two ellipses both obliquities would stand in the same direction, and of course the legs of the eye in passing into a button-head would not spread or be deflected in opposite ways, but would be in the same way.

Besides the characteristics as hereinbefore mentioned, my said machine is provided with means of expelling from it each button after its completion therein, as explained.

In the drawings, A denotes the bed-plate of the machine, such plate being provided with a main shaft, B, and an auxiliary shaft, C, they being duly journaled in boxes or bearings a a and b b . A bevel-gear, c , fixed on the main

shaft, engages with a similar gear, *d*, fastened on the auxiliary shaft, which stands at right angles to the main shaft. At one end of the main shaft there is a fly-wheel, *e*, and at the other, or thereabout, there is a fast pulley, *f*, and a loose pulley, *g*.

The wire for the formation of the button-eyes is shown at *h* as going through a stationary guide, *i*, and thence between two feed-rollers, *k* *l*, on the shaft *o*, one of which is a grooved pulley, *m*, about which, and another such pulley, *m*², on the shaft *C*, an endless-crossed belt, *n*, works. The shaft *p* of the other roller is pivoted at one end to a standard or post, *q*, in order that such shaft may be turned or swung outwardly horizontally. The roller *l* turns freely on its shaft *p*, through which and a spring, *r*, fixed to the post, a headed screw, *s*, extends, and has screwed upon it a hand-nut, *t*. By revolving the said nut the grip of the feed-rollers on the wire may be increased or diminished, as occasion may require. In descending, the wire at its lower end will be forced into contact with and arrested by a stop or abutment, *D*, which has in it an angular recess, *u*, as shown in Fig. 13, such recess being to centralize the wire and to stop it in its descent. On the wire being stopped by the abutment the feed-rollers will continue to revolve, but will slip on the wire and will not again move it until after a piece may have been separated from the wire and converted into a button-eye and inserted in a button-head. Before entering the said recess the wire passes through a stationary tubular guide, *E*, whose lower end is oblique or inclined, as represented, it being to operate with a cutter, *F*, properly formed for it, while being moved underneath or across the said guide, to cut the wire obliquely to its axis, as hereinbefore mentioned. Each eye-blank severed from the wire has its ends wedge-shaped, as shown. The said cutter *F* not only performs the function of removing a blank from the strip of wire, but that of bending the said blank at its middle around a pin, *G*, arranged horizontally, the wire being, by a curved notch, *v*, in the cutter, bent into the form of a staple. The cutter projects from and is attached to a slide, *H*, adapted to move rectilinearly. It is impelled forward by a lever, *I*, which is moved one way by a cam, *w*, fixed on the shaft *C*. A spring, *x*, properly applied to the bed-plate and the slide *H*, serves to retract the slide, and to keep a friction-roller, *y*, on the lever against the cam *w*.

After the blank has been bent, as described, two jaws, *K K*, are advanced horizontally toward and grasp it between them, leaving extending from them sufficient portions of the legs of the eye to enter a button-head blank. (See Fig. 16.) The jaws slide horizontally, and are forced toward each other by two levers, *L*, arranged as represented, and actuated by cams *z*, fixed on the driving-shaft. Each lever *L* has in its arm that is next the jaws a screw, *a*, that screws through the arm and receives in a

socket at its end a pitman, *b*, extending from the screw into a projection, *c*, from the jaw. Each jaw is provided with a spring, *d*, for moving it backward and keeping the friction-roller *e* in the lever *L* against the cam *z*.

The button-head blanks, being short cylinders of leather-board, are forced successively by suitable mechanism into a guide-path or raceway, *f*, arranged above and extending over one of the jaws, the innermost blank passing into a cylindrical chamber, *g*, arranged or formed in the two jaws. Extending within this chamber is the header *M*, in whose inner end is a cup-shaped recess or concavity, *h*. After the eye has been seized by the jaws, the header is advanced, and not only forces a head-blank upon the legs of the eye, but imparts to the said blank a semi-globular form, or an approximation thereto.

The header *M* is fixed in a carrier, *N*, which is operated by an eccentric, *i*, carried by the driving or main shaft, such carrier being adapted to slide rectilinearly back and forth. It is connected with the eccentric by a collar, *k*, thereon, a revoluble screw, *l*, and a joint-piece, *m*, the latter being jointed, as shown, to the carrier. The screw screws into the joint-piece, and is revoluble within the collar, and is held thereto by a set-screw, *n*, all being as represented in Fig. 4.

The button-head-blank plunger is shown at *O*, it being reciprocated or moved vertically, as occasion may require, by a lever, *P*, which, fulcrumed in a post, *Q*, is properly jointed to the plunger and bears upon a cam, *R*, fixed on the main shaft. This plunger, arranged as shown, is adapted to slide vertically and is adjustable in a carrier, *s*, which is jointed to the lever and provided with a set-screw, *p*, for holding the plunger in position. At the lower part of the groove *a*, in which the plunger works, there is a spring, *b*, which holds the head-blank, so that it shall not fall out of the raceway before the jaws are ready to receive such blank.

The pin *G* projects from and is carried by one of the jaws *K*, and enters a recess or hole, *q*, in the other jaw, when the jaws are moved toward each other, they holding the pin firmly while the eye-blank is being bent around it, after which they close upon the eye and hold it securely while the button-head blank is being forced upon it, the said eye. Next the jaws move apart, so as to draw the pin *G* out of the button-eye, and the header retreats. In moving backward through the button-eye the pin *G* draws the eye against a stationary stud or pin, *r*, which extends from the part in which the jaws slide. This stud or pin *r* serves to hold the button until the pin *G* is drawn out of the eye. On the pin passing out of the eye, the button is free to fall or drop out of the machine.

I would observe that I do not claim a button-making machine in which each of the pieces to form the eyes of the buttons is cut from a strip of wire at right angles to its axis,

and subsequently bent around in the form of a staple having each leg curved outwardly in the plane of the axis of the piece, all being essentially as described and represented in the

5 United States Patent No. 244,310.

I claim as of my invention—

1. The combination of one movable jaw K and the pin G, carried thereby, and the other movable jaw K, having the recess or hole to receive the said pin, with the cutter F, provided with the wire-bending notch *v*, and with the header M, having in it the cup-shaped recess *h'*, as described, such jaws, cutter, and header being provided with mechanism for
10 operating them, substantially as set forth.

2. The combination of the movable jaws K K, having to one the pin G and to the other the recess *q'*, for its reception, the stationary tubular guide E, having its lower end oblique
20 or inclined, as represented, the cutter F, hav-

ing the wire-bending notch *v*, and formed to operate with such lower end of such guide so as to cut the wire obliquely, and the header M, having the cup-shaped recess *h'*, as described, such jaws, cutter, and header being
25 provided with mechanism for operating them, substantially as set forth.

3. The combination of the stop or abutment D, having in its upper end the wire centralizing angular recess *u*, as represented, with
30 the feed-rollers *kl*, stationary tubular guide E, movable wire cutter and bender F, pin G, and the jaws K K, such feed-rollers, cutter and bender, and jaws being provided with mechanism for operating them, substantially as set
35 forth.

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Witnesses:

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R. B. TORREY.