(No Model.) 5 Sheets—Sheet 1.

C. L. OLDS & J. EKLUND.

BUTTON FASTENING MACHINE.

No. 368,419. Patented Aug. 16, 1887.

Fig. 1.

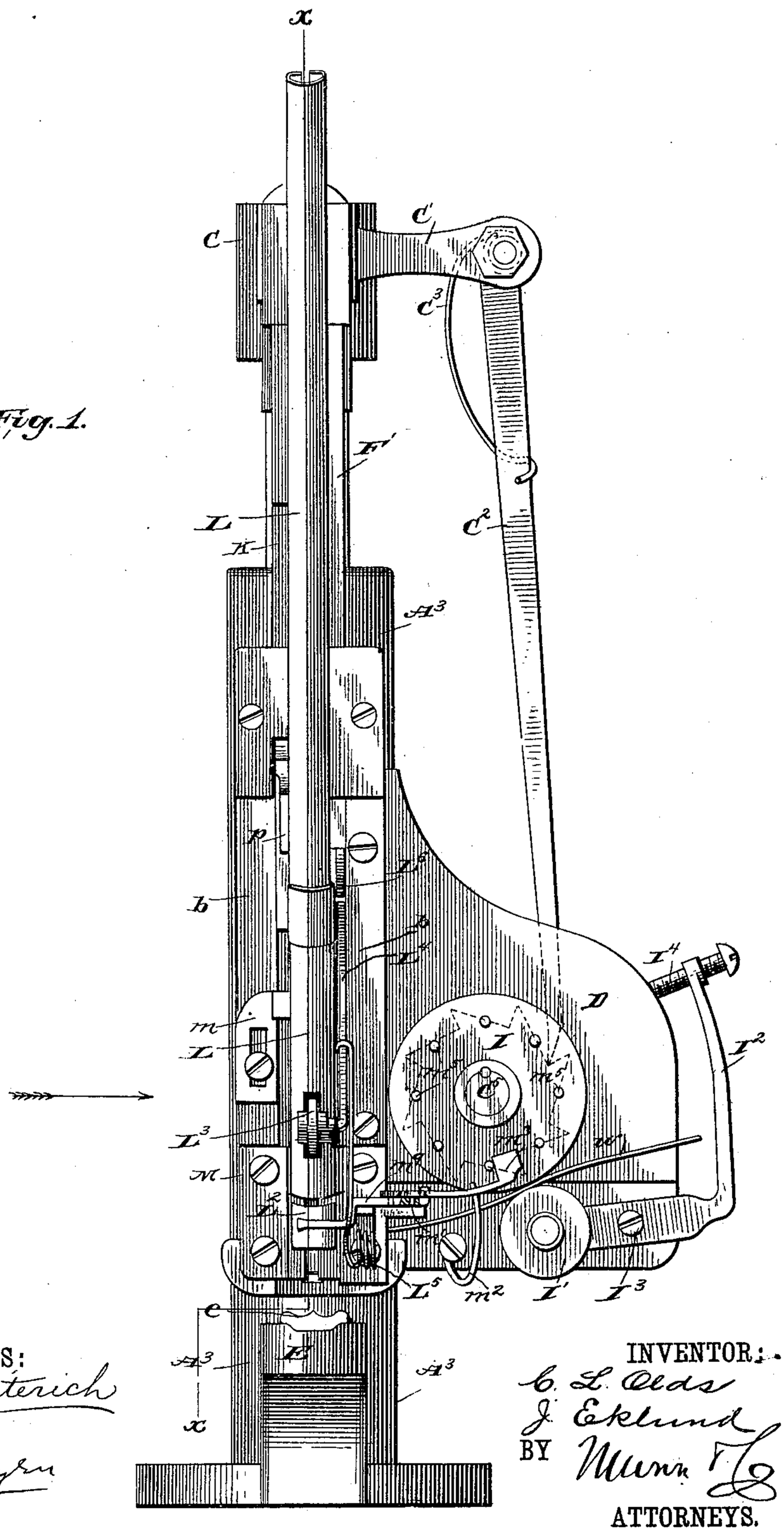

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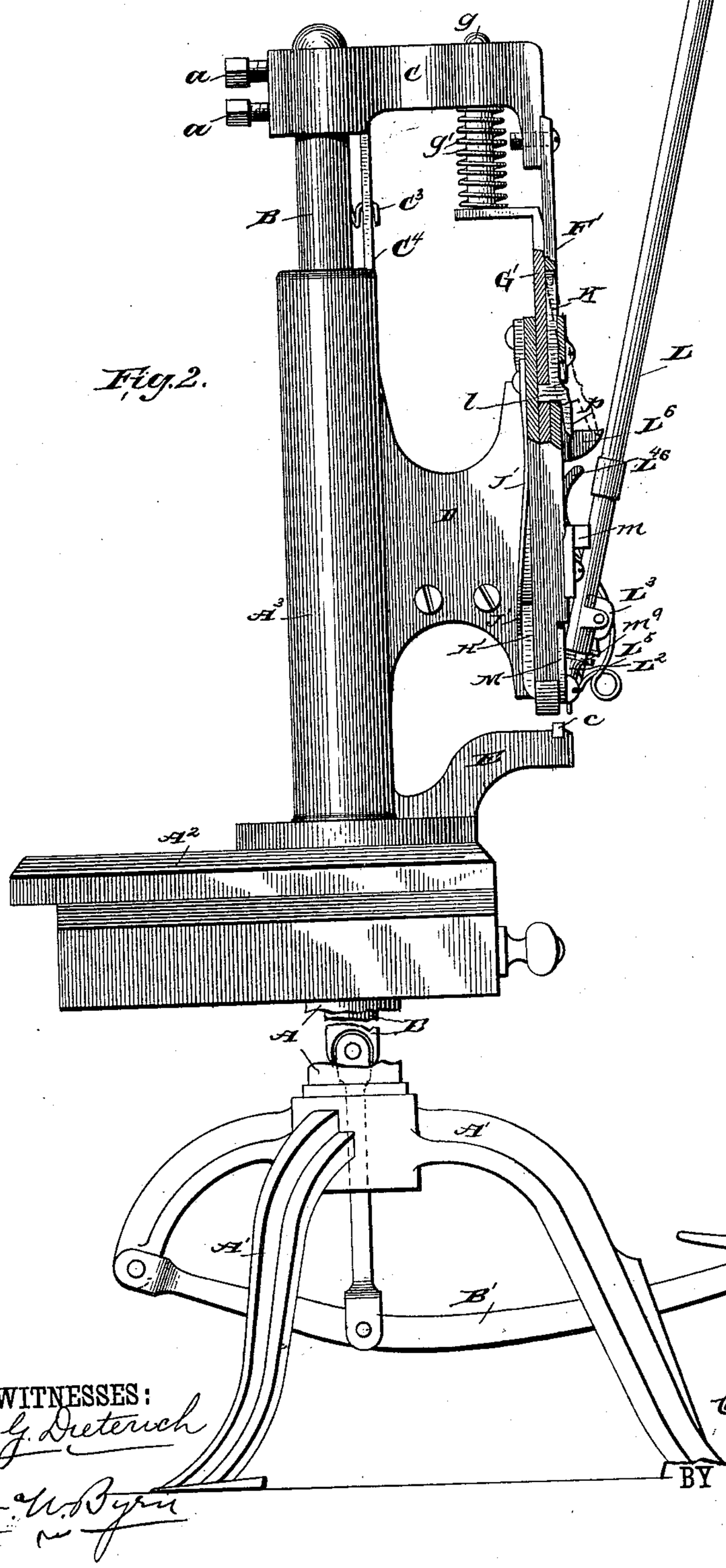
Fig. 2.



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BUTTON FASTENING MACHINE.

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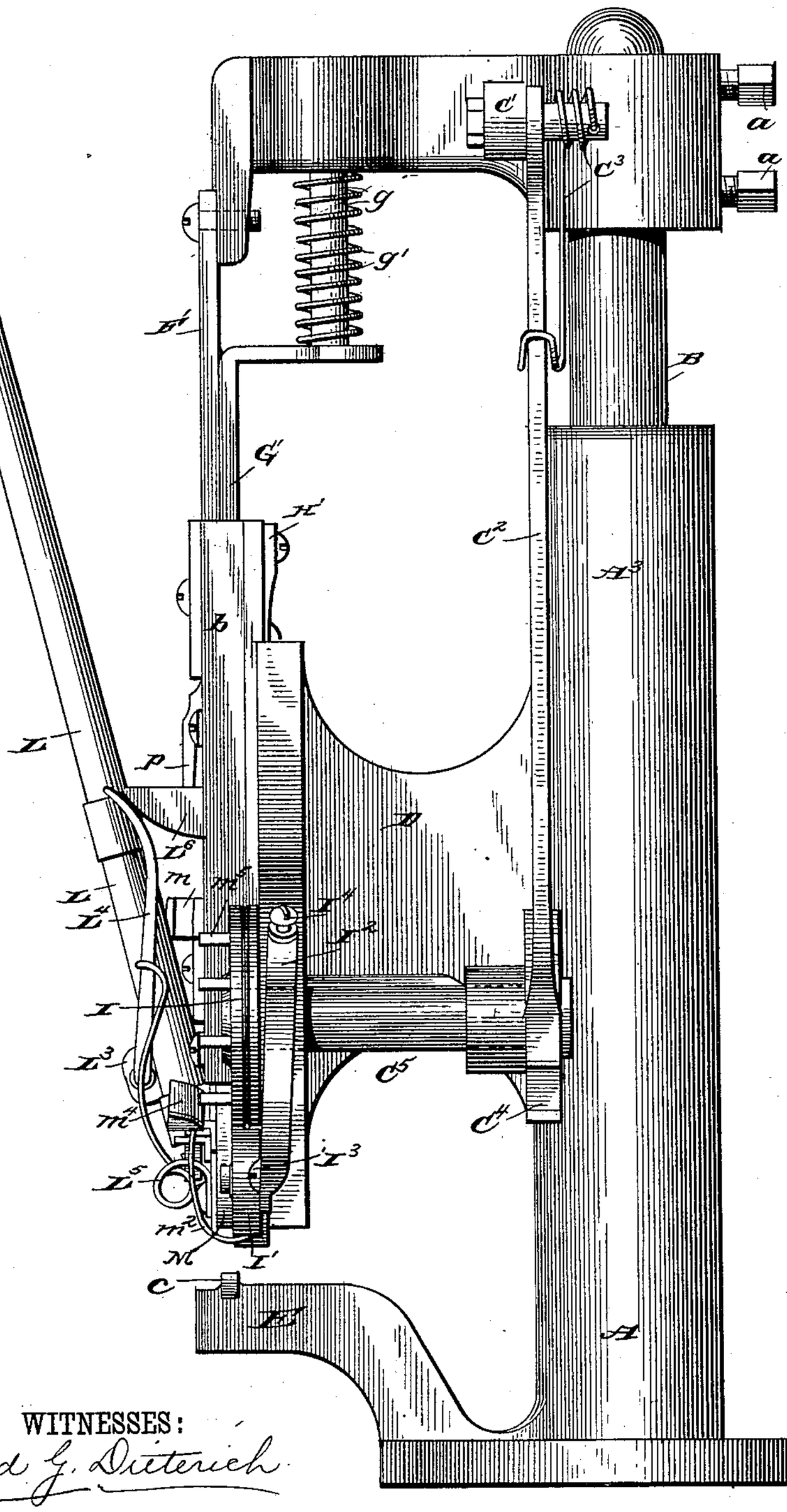

Fig. 3.

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BUTTON FASTENING MACHINE.

No. 368,419. Patented Aug. 16, 1887,

Fig. 4.

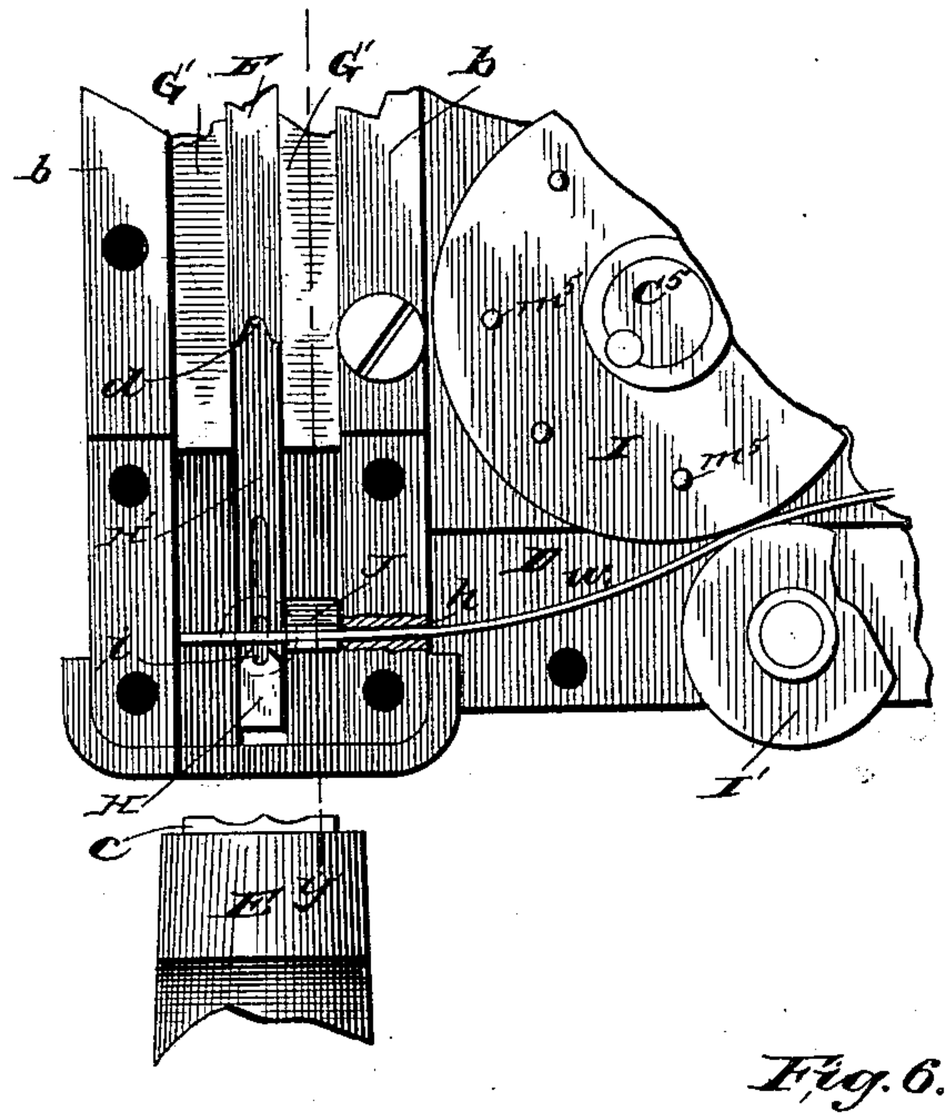


Fig. 5.

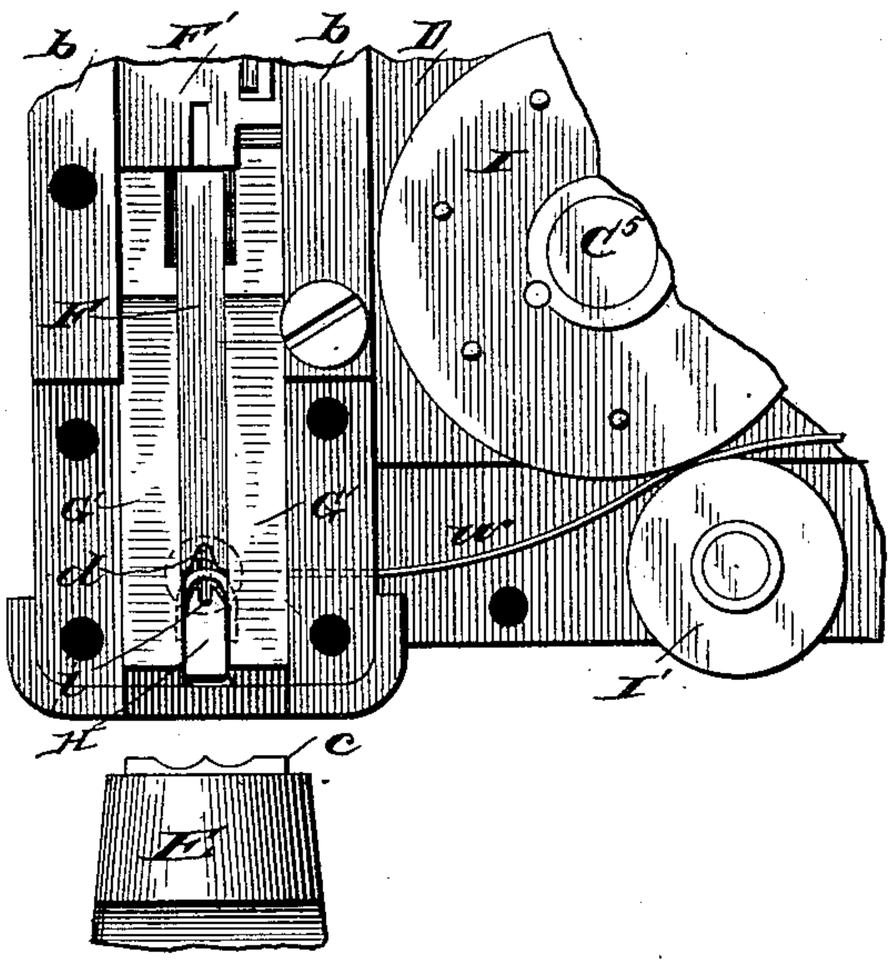
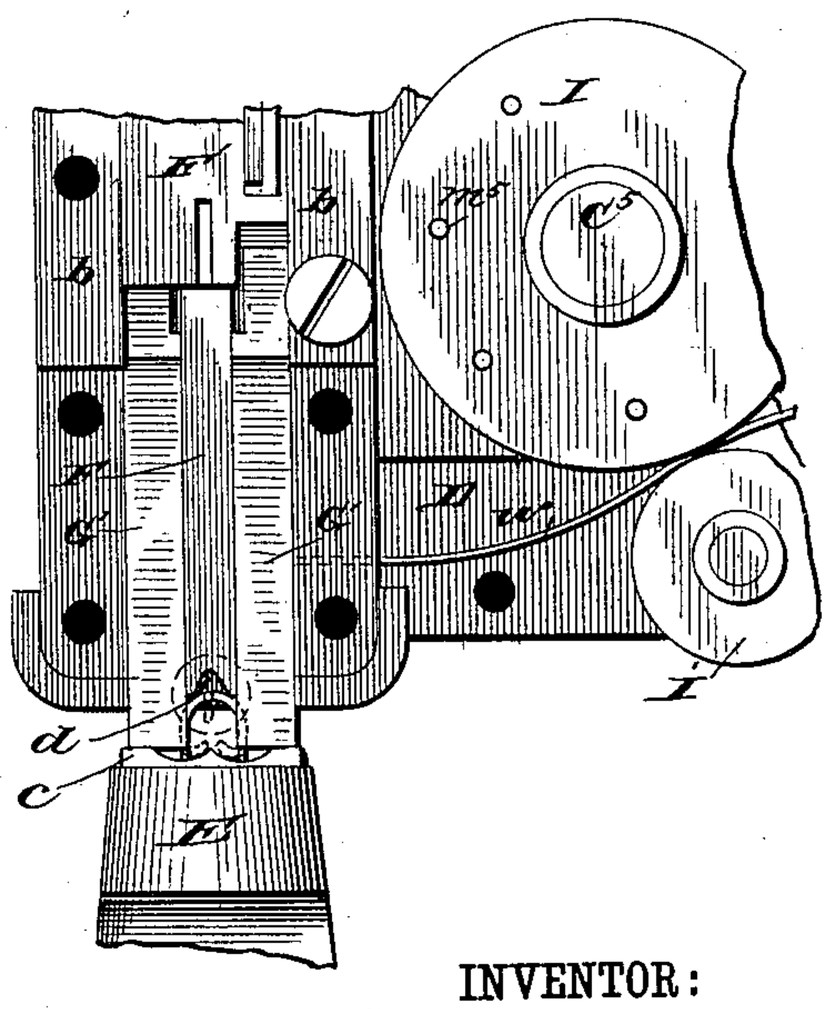


Fig. 6.



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BUTTON FASTENING MACHINE.

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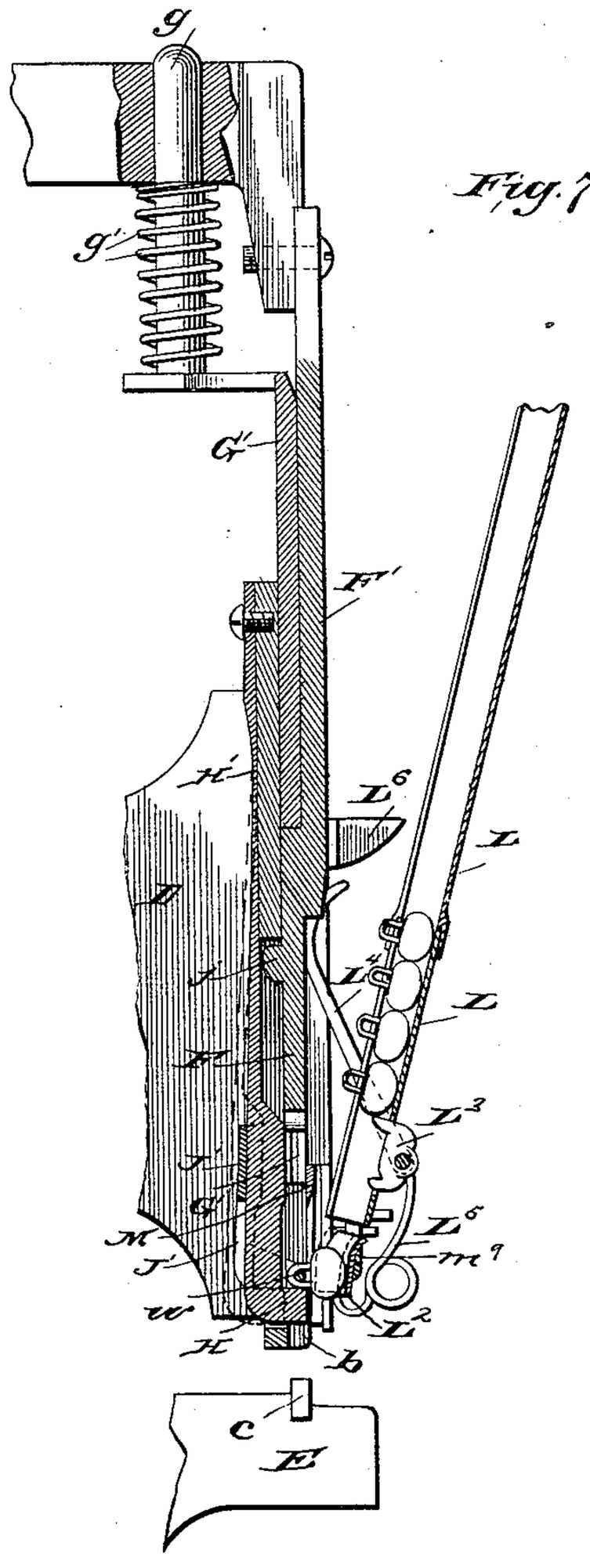

Fig. 7.

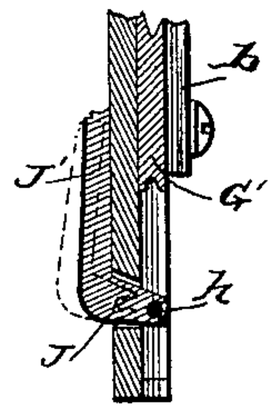

Fig. 8.

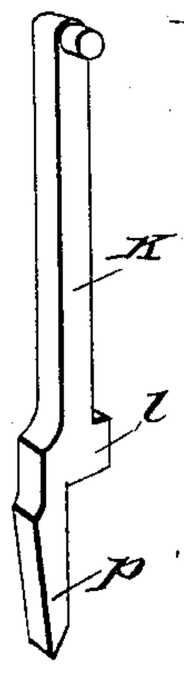

Fig. 9.

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UNITED STATES PATENT OFFICE.

CHARLES LESTER OLDS AND JOHN EKLUND, OF ST. JOSEPH, MICHIGAN.

BUTTON-FASTENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 368,419, dated August 16, 1887.

Application filed May 28, 1887. Serial No. 239,640. (No model.)

To all whom it may concern:

Be it known that we, CHARLES LESTER OLDS and JOHN EKLUND, of St. Joseph, in the county of Berrien and State of Michigan, have invented a new and useful Improvement in Button-Fastening Machines, of which the following is a specification.

The object of our invention is to provide a machine for fastening buttons upon shoes which shall in one operation form the staple from a continuous wire, pass it through the eye of the button, and clinch it in the leather, the order of the operations being to thread the continuous wire through the eye of the button, cut it off the proper length, bend it into a staple, and then drive this staple through the leather and clinch it therein, so as to securely attach the button; and our invention consists in the peculiar construction and arrangement of parts for carrying out these successive steps, which we will now proceed to describe with reference to the drawings, in which—

Figure 1 is a front elevation of the upper portion of the machine. Fig. 2 is a side elevation on a smaller scale, with the standard A broken away. Fig. 3 is a side elevation from the opposite side to that shown in Fig. 2, the view being on the same scale as that given in Fig. 1. Figs. 4, 5, and 6 are detail views of the cutting, bending, and setting bars, showing the successive positions of these parts. Fig. 7 is a vertical section taken through line *x x* of Fig. 1, looking in the direction of the arrow. Fig. 8 is a section through line *y y* of Fig. 4, and Fig. 9 is a perspective detail of locking-bar K.

The machine-frame (see Fig. 2) consists of a hollow standard, A, with feet A′ at the bottom, a table, A^2, above, a hollow flanged section, A^3, of the standard continued above the table and screwed or bolted to a screw-collar on the lower section of the standard, so as to clamp the table between them. Within the hollow standard there plays a vertically-reciprocating rod, B, which is held up by a spiral spring within the standard, as usual, and is depressed by a treadle-lever, B′, which is jointed to a pull-rod connected to the lower end of said rod, and is fulcrumed to an offset at the lower part of the standard. At the upper end of the rod B, where it projects above the upper section of the hollow standard, there is attached to it by clamp-screws *a* a short horizontal arm, C. This arm carries a vertically-reciprocating bar which cuts and bends the staple, and also carries a vertically-reciprocating bar which sets and clinches the staple.

On the front side of the upper section of the hollow standard is formed an offsetting frame, D, Figs. 1 and 3, having guides *b b*, in which reciprocate vertically the cutting and bending bar and also the setting-bar. Offsetting from the lower portion of this upper section of the standard is a rigid foot, E, bearing a steel anvil-plate, *c*, having two concavities to receive the lower ends of the staple and give them the necessary inward turn to clinch. This anvil-plate occupies a position immediately below the setting-bar.

F F′, Figs. 4, 5, 6, 7, is the setting-bar, and G′ G′ is the cutting and bending bar. The upper portion, F′, of the setting-bar, which is attached to arm C, is made broad and fits in the guides *b b*, while the lower portion, F, is made much narrower and fits between the two branches G′ G′ of the cutting and bending bar. The lower end of the setting-bar F is made with an arched recess, *d*, to receive the eye of the button and bear against the wire section on each side in setting the staple. The cutting and bending bar G′ G′ lies just back of the bar F′ and in the same plane with the lower setting-section, F. The upper end G′ of this cutting and bending bar is (see Fig. 7) bent horizontally and provided with a vertical stud, *g*, which passes through a hole in the arm C and has a spiral spring, *g′*, surrounding it and interposed between the bent end and the arm, so that at a certain period in its downward movement the downward stress of arm C will exert a spring-pressure on the cutting and bending bar. The lower end of this cutting and bending bar is, as before stated, branched, (see Figs. 4 to 6,) and the lower ends of its branches are grooved to receive the wire and hold it while being bent around the former H. The wire *w* is fed between a large grooved roller, I, and a smaller roller, I′, Figs. 1, 4, 5, 6, by feed mechanism hereinafter described, and it passes through a hole, *h*, Fig. 4, in the side of the guide-frame, and when it extends a sufficient distance over the

former H a section of this wire is cut off by the sharp edge of one of the branches G′ of the cutting and bending bar, (see Fig. 4,) and the two branches G′ G′ then bend this section of wire down on opposite sides of the former H to make the staple. (See Figs. 5 and 6.) Inasmuch, however, as the wire is to be threaded through the eye of the button before this bending is done, it is necessary to provide some sort of a wire-guide to bridge the space from the hole *h* in the frame to the eye of the button, and this wire-guide must also immediately move out of the way to allow the cutting branch G′ of the cutter and bender to descend. For this purpose a hole is made through the guide-frame just back of the path of the wire and between the hole *h* and the former H. A piece of steel, J, Figs. 4 and 8, with an inclined upper surface and a groove in its front end, plays in horizontal direction through this hole, as shown in dotted lines, Fig. 8. This wire-guide J is formed on the lower end of a spring, J′, Figs. 2 and 8, secured to the back of the guide-frame, and the groove in its front edge makes a continuous channel for the wire to pass from its hole *h* along said groove and through the eye of the button, whose position is shown by the dotted circle in Fig. 4. Then when the branches G′ G′ of the cutter and bender descend, the branch next to the feed-wheel of the wire first strikes the inclined upper surface of the wire-guide J and forces it back against the spring, and said branch in passing the hole *h* also cuts off the wire. The cut wire section is now resting through the eye of the button, which eye is seated horizontally in a little notch, *i*, in the top of the former, and the wire projecting equally on both sides of the former is caught by the ends G′ G′ of the still descending bar, and its ends bent downwardly around the former, forming a staple in the eye, as shown in Fig. 5. The former itself must now get out of the way and the setting-bar descend to drive the staple (with attached button) through the leather article on the foot. For this purpose the former H is also made to play laterally in a hole in the frame, and is mounted upon the lower end of a spring, H′, Fig. 7, attached to the back of the frame. A cam, *j*, is also formed on the back of the setting-bar, which at a certain point in the descent of said bar strikes the spring-bar of the former and forces the latter back, as shown in dotted lines, Fig. 7, so that the button and staple can pass downwardly to be set. Immediately following this action (shown in Fig. 5) the lower recessed edge of the setting-bar strikes the button-eye and staple and carries it down, driving the ends of the staple through the leather and clinching the ends of the staple in the concavities in the anvil-plate on the foot, as shown in Fig. 6. In carrying out this result the cutting and bending bar G′ G′ and the setting-bar F F′ move together through the first period of their stroke as one bar. When, however, the cutting and bending bar has done its work and reached the end of its stroke, (resting upon the anvil-plate,) the setting-bar then continues its descent, moving independently of the cutting and bending bar for the purpose of setting and clinching the button and completing the work. For this purpose these two bars are connected by a lock-bar, K, Figs. 2 and 9, pivoted at its upper end to the upper section, F′, of the setting-bar, and having a lug, *l*, that passes through into a notch in the cutting and bending bar G′. As long as so engaged they move as one; but at a certain point in their descent above described an inclined projection, *p*, on said lock-bar rides upon a stationary bearing-surface, *m*, Fig. 2, on the frame, and this pulls out the lug from the recess in the cutting and bending bar, as shown in dotted lines, and the latter being now disconnected, it cushions on the anvil below from the effect of the spiral spring *g*′, while the setting-bar continues its descent, and by a positive setting action completes its work, as shown in Fig. 6.

Attached to the arm C of the machine is a side arm, C′, Figs. 1 and 3, bearing a long downwardly-projecting pawl, C^2, which is held by a spring, C^3, against a ratchet-wheel, C^4, rigidly fixed on the end of a short horizontal shaft, C^5, which is journaled in the frame-work, and has rigidly attached to it on the front of the machine the wire feed-roller I. To regulate the tension on the wire passing between this roller I and its mate I′, the latter is journaled in an elbow-lever, I^2, Fig. 1, which is fulcrumed at I^3 to the frame-plate, and has its vertical arm provided with a set-screw, I^4, which bears against the frame-plate, and by adjusting which set-screw the wheel I′ may be pressed to a stronger or lighter contact with the feed-wheel I.

L is a chute for feeding the buttons to the machine. This chute consists of a metal tube made in two or more telescopic sections and having a longitudinal slit in its side the entire length, to allow the button-eyes to project through. The buttons rest in this tube one above another, and are fed to a button-cup, L^2, below, Figs. 1 and 7, one at a time, as follows: L^3 is a two-pronged rocking feeder pivoted to the chute to work through a slot in the front of the same, and attached to an arm, L^4, which is pressed toward the machine by a spring, L^5, and is thrown in the opposite direction by a cam, L^6, fixed to the upper part, F′, of the setting-bar, so that each time said bar descends and rises a button is fed to the button-cup below by the feeder L^3. When arm L^4 is thrown outwardly by this cam, as in Fig. 3, the row of buttons rests upon the lower prong of the feeder, and when the bar rises and the spring L^5 rocks the feeder in the opposite direction the upper prong of the feeder passes above the bottom button and the lower prong passes from beneath the same and allows the bottom button to fall to the button-cup L^2, as seen in Fig. 7. On the next motion of the feeder the upper prong moves out and the lower one goes in, and the column

of buttons falls to and is supported upon the lower prong again.

The function of the button-cup L^2 is to seize the button and press its eye through a slot in the face-plate M and hold it upon the top of the former H in line with the wire-guide, so that the wire may be threaded with certainty through the eye, and it also supplies a gentle friction to hold the button taut while its staple is being forced down and clinched. This button-cup is mounted upon a horizontal arm, m^9, Figs. 1 and 7, fulcrumed at m' to the framework, and it is pressed toward the machine by the tension of a spring, m^2, connected to a latch, m^3, which is jointed to the arm m and forms a compound lever therewith. The beveled face end of latch m^3 is struck by laterally-projecting pin m^5 on the wire-feed wheel, and the deflection of this latch throws the button-cup with the button up to the setting mechanism, and the spring acting on the compound lever holds the button-cup there even after the latch drops behind the pin. These pins correspond in number to the notches of the ratchet-wheel in the rear, so as to adjust a button to place with each descent of the treadle.

Having thus described our invention, what we claim as new is—

1. A combined staple-forming and button-setting machine consisting of feed devices for the wire, a subjacent anvil-plate, a frame with hole *h* for the wire to pass through, the laterally-adjustable former H, over which the staple is bent, the double-branched cutting and bending bar G′ G′, arranged to straddle the former, the setting-bar F F′, and a receding wire-guide, J, arranged to guide the wire from its hole to the former and through the eye of the button and then move laterally out of the way, substantially as shown and described.

2. The combination, with the setting devices and chute, of the button-cup L^2, mounted independently upon an arm and adapted to move laterally to press and hold firmly the button to the devices for inserting the wire and forming the staple, as described.

3. The combination, with the setting devices and the chute, of the button-cup L^2, the compound lever m^9 m^3 and spring m^2, and the feed-wheel I, with pins m^5, substantially as shown and described.

4. The combination of the vertically-reciprocating setting-bar F F′, having cam L^6, the two-pronged feeder L^3, arm L^4, spring L^5, and the slotted chute, substantially as and for the purpose described.

5. The combination, with a subjacent anvil-plate and feed devices for the wire, of a vertically-reciprocating cutting and bending bar, a vertical reciprocating setting-bar, a locking device for connecting the two during the first part of the stroke, and a tripping device for disconnecting the two to allow the setting-bar to continue its descent after the cutting and bending bar has done its work, as described.

6. The combination, with a subjacent anvil-plate and feed devices for the wire, of the vertically-reciprocating cutting and bending bar G′ G′, the vertically-reciprocating setting-bar F F′, the locking-bar K, with lug *l*, and projection *p*, and bearing *m*, the bar F F′ having a rigid connection with its operating-arm C, and the bar G′ G′ having a spring-seated connection therewith, as described.

7. The combination, with the frame, the laterally-adjustable former H, and its carrying spring H′, of the vertically-reciprocating setting-bar F F′, having cam *j* on its rear side to throw the former laterally out of the way of the descent of the button when being set, as described.

8. The combination, with the laterally-adjustable former, the setting-bar F F′, and the cutting and bending bar G′ G′, of the laterally-adjustable wire-guide J and its carrying-spring J′, the said guide having a beveled upper face for contact with the bending-bar, whereby it is thrust aside when the bending-bar descends, as set forth.

9. The combination of the arm C and C′, the first carrying the cutting and bending bar and also the setting-bar, the other a pawl, C^2, the ratchet C^4, shaft C^5, rigid feed-wheel I, with pins m^5, the button-cup and compound lever acted upon by said pins, and the staple-forming and button-setting mechanism, substantially as described.

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