

No. 785,146.

PATENTED MAR. 21, 1905.

E. B. ALLEN.
BUTTONHOLE CLAMP.

APPLICATION FILED SEPT. 28, 1904.

2 SHEETS—SHEET 2.

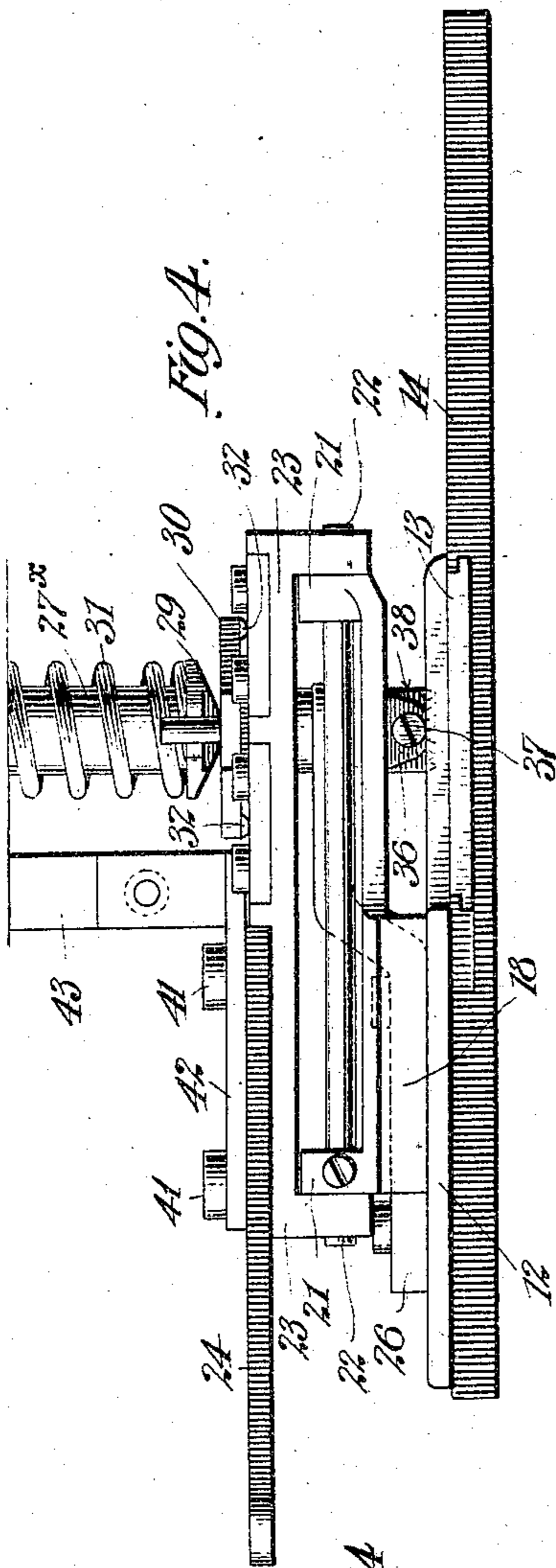


Fig. 4.

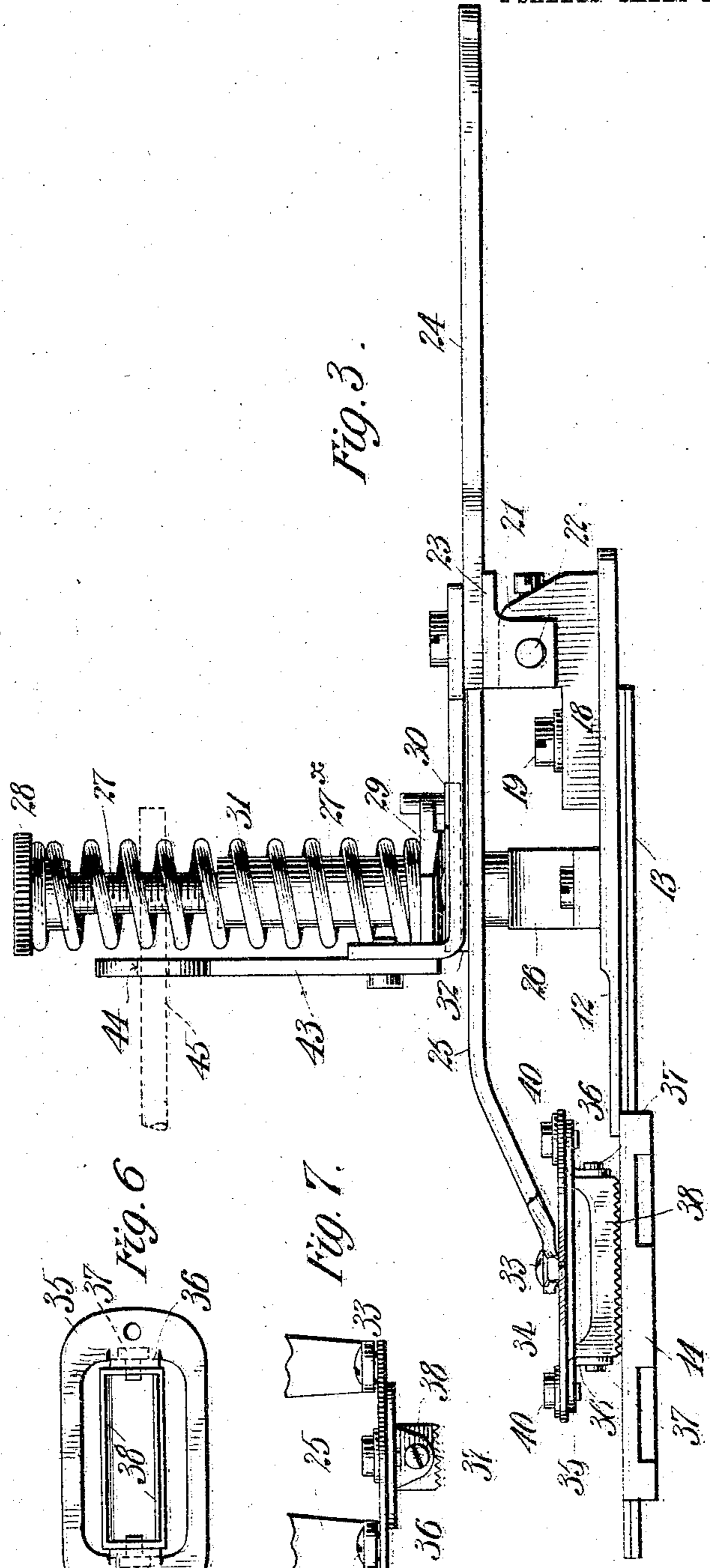


Fig. 3.

Fig. 5.

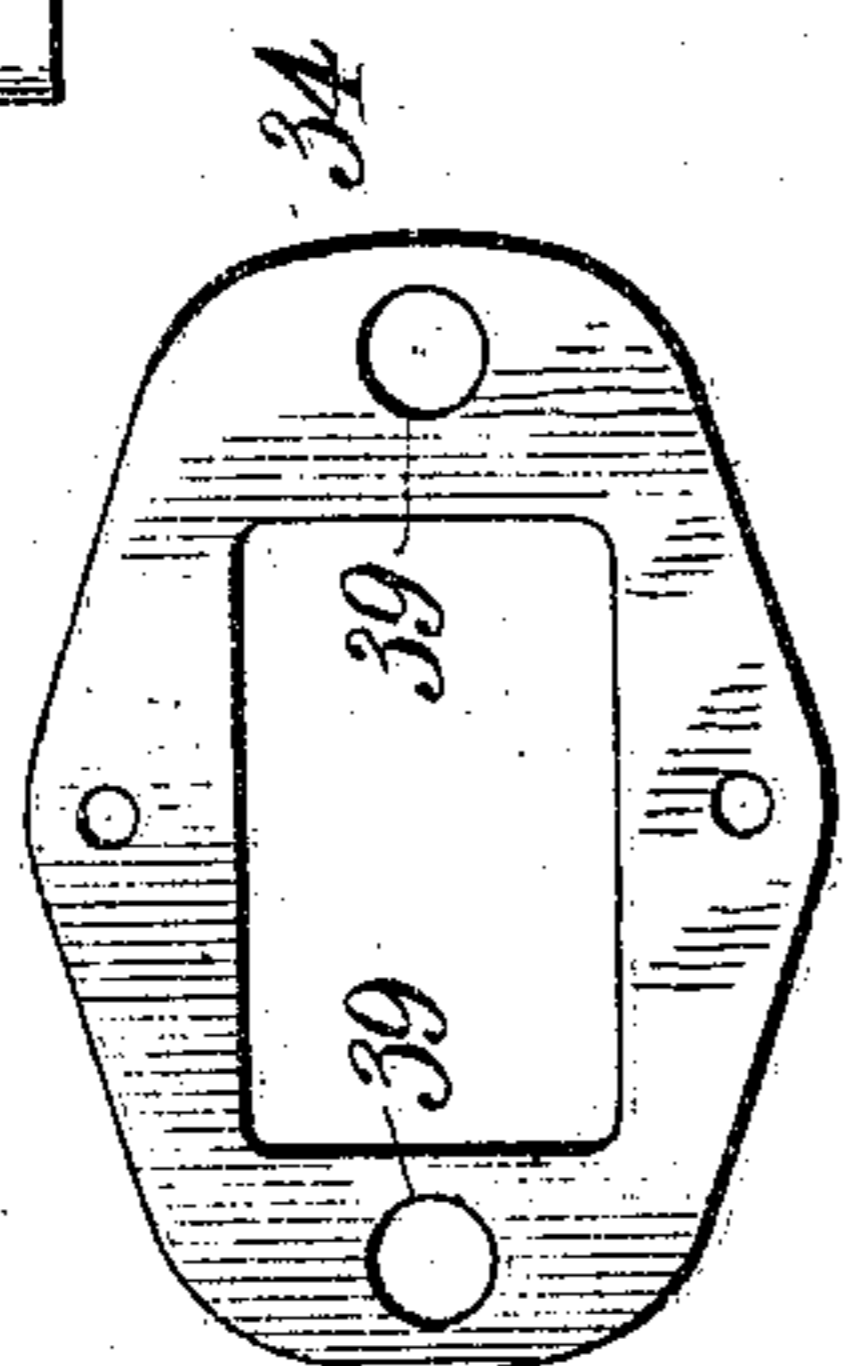


Fig. 6.

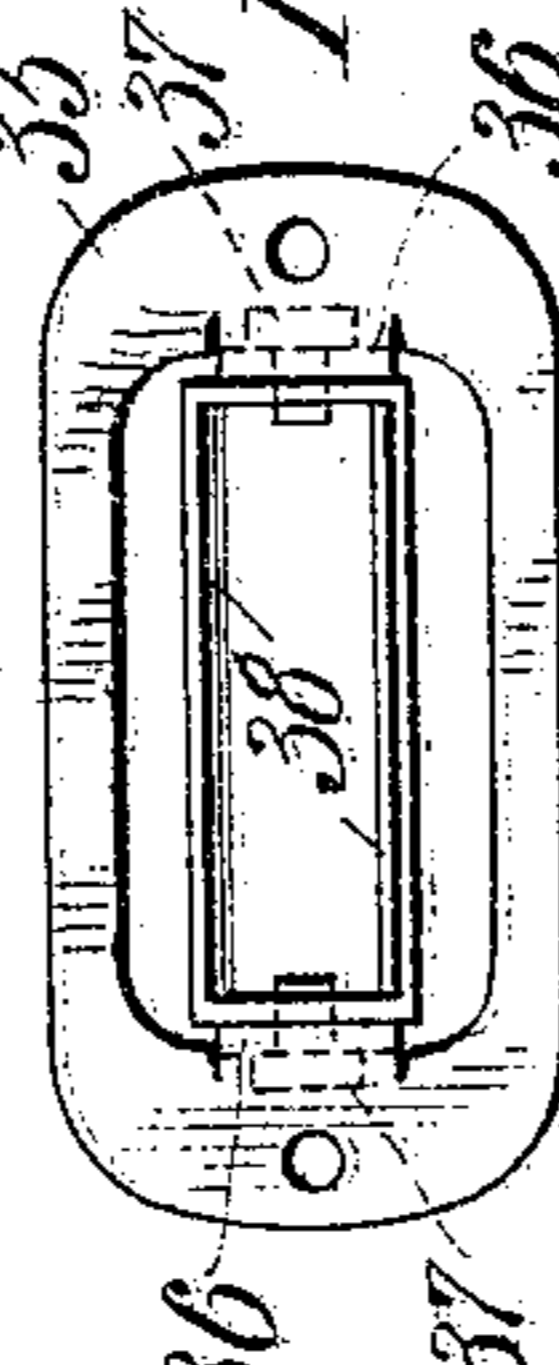
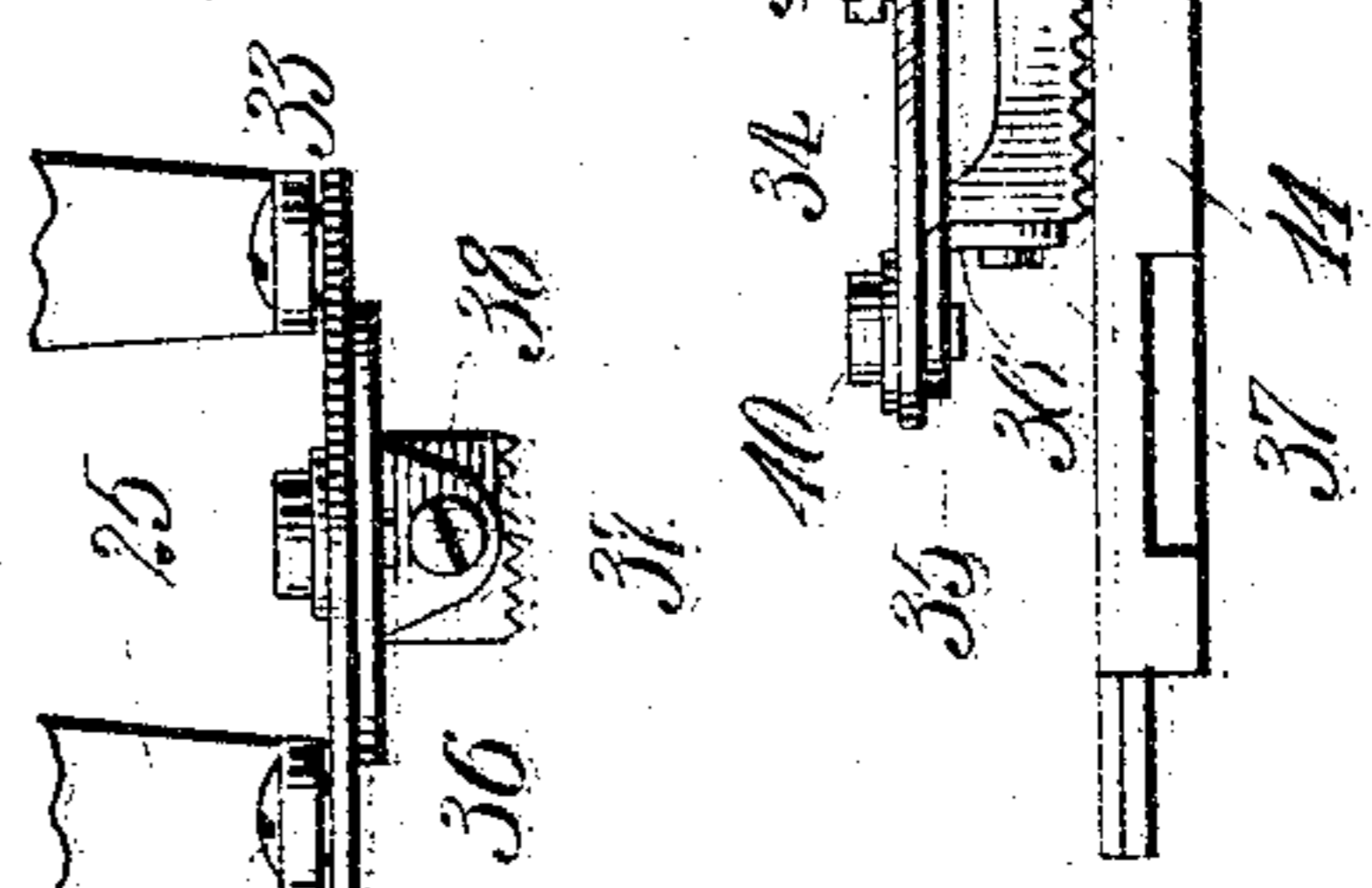


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWARD B. ALLEN, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

BUTTONHOLE-CLAMP.

SPECIFICATION forming part of Letters Patent No. 785,146, dated March 21, 1905.

Application filed September 28, 1904. Serial No. 226,405.

To all whom it may concern:

Be it known that I, EDWARD B. ALLEN, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Buttonhole-Clamps, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to work-clamps for buttonhole-machines, and has for its object to provide a work-clamp of simple construction which will be conveniently adapted for a wide range of work, particularly in stitching buttonholes in collars and cuffs, so that by simple adjustments it will serve the purpose for which several clamps have heretofore been required.

In stitching buttonholes in collars and cuffs it is sometimes necessary that the outer ends of the buttonholes should be very near the outer ends of the tabs of the collars or cuffs, while at other times or in other classes of work it is necessary that the buttonholes should be more distant from the ends of the tabs, and for these different kinds of work different clamps have heretofore been provided for the same buttonhole-machines. In the present case the hinged clamp-frame, carrying the spring-pressed clamping-arms and clamp-foot, is adjustably mounted relative to the clamp base-plate, so that it may be set in different positions longitudinally of the buttonholes or longitudinally of the buttonhole-opening in the clamp-foot or upper jaw of the clamp, thus changing the working position of said foot or upper jaw relative to the throat or transverse opening in the lower jaw or plate of the clamp, and in which opening the needle of the machine works. Also in the present improved clamp the clamp-frame overhangs the base-plate of the clamp in such a manner as to leave a work clearance in the longitudinal line of the clamp foot or jaws and rearward of the latter to conveniently receive a strip of fabric, as a collar, in which it may be desired to work a lengthwise-extending buttonhole at a considerable distance from the ends thereof, as in forming a buttonhole in

the middle of a collar and extending lengthwise thereof, such clearance-space behind the clamp-jaws permitting the use of a spring which is centrally arranged relative to the clamp-arms, so as to exert an even pressure on the latter. Also in the present improved clamp the clamp-foot is jointed to a frame, which in turn is loosely jointed to the clamp-arms, so that the said clamp-foot is practically hung on a universal joint and can thus readily adjust itself in all directions to inequalities of the work, as where there are different thicknesses in one and the same part of a collar or cuff in which a buttonhole is to be stitched.

In the accompanying drawings, Figure 1 is a plan view of the improved clamp. Fig. 2 is a sectional view of the same on line *x x*, Fig. 1. Fig. 3 is a side view, and Fig. 4 a rear end view, of the same. Figs. 5, 6, and 7 are detail views of the clamp-foot frame and the clamp-foot.

Referring to the drawings, 12 denotes the base-plate of the clamp, and to the bottom of which is rigidly attached the lower clamp-plate 13, which is mounted to slide or travel lengthwise of the buttonholes on the shifting plate 14, carrying the throat-plate 15, the latter being provided with a transverse needle opening or throat 16 and the longitudinal cutter-receiving slit or throat 17.

Adjustably attached to the base-plate 12 is a fulcrum block or plate 18, these parts being secured together by screws 19 passing through slots 20 in said block or plate 18.

Hinged to ears 21, with which the block or plate 18 is provided, by a pivot-pin 22, is a clamp frame or block 23, provided with the rearwardly-extending lifting-arm 24 and with the clamp-arms 25, the latter being preferably of spring metal, so as to be capable of yielding somewhat independently of each other. That part of the fulcrum block or plate 18 which is beneath the clamp-arms 25 and which is therefore directly rearward of the clamp-jaws or clamp-foot is elevated above the base-plate of the clamp to afford a work clearance.

Rigidly secured to the base-plate 12 is a block 26, a portion of which is elevated above said base-plate, and which rigid elevated por-

tion supports the post 27, which is threaded at its upper end for the reception of the nut 28, between which and bearing-plates 29 and 30 is interposed the clamp-spring 31, encircling a sleeve or bushing 27^x on said post. The lower bearing-plate 30 is preferably provided on its lower face with rounded ribs 32, impinging against the upper surfaces of the clamp-arms 25, and the lower face of the upper bearing-plate or washer 29, impinging against the upper face of the lower bearing-plate 30, is preferably rounded, as shown. The post 27 and the clamping-spring 31 are located centrally of the clamp-arms and clamp-foot in the line of the buttonhole to be stitched or in the line of the cutter-receiving slit or throat 17 in the throat-plate 15. These constructions permit the pressure of the spring 31 to be evenly applied to the clamp-arms 25 notwithstanding that the latter may occupy somewhat different horizontal planes, owing to unevenness of the work.

Loosely hung to the forward ends of the clamp-arms 25 by the ball-screws 33 is a clamp-foot frame consisting of the plates 34 and 35, each having a central opening. The ball-screws 33 are tapped in the upper plate 34, and the lower plate 35 is provided with depending ears 36 to receive pivot-screws 37, by which the clamp-foot 38 is hung to the clamp-foot frame in such a manner as to be adapted to rock relative thereto. It will thus be apparent that the clamp-foot has a universal-joint connection with the clamp-arms, so that it can rock in any direction to automatically adjust itself to irregularities or inequalities of the work occasioned by different thicknesses of material in different parts of the work in which the buttonholes are to be made. To provide for any desired horizontal adjustment of the clamp-foot 38 relative to the upper plate 34 of the clamp-foot frame, the holes 39 in the said plate 34, through which holes pass the attaching-screws 40, tapped in the lower plate 35, are of a diameter considerably greater than the diameter of said screws.

Attached to the pivoted clamp frame or block 23 by screws 41 is a plate 42, which supports an upwardly-projecting arm 43, having an opening 44 to engage an arm or rod 45, forming part of a tension-release and by which the tension on the needle-thread is relaxed when the clamp is opened for the removal and replacement of the work after a buttonhole has been stitched.

From the foregoing it will be apparent that the clamp-frame, with its attached clamp-arms and clamp-foot, may be adjusted to different working positions lengthwise of the buttonholes being stitched or to different positions relative to the needle of the machine, as the position of the said needle is denoted by the needle-throat 16 in the throat-plate 15, which latter is stationary and fixed relative to the shifting plate 14 on which said throat-plate is

mounted, such adjustment being possible by virtue of the slotted connection of the fulcrum plate or block 18, carrying the clamp-frame, with the clamp base-plate 12. This adjustment of the clamp-foot to different working positions relative to the needle of the machine enables a buttonhole to be stitched in any desired proximity to the end of a tab or edge of the work, as heretofore stated, and still enables the work to be properly held by the clamp-foot, and thus adapts a clamp suitable for general work to be utilized for the special work for which a special clamp has heretofore been required. Also by virtue of the work clearance rearward of the clamp-foot (in the direction of the length of the buttonholes) afforded by the raised part of the block 26, which thus supports the clamp-spring post 27 above the level of the work, and by virtue of the elevated part of the fulcrum block or plate 18 rearward of the clamp-foot lengthwise-extending buttonholes may readily be made in the middle portions of collar-strips or other similar pieces of work without requiring such strips to be bent over or folded, as has heretofore been necessary with some kinds of clamps, while the pressure-spring of the clamp may still be located centrally of the clamp-arms instead of being off to one side in such position that its pressure will not be evenly exerted on the clamping foot or feet, as in some other kinds of clamps. Also by virtue of the universal-joint connection of the clamp-foot frame with the two independent clamp-arms, in cooperation with the even pressure exerted by the centrally-disposed clamp-spring on said arms, the clamp-foot is enabled to be perfectly self-adjusting to the most irregular or uneven work, so as to hold all kinds of work properly at all times.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a work-clamp, the combination with a base-plate and a throat-plate having a fixed relation thereto, of an upper clamping part or foot adjustably connected with said base-plate, so that its working position, lengthwise of a buttonhole to be stitched, may be changed, as may be desired.

2. In a work-clamp, the combination with a base-plate and a throat-plate having a fixed relation thereto, of a fulcrum-block adjustably mounted on said base-plate, a clamp-frame hinged to said fulcrum-block, clamp-arms carried by said clamp-frame, and an upper clamp element or elements carried by said clamp-arms, and which upper clamp element or elements may thus be adjusted to different working positions, lengthwise of the buttonholes to be stitched.

3. In a work-clamp, the combination with a base-plate, of an upper clamp device or foot, clamp-arms by which the latter is carried, a rigid support for said clamp-arms which is above said base-plate in a direction length-

wise and rearward of the said clamp device or foot, to afford a clearance for a rearwardly-extending strip of work, a post in said support centrally behind the clamp foot or feet, and a clamp-spring encircling said post.

4. In a work-clamp, the combination with a base-plate, of an upper clamp device or foot, clamp-arms by which the latter is supported, a spring for yieldingly forcing said clamp-arms downward and which is located centrally of said arms in the longitudinal line of the buttonhole-slit in the throat-plate, and a rigid support for said spring above said base-plate in a direction lengthwise and rearward of said clamp device or foot, to afford a clearance for a rearwardly-extending strip of work.

5. In a work-clamp, the combination with a base-plate, of an upper clamping device comprising two clamp-arms, a spring for yieldingly forcing said arms downward and centrally arranged relative to said arms and in the line of the cutter-receiving slit in the throat-plate, and a post supported above said plate and encircled by said spring; whereby an even pressure on said arms may be exerted by said spring, and a work clearance lengthwise of the buttonholes and rearward of the clamp foot or device will be afforded.

6. In a work-clamp, the combination with two clamp-arms and a support or carrier therefor, of a clamp-spring centrally arranged relative to said arms and in the line of the cutter-receiving slit in the throat-plate, so as to exert

an even pressure on said arms, and a clamp-foot having a universal-joint connection with said arms.

7. In a work-clamp, the combination with two clamp-arms and a support or carrier therefor, of a spring for yieldingly forcing said arms downward, and a clamp-foot frame having ball-joint connections with said arms, and a clamp-foot jointed to said frame.

8. In a work-clamp, the combination with clamp-arms and a support or carrier therefor, of a clamp-foot frame jointed to said arms and comprising two plates, one of which is adjustably attached to the other, and a clamp-foot jointed to said frame.

9. In a work-clamp, the combination with clamp-arms and a support therefor, of a clamp-foot frame jointed to said arms and comprising two plates one of which is superposed relative to the other, the uppermost of said plates being jointed to said arms and the lowermost of said plates being adjustably secured to the upper plate so as to be capable of a limited horizontal adjustment relative to the said upper plate, and a clamp-foot pivotally attached to said lower plate.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD B. ALLEN.

Witnesses:

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