(No Model.) 2 Sheets—Sheet 1.

J. H. REED.

BUTTON HOLE STITCHING AND BARRING MACHINE.

No. 454,067. Patented June 16, 1891.

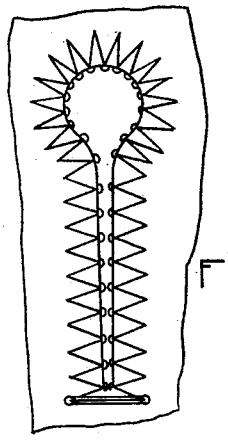

Fig. 7.

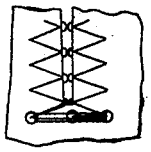

Fig. 6.

Fig. 1.

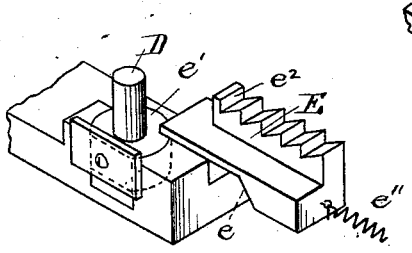

Fig. 4.

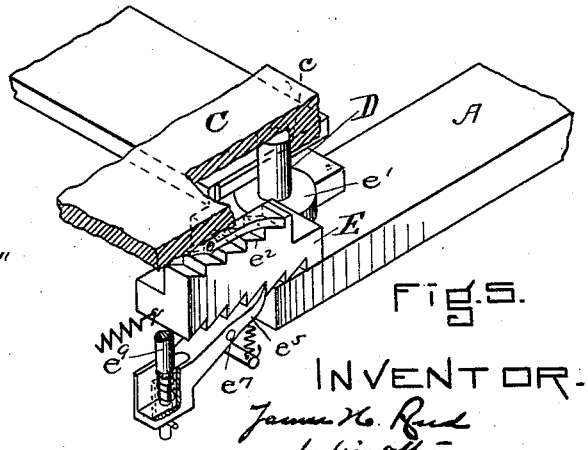

Fig. 5.

WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

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BUTTON HOLE STITCHING AND BARRING MACHINE.

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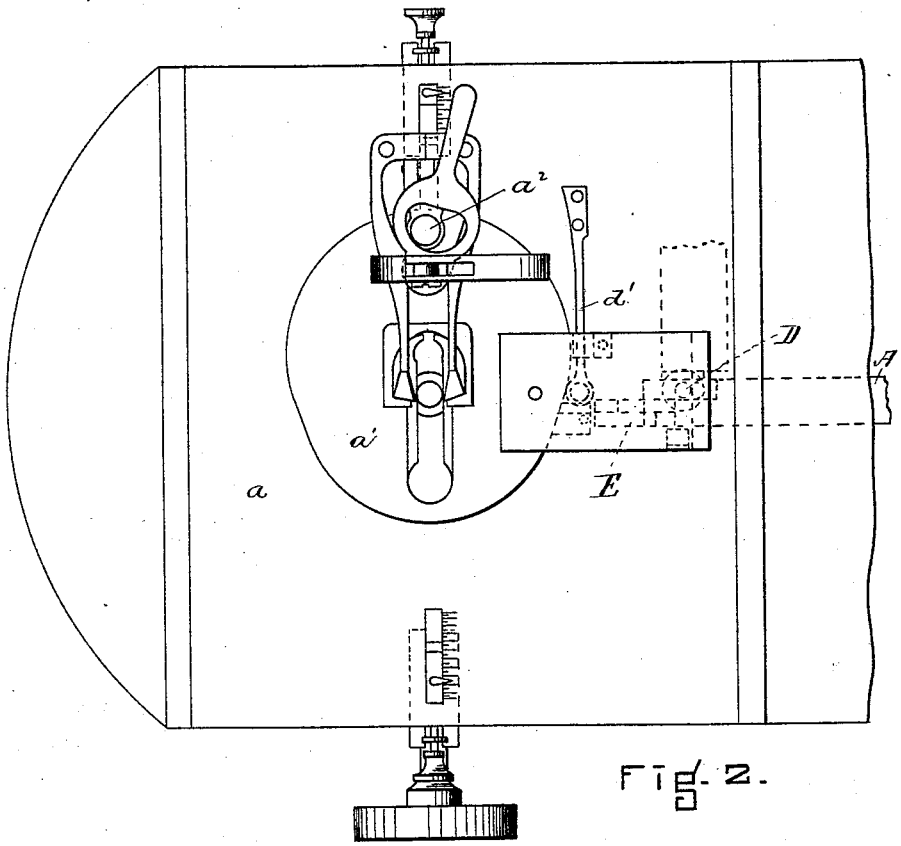

Fig. 2.

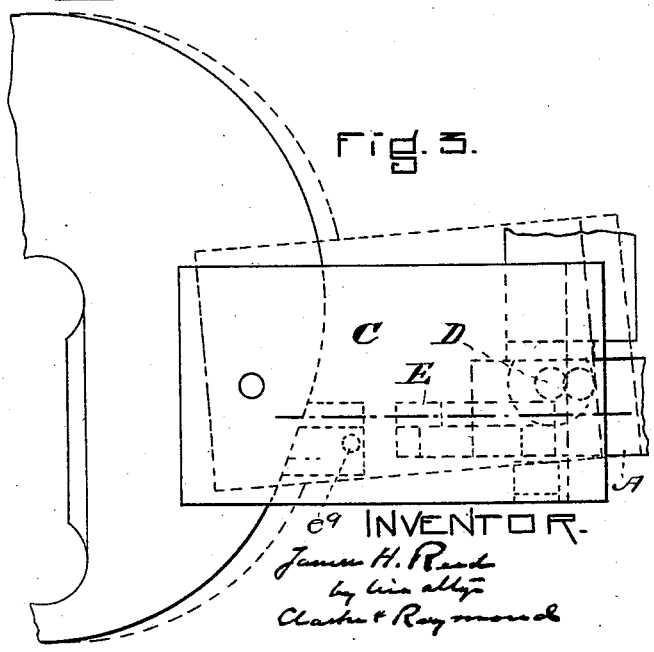

Fig. 3.

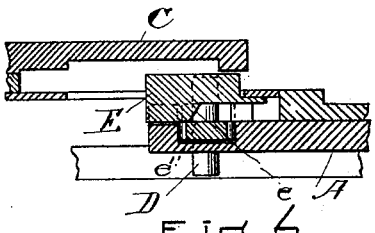

Fig. 6.

WITNESSES.

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UNITED STATES PATENT OFFICE.

JAMES H. REED, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE GLOBE BUTTONHOLE MACHINE COMPANY, OF KITTERY, MAINE.

BUTTON-HOLE STITCHING AND BARRING MACHINE.

SPECIFICATION forming part of Letters Patent No. 454,067, dated June 16, 1891.

Application filed March 9, 1888. Serial No. 266,667. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. REED, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Button-Hole Stitching and Barring Machines, 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 relates especially to means or devices for automatically barring the end of an eyed button-hole and for sewing one or more locking-stitches at the completion of the stitching of the bar, and it is represented as applied to the machine shown and described in my patent, No. 357,537, dated February 8, 1887.

In the drawings, Figure 1 is a view, principally in vertical central section, of a portion of the machine sufficient to illustrate the features of my invention. Fig. 2 is a plan view of the work-plate with the clamp-plate thereon, illustrating in dotted lines the position of parts, to which reference will hereinafter be made. Fig. 3 is an outline detail view in full and dotted lines, to which reference will hereinafter be made. Figs. 4, 5, and 6 are enlarged detail views illustrating the construction of the mechanism specially involved in this invention. Fig. 7 is a view in plan of a stitched and barred button-hole, the bar not being locked. Fig. 8 represents the end of a button-hole, showing the bar and the locking-stitch.

The class of machine to which the invention is applied is one that employs a movable clamp-plate, which is fed with an intermittent movement upon a straight line toward the button of the machine, then upon a circular path about it for half a revolution, and then again forward upon the same line as that upon which it originally started, and is a well-known form of clamp-plate. The machine to which the invention is applied also employs but a single needle, using a single needle-thread, the needle being a straight-eye pointed needle and having a reciprocating movement imparted to it, and also a traversing movement, whereby upon one stroke it passes through the material to present the thread to the looping devices and at the next stroke through the button-hole slit. In my said patent I described a device or mechanism for automatically engaging the clamp-plate at the end of the stitching of the last side of the button-hole for automatically moving or reciprocating the clamp-plate upon its guide-pin as a center, whereby the needle, instead of entering the material in line with the button-hole slit, was caused to enter it upon the other side thereof, thereby making a stitch of about twice the length of that used in stitching the sides and eye, and as many barring stitches were thus made as desired; but the end of the thread was not locked or secured. By my present invention the number of barring-stitches sewed is limited, and before the machine comes to rest one or more short stitches of the length used in stitching the sides and eye are sewed through the bar as locking-stitches.

A represents the bed of the machine; *a*, the work-plate; *a'*, the clamp-plate; B, the arm supporting the needle-bar; *b*, the needle-bar, and *b'* the eye-pointed needle.

a^2 is the guide-pin of the clamp-plate. The clamp-plate is guided and fed in relation to the button a^3 as described in my said patent, and the needle-bar is operated as therein specified. The clamp-plate is represented as provided with a lateral extension C, which, upon the revolution or turning of the plate, is brought into position over the pin or stud D, and the stud D is released to engage this extension by the contact of the clamp-plate with a block connected with a tripping device or latch adapted to release the pin or stud, as described in my said patent. The pin D is, upon being unlatched, thrown upward by its spring *d* (see Fig. 1) into position to engage the shoulder *c* upon the plate or extension C, and it serves to move or draw the clamp-plate *a'* when operated by its cam in one direction in opposition to the spring *d'*, which spring serves to move the clamp-plate in a reverse direction upon the return of the pin D to its original position. This pin is moved as described in said patent.

In order to permit the sewing of the addi-

tional locking-stitches after the sewing of the barring-stitches, it is necessary that the pin D should be automatically disengaged from the plate C, and this I accomplish by means of a slide-block E, which is mounted upon the work-plate *a* of the machine and in proximity to the stud or pin D, and has an inclined surface *e* upon its under side, which is moved over a shoulder *e'* of the pin and serves to throw or move it downward and to hold it in its lowest position or in a position which prevents it from operating the clamp-plate. To bring this slide-block E into this position in relation to the pin or post D, I avail myself of a reciprocating movement of the clamp-plate *a'* during the sewing of the barring-stitches, and I form upon the block E any desired number of ratchet-teeth e^2 upon its upper surface, and I mount upon the under side of the extension C of the clamp-plate a feed-pawl e^3, which is restricted as to the extent of its downward movement by its rear end e^4 striking the under surface of the plate C, and which is located to engage the teeth e^2 of the slide-block upon the movement of the clamp-plate to bring the extension C over the reciprocating pin or stud D. The pawl being then in a position to engage the teeth e^2, the slide-block is moved forward in relation to the pin or stud D at each outward movement of the clamp-plate until the wedge or incline *e*, riding upon the shoulder *e'*, throws the pin downward, when of course the clamp-plate is no longer oscillated and the length of the stitch is decreased to one-half the length of the barring-stitch, and the feed of the clamp-plate having been stopped the locking-stitch is taken through the previously-sewed barring-stitches. As many of these barring-stitches may be taken as desired. This is regulated by the number of teeth e^2 upon the block E and its length. Generally, however, two, three, or four are sufficient.

To hold the slide-block E during the downward movement of the pawl e^3, I employ a detent-pawl e^5, which engages the teeth e^6 upon the under side of the slide-block. This pawl is pivoted to a stationary support e^7 and has its end e^8 extended backward to receive and hold a post or stud e^9, which projects upward back of the slide-block into a position to bear against the under surface of the extension C, when of course it has been moved into a position over it, and the detent-pawl e^5 has a yielding connection with the stud e^9. There is also a spring e^{10} for drawing or moving the engaging end of the pawl downward or away from the block E when the stud e^9 is not held down by the extension C.

To return the slide-block automatically to its original position, I employ a spring e^{11}, which serves to return or draw back the block upon the return of the clamp-plate after the sewing of the barring and locking stitches to its original position, which removes the extension C from over the pin D and slide-block and the pin e^9, thereby permitting the detent-pawl to be disengaged, removing the feed-pawl, and allowing the spring to return the block to its normal position.

In operation the work is clamped upon the clamp-plate and the machine is set in operation, the clamp-plate is caused to be operated in relation to the button and the needle to be actuated as above specified, and the turning of the clamp-plate and its forward movement finally bring it in contact with the block, which releases the pin or stud D. The extension C then being in operative position in relation to it, the clamp-plate is oscillated and the barring stitches sewed and the mechanism for causing the automatic sewing of the locking-stitches set in operation and the locking-stitches sewed.

I would say that I do not confine myself to the especial form or detail of the mechanism herein specified, but may use in lieu thereof any of the mechanical equivalents for obtaining the result desired.

The automatic locking of the bar by shorter stitches sewed through the bar as an automatic operation following the sewing of the bar I consider to be of very material importance in all machines organized to sew with a single-needle thread a long bar consisting of a number of long stitches across the end of the button-hole.

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

1. The combination, in a button-hole stitching and barring machine, of a single reciprocating eye-pointed needle and mechanism for imparting to it a traversing or step-by-step motion, suitable looping mechanism, a clamp-plate supporting clamps for holding the work and its feed mechanism for moving it in relation to the stitch-forming devices, a reciprocating device to engage the clamp-plate by a latch and impart to it an oscillating movement during the stitching of the bar of the button-hole, the said latch, and a latch-disengaging slide-block to disengage the latch connecting the said clamp-plate with said reciprocating device after the sewing of barring-stitches, but before the machine is stopped, substantially as specified.

2. The combination, in a machine for stitching and barring button-holes, of a reciprocating eye-pointed needle having a traversing or step-by-step movement imparted to it, suitable looping mechanism, a clamp-plate supporting clamps for holding the work and having a suitable feed movement in relation to the stitch-forming devices imparted to it, a pin carried by a reciprocating block, a catch to hold the pin down in the block, a spring to force it upward therefrom, a latch actuated by the clamp-plate to disengage said pin, the spring *d'*, and a device for automatically returning the clamp-plate-operating pin to its original or normal position, operated by the clamp-plate, and comprising, essentially, a pawl carried by the clamp-plate and a wedge-

block having ratchet-teeth arranged to engage the pin and force it downward upon its movement by the said pawl, substantially as described.

3. The combination, in a button-hole stitching and barring machine, of the reciprocating and vibrating needle b', suitable looping devices, the clamp-plate a', having two straight feeding movements and a circular rotary feeding movement between the same and having an extension C, a reciprocating block carrying a pin, stud, or post D, a spring for forcing said pin or stud upwardly to engage the extension C, a latch-plate to hold the pin, stud, or post depressed in the reciprocating block, operated by the clamp-plate to release said pin, stud, or post, a pawl carried by the clamp-plate, a slide-block E for forcing the pin downward in its block and having ratchet-teeth adapted to be engaged by said pawl, and the spring d', substantially as described.

4. The combination, in a button-hole stitching and barring machine, of the reciprocating and vibrating needle b', suitable looping devices, the clamp-plate a', having two straight feeding movements and a circular rotary feeding movement between the same and having an extension C, a reciprocating block carrying a pin, stud, or post D, a spring for forcing said pin, stud, or post upwardly to engage the extension C to give the clamp-plate an oscillating movement during the stitching of the bar, the latch-block E, having a wedge or inclined surface, and the ratchet-teeth e^2, and ratchet-teeth e^6, a feed-pawl e^3, attached to the clamp-plate, the detent-pawl e^5, and the spring d', substantially as described.

5. The combination, in a button-hole stitching and barring machine, of the reciprocating and vibrating needle b', suitable looping devices, the clamp-plate a', having two straight feeding movements and a circular rotary feeding movement between the same and having an extension C, a reciprocating block carrying a pin, stud, or post D, a spring for forcing said pin, stud, or post upwardly to engage the extension C to give the clamp-plate an oscillating movement during the stitching of the bar, the spring d', the latch-block E, provided with a wedge-surface and with the ratchet-teeth e^2 e^6, a feed-pawl e^3, carried by the clamp-plate and oscillated therewith, the detent-pawl e^5 and means for releasing it from engagement with the teeth e^6, and the latch-block-return spring e^{11}, substantially as described.

JAMES H. REED.

Witnesses:
CHAS. L. BEALE,
F. F. RAYMOND, 2d.