W. RANDEL.

Button-Hole Attachment for Sewing Machines.

No. 166,810. Patented Aug. 17, 1875.

Fig: 1.

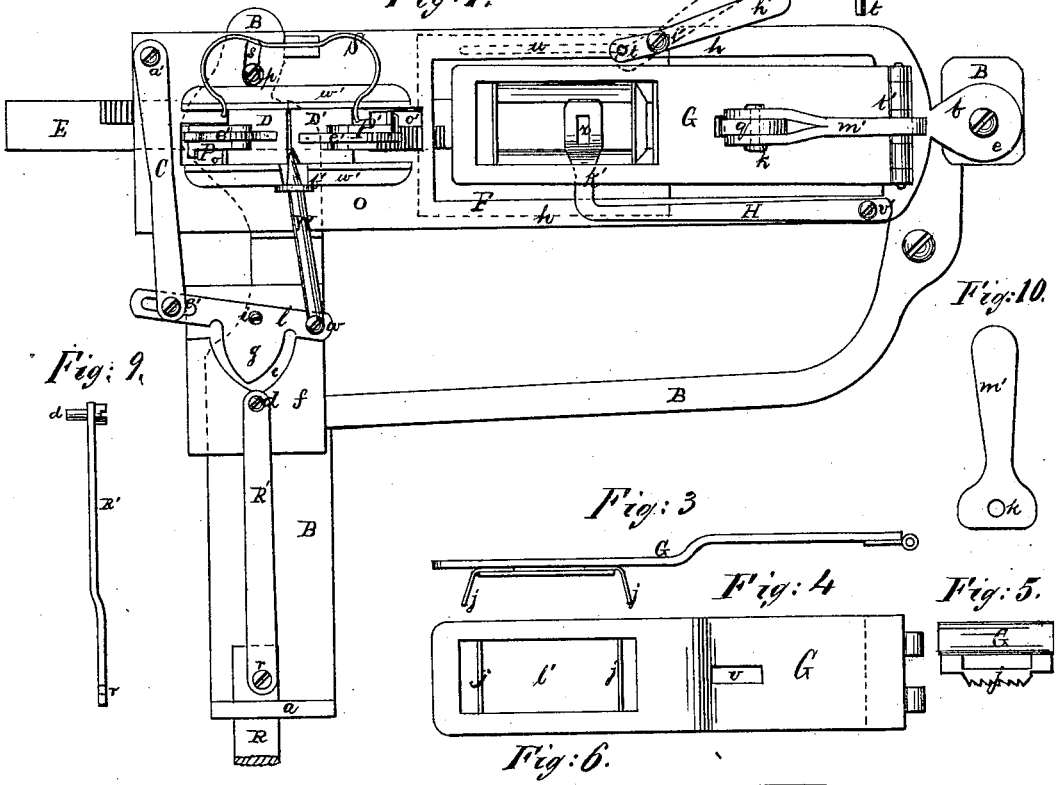


Fig: 2.

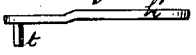


Fig: 10.

Fig: 9.

Fig: 3.

Fig: 4.

Fig: 5.

Fig: 6.

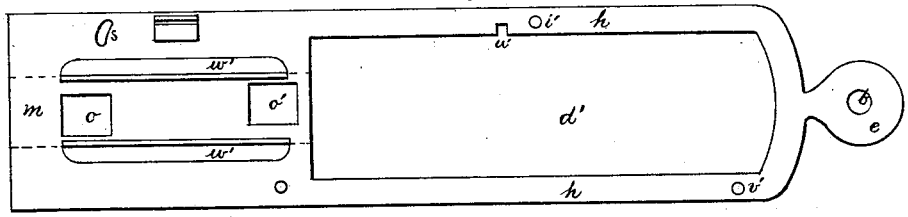


Fig: 7.

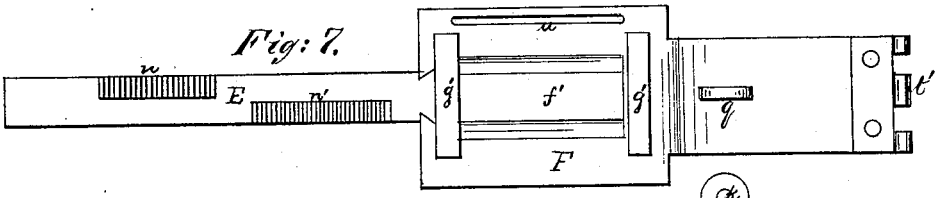
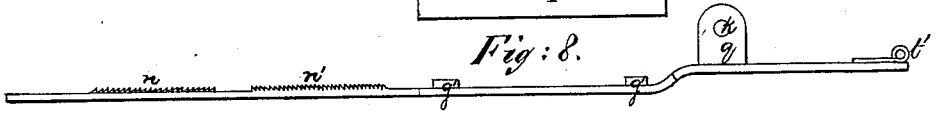


Fig: 8.



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UNITED STATES PATENT OFFICE.

WILLIAM RANDEL, OF TROY, NEW YORK.

IMPROVEMENT IN BUTTON-HOLE ATTACHMENTS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **166,810**, dated August 17, 1875; application filed May 1, 1875.

To all whom it may concern:

Be it known that I, WILLIAM RANDEL, of Troy, county of Rensselaer, State of New York, have invented an Improved Button-Hole Attachment for Sewing-Machines, of which the following is a specification, reference being had to the accompanying drawings forming part hereof.

My invention consists of the combination of the peculiar devices hereinafter particularly described, constituting a feed-movement, and the mechanism for actuating the same, and the clamp attachment for firmly holding the fabric operated upon, whereby a button-hole may be stitched by the sewing-machine.

Figure 1 is a plan view of my invention, showing its various parts. Fig. 2 is a side view of the switch-lever. Fig. 3 is a similar view of the cloth-clamp. Fig. 4 is a plan of the same. Fig. 5 is a front end elevation of the same. Fig. 6 is a plan view of the oscillating plate. Fig. 7 is a similar view of the traveling feed-plate, carrying the ratchet feed-bar. Fig. 8 is a side elevation of the same. Fig. 9 is a side elevation of the small driving-rod; and Fig. 10 is a similar view of the eccentric clamp-lever.

B is the bed-plate, intended to be secured upon the bed-plate of a sewing-machine, and is formed with the slotted shoulder *a*, in which the main driving-rod R has a bearing, which said driving-rod is given an alternate advancing and receding motion by the needle-arm of the machine, with which it should be suitably connected. O is the oscillating plate, pivoted at its end *e* upon the bed-plate B, at *b*, and guided in its motion by a pin, *p*, fixed in the bed-plate B, working in a curved slot, *s*, formed in the plate O, as shown. R′ is the small driving-rod, pivoted at *r* upon the end of the main driving-rod R, and carries the pin *d* on its forward end, as shown. *f* is a guide-plate, intended to be cast or otherwise made in the same piece with the bed-plate B, and is formed with the V-shaped slot *c*, as shown. *l* is a cam-lever carrying the cam *g*, and is pivoted upon the guide-plate *f* at *i*, as shown. C is a connecting-rod, pivoted adjustably to the cam-lever *l*, at *c′*, as shown, and pivoted upon the plate O at *a′*. W is the reciprocating feed-wedge, pivoted to the cam-lever *l* at *w*, as shown, and has a bearing in the slotted shoulder *b′*, fixed in the plate O. D and D′ are feed-blocks, arranged to move in ways *w′* on the plate O, and provided with the leaf bow-spring S, which operates to press them together, and having pivoted to them, respectively, looking in opposite directions, the dogs P and P′, which are provided with the leaf-springs *e′*, and which project below the plate O through the openings *o* and *o′*, as shown. F is the traveling feed-plate, arranged to slide in ways *h* in the large opening *d′* in the plate O, and provided with the opening *f′*, and having the ratchet feed-bar E, which is arranged to move in the channel *m*, formed in the under face of the plate O, directly under the dogs P and P′, as shown. The ratchet feed-bar E is formed with a ratchet, *n*, at one side, near one end, extending laterally only about half-way across the surface of the bar, and with a ratchet, *n′*, at the other side, near the other end, also extending laterally only about half-way across the surface of the bar, so that each half of the surface of the bar is formed with an alternate smooth and ratchet or toothed surface, in line with the jaws of the dogs P and P′, as shown. The teeth of the ratchet *n* project against the jaw of the dog P, and the teeth of the ratchet *n′* project against the jaw of the dog P′, as shown. *g′ g′* are transverse guide-bars, fixed on the plate F, as shown, and of a length sufficiently less than the width of said plate to allow said plate, with its ratchet feed-bar E, to be shifted in the ways *h* and channel *m*, by means of the switch-lever *h′*, which is pivoted upon the plate O at *i′*, and which engages, by means of a pin, *t*, in the long slot *u* in the plate F, and the notched slot *u′* in the plate O, as shown, so that the ratchet *n* may be adjusted under the dog P, and the feed-bar and guide-plate F caused to travel in one direction, or the ratchet *n′* be adjusted under the dog P′, and the feed-bar and feed-plate be caused to travel in the opposite direction, the unadjusted dog in either case resting upon the smooth surface of the bar E, as shown. G is the cloth-clamp, hinged to feed-plate at *k*, *e′* and formed with the opening *l′*, and provided with the spring-jaws *j* fixed on its under side, as shown, and operating to hold the cloth in which the button-hole is to be stitched, by

means of the eccentric lever m', which is pivoted at k in the post q, which is fixed in the feed-plate F, and extends upward through the opening v in the clamp G, as shown. H is a leaf-spring fixed at one end upon the plate O at v', and having upon its other end the arm k', which passes under the clamp G, as shown, and which is provided with the slotted opening x, through which the needle passes in making the stitch, operating to hold smooth and taut the portion of the fabric in which the stitch is made, while the feed-plate and cloth-clamp are traveling.

The operation of my mechanism is as follows: A reciprocating motion being given to the main driving-rod R, the pin d on the forward end of the small driving-rod R′ is forced first against one side and then against the other of the cam g on the cam-lever l, thus causing the said cam-levers to rock or oscillate. The plate O by the connecting-rod C is oscillated so that the proper length of stitch is made upon the edge of one side of the slit forming the button-hole, the feed-plate F carrying the cloth under the clamp G, being carried along by the feed-bar, so that the edge on one side of the slit is stitched along its whole length by the operation of the reciprocating feed-wedge, which pushes the feed-blocks D and D′ carrying the dogs P and P′ apart, the ratchet n being adjusted under the dog P.

When one side of the slit forming the button-hole is stitched, the feed-plate F, with the feed-bar, are shifted in the ways h by means of the switch-levers h', so that the ratchet n' is brought under the dog P′ when the direction of travel of the feed-plate is obviously reversed and the other side of the slit forming the button-hole is carried along under the needle and stitched.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the feed-plate F, the feed-bar E with its ratchets n and n', the dogs P and P′ pivoted in the blocks D and D′, respectively, the spring S, the reciprocating feed-wedge W, and the switch h', as and for purpose described.

2. The combination, with the plate O, pivoted at b, and the feeding and clamping mechanism, of the pivoted connecting-rod C, the cam-lever l, the reciprocating driving-rod R′, provided with the pin d, cam g, and the plate f, as described, and for the purpose specified.

3. The combination, with plate O, pivoted at b, block D D′, dogs P P′, springs S and e e', and the feed-bar E, of the pivoted connecting-rod C, cam-lever l, feed-wedge W, and reciprocating driving-rod R′, as described, and for the purpose specified.

4. The combination of the feed-plate F, the feed-bar E with its ratchets n and n', the dogs P and P′, the blocks D and D′, the spring S, the reciprocating feed-wedge W, the switch h', the plate O pivoted at b, the connecting-rod C, the cam-lever l, the reciprocating driving-rod R′, pivoted with the pin d, the cam g, the plate f, the hinged clamp C, jaws j j, the spring H, and eccentric lever m', as described.

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