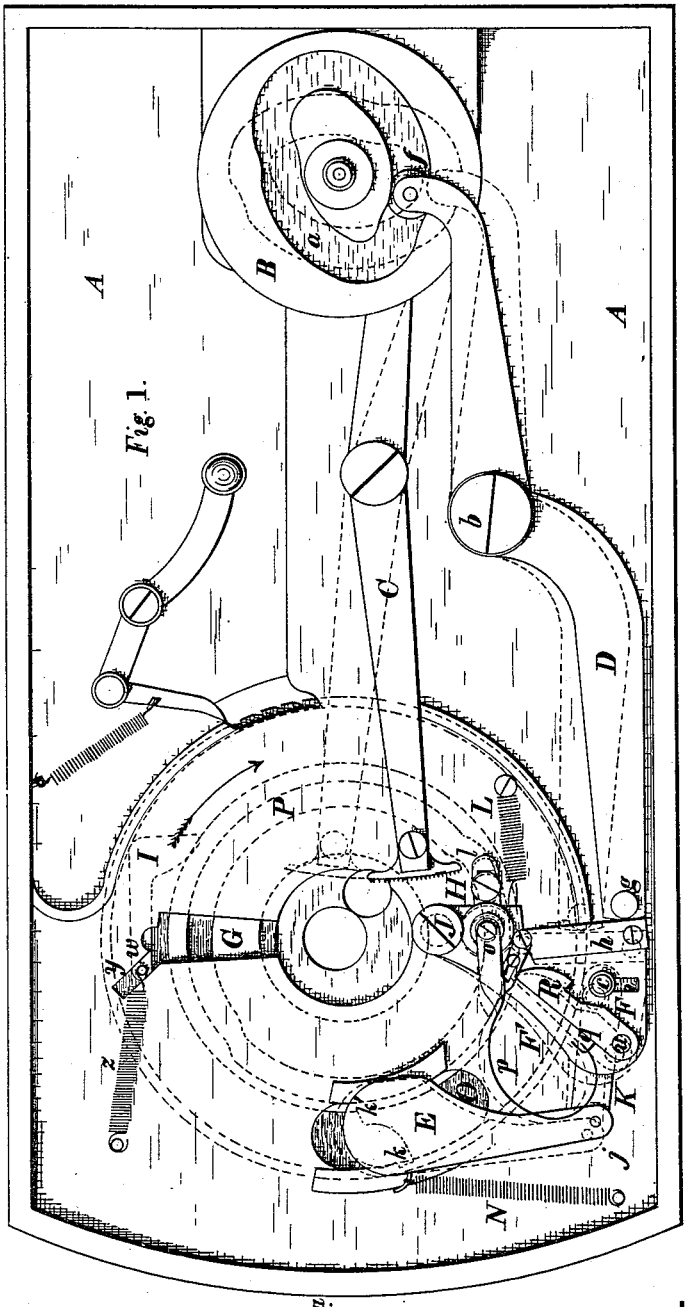
(No Model.) 2 Sheets—Sheet 1.

J. G. GREENE.

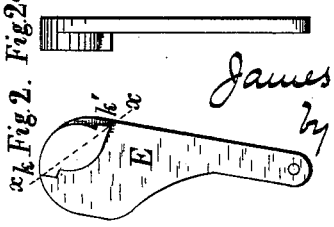
BUTTON HOLE SEWING MACHINE.

No. 266,690. Patented Oct. 31, 1882.



WITNESSES—

H. G. Phillips.
John Connell.



INVENTOR—

James G. Greene,
by Geo. B. Selden,
atty—

(No Model.) 2 Sheets—Sheet 2.

J. G. GREENE.

BUTTON HOLE SEWING MACHINE.

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Fig. 4.

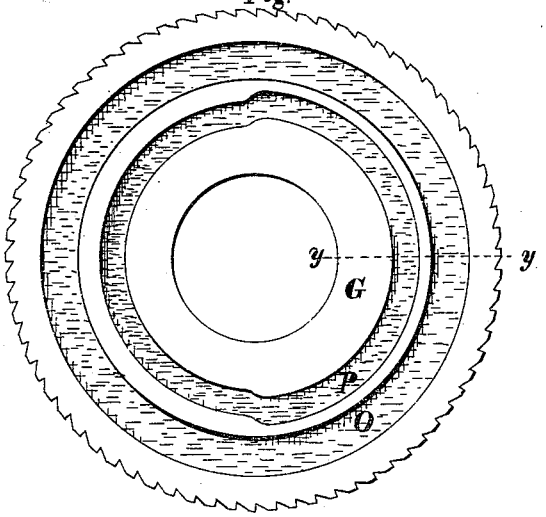


Fig. 6.

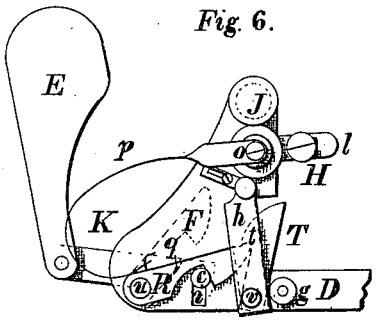


Fig. 5.

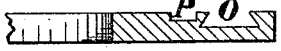


Fig. 7.

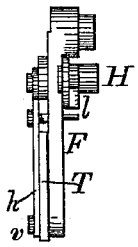


Fig. 8.

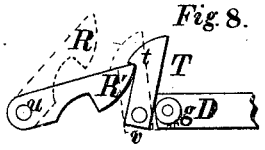


Fig. 9.

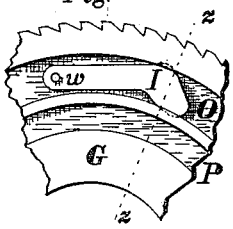


Fig. 13.

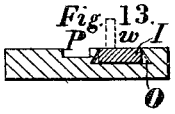


Fig. 10.

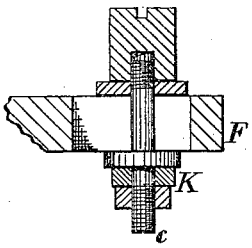


Fig. 11.

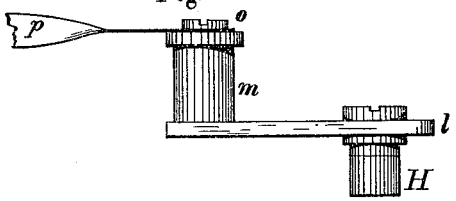
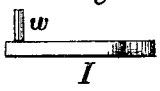


Fig. 12.



WITNESSES-

H. G. Phillips.
John Connell.

INVENTOR-

James G. Greene,
by Geo. B. Selden,
atty.

UNITED STATES PATENT OFFICE.

JAMES G. GREENE, OF ROCHESTER, NEW YORK.

BUTTON-HOLE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 266,690, dated October 31, 1882.

Application filed May 22, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES G. GREENE, of Rochester, New York, have invented certain Improvements in Button-Hole Sewing-Machines, of which the following is a specification, reference being had to the annexed drawings.

My invention relates to an improved feed mechanism for button-hole sewing-machines, designed more particularly for use on machines of the Singer type, but capable of being employed in connection with other forms of machine.

My improvements in button-hole sewing-machines are represented in the acccompanying drawings, in which—

Figure 1 is an inverted view. Fig. 2 is a plan view of the feed-dog. Fig. 2ª is a side view of same. Fig. 3 is a section on the line *x x*, Fig. 2. Fig. 4 is the feed-wheel. Fig. 5 is a section of the same on the line *y y*, Fig. 4. Fig. 6 represents the swinging plate and mechanism for actuating the feed-dog. Fig. 7 is an end view of the same. Fig. 8 is a diagram representing the latch and movable cam-bar. Fig. 9 represents the brake. Fig. 10 is a sectional view through the slot in the swinging plate, showing the stud and nut. Fig. 11 represents the shipper-roller, lever, and a portion of the spring. Fig. 12 is a side view of the brake-dog. Fig. 13 is a section on line *z z*, Fig. 9.

Similar letters indicate corresponding parts.

In the accompanying drawings, A is the base-plate or bed of a button-hole sewing-machine embodying my improvements; B, the cam which actuates the lever C and the feed-lever D; E, the feed-dog; F, the swinging plate; G, the feed-wheel; H, the shipper, and I, the brake.

The cam B is provided with a groove, *a*, of a shape adapted to give the feed-lever D two reciprocations about its pivot *b* for each revolution of the cam. The end of the lever D is provided with a roller, *f*, which fits the groove *a*. The other end of the lever D carries a roller, *g*, which, bearing against the edge of the swinging plate F, or a bar, *h*, secured thereto, transmits to the plate an oscillating motion about the stud or pivot J, as indicated by the dotted lines F′, Fig. 1, which motion is transferred to the feed-dog E by the connection K, so as to cause the feed-wheel to revolve in the direction indicated by the arrow. The return motion of the swinging plate is effected by the spring L, which is fastened at one end to the plate and at the other to the bed of the machine, assisted also by the spring N, which operates on the feed-dog. The connection K is pivoted to the lower end of the feed dog at *j*, and at its other end it is pivoted on a stud, *c*, which is arranged to be adjusted in the slot *i* in the swinging plate F, to vary the length of the feed. The arrangement of the stud in the slot in the plate is represented in Fig. 10, which is a section of a portion of the plate lengthwise of the slot. The groove O in the feed-wheel is dovetailed, as represented in Fig. 5, and the feed-dog is provided with two correspondingly-shaped lugs, *k k′*, which bear on the opposite sides of the grooves in such position that the motion of the lower end of the feed-dog to the left hand in Fig. 1 causes the lugs to bind in the groove, so that the motion of the dog is imparted to the feed-wheel.

By means of the mechanism thus far described a regular intermittent feed movement is transmitted to the feed-wheel. It remains to describe the mechanism by which I am enabled to automatically secure a longer feed movement during the operation of forming the eye of the button-hole.

The feed-wheel G is provided with a cam-groove, P, as represented in Fig. 4 and in the dotted circles in Fig. 1. Within this cam-groove P runs the shipper-roller H, Figs. 6, 7, and 11, which is carried by an arm, *l*, pivoted by a journal, *m*, Fig. 11, in the swinging plate F. The journal *m* turns in a suitable opening in the swinging plate, said opening being located in the plate opposite or nearly opposite the cam-groove P, so that the roller H may reciprocate in the groove as the plate swings without turning the journal in the opening sufficiently to influence the feed. To the outer end of the journal is attached by means of the screw *o* the spring *p*, which extends outward and downward and is connected by a suitable hook, *q*, or other device, to the latch R, pivoted at *u* to the lower part of the swinging plate. The function of the latch R is to hold the cam-bar T projecting outward at an angle with the

bar *h*, as represented in Fig. 6, so that the swinging plate may receive a longer oscillation from the roller *g*, thereby increasing the length of the feed. This operation is accomplishsd by the cam-groove P, the smaller portion of which operates, as the feed-wheel revolves, to move the roller H upward toward the center of the feed-wheel, thereby depressing the outer end of the spring *p* and throwing down the latch R from the position indicated by the full lines in Fig. 1 and the dotted lines in Fig. 6 to that marked R′ in Fig. 6, in which case the point of the latch engages with a hook or notch, *t*, on the cam-bar T, and the latter is held positively in position with its free end projecting at an angle with the bar *h* and the edge of the swinging plate F. The roller *g* on the end of the feed-lever D, now acting against the cam-bar T, will give the swinging plate a longer oscillation than when it bears directly on the bar *h* or on the edge of the swinging plate F. The latch R is pivoted to the swinging plate at *u*, and the cam-bar is pivoted thereto at *v*, Fig. 6. Instead of the spring *p*, a rigid connection may be employed to actuate the latch from the shipper; but I prefer to use the spring. It is not essential that the cam-bar T should be provided with the notch *t;* but by its use I am enabled to shorten the travel of the point of the latch R.

It is obvious that instead of being pivoted to the bed-plate at J the plate F may be arranged to move backward and forward on suitable guides or ways attached to or formed on the bed.

The brake-dog I is constructed so as to be entirely inclosed within the groove O in the feed-wheel. Its function is to prevent any recoil or return movement of the feed-wheel. The foot of the brake-dog is provided with two inclined friction-surfaces, which bear on the opposite sides of the dovetailed groove O in such fashion that any backward movement of the feed-wheel is arrested by the dog, the end of which carries a pin, *w*, which enters an inclined slot, *y*, in the bed-plate. A spring, *z*, is attached to the pin *w*. As the pin *w* is forced up the inclined slot *y* by the backward movement of the feed-wheel it causes the bearing-surfaces on the foot of the dog to produce friction in the groove O, and thereby arrest the motion of the wheel. It is not essential for the operation of either the feed-dog or the brake-dog that the groove O should be dovetailed; but I prefer to use a groove of this form.

My improved feeding mechanism will be found to act smoothly and without recoil, is simple in construction and durable in operation, and possesses the further advantage of avoiding a friction on the feed-wheel, which, in most of the feed mechanisms heretofore constructed, has been necessary to prevent overthrow.

The movable cam-bar T may be used alone without the plate *h*, provision being made of a suitable stop in the plate F to prevent its free end from being pushed inside the edge of the plate.

I claim—

1. The combination, with the feed mechanism of a button-hole sewing-machine, of the swinging notched cam-bar T and latch R, substantially as described.

2. The combination, with the feed mechanism of a button-hole sewing-machine, of the movable plate F, the cam-bar T, latch R, spring *p*, and shipper H, substantially as described.

3. The combination, with the feed-lever D, provided with roller *g*, of the feed-wheel G, feed-dog E, swinging plate F, provided with inclined bearing-surface *h*, cam-bar T, latch F, spring *p*, and shipper H, substantially as and for the purposes set forth.

4. The brake-dog I, concealed within the groove O of the feed-wheel, and provided with pin *w*, projecting into an inclined plane in the bed-plate, substantially as and for the purposes described.

5. In combination with the movable plate F, the pivoted shipper H, latch R, and swinging notched cam-bar T, substantially as described.

JAMES G. GREENE.

Witnesses:
EDMOND REDMOND,
GEO. B. SELDEN.