E. S. SPAULDING.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 180,952. Patented Aug. 8, 1876.

Fig. 4.

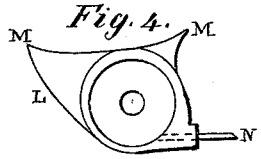


Fig. 1.

Fig. 2.

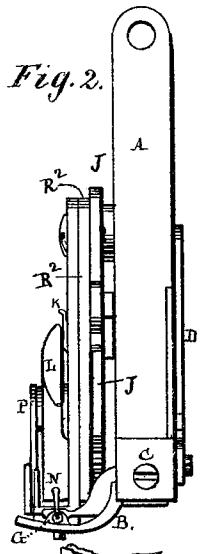


Fig. 3.

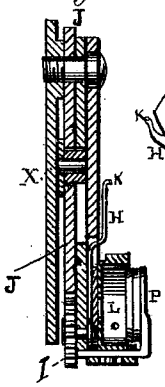


Fig. 5.

Fig. 7.

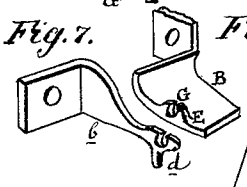
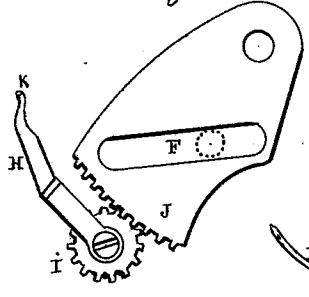


Fig. 8.

Fig. 6.



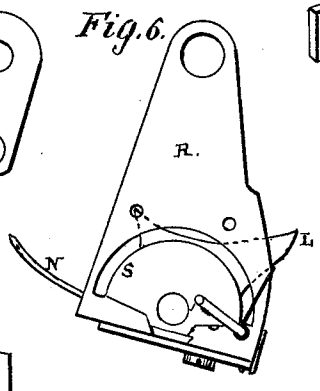


Fig. 9.

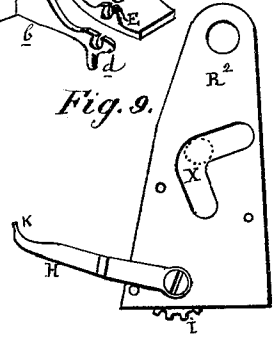


Fig. 10.

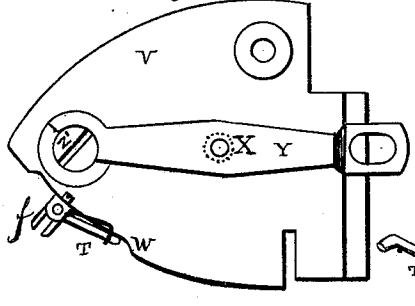


Fig. 12.

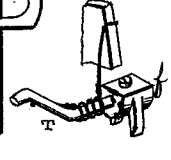


Fig. 11.

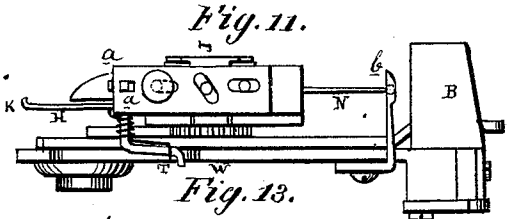
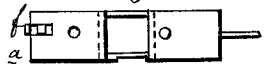


Fig. 13.



Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD S. SPAULDING, OF NEW YORK, N. Y.

IMPROVEMENT IN BUTTON-HOLE ATTACHMENTS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **180,952**, dated August 8, 1876; application filed January 11, 1876.

To all whom it may concern:

Be it known that I, EDWARD S. SPAULDING, of the city of New York, county of New York, and State of New York, have invented a new and useful Single-Thread Stitch Button-Hole-Sewing Attachment, to be worked in connection with Sewing-Machines; and I do hereby declare the following to be an exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 represents a side elevation of the attachment; Fig. 2, an end view of the same; Fig. 3, a rear sectional view of the same, taken on the line of Fig. 1; Fig. 4, a view of the shuttle. Fig. 5 shows the shape of the plate J, and as operating on the pinion I of the loop-carrier H. Fig. 6 shows a view of the front plate or shuttle-carrier R. Fig. 7 shows the projecting arm *b*, as the guide for the needle. Fig. 8 shows the shape of the adjustable foot, with its throat-plate E. Fig. 9 shows the plate R^2, for operating the shuttle-carrier. Fig. 10 exhibits the main stationary plate V, with the needle-bar lever Y attached. Fig. 11 is a bottom view of the attachment. Fig. 12 shows the shape of the spring and lever T. Fig. 13 represents the lower plate *a*, to which the forked cam *f* is attached.

My invention relates to that class of button-hole attachments wherein a shuttle carrying an eye-pointed needle is employed, and in the operation of which the thread carried by the needle, after having been forced through the cloth or material operated on, is carried over the said shuttle, forming thereby a stitch similar to the button-hole stitch usually formed by hand; and the invention consists in certain new and useful combination of parts for operating the shuttle, the presser-foot, and the loop-forming mechanism, all of which will be more fully hereinafter explained.

A represents the presser-bar of an ordinary sewing-machine. B is the adjustable foot at the lower end of the bar, pivoted thereto by a set-screw, C. D is a lever for raising or lowering the said foot, as may be desired, to clamp or release the cloth or material operated on.

The foot B is provided with a throat-plate, E, cast solid to the side next to the needle, and has an aperture with an open slot, G, at top, to allow the thread to be drawn up through it by the loop-carrier H.

H is a loop-carrier, attached to a pinion, I, which is operated backward and forward by the teeth on the plate J; and the loop-carrier H has a hook, K, on its extremity, that takes hold and carries the loop of the thread over and behind the shuttle L, and casts the thread on the opposite side of the shuttle, the loop being parted for that purpose by the front and back points M M of the shuttle.

N is an eye-pointed needle, attached to the front end of the shuttle, which is held and released in its forward and backward movement by the reciprocating motion of the circular plate P.

The shuttle-carrier R receives a pendulous movement on its pivot by means of its connection with cam-slot S at the lower end of the carrier R; and the spring and lever T, that slide backward and forward on the cam edge W, at the lower side of the main stationary plate V, operate the plate P, that clasps and releases the shuttle.

The shuttle L has a circular recess to hold the bobbin, which is confined therein by the circular plate P; and the end of the thread of the bobbin passes through the aperture of the shuttle, and along the groove in the needle to the eye, where the thread spreads to form the loop. After the needle has perforated the cloth or material operated on, the hook K, at the end of the loop-carrier H, catches in the loop, and carries the thread back over the rear of the shuttle.

The rack-plate J has a cam-slot, F, diagonally across its center, with a circular rack at the lower end.

Motion is imparted to this plate by the cam-roller X on the center of the needle-bar lever Y, acting in said slot. The rack J is pivoted at top to the main plate V, by which, with the roller X and up-and-down movement of the lever Y, the rack J receives its pendulum motion. The shuttle-carrier R, with its cam-plate R^2, moves in front of the rack J on the same pivot at top. The cam-plate R^2 is provided with a heart-shaped cam or recess across its center, in which the roller X operates, that gives the carrier-plate R a separate motion from the

rack J, which is independent of the rack J, and the rack J, engaging in the pinion I, moves the loop-carrier H backward and forward, and this independent motion of the shuttle-carrier R is to produce the half-motion of the loop-carrier H. The needle-bar lever Y is centered at Z′ on the main plate V, and moves up and down with the needle-bar of a sewing-machine, to which it may be attached by any suitable cam-roll in the slot at the end of the lever. The spring-lever T is attached to the lower plate *a* by a forked cam, *f*, at one end of the plate R, for the purpose of giving the circular plate P its in and out motion to hold and release the shuttle L. The guide *b* for the needle and inside of the button-hole or eyelet-hole to be stitched is a projecting arm fastened to the main plate V, with the circular aperture as the guide, and the opening at top for the thread to pass up, and corresponds with the throat-plate E. Below the aperture, in this guide, is the guide-pin *d*, around which the button-hole or eyelet-hole moves while being stitched, the feed of the sewing-machine moving the work while the pin guides it.

The operator first raises the adjustable foot B, then places the work under the arm *b*, with its projecting pin *d* in the center of the button-hole to be stitched, then lowers the foot B to its proper position, and adjusts the lever D to hold it; next, the operator starts the sewing-machine, and the downward motion of the needle-bar lever Y gives to the shuttle-carrier its pendulum motion—at the same time tightens the shuttle to insure the accuracy of the stitch. The needle then enters the guide *b*, and then, through the work, into the throat-plate E. The loop-carrier H then moves forward, and catches the loop on the opposite side of the throat-plate E; the upward motion of the needle-bar then carries it to the rear of the shuttle; the shuttle-carrier starts back; then the circular plate moves outward, and releases the shuttle, when the shuttle-carrier R moves still farther back, and draws up the stitch.

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

1. In combination with the plate V, shuttle-carrier R, and rack J, the lever Y and connecting mechanism, as described, whereby a pendulous movement is imparted to said shuttle-carrier and rack, as and for the purposes set forth.

2. In combination with the shuttle L and plate V, provided with the cam-surface W, the plate P, lever T, provided with the cam *f* and sliding plate *a*, for clamping and releasing the shuttle as the same is vibrated toward and from the material operated on, as set forth.

3. In combination with the rack J, provided with the cam-slot F, and lever Y carrying the rolier Z, the loop-carrier H, and pinion I, whereby the proper oscillatory movement is imparted to the said loop-carrier, as set forth.

4. The arm-guide *b*, provided with the aperture and slot in its top, and having the guide-pin *d* on its under side, as and for the purposes described.

5. In combination with the presser-bar A, and the adjustable foot B, provided with the throat-plate E and open top aperture G, the lever D, for raising and lowering said foot, as specified.

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Witnesses:

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