

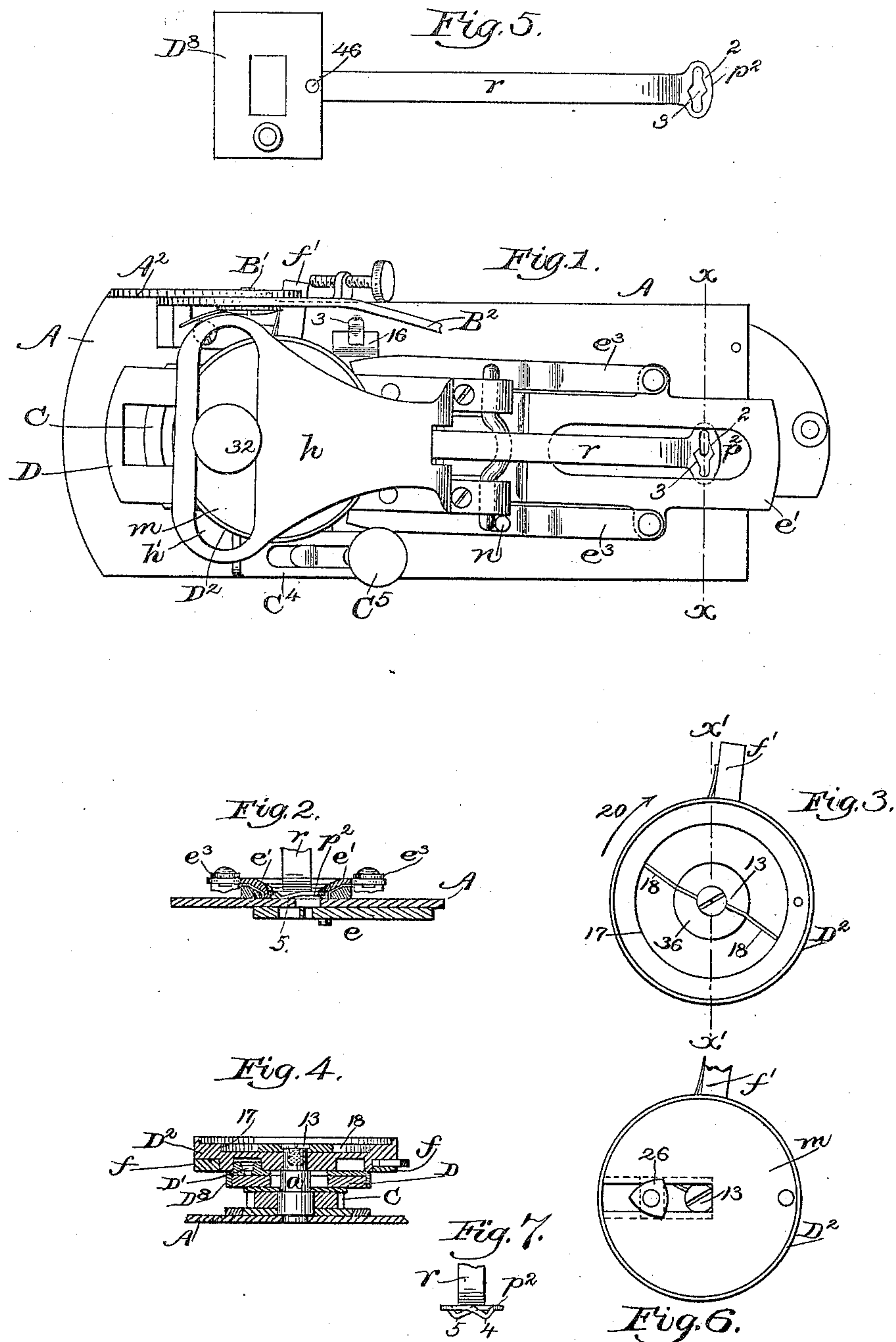
(No Model.)

E. FLETCHER.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 446,736.

Patented Feb. 17, 1891.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 446,736, dated February 17, 1891.

Application filed March 7, 1890. Serial No. 342,948. (No model.)

*To all whom it may concern:*

Be it known that I, ELMER FLETCHER, of Needham, county of Norfolk, State of Massachusetts, have invented an Improvement in Button-Hole Attachments for Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to improve and simplify the construction of the attachment described in United States Letters Patent No. 412,081, granted to me October 1, 1889, in such manner as to prevent the slipping or reverse rotation of the cam-wheel employed to move the cloth-clamp in the direction of the length of the button-hole and to give shape to the button-hole. I have also provided the attachment with a stripper-plate which enters grooves or guideways of the upper member of the cloth-clamp so as to rise and fall and vibrate with it, the clamp in its longitudinal movements sliding over the stripper-plate, the latter not bearing on the goods but lying close to the same, so that the goods cannot be lifted by the rising needle to thus lift the loop of needle-thread and cause the skipping of stitches, a difficulty which is liable to occur in other button-hole attachments known to me.

Another feature of my invention consists in making the slot in the stripper-plate through which the needle passes of a shape whereby the cord or upper thread is brought to or carried around the inner edge of the button-hole and a stronger and more finished button-hole obtained.

Figure 1 is a partial top or plan view of a button-hole attachment embodying my invention; Fig. 2, a section in the line  $x$ , Fig. 1; Fig. 3, a top view of the cam-plate  $D^2$ . Fig. 4 is a section in line  $x'$ , Fig. 3, looking to the left, said figure, however, showing the base-plate and parts between it and the cam  $D^2$ . Fig. 5 is a detail showing the stripper-plate and the arm to which it is attached, together with the bridge-piece which supports the said arm. Fig. 6 is a detail showing the cam-ring, the plate  $m$  within it, and the triangular cam 26; and Fig. 7, a detail of an end view of the

stripper-plate shown in Fig. 5 to more clearly show the form of the under side of the stripper-plate.

Referring to the drawings, the base-plate  $A$ , having the upturned part  $A^2$  and lip 3; the actuating-lever  $B^2$ , pivoted at  $B'$ ; the stud  $a$ , the yoke  $C$ , having an ear 16; the shank  $D$  of the cloth-holding clamp, composed of a plate  $e$ , an open foot  $e'$ , and spring-arms  $e^3$ ; the cam  $D^2$ , the bridge-piece  $D^3$ , having a roller-stud  $D'$  to enter a cam-groove at the under side of the cam  $D^2$ ; the extension  $C^4$ , connected to the yoke  $C$ ; the stud-screw  $C^5$ ; the ring  $f$ , its attached pivoted dog  $f'$ , and the arm  $h$ , slotted at  $h'$ , the triangular cam 26, the nut 32, and the slotted plate  $m$ , (shown separately in Fig. 6,) together with the said cam  $D^2$ , are and may be all substantially as in the said patent, wherein like letters are employed to designate like parts, with the exception of a somewhat different shape given to the inner edges of the foot  $e'$ , and to slight differences in the upper side of the cam  $D^2$ .

In accordance with my invention the bridge-piece  $D^3$  has loosely connected to it in any usual or desired manner, as by a rivet 46, an arm  $r$ , which at its outer end has attached to it a stripper-plate  $p^2$ , the said plate having a slot therein at right angles to the length of the button-hole, the said slot being as long as the distance between one and the other side of the slot in the said foot  $e'$ , so as not in any way to limit the vibrations of the clamp. The inner edges of the side pieces of the foot are grooved or chambered, as best shown in Fig. 2, to receive this stripper-plate loosely, so that the clamp can easily be moved longitudinally with relation to the stripper-plate, the latter not following the clamp in its longitudinal movements, but in its vibrations, and up and down, as when the goods are being applied to or being removed from the attachment. The under side of this stripper-plate is so arranged as to just touch or substantially touch the goods being stitched, care being taken that it does not touch the goods with force sufficient to restrain the free motion of the goods with the clamp as the latter is moved longitudinally to take the material with it. This stripper, as has been stated, prevents the material be-



ing stitched from being lifted from the base-plate containing the needle-hole by the needle in its upward movement, and the material being kept down, as described, or prevented from rising, stitches are not skipped. If the material is permitted to rise with the needle, the loop in the needle-thread at the under side of the material has given to it an additional lift, due to the rising of the cloth, which shortens the loop so that the shuttle or under-thread carrier used in the sewing-machine to which the attachment is applied does not have the full amount of loop to enter.

In the patent referred to the stud *a*, serving as the pivot for the cam-wheel  $D^2$ , received in it a screw 13, and the said screw served to keep down a washer upon the upper side of the cam-wheel, the washer in the said patent being spring-like and being intended by its friction to prevent any further movement of rotation of the wheel  $D^2$  than that given to it positively by the ring *f* and dog *f'*. Herein I employ a screw 13, as in the said patent, to enter the top of the stud *a*; but instead of the spring-washer I have applied upon the said stud a rigid washer 36, which is held in place by the screw 13. I have also cut out the upper side of the cam-wheel  $D^2$  more than in the said patent, so as to leave an annular wall 17, and I have connected to this washer 36 two dogs 18, herein shown as spring-arms, which occupy an inclined position, as best shown in Fig. 3, so that the cam  $D^2$  has perfect freedom to move in the direction of the arrow 20 of Fig. 3, but cannot have any back motion because of the said dogs.

I do not desire to limit my invention to the exact construction of the dogs shown, as instead of the springs I may use any other equivalent or well-known form of friction-dog.

The dogs or equivalents are employed to prevent any retrograde motion of the cam  $D^2$ , as such motion, even to the slightest degree, results in an unevenness in the spacing of the stitches. The employment of the dogs referred to instead of the washer also enables the cam  $D^2$  to be moved in its regular and proper direction much more easily than in the patent referred to, thus avoiding strain upon not only the attachment, but upon the needle-bar employed to move the actuating-lever of the attachment.

In order that the cord or upper thread may be brought to or carried around the inner edge of the button-hole, the slot in the stripper-plate  $p^5$  is provided with two diagonally-opposite inclined sides or walls, (marked 2 3 in Figs. 1 and 5,) which extend, preferably, from the longitudinal axis of the slot to the transverse axis of the same.

In the operation of the machine the upper thread or cord when put under tension by the upward movement of the needle is carried by the inclined side 2 of the slot toward the transverse axis of the same as the stripper-

plate is moved in one direction to form one side of the button-hole, and on the movement of the said plate in the opposite direction the said cord is carried toward the transverse axis of the slot by the inclined side or wall marked 3. In this manner the cord or upper thread is carried toward the inner edge of the button-hole, so that practically the stitches appear on but one side of the said cord and a more finished and stronger button-hole is obtained as the said stitches are relieved from wear by the said cord. To facilitate the inclined sides 2 3 in the operation of carrying the cord or upper thread toward the inner edge of the button-hole, the stripper-plate on the under part of the said sides is beveled or inclined upwardly toward the transverse axis of the slot, as indicated at 4 5, Fig. 7, and while I prefer to employ the said beveled under sides 4 5, I do not desire to limit my invention in this respect, as they may be dispensed with and the under side made flat and good results obtained.

I do not claim a presser-foot or device to bear on the cloth held between the members of a clamp, as in United States Patent No. 166,810.

It will be noticed in my invention that the stripper is not intended to bear on the material in the clamp, but only to stand just at or above the surface of the material where the needle works.

I claim—

1. The button-hole-attachment foot-plate, combined with the slotted stripper-plate carried by and rising and falling in unison with the said foot-plate and having its under side close to the upper side of the material, but not resting thereon, to thus retard the free movement of the material with the foot-plate in the length of the button-hole, the said stripper-plate preventing the rising needle from lifting the material to shorten the loops and skip stitches, substantially as described.

2. The base-plate A, the cloth-clamp having a foot-plate, as *e'*, slotted along its inner edges, the bridge-plate, the arm *r*, connected to the base-plate, and the stripper-plate  $p^2$ , located close to the upper side of the material and slotted, as described, and sustained in the slot of the foot-plate, as described, to rise and fall and vibrate in unison with it, combined with means to move the said clamp longitudinally, the stripper-plate being restrained from motion therewith in the direction of the length of the slot in the foot-plate, substantially as described.

3. The base-plate, the stud, the washer, means to hold it in place, the cam-wheel  $D^2$ , the cloth-clamp, and intermediate devices actuated by the said cam to move the cloth-clamp longitudinally, combined with means to rotate the said cam and with dogs to prevent reverse rotation of the said cam, substantially as described.

4. In a button-hole attachment, the herein-described stripper-plate, provided with a slot



having two of its diagonally-opposite sides or walls inclined from the longitudinal axis of the slot toward the transverse axis of the said slot, substantially as described.

5 5. In a button-hole attachment, the herein-described stripper-plate, provided with a slot having two of its diagonally-opposite sides or walls inclined from the longitudinal axis of the slot toward the transverse axis of the said  
10 slot, and having the under side of the said

walls beveled or inclined upward toward the transverse axis of the slot, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of 15 two subscribing witnesses.

ELMER FLETCHER.

Witnesses:

JAS. H. CHURCHILL,

E. J. BENNETT.