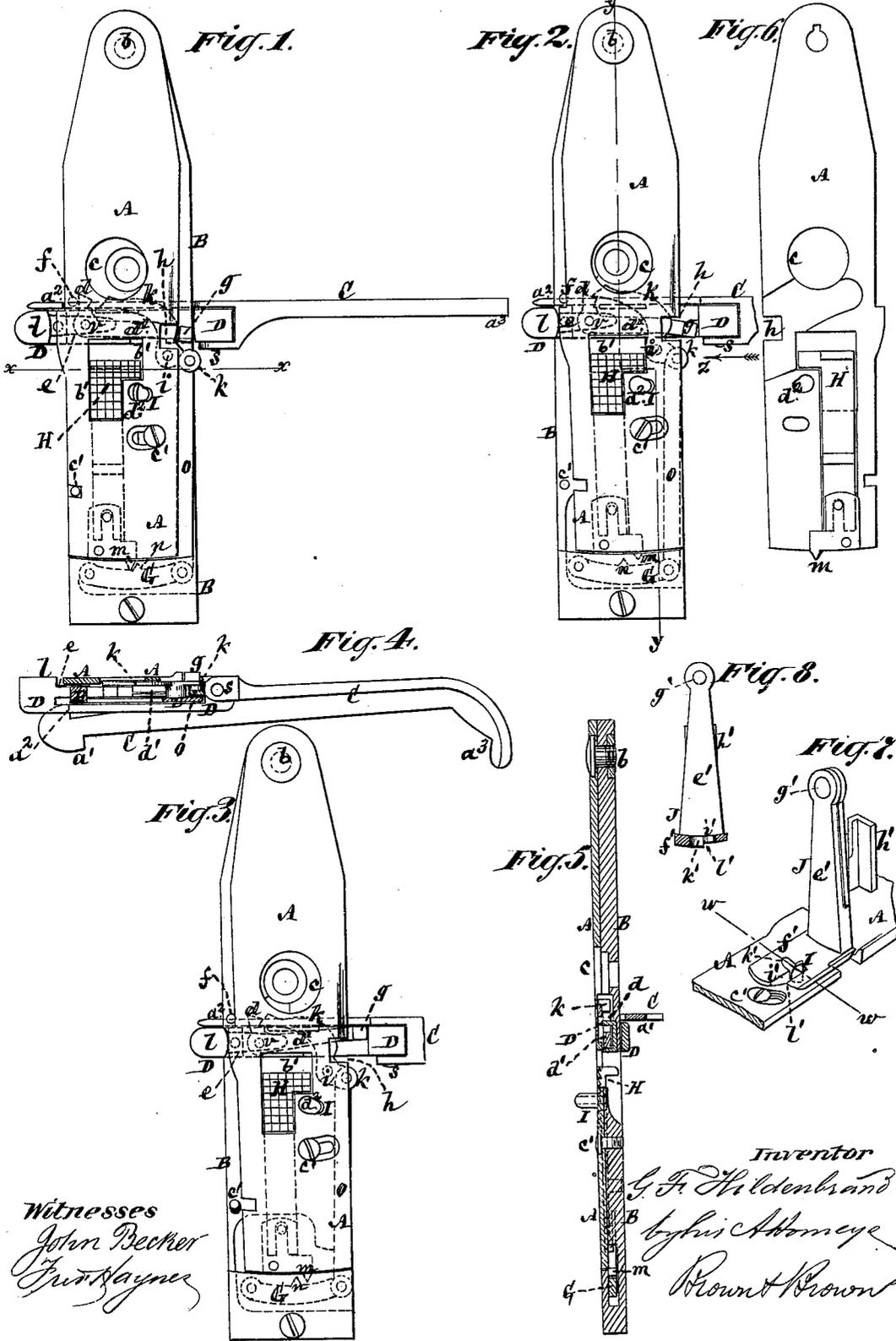


G. F. HILDENBRAND.
 Button-Hole Attachment for Sewing-Machines.

No. 220,616.

Patented Oct. 14, 1879.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE F. HILDENBRAND, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF,
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IMPROVEMENT IN BUTTON-HOLE ATTACHMENTS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. 220,616, dated October 14, 1879; application filed
November 13, 1878.

To all whom it may concern:

Be it known that I, GEORGE F. HILDENBRAND, of the city and State of New York, have invented certain Improvements in Button-Hole Attachments for Sewing-Machines, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

This invention is designed as an improvement upon the button-hole attachment described in Letters Patent No. 204,572, granted to me, conjointly with Peter J. Eckes, June 4, 1878, the object of which was to provide an efficient means of making the button-hole loop by the use of an attachment which could be readily adapted to many of the shuttle sewing-machines now in use, and to apply which it was only necessary to detach the ordinary throat-plate from the machine, and to insert in its place the button-hole attachment.

The invention consists in novel means or certain combinations of means for vibrating and locking, when required, the pivoted upper plate of the attachment to produce the necessary stitch without laterally moving the needle to pass it alternately through the cloth and the button-hole, whereby I dispense with certain toothed wheels and spring-dogs used in the patented attachment hereinbefore referred to, and employ instead simple levers and other mechanical means, which, while durable and certain and positive in their action, enable me to do away with springs controlling the action of the parts.

The invention also consists in a combination, with the pivoted upper plate of the attachment, of a pendent presser-foot actuated by said plate and having a curved pressing-surface, whereby a positive rolling action is obtained for said foot in timely relation with said plate, and creasing of the cloth is avoided.

The attachment represented in the drawings is adapted to a Singer sewing-machine; but it may readily be adapted to machines having a transverse or curved shuttle-race.

Figures 1, 2, and 3 represent a top view of the attachment, with certain of its parts in different working positions. Fig. 4 is a trans-

verse section of the same on the line $x x$, Fig. 1; and Fig. 5, a longitudinal section on the line $y y$, Fig. 2. Fig. 6 is an inverted plan of the working top plate. Fig. 7 is a view, in perspective, of the presser-foot applied to the attachment; and Fig. 8, a transverse section through said foot on the line $w w$ of Fig. 7.

A is the vibrating or top moving plate, and B the bottom stationary plate, of the attachment. These plates are united together at their one end by a screw-pivot, b . An enlarged aperture, c , is made in the vibrating top plate, A, for the screw of the throat-plate to attach the lower stationary plate, B, to the table of the machine, with provision for the vibration or lateral movement of the upper plate, A, as required.

C is the working-arm of the attachment, arranged to extend along and within the shuttle-race, and is provided at its one end with a projection, a^1 , which the shuttle-carrier in its forward movement strikes and locks the mechanism of the attachment, by means of the catch a^2 , in the position shown in Fig. 1, and holds it locked until the return of the shuttle-carrier to the bent end a^3 at the opposite end of the arm C raises said end, and thereby disengages the catch a^2 and draws back a slide, D, pivoted at s to the arm C. Pivoted at v to this slide, which is arranged to travel transversely within the bottom plate, B, is a bell-crank lever composed of arms $d d^1$. This lever may or may not have a spring, e , applied to prevent its too free movement. In the forward movement of the slide D the arm d of the lever $d d^1$ strikes at its back a fixed stop, f , in the lower plate, B, as shown in Fig. 1. This causes the arm d^1 of said lever to be moved toward the outer working end of the plate A, and brings a projection, g , on the outer end of the arm d^1 in line with a notch, h , in one edge of the upper plate, A, as shown in Fig. 1. In the opposite movement of the slide D said arm d engages with or strikes at its front a two-armed bent lever, k , having its fulcrum at i in the lower plate, B. This causes the arm d^1 of the lever $d d^1$ to be moved toward the pivoted end of the upper plate, A, and brings the projec-

tion *g* on said arm *d*¹ out of line with the notch *h* in the plate A, as shown in Fig. 3. The projection *g* on the arm *d*¹ acts when out of line with the notch *h*, and the slide D is moved in a forward direction to move the plate A in a corresponding direction, and a shoulder or projection, *l*, on the opposite end of said slide acts when the latter is moved in a reverse direction to move said plate accordingly.

When the plate A is being moved by the shoulder *l* of the slide D, a projection, *m*, on the outer end of said plate comes in contact with and passes or rides over a projection, *n*, on a lever, G, having its pivot in the lower plate, B. This lever is connected by a rod, *o*, with the bent lever *k*, and as the lever G is moved by the passage of the projection *m* over or past the projection *n*, the bent lever *k* is moved to admit of the arm *d* of the lever *d*¹ clearing it when the plate is making its back stroke. Fig. 2 illustrates this position of said levers *k* and *d*¹ and the projection *g* in line with the notch *h* in the plate.

Supposing the plate A to have been moved back by the shuttle-carrier to the position represented in Fig. 2, and the several parts of the attachment to occupy the position shown in said figure, then, when the slide D is moved forward, as indicated by the arrow *z*, the projection *g* on the lever *d*¹ enters the notch *h* of the plate A, which accordingly is not moved by the action of said slide, and when the slide reaches the extremity of its forward position the mechanism is locked by the catch *a*² on the working-arm C till the shuttle-carrier in its back stroke strikes the bent end *a*³ of said arm, which releases the catch. At the extremity, however, of the forward stroke of the slide D, when the several levers were in the position as represented in Fig. 2, the projection *g* will have struck and moved the lever *k*, so that as the slide D completes its back stroke the arm *d* of the lever *d*¹ will strike the lever *k* and be moved to bring the projection *g* out of line with the notch *h* in the plate A. In the next forward movement of the slide D the projection *g* will accordingly be made to move the plate A along with the slide, the arm *d* of the lever *d*¹ striking the stop *f*, to readjust said lever for entry of the projection *g* in the notch *h* in the succeeding forward movement, before which, however, the slide, having been liberated by the catch *a*², is moved back, and by its shoulder *l* returns the plate A to its original position, (shown in Fig. 2,) and in such backward movement of the plate A the projection *m* on the outer end of it, striking the projection *n*, moves the lever G to restore the bent lever *k* to the position shown in said Fig. 2.

The action again is repeated as before, and the plate A is carried to one side at each alternate motion of the shuttle and needle, as in the patented attachment hereinbefore referred to, the needle on the first motion pass-

ing through the cloth, forming a lock-stitch, and the cloth having been carried aside by said plate A and presser-foot, through the button-hole cut, on the alternate motion, locking again around the edge of the cloth with the shuttle-thread, thus making a perfect button-hole stitch.

H is the feeding-dog applied to the top plate, A, and working through an opening, *b*¹, in it. Said feeding-dog or feeder, which is a four-motion one, may be operated by any suitable means, and the plate A have the limit of its lateral movements controlled by stops *e*¹ *e*¹, to prevent any jamming of the feed. I is a partially-tubular lug on the upper surface of the plate A and adjoining the needle-hole *d*². This lug, as in the patented attachment hereinbefore referred to, serves to keep open the button-hole previously cut in the cloth, and permits the needle to pass through the cut when the outside loop is to be formed. Said lug also secures the proper motion of the presser-foot. The presser-foot, J, proposed to be used with this button-hole attachment is mainly composed of an upright or pendent arm, *e*², and a foot-piece, *f*². The upright arm *e*² is connected by a pivot, *g*², the axis of which is parallel with the upper surface of the plate A, and in direction of the feed, to a socket-piece, *h*², which is constructed to fit the presser-bar of the machine, and may be secured thereto by means of a set screw. The foot-piece *f*² of said presser-foot is of curved form on its under face, struck from a center in the axial line of the pivot *g*². This rounded configuration of the pressing-surface of the foot-piece gives it an easy rolling motion, which prevents any creasing or injury of the cloth. Said presser-foot moves with the top plate, A, of the attachment, and has its motion given to it by the tubular lug I, which projects through a slot, *i*², in the foot-piece, that is furthermore provided with a branch needle-hole, *h*², and the under surface of which foot-piece is rabbeted, as at *l*², to facilitate the turning of the ends of the button-hole without stopping the machine or making a break in the work.

I claim—

1. The combination, with the vibrating plate having its one edge notched, and with the slide by which said plate is moved in one direction, of a lever pivoted to said slide, and mechanism, substantially as described, for causing the latter to alternately engage with and disengage from the notched edge of the vibrating plate during alternate movements of the slide in a like direction, substantially as and for the purposes specified.

2. The combination, with the stationary plate B, the vibrating plate A, having a notch, *h*, in its one edge, the slide D, and working-bar C, of the bell-crank lever *d*¹, pivoted to the slide D, and having a projection, *g*, the lever *k*, pivoted to the lower plate, B; the lever G, connected with the lever *k*, and mechanism,

substantially as described, for causing the said lever G to engage with the plate A, essentially as specified.

3. In combination with the vibrating or laterally-moving upper plate, A, of the button-hole attachment, the pendent presser-foot J, actuated by said plate, and having its axis or center of motion g' parallel with the latter, said

foot being of curved form, to give it a rolling action as it is moved in common with the upper plate, A, essentially as described.

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Witnesses:

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