

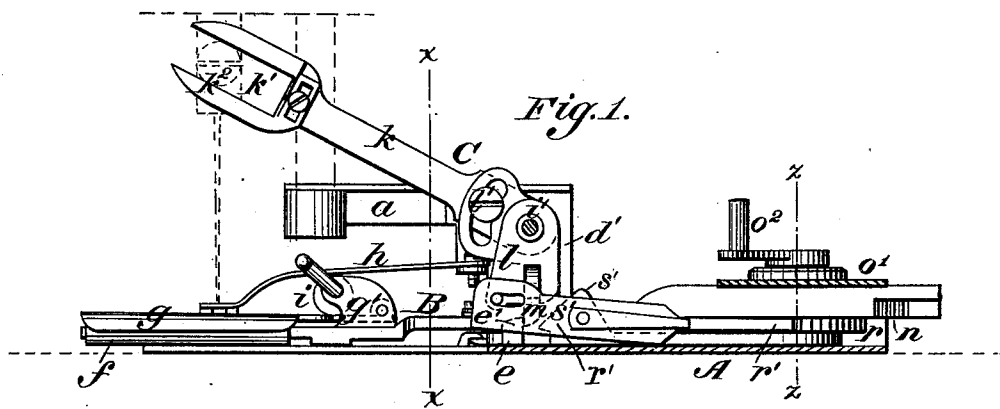
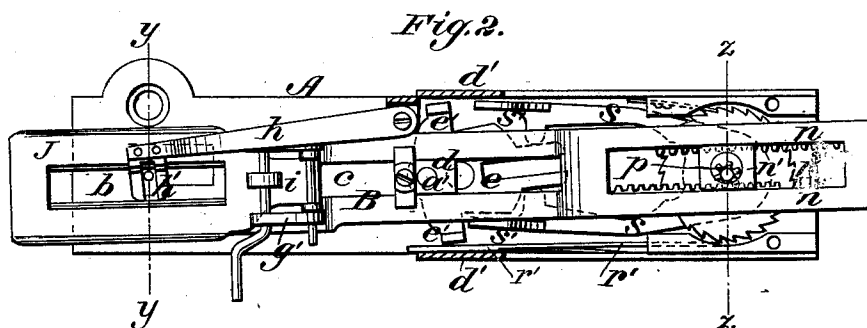
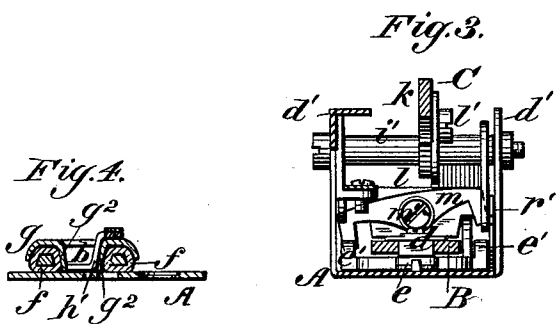
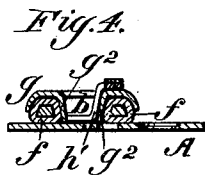
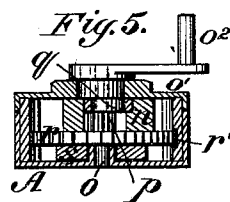
(Model.)

J. K. HARRIS.

Button Hole Attachments for Sewing Machines.

No. 235,235.

Patented Dec. 7, 1880.



WITNESSES:

Donn B. Twitchell.
C. Sedgwick

INVENTOR:

J. K. Harris
BY *Mum & Co.*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN K. HARRIS, OF SPRINGFIELD, OHIO.

BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 235,235, dated December 7, 1880.

Application filed March 8, 1880. (Model.)

To all whom it may concern:

Be it known that I, JOHN K. HARRIS, of Springfield, in the county of Clarke and State of Ohio, have invented a new and useful Improvement in Button-Hole Attachments for Sewing-Machines, of which the following is a specification.

My improvements relate to attachments for sewing-machines for working button-holes, and have for their object to furnish an automatically-acting and adjustable feeding device for giving to the cloth an intermittent lateral movement combined with the forward movement of the material.

In the accompanying drawings, forming part of this specification, Figure 1 is a sectional side elevation of my improved feeding attachment. Fig. 2 is a sectional plan view; and Fig. 3 is a vertical cross-section on line *x* of Fig. 1. Figs. 4 and 5 are cross-sections on lines *y y* and *z z*, Figs. 1 and 2.

Similar letters of reference indicate corresponding parts.

The operative mechanism is carried by a bed-plate, A, which, with slight variations in form, may be used with any of the well-known sewing-machines. The connection of the plate A to the machine by the arm *a*, as shown in Fig. 1, is for the "Domestic" machine.

B is the feed-bar, which is formed with a needle-slot, *b*, at one end, and a slot, *c*, at or near its mid-length, into which enters the guide *d*, that projects upward from a lever, *e*, hung on plate A by a pin, *a'*. The bar B is fitted at the sides of slot *b* with india-rubber or other elastic material, *f*, which extends upon the plate A and forms the pressure-surface to hold the goods. Above the slot *b* is a slotted plate, *g*, pivoted to the lugs *g'* of bar B, and formed with flanges *g''*, that extend through slot *b* at each side to bear upon the material. *h* is a spring-arm pivoted on plate A, and bearing upon plate *g*, and carrying a slotted piece, *h'*, that extends through slot *b* to the plate A to bear upon the material closely around the needle and swing laterally with the bar B. *i* is a cam on a shaft hung in lugs *g'*, so that it may be turned upon plate *g* to prevent the said plate from rising except with bar B. These parts act to keep the material in place and smooth.

In side flanges, *d'*, of plate A a bell-crank lever, C, is hung by a cross-pin, *i'*. The two arms *k l* are hung separately on the pin *i'*, so that the angle between them can be varied, and are held together by a screw, *l'*, which passes through a slot in arm *l* into arm *k*. The arm *k* is formed at its outer end with a slot, *k'*, for passing upon the needle-screw or a projection of the reciprocating needle-bar of a machine, as shown in Fig. 1. The outer end of arm *k* is provided with the adjustable piece *k''*, which may be moved to vary the width of slot *k'*. This adjustment and also the adjustment of the angle of the crank are for varying the feed and adapting the mechanism to the stroke of the needle-bar of different machines.

Upon the arm *l* of lever C is hung a piece, *m*, Fig. 3, by a pin, *m'*, which permits said piece to rock. The two ends of the piece *m* extend downward toward lugs *e'*, that project from opposite sides of the lever *e*, which carries the guide *d* of the feed-bar, so that when the piece *m* is rocked, as hereinafter described, its ends come alternately in contact with the lugs *e'* and swing the lever *e* by the forward movement of lever C.

The feed-bar B at its rear end is formed with parallel racks *n* and is slotted to receive the block *n'*. An arbor, *o*, having bearings in plate A and a cap-plate, *o'*, (see Fig. 5,) passes between the racks *n* and carries a fixed pinion, *p*, and loose eccentric *q*, the former being between the racks, and the latter fitting in block *n'*. The arbor *o* is fitted with a handle, *o''*, upon the hub of eccentric *q*, by turning which the eccentric *q* is made to move block *n'* and bar B to bring either rack *n* in mesh with pinion *p*. The arbor *o* also carries a ratchet-wheel, *r*, which is engaged by a pawl, *r'*. Said pawl *r'* is provided at its rear end with a slot which is engaged by a pin on the arm *l* of the lever C.

Upon the arbor *o* is hung a forked arm, *s*, which lies upon the plate A, its forked ends extending forward at opposite sides of lever *e*, and being provided with inclined lugs *s'*, that project upward at opposite sides of feed-bar B.

The operation is as follows: The arm *l* of lever C being engaged by the pawl *r'*, the vibrations of said lever impart a reciprocating motion to the pawl, which in turn operates the

ratchet-wheel *r* and pinion *p*, and the feed-bar B is thus given an intermittent movement forward or back, according as to which rack *n* is engaged with pinion *p*. As the arm *k* of lever C rises, the rocking-piece *m* being turned so that one of its ends will come in contact with one of the lugs of lever *e*, the lever *e* is swung on its pivot, and the guide *d* swings the bar B sidewise on the pinion *p* as a center, so that the feeding end of bar B is caused by the combined forward and side movement to give a zigzag feed to the cloth. The swinging movement of lever *e* at the same time swings the arm *s* in a direction opposite to that in which bar B moves, and one lug, *s'*, is thereby moved behind the depressed end of piece *m*, so that as the lever C descends the lug *s'* will rock the piece *m* and depress its other end. Then, as lever C again rises, the bar B is swung to the other side. At the end of the button-hole the forward movement of bar B is to be arrested by turning the handle *o*² to bring the pinion *p* in contact with the other rack, when the bar B will be moved backward to work the other side of the button-hole. The movement of bar B by the handle *o*² is upon the guide *d* as a center, so that the feed end of the bar is carried in the opposite direction, and the material is thus carried sidewise while oscillating, thus working the end of the button-hole and causing the next line of stitching to come at the other side of the button-hole.

It will be seen that the presser-piece *h* has

the same lateral movement as the feed-bar and gives an extra pressure on the cloth. It also causes the locks of the stitches to terminate in a straight line, either above or below the surface of the material, or at the edge, according as the tensions are regulated, by preventing any rise or fall of the part of goods immediately surrounding the needle.

The feed-bar is shifted to form the ends of the button-hole and change the direction of feed without stopping the machine.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the bed-plate A, of the feed-bar B, having slots *b c*, lugs *g'*, and elastic pressure-faces *f*, the pivoted slotted plate *g*, having flanges *g*², the spring-arm *h*, pivoted on plate A, bearing on plate *g*, and carrying slotted piece *h'*, and the cam *i* on a shaft having its bearings in the lugs *g'*, as and for the purpose described.

2. The combination, with the feed-bar B and the vibrating lever C, of the lever *e*, having lugs *e'*, guide *d*, rocking piece *m*, and forked arm *s*, having inclined lugs *s'*, substantially as herein shown and described, and for the purposes set forth.

JOHN K. HARRIS.

Witnesses:

A. E. TURNBULL,
J. P. SHARP.