(No Model.) 3 Sheets—Sheet 1.

C. D. CAMPBELL.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 244,851. Patented July 26, 1881.

Fig 1,

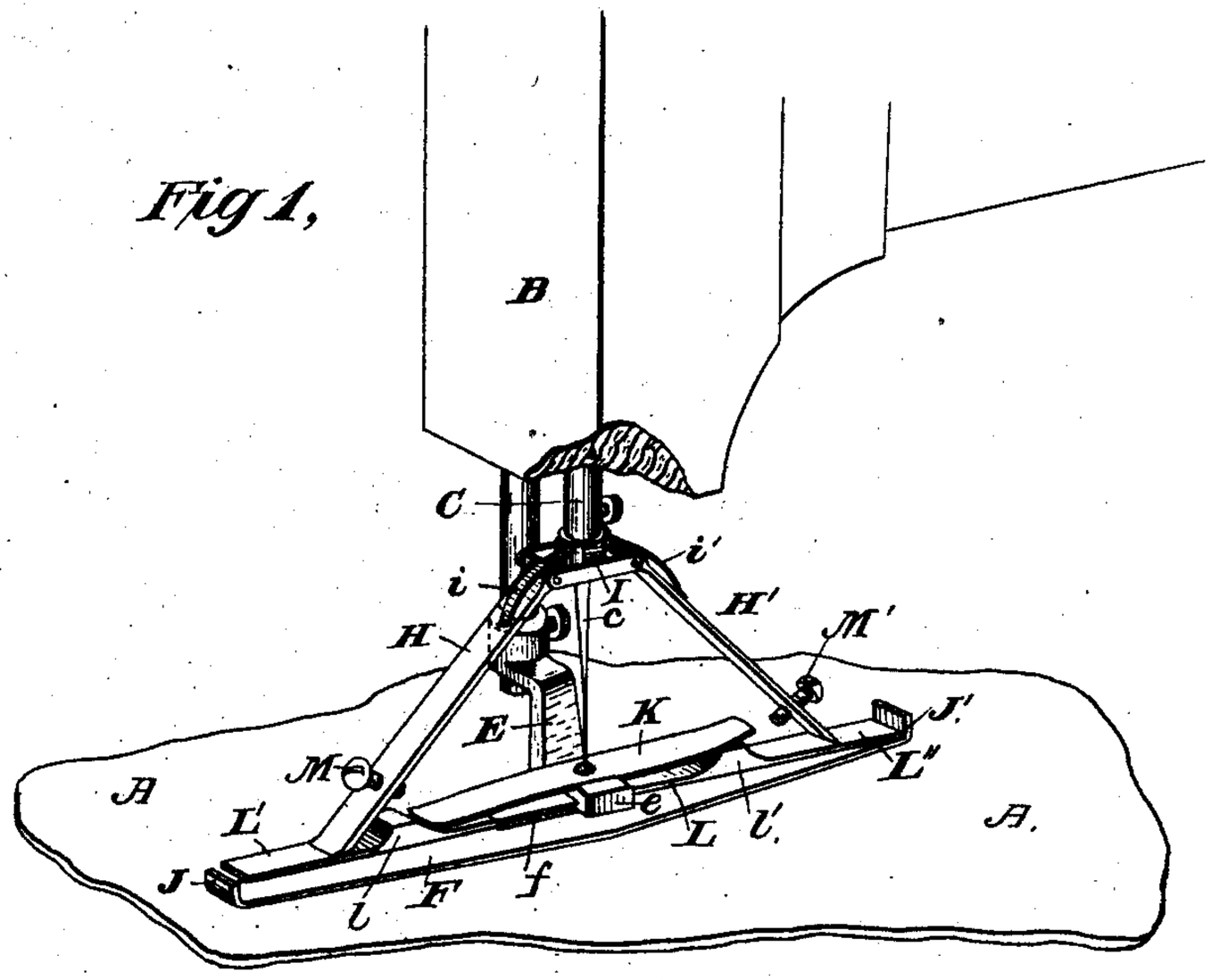


Fig 2,

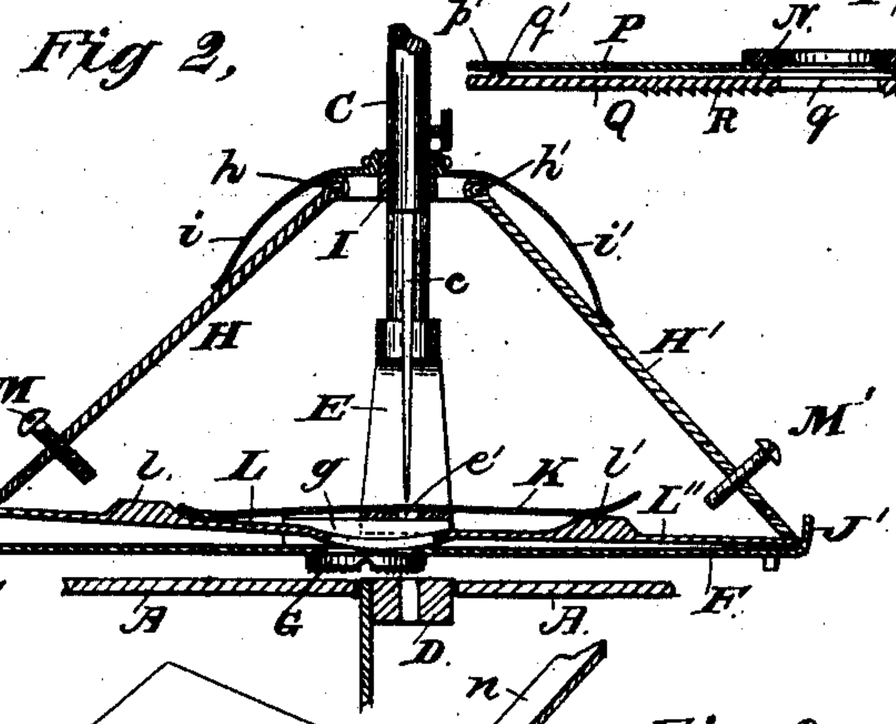


Fig 4,

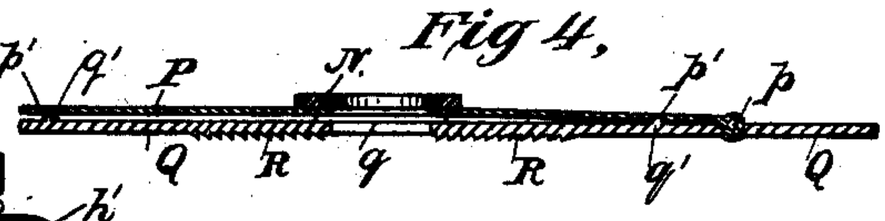
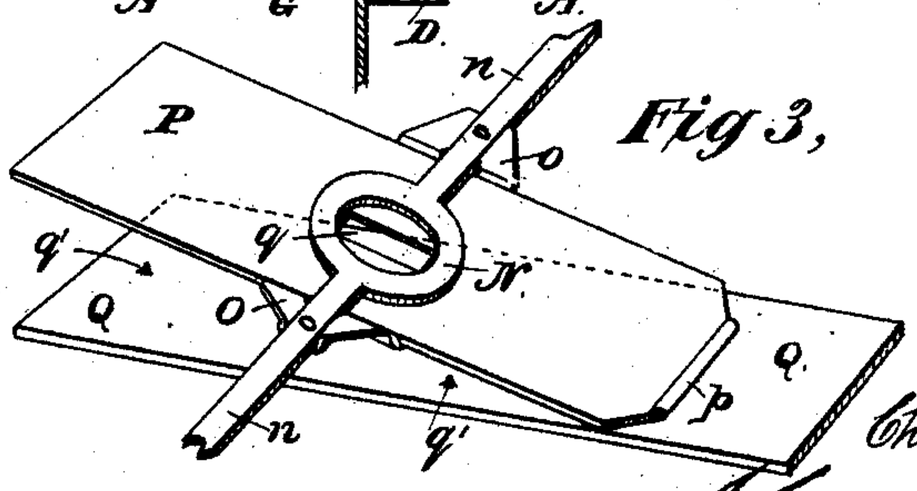


Fig 3,



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(No Model.) 3 Sheets—Sheet 2.

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No. 244,851. Patented July 26, 1881.

Fig 5.

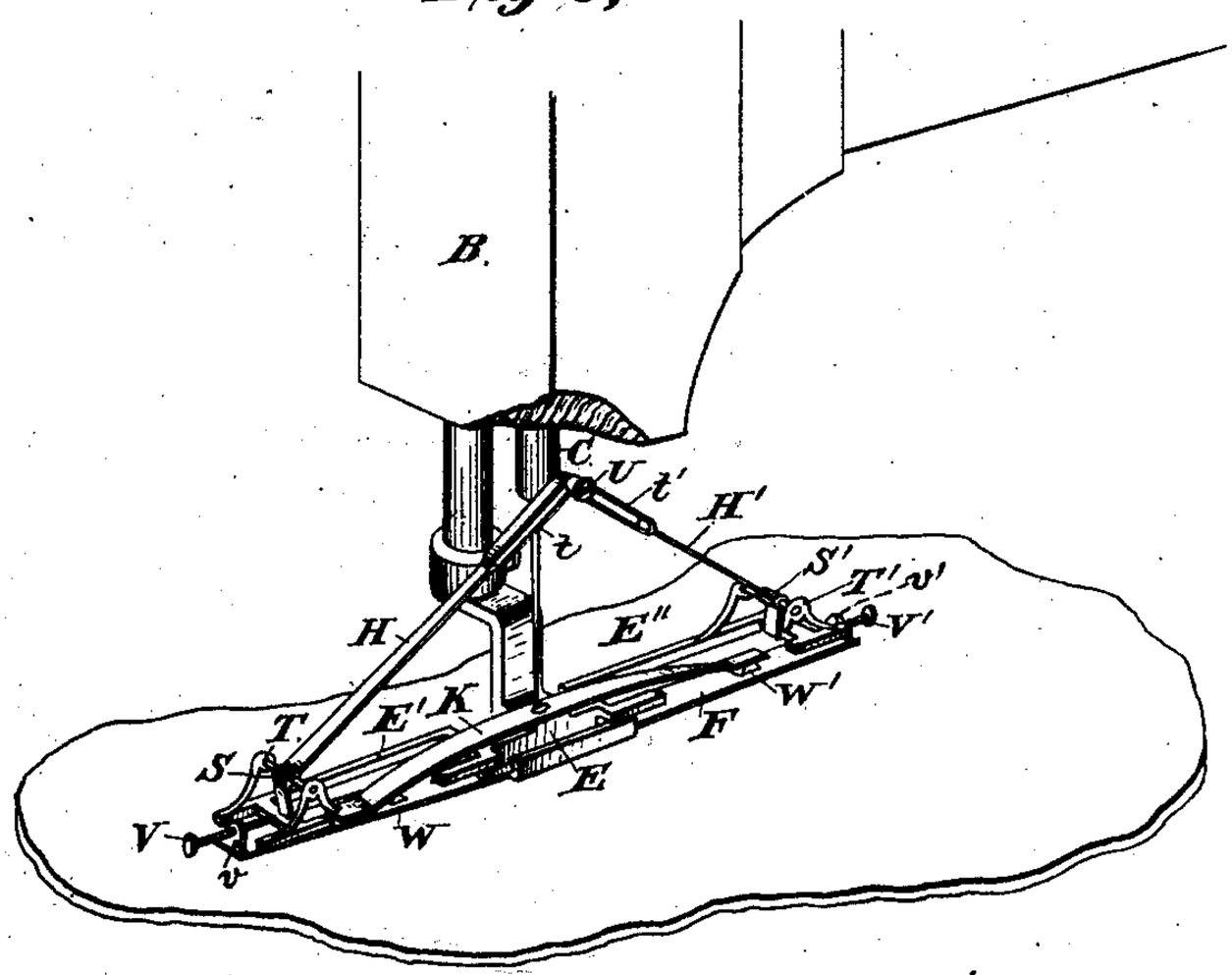

Fig 6.

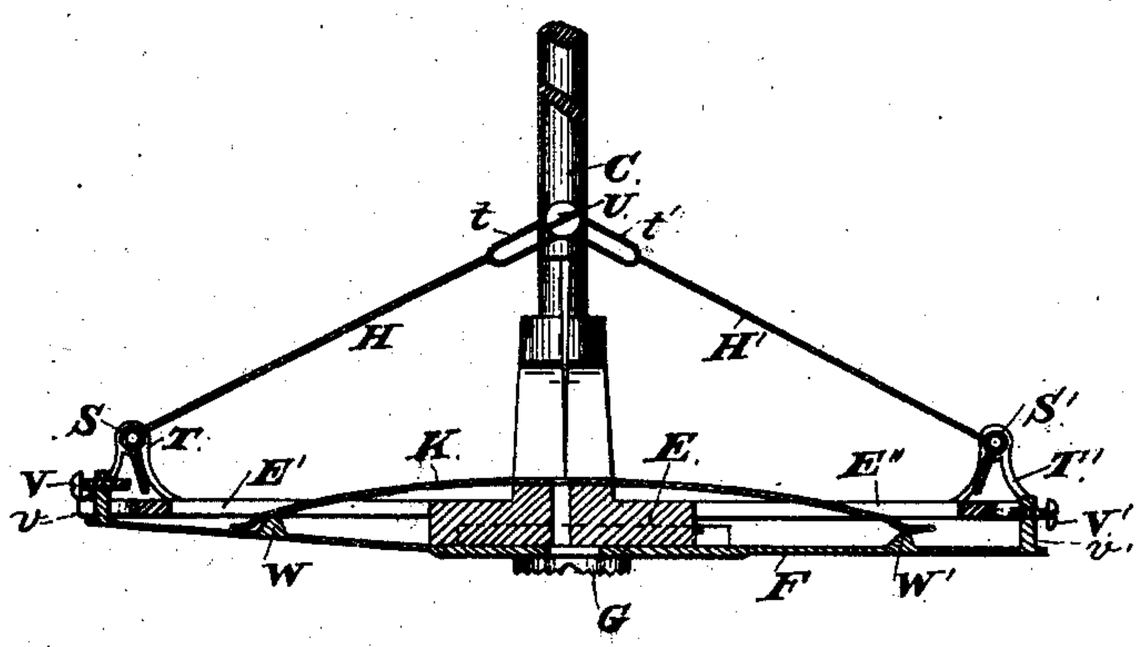

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Fig 7.

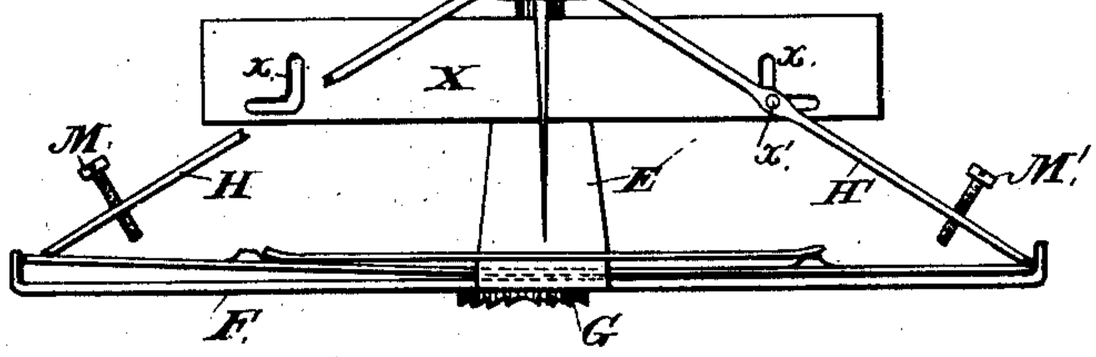
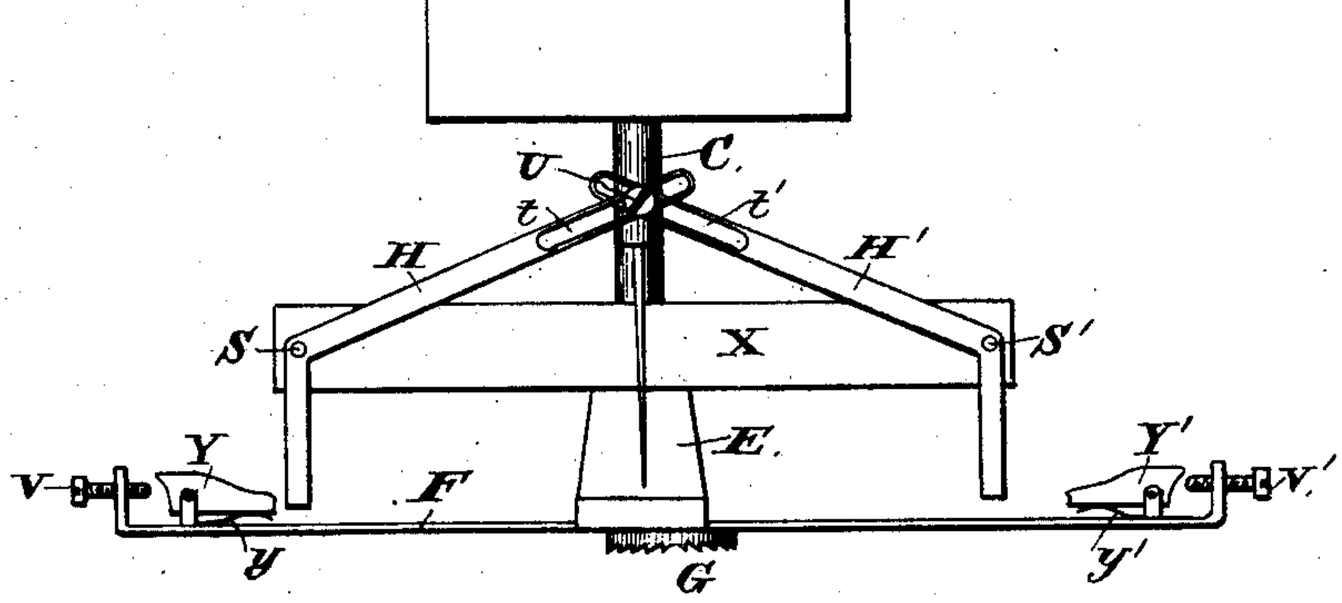


Fig 8.



Attest:
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UNITED STATES PATENT OFFICE.

CHARLES D. CAMPBELL, OF LIMA, OHIO.

BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 244,851, dated July 26, 1881.

Application filed July 12, 1880. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. CAMPBELL, a citizen of the United States, residing at Lima, in the county of Allen and State of Ohio, have invented Improvements in Button-Hole Attachments for Sewing-Machines, of which the following is a specification.

The object of this invention is to give the cloth a reciprocating motion across the line of feed for ornamental stitching, overseaming, sewing button-holes, and other operations requiring a transverse relative motion of the needle and cloth. To accomplish this a reciprocating transverse feed-motion is placed above the cloth, whereby each downward stroke of the needle-bar causes the cloth to move from one side to the other of the regular line of feed, thus imparting to the cloth the required motion.

The device consists, essentially, of a feeding-plate adapted to slide on a foot depending from the stationary arm of the machine, and operated by a pair of pivoted levers that, having a vertical motion imparted to their inner ends, operate at their outer ends by striking alternately against projections or stops on the feed-plate to move said plate first to one side and then to the other of the ordinary feed. A spring-plate fastened to the stationary foot operates by impinging alternately against two lugs or studs projecting from the flattened ends of a rocking plate on the reciprocating feed-plate to alternately throw the aforementioned levers out of range with the aforementioned stops or projections, so that only one lever may act at a time. For sewing the rounded end of button-holes or eyelets a hinged clamp is provided to hold and rotate the cloth. This clamp consists of two plates hinged together, each plate being slotted in the middle, and the lower one having corrugations adapted to fit onto and be operated by the ordinary feed of the machine. The upper plate is adapted to slide freely in guides on a transverse arm that embraces and rotates upon the aforementioned transverse feed-plate, which is made circular on this account. By these means the cloth may be securely held and fed forward or backward, or rotated at will.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the improved attachment as applied to the needle-bar and presser-foot of a sewing-machine, showing, also, a portion of the bed-plate and stationary arm. Fig. 2 is a section on the line of the transverse feed. Fig. 3 is a perspective view of the button-hole attachment. Fig. 4 is a longitudinal section of the same. Figs. 5 and 6 are respectively perspective and sectional views of a modification. Figs. 7 and 8 show portions of two other modifications.

A is the cloth-plate, and B the stationary arm, of an ordinary sewing-machine. C is the needle arm or bar, *c* the needle, and D the ordinary feed-plate.

Depending from the arm B is a foot, E, having guides *e* for the slide *f*, that is fastened on the upper face of the reciprocating plate F, on the under face of which is secured a circular feed-plate, G. A slot, *g*, extending through the parts *f* F G and a circular hole, *e'*, in the foot E, allows the free passage of the needle *c*. The plate F, and consequently the cloth fed beneath it, is moved back and forth by the levers H H', pivoted at *h h'* to a collar, I, on the needle arm or rod C, and depressed by springs *i i'*, said levers H H' striking alternately against the projections or stops J J' extending upward from the extremities of the plate F.

Fastened to the foot E is a horizontal plate-spring, K, and pivoted at the center of the plate F is a rocking plate, L, spreading out endwise into two flat portions, L' L'', upon the upper faces of which slide the lower ends of the levers H H', which are preferably beveled, as shown. On each of the portions L' L'' is a beveled protuberance or lug, *l l'*, against which the spring K alternately impinges, so as to depress that part of the rocking plate nearest the foot E, thereby elevating the other part, and causing one of the levers H H' to strike while the other slides over the stops J J'. Set-screws M M' in the levers H H', by impinging against flat portions L' L'' of the plate L, serve to regulate the point of escape of the said levers from the stops J J', and consequently afford a means of adjusting the transverse feed of the cloth.

The device, so far as described, is sufficient

for hem and ornamental stitching, ordinary button-holes, and overseaming; but for sewing button-holes, eyelets, &c., a further attachment is necessary, which will now be described.

N is an annular plate, adapted to encircle and rotate upon the circular feed-plate G, and having two arms, *n n*, and upon each of these is fastened a guide, O, in which slides freely the plate P, that, together with the plate Q, to which it is hinged at *p*, forms the cloth-clamp. Each plate of this clamp has a longitudinal slot, *q*, through which the needle plays, and upon the under side of the lower plate are two series of corrugations or teeth, R, inclined toward the middle of the slot, for the purpose of engaging with the ordinary feed-plate D, and thus impart to the clamp P Q the necessary longitudinal feed. The plates P Q are provided with protuberances *q'* and depressions *p'*, so as to hold the cloth more securely.

In starting the machine one end of the plate F—say, for instance, the end J'—is placed a little nearer the foot E than the other end, thus causing the spring K to slide upon the protuberances *l'* and depress the end L'', and consequently raise the other end, L'. Then as the needle-bar descends the levers H H' slide along the flat portions L' L' of plate L until the under feed, D, has stopped, when the nearer stop, J', is struck by the lever H', and the plate F caused to slide across in the guides *e* in the direction of the end J', thereby causing the spring K to slide off the lug *l'* and onto the lug *l*, and thus reverse the positions of the plate L. The flat portion L'' having been in an elevated position during the descent of the lever H, the latter is caused to slide over and thus escape the stop J. The plate F having arrived at the end of its stroke, the screw M, impinging against the flat portion L', causes the outer end of the lever H to trip over the stop J, after which the needle-bar rises, and the operation is repeated in the reverse direction, and so on.

In sewing a button-hole the cloth is placed in the clamp P Q with the slit opposite the slots *q q*, and the whole is then placed under the plate F, the annular plate N encircling the feed-plate G, and the teeth R engaging with the teeth of the feed-plate D. The machine being then started, the clamp and cloth is fed along by the teeth R and feed-plate D until the end of the button-hole is reached. The arms *n n* enable the operator to steady and regulate the movement of the cloth and assist its gradual rotary motion, and, if a small oblong or elliptical eyelet is being sewed, on reaching the end of the slit, to turn the cloth half-way around, when the operation is repeated on the other side of the slit. It will, of course, be understood that during this longitudinal feed the transverse feed has also been operating to move the cloth back and forth across the usual feed, so as to produce the usual button-hole stitch.

In working an eyelet-hole the operation is similar, there being no longitudinal feed, however, and the arms *n n* being moved all the way around without stopping.

It will be seen that this device may be easily attached to many of the existing sewing-machines, and will do the work accurately and completely with a minimum of expense.

In the modification shown in Figs. 5 and 6 the levers H H', instead of being pivoted to the needle-bar, are fulcrumed at S S' to arms T T', that extend upwardly from the extremities of the horizontally-extending arms E' E'' on the foot E. In this modification the levers H H' are L-shaped, and at their inner ends are provided with slots *t t'*, in which slides a pin or stud, U, on the needle-arm C. The other ends of these levers are adapted to strike alternately against adjusting-screws V V' in the vertical ends *v v'* of the sliding plate F, which plate, in this modification, is shown pivoted at its center and provided with studs W W', against which the spring K alternately presses as said plate is fed back and forth, thereby lowering one end of said plate out of range of and lifting the other end into range with the levers H H'. To this plate F is secured the feed-plate G, as in the preferred form, and the two together slide on guide *e*, as in the preferred form, described hereinbefore.

The operation of the modification is substantially the same as the one first described, the set-screws V V' serving the same purpose as the screws M M', and the studs W W' being substituted for the studs *l l'*, while the rocking plate F in the modification performs the function of the rocking plate L in the preferred form.

The feed-plate G has teeth slanting both ways from the center, thereby forming a central groove, through which a thread or cord may be passed when it is desired to sew the same onto the cloth.

In Fig. 7 is shown another manner of operating the arms H H'. A plate, X, secured to the presser-foot E, and having slots *x*, through which pass studs *x'* on levers H H', serves to support said levers and form a connecting-link between them and the presser-foot, so that the whole attachment may be handled as a unit.

In the modification shown in Fig. 8 the levers H H' are pivoted to the plate X, and operated from the needle-bar C by a pin, U, sliding in slots *t t'* in the levers. The plate F is adapted to slide on the presser-foot E, and is operated by the lower ends of the levers H H' impinging alternately against pivoted stops Y Y'. Set-screws V V' limit the backward tip of stops Y Y', and spring-supports *y y'*, which hold up the stops to their normal position, allow of a slight depression of said stops when the levers H H' strike against the same on their backward stroke. As the needle-bar descends, the stop nearest the needle will be struck by one of the levers H H' and tipped upward until its heel strikes against the adjoining set-screw,

the plate F being thereby shifted to the opposite side, thus effecting the feed-movement. The lever which does not strike its stop escapes over the top of the same, and upon its return impinges against the end of the stop, which allows it to pass by depressing the spring.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent.

1. The combination of levers H H′, pivoted to the needle-bar, and a feeding device capable of transverse reciprocating motion on the presser-foot, substantially as described.

2. The combination of levers H H′, reciprocating plate F, having feed-plate G and lugs J J′, and suitable mechanism for carrying the end of the non-engaging lever over the said lugs, substantially as described.

3. The combination of spring K, adapted to be fastened to the presser-foot of a sewing-machine, and the rocking plate L, having protuberances *l l′*, with the sliding plate F, having stops J J′, to receive impact from the ends of levers H H′, as and for the purpose set forth.

4. The actuating-levers H H′, adapted to be pivoted to the needle-bar C, and provided with adjusting-screws M M′, in combination with the sliding plate F, oscillating plate L, having projections *l l′*, and spring K, as described.

5. The hinged cloth-clamp P Q, having ridged portion R, whose teeth all project toward the needle-opening for feeding the cloth around the needle, as described.

6. The hinged cloth-clamp P Q, in combination with the plate N, having arms *n*, as and for the purpose set forth.

C. D. CAMPBELL.

Witnesses:

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T. H. BOYD.