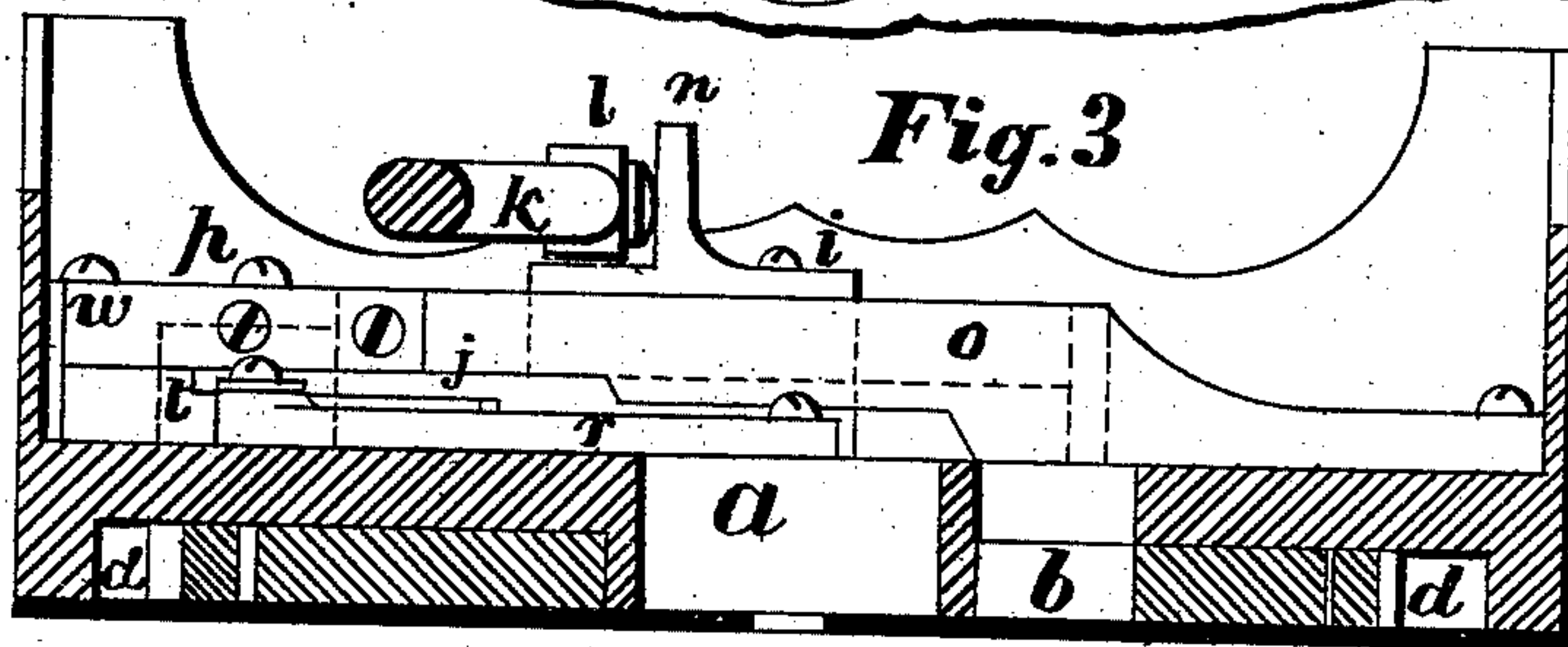
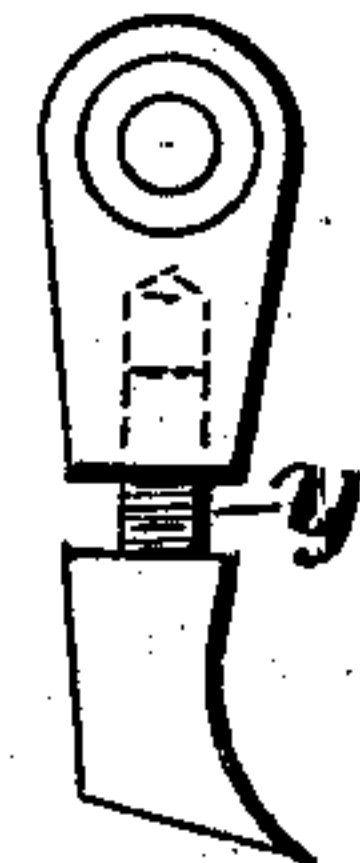


Fig. 4



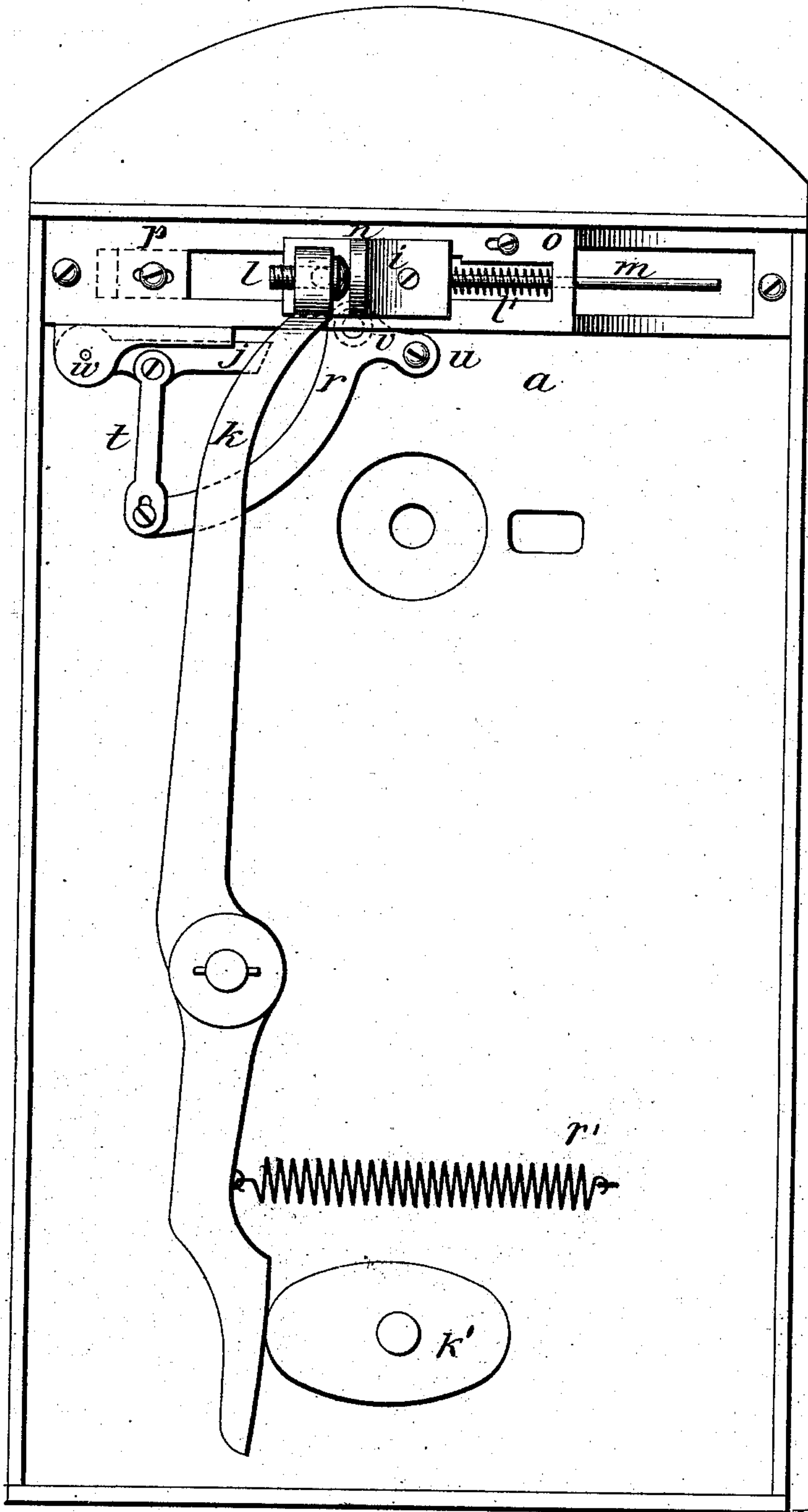
Witnesses.
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2 Sheets—Sheet 2.

D. BARCELLOS.
Button Hole Sewing Machine.
No. 235,725. Patented Dec. 21, 1880.

Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

DANIEL BARCELLOS, OF BROOKLYN, NEW YORK.

BUTTON-HOLE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 235,725, dated December 21, 1880.

Application filed May 8, 1879.

To all whom it may concern:

Be it known that I, DANIEL BARCELLOS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Button-Hole Sewing-Machines, of which the following is a specification.

This invention relates to improvements upon the feed mechanism and clamp-plate-adjusting devices of the machine known as the "Union Button-Hole Machine," patented to D. W. G. Humphrey, August 29, 1865.

The objects of my improvements are to secure a positive and accurate movement of the feed mechanism, to provide for the prompt variation of the feed as required.

In the accompanying drawings, Figure 1 is a plan view of a portion of a button-hole sewing-machine, the clamp-plate being removed to show in part the feed mechanism and the clamp-plate-adjusting device. Fig. 2 represents a bottom view of a portion of the machine. Fig. 3 represents a section of the inverted machine on a plane coincident with the diameter of the feed-wheel. Fig. 4 is a detail view of an adjustable pawl constructed according to my invention. Fig. 5 is a bottom view of the machine, showing the feed-operating lever and its motive cam.

The letter *a* designates the bed-plate of the machine, and *b* is the ratchet or feed wheel, which in a complete machine is connected with the clamp-plate in the ordinary manner, as in Humphrey's patent, before referred to.

Pivoted in recesses in the bed-plate are pawls *d d*, engaging with the teeth of the wheel *b* and held thereto by suitable springs. These pawls *d d* are adjustable in length, being made in two parts, the outer one of which has a screw-shank, *y*, which screws into the other, as shown in Fig 4, so that the adjustment may be made to compensate for wear, or in originally assembling the parts. The bottom of the recess and the covering-plate prevent the tongue portions of the pawls from turning when in place. The pawls *d d* in Fig. 1 are provided with double tongues projecting in opposite directions, and either of which may be turned to engage with the teeth of the wheel, and thus the desired ad-

justment may be attained within the limit of half the distance from thread to thread.

At *e e'* is indicated in dotted lines a cam-groove in the lower face of wheel *b*, said groove in its half *e'* having a somewhat shorter radius than in the other half. Into this cam-groove extends a pin, *v*, projecting from a curved lever, *r*, which is pivoted to the under side of the bed-plate by a screw-pin, *u*, the end of the extended portion of this lever being connected by a link, *t*, with a stop-pawl, *j*, pivoted to an adjustable lug, *w*, secured to inner side of the race-block *o*, said stop-pawl *j* having a movement across the top of the side wall of the raceway, and partially across the raceway, as shown in full lines, Fig. 1, and dotted lines, Fig. 2. The function of this pawl will presently appear. The race-block *o* is secured to the under side of the bed-plate, and the rabbeted upper edges of its side walls form the raceway upon which reciprocates a pawl-carrier, *i*, having pivoted upon its upper side, as shown in Fig. 1, a pawl, *g*, provided with an adjustable tongue, *f*, which engages with the teeth of the feed-wheel *b*, being held thereto by a suitable spring.

From the pawl-carrier *i* a broad-faced lug, *n*, projects downward in the path of an adjustable tappet, *l*, arranged in the end of a vibratory lever, *k*, fulcrumed on the under side of the bed-plate, and having its other end in contact with the edge of a rotary cam, *k'*, having two portions of unequal length on opposite sides of its shaft, so that it will impart alternately long and short strokes to the lever, which, in turn, imparts corresponding movements in one direction to the pawl-carrier by striking the lug *n*, and causes the pawl-tooth *f* to propel the feed-wheel. The return movement of the pawl-carrier *i* is caused by a spring, *l'*.

When the feed-wheel *b* is in such part of its revolution that the pin *v* is in the smaller portion *e'* of its cam-groove the lever *r* is moved inwardly to the position shown in Figs. 2 and 5, and the stop-pawl *j* stands in the position shown in full lines, permitting the pawl-carrier *i* to follow back the tappet *l* as far as the stop-block *p*, which is adjustably secured in the race-block. The tappet, in the vibrations of the lever, will drive the pawl-carrier, first,

so far as will suffice to advance the wheel *b* one tooth, and at the next stroke far enough to advance said wheel three teeth, while the cam-shaft is making one revolution, these
5 short and long feeds resulting from the unequal projections of the cam.

When the large portion *e* of the cam-groove of the feed-wheel embraces the pin *v* the lever *r* will be moved to such position as to hold
10 the stop-pawl in the position indicated by dotted lines, as at *j'*, Fig. 2, so that its tip stands in the path of and limits the return movement of the pawl-carrier, holding it beyond the range of the short strokes of the lever, and
15 in such position that the long strokes will cause the wheel *b* to be advanced one tooth per revolution of the cam-shaft. I preferably arrange the relative adjustments of the parts to produce a two-tooth feed instead of
20 the one-tooth feed, and a four instead of a three-tooth feed, as just described.

In order to avoid the disagreeable and damaging jarring and clicking observed in most machines of this class, I face the lug *n* and
25 the abutting surface of the pawl-carrier with leather, rawhide, or similar material.

For the purpose of adapting my improvement to machines already made, and which have the cam-groove in the feed-wheel of
30 greater throw and less prompt change than is required for the best action of my devices, I form a slot in the end of the link *t*, where it is connected to the lever *r*, so that the length of the said link may be regulated to cause the
35 pawl *j* to be actuated only by the last part of the throw of pin *v*.

The letter *c* designates an ordinary inclined toothed wheel mounted in a recess in the bed-plate, and having its teeth in engagement
40 with those of the wheel *b*. The shaft of this wheel *c* extends upward through a plate which covers the recess, and has secured to its end a crank, *s*, by which it and the wheel may be turned to turn the ratchet-wheel *b* forward
45 from the position at which it is stopped upon the completion of a button-hole to the proper position for beginning another.

What I claim is—

1. The combination, with the ratchet feed-wheel provided with the cam-groove having
50 a variable throw, of the reciprocating pawl-carrier provided with an impelling-pawl engaging the teeth of said feed-wheel, the movable stop-pawl for varying the movement of the pawl-carrier, the lever *r*, connected with
55 said stop-pawl and having a pin extending into the cam-groove of the feed-wheel, and suitable devices connected with the driving-shaft of the machine for imparting a reciprocating motion to the pawl-carrier, substantially as described. 60

2. The combination, with the feed-wheel and race-block, of the reciprocating pawl-carrier and its pawl, the stop-pawl *j*, pivoted to the pawl-carrier, the lever *r*, connected with
65 said stop-pawl and operated by the feed-wheel, the vibratory lever *k*, mechanism for imparting thereto alternately longer and shorter strokes for actuating the pawl-carrier, and suitable pawls for preventing back movement
70 of the feed-wheel, all arranged and operating substantially as described, and for the purpose set forth.

3. The combination, with the toothed feed-wheel provided with the cam-groove *e e'*, of
75 the reciprocating pawl-carrier and its pawl, the lug *n*, depending from said pawl-carrier, the vibratory lever *k* for striking said lug, the rotary cam *k'*, having unequal projections, for imparting alternately long and short strokes
80 to said lever, the movable stop-pawl *j*, the lever *r*, connected with said stop-pawl by a suitable link, and having the pin *v* extending into the cam-groove of the feed-wheel, and suitable pawls for preventing back movement of
85 said feed-wheel, all arranged and operating substantially as and for the purpose set forth.

DANIEL BARCELLOS.

Witnesses:

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EMERSON W. QUICK.