

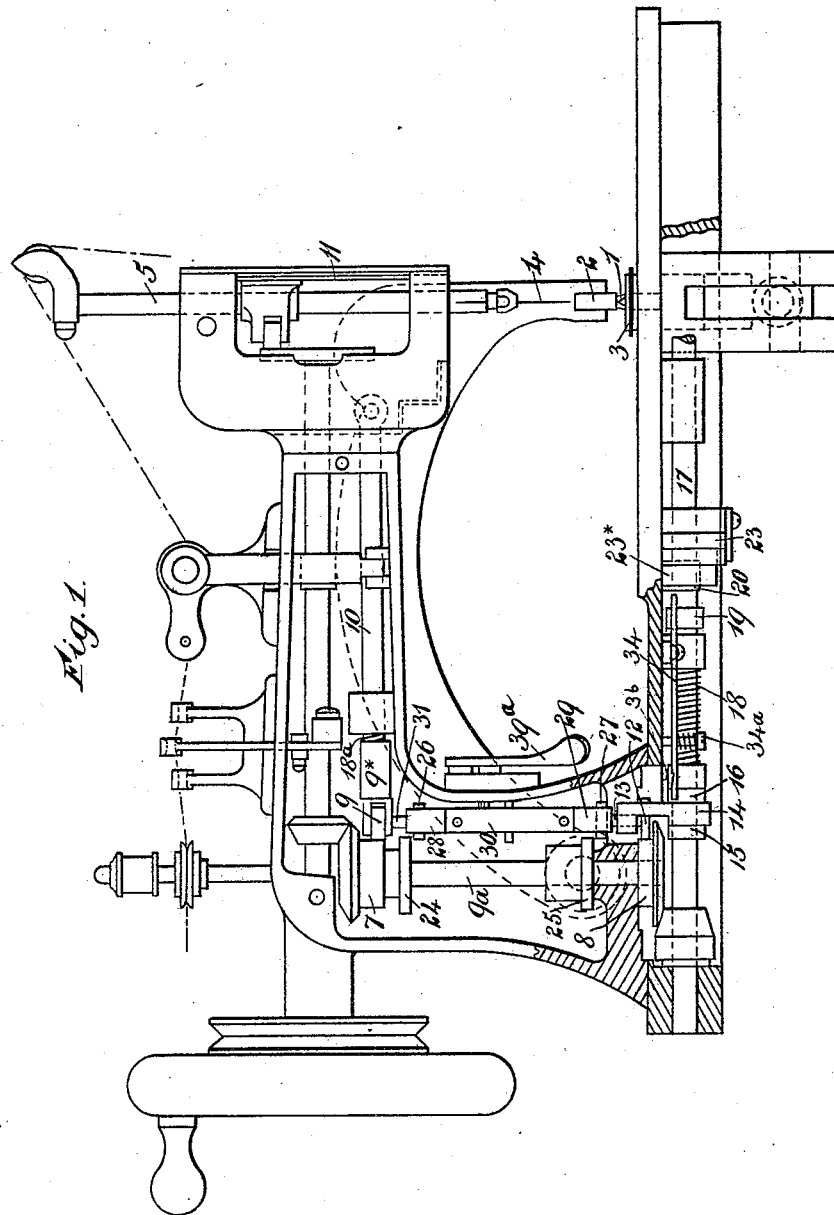
(No Model.)

4 Sheets—Sheet 1.

A. HELWIG.
BUTTON HOLE SEWING MACHINE.

No. 455,207.

Patented June 30, 1891.



Witnesses

W. Wheeler
Chas. J. Maguire

Inventor

Arthur Helwig
By his Attorneys
Curtis & Crocker

(No Model.)

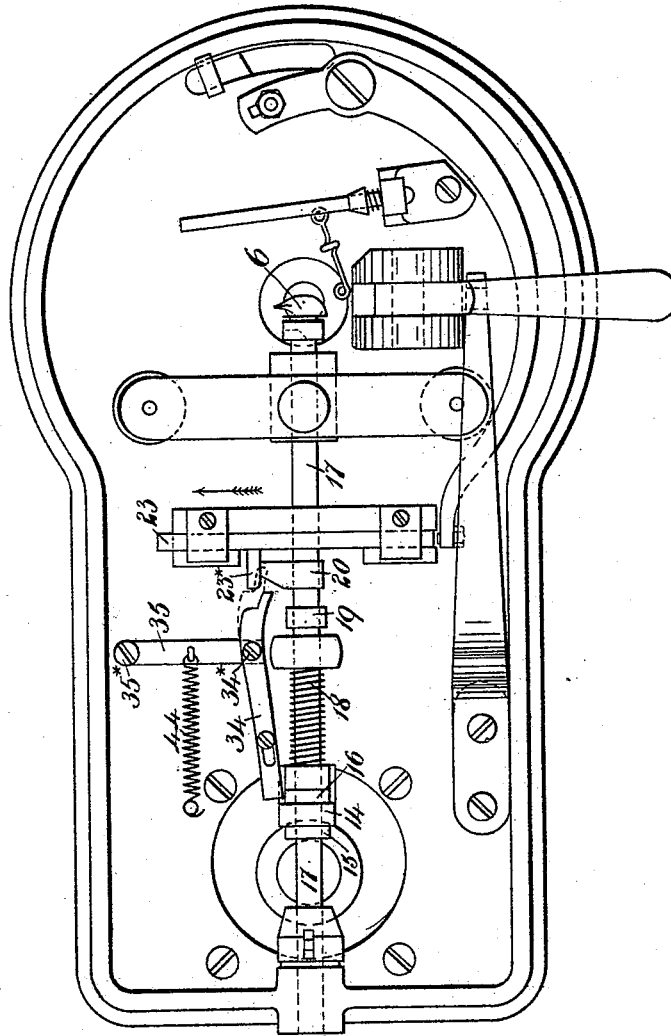
4 Sheets—Sheet 2.

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Fig. 2.



Witnesses

R. Schaefer
Chas. J. Maguire

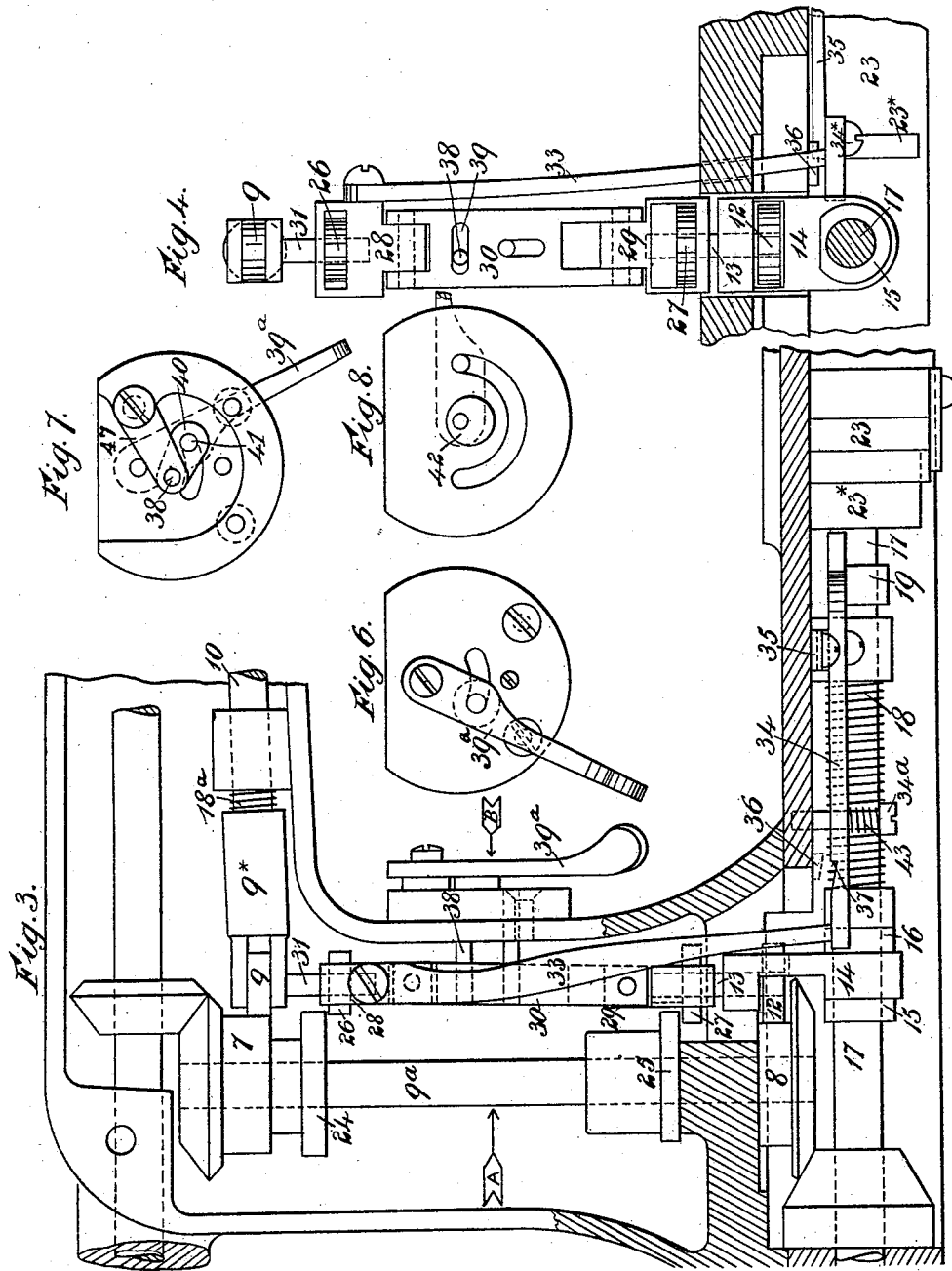
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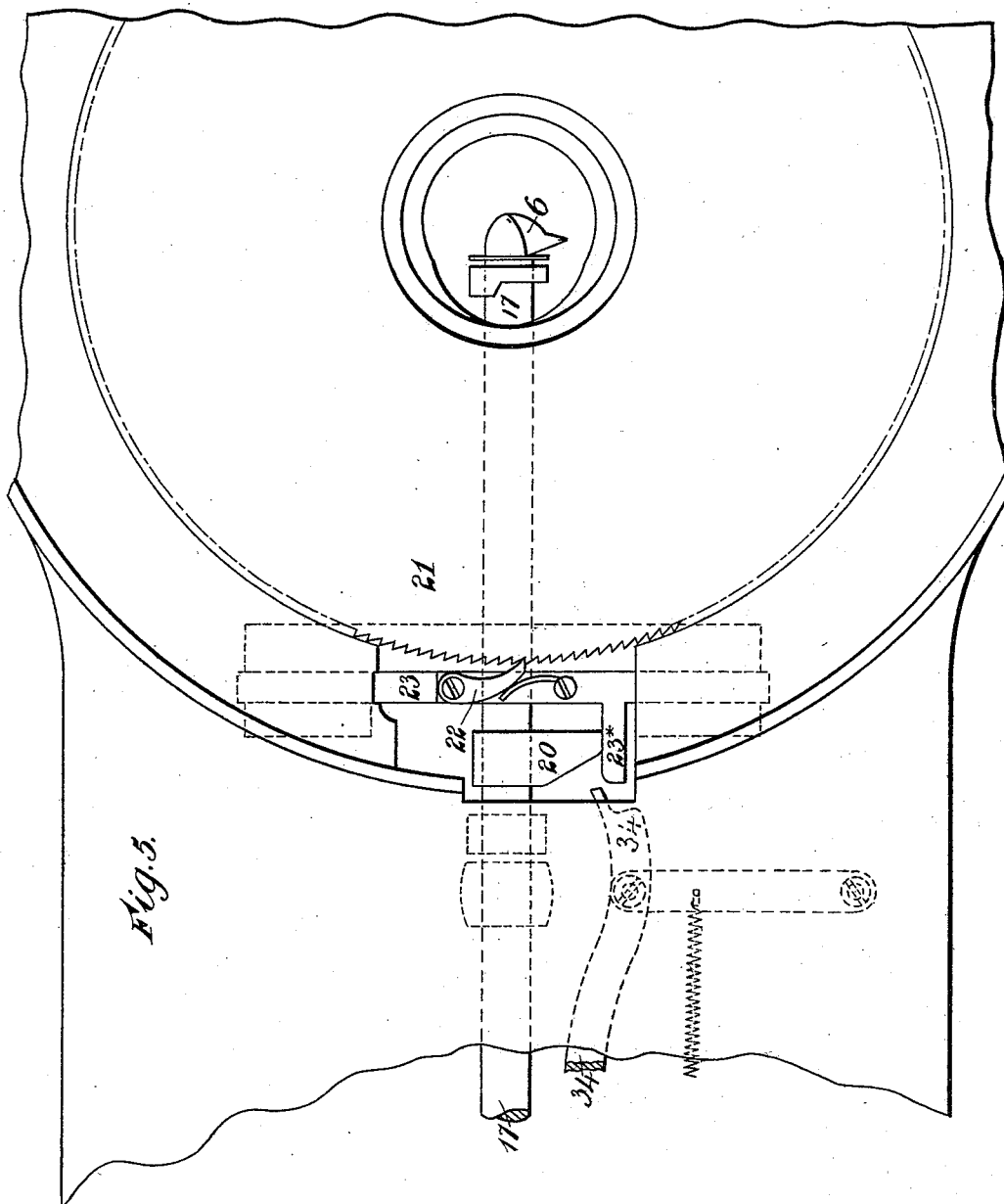
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UNITED STATES PATENT OFFICE.

ARTHUR HELWIG, OF LONDON, ENGLAND.

BUTTON-HOLE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 455,207, dated June 30, 1891.

Application filed September 15, 1886, Serial No. 213,557. (No model.) Patented in England August 28, 1886, No. 11,013, and in Germany September 3, 1886, No. 38,890.

To all whom it may concern:

Be it known that I, ARTHUR HELWIG, a subject of the Queen of Great Britain and Ireland, residing at Leighton Road, Kentish Town, London, in the county of Middlesex, Kingdom of Great Britain and Ireland, have invented Improvements in Sewing-Machines for Making Button-Holes, (for which I have obtained German Patent No. 38,890, dated September 3, 1886, and English Patent No. 11,013, dated August 28, 1886,) of which the following is a specification.

This invention has reference to machines known as automatic button-hole-making machines, and particularly that kind forming the subject of my application for Letters Patent of the United States filed December 1, 1883, Serial No. 113,343.

My present invention has for its object to make what is known in the trade as the "final bar"—that is to say, the stitching across the narrow end of the button-hole—which heretofore it has been usual to do by hand. Thus by my invention I am enabled to completely make the button-hole by machinery without any hand-work; and in order that the nature of my invention and the manner of carrying it into practical effect may be clearly understood, I append four sheets of illustrative drawings.

Figure 1 shows a machine embodying my invention, which comprises an arrangement of mechanism in connection with the needle-bar, the revolving hook or looper, and the feed, the operation being such that when it is required to produce the final bar or sewing across the narrow end of the button-hole the needle is caused to have a greater swinging or side-to-side motion, and the revolving hook or looper or its equivalent, which engages the loop of thread formed below the fabric, is caused to have an increased end-wise motion, such as will place the same in a proper position to receive the thread from the needle when it descends through the fabric, and the feeding mechanism is caused to remain stationary or out of operation, all these changes in operation being brought about by a single adjustment of the final-bar mechanism or attachment, according to my

invention, as hereinafter described, and continuing during the formation of the final bar. The upper part of the machine is shown in elevation with the side plate or arm of the "goose-neck"—that is, the hollow arm containing the operating mechanism—removed, and the base-plate and parts connected therewith are shown in section. Fig. 2 is an inverted plan or under side view. Fig. 3 is a view similar to Fig. 1, showing part of the goose-neck and base-plate with connected mechanism. Fig. 4 is a view at right angles to Fig. 3 of the attachment for producing the final bar or sewing across the narrow end of the button-hole. It is shown as seen looking in the direction of the arrow A in Fig. 3. Fig. 5 is a plan or top view showing part of the ratchet-wheel 21, that constitutes the feed-plate; also the pawl 22, whereby the same is actuated; the slide or bar 23, that carries the said pawl, and the cam 20 on the revolving hook or looper-shaft 17, which operates the said slide or bar, and part of the locking-bar, whereby the slide or bar 23 is locked, so as to keep the feeder out of action during the formation of the final bar. Fig. 6 shows in side elevation a contrivance whereby the final-bar attachment is moved into position for causing the greater traverse of the needle and of the revolving hook or looper, respectively, for producing the final bar, and whereby the said attachment is afterward lowered into the position it occupies during the ordinary sewing round of the button-hole. This view shows the contrivance as seen looking in the direction of the arrow B in Fig. 3. Fig. 7 shows the same contrivance as seen looking in the contrary direction. Fig. 8 represents an eccentric device, which can be used for the same purpose.

In a machine of the kind hereinabove referred to for making button-holes there are used a die or cutter 1 and cutter-block 2 for cutting the hole, sewing mechanism (it may be of the construction shown in the drawings or of any other suitable construction) for sewing the edges of the hole, and a traveling clip or holder (described in the specification of the previous patent already alluded to) that holds the material during the cutting and sewing

operations. The clip or holder is guided by a central stud or pivot 3, through which the sewing-needle 4 passes, and about which the clip or holder turns, a stud or projection on the clip or holder, and a guiding-slot in the face-plate or table of the machine, the clip or holder being worked by means of a cam or eccentric (not shown) whose axis of rotation is coincident with the axis of the stud or pivot 3, through which the needle works. The two ordinary motions—videlicet, the side-to-side motion of the needle-bar 5, and the ordinary endwise motion of the revolving hook or looper 6—may be conveniently derived from two cams 7 and 8 on a vertical shaft 9^a, as before. The upper one 7 acts on a roller 9 at the end of a rod 10, in connection with the slide 11 of the needle-bar, and the lower cam 8 on a roller 12 running on an arm or stud 13 attached to a sleeve 14, retained between collars 15 and 16 on the revolving hook or looper-shaft 17. In each case (as before) the cam forces the roller in one direction only, the return motion being effected by a spring 18, and limited by an adjustable stud 19. 20 is a cam on the revolving hook or looper shaft 17. This cam in its rotation operates the bar or slide 23 in the direction of the arrow, and it is returned by a spring. (Not shown.) The slide 23 carries a pawl 22, which, by the reciprocations of the slide, is caused to impart intermittent motion in a rotary sense to the ratchet-wheel 21.

I proceed now to describe arrangements whereby the machine is rendered capable of producing the final bar.

24 and 25 are cams fixed to the shaft 9^a. They are of greater throw or eccentricity than the cams 7 and 8, and act upon rollers 26 and 27, respectively, when they occupy the higher positions, hereinafter described. Then they impart longitudinal motion to the said rollers in one direction. The rollers 26 and 27 are carried, respectively, in a slot or opening in a frame-piece 28 and in a frame-piece 29. Each of these frame-pieces is hinged or jointed to an intermediate connecting bar or link 30. The roller 26 is on the same stud or pin 31 as the roller 9, and the roller 27 is on the same stud or pin 13 as the roller 12. The combined parts 28, 29, and 30 slide on and are guided in their vertical motion (when lifted or lowered) by the studs or pins 13 and 31 on which the rollers work.

33 is an arm or finger hinged to the frame-piece 28. It extends through the base-plate of the machine and takes against one end of the feed-locking bar 34, which is jointed at 34* to the bar 35, pivoted at 35* to the under side of the base-plate.

36 is a catch or stop on the under side of the base-plate adapted to engage with a shoulder 37 on the locking-bar 34 and to hold the said bar in its forward or locking position during the production of the final bar of a button-hole.

34^a is a stud that extends through a slot in

the locking-bar and is fixed in the under side of the base-plate. 43 is a spring under compression between the head of the stud and the locking-bar.

Referring now to the means for altering the positions of the rollers to change the throw of the needle and looper in the one arrangement, 38 is a pin working in a slot 39 in the link 30. It is carried by a link 47 and can be operated so as to impart vertical motion to the link 30 by a lever 39^a through the intervention of a link 40. This link is fixed at one end to a pin 41 on the lever 39^a and at its other end is hinged or pivoted to the link 47.

In lieu of the just-described arrangement the lever 39^a may operate an eccentric 42 direct, as shown in Fig. 8, the eccentric taking into the slot 39 in the link 30, as will be readily understood.

The operation of the mechanism is as follows: When the parts are in the relative positions shown in the drawings, the roller 7 and 8 and springs 18 during the working of the machine will impart the swinging or to-and-fro movement to the needle-bar and the longitudinal to-and-fro motions to the hook or looper-shaft 17 required to effect the ordinary sewing round of the button-hole. When this has been finished, the combined parts 28, 29, and 30 and attached arm or finger 33 are raised by operating the lever 39^a by hand, so as to place the cams 24 and 25 in rolling contact with the rollers 26 and 27. The locking-bar 34 will then be pressed against the catch or stop 36 by the spring 43. While the parts occupy these positions the rotation of the machine will cause the rollers 24 and 25 to impart the increased longitudinal motion to the shafts 10 and 17, and consequently also to the needle and looper required to produce the final bar. The final bar may consist of any desired number of stitches. On the first forward movement of the sleeve-piece 14 after the raising of the parts 28, 29, and 30 and attached parts the locking-bar 34 will be forced forward, so as to take behind a projection 23*, attached to the feeding-bar 23, as shown in dotted lines, and so will prevent the said bar being returned under the action of its spring or equivalent, thus stopping the feeding mechanism. When the final bar is finished, the combined parts 28, 29, and 30 and attached parts are again lowered into the position shown in the drawings. The lowering of the arm or finger 33 will cause it to force the locking-bar 34 away from the catch or stop 36. The locking-bar 34 will then return to its original position under the action of the spring 44, and the ordinary sewing of another button-hole can be proceeded with.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a button-hole sewing-machine, the combination of a laterally-movable reciprocating needle-bar and a laterally-movable ro-

5 tary looper, a rotary drive-shaft to impart the lateral stroke to said looper and needle-bar, a feeder, a lock therefor operating substantially as set forth, interposed operating mechanisms and connections, substantially as described, arranged to impart varied lateral strokes to said needle-bar and looper, and shifting mechanism, substantially as described, controlling said lock and operating mechanisms and arranged to alternately throw the needle-bar and looper into connection with the shaft through one or the other of said mechanisms, as and for the purposes set forth.

15 2. In a machine for making button-holes, provided with a needle and a looper, the combination, with a shaft that imparts swinging motion to the needle-bar, of mechanism comprising a sleeve 9*, spring 18, rollers 9 and 26 on a pin 31, and cams 7 and 24 on a shaft 9^a, the arrangement being such that a smaller or greater swinging motion can be imparted to the needle-bar by adjusting the position of the roller 26 according as it is required to effect ordinary sewing of the edge of a button-hole or to make the final bar or stitches across the end of such button-hole, as above described.

30 3. In a machine for making button-holes, provided with a needle and a looper, the combination of a shaft that imparts swinging motion to the needle-bar, a sleeve 9*, spring 18, rollers 9 and 26 on a pin 31, cams 7 and 24 on a shaft 9^a, a sleeve on the looper-shaft, rollers 12 and 27 on a stud or pin 13 in a lower frame-piece connected to the upper frame-

piece 28, and cams 8 and 25 on the shaft 9^a, the arrangement being such that a smaller or greater swinging motion can be imparted to the needle-bar by adjusting the position of the roller 26, as and for the purposes substantially as described. 40

4. In a machine for making button-holes, provided with a needle and a looper, the combination, with mechanism comprising cams 7, 8, 24, and 25, and frame-pieces 28 and 29, with rollers 9, 12, 26, and 27, operated by said cams, whereby a smaller or greater swinging motion can be imparted to the needle-bar and a corresponding longitudinal movement to the looper, of a feeder, a catch or stop 36, slotted locking-bar 34, with shoulder 37, jointed to a pivoted bar 35, a stud 34^a, spring 43, spring 44, and an arm or finger 33, jointed to the frame-piece 28, the arrangement being such that when the rollers have been moved into the positions for imparting the greater throw to the needle and looper for making a final bar the locking-bar 34 will, by the action of the cam 25, be caused to take a position in which it will lock the slide or bar 23, thus arresting the feed, as described. 55 60

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

ARTHUR HELWIG.

Witnesses:

W. F. WHITE,

CHARLES ERNEST BROUGHAM,

Both of 40 Lincoln's Inn Fields, London.