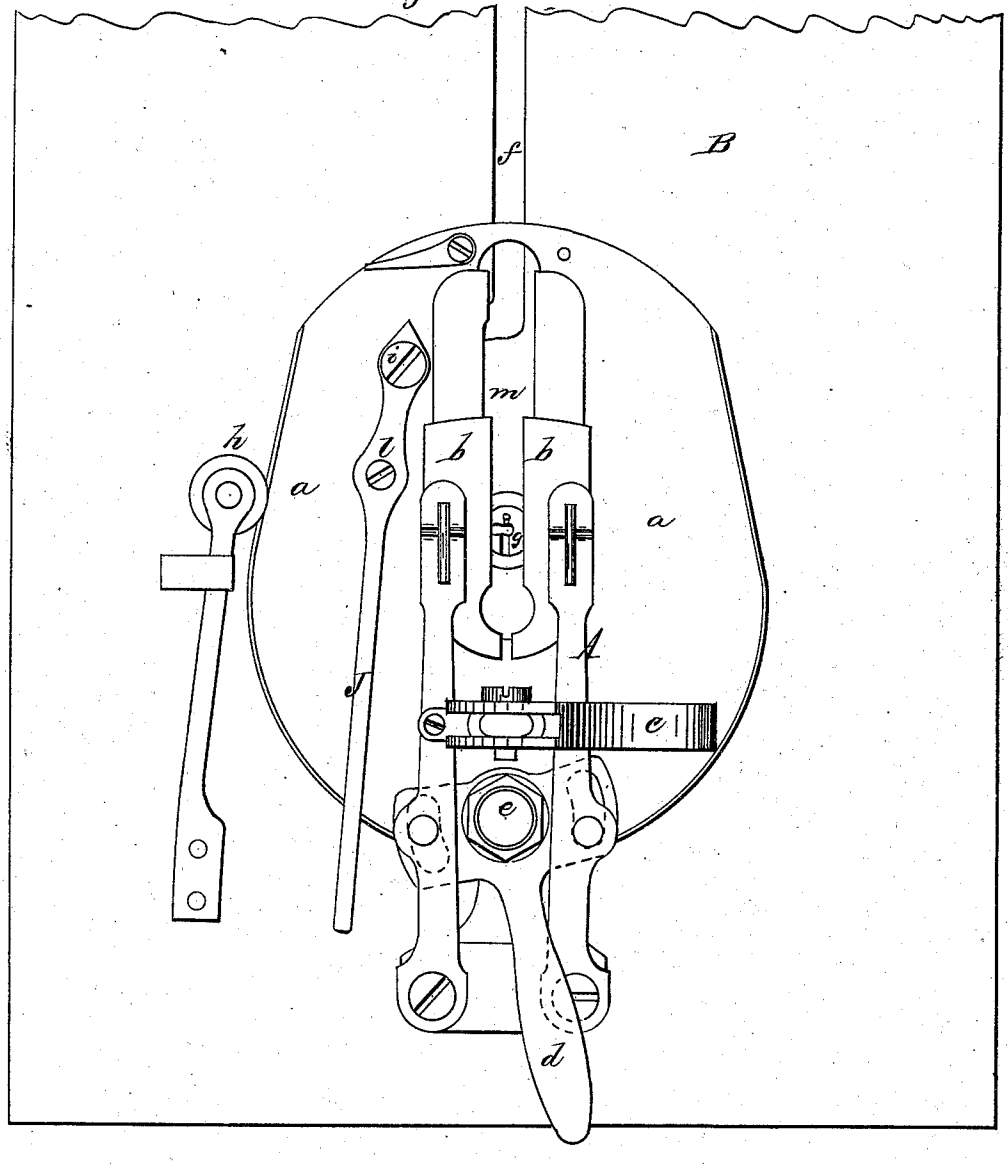
L. DUSTIN. 2 Sheets—Sheet 1.

MACHINES FOR BARRING BUTTON-HOLES.

No. 194,079. Patented Aug. 14, 1877.

Fig. 1



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2 Sheets—Sheet 2.

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MACHINES FOR BARRING BUTTON-HOLES.

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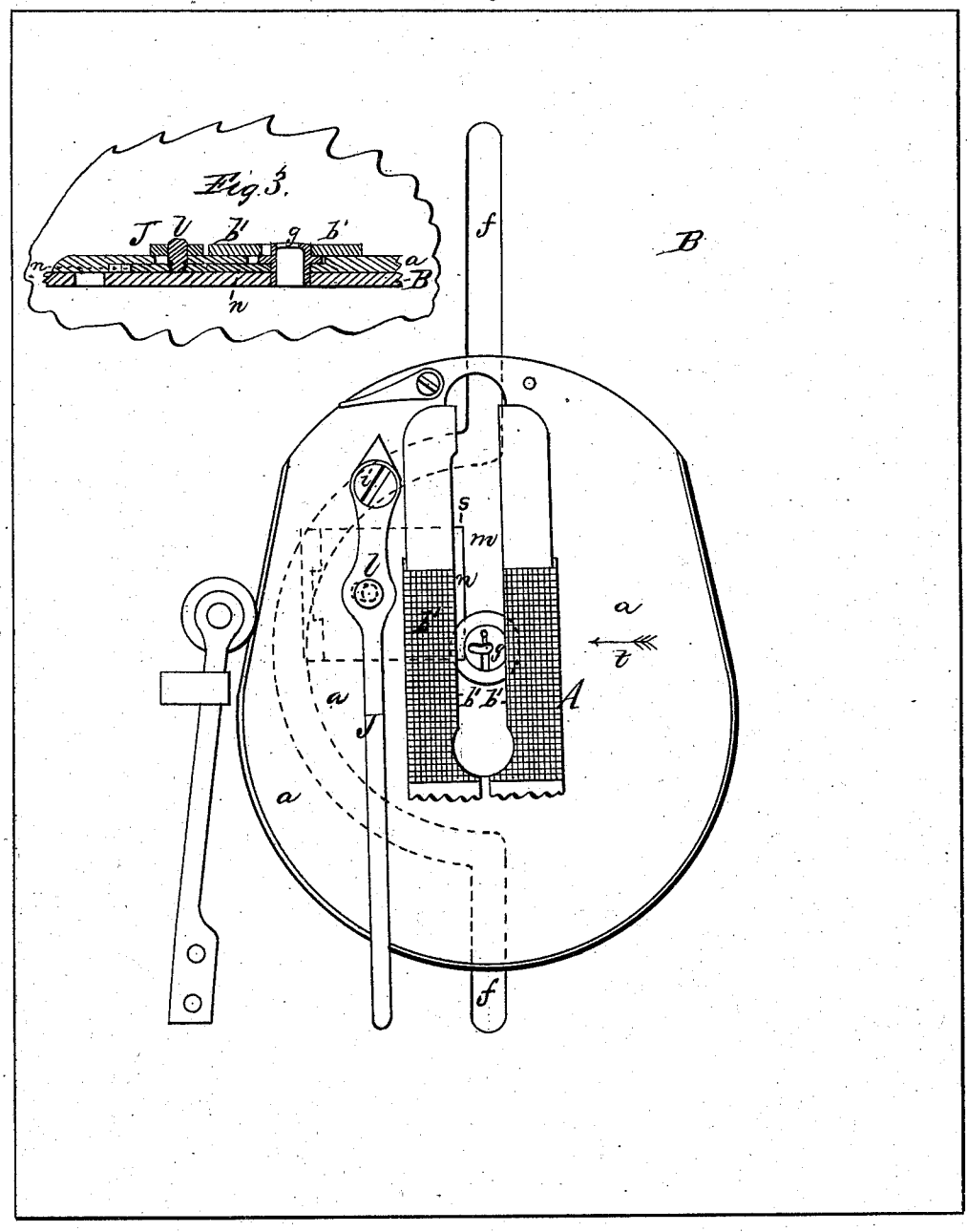
Fig. 2.



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UNITED STATES PATENT OFFICE.

LEANDER DUSTIN, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR BARRING BUTTON-HOLES.

Specification forming part of Letters Patent No. **194,079**, dated August 14, 1877; application filed May 22, 1877.

To all whom it may concern:

Be it known that I, LEANDER DUSTIN, of Elizabeth, in the county of Union and State of New Jersey, have made an invention of certain new and useful Improvements in Machines for Barring Button-Holes; and that the following is a full, clear, and exact description of the same.

The object of this invention is to enable button-holes which are worked upon a machine to be barred at the point of the button-hole by the operation of the machine, so as to avoid the necessity of barring the button-holes by hand after the work has been removed from the machine.

Button-hole machines as previously constructed have a reciprocating needle which is caused to descend alternately through the slit of the button-hole, and through the cloth at the side of that slit. The stroke of the needle through the cloth may, for the sake of distinction, be called the "cloth stroke," and that through the slit, being near the center of the button-hole, may be called the "central stroke." The cloth or work is held in a movable carriage, called the "cloth-clamp," in which the work is clamped, and by which it is carried past the needle, the work being commenced at the point of the button-hole. In the movement by the cloth-clamp one of the straight sides of the button-hole is first moved past the needle until the position of the eye of the button-hole reaches the needle. Then the work is turned around the needle until the eye is completed and the other straight side of the button-hole is adjacent to the needle. Lastly, the work is moved backward, so as to carry the second straight side of the button-hole past the needle and terminate the work at the point of the button-hole. In these movements the edge of the work is maintained in the proper position relatively to the needle by means of a round stud or projection from the bed-plate, such stud forming the needle-throat and entering a central guide-slot in the cloth-plate of the movable cloth-clamp. This stud, commonly called the "guide-button," has hitherto been constructed of circular form, and the edge of the guide-slot of the cloth-plate bears upon the guide-button, and thus determines the position of the edge of the cloth relatively to the needle. The slot of the cloth-carriage is similar in form to a button-hole, being straight for the straight portion thereof, and terminating in an enlarged eye at the part to which the eye portion of the work is to be held, and the width of the straight portion of the slot in ordinary button-hole machines has been substantially equal to two-thirds of the diameter of the guide-button, so that the cloth cannot be brought nearer to the central stroke of the needle than about one-third of the diameter of the guide-button.

In order that a button-hole should be barred by the stitching-machine, it is necessary that the cloth should be shifted laterally after the sewing has terminated at the point of the button-hole, so that the central stroke of the needle, instead of being made through the slit of the button-hole, is made through the cloth at one side of that slit, while the cloth stroke of the needle is made through the cloth at the other side of the button-hole, but nearer the edge of the slit than previously.

In order that this lateral shifting may be effected according to my invention, the guide-button is either flatted at one side, or, if circular, made of smaller diameter than the central slot of the cloth-plate of the cloth-clamp, and a movable guide is fitted to the carriage to move the carriage laterally upon the guide-button at the time the barring is to be effected, so that the needle may then strike through the cloth at alternately opposite sides of the slit. The new combinations which result from these changes constitute my invention, and are stated in detail at the close of this specification.

In order that the invention may be fully understood, I have represented in the accompanying drawings, and will proceed to describe, such portions of a button-hole machine as are necessary to illustrate the best manner in which I have embodied my invention up to this date, it being understood that the arrangement of the movable guide may be modified as deemed expedient.

Figure 1 represents a plan of the table-plate of the said machine, with the cloth-clamp or

clamp-carriage upon it in the position it occupies just before the button-hole is barred. Fig. 2 represents parts of the same in the position occupied during the barring. Fig. 3 represents a transverse section of a portion of the cloth-clamp and of the button-guide.

The sewing and feeding mechanisms of the machine may be the same as those in common use for stitching button-holes. The cloth-clamp A, which is slotted centrally in the usual manner, and is fitted to move upon the top of the table-plate B of the machine, consists, substantially, of the cloth-plate *a*, and the clamp mechanism for securing the cloth to that plate. These do not vary from those in common use except in the respects hereinafter described, *b b* being the movable clamp-jaws, *b' b'*, Fig. 2, the fixed clamp-jaws, *c* the clamp-lever, *d* the lever for moving the movable jaws laterally toward and from each other, and *e* being the head of the feed or operating pin, which projects down through the cam-slot *f* of the table-plate B, and connects the cloth-clamp with the feed mechanism of the machine.

The guide-button *g* of the machine is at the center of the top of the table-plate, and protrudes into the central slot *m* of the cloth-clamp, whose sewing-edge bears against the side of the guide-button, and is maintained in contact therewith by the action of the spring-wheel *h* bearing against the opposite outer rim of the cloth-plate *a*. The guide-botton *g* is perforated, as usual, to form the needle-throat, and also the guide for the cord, which is worked into the stitching in the usual manner. Instead, however, of being as great in diameter as the breadth of the straight portion of the slot of the cloth-plate, this guide-button is flatted at the side farthest from the spring-wheel *h*, so as to permit the cloth-clamp to be moved laterally in a direction toward the left hand of the drawings, as seen in Fig. 2, thus moving the central line of the point of the button-hole midway between the successive positions of the needle at its cloth stroke and central stroke, so that the needle will then strike down through the cloth at opposite sides successively of the point of the button-hole, and to stitch a bar across that point. In order that the cloth-clamp may be moved laterally, a guide-plate, *n*, partly represented in dotted lines in Fig. 2, is fitted into the cloth-plate, with the capacity to be moved crosswise of the length of the central slot of that plate, so that its edge *s* may either be protruded into the central slot, as seen in Fig. 2, or may be retracted so as to be even with the edge of the straight part of the central slot. While the straight portions of the button-hole are being sewed, the edge *s* of this guide-plate *n* forms part of the edge of the central slot, and bears against the side of the guide-button; the guide-plate *n* then being retracted in its cavity in the cloth-plate, with the rear edge of the guide-plate in contact with the bottom of that cavity. But when the button-hole is to be barred, the guide-plate *n* is protruded against the guide-button *g*, so as to force the cloth-clamp laterally in the direction of the arrow *t*, Fig. 2, and present the cloth in the required position to the needle, as above stated. In order that the movable guide *n* may be readily protruded, it is connected with a lever, J, which is connected at its point to the cloth-plate *a* by a pivot, *i*, and is also connected with the guide *n*, by means of a pivot, *l*, which passes downward to the movable guide *n* through a slot made in the cloth-plate for that purpose. The handle of the lever J is thus arranged in a convenient position to be operated by the hand of the workman who manipulates the cloth-clamps.

In operating the machine, the stitching proceeds in the usual manner until the button-hole is to be barred, at which time the workman, operating upon the guide-lever J, moves the cloth-clamp laterally, as above described, so that the stitching then takes place across the point of the button-hole. But as the cloth-clamp is not turned round on the guide-button, the direction of feeding, during barring, is in the direction of the length of the button-hole, and the feeding is effected through the intervention of the single operating-pin *e*, which is used for feeding during the stitching of the straight portion of the button-hole. Hence the bar produced is composed of a series of parallel stitches laid side by side. When the barring is completed, the pressure upon the guide lever J is relaxed; whereupon the action of the spring-wheel *h* restores the cloth-clamp to its central position.

I claim as of my invention—

1. The combination, substantially as before set forth, of the cloth-clamp, the movable guide for moving the cloth-clamp laterally, and one feed-pin, whereby the cloth-clamp during barring is fed lengthwise of the button-hole.

2. The combination, substantially as before set forth, of the cloth-clamp, the movable guide for moving the cloth-clamp laterally, the single feed-pin, and the lever for operating the said guide.

3. The combination, substantially as before set forth, of the cloth-clamp, the movable guide for moving the cloth-clamp laterally, the spring-wheel, and the single feed-pin.

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