

(No Model.)

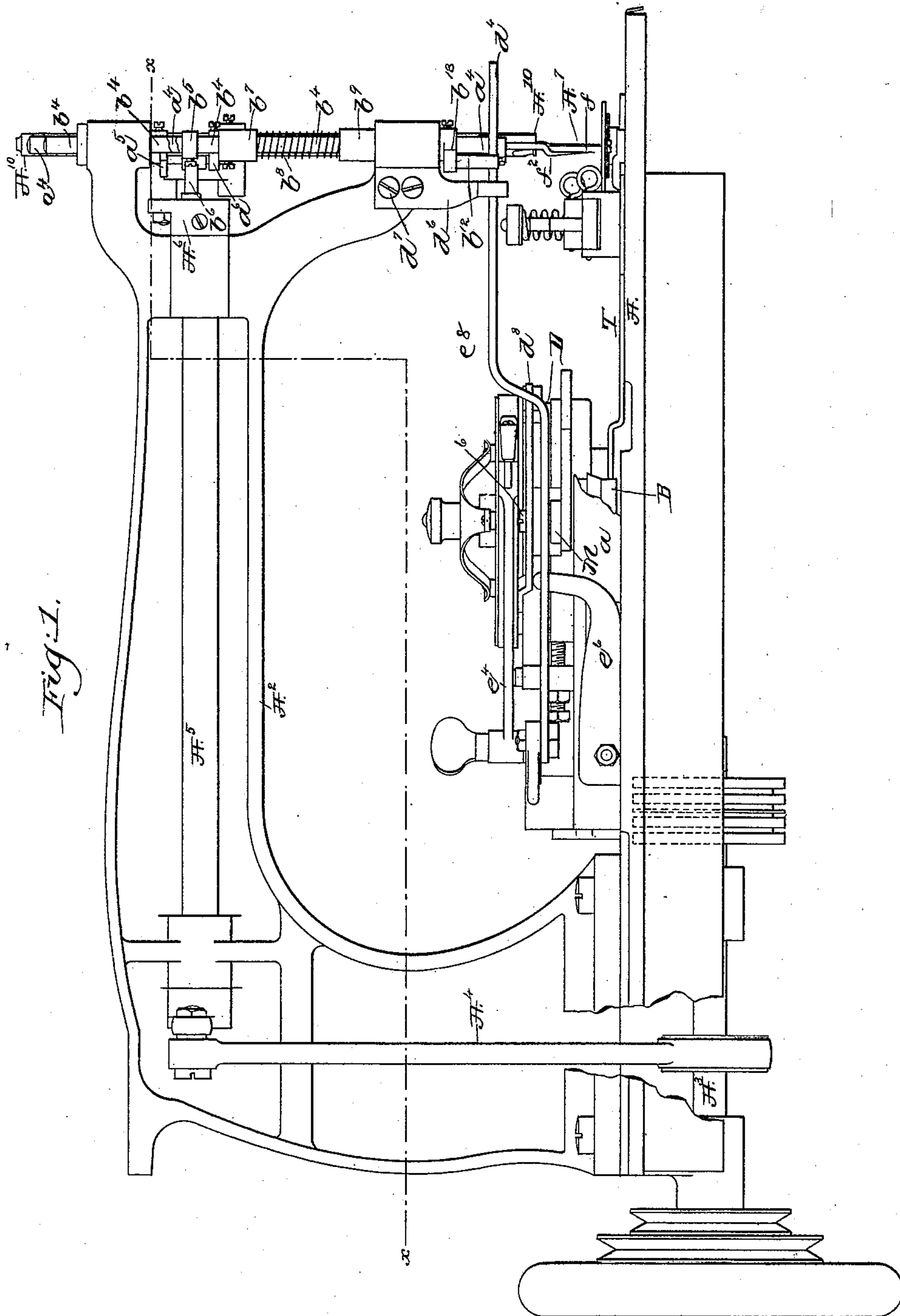
2 Sheets—Sheet 1.

F. W. OSTROM.

MECHANISM FOR STITCHING AND CUTTING BUTTON HOLES.

No. 431,527.

Patented July 1, 1890.



Witnesses.

Fred L. Emery.  
Howard F. Eaton.

Inventor.

Fred W. Ostrom  
by Lewis & Gregory  
Attys.





# UNITED STATES PATENT OFFICE.

FREELAND W. OSTROM, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE  
WHEELER & WILSON MANUFACTURING COMPANY, OF SAME PLACE.

## MECHANISM FOR STITCHING AND CUTTING BUTTON-HOLES.

SPECIFICATION forming part of Letters Patent No. 431,527, dated July 1, 1890.

Application filed June 15, 1887. Serial No. 241,353. (No model.)

*To all whom it may concern:*

Be it known that I, FREELAND W. OSTROM, of Bridgeport, county of Fairfield and State of Connecticut, have invented an Improvement in Mechanism for Stitching and Cutting Button-Holes, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention has for its object to provide a button-hole-stitching mechanism with a cutting mechanism to cut the button-hole slit step by step, the cutting of the button-hole being commenced after the stitching for one  
15 side, one end of the button-hole, and a portion of the opposite side of the button-hole has been finished, the portion at the said opposite side being in length substantially the width of the cutting-blade.

20 In all machines heretofore used wherein the button-hole slit has been cut step by step while the material is held in a clamp, the cutting-blade has been located in line with the needle, and has acted to cut the material immediately after stitching the same; but such  
25 class of machine is objectionable for the reason that the cutter has to be vibrated at each operation of the needle-bar from the commencement of the button-hole to its completion, and also because from the position of  
30 the cutter behind and in line with the needle, the needle-thread is frequently caught and cut off. These objections are herein obviated by offsetting the cutting-blade, so that its  
35 cutting-edge occupies a position at one side of the needle for a distance equal to the width of the over stitching or depth stitches, or for a distance equal to the vibration of the clamp carrying the material.

40 Another application, Serial No. 238,090, filed by me May 13, 1887, shows and describes a cutting-blade offset, as described, with relation to the needle; but the said blade, as shown in the said application, cuts the button-hole slit at one operation.

45 Figure 1 is a side elevation of a sufficient portion of a button-hole-stitching machine to enable my invention to be understood, the controlling-bar being partially broken out to  
50 show the cutter-bar in line with it, the guide-

way being also partially broken out to show parts within it. Fig. 2 is a plan view of Fig. 1 below the irregular dotted line *xx*. Fig. 2<sup>a</sup> shows detailed views of the lower end of the needle-bar. Fig. 3 shows the cutter-cam detached. Fig. 4 shows the throat-plate. Figs. 5 and 7 details of collars attached to the cutter-bar, and Fig. 6 details of a collar and lug attached to the controlling-bar. Fig. 8 shows a front view of the rocker-crank; and Fig. 9  
60 a partial front elevation of the head of the overhanging arm, with the needle-bar, cutter-bar, its attached cutter, and the controlling-bar.

This invention is shown as embodied in a  
65 machine substantially such as shown and described in United States Patent No. 303,557, dated August 12, 1884.

Referring to the drawings, the bed-plate A, the plate B, sliding between the ways *aa*, the  
70 link L to move plate B, the lever H H', the plate C, the lower member T of the cloth-clamp, the cover-plate D, the heart-cam E, the feeding-wheel F, roller-stud *o*, and cross-slide M are all substantially as in the said  
75 patent, wherein like letters are employed to designate like parts.

Herein the feeding-wheel and cam-plate are rotated step by step by means of a friction-strap *e*<sup>8</sup> and link *e*<sup>4</sup>; but such mechanism is  
80 not herein claimed.

The overhanging frame A<sup>2</sup>, main shaft A<sup>3</sup>, link A<sup>4</sup>, needle-bar-actuating rock-shaft A<sup>5</sup>, its attached rocker-crank A<sup>6</sup>, and means to connect it with and to actuate the needle-bar  
85 A<sup>10</sup>, having an eye-pointed needle A<sup>7</sup>, and the switch-cam, are all common to the Wheeler & Wilson button-hole-stitching machine now in common use, it containing the chief features described in United States Patent No. 303,557, and in practice the entire stitch-forming mechanism will preferably be as in the Wheeler & Wilson machines or as in United States Patent No. 328,165.

The upper part of the cloth-clamp herein  
95 shown is as represented in application, Serial No. 202,733, filed May 30, 1886, wherein the said clamp is shown and claimed.

All the devices herein shown as instrumental in moving the cloth-clamp under the nee-  
100



dle to enable the stitch-forming mechanism to stitch the material for the formation of a button-hole are old and not herein claimed.

Herein the cutter-bar  $a^4$  is located in guides 5 between the needle-bar  $A^{10}$  and a cutter-controlling bar  $b^4$ , herein shown as an oscillating bar having bearings in the head of the machine, the said controlling-bar being also free to be reciprocated in unison with the cutter-bar  $a^4$ , the position of a lug 3 of a collar  $b^5$  10 attached to the controlling-bar with relation to a depressing pin or projection  $b^6$ , herein shown as carried by the rocker-crank  $A^6$ , determining when the cutter-bar shall descend 15 to cut the material.

The controlling-bar has secured to it a collar  $b^7$ , to which is attached a spring  $b^8$ , the other or lower end of the spring being in turn fastened to a fixed part of the head or a sleeve-bearing  $b^9$  therein in such manner that the 20 spring  $b^8$  normally acts to hold the controlling-bar in such position as to retain the lug 3 of the collar  $b^5$  of the said controlling-bar out of the range of movement of the pin or projection  $b^6$  of the rocker-crank, as when the 25 cutter-bar is to remain at rest, which is the case, as herein provided for, while one end, one side, the other end, and a portion of the other side of the button-hole stitching is being 30 made.

The cutter-bar  $a^4$  has attached to it two collars  $a^5$  and  $a^6$ , located one above and the other below the lug 3, carried by the controlling-bar. So long as the cutter-bar is to remain at 35 rest the pin or projection  $b^6$  of the rocker-crank  $A^6$  moves up and down in the space between the projecting portions of the two collars  $a^5$  and  $a^6$  without reciprocating the cutter-bar  $a^4$ , the spring before described aiding 40 in keeping the controlling-bar in its elevated position.

When it is desired to operate the cutter-blade  $a^4$ , the controlling-bar  $b^4$  is oscillated 45 sufficiently to place the lug 3 above the upper side of the collar  $a^6$  and in the path of movement of the pin or projection  $b^6$ , so that the latter as it descends, meeting the said lug, pushes it down against the collar  $a^6$ , causing the cutter-bar  $a^4$  to be carried down in unison 50 with the controlling-bar and with the needle-bar. As the rocker-crank is turned to raise the needle-bar, the pin or projection  $b^6$  acts against the under side of the collar  $a^5$ , lifts the cutter-bar  $a^4$ , and the latter, by the action 55 of its collar  $a^6$  on the lug 3, lifts the controlling-bar.

The controlling-bar, as herein shown, has at its lower end an arm or crank  $b^{13}$ , provided with a crank-pin  $b^{12}$ , which, when it is desired 60 to reciprocate the cutter-bar, is engaged by a vibrator  $d^4$ , herein shown as a bent bar having a notch 4 at or near its front end, the said bar at its opposite end being pivoted upon the lever  $H'$ , which carries the feed-link  $e^4$ , 65 employed as part of the mechanism to rotate the feeding-wheel  $F$  of the cloth-clamp-actuating mechanism, all of usual construction,

the said vibrator being reciprocated in unison with the said link, it also being moved at the same time, but in direct opposition to the lateral or vibrating motion of the usual cloth-clamp. The vibrator is guided near its outer end in a slot in a bracket  $d^6$ , secured to the head of the machine by screws  $d^7$ . 70

The vibrator  $d^4$  between its ends is provided with a pin or projection 5, which is acted upon by the long arm of a lever  $d^8$ , having its fulcrum upon a fulcrum-screw 6, 75 screwed into the cover-plate  $D$ , common to the patent referred to, or it may be attached to some other part of the upper slide-frame  $C$ , or parts carried by it. The short arm of the lever  $d^8$  is bent inwardly, and preferably rounded (see Fig. 2) to form a toe 10, the said toe being held normally in contact with the 85 periphery of a cam  $e^5$ , attached to or forming part of the heart cam-plate  $E$ , also common to the said patent, the toe of the said lever being normally kept in contact with the said cam  $e^5$ , as herein shown, by a spring  $e^6$ , 90 attached to the guideway  $a$ , in which the slide-frame reciprocates. The cam  $e^5$  is so arranged with relation to the heart-cam  $E$  that as soon as the first side and the end following it and a portion of the second side of the button-hole 95 over stitching or depth-stitching has been made for a distance substantially equal to the width of the cutter-blade  $f$ , bent or offset, as at  $f^2$ , that part of the said cam  $e^5$  of least radius arrives under the toe 10 of the lever  $d^8$  and permits 100 the said toe to enter the space 13, (see Fig. 3,) and consequently the long end of the lever  $d^8$  is permitted to move outwardly, and permits the vibrator to move under the action of the spring  $e^6$ , the said vibrator being moved 105 far enough to enable the notch 4 therein to engage the crank-pin  $b^{12}$ , connected with the crank  $b^{13}$ , attached to the controlling-bar, and thereafter the said vibrator, so long as the toe of the lever  $d^8$  remains in the space 13 of 110 the cam  $e^5$ , will cause the controlling-bar to be oscillated, so that the lug 3 carried by it will be turned into the line or path of movement of the pin or projection  $b^6$  of the rocker-crank  $A^6$  at every other revolution of the 115 main shaft  $A^3$ , or at every other descent of the needle-bar  $A^{10}$ , so that the cutter-bar is thrown down, causing the cutter  $f$  to penetrate the material just in the rear of the stitching, but at a point distant therefrom 120 equal to the vibration of the cloth-clamp, the descent of the cutter-bar taking place, however, only when the needle is in position to make the depth-stitch in the material back from what is to be the inner edge of the button-hole. 125

The cutter or blade  $f$  attached to the cutter-bar  $a^4$  by a suitable set-screw, as shown in Fig. 1, is offset, as at  $f^2$ , so as to place the narrow sharp lower end of the cutter at one 130 side the needle equal to the distance of the over stitching or of the depth-stitches, or for a distance equal to the vibrations of the cloth-clamp at right angles to the button-hole. The



cutter descends to cut the material only while the last half or side of the button-hole is being stitched, and at only those descents of the needle when the latter is to penetrate the material back from its edge, the cutter at such time passing through the material, it being held in the clamp and through the slot 16 of the throat-plate  $h^4$  at one side the needle-hole 17. The lower end of the needle-bar is cut away, as at 18, to permit the cutter to be moved vertically opposite the needle.

In another application, Serial No. 241,354, filed June 15, 1887, I have shown a machine substantially such as herein represented; but some of the parts are so changed as to enable the slit to be cut in advance of the stitching of the first side of the button-hole.

I have herein shown the lower end of the needle-bar recessed or cut away so as not to interfere with the movement of the cutter; but such construction is not herein claimed, for that feature is made the subject-matter of an application, Serial No. 250,803, filed September 27, 1887.

I claim—

1. The cutter-bar, its attached collar  $a^6$ , the cutter or blade  $f$ , and the controlling-bar and its collar  $b^5$ , having the lug 3, combined with a pin or projection  $b^6$ , deriving movement from or in unison with the mechanism for moving the needle-bar, and with means for oscillating the controlling-bar, substantially as described.

2. The cutter-bar, its attached cutter-blade, the collar  $a^6$ , the controlling-bar, its attached collar having a lug 3, the crank-pin or projection  $b^{12}$ , and the pin or projection  $b^6$ , to strike the said lug when the latter is interposed in the path of the said pin or projection  $b^6$ , combined with the reciprocating vibrator, and with a lever and cam to actuate it to determine the time when the vibrator shall engage the said crank-pin and oscillate the controlling-bar, substantially as described.

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

FREELAND W. OSTROM.

Witnesses:

ISAAC HOLDEN,  
JOHN HOLDEN.