

(No Model.)

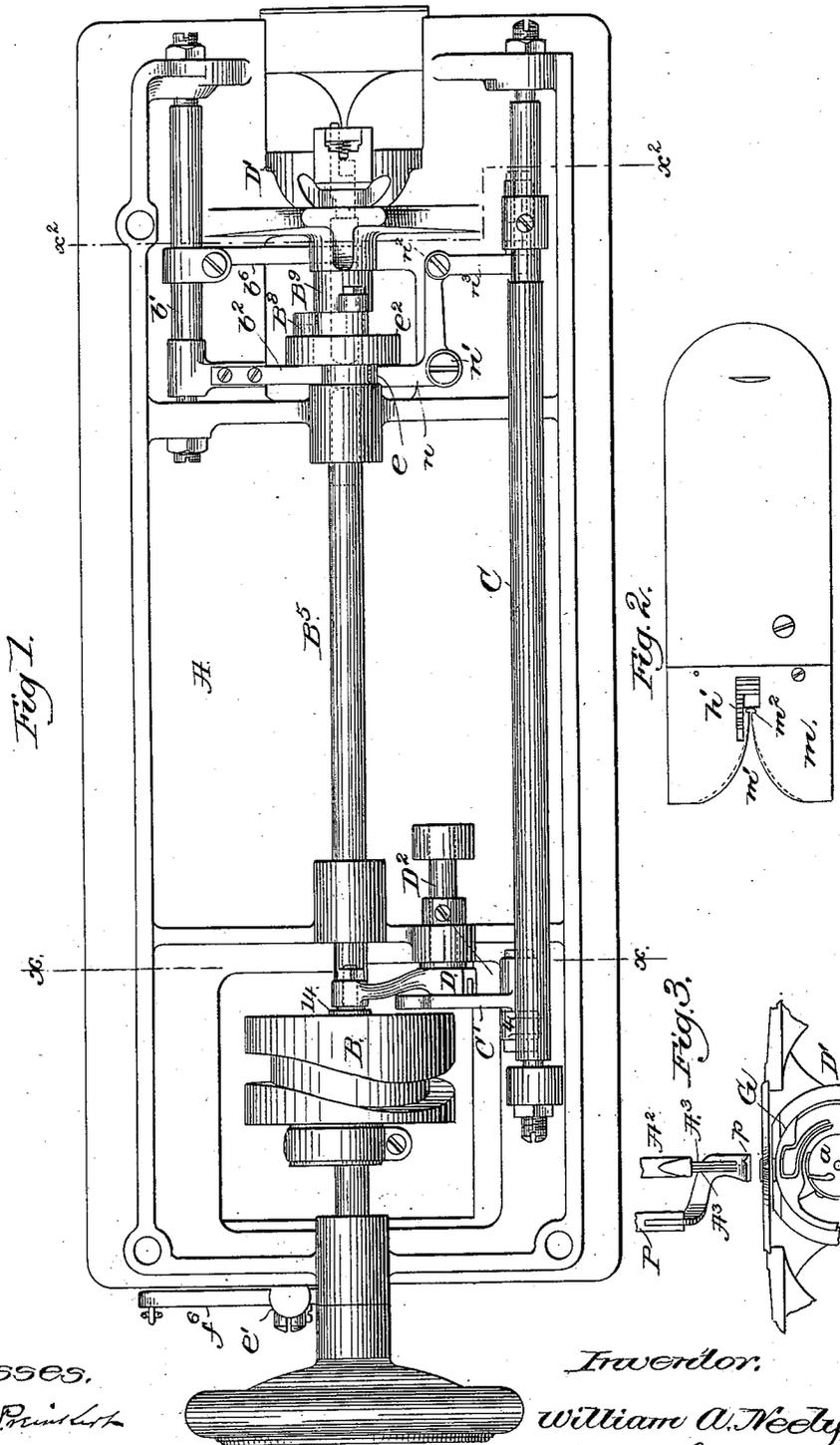
3 Sheets—Sheet 1.

W. A. NEELY.

FEED REVERSING MECHANISM FOR SEWING MACHINES.

No. 374,551.

Patented Dec. 6, 1887.



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Inventor.
 William A. Neely,
 by Crosby & Emory attys.

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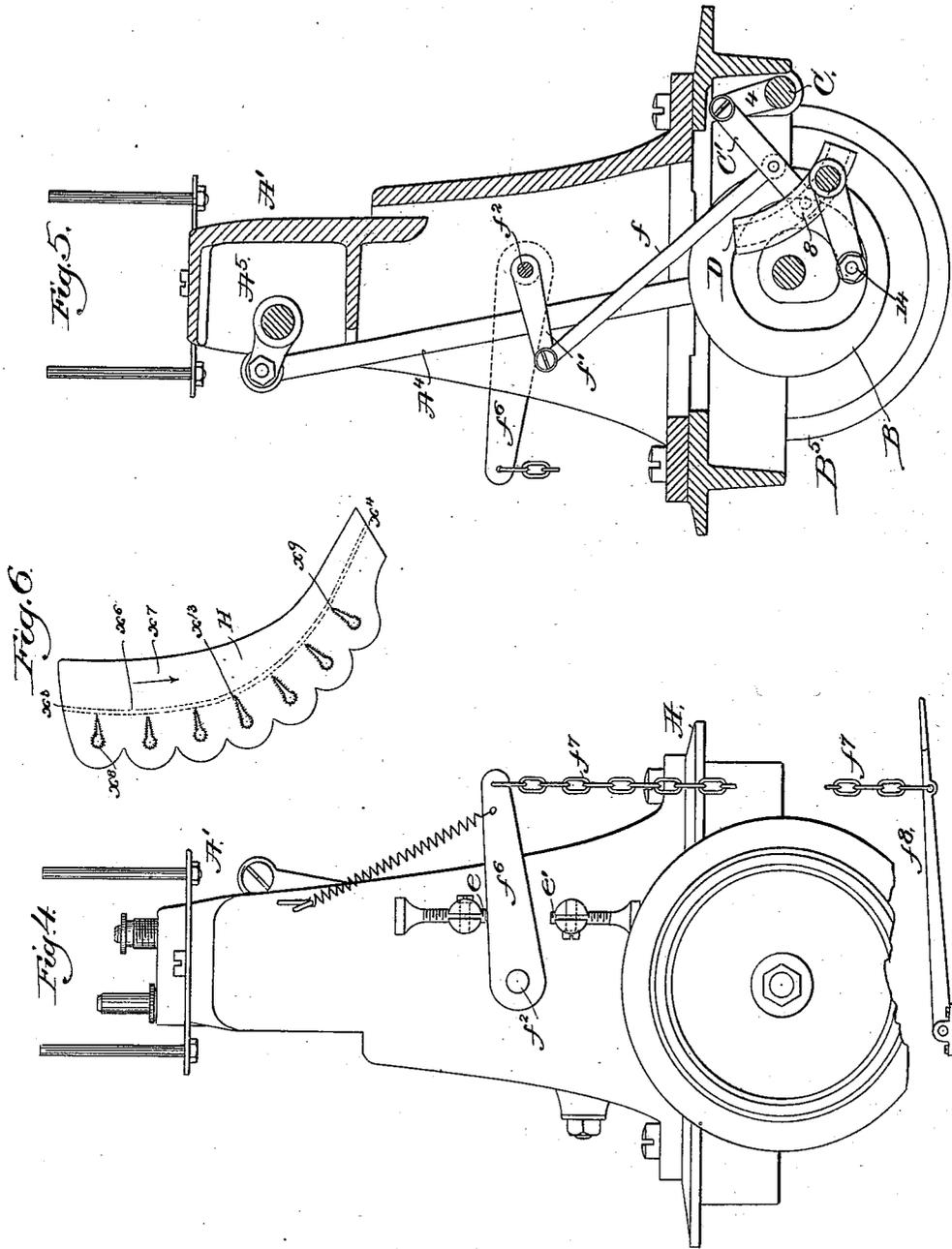
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by Lewis & Gregory Attys.

UNITED STATES PATENT OFFICE.

WILLIAM A. NEELY, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE WHEELER & WILSON MANUFACTURING COMPANY, OF BRIDGEPORT, CONNECTICUT.

FEED-REVERSING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 374,551, dated December 6, 1887.

Application filed April 2, 1887. Serial No. 233,406. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. NEELY, of Lynn, county of Essex, and State of Massachusetts, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates more particularly to the feeding mechanism, whereby the same may be reversed quickly when it is desired to form a stay for or add strength to a seam or for other purposes.

Herein I have shown my invention as applied to that form of sewing-machine known as the "Wheeler & Wilson," it being provided with a peculiar throat-plate having converging edges, brought together substantially at the needle-hole, to thereby collect together the projecting ends and threads called "thrums" at the under side of a button-hole piece, in order that the said collected threads and ends may be overstitched or "whipped," as it is termed, down upon the under side of the material, the machine, in this embodiment of my invention, having two eye-pointed needles carried by a single needle-bar, the two needles, in connection with the usual rotating loop-taker of the Wheeler & Wilson machine, forming parallel rows of stitching.

The throat-plate and stitch-forming mechanism, herein to be described, are not of my invention; but the same have been heretofore employed; but in all instances where such devices have been employed in connection with a button-hole piece, the parallel rows of stitching have extended from the upper to the lower end of the button-piece, which is objectionable because of the appearance of the two rows of stitches across the button-piece from its top to the inner end of the uppermost button-hole.

In accordance with my invention the stitching, to bar and finish the inner ends of the button-hole of a button-piece, will be started at some point between adjacent button-holes, and the button-piece will be fed by the feeding mechanism until the stitching is carried to one of the endmost button-holes of the row of button-holes, and then the feed will be reversed,

the stitching taking place in the opposite direction, or being turned back upon itself and carried to the button-hole forming the other end of the series of holes, and then the feed will be preferably again reversed for a short distance, the reversal of the feed and the making of stitches backward in the line in which they had been previously made serving to lock, as it were, and fasten the seam.

My invention is also especially advantageous in connection with a sewing-machine having an ordinary throat-plate and a single needle to co-operate with the under thread-carrier, for by reversing the feed quickly two or more stitches may be made back upon a previously-formed line of stitching to fasten the seam—as, for instance, the seams in pantaloons or clothing of any sort, may be run their full length, and the material be then fed in the opposite direction for a few stitches to fasten the seam, thus obviating tying knots or hand-finishing.

My invention consists, essentially, in the combination, with stitch forming and feeding mechanism, of a treadle located below the bed-plate, by which to move that part of the feeding mechanism which determines the length and direction of the stitch, whereby the direction in which the feed operates may be immediately changed, while the machine is running at speed, to stitch the material back upon itself, for the purposes of staying or strengthening the seam, substantially as will be described.

Figure 1 is an under side view of a sewing-machine embodying my invention; Fig. 2, a view of the throat-plate removed, the feed-points of the feed-bar being in position. Fig. 3 is a partial detail of the front end of the machine, chiefly to show the needle-bar, its needle, presser-bar, presser-foot, throat-plate, and part of the bed-plate of the sewing-machine. Fig. 4 is a rear end view of the sewing-machine shown in Fig. 1. Fig. 5 is a section of Fig. 1 in the dotted line *x*, looking toward the left; and Fig. 6 is a diagram showing a button-piece containing button-holes, which may be barred or finished by the machine to be herein described; Fig. 7, a partial longitudinal vertical section of the bed-plate, chiefly to show the feed-bar and the lever for actuat-

ing it; and Fig. 8, a section in the irregular line x^2 , chiefly to show the feed-bar and its lifting device.

The bed-plate A, the overhanging arm A', the needle-bar actuating rock-shaft A⁵, the connecting-rod A⁴, to operate it, the needle-bar A², the presser-bar P, the under rotating shaft, B³, the cam B, the elbow-lever D, having one segmental slotted arm and an arm provided with a roller or other stud, 14, to enter the groove of the cam B, the link C', connected to the arm 4 of the feed-actuating rock-shaft C, and having at its other end a roller or other stud, 8, the link f , the arm f' , the rock-shaft f^2 , the disk e^2 , fast to the rock-shaft B³, the cam e , the feed-lifting rock-shaft b' , and its arm b^2 are all substantially as in United States Patent No. 331,174, dated November 24, 1885, where like parts are designated by like letters, except as to the presser-bar P.

The link B³ is in practice connected to an arm, B³, of a loop-taker shaft, B³, having at its outer end a driver to drive a loop-taker, G, (partially shown in Fig. 3,) in a loop-taker guide, D', and the bobbin-case a , inclosing the bobbin containing the under thread, which are and may be all as in United States Patent No. 328,165, the said loop-taker entering the loop of needle-thread carried by the eye-pointed needle-A³, or, it may be two, such needles, as shown in Fig. 3, to form a stitch.

If both needles are used, the material will present at its upper side two parallel rows of stitches, as shown in Fig. 6 by dotted lines, the loops of thread taken from both needles being locked by the same under thread.

The feed-lifting rock-shaft b' has a feed-lifting arm, b^2 , which, as the shaft b' is rocked, acts against the under side of and lifts the feed-bar h , having usual points at h' to at the proper time engage the material lying on the throat-plate m .

The feed-bar h is herein shown as arranged to slide longitudinally with relation to the bed-plate A, the rear end of the feed-bar being forked (see Fig. 8) to embrace a block, h^2 , on a pin, h^3 .

The feed-bar h between its outer end and the block h^2 is recessed to receive in it one arm of an elbow-lever, n , pivoted at n' under the bed-plate, the opposite end of the said lever being jointed, as at n^2 , to a link, n^3 , in turn jointed to the arm n^4 of the feed-actuating rock-shaft C.

Herein I have prolonged the segmental arm D, and extended the groove therein across the auxiliary shaft D², which is the center of motion for the said arm, this being done so that by changing the position of the roller or other stud 8, carried by the link C in the said groove, from one to the other side of the center of the rock-shaft D², the arm D will so move the feed-actuating rock-shaft and the feed-bar with relation to the stitch-forming devices—viz., the needle or needles A³ and the loop-taker or other usual device for engaging

the loop of needle-thread to pass through it, in usual manner, the under thread—that the feed-points h' will be raised to engage the material, either when the feed-bar is moving backward or forward, as may be desired, which enables the operator to reverse the direction of movement of the material or its feed, as desired, over the bed-plate.

To enable the direction of movement of the feed and of the material to be changed at will, and while the machine is running at high speed, I have provided the rock-shaft f^2 with an arm, f^6 , which is joined by a connection, f^7 , a chain, cord, or equivalent, to a treadle or lever, f^8 , which, as herein shown, is so pivoted or mounted as to be actuated by the foot of the operator when it is desired to reverse the direction of the feed, the turning of the shaft f^2 causing the arm f^7 , rod f , and link C' to be moved in one or the other direction to place the roller 8 at one or the other side of the center of the auxiliary rock-shaft D². In this way the hands of the operator are left free to control the work, both hands being quite necessary when the machine is running at high speed; but I desire it to be understood that instead of the particular lever D shown I may employ any other usual form of lever commonly employed in connection with the feeding mechanism of sewing-machines.

The throat-plate m , as herein shown, has a diverging slot, m' , by which to gather and collect together at the needle-bar m^2 the thrums at the under side of a button-hole piece, H, the button-holes of which have been stitched by machine and not finished or stayed.

Fig. 6 shows a button-hole piece, H, having a series of button-holes stitched by machine, it having at its under side between each button-hole and the one next to it, as usual, a stay-thread, an under-thread, and the ends of the needle-thread. It has been customary in this class of work to whip down the said threads or to cover them by an under thread cooperating with two eye-pointed upper thread-carrying needles; but in all instances where this has been done, so far as I am aware, the stitching by the two needles referred to has been commenced at the end of the button-piece, as at x^3 , and carried to the other end, as at x^4 . In practice it has been found that the two lines of stitching, from the uppermost and the lowermost button-holes to the ends of the button-piece nearest them, is objectionable. To overcome these objections I start the stitching made by the two needles A³ between the endmost button-hole—as, for instance, at the point x^6 , (see Fig. 6)—and then move the material in the direction of the arrow x^7 thereon until the stitching has been carried to or just past the end of the hole x^8 , and then I reverse the direction of the feed and the material, stitching the material in the opposite direction along the lines of stitching just made and to the end of the button-hole x^9 , and then I again reverse the feed movement to make a

few stitches backward over those previously made to fasten the stitch.

It is obvious that stitches returned upon a line of stitches previously made make a secure junction of parts, which cannot ravel out, add greatly to the strength of the seam, and obviate the necessity of finishing the end of a seam by a hand-operated needle.

If desired, I may commence the stitching on the button-piece at the point x^3 , stitch just across the end of the hole x^8 , reverse the feed, stitch to or across the end of the button-hole x^9 , and again reverse the feed until the stitching again arrives at the point x^3 . In like manner when arriving at the end of a seam in a pair of pantaloons, the machine having, say, but one needle, I may quickly reverse the feed to fasten the seam; or I may reverse the feed for a greater or less distance when sewing any part of a garment upon which much strain is to be exerted in wear, thus stitching it over two or three times, and that without material loss of time or stopping the machine, and without obliging the operator to remove her hands from the material.

The stops e e' (shown as screws) may be adapted to secure exactly the same length of stitch in both directions of feed or a different length of stitch in one than in the other direction, or, by adjusting the stop e , the arm f^6 may be arrested in such position as to stop the feed, so that the needle will descend more than once in the same spot, which results in locking the stitch.

As herein shown, the two devices, which by their co-operation determine the length of stitch and the direction of the feed, are the slotted arm D, attached to the auxiliary rock-shaft, and the link C', having the roller or other stud S; but, instead of these particular devices, I may employ any other well-known or equivalent device for like purpose.

The auxiliary rock-shaft D² and its segmental arm have a constant throw, and serve to impart, through the link C', more or less movement to the main or feed-actuating rock-shaft C, to thus vary the length of stitch; and by changing the position of the roller S to one

or the other side of the center of the auxiliary rock-shaft D² the direction of the feed is changed.

The gist of this invention consists in the provision of mechanism whereby the reversal of the feeding mechanism may be done through a treadle, thereby leaving the hands of the operator free to manipulate the work.

The arm f^6 , shaft f^2 , arm f' , rod f , and link C', auxiliary rock-shaft D², and arm D constitute what I herein denominate as the "feed regulating and reversing mechanism."

I desire it to be understood that my invention may be used with a machine having either one or two needles.

The presser-foot p will in practice have two holes for the passage of the two needles, the bottom of the presser-foot resting upon the surface of the material being stitched.

I claim—

1. In a sewing-machine, the combination, with stitch-forming mechanism, of the following instrumentalities, viz: the feed-bar, the feed-actuating rock-shaft C, to which it is attached, the treadle, and feed regulating and reversing mechanism, substantially as described, between the said treadle and the said rock-shaft, whereby the direction of the feed may be instantly changed while the machine is running at speed, leaving both hands of the operator free to manipulate the material being stitched, as set forth.

2. In a sewing-machine, a longitudinally-movable feed-bar, the shaft, an elbow-lever engaging the feed-bar, means to connect the lever with the said shaft to control the longitudinal movement of the feed-bar, combined with means, substantially as described, to reverse the feed and to alter the length of the feeding movement of the feed-bar and the length of the stitch.

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

WILLIAM A. NEELY.

Witnesses:

G. W. GREGORY,
C. M. CONE.