2 Sheets—Sheet 1.

C. O. CROSBY.

Sewing Machine.

No. 90,507. Patented May 25, 1869.

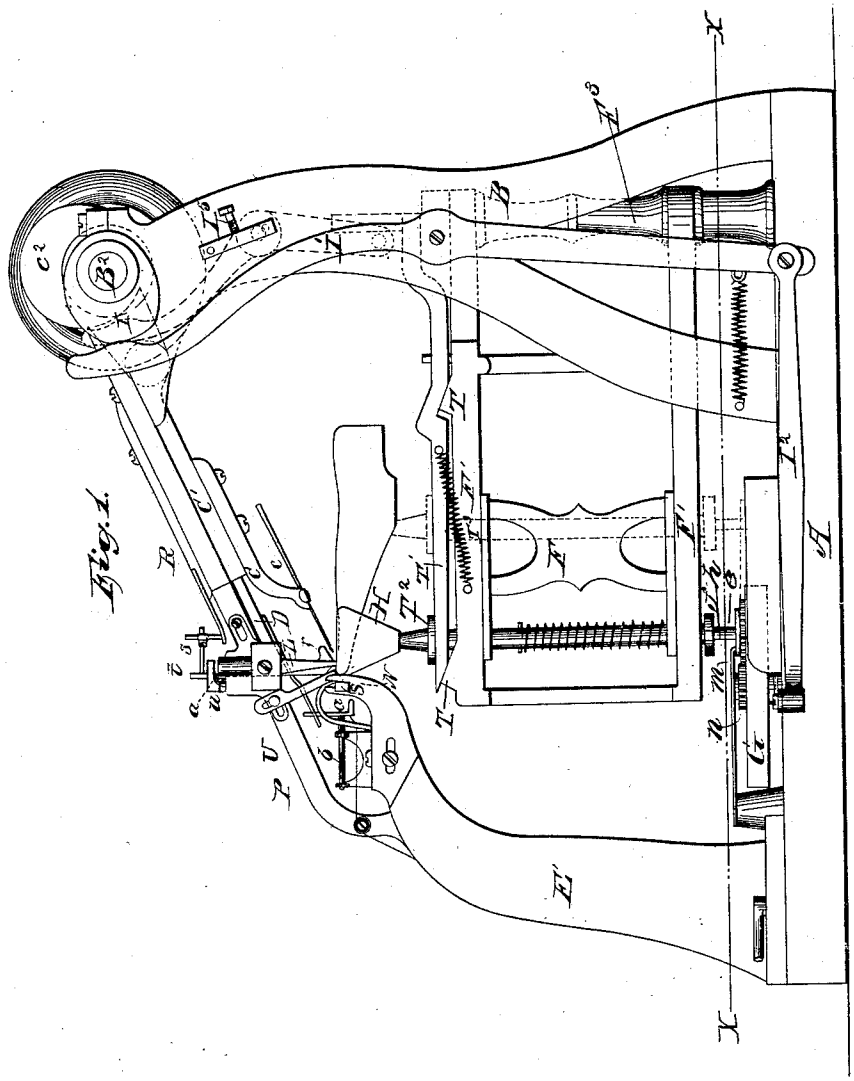

Fig. 1.

Witnesses.
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2 Sheets—Sheet 2.

C. O. CROSBY.

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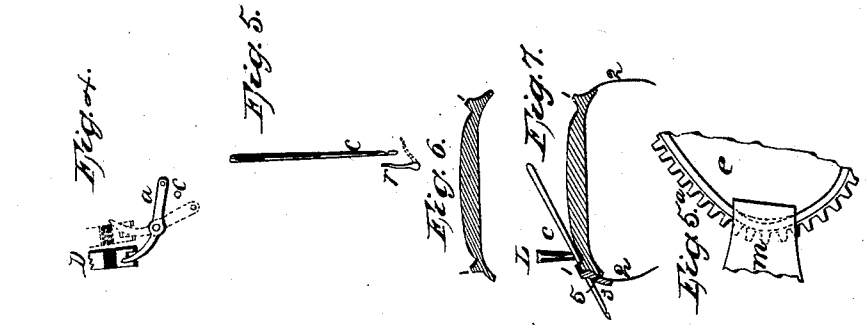

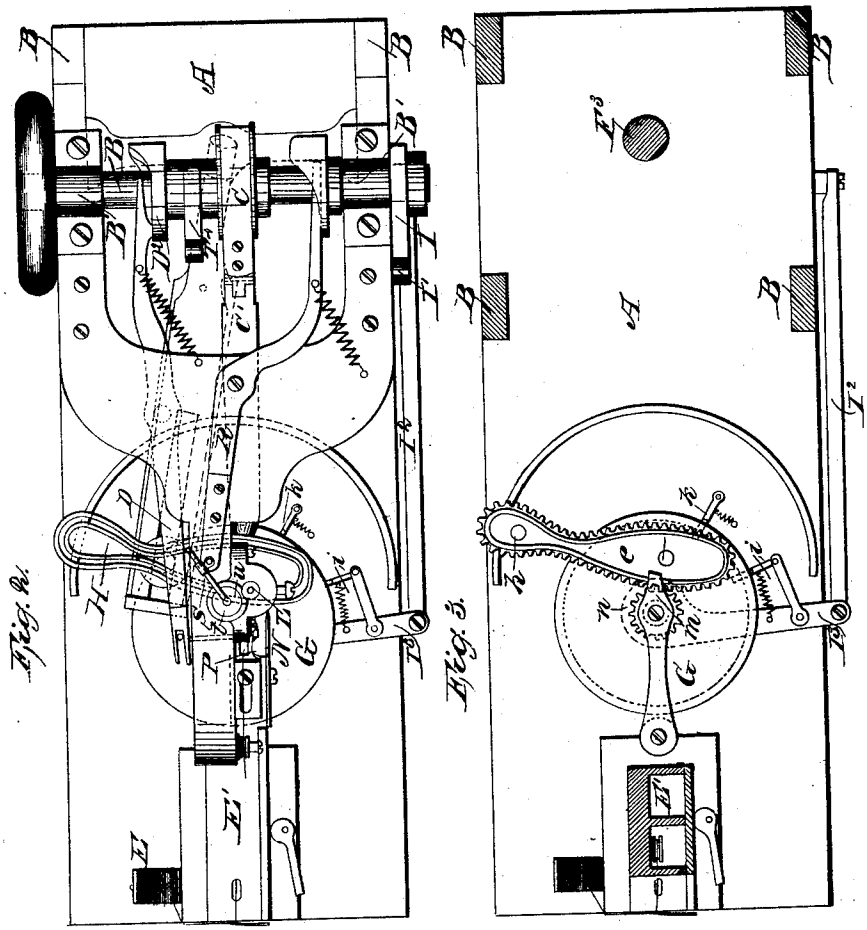

Witnesses.

J. H. Shumway

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UNITED STATES PATENT OFFICE.

C. O. CROSBY, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN SEWING-MACHINE FOR MAKING BOOTS AND SHOES.

Specification forming part of Letters Patent No. **90,507**, dated May 25, 1869.

To all whom it may concern:

Be it known that I, C. O. CROSBY, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Sewing-Machine; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view; Fig. 2, a top view; Fig. 3, a sectional view on line *x x*, looking down; and in Figs. 4, 5, 6, and 7, detached views, to illustrate the operation.

This invention has for its object the stitching of the upper, insole, and welt together, preparatory to putting on the outer sole, or to stitching the upper to the soles of shoes to be turned, and is especially adapted to the use of the sole for which Letters Patent were granted to me, dated February 26, 1867.

To enable others skilled in the art to construct and use my improvement, I will fully describe the same as illustrated in the accompanying drawings.

A is the bed-plate, from which rise standards B, supporting in bearings B^1 the driving-shaft B^2, to which power is applied in any convenient manner. C is the needle-bar, carrying the needle *c*, and supported on a slide, C^1, to which a reciprocating movement is imparted by the eccentric C^2. The path of the needle is at an angle from the bed-plate. *a* is the looper attached to a shaft, *b*, parallel to the bed of the machine, or at an angle to the needle, *c*, as seen in Fig. 1, and is operated by the vibration of a lever, D, from a cam, D^2, which gives to the looper a vibratory movement, as seen in Fig. 4, so as to carry the looper above and below the needle, crossing the path of the needle in its movement, as seen in Fig. 4.

The axis of motion of the looper is inclined to the needle, and, in passing up over the needle, it shortens the thread between the needle and looper, so that as the looper drops there is no slack thread; hence, the looper serves the double purpose of looper and take-up.

The needle is of the kind known as hooked or barbed, and catches the thread when it is passed over the needle by the looper in similar manner as in other chain-stitch machines.

The thread is run from a spool, E, through the column E′, where it is heated to soften and render it more flexible by applying heat to the said column in any convenient manner; then the thread is run through the eye of the looper, as denoted in red, Figs. 1 and 2, the proper tension being applied in its course.

F is a carriage, supported in a frame, F^1, and carries a vertical spindle, F^2. The frame F^1 is attached to a column, F^3, so as to swing transversely thereon, while the carriage F will move longitudinally in the said frame, thus enabling a universal movement to be given to the spindle F^2, and the said spindle, passing through the bars of the frame F, is firmly fixed to a cross-head, *f*, to which a former, *e*, is attached by connections *h*, (see Figs. 1 and 3,) by the turning of which former the spindle will be turned correspondingly. This former is of the shape of the sole of the shoe to be stitched, and is constructed with teeth upon its edge, as seen in Fig. 3, into which a pinion, *n*, fixed to a wheel, G, works, so that by the turning of the said wheel G the former is turned or worked along by the pinion *n*, the former being held in connection with the pinion by an arm, *m*, extending over and hooking into a groove or flange in the said former, as seen in Fig. 3.

The end of the said arm which hooks onto the former is necessarily of the peculiar form denoted in Fig. 5^a, in order that the form may turn properly at the toe—that is, so that the edge of the hook will strike the flange or sides of the grooves in the former a little in advance of the turn of the toe. Upon the upper end of the spindle F^2 the last, with the shoe or boot thereon, is arranged as at H, Figs. 1 and 2, corresponding in position to the former *e* below, and so as to present the shoe to the needle in proper position for stitching, an intermittent motion being given to the wheel G in order to feed the shoe for each successive stitch, and such movement is given by a cam, I, through a lever, I^1, and a connecting-rod, I^2, operating a radius-bar, I^3, attached to the center or shaft of the wheel G, and upon which a pawl or clamp, *i*, is arranged, so that the movement of the lever I^3 back will take back

the pawl, and its forward movement will carry with it the wheel G, the extent of such movement being regulated by the set-screw I^5, (see Fig. 1,) and the wheel G is held to prevent its return by a set-pawl, *k*.

In order to raise and lower the shoe, so as to present the shoe in proper position to be stitched in passing the curves of the sole, the spindle F^2 is supported by a spring, which forces it upward, so as to always present the shoe for the passage of the needle properly through the sole, the sole bearing against the guide L, arranged so as to be adjusted vertically to guide the shoe, as before described.

Before proceeding further, I will describe the sole, which is the invention patented, as before referred to, and to the use of which this machine is especially adapted and shown in section, Fig. 6. The sole is cut into proper form, and a ledge, 1, formed entirely around near its edge, so that the upper 2 being placed upon the outer side of this flange, as seen at the right of Fig. 7, or with the upper 2 and welt 3, as at the left, so that the needle may enter upon the inside of the projecting ledge, and pass through the said ledge and upper and welt (if used) as seen at the left in Fig. 7. The guide L rests in the angle of the sole and ledge, as seen in Fig. 7; therefore, as the sole passes under the said guide, it depresses the shoe to force it down as the elevated portions advance toward the needle, and the spring on the spindle forces up the shoe as the depressed portions of the sole advance toward the needle, so that the shoe is always presented in proper position for the passage of the needle through the sole.

N is the welt-guide, arranged so as to present the welt *s* in proper position to be stitchd to the sole upon the upper. This, of course, is not needed when no welt is used, as for turned work.

As a support against the shoe while the needle is passing through, I arrange an arm, P, which bears against the edge and prevents the yielding of the shoe, so that the needle easily passes therethrough.

When the shoe has been presented in proper position for the needle to pass through and form the stitch, it is important that the shoe be firmly held in that position; therefore it is not expedient to depend entirely upon the upward pressure of the spring on the spindle, as that might be liable to yield. I therefore arrange upon one of the bars of the frame F an incline, T, may be one or two, as seen in Fig. 1, and over this a sliding bar, T^1, with corresponding inclinations. The said bar is brought around the spindle, so as to move freely back and forth, and on the spindle a collar, T^2, is formed, so that when the bar T^1 is drawn forward the inclines will force it upward until the bar rests against the collar T^2, and it is so forced forward by a spring, T^3, and at each movement or feed the bar is withdrawn by the action of a cam, T^4, through a lever denoted in broken lines, Fig. 1, and so soon as the feed has taken place the bar springs forward, wedging, as it were, the shoe up to its proper position, its forward movement being limited only by raising or lowering the spindle to accommodate the curvatures of the sole.

The waxed thread sometimes adheres to the needle, so that after the loop is formed the needle cannot free itself from the loop. To insure such operation, I arrange a vertical shaft, *t*, to the lower end of which is a finger or hook, *r*, to which a vibrating movement is given by the lever R, through the arm S, to turn the finger, as from the position in Fig. 5 to that in red in the same figure, in which movement the finger will turn the loop from the needle; but the needle being inclined, it is necessary that a corresponding downward movement be given to the hook *r*, so as to lift the thread from the hook of the needle and carry it down. For this purpose I arrange a cam, *u*, so that as the shaft T revolves a projection from the said shaft, as seen in Fig. 1, will work upon the face of the said cam, and depress the hook, so as to take the loop and carry it from the needle.

As an additional support or guide, I arrange an adjustable presser-foot, U, (see Fig. 1,) set so as to bear upon the sole and aid the guide L in governing or controlling the movement of the shoe.

The column E′ is made so as to open by the removal of one side, or in any convenient manner, for the introduction of the thread and proper device for heating the same.

Having fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. The arrangement of the vertical last-carrying spindle F^2, in the carriage F, and arranged to move in the swinging frame F^1, whereby a universal movement may be imparted to the said last, substantially as set forth.

2. In combination with the mechanism of the first clause of claim, the former *e*, for controlling the movement of the last-carrying spindle, substantially as set forth.

3. The reciprocating bar T^1, with one or more inclines, T, in combination with the last-supporting spindle, carried in a swinging frame, so as to hold the said spindle in the required position vertically, substantially as set forth.

4. The adjustable stationary guide L, in combination with the mechanism of the first clause of claim, so as to govern the extent of the vertical movement of the last-supporting spindle carrying the boot or shoe being sewed, substantially as set forth.

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Witnesses:
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