

C. O. CROSBY.

SEWING MACHINE FOR SEWING BOOTS AND SHOES.

No. 98,151

Patented Dec. 21, 1869.



Fig. 1.

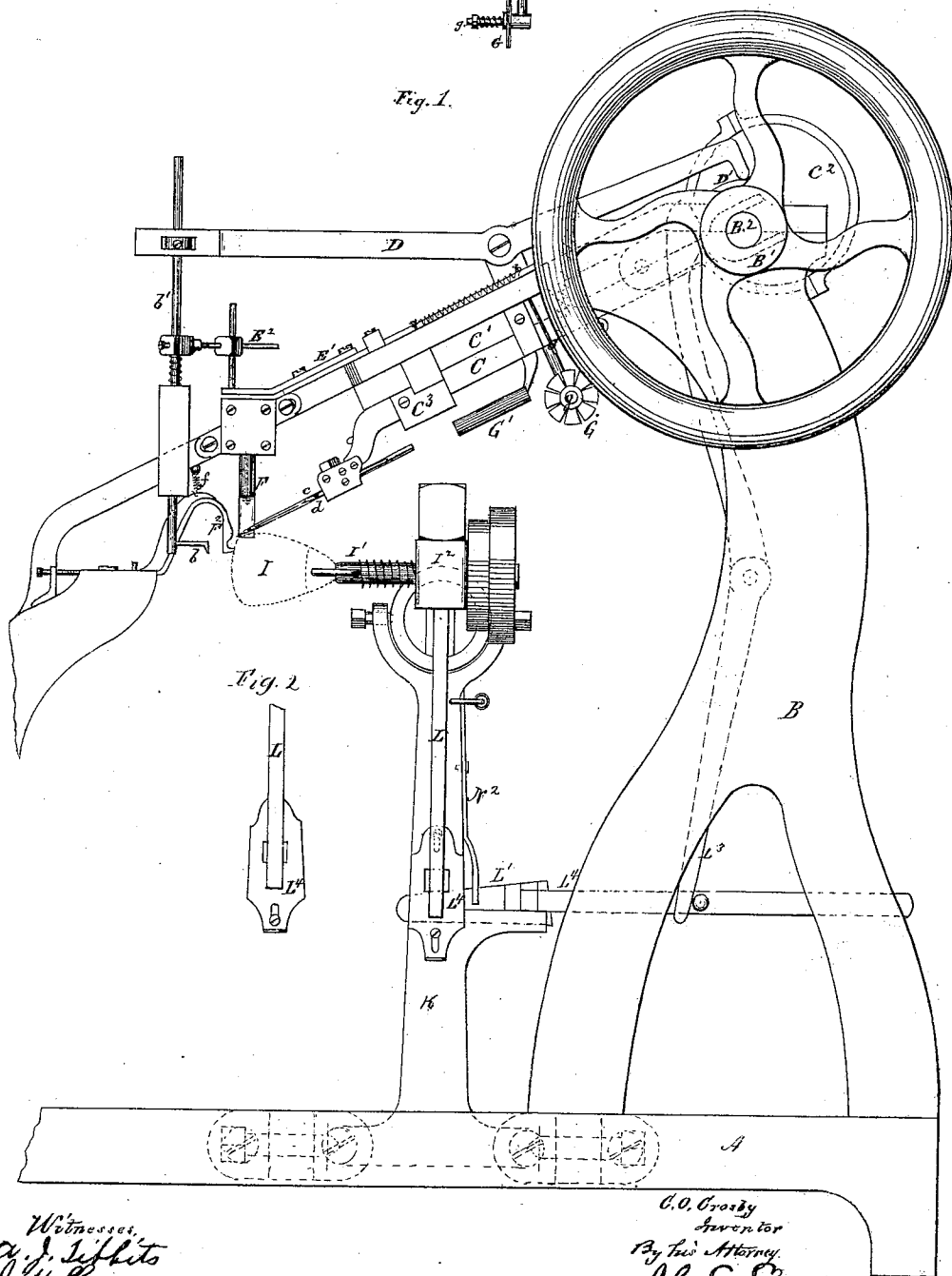


Fig. 2.

Witnesses,  
*C. J. Sibley*  
*J. H. Hummer*

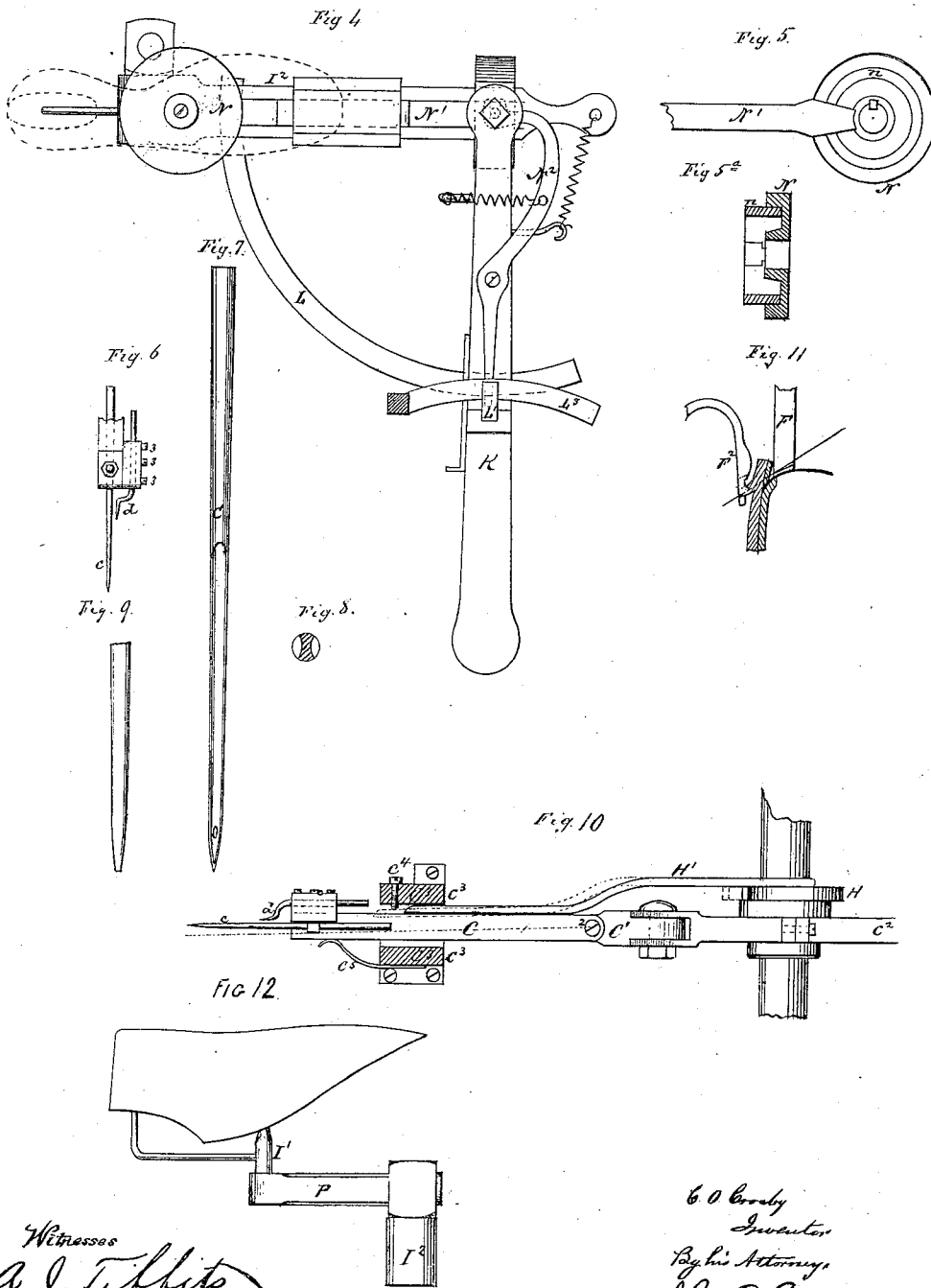
C. O. Crosby  
 Inventor  
 By his Attorney,  
*J. E. Case*



C. O. CROSBY.  
SEWING MACHINE FOR SEWING BOOTS AND SHOES.

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Witnesses  
*A. J. Tibbitts*  
*J. H. Shumway*

C. O. Crosby  
 Inventor  
 By his Attorneys  
*Wm. E. Gault*

# United States Patent Office.

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

Letters Patent No. 98,151, dated December 21, 1869.

## IMPROVEMENT IN SEWING-MACHINE FOR SEWING BOOTS AND SHOES.

The Schedule referred to in these Letters Patent and making part of the same.

### 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;

Figure 1<sup>a</sup>, a view of the tension-device detached;

Figure 2, a detached view of the adjusting-segment L;

Figure 3, a top view of the machine; and in

Figures 4 to 12, inclusive, detached views, to illustrate the operation of this part of my invention.

This invention relates to an improvement in sewing-machines designed to operate in connection with sewing-machines patented to me, May 25, 1869.

The object of this machine is to stitch the sole to the welt.

To enable others skilled in the art to construct and use my invention, I will proceed to describe the same as illustrated in the accompanying drawings—

A is the bed-plate, from which rise standards B, supporting, in bearings B<sup>1</sup>, the driving-shaft B<sup>2</sup>, to which power is applied in any convenient manner.

C is the needle-bar, carrying the needle *c*, and supported on a slide, C<sup>1</sup>, to which a reciprocating movement is imparted by the eccentric C<sup>2</sup>.

The needle is shown enlarged in figs. 7, 8, and 9, and so constructed that it will pass freely and easily through the leather.

The needle is grooved on its opposite sides, so that in section it will be as seen in fig. 8, one concave side being shown in fig. 7, with the eye near the point.

Instead of being brought to a sharp point, as common needles, I make a flat point, as seen in fig. 9, this being a view of the needle turned one-quarter around from fig. 7. This form cuts its way through the leather, making a perforation which will close when the needle returns, whereby the thread is held tightly in the leather.

*b* is the looper, fixed to a vertical spindle, *b*<sup>1</sup>, and attached to a lever, D, which, operated by a cam, D<sup>1</sup>, depresses the looper at the required moment, and a partial rotation is thereby given to the looper by the cam E, through the lever E<sup>1</sup>, and a connecting-rod, E<sup>2</sup>, which is attached to the spindle *b*<sup>1</sup>, as seen in figs. 1 and 3.

The operation of the looper is such that the needle being threaded and passed through the leather, the looper will catch the thread above the eye of the needle, holding and carrying it from the needle, so that

at the next passage of the needle through the leather, it will pass through the loop first made, and held by the looper *b*.

F is a guide, made adjustable vertically, so as to bear upon the upper leather, near the edge of the last, and at the welt, as seen in fig. 11.

F<sup>2</sup> is an adjustable guide, hooked at its end, so as to run in the groove of the sole, as seen in fig. 11.

The needle, in its descent, passes over the end of the guide F<sup>1</sup>, through the sole and welt, and through a slot formed in the end of the guide F<sup>2</sup>, as denoted in fig. 11.

The guide F<sup>2</sup> is held up by a spring, *f*, so as to accommodate itself to the slight irregularities which may exist in the formation of the groove, in the sole, or to accommodate itself relatively to the guide F, which is set rigidly.

The thread which the needle carries is passed over a tension-apparatus, G, thence through a tube, G<sup>1</sup>, to the needle.

Heat is applied in any convenient manner to the tube G<sup>1</sup>, to soften the waxed thread, and bring it to the required state for sewing.

To feed the work, a vibratory movement is given to the needle-bar by the cam H, operating a sliding bar, H<sup>1</sup>, as more clearly shown in fig. 10, inverted, that is to say, looking up from below the machine.

The needle-bar works through a guide, C<sup>3</sup>, the space in the said guide being broader than the needle-bar, to allow the vibration of the needle-bar, the bar being pivoted to the slide C<sup>1</sup> at 2.

The bar H<sup>1</sup> extends into the guide C<sup>3</sup>, beside the needle-bar, and its end is inclined, so that as it is forced through the guide, it will strike an adjusting-screw, C<sup>4</sup>. The inclined end passing over the screw, forces the bar H<sup>1</sup> and the needle-bar C to one side, as denoted in broken lines, and on the return of the bar H<sup>1</sup>, a spring, C<sup>5</sup>, throws back the needle-bar.

The operation of the bar H<sup>1</sup> occurs at the dead-point, while the needle is through the sole.

To aid the needle both in the feed as well as in the perforation of the leather, I arrange an auxiliary awl, *a*, in such position that when the needle has passed through the leather to its fullest extent, the said awl being attached to the needle-bar will enter the leather and partially perforate, and the awl is set at the distance in advance from the needle required for the length of the stitch, so that as the needle comes down for the next stitch, it will strike into the previous partial perforation of the awl.

This operation facilitates or lessens the force required to drive the needle through the leather, and at the same time relieves the needle, to a great extent, in the operation of feeding, as the feed occurs while the awl is in the leather.

The awl is made adjustable by set-screws 3 3 3, as seen in fig. 6, so as to be arranged at the required distance for the needle.

I is the last upon which the boot or shoe is prepared for soling.

It is fixed to a spindle, I<sup>1</sup>, arranged in the end of an arm, I<sup>2</sup>, and so as to turn freely thereon, and with a spring arranged on the spindle I, so as to bear the shoe or last against the guides, as seen in fig. 1.

To accommodate the last to the required position, the arm I<sup>2</sup> is hung in a universal joint to a vertical-swinging bar, K, and is supported by a segment, L, extending from the arm I<sup>2</sup>, down and passing through a slot in the bar K.

The vertical movement of the arm I<sup>2</sup> is necessary to turn the last around the heel and toe, as also to the irregular shape of the edge, but at each stitch it is advisable that the arm I<sup>2</sup> be locked, to prevent the displacement of the shoe by the operation of the needle. For this purpose I arrange a sliding key, L<sup>1</sup>, seen in fig. 1, operated by a cam, L<sup>2</sup>, to a lever, L<sup>3</sup>, and a bar, L<sup>4</sup>, which connects to the said key, so that as soon as the feed has taken place, the said bar L will be locked by the said key L<sup>1</sup>, at that time being thrown forward, so as to wedge the bar L by the action of a spring, seen in fig. 3, and then, immediately before the feed takes place, the cam L<sup>2</sup> operates to withdraw the key L<sup>1</sup>. This provides only for the vertical movement of the arm I<sup>2</sup>, trusting to the transverse movement of the spindle I<sup>1</sup> for the irregular shape of the bottom of the sole. This transverse movement may, however, be given by allowing the segment L a little play transversely. This is done by placing a plate, L<sup>5</sup>, upon the swinging-bar K, over the slot through which the segment L moves, and arranging this plate so that it may slide vertically, as from the position in fig. 1 to that in fig. 2, and *vice versa*, the corresponding slot formed in the plate, when in the position seen in fig. 2, being of the same width as the segment, will prevent any transverse movement; but if the plate be dropped to the position seen in fig. 1, and the slot to that position made wider, as shown, then the bar-segment is free for the transverse movement. The plate L<sup>5</sup> is arranged so as to be fixed in either position.

At the same time that the arm I<sup>2</sup> is locked, it is also necessary to lock the spindle I<sup>1</sup>, to prevent it turning. To do this, I arrange upon the spindle a flanged wheel, N, (see figs. 4, 5, and 5<sup>2</sup>;) keyed firmly thereto.

Then, within the flange, I arrange a divided ring, n, and along the side of the arm I<sup>2</sup>, I arrange a sliding bar, N<sup>1</sup>, entering the divided side of the ring n, as seen in fig. 5; and the end of the sliding bar N<sup>1</sup> is made wedge-shape, so that as it is forced in, the ring n is spread and clamps on the flange of the wheel N, and prevents its turning; but when the bar is withdrawn, the wheel N will turn freely, and the sliding bar N<sup>1</sup> is operated at the proper time by the lever N<sup>2</sup>, hung on the swinging bar K, and so as to be operated by the key L<sup>1</sup>, that is, when the key L<sup>1</sup> throws forward to lock the segment L, it will at the same time throw forward the sliding bar N<sup>1</sup> to clamp the spindle.

The boot or shoe, after the welt has been sewed thereon, as described in my specification in the patent of May 25, 1869, before referred to, and the outer sole temporarily attached thereto in any convenient manner, is, with its last, placed in the machine, as seen in figs. 1 and 3, and in relation to the guides F and F<sup>2</sup>, as seen in fig. 11. Power then being applied to the machine, the welt and sole will be stitched together.

This machine may be adapted to the stitching of the welt to the upper and insole, by placing in the arm I<sup>2</sup>, as seen in fig. 12, an arm, P, to which the spindle I<sup>1</sup> is fixed, so as to set the shoe, sole up, and thus adapt the machine to the sewing of two kinds of work. I prefer, however, the two machines I have described.

The tension-device G is formed from a single round plate or disk of metal, hung so as to revolve on a pivot, g, and is divided radially, as seen in fig. 1, and alternate segments turned in either direction, as seen in fig. 1<sup>a</sup>, so that the thread is passed between the segments, and interlaced therein, and produces tension upon the thread.

The said tension-device is fixed to the slide C<sup>1</sup>, so as to move with it, and always maintain the same relative position to the needle.

The tension is regulated by pressing the spring on the pivot more or less hard against the plate G, as seen in fig. 1<sup>a</sup>.

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

1. The combination of the needle-bar O and the sliding bar H<sup>1</sup>, upon which is formed an incline, and the adjusting-screw C<sup>1</sup>, to move the needle, so as to feed the work, substantially as set forth.
2. In combination with the subject-matter of the first clause of claim, the sewing-needle and awl D, substantially as set forth.
3. The combination, substantially as described, of the vibrating arms: K and I<sup>2</sup>, with the spring-spindle for supporting and moving the last.
4. In combination with the last-supporting spindle I<sup>1</sup>, the wheel N, the ring n, and the wedge-shape bar N<sup>1</sup>, so as to lock the spindle and prevent its turning, substantially as described.
5. In combination with the arm I<sup>2</sup>, the segment L, with the wedge I<sup>3</sup>, arranged for clamping and holding the said arm, substantially as set forth.
6. In combination with the arm I<sup>2</sup> and the segment L, the plate L<sup>5</sup>, constructed and adjustable so as to permit or prevent, as the case may be, the lateral movement of the arm I<sup>2</sup>, substantially as set forth.
7. In combination with the arm I<sup>2</sup>, substantially as described, the swinging-arm P, so as to hold the spindle I<sup>1</sup>, to adjust the shoe for stitching, as set forth.

C. O. CROSBY.

Witnesses:

A. J. TIBBITS,  
J. H. SHUMWAY.