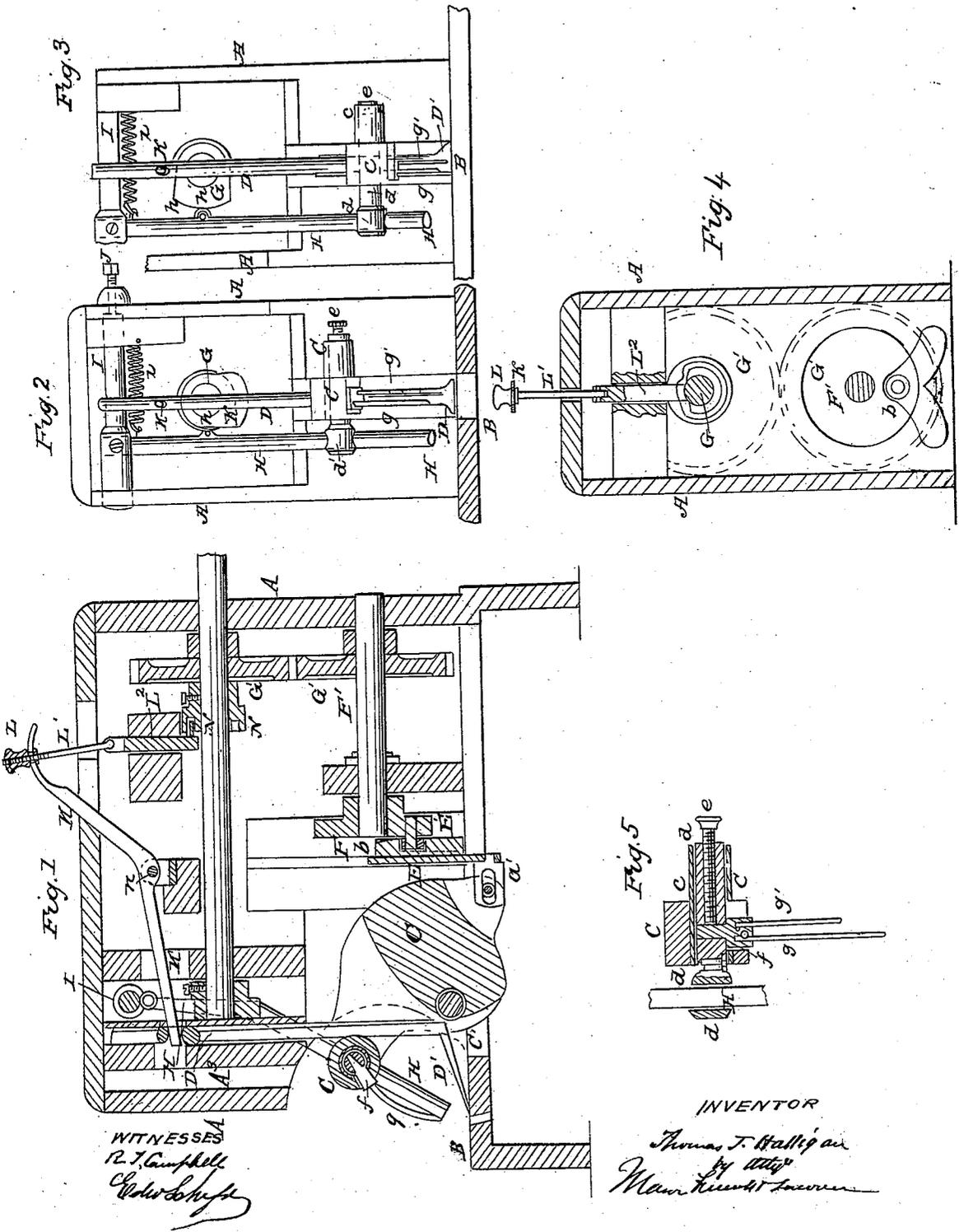


T. J. HALLIGAN.
Waxed Thread Sewing Machine.

No. 59,127.

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WITNESSES
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UNITED STATES PATENT OFFICE.

THOMAS J. HALLIGAN, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND SAMUEL SHAPTER, OF SAME PLACE.

IMPROVEMENT IN WAXED-THREAD SEWING-MACHINES.

Specification forming part of Letters Patent No. **59,127**, dated October 23, 1866; antedated June 14, 1866.

To all whom it may concern:

Be it known that I, THOMAS J. HALLIGAN, of the city and county of New York, State of New York, have invented certain new and useful Improvements in Sewing Machinery; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a longitudinal section, taken in a vertical plane through the center of my machine. Fig. 2 is a front view of the machine with the front plate removed, showing the needle and awl elevated. Fig. 3 is a similar view of the same parts, showing the needle and awl depressed. Fig. 4 is a sectional view, taken in the vertical plane indicated by red line *x x* in Fig. 1. Fig. 5 is a sectional view of the needle slide and holder.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates particularly to improvements in wax-thread sewing-machines in which a shuttle is employed beneath the bed-plate for taking the loop of an upper needle-thread, so as to interlock the upper and lower threads in the material being sewed, on substantially the same principle as is demonstrated in my previous patented wax-thread sewing-machines.

The nature of my invention consists in the arrangement of an eye-pointed needle above the perforated bed-plate, said needle being curved, as hereinafter described, in combination with a similarly curved awl, also arranged above the perforated bed-plate, said awl being of a length less than that of the needle, so as not to interfere with the looping of the upper thread, nor with the shuttle's passage through said loop when the awl and needle are both down through the material being sewed, the said needle and awl being arranged on a laterally-sliding needle-carrier, which has an oscillating motion in the path of a vertical circle imparted to it, the lateral or right-line movement being made for the purpose of feeding the material with the needle, and the circular movement being made for the purpose of carrying the upper thread through the cloth, so that it may be interlocked with a lower thread carried by a reciprocating shuttle on a

well-known principle. By this part of my invention I am enabled to employ the right-line needle-feed, and to use a curved needle in shuttle sewing-machines.

My invention also consists in arranging the pressure-foot rod in rear of the needle and awl carrier, and the pressure-foot underneath said carrier, the said rod being out of the way of the arm which oscillates the needle-carrier, all as will be hereinafter described.

My invention also consists in supporting the needle-carrier by means of two sliding bars connected together by a guide-rod and an articulating joint or eye, in combination with a spring, an adjusting-screw, and a cam, the adjusting-screw being arranged in line with the upper sliding bar, all as will be hereinafter described.

My invention also consists in an arrangement of the pressure-foot and a cam, whereby without the aid of a spring the pressure-foot is caused to rise and release the work upon the table during the descending strokes of the needle, and also is caused to descend and hold the work firmly upon the table during the ascent of the needle.

My invention also consists in an arrangement of the hinged device for adjusting the pressure-foot for different thicknesses of work, and also graduating the pressure as circumstances may require.

My invention also consists in feeding the material, and also carrying the upper thread down through the bed-plate, for the purpose of having it interlocked with a shuttle-thread by means of a needle which is curved, as described, and moves laterally in a right line and vertically in a curved line, all as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

The mechanism for operating the needle and also the pressure-foot is inclosed within a box-frame, A, which is suitably secured upon a table, B. The front end of this frame A is curved out for the purpose of affording space for the working of the needle-arm and pressure-foot.

The needle-arm C is constructed of the form shown in the drawings, Fig. 1, for the purpose of giving it the required strength, and also to

allow of the passage through it of the bar D, which carries on its lower end the pressure-foot D'. This needle-arm C is pivoted to a shaft, C', which passes transversely through the frame A, near the front end of this frame, and slightly above the plane of the table. Consequently the needle-arm will vibrate in a plane which is perpendicular to the surface of the table B.

Arm C receives its vibrating motion from a vertically-reciprocating gate or frame, E, to which it is connected by means of a pin, *a*, playing in an oblong slot, which is made through a projection, *a'*, of the frame E, as shown in Fig. 1.

The frame E has a plate, E', projecting from its rear side, in which is an inverted-V shaped slot, the shape of which is shown in red lines in Fig. 4. In this slot works a pin, *b*, which projects from the face of the wheel F, and which is arranged eccentrically upon this wheel, so that when the shaft F', upon which the wheel F is keyed, is revolved the frame A will receive a rectilinear reciprocating motion and the needle-arm C a vibrating motion.

The shaft F' receives its motion from the main shaft G through the medium of the spur-wheels G' G', which are located near the rear end of the frame A, as shown in Fig. 1.

The outer or front end of the vibrating needle-arm C has a tubular bearing, *c*, passing transversely through it, in which a short rod, *d*, slides freely. This rod has a rocking joint-eye, *d'*, pivoted on one end, through which a guide-rod, H, passes, and in the opposite end of this rod *d* a screw, *e*, is tapped, for the purpose of securing the block *f* to the rod *d*, as shown in Fig. 5.

The block *f* has the needle *g* and awl *g'* suitably secured to it, which needle and awl are curved concentrically to the axis of motion of the arm C, as shown in Fig. 1. The awl is of less length than the needle, for the purpose before stated.

Slots are made through the tubular bearing *c*, and also through the end of the arm C, of sufficient length to allow of all the lateral movement required for the needle and awl block *f* with its bar or rod *d*.

The block *f* is secured into the rod *d* by means of the screw *e*, so that by loosening this screw the needle and awl can be detached from their sliding rod.

The rod H, which passes through the rocking joint-eye *d'* on the end of the rod which carries the needle and awl, is secured rigidly at its upper end to a transverse shaft, I, which is located near the top of the frame A, and which is allowed to have a rocking motion and also an endwise motion.

On the rod H a friction-roller, *h*, is applied, which is held in contact with a single-throw cam, *h'*, on the front end of the main shaft G, by means of a coiled spring, *i*, as shown in Figs. 2 and 3.

One end of the shaft I abuts against and is held by the spring *i* in contact with the end

of an adjusting-screw, J, which is tapped through the side of the frame A, as shown in Fig. 2. By adjusting this screw the length of lateral throw of the shaft I can be increased or diminished at pleasure.

The single-throw cam *h'* imparts a lateral motion to the rod H, shaft I, and also the needle-bar *d*, which motion takes place at such times as to cause the needle and awl to feed the cloth along upon the table B the distance of the length of a stitch at every ascending stroke of the outer end of the arm C after each stitch is formed. When the needle rises free from the work it is moved back by the spring *i* to a position for entering it again and forming another stitch.

It will thus be seen that the needle and its bar have a movement independently of the vibrating arm, and that such movements are at right angles to each other, the arm C being moved in a plane perpendicular to the surface of the table for causing the needle to enter and leave the work, and the needle and its awl being moved laterally.

The length of lateral movement of the needle and awl is regulated by means of the adjusting-screw J, which regulates the length of the stitches.

The bar D of the pressure-foot D' passes up through a slot, which is made vertically through the needle-carrying arm C, and moves in a guide, A³. (Shown in Fig. 1.) This pressure-foot bar is raised and depressed by means of a lever, K, which is pivoted at *n* to a cross-bar of frame A. The rear arm of this lever is bent upward through an oblong slot, which is made through the top of said frame, and its rear end is forked and curved, as shown in the drawings, Fig. 1.

L represents an adjusting-nut having an annular groove formed in it, which groove is embraced by the forked end of lever K. This nut L is applied to a screw-rod, L¹, which is pivoted by a transverse pin to a sliding bar, L², that is moved up and down vertically by means of a grooved cam, N, which is keyed on the main shaft G. (Shown in Figs. 1 and 4.) This cam N should be adjusted in such relation to the movement of the arm C that during the ascent of the needle and awl the cam L will hold the pressure-foot D' down firmly upon the work, and thus prevent the work from being raised from the table. Then when the needle and awl descend and penetrate the work, the cam N will rise, and allow the needle and awl to feed the work along.

By means of the screw L the pressure-foot can be adjusted up or down according to the amount of pressure required or the thickness of the material to be stitched. By slipping the thumb-screw L backward, and thus releasing the lever K, the pressure-foot can be raised or lowered by the hand for adjusting the work beneath it.

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

1. The vertically-oscillating and laterally-sliding curved eye-pointed needle arranged above a perforated bed-plate of a shuttle sewing-machine, and operated, substantially as described, for sewing and feeding the material or work, as set forth.

2. The combination of an awl with an eye-pointed needle, constructed, arranged, and operated substantially as specified.

3. The arrangement of a curved awl with a curved eye-pointed needle above a perforated bed-plate of a shuttle sewing-machine and upon a carrier which receives a right-line movement, for the purpose of feeding the material, and a curved movement in a vertical plane, for the purpose of carrying the upper thread through and below the bed-plate, substantially as described.

4. The arrangement of the pressure-foot and

its rod with respect to the curved laterally-sliding and oscillating needle, substantially as herein described and shown.

5. The arrangement of the sliding rods I and *d*, guide H, joint-eye *d'*, cam *h'*, spring *i*, and set-screw J, substantially as and for the purpose set forth.

6. The arrangement of the hinged devices L L', lever K, and pressure device D D', substantially in the manner and for the purpose described.

7. The pressure-foot, controlled by means of a cam, N, constructed and arranged as set forth, in combination with the perforating and feeding needle, substantially as described.

THOMAS JOHN HALLIGAN.

Witnesses:

JOHN ADRIANCE,

JOHN VANDERPOEL.