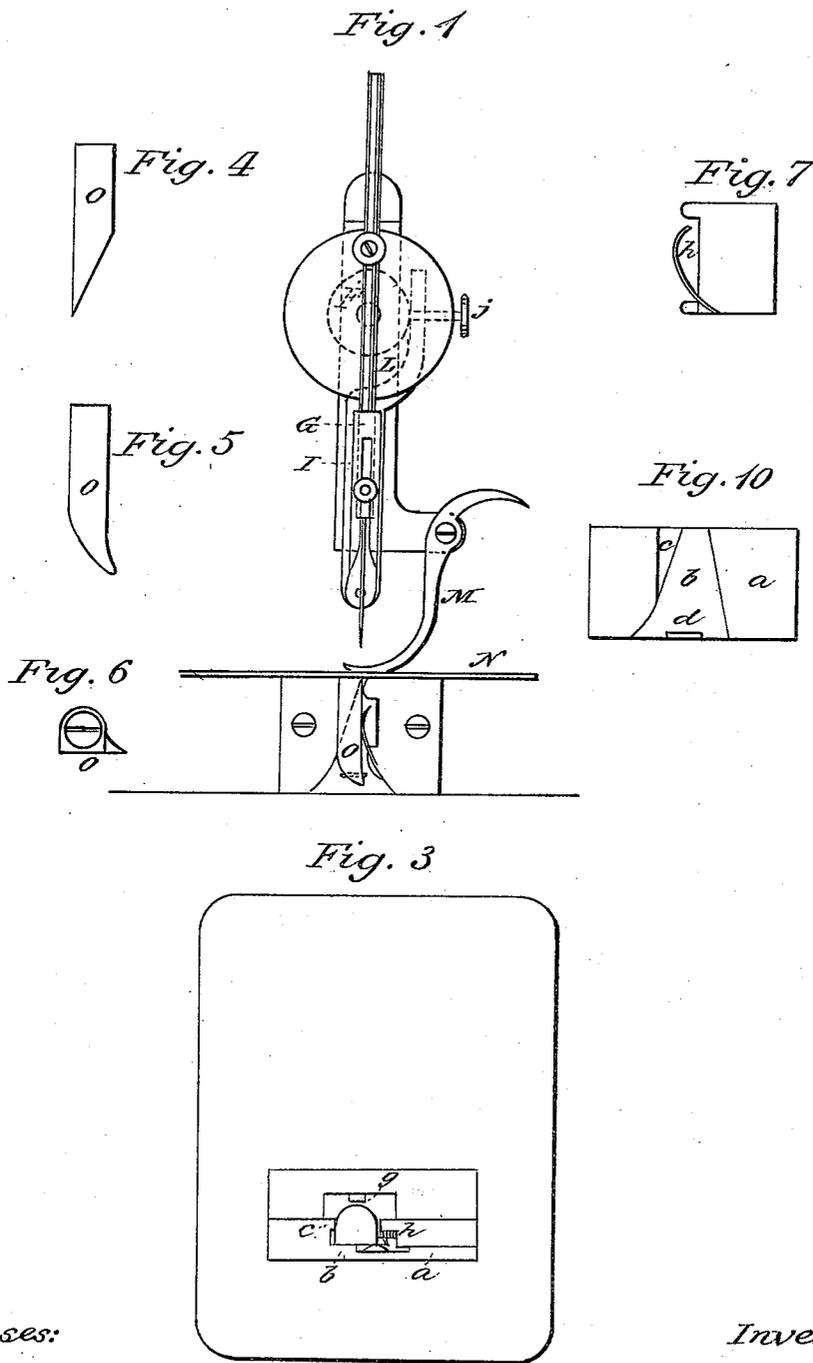


H. F. WILLSON.  
Sewing Machine.

2 Sheets—Sheet 1.

No. 62,986.

Patented March 19, 1867.



Witnesses:  
Geo. W. Jones  
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Inventor:  
H. F. Willson



# United States Patent Office.

HENRY F. WILLSON, OF FORT WAYNE, INDIANA, ASSIGNOR TO W. G. WILSON, OF CLEVELAND, OHIO.

Letters Patent No. 62,986, dated March 19, 1867: antedated March 12, 1867

## IMPROVEMENT IN SEWING MACHINES.

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, HENRY F. WILLSON, of Fort Wayne, in the county of Allen, and State of Indiana, have invented certain new and useful Improvements in Sewing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a front elevation.

Figure 2 is a side elevation.

Figure 3 is a detached plan view.

Figure 4 is an edge view of shuttle.

Figure 5 is a side view of shuttle.

Figure 6 is a top view of shuttle.

Figures 7, 8, 9, 10, and 11 are detached views of the shuttle holder.

Figure 12 is a detached view of the eccentrics.

The nature of my invention consists in combining the needle-bar of sewing machines having an oscillating needle-feed motion with an oscillating lever and stationary shuttle, for the purposes of—

1. So governing and controlling the action of the needle, that when it has pierced the cloth to its full length, and has, by its vibration, passed its point to the point of the shuttle, and has been partially withdrawn from the cloth to form a loop, the cloth has not been moved, but has remained stationary.

2. So governing the feed that stitches of any desired length may be spaced off in an even, uniform manner, without at the same time interfering with the looping of the thread and the catching the same by the point of the shuttle.

3. Enabling the needle to have a long throw and great vibration; to allow it to cast the loop over the point of the shuttle and not interfere with the length of the stitch.

To enable others skilled in the arts to make and use my invention, I will proceed to describe its construction and operation.

A represents the frame of the machine. B represents an axle, which runs horizontally through the machine and imparts motion to it. C represents a crank-wheel, which is secured to the end of axle B, and is provided with a crank-pin, D. E E' are irregular eccentrics, which are secured to the axle B, and are located directly behind the crank-wheel; eccentric E governs the motion of the needle, while E' governs the length of stitch. F represents a needle-bar, which is secured near its centre to crank-pin D so as to move freely. The lower end of said needle-bar extends downward through an oscillating tube G. Said tube is secured by a pivot to the lower end of an oscillating lever, H, which lever H is pivoted on a stationary fulcrum, I. Its upper end is curved outward and upward so as to extend above the centre of axle B, and comes in immediate contact with the eccentrics E E'. J represents a thumb-screw, which passes through the upper end of lever H, and is acted upon by projection K of eccentric E'. Said lever is kept in position by means of a spring, L. M represents a cloth-presser. N represents a plate for support of cloth to be sewed, having a suitable slot for the passage of needle, thread, &c. O represents a shuttle, which is made in the form seen in the drawings, (figs. 1, 2, 3, 4, 5, and 6.) The shuttle used in this machine may be constructed with an open end, to admit the spool loosely, or the end may be closed by means of a head, having a suitable screw for the purpose of securing it in place, and is supported in a shuttle holder constructed as follows: a represents a plate, having a ledge, b, which extends diagonally across it, on which the shuttle rests, and also another ledge, c, which extends vertically across it, and against which the back of the shuttle is supported. This plate is also provided with a recess, into which the needle passes, and is formed as seen in the drawings. (See figs. 10, 11.) In the lower portion of this recess is a projection, d, on which the point of the shuttle rests for support. Directly in front of the point of the shuttle, and a short distance from it, is located another projection, e, against which the shuttle is forced while the thread is passing over the same. g represents an elliptic spring, which presses slightly against the back of the shuttle, to keep it in place. h represents another elliptic spring, which presses against the inner side of the shuttle and serves to hold it against the ledge against which the back of the shuttle rests.

If the fulcrum of the needle-bar were stationary, as in Boynton's and Cately's machines, while the crank-pin supporting the needle-bar was passing through the lower part of its nether semi-revolution by a lateral movement, that part of the needle immediately in contact with the cloth would, in common with the other parts of the needle below the fulcrum, receive a lateral movement in the opposite direction. A lateral movement of that part of the needle immediately in contact with the cloth I desire to prevent, and I carry out this desire by making the fulcrum-pin of the needle-bar a joint-pin, connecting the needle-bar holder with the lower end of the oscillating lever H, the upper end of which is held by a spring, L, against the eccentric E, and is thus compelled to follow the face of the eccentric over the retreating parts thereof. The eccentric is so arranged as to present the retreating parts of its face to the upper arm of the lever H during a part of the nether semi-revolution of the crank-pin which supports the needle-bar, and the said upper arm is thus drawn toward the left, and the lower arm toward the right, at the time when the needle is passing down through the cloth. This movement of the lower arm of the lever H toward the right causes, of course, a similar movement of the fulcrum of the needle-bar; and as the fulcrum passes toward the right, it carries with it that part of the needle in its immediate proximity. But as the crank-pin with which the needle-bar is connected near its upper end moves considerably faster than the fulcrum toward the right, it inevitably throws the point of the needle toward the left. Between that part of the needle moving toward the right and that part moving toward the left there must be a point that moves in neither direction, but is at rest. My mechanism is so adjusted that this point is that immediately surrounded by the cloth. The fulcrum of the needle is, in effect, fixed at this point during a portion of the revolution of the crank-pin. The point of the needle, however, receives motion enough to enable it to throw the loop over the point of the stationary shuttle, and thus form the stitch. This compensating vibration of the fulcrum of the needle-bar, simultaneously with that of the needle-bar itself, I consider the chief feature of my invention. Just after the crank-pin has ceased its lateral motion toward the right, and the needle-bar commenced to rise, the projection K of the eccentric E' comes in contact with the point of the set-screw J, passing through the upper arm of the lever H, and forces said upper arm toward the right. The lower arm of the lever consequently moves toward the left, carrying with it the needle not yet retracted from the cloth, and thus effecting the feed. The needle, on the completion of its retraction, is at the limit of its throw to the left, and the extent of this throw depends upon the distance to which the set-screw J is passed through the upper arm of the lever H. The length of the stitch also depends upon this circumstance, since the further the needle is thrown to the left, the greater the distance it has to pass over to reach the limit of its throw to the right, which limit always remains the same.

Having thus fully described the construction and operation of my machine, what I claim as new, and desire to secure by Letters Patent, is—

1. A needle-bar, receiving an independent vibration from a crank, in combination with an oscillating lever, and with a vibrating needle-bar holder in such manner as to produce a compensating vibration of the needle-bar, substantially as described.

2. The set-screw J, in combination with the eccentric E' and oscillating lever H, for the purpose of affecting the length of the stitch by regulating the throw of the needle to the left, said lever being jointed to the vibrating fulcrum of the needle-bar, as described.

3. I claim the stationary shuttle, constructed and supported substantially as described, in combination with the needle-bar and oscillating bar, for the purposes described and set forth.

H. F. WILLSON. [i. s.]

Witnesses:

GEO. W. JONES,  
W. G. WILSON.