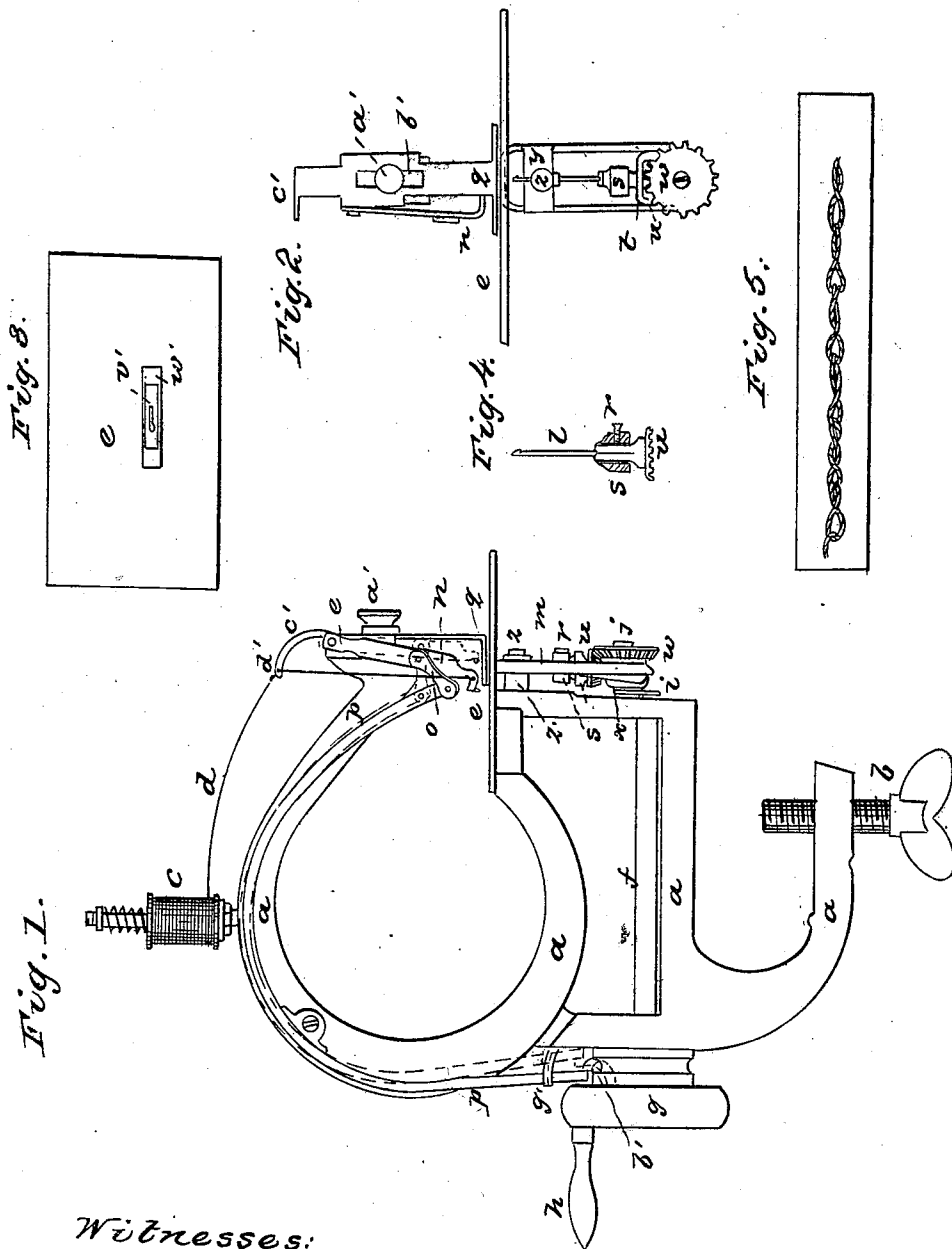


J. HARRISON, Jr.
Sewing Machine.

No. 25,013.

Patented Aug. 9, 1859.



Witnesses:
J. A. Bondle
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UNITED STATES PATENT OFFICE.

JAMES HARRISON, JR., OF NEW YORK, N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 25,013, dated August 9, 1859.

To all whom it may concern:

Be it known that I, JAMES HARRISON, JR., of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Sewing - Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters and marks thereon.

The machine of which the improvements of this application form part is one in which a barbed or bearded needle is used, the needle being passed up through the cloth, turned or rotated in its movements, the thread presented to it by a vibrating or switching lever, the thread brought down by the needle, twisted, and made into a loop, and the needle again passed up through the cloth, and the thread again brought down and acted upon as before, the stitch being the chain-stitch, in which the threads of the loops are twisted and a single thread used.

Of the drawings forming part of this specification, Figure 1 is a side view of the machine; Fig. 2, an end view; Fig. 3, a top view of a part of the cloth-plate, showing the slot through which the top of a vibrating feeding-frame and the needle play; Fig. 4, a vertical view, in section, of the needle-holder; and Fig. 5 represents the stitch made by the machine.

In each of these figures the same parts are marked with the same letters.

a indicates the frame of the machine; *b*, the screw by which it may be affixed to the working-table; *c*, the spool; *d*, the thread; *e*, the cloth-plate; *f*, the power-shaft, having its power crank-disk *g*, with a handle, *h*, at one end and an actuating crank-arm, *i*, with its pin *j* at the other end; *k*, the needle-holder; *l*, the needle; *m*, the vibrating feeding-frame; *n*, the switching-lever; *o*, the link connecting the switching-lever to the main operating-lever *p*; and *q* the shoe or cloth-holder.

By referring to Fig. 4 it will be seen that the needle-holder has a split or double-jawed upper part, the needle being clamped between the jaws by the pressure of a screw, *r*, either direct upon one of the jaws, or upon a plate interposed between the end of the screw and jaw. The jaws are surrounded by a collar, *s*, through which the screw passes. This method of holding the needle allows of its being taken

out and replaced conveniently, and of its ready adjustment lengthwise for regulating the feed and the size of the stitch, as it will readily be perceived that the higher the point of the needle projects above the cloth the farther the cloth is moved or fed, and vice versa. The needle-holder is prolonged downward, passing through a hole in the upper end of a frame, *t*, and has attached to its lower end a beveled pinion, *u*. This beveled pinion gears into a wheel, *w*, on the crank-pin *j* of the power-shaft *f*. It is through this beveled pinion and beveled wheel that the needle receives from the power-shaft its rotary motion, its upward and downward oscillating movements being derived from its connection with the frame *t*. It will be seen that the lower end of this frame *t* is a block or knob, *x*, in which is a hole for the crank-pin of the power-shaft, and with every revolution of the power-shaft the needle has one complete stroke, passing up through the cloth, seizing the thread, and bringing it down below the cloth. In this stroke of the needle it will be noticed that its movements are not vertical, but oscillating, and that there is a difference of about an eighth of an inch between the two points of the needle's entering and leaving the cloth, the movement of the needle between these two points carrying with it the cloth; hence it follows that the farther the needle passes through the cloth the greater will be the distance the cloth will be moved or fed. During this upward and downward motion of the needle it is rotated.

The drawings show a certain relation between the teeth of the beveled wheel and pinion; but it is obvious that the teeth of one or both may be of greater or less number than shown—or, in other words, that the diameter of the wheel and pinion may be greater or less, and thus the needle have more or less motion with each revolution of the power-shaft. It is also obvious that, instead of toothed wheel and pinion giving continuous motion to the needle, disks having studs or projections upon their peripheries may be used, the studs being so arranged that the needle shall have intermittent rotary motion, or be moved only at stated or fixed points of time.

The frame *m* has a cross-bar or block, *y*, in which is a hole for the pin *z* of the supporting-frame *z'*, to which it is connected. This frame

z is affixed to the frame of the machine by a pin or screw which passes through a slot, (not shown in the drawings,) and thus the frame may be vertically adjusted. This frame m oscillates upon the pin z , the motion being derived by its lower ends embracing the block x upon the crank-pin j . The frame m therefore moves with the oscillating motions of the needle. The upper end of this frame m , as is shown by the drawings, is rounded and plays in the slot w' of the cloth-plate e . In the upper and rounded part of the frame m is an elongated hole, v' , through which the needle passes in its upward and downward movements, the needle also passing through a hole in the block y . The elongated hole v' allows the needle room in its movements and serves to guide it, preventing the dropping of the stitches, and its edges also give a bearing to the fabric upon the downward movement of the needle. The frame m serves to guide and protect the needle; to aid in the feed, as the cloth rests upon the upper rounded surface; to prevent the cloth being drawn down by the needle and the stitches becoming entangled; and, in a measure, to assist the needle in twisting, or rather to protect the loop while being twisted, as the loop is embraced by the bars of the frame. The shoe or cloth-holder q is secured to one of the arms of the frame of the machine by a binding-screw, a' , which, by means of the slot b' , allows of the vertical adjustment of the holder. A projecting flange, c' , of the upright part or extension of the holder has a hole, d' , for the thread from the spool, and a similar hole may be in the corner of the shoe nearest the end of the switching-lever for giving direction to the thread. This last hole is not shown on the drawings. When used, the end of the shoe in which it is should be somewhat turned upward. The switching-lever N is attached to the upright part of the cloth-holder by a pin, e' , upon which it plays. It derives its forward motion, upon the rotation of the power-shaft, from a cam, f' , on the crank-disk g , and its backward motion from a spring, g' , affixed to the back part of the machine's frame, the actuating means interposed between it and the cam being the link o and the curved lever p . The switch-lever has one movement forward to and backward from the needle for every upward and downward movement of the needle. The lower end of the switch-lever, as is shown by the drawings, is so curved as to present the face of its terminal process to the barbed part of the needle, this face performing the important function of presenting the thread to the barb of the needle and there holding it until the needle has commenced its downward movement, carrying the thread with it, the cam being of that form to give the switch-lever a quick advancing motion and to hold it for the required time. It will be perceived that, in order to enable this cam the better to perform its functions, it may be so made and affixed to the disk of the power-shaft as to be susceptible of delicate adjustment.

From the preceding description of the construction of this machine its operation will readily be seen. Supposing the handle of the crank-disk to be in the reverse position to that shown by Fig. 1 of the drawings—viz., at its down position—the crank-arm will also be in its down position, and upon motion being given to the power-shaft the needle will have given to it a rotating and an upward movement, as also an oscillating movement, in which the feeder-frame moves with it. At starting, the face of the recess under the barb will be toward the machine. Just before the crank-arm reaches a horizontal position at right angle to its first-named position, being one-quarter of a revolution of the power-shaft, the point of the needle will be even with the feeding-surface of the feeder-frame, with the face of the barb's recess from the machine, the needle having made a half-revolution and the oscillating frame moved half of its travel to the right. The further movement of the crank-arm, by which it is brought to its upward vertical position, or half-revolution, will carry the needle to its extreme upward movement, giving it another half-revolution and placing the face of the barb's recess again toward the machine. In this movement of the needle the oscillating feeding-frame has also moved to its extreme motion to the right, and while the needle and the frame are in this position, the needle having passed entirely through the cloth, the front face of the cam will be just in contact with the back end of the curved lever. A slight further movement of the power-shaft moves the cam direct upon the end of the lever, rapidly moving forward the switch-lever, and presenting the thread to the barb of the needle. With this further rotation of the power-shaft the needle and the feeder-frame are carried to the left, carrying along the cloth, and when the crank-arm has reached its third quarter movement the needle and frame will have made the extreme movement to the left, the needle having made its third quarter of rotation and moved downwardly, the fourth rotation of the needle then completing with its extreme downward movement the drawing down of the thread to its lowest point. Upon the face of the cam leaving the end of the lever the spring g' comes into play, and the switcher, by a sudden motion, is carried back with the thread from the slot in the cloth-holder. It will be noticed that the needle in its passage through the cloth has a tortuous track, twisting the thread from the time the barb first seizes it until it leaves it as a loop and again passes up through the cloth, to again seize the thread for forming another loop. It will also be noticed that the one loop remains around the needle until the thread is drawn through the cloth for the forming of the subsequent loop.

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

1. The switching-lever *n*, constructed and operated, as herein set forth, for directing the thread to the beard or barb of the needle and preventing the escape of the thread therefrom.

2. Controlling the feed and the stitch by the raising or lowering of the needle, as set forth.

3. Rotating the needle and carrying with it the thread, thus forming a twisted-threaded loop, as described.

This specification signed and witnessed this 4th day of May, 1859.

JAS. HARRISON, JR.

Witnesses:

J. H. FONDA,
JOHN WAITE.