

D. HARRIS,
Sewing Machine.

No. 17,571.

Patented June 16, 1857.

Fig. 4.



Fig. 5.

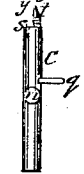


Fig. 6.

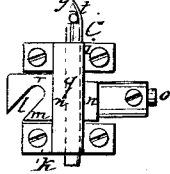


Fig. 3.

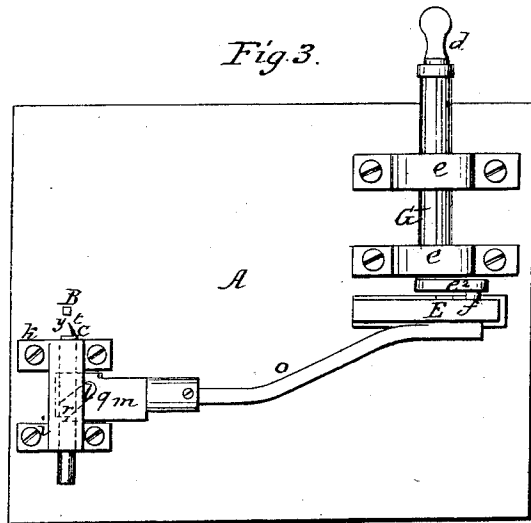


Fig. 2.

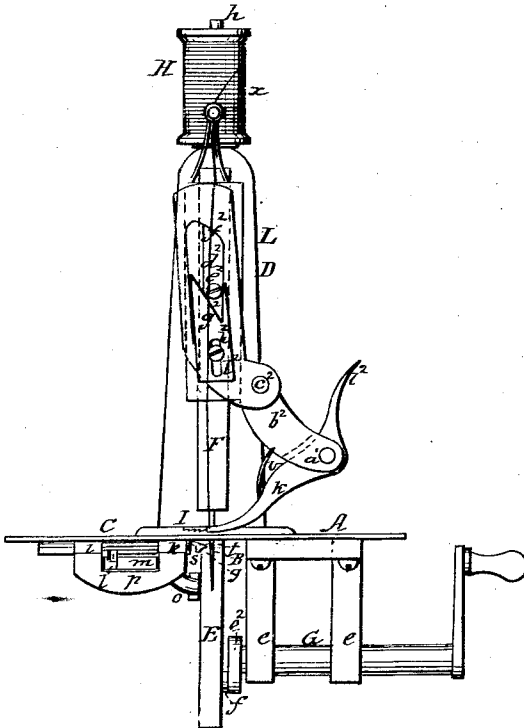
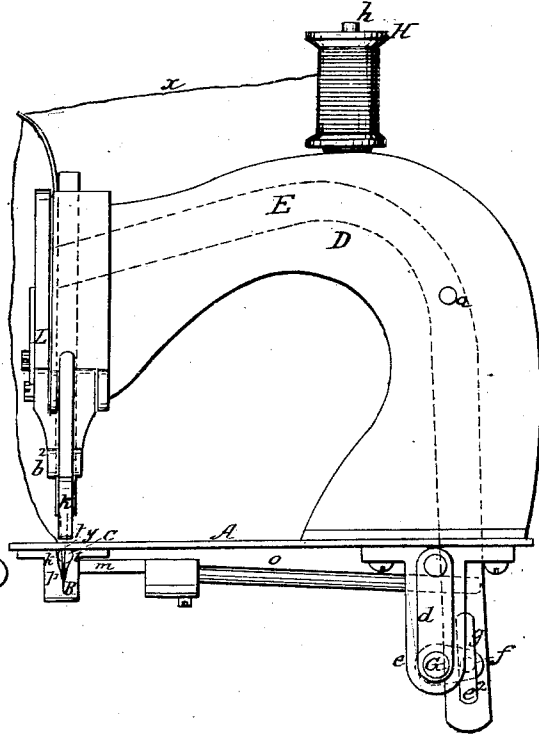


Fig. 1.



UNITED STATES PATENT OFFICE.

DANIEL HARRIS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 17,571, dated June 16, 1857.

To all whom it may concern:

Be it known that I, DANIEL HARRIS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful or Improved Sewing-Machine, the nature and operation of which I hereby declare to be fully set forth in the following specification and accompanying drawings, to which the specification and letters refer.

Figure 1 of the drawings represents a side elevation of the machine; Fig. 2, a front view, and Fig. 3 a bottom view, of it.

A in the drawings denotes the table over which the material to be sewed passes. B is the needle; C, the hook or looper, which forms and holds the loop of thread for the needle to pass through in its descent; D, the goose-neck of the machine, through which a lever, E, passes, said lever turning upon a fulcrum, *a*, and being jointed to the needle-carrier F in any proper manner. A suitable shaft, G, turning in bearings *e e*, and having a crank, *d*, affixed to its ends, serves, by a crank-arm, *e'*, and pin *f*, working in a slot, *g*, of the lever, to give a reciprocating motion to the lower end of the lever, and thereby to impart reciprocating vertical motions to the needle, as will be readily understood from Fig. 1, such operation of the needle being essentially like that of many other sewing-machines. H is the spool, turning on a pin, *h*, inserted in the top of the goose-neck, and having its thread *x* passing from it through suitable guides to and through the eye of the needle. As the needle and thread after passing through the cloth come before the point *y* of the looper, the thread is acted upon by the looper, constructed and operating essentially as follows:

The looper, as shown particularly in Figs. 4 and 5, which represent end and side views of it, is made at the front end of a straight cylindrical rod, said rod sliding horizontally in bearings *i k*, placed just underneath and attached to the table-plate, and rotating in said bearings at proper times. Its horizontal motion is directly under and parallel to the line of sewing on the cloth or material operated upon, and said motion is produced by a pin, *n*, projecting from the side of the looper-rod, working into an inclined slot, *l*, in a horizon-

tal sliding plate, *m*. The plate *m* is connected by a connecting-rod, *o*, to the lever E, that works the needle-carrier, reciprocating motion being communicated to the plate *m* by the similar motion of the lower arm of the lever. The plate *m* slides between the bearings *i k* as ways, and upon a bed, *p*, placed under the plate. When the plate begins to move forward, the pin *n* is in the front part of the slot, and as the plate moves the slot causes the pin, and consequently the looper-rod with it, to move forward until the point of the looper reaches its most outward position, when the pin will have reached the inner end of the slot. The plate then continuing to move against the pin causes the cylindrical looper to turn or rotate in its bearings until a stud, *q*, extending from the looper-rod, strikes against the bed *p* and stops the rotary motion. As the plate next moves back, a projection, *r*, strikes against said stud and rotates the looper, so that the pin *n* shall again enter the rear part of the slot and the looper be pushed back. When the point of the looper reaches its outer position under the needle-slot and begins to rotate, the stud *q* comes against the edge of the plate, or between it and the bearing *k*, in such manner as to prevent the looper from sliding longitudinally until it is rerotated, as before described. The point or forward end of the looper is constructed as follows: It has a slot, *s*, made from one edge down into it, sufficiently large for the needle to penetrate, and just front of this slot a loop spreader or opener, *t*, and a nose, *y*. The loop-spreader is made flat on one side, and the nose and spreader both far enough on one side of the axis of the cylinder and needle to allow the loop-rod, when rotated at the proper times, to retreat past the needle.

The effect of the above operations is as follows: When the needle and its thread are upon their downward course and the point of the needle has just penetrated the cloth, the looper is at its most forward position, as seen in Fig. 6, its nose being advanced past the path of the needle, its loop-spreader holding the loop of thread open in said path, and the slot or aperture of the looper also in said path. As soon as the needle has penetrated entirely through the cloth, it begins to enter the loop

spread out under it, and as it continues through it the looper-rod rotates until the spreader is turned at right angles to the table, when it is drawn back horizontally through its bearings, the needle descending until the looper is fully pushed back. When thus back, the nose of the looper is just against the side of the needle and in rear of the thread on the back of the needle, and as the needle begins to rise the thread slacks, the nose moves forward between the thread and needle, and as the point of the needle rises from under the table the spreader having the thread cast over it rotates and spreads the thread, ready for the next descent of the needle and thread. By this arrangement and movement of the looper I am always certain of catching the thread and making the loops, there not being that liability to miss the loops or thread that there is in most machines that sew the chain-stitch by the operation of a hook and needle.

The operation of the feed is as follows: A feed-bar, I, is placed on the lower end of a spring-arm, K, said arm having a spring, v , applied to it in any suitable manner to keep the bar I upon the cloth, and turning on a pin, a' , extending through the lower arm, b^2 , of a lever, L, turning on a fulcrum, e^2 . The upper arm of this lever extends up in front of the needle-carrier, and has a long vertical slot, d^2 , made in it, through which a pin, e^2 , extending from said needle-carrier, works. The top of this slot is made inclined, as seen as f^2 , and to the bottom of it an adjusting-wedge, g^2 , is so applied that by means of a set-screw, h^2 , and slot i^2 , or any other suitable mechanism, said wedge may be raised or lowered. When the needle-carrier and needle descend, the pin e^2 strikes against the face of the wedge or inclined plate in such manner as to turn the lever L on its fulcrum, and thereby move the feed-bar backward over the surface of the cloth, the cloth being prevented from sliding back with it by the needle which is in it. When the needle-carrier next moves up, and after the needle has left the cloth, the pin strikes the incline at the top of the slot, and thereby turns the lever in the opposite direc-

tion, forces the feed-bar forward, and with it the cloth, the extent of the feed and consequent length of the stitch being regulated or varied at pleasure by raising or lowering the wedge or incline g^2 . To raise the feed-bar in order to draw the cloth under the needle, a handle, i^2 , is applied to the top of the spring-arm K, as seen in Fig. 2.

I am aware that a looper or hook has been before made and used for effecting the same purpose as my looper—namely, to take the loop from the side of the needle and lay it open under the point thereof—by having reciprocating horizontal and rotary movements imparted to it. I therefore do not intend to claim as my invention these peculiar movements of a looper; neither do I intend to claim moving a hooked needle vertically through a fixed bearing up through a feed-bar to take the thread from the cloth, as my looping apparatus is not for such purpose. By my arrangement the looper is moved horizontally through fixed bearings up to and away from the needle, and rotated in such bearings when under the needle-point, a more certain and effective action being thereby imparted to the looper than can be done where a spiral rotary movement is given to the looper in taking the thread and spreading the loop, or where for this purpose it is placed on the end of a vibrating arm and plays through the arc of a circle.

What, therefore, I do claim as my invention, and desire to secure by Letters Patent, is—

The arrangement of the mechanism herein described for operating the reciprocating looper and giving it rotation or partial rotation for the purposes set forth—that is to say, the combination of the inclined slot-plate m , the pin n , and the stud g , or their equivalents, they operating, as above described, to produce the proper movements of the looper.

In testimony whereof I have hereto set my signature this 11th day of March, A. D. 1857.

DANL. HARRIS.

Witnesses:

FRANCIS GOULD,
L. A. BIGELOW.