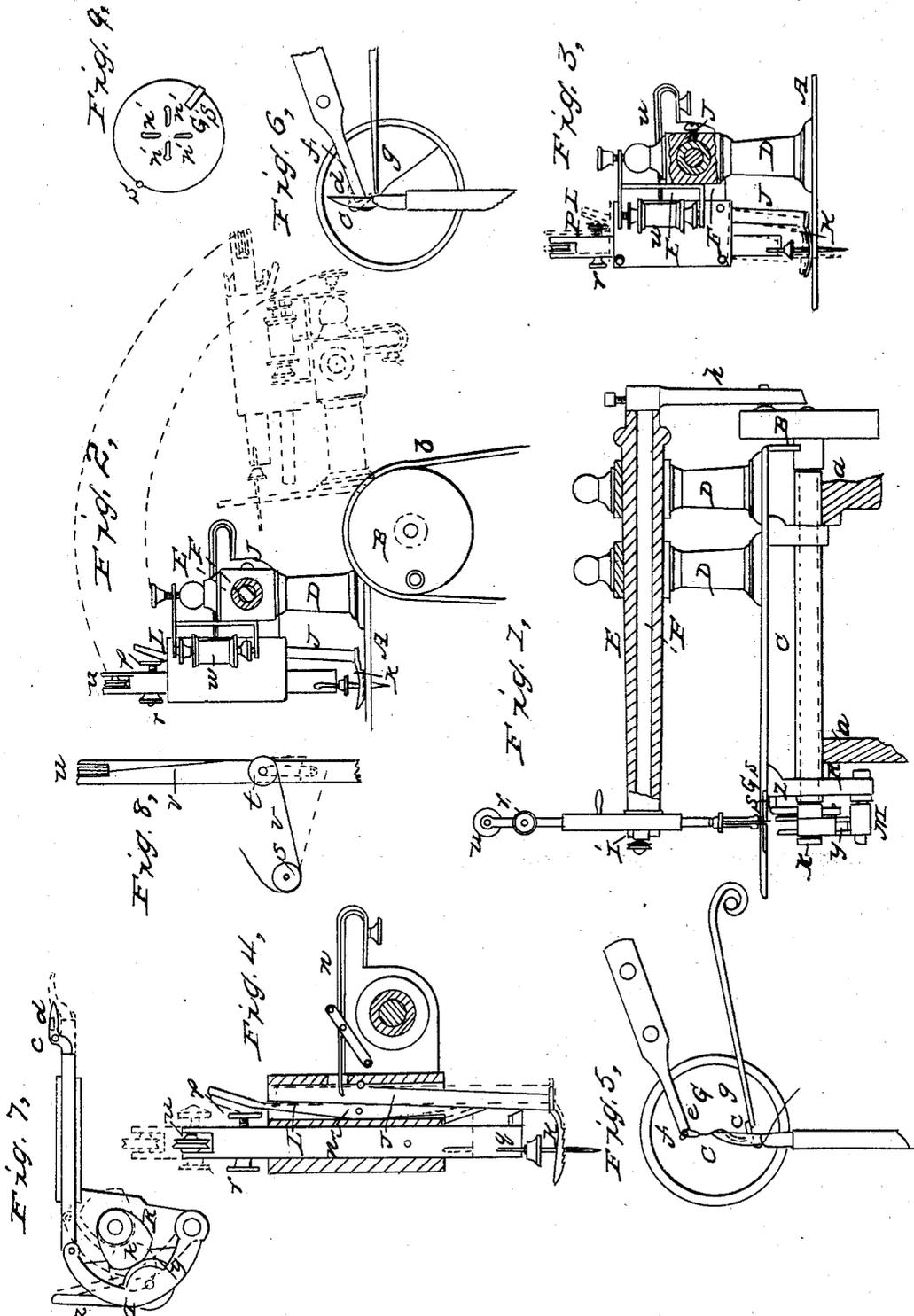


B. HOLLY.  
Sewing Machine.

No. 28,176.

Patented May 8, 1860.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

BIRDSILL HOLLY, OF LOCKPORT, NEW YORK.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 28,176, dated May 8, 1860.

*To all whom it may concern:*

Be it known that I, BIRDSILL HOLLY, of Lockport, in the county of Niagara 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, making part of this specification, in which—

Figure 1 is a side elevation with the hollow shaft E shown in section. Fig. 2 is an elevation showing also in dotted lines the method of turning the machine on the axis of the driving-pulley B. Fig. 3 is an end elevation, with the hollow shaft E, interior shaft, F, and a portion of the standard D in section, showing the swivel method of setting the needle. Fig. 4 is a section of the shafts E F and box in which the needle-bar and feed-works operate, showing the construction of the latter. Fig. 5 is an enlarged view, showing the reacting looper c as being drawn back after forming the loop. Fig. 6 represents the same in the act of forming the loop for the next stitch. Fig. 7 shows the cam K, looper-bar O, and frame M detached. Fig. 8 is a diagram of the pulleys for taking up the slack of the thread. Fig. 9 is a plan of the revolving needle-plate detached.

Similar letters refer to corresponding parts in all the figures.

I will proceed to describe my improvements separately so far as they do not relate to each other.

In order to make the works beneath the bed-plate A quickly and conveniently accessible, I dispense with throwing off the band from the driving-pulley B, which is attended with much trouble and delay. I place a hollow shaft, C, underneath and fixed permanently to the bed-plate, which rests on bearings or journals in the stand or table at a. The mandrel of the driving-pulley passes through the hollow shaft C, as shown in dotted lines, making it the axis on which the machine is turned, as seen in Fig. 2, as well as of the motion of the driving-pulley. This being the case, it will be readily seen that the machine may be turned without throwing off the band b, which connects the pulley with the treadle.

The stitch is formed by means of a reacting looper, c, Figs. 5, 6, and 7, which carries the

lower thread, (indicated by blue, the upper thread being shown in red.) As shown in Fig. 7, it consists of a bent looper having a slot near its point, in which the latch d is pivoted at its center, and on which it plays. The thread is passed from the spool through a hole in the stem of the looper, then back through a hole in the latch, as seen in Fig. 7. As the needle is drawn back, after having pierced the cloth, its thread by slackening forms a loop, which the looper-point, moving close by the side of the needle, passes through, carrying the forward end of the latch through the loop also before it is drawn down by the retiring of the needle. As the needle is drawn back the looper advances till the projecting end of the latch strikes the end of the piece f, (called the "latch-turner,") which is bent in a position transverse to the direction of the looper, and is grooved at its outer side, e, to form a space for the needle to pass. The end of f being stationary, the latch turns on it by the motion of the looper, which throws the forward end out, carrying the lower thread far enough from the looper to allow the needle in advancing to pass between the lower thread and the looper, which backs out as the needle advances, and the latch, reacting to pass the turning-stud f, at the same time throws off the loop, which is now interlocked with the upper thread, and it is drawn in to form the stitch. The looper advances only till the pivot of the latch is opposite the groove e in the latch-turner, when the loop is also at that point, and the needle passes in the angle of the latch, which, by turning, has thrown the lower thread out, so as to form another loop, through which the needle passes. A spring, g, by pressing against the heel of the latch, keeps its head within the looper, so that it cannot fail to pass through the loop with the lower thread.

The studs D D sustain the hollow shaft E, to which are attached the boxes and bearings in which the needle-bar and feed-works operate. Through this passes the rock-shaft F, which is actuated by a pitman, h, having a slotted connection with a pin on the face of the driving-pulley B. Reciprocating motion is given to the needle-bar by an arm, i, (seen endwise in Fig. 1,) rigidly attached to the end of the shaft F. By loosening set-screws j in the standards the tubular bearing-shaft E

may be turned to adjust the needle to the center of the hole in the needle-plate and to the proper position in relation to the looper, as shown by the dotted lines in Fig. 3, the shaft acting as a swivel-bearing for this purpose.

My method of operating the feed-plate *k* consists in employing an oscillating lever, *L*, working on the pivot *m*. It lies parallel with and against the feed-bar *J*, which is hung on the spring *n* in the ordinary manner for convenience of raising, and presses it against the pin *o*, which forms the axis of its motion. The lever *L* is provided with inclined planes at either end, facing the needle-bar and inclined in opposite directions. As the needle descends and enters the cloth the screw *p* strikes the upper incline and causes the top of the lever to crowd the bar *J* at the top, and thereby releases the teeth of the foot *k* from the cloth and impels it forward the distance of the stitch, and as the needle rises the pin *q* strikes the lower incline of the lever and throws back the foot, which, by its hold upon the cloth, carries it along. The length of the stitch is regulated by turning the screw *p* more or less out from the needle-bar, and it is secured in the desired position by tightening the counter-screw *r*.

A circular needle-plate, *G*, is constructed to fit accurately a hole in the bed *A*, from which it is readily removable, being held only by the lugs *s s* on the lower side. This is provided with any convenient number of needle-holes *n'*, of different sizes, as represented in Fig. 9, arranged on a circle around the center, so that by revolving the plate either one may be brought into the proper position to the needle. This accommodates the requirements of different fabrics, the lighter and more delicate of which require the support which is afforded by a plate having a small hole to prevent their receiving injury by being stretched or pressed through by the action of the needle, while some coarse fabrics, requiring a larger thread and needle, could only be sewed through a larger hole. Revolving the plate also adjusts the hole laterally to the needle, while it is adjusted vertically by the swivel-shaft *F* in the manner previously explained.

The method of taking up the slack of the thread is exhibited in Fig. 8. It consists of three sheaves, around which the thread is

passed, the first of which, *s*, is attached to the needle-arm *i* at its axis, being the center of motion of the rock-shaft *F*; another, *t*, where the arm is pivoted to the needle-bar. The first being stationary and the others moving with the needle-bar, it will readily be seen that their relative positions, when the needle-bar is at its highest and lowest points of motion, are such as to require a greater length of the thread *v* to encircle them when the needle is thrown down, as shown by the dotted lines, than when raised, as the angle in one position is obtuse and in the other acute. As the needle enters the cloth the thread is slack, but is drawn up by the sheaves as the needle reaches the end of its stroke, in order to draw in the stitch and tighten the loop. As the sheaves turn easily on their axes, it allows the tension on the thread to extend to the spool *w*, which renders thread for the next stitch.

The cam *K*, Figs. 1 and 7, which operates the looper-bar *O*, is attached to the mandrel of the driving-pulley *B*. It works against the friction-pulley *y*, which is hung in the semi-circular yoke *M*, which is pivoted at one end to the bar *O* and at the other to a hanger, *R*, from the bed-plate *A*. The latter bearing being immovable, and the yoke *M* being held against the cam by a spring, *z*, reciprocating motion is imparted to the looper-bar, which is the same, let the driving-pulley be turned in either direction, so that a change in the motion of the machine makes no difference in its operation.

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

1. Constructing the machine so that by means of the hollow bearing-shaft *C* or its equivalent it may be turned on the axis of the driving-pulley *B* for access to the parts below the table without unbanding the pulley, substantially as set forth.

2. The method of setting or adjusting the needle by turning the swivel tubular bearer *E* in the posts *D D*, substantially as herein shown and described.

BIRDSILL HOLLY.

Witnesses:

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S. J. ALLIS.