

D. HARRIS.
Sewing Machine.

No. 17,508.

Patented June 9, 1857.

Fig. 4.

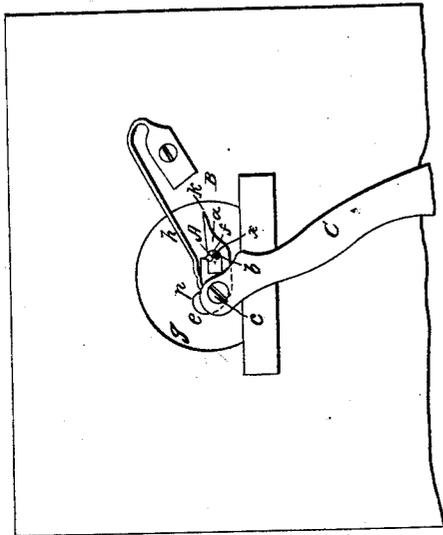


Fig. 1.

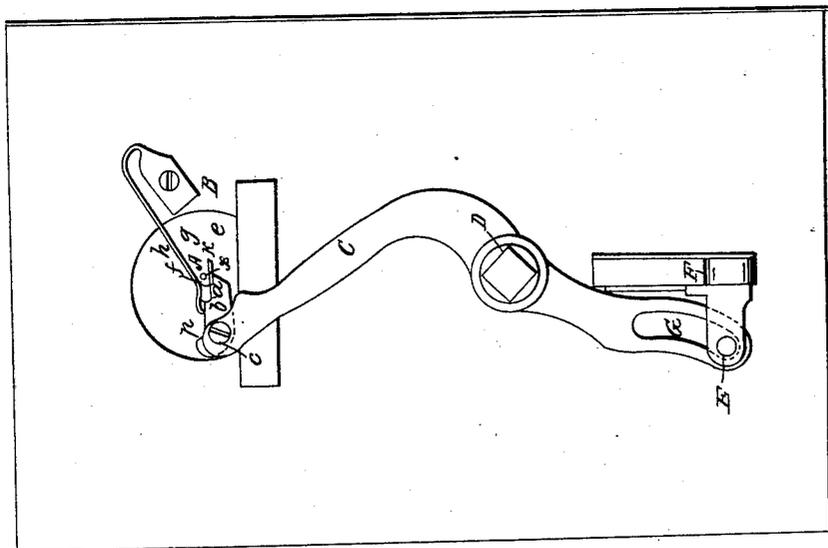


Fig. 3.

Fig. 2.

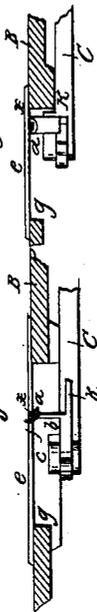


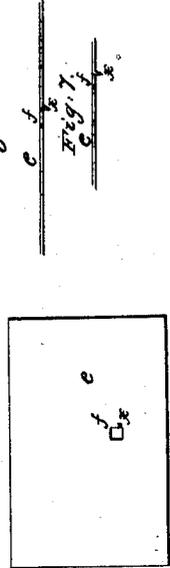
Fig. 10.

Fig. 9.

Fig. 8.

Fig. 5.

Fig. 6.



UNITED STATES PATENT OFFICE.

DANIEL HARRIS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 17,508, dated June 9, 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 certain Improvement in Sewing-Machines; and I hereby declare that the nature and operation of said improvement are fully set forth in the following specification, reference being made to the accompanying drawings, to which the specification and letters refer.

My improvement relates to the mechanism for producing; in connection with the needle, the chain or tambour stitch, and is for application to such machines only as are to sew with this stitch.

Figure 1 of the drawings denotes a bottom view of a machine, showing my looping mechanism as applied thereto. Fig. 2 is a front view, and Fig. 3 a side view, of said mechanism; Fig. 4, a bottom view of it, taken when the "beak" is at its most advanced position, (Fig. 1 showing the mechanism preparatory to the beak entering between the needle and thread.) Fig. 5 shows a top view, Fig. 6 a front view, and Fig. 7 an end view, of the needle throat-plate and catch-pin.

A in the drawings denotes the needle; B, the table or plate through which the needle works; C, a horizontal rocking lever, turning on a fulcrum, D, and thereby operating the looping mechanism. This lever is driven to and fro by a pin, E, (projecting from or attached to the lever F, which operates the needle-bar,) which enters an inclined slot, G, of the lever C. As the needle-bar lever plays back and forward the pin slides through the slot G and rocks the bar C, which may, however, be rocked in any other convenient or desirable manner.

The mechanism which forms the stitch in connection with the needle A is constructed and applied and operates as follows: The beak or point *a*, which takes the thread from the side of the needle, is attached to a horizontal tipping plate, *b*, which turns on a pin, *c*, inserted in the front end of the bar C. As the bar rocks the beak is thrown to and fro just behind the needle, and it is so attached to the plate *b* that during its reciprocating movements it plays horizontally just underneath or nearly in contact with the bottom surface of a thin plate, *e*, of steel or other suitable metal, fastened upon the top of the table B, and covering a wide aperture, *g*, and having a needle-

throat, *f*, through which the needle and thread pass. The beak, by being made to play just underneath or against this plate, is brought very near to the cloth or material being sewed, which moves over and upon the top surface of the plate *e*. The point of the beak *a* in its forward movement plays through the arc of a circle, (from the fulcrum D as a center,) and is kept stationary with respect to the bar B, as seen in Fig. 1, till just before the end of such movement by the end of a spring, *h*, which bears against the front edge of the plate *b* and keeps it from turning. Just before the termination of its advance a projection, *p*, from the front of the plate, is brought against the end of the spring and causes the beak to be thrown or tipped horizontally toward the front end of the machine a slight distance, as seen in Fig. 4, the spring bearing down upon the plate and carrying the beak back the instant the bar C begins to rock back. A thread catch or pin, *x*, extends down from the bottom of the plate *e*, just at the rear side or corner of the needle-throat *f*, as seen in Figs. 5, 6, and 7. Under the beak, and extending out from the plate *b*, is a projection, *k*, which at each advance of the beak moves against or nearly against the needle and insures the proper position of the needle with respect to the point of the beak.

Figs. 8, 9, and 10 show, respectively, a bottom, side, and front view of the beak, beak-plate, and needle-guard, they being constructed and applied together as there seen.

The operation of the above mechanism to form and interloop the successive loops of thread is as follows: When the needle, (with its thread *o*,) after having completed its downward movement, commences to rise, the beak begins to advance toward the needle, the point of the beak lying, when at rest, nearly up to the needle and so as to pass against or in rear of it as soon as the needle has started up in its rise enough to slacken its thread. This causes the beak-point to enter between the thread and needle nearly as soon as the needle commences to rise and before the thread has a chance to twist. The thread, as the beak advances, is laid around or partially around the beak, and is drawn against the side of the throat *f*, and over or straddle of the thread-catch *x*. This occurs during the movement of the beak through the arc of its circle, as above described, and when the beak has advanced so

that the plate projection *p* is brought against the end of the spring *h*, and the beak thereby tipped forward, the beak drags the thread on its rear side against the catch-pin *x*, and the part of the loop at its front side up to or nearly to the adjacent front side or corner of the throat *f*, or, in other words, spreads or enlarges the opening in or between the two portions of thread, as seen in Fig. 4 by red lines, the spread being such that the needle, when the parts are properly arranged, is not liable in its descent to miss passing between the threads. The beak is kept in this forward and tipped position until the needle in its next descent has penetrated the cloth and its point just entered the loop. Then the front of the bar *C* begins to rock back, causing the spring *h* to instantly depress the plate *b*, so as to slacken the thread, which is strained or drawn over the beak and catch-pin. This release allows the needle in its further descent to draw its thread in part from the slack of the preceding loop, instead of wholly from the spool, and tightens the seam by drawing the thread closer into or against the surface of the cloth. (Were the thread to be kept spread upon the beak and catch-pin during the whole descent of the needle, all its thread must be taken from the spool, and when the cloth is fed forward it is fed with the slack from the old loop lying loosely under it, instead of being tightly drawn in as described.) The same results take place with each complete movement of the needle and beak-plate, insuring a very perfect and regular-sized stitch in the material being operated upon. The throw of the beak, as seen in the drawings, is very small, the point of the beak passing from one side of the throat *f* over a little beyond the opposite side thereof, so that it takes but a short length of thread to form the loop, and, furthermore, by having the beak take the thread when the needle has but just started in its rise, we can employ a much shorter needle than is generally used. The movement of the needle and beak must, however, be made simultaneous, and the beak and needle be kept or made to move in precise paths, as the bend of the thread is so small at the time the beak is to enter it that the beak has to come nearly

in contact with the side of the needle. To insure their proper position and keep the point of the beak from striking the needle, the projection *k* is affixed to the beak-plate *b*, as seen in the drawings. At each retreat of the beak-plate and after the needle has completed its descent this projection swings against or nearly against the needle just above its point, and if the needle has been deflected or bent back it will so press against the needle as to rebend it and prevent the beak from striking the needle as it advances. The action of this guard is different from the action of a stationary inclined guard placed under the table-plate and in the path of the needle against which, as the needle descends, it strikes, (if it by any means has been bent back out of place.) The point of such needle striking upon a guard is liable to become bent or blunted, and the action of the needle impeded; but with the movable guard above described the needle is stationary when acted upon, the projection thereby coming against but a very small portion of its surface, and it is never bent by the guard or projection coming against its point. Thus it will be seen that by the action in conjunction of the needle, the catch-pin, the double-moving beak, and moving guard, constituted as set forth, a machine is built in which the looping mechanism is very simple, effective, cheap, and not liable to get out of order. The mechanism can be arranged close to the under surface of the table, enabling a short needle to be used with a beak having a small play, so that the slack of the loop is taken up by the needle and the thread drawn into the cloth, as specified.

What therefore I claim is—

The mechanism for forming and interlooping the stitches, (consisting of the beak *a*, the catch *x*, the plate *b*, and its projection *k*, the spring *h*, and the needle,) when constructed, arranged, and operated together in the manner as above set forth.

In testimony whereof I have hereto set my signature this 16th day of May, A. D. 1857.

DANL. HARRIS.

Witnesses:

FRANCIS GOULD,
L. A. BIGELOW.