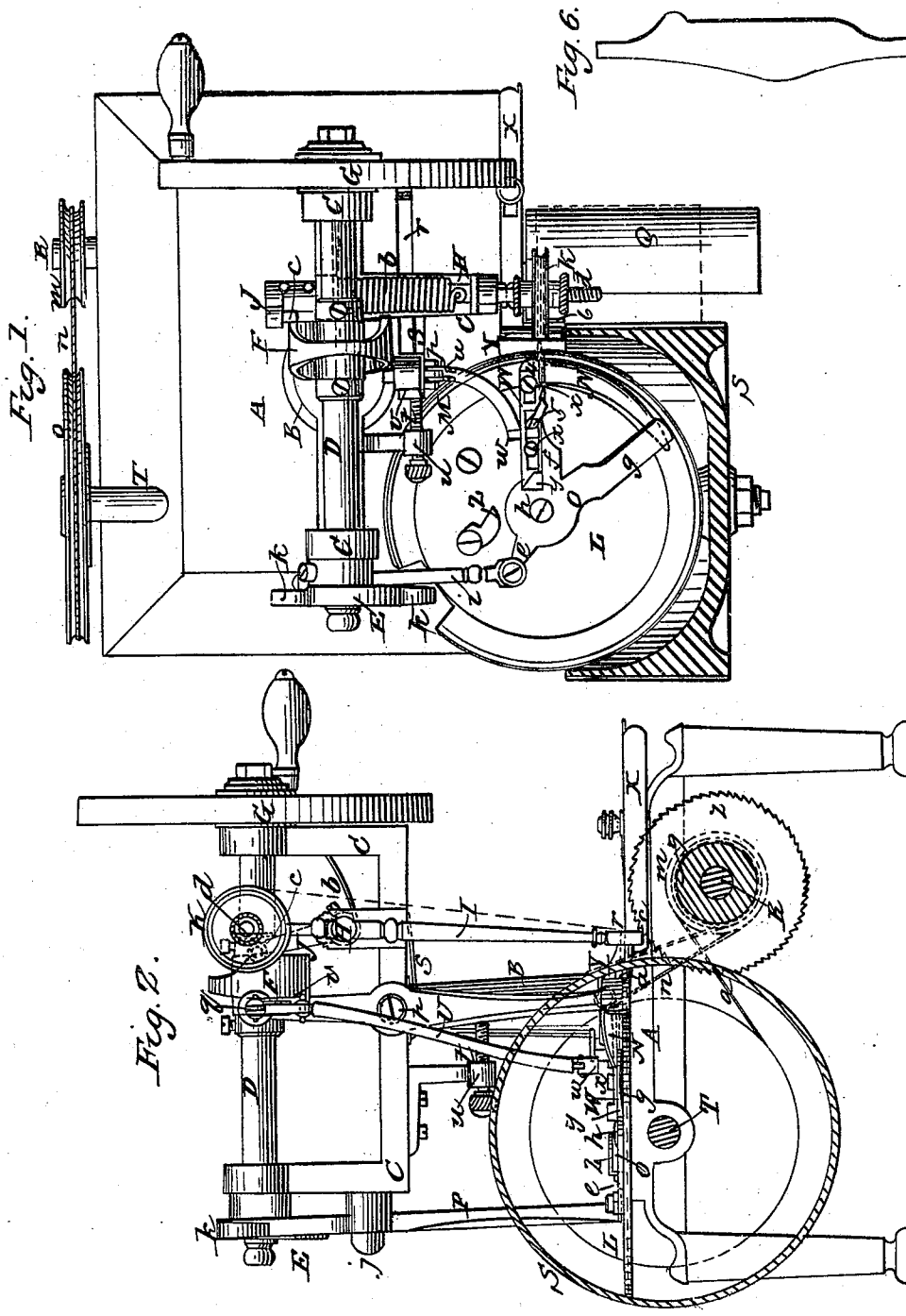


C. MILLER.
Sewing Machine.

No. 9,139.

Patented July 20, 1852.



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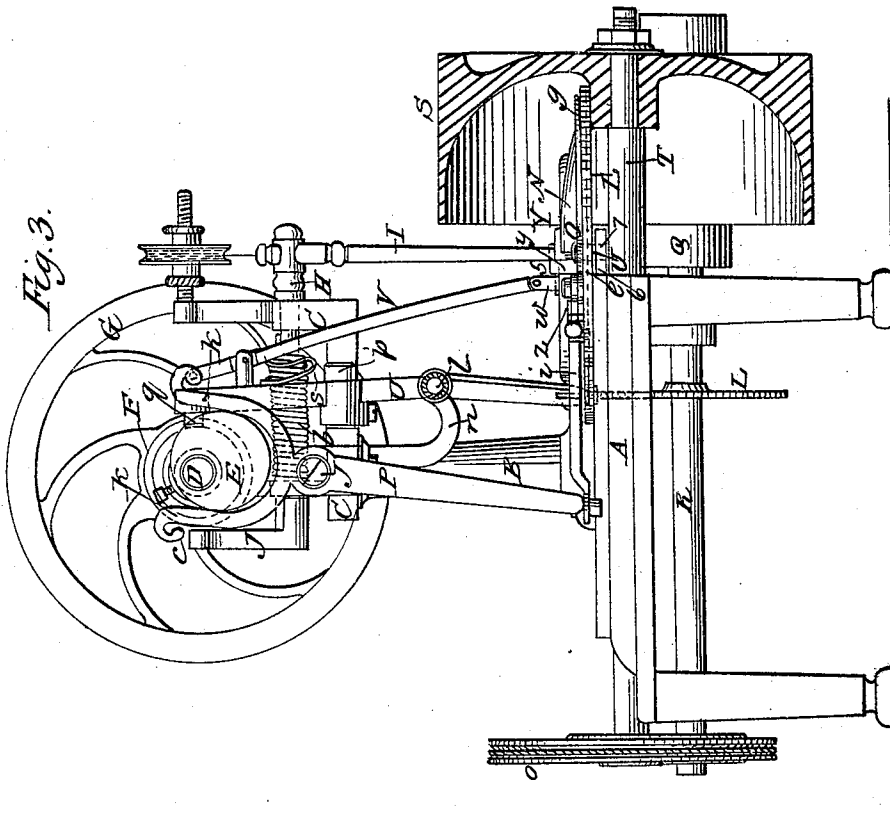


Fig. 3.

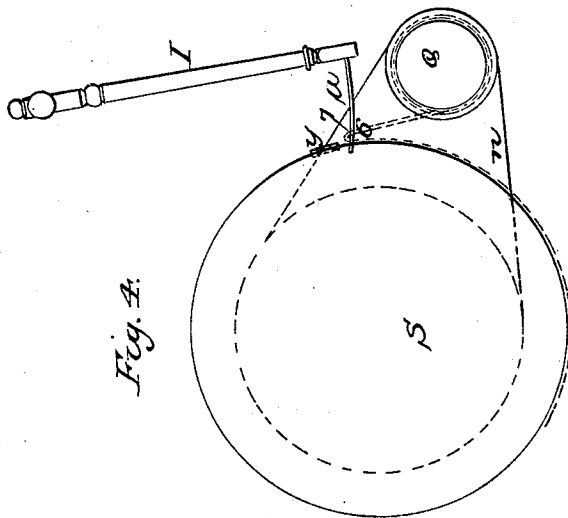


Fig. 4.



Fig. 5.

UNITED STATES PATENT OFFICE.

CHAS. MILLER, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 9,139, dated July 30, 1852.

To all whom it may concern:

Be it known that I, CHARLES MILLER, of the city and county of St. Louis, and State of Missouri, 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 of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan of a machine having my improvements applied to it. Part of the cylinder which takes up the cloth is supposed to be cut away to show other parts of the mechanism. Fig. 2 is a front elevation of the same. Part of the cylinder and cloth roller are cut away in this figure. Fig. 3 is a side elevation of the same, the cylinder being also cut away in this figure. Fig. 4 is a diagram illustrative of the mode of making a back-stitch. Fig. 5 is a perspective view of a part of the stop-motion detached from the machine. Fig. 6 is a projection of the periphery of the cam which actuates the needle-arm and feeding mechanism.

Similar letters of reference indicate corresponding parts in each of the several figures.

This invention relates to that description of sewing-machine which forms the stitch by the interlacing of two threads, one of which is passed through the cloth in the form of a loop, and the other carried by a shuttle through the said loop.

It consists, first, in an improved stop-motion, or certain means of preventing the feed or movement of the cloth when by accident the thread breaks or catches in the seam; and, second, in certain means of sewing or making a stitch similar to what is termed in hand-sewing "the back stitch."

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

A is the bed-plate or table which carries all the parts.

B is an upright standard, which stands near the middle of A and supports a small frame, C C, in which the main driving-shaft D is hung in suitable bearings. The driving-shaft D carries an eccentric, E, which drives the mechanism for throwing the shuttle, a cam, F, which actuates both the needle-arm and the feeding mechanism, and a fly-wheel, G.

H is the needle-arm shaft, hung in suitable bearings in the frame C C.

I is the needle-arm, and *a* is the needle, which are of ordinary construction.

J is a small arm secured upon the needle-shaft, and carrying a pin or stud, *c*, for the cam F to act upon to drive the needle forward or into its work. A spring, *b*, coiled around the shaft H, serves to keep the pin *c* close to the cam and withdraw the needles.

K is the spool which supplies the needle with thread. It is hung on a stud, *d*, which is stationary on the frame C C.

L is a horizontal circular table, secured to the bed-plate A, having the circular raceway M on its upper side.

N is the shuttle which carries the filling-thread.

O is a bell-crank, having three arms, *e f g*. It turns freely on a pivot, *h*, secured in the center of the table L, receiving reciprocating circular motion through a rod, *i*, attached to the arm *e* and to the end of a lever, P, which is hung on a pivot or fulcrum, *j*, in the frame C C, the said lever receiving a vibrating motion through the eccentric E, which is embraced by the fork *k k* of the lever. The arm *f* of the bell-crank drives the shuttle forward to put in the filling, and the arm *g* drives it back after the filling, the said arms being, in fact, pickers.

Q is the roller upon which the cloth or material to be sewed is wound. It is carried by a horizontal shaft, R, which hangs in suitable bearings under the bed-plate A. This shaft R carries, also, a ratchet-wheel, *l*, which is under the bed-plate, and a pulley, *m*, which is at its extreme back end.

S is the cylinder upon which the cloth is wound or taken from the roller Q as it is sewed, the cloth being caught or held by pins, clips, or any suitable means. It is hung upon a horizontal shaft, T, parallel to R, and is hollowed out on its back side to allow it to cover nearly the half of the horizontal table L. The shaft T derives motion from the shaft R through a band, *n*, running from the pulley *m* to a pulley, *o*, on its own back end. The band *n* is either straight or crossed, according to the nature of the work, the common stitch requiring the roller Q and cylinder S to revolve in opposite directions, and the back-stitch requiring both to move in the same di-

rection. This will be more fully explained hereinafter.

The feed-motion, or mechanism for giving the required movements to the cloth-roller Q and cylinder S, consists in a lever, U, hung on a pivot or fulcrum, *p*, and carrying at the upper end a pin or stud, *q*, which bears on the opposite side of the cam F to that upon which *c* runs, and at the lower end a click, *r*, which slides on the top of the bed-plate, but whose tooth, passing through a slot in the bed-plate, takes into the teeth of the ratchet-wheel Z. (See Fig. 2.) The click is driven forward, so as to move the ratchet-wheel in the direction of the arrow 1 by the operation of the cam F on the stud *q*, and is returned, ready for its next movement, by a small flat spring, *s*, attached to U below its fulcrum, and impinging under the frame C C. A screw, *t*, adjustable in a bracket, *u*, secured to the frame C C, regulates the length of the movement of the lever U, and consequently the length of the feed, and thereby the length of the stitch. The lever is thrown back, so as to rest against the screw after every feed, by means of the spring *s*.

The machine as far as described does not differ materially from other sewing-machines; but I will proceed now to describe the stop-motion.

The stud *q*, before described, is not fixed in the lever U, but slides through a hole in it, and is intended to project through far enough to be acted upon by the revolution of the cam F until the stitch breaks or is not properly formed, and the mechanism constituting the stop-motion is for the purpose, when such accidents happen, of drawing this stud *q* far enough toward the front of the machine to enable the cam to clear it in its revolution, and thus leave the lever U stationary, when it is obvious the feed will stop. The stud *q* is attached to the upper end of a smaller lever, V, of curved form, having its fulcrum in a knuckle, *v*, secured in front of the lever U. The lower ends of this lever V has a small catch-piece, *w*, jointed to it in such a manner (as will be easily understood by referring to Figs. 2 and 3 of the drawings) that on anything striking it (the catch-piece) on its back side it will swing free and allow it to pass; but on anything striking it in front it will form a rigid joint with the lever and cause it (the lever) to be thrown back.

On the upper side of the arm *f* of the bell-crank before described there is a sliding piece, W, whose form is most distinctly shown in Fig. 5, but is also clear in Fig. 1. It is attached to the arm *f* by screws *x x*, which pass through slots in it, the slots admitting of its sliding freely along the arm. At the end nearest the center of the table L there is a wedge-shaped projecting part, *y*, of such form that every time the arm or picker *f* moves back during the return of the shuttle the said projecting part *y* comes in contact with a stationary stop, Z, secured to the table L in a suitable position, and draws the sliding piece W toward the cen-

ter of the table. In this position it is seen in Fig. 1. At that end of W which is opposite to *y* there is a small tongue, 4, formed, which, during the forward movement of the shuttle and filling of the loop, bears on the back end of the shuttle, so that when the shuttle is through the loop and the loop is being drawn tight in slipping off the shuttle it catches the tongue 4 and pulls the sliding piece W from the center of the table L before it escapes. In Fig. 1 the shuttle is supposed to be moving forward, having just passed through the loop, which is represented, in red color, as slipping off over its back end and just catching the tongue 4 to pull the sliding piece W outward from the center of the table.

On the top of the sliding piece W there is a wiper, 5, of such form and so placed that when the loop acts on the tongue 4 of W and draws it out, it will clear or not touch the catch-piece *w* of the lever V on its return. Consequently, as the loop acts on the tongue 4, the lever V will remain undisturbed and the stud *q* will be acted on by the cam, but if the loop breaks or is otherwise prevented from catching the tongue 4, the sliding piece W will remain in the position in which it was left at the end of its last backward motion by the stop Z, and the wiper 5 will strike the catch-piece *w* and throw back the lower end of the lever V and withdraw the pin *q* from contact with the cam F. It will be understood that while the shuttle moves forward, although the wiper 5 is always in position which brings it in contact with the catch-piece *w*, it does not operate on the lever, as the catch-piece, owing to the form of its joint, swings free and allows it to pass. The lever V every time it is acted upon by the wiper is returned to its original position as soon as the wiper passes it by a spring, 8, (see Fig. 3,) placed between it and the frame C C. This spring always keeps the lower end of the lever V forward and the stud *q* in position for being operated on by the cam F, except at such times as the wiper is actually in operation on the lever.

The arrangement for securing the back stitch and the manner in which it effects its purpose remain now to be described.

On the front edge of the bed-plate an adjustable bar, X, is secured by a set-screw, 9. This bar carries a small guide-plate, Y, which stands out parallel and nearly flush with the periphery of the cylinder S, and another guide-plate, 6, which is parallel with but a little farther off than Y from the cylinder and a short distance below it. The upper edge of the guide-plate 6 stands a little higher than the line described by the point of the needle in its motion, and a notch, 7, is cut in the said upper edge (see Fig. 3 where the back of the plate is seen, and in Fig. 4 where it is shown in section) to allow the needle to pass. In sewing the common stitch the cloth is conducted from under the roller Q, between the plates 6 and Y, and over the cylinder S, as indicated in blue color in Fig. 2, the cylinder being driven

by the crossed band *n* in the opposite direction to the roller *Q*. The stitch is formed in the same manner as in other machines, the cloth being given out from the roller and taken up by the cylinder for every new stitch. In sewing the back stitch the cloth passes from under the roller *Q*, over the top of the plate *G*, and then descends under the cylinder *S*, as shown in Fig. 4, and also in Fig. 1 in blue color, the roller and cylinder running in the same direction.

It will be understood by looking at Fig. 4 that the needle passes through the cloth in two places instead of one, as ordinarily. Now, by proportioning the feed so as to move the cloth a distance about equal to half the distance between the two points where the needle passes through, supposing the cloth to be straight every time the needle passes through, it will enter the length of the feed in advance, and will come out half-way between the two points last perforated. This, except the difference necessarily existing between stitches formed by the machine and those formed by hand, is the same as that termed the "back stitch," and is, I believe, what has never been before performed by machinery.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The stopping or prevention of the operation of the feed substantially as herein described, when the thread breaks or is otherwise prevented from forming a loop, by attaching a stud, *g*, or its equivalent, through which the feed-lever *U* is operated upon by the feeding-cam, to a lever, *V*, the said lever *V* being subject to be operated upon in such a manner as to withdraw the said stud, or equivalent, from the operation of the cam by a sliding piece, *W*, attached to the picker *f*, which drives the shuttle forward for filling, the said sliding piece requiring to be caught and moved by every loop to prevent its operation on the said lever *V*.

2. Sewing or making the back stitch by folding or bending the cloth or material over the edge of a guide-plate, *G*, or any other suitable edge, and passing each loop through the cloth or material on each side of the said bend, and each succeeding loop through in advance of the preceding one and half-way between the two preceding perforations, substantially as herein set forth.

CHARLES MILLER.

Witnesses:

GILMAN SMITH,
ALFRED BRUNE.