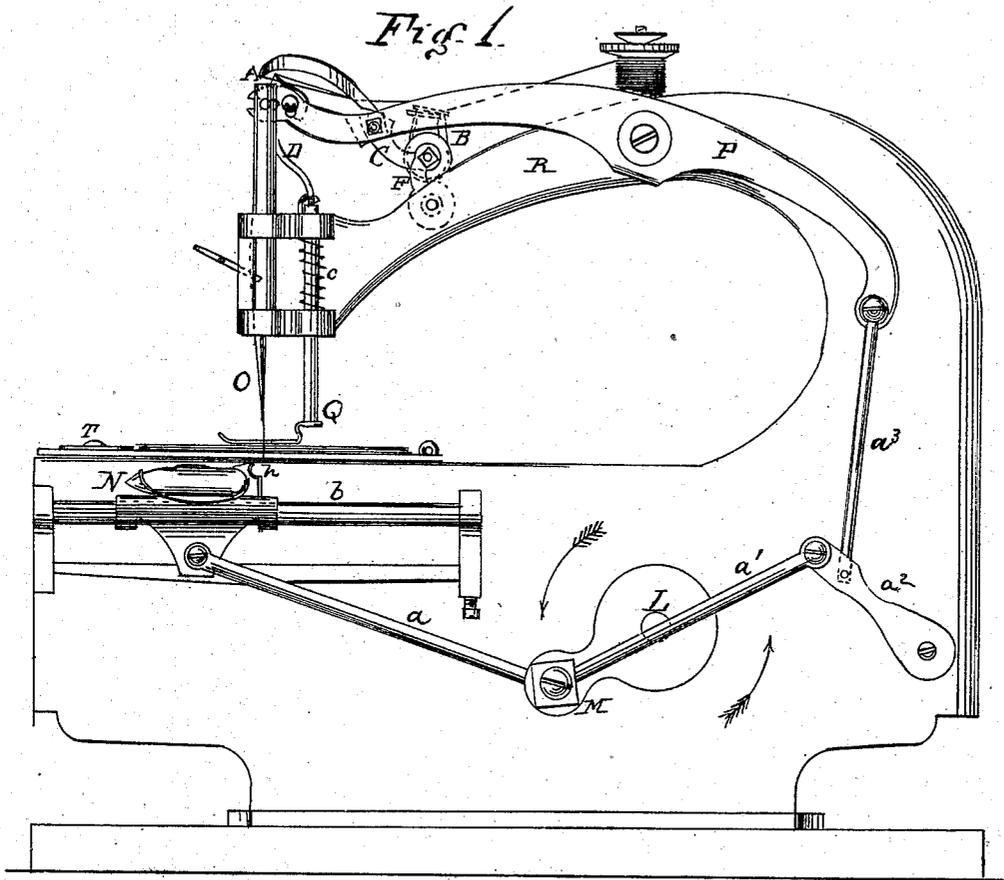


C. STEBBINS.
SEWING MACHINE.

No. 68,009.

Patented Aug. 20, 1867



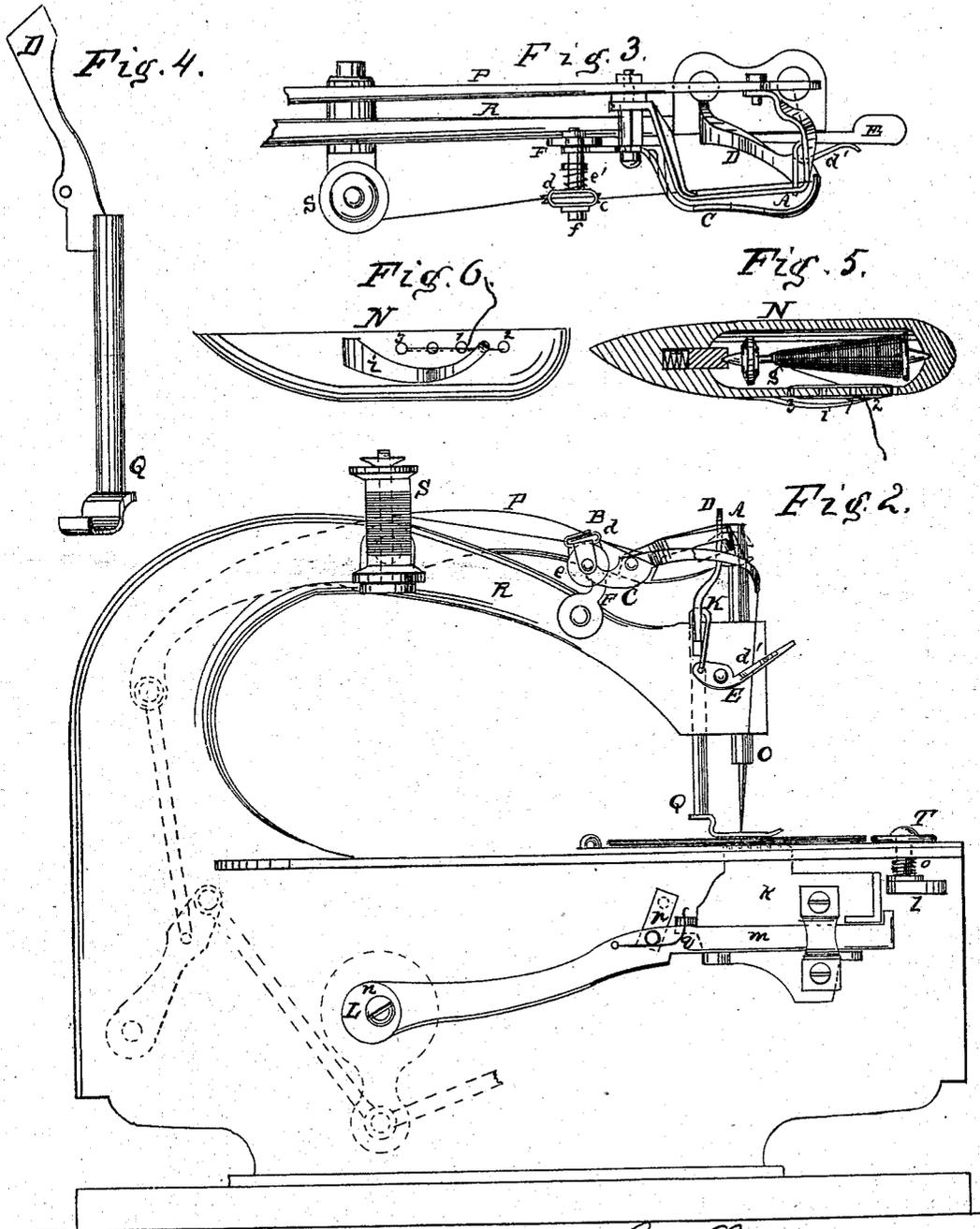
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United States Patent Office.

C. STEBBINS, OF PIKE, NEW YORK.

Letters Patent No. 68,009, dated August 20, 1867.

IMPROVEMENT IN SEWING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, C. STEBBINS, of Pike, in the county of Wyoming, and State of New York, have invented a new and useful Improvement in Sewing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, sheet 1, is a side elevation showing mechanism for working the shuttle and the needle.

Figure 2, a reverse side view.

Figure 3, sheet 2, a top view.

Figure 4, sheet 2, a detached view of the cloth-presser.

Figure 5, sheet 2, a detached view of the inside of the shuttle, showing the mode of threading.

Figure 6, a side view of the same.

Similar letters of reference indicate like parts.

This invention relates to improvements in sewing machines, and consists in part of new and improved mechanical devices whereby the movement of the needle-thread is regulated according to the varying thickness of the material which is being sewed, in such manner that slack thread shall be given when the eye of the needle reaches the surface of the material, in order to enable the needle to descend through the work, whatever may be the inequality in the thickness thereof. By the same automatic mechanism the quantity of slack thread is provided for forming the loop to allow the shuttle to pass through freely.

Another part of my improved sewing machine relates to the tension of the shuttle-thread in passing from the quill, by means of an interlocking of the thread with itself after passing in and out of the shuttle, in such a manner as to pull off thread from the bobbin on the back stroke of the shuttle, while on the forward stroke of the shuttle said thread becomes slack between a tension device and the bobbin, and is drawn through said tension device, whereby the final tightening tension upon the stitch is produced without the unevenness caused by running the thread directly from the bobbin to the work. Thus the interlocking arrangement of the thread is resolved into two distinct operations or movements, or two separately-adjustable and alternately-acting tension devices operating on the same thread, seam, and stitch, resulting in great evenness of stitch, and requiring no change or adjustment of the tension from the full to the empty bobbin.

Another improvement consists in forming a curved passage for the escape of the thread from the throat of the needle, in order that it shall form a loop to pass freely around the shuttle while the needle itself passes down within the face of the race, and cannot come in contact with the shuttle to subject it to the danger of breaking. By this device the loop is formed with positive certainty, at the proper time and place, for the passage of the shuttle through it.

Another improvement of my invention consists in a positive feed device, by the application of a horizontal feed-dog adjusted to a limited motion for each stitch according to the length required. This dog is moved forward to perform its work by means of a crank or its equivalent, with which it is connected by a bar, the traverse of the dog being regulated by an adjustable eccentric, so that the dog carries the cloth a certain distance positively for every stitch.

This device has the advantage of great simplicity in construction, silence in its operation, and certainty of movement. The length of the stitch is regulated by an index, at sight, without repeated trial. The movement of the needle is effected by an arrangement of devices for which Letters Patent were granted to me, dated March 25, 1862.

The driving-shaft L has a crank, M, attached, which gives motion to two connecting-rods, a^1 , one of which, a , operates the shuttle N, placed on a slide, b , and the other, a^1 , operates the needle O, suspended to the vibrating arm P by means of intervening connecting-rods a^2 and a^3 , as provided for by the Letters Patent aforesaid. The presser-foot or cloth-presser Q is provided with a spiral spring, c , to bear it down upon the work.

My improvement for regulating automatically the slack of the needle-thread, for the free passage of the shuttle through the loop, consists of the following devices and their operations: On the side of the vibrating needle-arm P, opposite that already described, on which the shuttle is placed, a thread-lifting lever, C, is pivoted, having its short arm connected with a tension device, B, that is pivoted upon the stationary supporting-arm H

The thread passes from the spool S over the loop *d* at the top of the tension device B, and downward between and around the disks *e*, thence upward through and over the same loop *d*, thence under the long arm of the thread-lifting lever C, and through the eye at its extremity, and thence through a guide-loop or eye, *d'*, on the lever E, down to the eye of the needle O. The disks *e* of the tension device B are pressed together by the spiral spring *e'*, fig. 3, placed around the stem *f*, which is attached to a rocking-arm, F, that is pivoted on the supporting-arm R, and receives its motion from the thread-lifting lever C, thus imparting to the tension device B a vibrating motion in concert with that of the thread-lifting lever. The lever E is pivoted on the head of the supporting-arm R, and is connected by its short arm with the cloth-presser Q by a rod, K. When the thread-lifting lever C is raised to the top of its vibrating stroke, the thread is carried forward through the tension device B, and drawn upward from the eye of the needle, tightening the seam.

The operation is twofold in its nature:

First, as the needle descends the thread is caught between the thread-lifter and the catch A, when, by the combined action therewith of the tension device B and the thread-lifting lever C, the thread is kept taut until the needle-eye strikes the cloth, at which moment the cast-off D, connected with the cloth-presser Q, fig. 4, releases the thread from the catch A to allow the needle to carry it down through the work, and as the cast-off D is moved upwards or downwards through its connection with the cloth-presser, as it is raised or lowered upon the surface of the cloth, slack thread is thus given exactly according to the thickness of the material and its varying surface.

Second, as the thread-lifting lever C further descends to supply the slack thread to form the loop through which the shuttle shall pass, the eye at the end of the lifting-lever C passes by the loop or eye *d'* on the lever E, and then, should the cloth vary in thickness, the cloth-presser is raised or depressed thereby, and the eye *d'* will be so moved and regulated relatively to the eye on the end of the thread-lifting lever as to let down more or less slack thread according to the thickness of the material and the inequality of the surface.

By the first part of the operation of the slack-thread regulating devices the thread is prevented from breaking in the changes from thick to thin, or thin to thick work, and greater evenness is insured to the laying of the stitch; and in the second part of the operation the advantage gained is that of preventing the breaking of the needle-thread by the loop being too small for the passage of the shuttle when the work is thick, and also keeping an equal tension upon the thread and seam, to produce evenness in the stitch.

My improvement for regulating the tension of the shuttle-thread consists in an interlocking arrangement, by passing thread from the bobbin *g*, figs. 5, 6, out through a hole, 1, in the side of the shuttle, and under the constant bearing spring backward to and in through another hole, 2; thence forward on the inside of the shell to and out through another hole, 3; thence backward and under the thread, between the holes 1 and 2, over and not beneath the spring *i*, to the work.

By this means perfect tension is secured during the whole unwinding of the bobbin, requiring no change from the full to the empty bobbin. The interlocking shuttle-thread tension device thus embraces two separately adjusting and alternately acting operations upon the same thread, seam, and stitch.

My improvement for insuring the formation of the shuttle-loop at the proper time and place for it to pass through consists in forming a curved passage around a lip, *h*, fig. 1, through which the thread, when carried down by the needle, escapes from the needle-throat, to pass around the shuttle, said passage being curved in such a manner as to prevent the needle from coming in contact with the shuttle, to endanger it, and at the same time allow the free movement of the thread. The formation of the loop is thus made sure in time and place for the passage of the shuttle through it, without coming in contact with the needle.

My improved feed-motion consists in the sliding horizontal dog *k*, fig. 1, that is provided with a serrated upper edge to bear against and hold the cloth, and is loosely connected with a reciprocating rod, *m*, operated by an eccentric, *n*, connected with the driving-shaft L. The rod *m* is suspended by a stirrup, *p*, pivoted loosely to the side of the machine. At the end of the dog *k* an eccentric, *l*, is fixed rigidly on the stem of an indicator, T, and held in place by a spiral spring, *o*, when it is turned around to give more or less reciprocating motion to the dog *k*, which comes up against it to regulate the length of its stroke, and consequently adjust the feed for a shorter or longer stitch, as required. The indicator T points to an index, to show precisely and fix the adjustment of the stitch by turning the eccentric attached to it. The forward positive movement of the dog *k*, to feed the cloth, is effected by the rod *m*, and the reverse movement is produced by a spring, *q*, connecting it with the rod *m* or other suitable device.

Having described the construction and operation of the several improvements in a sewing machine of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the cloth-presser Q, the thread-lifting lever C, the tension device B, the catch A, the cast-off D, and the lever E, the said combination being organized substantially as described, so that by its mode of operation slack shall be given to the thread according to the thickness of the work, when the eye of the needle reaches the surface of the cloth, as and for the purposes specified.
2. Interlocking the shuttle-thread with itself, in its passage from the bobbin to the work, after passing in and out through the holes 1, 2, 3 in the shell, substantially as and for the purposes herein described.
3. The curved passage formed by the lip *h* in the needle-throat, substantially as and for the purpose specified.
4. The combination of the eccentric *h*, sliding-rod *m*, stirrup *p*, and dog *k*, substantially as herein shown and described, for the purpose specified.

C. STEBBINS.

Witnesses:

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