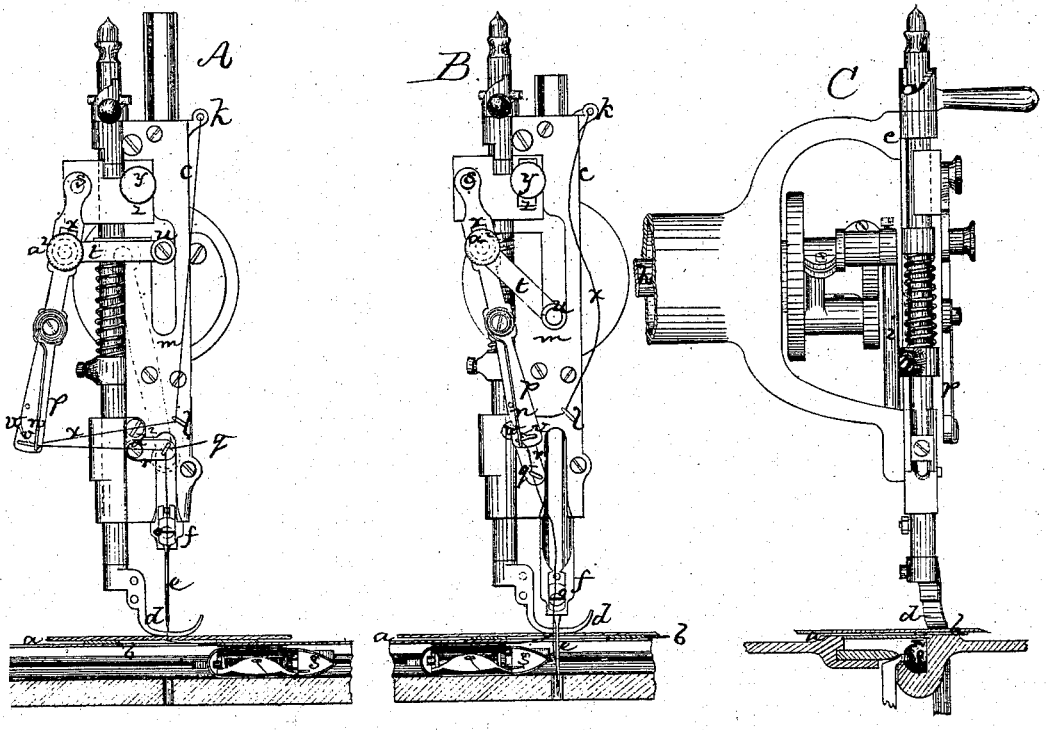
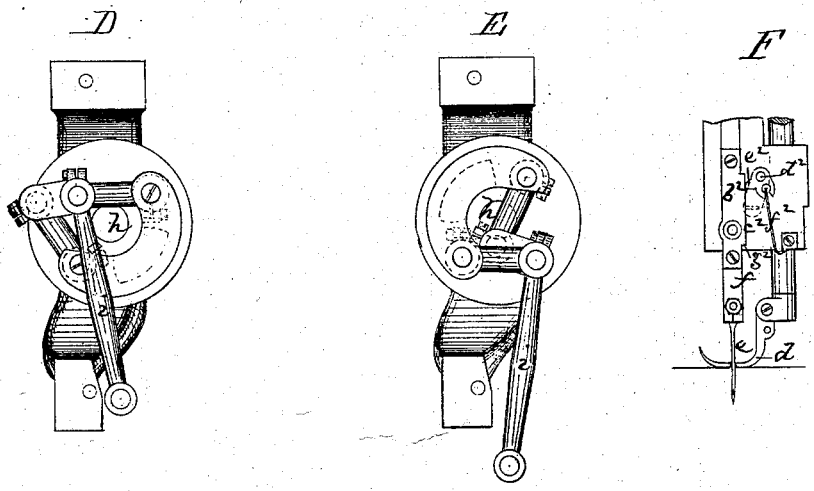
A. S. DINSMORE.

Sewing Machine.

No. 113,407. Patented April 4, 1871.





Alfred S. Dinsmore
by his Attys
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Witnesses
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UNITED STATES PATENT OFFICE.

ALFRED S. DINSMORE, OF BOSTON, ASSIGNOR TO HIMSELF, SOLON O. RICHARDSON, JR., AND DANIEL D. FOSTER, OF WAKEFIELD, MASS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **113,407**, dated April 4, 1871.

To all whom it may concern:

Be it known that I, ALFRED S. DINSMORE, of Boston, in the county of Suffolk and State of Massachusetts, have invented Improvements in Sewing-Machines; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to certain details of construction and arrangement of sewing-machine mechanism, having particular reference to shuttle-stitch machines, and to the mechanism thereof that regulates the draw upon the needle-thread and the taking up of the slack.

The drawing represents part of the head and work-supporting surface of a machine, and the feed and stitch-forming mechanism directly connected therewith.

A shows the mechanism in front and sectional elevation, the needle-point being above the work, and the shuttle through the loop; B, a similar view, the needle-point being at its lowest, or nearly lowest, position, and the shuttle advancing toward the loop. C is a side and sectional elevation of the mechanism. D and E show the crank-motion for effecting the proper movements of the needle-bar.

a denotes the table; *b*, the work-supporting plate; *c*, the head; *d*, the presser-foot; *e*, the needle; *f*, the needle-bar; *g*, the shuttle; *h*, the shaft that works the needle mechanism, the needle-bar being connected by a link, *i*, with the shaft through the intervention of a peculiar compound crank mechanism, which effects the differential movements of the needle by the rotation of the shaft, and without employment of any cam mechanism.

The needle-bar reciprocates in the head *c*, and the thread passes from the tension mechanism through a stationary guide-eye, *k*, at the top of the head, and thence through another stationary eye, *l*, on the front plate, *m*; thence around a take-up spring, *n*; thence through a guide-eye, *o*, on the needle-bar, to and through the needle-eye; but between the eye *l* and the take-up spring the thread passes through a swinging arm or lever, *p*, and between the spring and the needle-bar eye it passes through an eye, *q*, on a movable slack-regulating arm, *r*, the movements of the two arms *p* and *r* being positive, and controlling the stress upon the needle-thread, to insure the proper disposition of the needle-thread with relation to the shuttle-thread in forming each stitch.

The arm *p* is hung to the head (or to a projection therefrom) at *s;* and at a short distance below the fulcrum *s* the arm is connected to the needle-bar by a link, *t*, the front plate being slotted to permit vertical movement of the connecting-pin *u*.

At the lower end of the arm is a slot, *v*, (opening out through the arm at *w*,) through which the thread *x* passes.

The connection of the needle-bar to the arm *p* is such that as the needle-bar moves down to its lowest position the link *t* approaches a vertical position, and draws the lower end of the arm up toward and nearly into a vertical plane with the needle-bar, as seen at B, while, as the needle-bar moves up, the link comes to a horizontal position and throws the arm out from the head, as seen at A.

As the needle descends the arm moves in, and the needle takes the slack thread and thread from the spool. During this descent the shuttle moves back, and as the needle begins to ascend the shuttle begins to move forward, the point of the shuttle entering the bow of thread formed by the slack caused by the start of the needle upward. As the needle continues to move up and the shuttle to move forward, the arm *p* moves outward; but it does not take up the slackness in the thread until the shuttle is well through the needle-loop. During the last part of this outward movement, however, the shuttle is through the loop, and the arm then positively draws against the needle-thread with a force equal to the force exerted by the movement of the shuttle upon the shuttle or under thread, so that by the drawing action of the shuttle against one thread, and the equal drawing action of the arm against the other thread, both top and bottom threads are drawn with equal force into the work, thereby making the stitches uniformly strong and uniform in appearance.

To vary the throw of the arm *p*, to compensate for the varying amount of thread taken in forming stitches with coarse or fine thread,

the connection of the link t with the arm p is made adjustable by means of a slot, x, in the arm, the joint-pin being adjustably fixed in position at any point along said slot, and the throw of the arm being determined by the distance of the connecting-pin a^2 from the pin s, upon which the arm swings. The plate to which the arm is hung may also be adjusted vertically by means of a screw, y, and slot z.

It will be observed that when the needle is at its highest position and ready to begin its descent, the arm p stands out from the head, and that, in fact, it moves still farther outward as the needle begins to descend, the thread being thereby drawn taut. This being the case, it will be seen that the descending needle, if provision were not made to prevent it, would have such a lateral strain exerted upon it by the taut thread as to deflect the point, causing it not only to enter the work in the wrong place, but also at such a point as may result in its striking the table and thereby breaking the needle.

To obviate this I employ the movable arm r, which assumes a horizontal position as the needle starts up, and maintains such position until just as, or just before, the needle begins to move down, when the arm is tripped and drops down, producing, through the instrumentality of its eye q, a slack in the thread that enables the needle to run free from any strain by the thread. When the needle rises again, and before the arm p reaches its outermost position, the arm r is again thrown up, ready to slack the threads as the needle next begins to descend.

The arm r may be operated as follows, and by devices shown at F, which is a rear side view of the needle-bar and adjacent mechanism.

The needle-bar has a plate, b^2, fixed to it, from which plate projects an edge, c^2. The arm r is fixed on the outer end of a pin, d^2, on whose inner end is a cam piece or tooth, e^2, which is held up to the needle-bar by a spring, f^2. As the needle-bar is rising this tooth is held against the projecting edge c^2, and the arm r hangs down, as shown at B, and by the dotted lines at F. Just before the needle reaches its highest position, the shoulder g^2 at the bottom of the edge c^2 passes the cam-tooth, and the pressure of the spring then throws the tooth inward, carrying the arm into the position shown at A. Just as the needle next begins to move down this shoulder again strikes the cam-tooth, and the arm is instantly thrown down, and the slack produced in the thread to prevent deflection of the needle by the taut or tautening thread, as before described.

I claim—

1. The combination of a swinging arm, p, or its equivalent, the arm r, and a spring serving as a take-up, substantially as shown and described.

2. The combination, with a swinging arm, p, or its equivalent, of the arm r, a spring serving as a take-up, and means for adjusting the throw of the swinging arm, substantially as shown and described.

Executed January 6, A. D. 1871.

A. S. DINSMORE.

Witnesses:

E. LEROY SWEETSER,

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