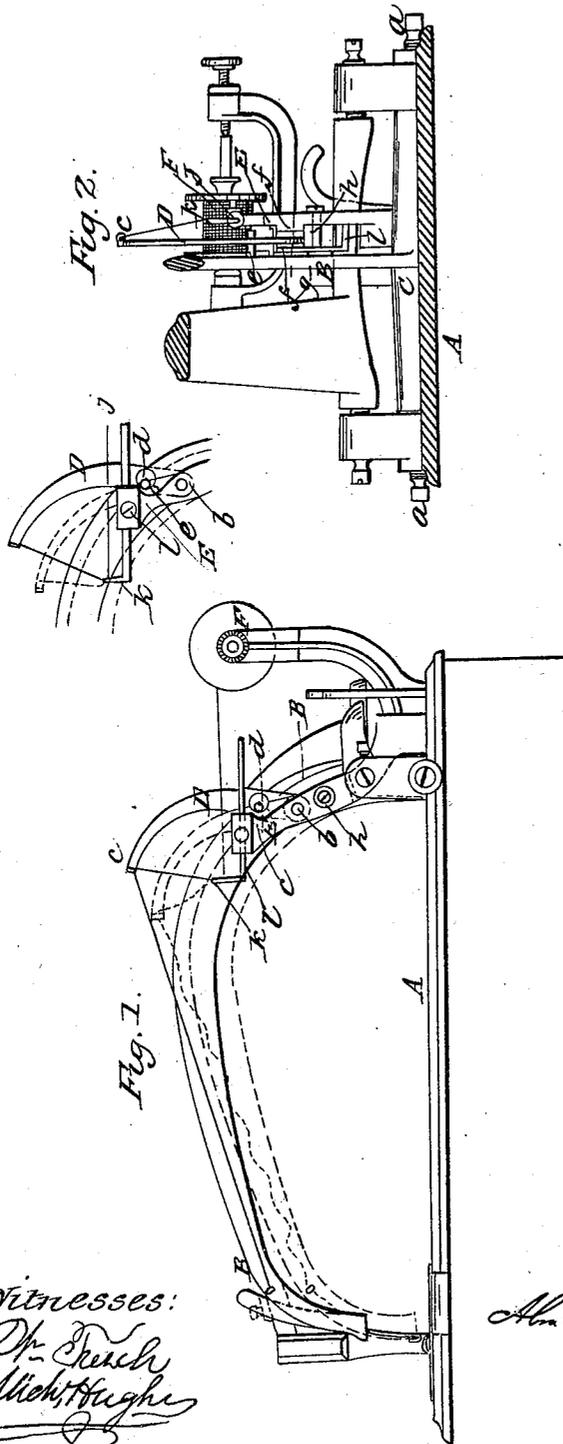


A. BARTHOLF.
Sewing Machine.

No. 24,000.

Patented May 17, 1859.



Witnesses:
Dr. French
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 21,000, dated May 17, 1859.

To all whom it may concern:

Be it known that I, ABRAHAM BARTHOLF, of the city, county, 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 of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of those portions of a sewing-machine to which my invention relates. Fig. 2 is a front view of the same partly in section. Fig. 3 is a side view of parts of the apparatus for controlling the needle-thread between the spool and the needle.

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

My invention consists in a novel and very effective mode of applying and governing the operation of a thread-controlling lever, by which the needle-thread is drawn back through the cloth to draw up the loop to complete the stitch, and held back to prevent its getting slack during the first portion of the descent of the needle and before the point of the latter enters the cloth.

It also consists in a certain novel arrangement of an adjustable eye, in combination with the thread-controlling lever, for the purpose of adapting the operation of the thread-controlling lever to sewing different thicknesses of material with the same degree of tension on the needle-thread, and with the same tightness of stitch.

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

A is the base-plate of the machine, upon which the cloth or other material is placed to be sewed, and which supports the principal working parts of the machine.

B is the needle-arm; C, the rock-shaft to which it is attached; and *a a* the two center screws between which the rock-shaft C is supported.

D is the thread-controlling lever, arranged to move in planes parallel with the planes of movement of the needle-arm upon a stationary fulcrum, *b*, which is represented as being secured in a small standard, E, set upon the plate A, but which may be attached to any fixed part of the machine in a suitable position near the needle-arm. The fulcrum *b* of

this lever is at one end of it, and at the other end is the eye *c*, through which the thread passes, and at a short distance from the fulcrum there is a hole, *d*, provided in the said lever to receive a pin, *e*, which projects from one side of the needle-arm, and serves to give the said lever a movement back and forth or up and down along with the needle-arm. The length of the lever D is so proportioned and the positions of the fulcrum *b* and pin *e* so arranged with regard to the movement of the needle-arm that the eye *c* of the said lever will move faster than the needle; but the pin *e* is allowed so much play in the hole *d* that the needle-arm, in withdrawing the needle from the cloth, does not communicate motion to the lever D till it has commenced to draw up the loop over the heel of the shuttle, and in the perforating movement of the needle does not communicate motion to the said lever till the point of the needle has entered the cloth.

The lever D has applied to it two friction pads or washers, *f f*, (see Fig. 2,) of leather or other material, which, while capable of clamping it firmly, will permit it to work smoothly when the requisite force is applied, said pads or washers being applied one on each side of the said lever, surrounding the fulcrum-pin *b*, and having the pressure to create the necessary degree of friction produced by a clamping-plate, *g*, and a screw, *h*, one end of the said clamping-plate resting against a projection, *i*, on the standard E, and the other end having the fulcrum-pin *b* passing through it and resting against one of the friction-washers *f*, and the screw *h* passing freely through the standard E and screwing into the clamping-plate *g*, and having its head bearing against the said standard. By turning the said screw *h* in the proper direction the clamping-plate is drawn toward the standard E and made to clamp the lever D and its friction-washers *f f* between it and said standard, and in this way the necessary degree of friction is created upon the said lever to hold it in a positively stationary condition during the first portion of the movement of the needle-arm—in the position in which it was left at the termination of the previous movement of the needle-arm in the opposite direction.

j is a wire or bar having an eye, *k*, at one end, and fitted into a hole in the top of the standard E, and secured therein by a set-screw,

7. The eye *k*, which is stationary during the operation of the machine, occupies such a position that the thread passes through it on its way from the spool *F*, whose axis is stationary, to the eye *c* of the thread-controlling lever *D*, and that the portion of the thread between the eyes *k* and *c* always forms a considerable angle with the portion between the eye *k* and spool *F* and the portion between the eye *c* and the needle, and the said wire or bar *l* is adjustable in the standard *E* in such a manner as to cause variations in the difference that will occur in the length of thread between the said eye *k* and the needle-eye in the two extreme positions of the thread-controlling lever, such adjustment being for the purpose of adapting the machine to sew various thicknesses of material, as will be more easily explained after I have more fully described the operation of the thread-controlling lever, which is as follows: When the needle is in its highest position, or farthest withdrawn from the cloth or other material to be sewed, the lever *D* occupies the position shown in black outline in Fig. 1, to which it has been moved by the pin *e* on the needle-arm, in the upward movement of the latter, and the thread is tight between the work and the spool *F*, from which the necessary quantity has just been drawn off to make the next stitch. As the needle descends to commence the next stitch the lever *D* remains stationary, being so held by the friction of the pads or washers *f f* until the point of the needle has entered the cloth, as shown in Fig. 1 in black outline, the thread being in the meantime held so tight that the eye of the needle runs along it, and being thus prevented by any possibility kinking round the needle; but when the point of the needle has penetrated the cloth the pin *e*, which has by this time moved across the hole *d* to the position shown in black in Fig. 1, begins to move the lever *D* along with the needle-arm, but faster, so as to let the thread slack enough to provide for the formation of the loop and its extension by the shuttle, and hence leaves the thread perfectly slack when the needle has completed its descent. The latter condition of the needle, needle-arm, and lever *D* are represented in red outline, and of the thread in blue dotted outline. The lever *D* is stationary in the position represented in Fig. 1 in red outline by the friction pads or washers *f f* till the needle-arm has risen far enough for the pin *e* to have moved back across the hole *d*, which is not until the loop is slipping over the heel of the shuttle, when the said lever *D* is caused to rise or move back along with the needle-arm, but at a sufficiently faster speed to draw up the whole of the slack of the thread and pull the stitch tight before the needle has quite completed its ascent, so that as the needle completes its ascent the said lever may draw from the spool the necessary quantity of thread for the next stitch.

In applying the thread-controlling lever *D* without the adjustable eye *R*, however accu-

ately and perfectly it might be constructed and adjusted, it could only operate with absolute perfection for one thickness of material, and the object of the adjustable eye *R* is to adapt it to different thicknesses of material and different thicknesses of cloth with equal perfection without the necessity of altering the tension of the needle-thread. The operation of the adjustment of the eye is illustrated in Figs. 1, and 3, in the former of which the eye is set for sewing a moderate thickness of cloth, and in the latter for a much greater thickness. In each of the above-mentioned figures the controlling-lever *D* is represented in its two extreme positions, and it will be seen that in the position of the eye *R* represented in Fig. 1 the difference in the length of thread in the two positions of the lever is considerably less than it is in the position of the eye *R* represented in Fig. 2, and hence provision is not made for drawing up the greater quantity of thread that is necessary to make the stitch in the thicker material. The proper adjustment of the eye *R* will be ascertained by the thread being just drawn tight when, in the lowest position of the lever *D*, the thickest part of the shuttle is passing through the loop. If the thread is not tightened at this stage of the operation, the eye *R* is shifted to make the thread form less acute angles at the eyes *c R*, and if it should be drawn so tight as to draw off more thread from the spool *F* or through the eye *c*, the eye *R* must be set to make the thread form more acute angles at *c R*.

I am aware that levers moved wholly or in part by the needle-arm or needle-carrier have been applied to sewing-machines to effect the same result as the lever *D*—viz., the drawing back of the thread through the cloth without drawing back the needle a distance equal to the whole length of the thread that was protruded through the cloth—but such levers have been either allowed to let the thread slack again immediately after drawing it back through the cloth, or have been controlled by springs or spring-latches to hold back the thread during the first part of the descent or return of the needle, which devices are not only less reliable, but more costly than my contrivance for governing the action of the lever. In view of such applications of a lever I cannot of course claim, broadly, the lever *D*, operated by the needle-arm or needle-carrier; but

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

1. Applying the said lever to work on a fixed fulcrum, in combination with a friction-clamp which, though it permits the said lever to be moved by and with the needle-arm or needle-carrier during a portion of the movement of the latter in either direction, for the purpose of drawing back the thread through the cloth and completing the stitch, and letting it slack again to form the loop of a succeeding stitch, holds the said lever in a positively stationary

condition during the first part of the movement of the said arm or carrier in either direction, and so prevents the thread getting slack till the needle has entered the cloth, and prevents it being drawn up through the cloth till the heel of the shuttle has arrived at the loop, substantially as herein described.

2. In combination with the thread-controlling lever constructed and applied as speci-

fied, and operated, as described, by the needle-arm or needle-carrier, the stationary eye R, made adjustable relatively to the said lever, substantially as and for the purpose herein set forth.

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Witnesses:

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