

J. J. COUCH.
Sewing Machine.

No. 27,593.

Patented March 20, 1860.

FIG. 1

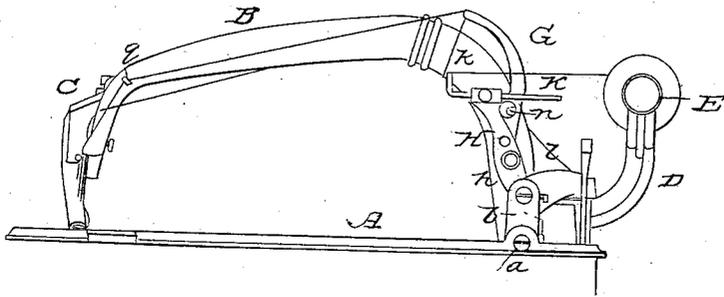


FIG. 2.

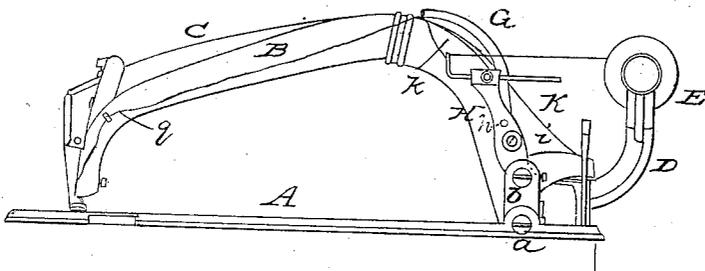


FIG. 3

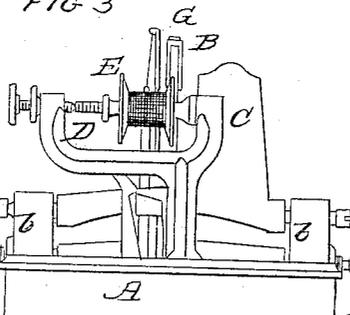
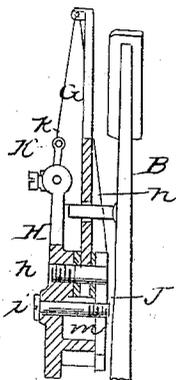


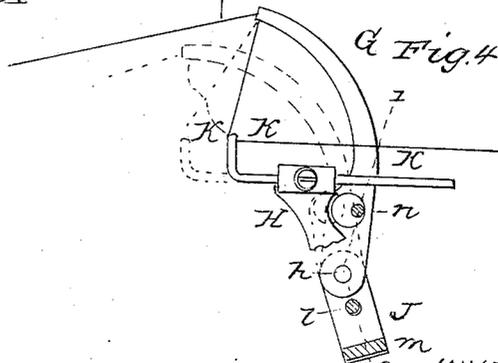
FIG. 5



WITNESSES

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FIG. 4



INVENTOR

Joseph J. Couch

UNITED STATES PATENT OFFICE.

JOSEPH J. COUCH, OF BROOKLYN, ASSIGNOR TO JOSIAH S. SWAN, OF NEW YORK CITY, N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 27,593, dated March 20, 1860.

To all whom it may concern:

Be it known that I, JOSEPH J. COUCH, of Brooklyn, State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists, first, in maintaining the needle-thread of a sewing-machine tight as the point of the needle penetrates the fabric, delivering out the necessary amount of thread for forming the loop, and for the distension of the loop by the passage through it of the shuttle, and finally drawing up the slack thread, so as to complete the stitch by means of a lever or its equivalent, to which a friction is imparted by means of washers and a clamp or other suitable devices, and which is operated by the needle-arm or other moving part of the machine, substantially as described hereinafter; secondly, in the combination of an adjustable eye with the above-mentioned lever or its equivalent, whereby the amount of slack thread delivered out may be regulated to suit the thickness of the fabric; thirdly, in a combination of the same lever, when operated and applied substantially as described hereinafter, with the shuttle of the sewing-machine, whereby the said lever may become a self-acting medium of delivering out any extra amount of thread which may be required in operating on a seam or any unusual thickness in the fabric, thereby preventing the breakage of the thread, which frequently occurs under such circumstances.

In order to enable others to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figures 1 and 2 are side views of sufficient of a sewing-machine to illustrate my improvements; Fig. 3, an end view of the machine, looking toward the rear; Fig. 4, a detached view of my improvement, drawn to an enlarged scale; Fig. 5, a sectional view of Fig. 4 on the line 1 2.

Similar letters refer to similar parts throughout the several views.

A is the base-plate of the machine, on which the fabric to be operated upon is placed.

B is the needle-arm, hung to the points of studs *a a*, which are screwed into projections *b b* on the base-plate A, the needle-arm being caused to vibrate by the usual revolving cam on a driving-shaft underneath the base-plate.

C is the pressure-bar, furnished at its outer end with the usual pad, *d*, and hung at its inner end to the points of studs screwed into the projections *b* of the base-plate in the same manner as the needle-arm.

D is a bracket secured to the base-plate, and forked at the top for the reception of the spool E of needle-thread and the appliances connected therewith.

Although the above-mentioned parts, which appertain to sewing-machines of a well-known construction, have been selected to illustrate my improvements, it should be understood that the latter are applicable to others differing in point of construction, form, and operation of parts from that illustrated.

G is a lever hung to a stationary pin, *h*, attached to and projecting from the bracket H, which in this instance is of a peculiar form and secured to the base-plate A, but which may be of different form to that shown and secured to any stationary part of the machine. To the same pin, *h*, is hung a plate, J, into which screws the end of a set-screw, *i*, the latter passing freely through a hole in the bracket H, the lower end of the plate bearing against the projection *m* on the said bracket. On each side of the lever G, and to the pin *h*, is hung a washer, of leather or other suitable material, so that on turning the screw *i* the lever may be pressed with more or less force between the washers, and the freedom of the lever's movement on the pin thereby increased or diminished at pleasure. In the lever G, at a short distance above the point where it is hung to the pin *h*, is an orifice, through which passes the pin *n* on the needle-arm B, this orifice being considerably larger than the pin, for a purpose which will be rendered apparent hereinafter. On the top of the bracket H is a horizontal opening, in which a rod, K, fits snugly, but so as to move freely when it has to be adjusted, a set-screw, *p*, in the side of the bracket serving to secure the rod in its proper position after adjustment. The thread from the spool E passes through an eye, *k*, in the turned-up-end of this adjustable rod K, thence

through an eye in the end of the lever G, thence through an eye, *q*, near the end of the needle-arm, and thence through the eye of the needle to the fabric. On the requisite vibrating motion being imparted to the needle-arm B, the latter will, through its pin *n*, impart a vibrating motion to the lever G. The latter, however, does not vibrate simultaneously with the needle-arm throughout, for after both have reached their most elevated position, as seen in Fig. 1, and when the needle-arm commences its downward movement, the lever G will, through the friction imparted to it by the clamping-plate J and the washers above alluded to, remain stationary until the pin *n* of the needle-arm strikes the side of the orifice in the lever opposite to that with which it had been previously in contact. The arm G then descends simultaneously with the farther descent of the needle-arm until both reach the limit of their downward movement. On the commencement of the return movement of the needle-arm the lever G will, through the friction imparted by the washers, remain depressed until the pin *n* strikes the edge of the opening in the lever opposite to that against which it had been previously bearing as the needle-arm descended, after which the needle will complete its upward movement simultaneously with the completion of the upward movement of the needle-arm. It will thus be seen that, owing to the pin *n* being smaller than the hole in the lever G, through which the pin passes, and to the friction imparted to the lever by the clamp and washers, the said lever will remain stationary and elevated while the needle-arm commences its downward vibration, and stationary and depressed while the needle-arm commences its upward vibration. The position of the eye in the end of the lever G in respect to the eye *k* on the upturned end of the rod K, and the amount of the movement of the lever, are such that when the latter is elevated it maintains the thread tight, and when it is depressed it has delivered out slack thread sufficient to form the loop as well as to allow for the distension of the loop by the passage of the shuttle. The friction imparted to the lever G by the washers is so regulated by turning the screw *i* that the said lever may remain stationary and sufficiently rigid during the commencement of the downward movement of the needle-arm to maintain the thread tight. The friction is not so great, however, as to prevent the lever from yielding slightly, and thereby delivering out a small portion of slack thread when the needle is operating temporarily on a seam or other unusual thickness which may occur in the fabric—a point which will be more especially alluded to hereinafter. The results accomplished by the aid of this lever G and the adjustable thread-guide K, and the manner in which they accomplish the results, may be described as follows: Supposing the moving parts above mentioned to be in the position illustrated in Fig. 1, the needle-arm being raised to its high-

est point and its needle withdrawn to its farthest extent from the fabric, the lever G being also at its highest point and the thread being thereby drawn tight. As the needle-arm begins to descend, the lever G will be retained stationary in its elevated position by the friction of the washers, and will thus maintain the thread tight until the point of the needle penetrates a short distance into the fabric, thereby effectually preventing any loose thread from folding round the point of the needle. By the time the needle has penetrated a short distance into the fabric the pin *n* will have reached the side of the orifice in the lever G opposite to that with which it had been previously in contact, so that on the farther descent of the needle-arm the needle will fall rapidly and deliver out the necessary quantity of thread to form the loop for the entrance of the point of the shuttle, and for the subsequent distension of the loop by the passage of the shuttle, the thread being perfectly slack when the needle has completed its descent. The moving parts have now assumed the position illustrated in Fig. 2. As the needle-arm begins to rise, the lever G remains stationary in its depressed position until the pin *n* bears against the opposite side of the hole in the lever, so that the thread remains slack until the heel of the shuttle passes the loop. The lever G now rises with the needle-arm, but much more rapidly than the latter, taking up the whole of the slack thread and drawing the stitch tight before the lever reaches its highest point, so that as the lever completes the limit of its upward movement it will draw from the spool E sufficient thread to form the next stitch.

The object of the adjustable thread-guide K is to regulate the amount of the thread to be delivered out by the lever G to correspond to the different thicknesses of fabrics submitted to the machine.

It will be seen on reference to the detached view, Fig. 4, that the distance between the eye in the end of the lever G and the eye *k* in the upturned end of the rod K may be increased or diminished by the adjustment of the rod in the bracket H. Thus when the turned-up end of the rod occupies a position near the bracket the thread between its eye *k* and that of the lever, as represented by a red line, will be shorter than the thread between the same points, as represented by a blue line, when the upturned end of the rod is adjusted to a position farther from the bracket, and as the movement of the lever is invariably the same, it will be evident that the amount of slack thread delivered out by the lever must depend upon the position of the eye in the rod K in respect to that in the end of the lever, and that the rod may be readily adjusted to deliver out the amount of thread required by the thickness of the fabric submitted to the machine.

It has been already observed that the friction imparted to the lever G by the clamp and washers is not so excessive as to prevent it from delivering out a small amount of slack

thread in case of a certain emergency. The emergency which calls for this slight yielding of the lever is when a seam or plait or other unusual thickness occurs in the fabric. When the needle is operating on a seam, for instance, more thread is required for completing the stitch than when the needle is operating on the body of the fabric, to suit the thickness of which the rod K has been originally adjusted. Consequently when the needle-arm is at its lowest point, and as the shuttle enters the loop, the slack thread delivered out by the lever will not be sufficient to allow for the distension of the loop for the free passage of the shuttle. As the latter is in the act of passing through the loop, the thread will be drawn tight and the lever G will yield slightly, giving out the amount of extra thread required, thus obviating the necessity of causing the shuttle, in its distension of the loop, to draw the extra thread from the spool through a series of eyes, which would impart such an undue friction to the thread as to render it liable to break. After the seam in the fabric has passed from the range of the needle, the lever will resume its proper position for performing the duties it has previously accomplished, and this without any stoppage or adjustment of the machine.

It will now be seen that the lever G, when viewed in connection with the shuttle, acts as a self-acting compensating lever, the passage of the shuttle through the loop causing the lever to yield to an amount corresponding to the thickness of fabric under which the loop is formed.

I am aware that auxiliary levers moved wholly or in part by the needle-arm or needle-carrier have been applied to sewing-machines for drawing up the slack of the needle-thread.

I do not therefore claim, broadly, the application of such lever; but

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

1. Maintaining the needle-thread of a sewing-machine tight as the point of the needle penetrates the fabric, delivering out the necessary amount of thread for forming the loop, and for the distension of the loop by the passage through it of the shuttle, maintaining the thread slack as the needle begins to rise, and finally drawing up the slack thread, so as to complete the stitch, by means of the lever G or its equivalent, in combination with the washers and clamp or other device for imparting the desired friction to the said lever, the latter being operated by the needle-arm or other moving part of the machine, substantially as and for the purposes herein set forth.

2. The stationary eye k, in combination with the lever G or its equivalent, when the latter is arranged, applied, and operated substantially as herein set forth, and when the said eye is made adjustable in respect to the lever, for the purpose specified.

3. The combination of the lever G, applied and operated substantially as set forth, with the shuttle of the sewing-machine, so that the said lever may yield slightly on the distension of the loop by the shuttle when more than the usual amount of thread is required for the stitch, as herein set forth, and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH J. COUCH.

Witnesses:

HENRY HOWSON,
S. N. BRADLEY.