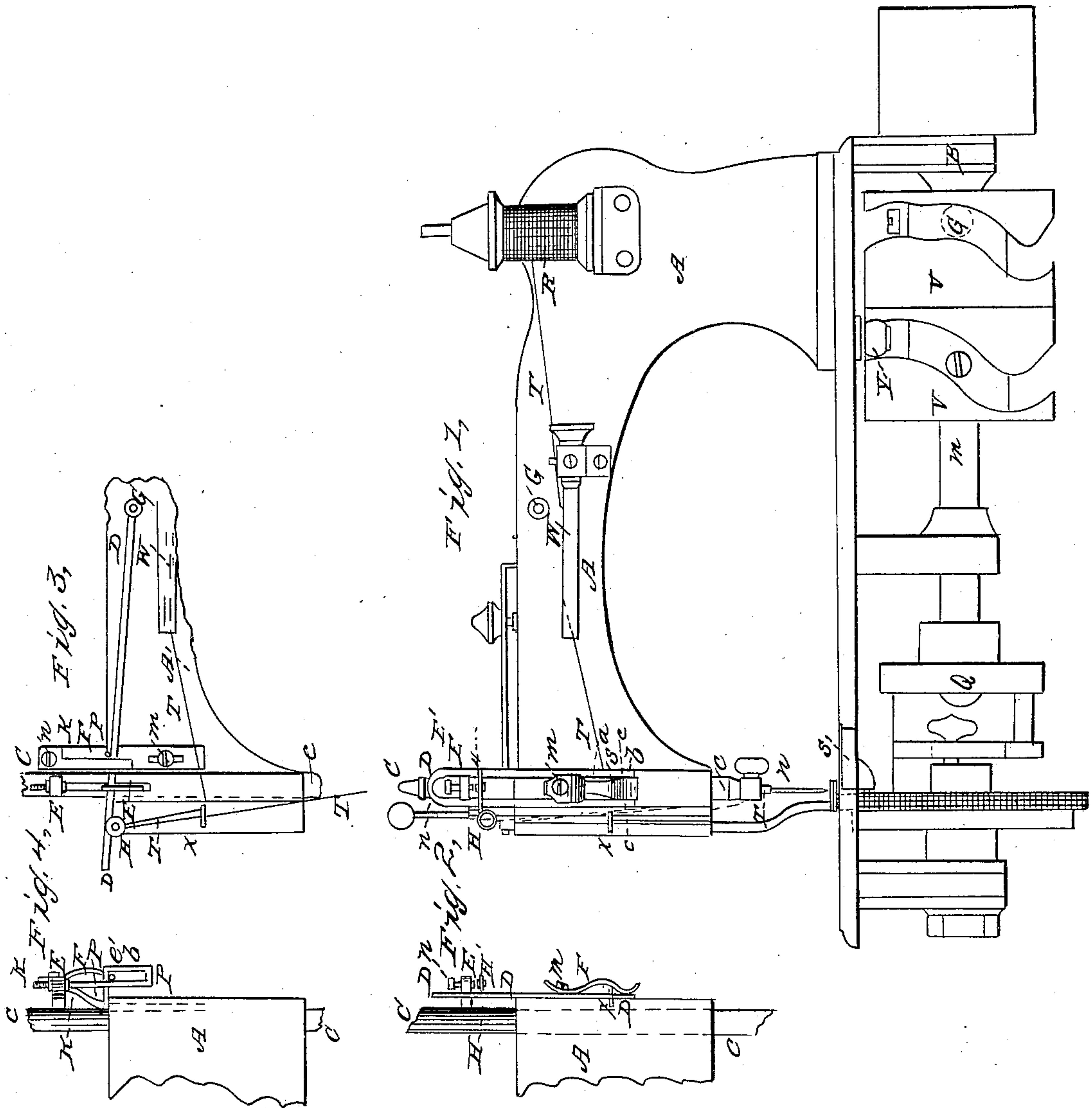


W. C. HICKS.
Sewing Machine.

No. 26,035.

Patented Nov. 8, 1859.



WITNESSES:
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WM. CLEVELAND HICKS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **26,035**, dated November 8, 1859.

To all whom it may concern:

Be it known that I, WM. CLEVELAND HICKS, of Boston, county of Suffolk, and State of Massachusetts, have invented a new Method of Controlling Needle-Thread in Sewing-Machines; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, the same making part of this specification.

The nature of my invention consists in a new method of loosening and tightening the needle-thread in sewing-machines for the purpose of forming a seam, in connection with the other parts of a shuttle sewing-machine, which are now so well understood that a particular description of them and their operation is not necessary.

My invention is adapted, first of all, to sewing-machines which sew with two threads, a needle, and shuttle; but it may be used in other kinds of machines for sewing. This loosening and tightening the needle-thread between the spool and the seam is called "controlling." Therefore my invention is a method of controlling, or an improved controller.

Other methods of controlling have been used before my invention, one class being that of tightening the needle-thread by the needle-bar, through the top of which this thread is made to pass. This tightening, for the purpose of drawing up the stitch, is done at the time when the needle is out of and farthest from the cloth or material to be sewed. When the needle-bar descends, the thread is loosened during the whole downward motion of the same, unless held up or drawn away by some additional device, until the needle-eye is at or nearly at the cloth. This holding the thread up or away while the needle approaches the cloth or material to be sewed is very desirable, and it is as desirable that this thread should be perfectly loose during the remainder of the downward stroke of the needle through the material to be sewed, for the double purpose of keeping the thread from breaking and to form slack for the passage of the shuttle with the filling-thread. Therefore a device is used, in addition to the needle-bar, for the purpose of keeping up or away the loose thread formed by its descent, and also for letting go, loosening, or yielding as the needle-eye approaches the cloth, that the slacking of the thread by the descent

of the needle-bar may be no longer hindered. There are various devices for effecting this method of controlling in conjunction with the needle-bar. One is by means of a riding-spring; another by a pad which is pressed upon the thread and caused to let go at the proper time. A second class of controllers is also used, and is preferable where the thread is passed not through the needle-bar, but through an independent bar or wire or spring. To this class my invention belongs. This wire or bar has imparted to it any desired motions, and by it to the thread, generally remaining still while the needle descends until the eye is near the cloth, and caused to loosen or be depressed while the eye passes through and below the cloth or material to be sewed.

Now, there are several methods of controlling where an independent wire or bar is used, one of which (by a spring) I will describe, as it is common, and it is with this that mine is best shown. By this method the thread from the bobbin, after passing around the tension apparatus, passes through a permanent eye or ring attached to the trunk of the machine and near the needle-bar, thence through the end of a spring whose tension or draft is up or in concert with the upward or outward motion of the needle-bar. This thread then returns through said permanent eye to the eye of the needle. It is obvious that whatever motions are communicated to said spring will be communicated to the thread. Suppose the needle-bar at its highest point and the spring at its highest point, the thread having been drawn tight and held so by the spring. Now, suppose an attachment placed upon the needle-bar, which, when on its descent, shall depress the spring at the moment the needle-eye reaches the material to be sewed—say, when the needle-bar has made one-third of its downward motion—and hold this spring depressed and slacken the thread to form a loop for the shuttle to pass through. When the needle-bar commences to ascend, of course the spring will follow, and will draw up the thread until it is arrested by a stop which determines its upward motion, and from whence it commenced to move downward when depressed by the projection on the needle-bar, (say, after completing two-thirds of its upward stroke.) The thread is now tight and the stitch formed. The needle-bar continues to rise, the spring

remaining at rest. As the needle again descends and the depresser comes in contact with the spring the thread is again loosened, &c. There are serious defects in this method of controlling. One is the necessity of drawing up the thread with a greater speed than that of the needle-bar, that it may remain still on the last part of the upward as well as the first part of the downward stroke of the needle-bar, the necessity of operating a stiff spring, whatever the nature or thickness of the fabric sewed, causing the same friction and using the same power whether sewing light or heavy goods, and at all times more than is required to draw up the stitch, as the only point where any power is required by my method is at the highest point in the stroke of the needle-bar, and the necessity of changing the amount of slack thread whenever the point of depressing the spring is changed, which often becomes important, in order to change from heavy to light goods or from thick to thin.

I will now proceed to describe my method of controlling by reference to one device for accomplishing the same, as shown in Figs. 1 and 2. Figs. 3 and 4 show another device for the same method.

In Figs. 1 and 2 the same letters show corresponding parts.

B represents the table or platform of a sewing-machine (called a "shuttle sewing-machine") where two threads are locked together in the manner of weaving, in order to fasten two fabrics together.

A represents a neck, which projects over said table to hold the perpendicular-acting needle-bar C, in which is fastened a needle, N, with the eye near its point. The needle-bar is caused to vibrate vertically by an angular lever concealed behind A and passing down behind the shaft *m* to the rod Y' in the cam V', which is driven in the frame B by a treadle and crank worked by the foot. The shuttle is driven in its vibrations by a similar lever lying horizontally and operated by the cam V and roll Y. The action of needle, shuttle, and feed is similar to machines in common use. I shall therefore describe only my invention.

Upon the side of the needle-bar, and sliding on the neck A, is a controller, D, being a piece of thin metal cut out in parts, in a manner to be hereinafter described, to which is attached a loop, H, with a small projecting platform, H'. Through this loop H the thread passes (shown in red lines) from the bobbin or spool R, after passing under the eye X, and from this loop H back through the eye X, thence to the needle-eye.

In the needle-bar C, and near its top, is an arm, E, which projects out over the neck A and through a slot in the controller D at the top. In the end of this arm is a set-screw, *n*, which is made to strike upon the leather or such like substance attached to the platform H', forming a cushion for the set-screw *n*. Below the platform H' the controller is slotted out, as shown in Fig. 1, nearly to its lower

end, a short distance from *a* to *b* being left solid, from *a* to *c* on an angle, as shown in Fig. 2, and from *b* to *c* flat and even with the face of the controller D. In this slot, and screwed permanently to the neck A, is a spring, F, which bears upon the controller D from *c* to *b* when the controller is up to its highest point and upon the neck A, except when rising on the taper from *a* to *c* during the remainder of the motion of D.

The top of the spring F is bent over to form a stop for the lowest point in the motion of the controller D, the same leather in the platform H', which formed a cushion for the set-screw *n*, being passed through to serve as a cushion on the bent part of the spring F.

The operation of the controller is as follows: Supposing it to be at its highest point, as shown, and where it was left by the needle-bar at its highest point, the spring F pressing it against the neck and holding it in its place by friction, the needle-bar C commences to fall, and with it the arm E and set-screw *n*, which are free in the slot of D, above the platform H, and continues to descend until the eye of the needle is near the material to be sewed, when the screw *n* strikes upon the platform H' and causes it and the controller D to descend, slipping from under the spring F, which slides over the taper from *a* to *c*, down upon the neck A, giving a rapid and sudden motion to the controller, which yields up the thread freely, and thereby prevents any strain near the needle-eye. The platform rests upon the spring F at its top until the needle-bar, ascending with the arm E, carries with it the controller D, drawing up the slackened thread with the motion of the needle-bar until it arrives at its highest point, and is held up by the spring F as we first found it, the spring F having been raised from the neck upon the controller, by means of the taper, from *a* to *c*. This taper may be made long or short, as the case may be, the controller being always allowed to fall by its own gravity at least the distance that the slot E' at the top is made.

By my method the same amount of slack thread is given out every time the needle-bar moves at whatever point the screw *n* strikes the platform, since the part of the stroke lost by the remaining still of the controller at the first part of the fall of the needle-bar is made up by the falling of the controller, and gaining time over the descent of the needle-bar.

My controller is drawn up with the speed of the needle-bar, has only the strain of the tension of the thread upon it and its own friction, can be made to yield the thread at any desired point in the descent of the needle-bar without changing the amount of slack thread, is always positive and accurate in its motions, yields suddenly as the needle-eye approaches the material to be sewed, and gains by falling the amount of motion lost by remaining stationary at the first part of the stroke downward of the needle-bar.

I do not claim controlling the needle-thread

in any of the methods now used or patented; nor do I claim an independent bar or spring controller; nor causing said bar to yield as the needle-eye approaches the material to be sewed; nor giving said independent controller motion by the needle-bar; but

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

My method of controlling needle-thread in sewing-machines by a combination of mechanism, substantially as herein described, by which a bar or wire, through which the thread passes, and by which the thread is tightened and loosened, shall have the herein-described motions combined: first, to be drawn up by

the needle-bar or its equivalent during its entire upward motion; secondly, held at rest until the needle-eye is at or near the material to be sewed; and, thirdly, to be disengaged and allowed or caused to fall by its own gravity or by the assistance of a spring, for the purpose of gaining the amount of motion lost by remaining at rest during the first part of the downward motion of the needle-bar, all substantially as herein described and specified.

WM. CLEVELAND HICKS.

Witnesses:

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