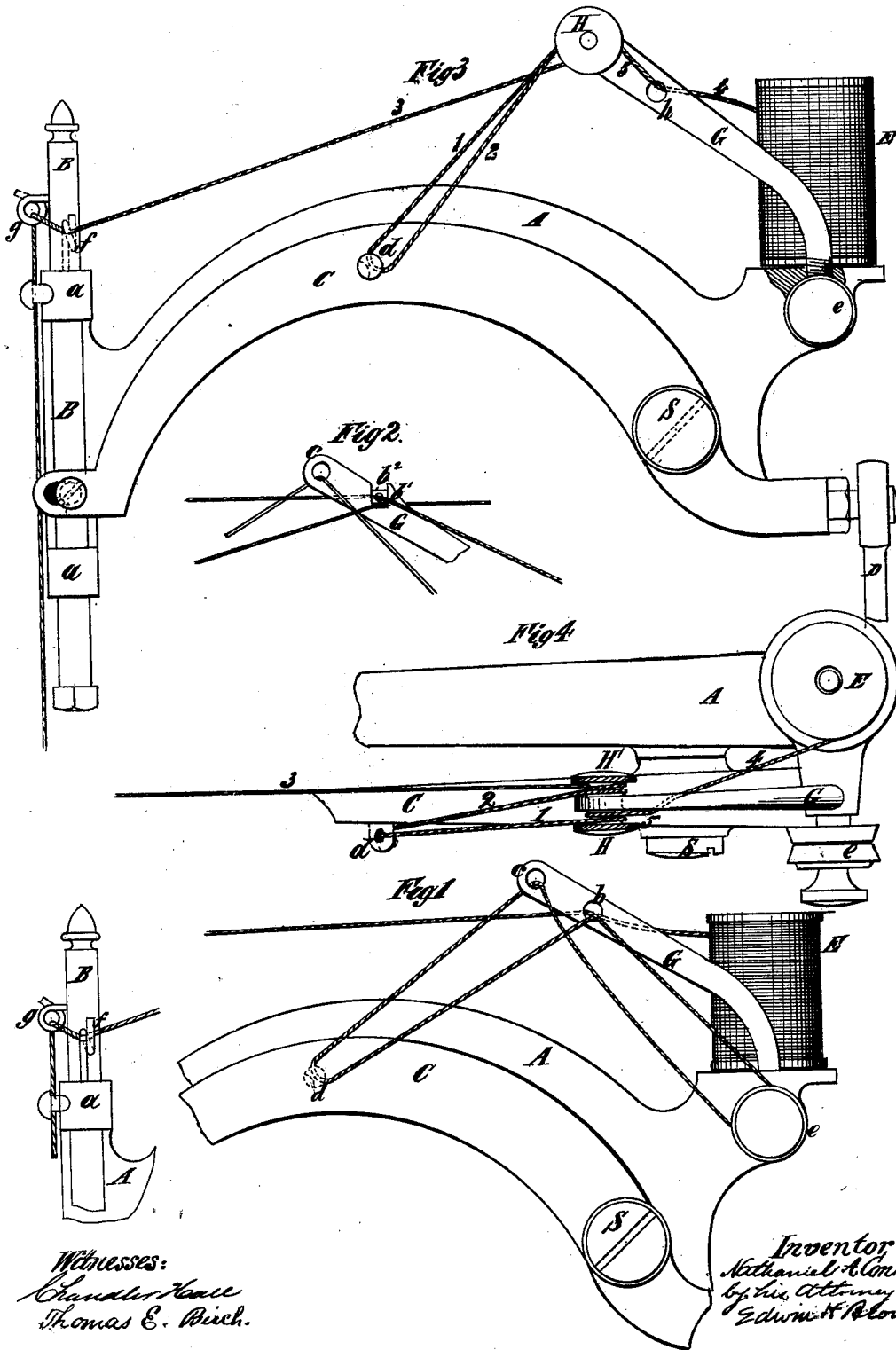


N. A. CONKLIN.  
Thread-Tension for Sewing-Machine.

No. 206,774.

Patented Aug. 6, 1878.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

NATHANIEL A. CONKLIN, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN THREAD-TENSIONS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **206,774**, dated August 6, 1878; application filed May 20, 1878.

*To all whom it may concern:*

Be it known that I, NATHANIEL A. CONKLIN, of Brooklyn, in Kings county and State of New York, have invented an Improved Automatic Thread-Tension for Sewing-Machines, of which the following is a specification:

The object of my invention is to provide for furnishing a sewing-machine at the time of making each stitch, and in a simple and inexpensive manner, with the exact quantity of thread required to form a stitch.

To this end the invention consists in the combination, with the means for operating the needle, of a tension device, whereby the thread required to form a stitch is caused to be drawn out on the descent of the needle-bar, and one portion of the thread is caused, directly or indirectly, to bind and hold another part, so as to obstruct the drawing of thread from the spool save at the proper time.

In the accompanying drawing, Figure 1 is a side view of a portion of a sewing-machine embodying my invention. Fig. 2 is a detail view illustrative of a modification of the invention. Fig. 3 is a side view of a portion of a sewing-machine embodying the invention in a modified form; and Fig. 4 is a plan or top view of a portion of the sewing-machine illustrated in Fig. 3.

Similar letters of reference designate corresponding parts in all the figures.

Referring first to Fig. 1, A designates the frame of the sewing-machine. B designates a needle-bar arranged to reciprocate vertically in guides *a a*, and C designates a vibratory needle-arm, supported by a pivot or stud, S, and operated, through a rod similar to that marked D in Fig. 3, by any suitable mechanism, so as to impart the requisite motion to the needle-bar.

E designates a spool of thread supported on a suitable rod or holder extending from the frame A, so as to be free to turn in order that the thread may be unwound in the ordinary manner.

G designates a device consisting, in this example of my invention, of an arm provided with eyes *b c*, and extending from the frame A, it being represented as secured thereto by a screw-threaded shank entering the same.

I have omitted in my drawings and shall omit

in my description many of the elements necessary to the operation of the sewing-machine, because they may be of any ordinary or well-known construction, so far as my invention is concerned.

The thread on its way from the spool E to the needle successively passes through the eye *b* of the device G; thence through an eye, *d*, arranged on the vibratory needle-arm or its equivalent; thence through the eye C of the device G; thence around, through, or over a loose wheel, *e*, or its equivalent, arranged on the frame A; thence through the eye *b* of the device G again, where it crosses a portion of itself; thence through an eye, *f*, on the upper guide, *a*, of the needle-bar; and finally through an eye, *g*, on the needle-bar and through the needle.

In Fig. 2 the thread, instead of passing twice through an eye, *b*, in the device G, is made to pass first through a notch or fork, *b*<sup>1</sup>, in said device, and subsequently through a block, *b*<sup>2</sup>, fitting in said notch or fork, so as to be free to move up and down and bear upon the portion of the thread lying in the said notch or fork.

In both cases one portion of the thread is caused to bind and hold a portion nearer the spool E, so as to control the unwinding of the thread thereon, as I shall now more fully describe.

On the descent of the needle-arm C its eye *d* draws from the spool, through the eye *b* or notch *b*<sup>1</sup> of the device G, sufficient thread to replace that used in forming the previous stitch during the last upward motion of the needle; and on the ascent of the needle-arm and bar the portion of the thread which passes the second time through the eye *b*, or which passes through the block *b*<sup>2</sup>, is caused to bind, directly or indirectly, through the block *b*<sup>2</sup>, on the portion of the thread which passes first through the eye *b*, or which passes through the notch or fork *b*<sup>1</sup>, with sufficient force to obstruct the drawing of any thread from the spool until the completion of the stitch and the downward motion of the needle arm and bar releases the thread.

The modification shown in Fig. 2 is advantageous because the wear incident to direct contact of the crossing portions of the thread is avoided.

I do not claim in connection with this device the weight of a block, or its equivalent, on a thread for the purpose of producing a tension, nor a block serving to clamp the thread so as to produce a tension thereon; but I consider that my particular method of actuating a block by one portion of the thread so that it will operate at proper times upon another portion is new and valuable.

Whenever practicable, open loops, recesses, or notches may be used in lieu of the eyes and without any blocks like the block  $b^2$ , previously described.

Referring now to Figs. 3 and 4, the example of the device G here shown is provided with an eye,  $h$ , and a pair of peripherally-grooved wheels, H H', secured on a single axle to rotate in unison, and forming practically a single wheel, having two peripheral grooves. The thread from the spool E passes through the eye  $h$ , is wound preferably twice around the wheel H, passes through the eye  $d$ , is wound preferably twice around the wheel H', (see Fig. 4,) and passes thence to the eyes  $f$   $g$  and to the needle. The downward movement of the eye  $d$  during the vibration of the needle-arm causes portions 1 and 2 of the thread to rotate the wheels H H' until the tension of portion 3 binds the thread on the wheel H' and stops the rotation; but as there is only a nominal tension on parts 4 and 5 they readily slip to part 1 around the now stationary wheel H. When, during the ascent of the needle-arm, the eye  $d$  approaches the wheels H H', the tension on portions 1 and 2 is relaxed, the "take-up" at the needle draws the requisite thread from part 3, and reverses the motion upon the wheel H', which, communicated to H, causes the latter to act as a brake on the thread and obstruct any fur-

taer withdrawal from the spool until the next descent of the needle-arm, the stitch being completed with a fixed amount of thread.

An important advantage of my invention is that, notwithstanding the obstruction offered to the withdrawal of more thread than is requisite for the formation of an ordinary stitch, a stout thread may slip at its extreme tension instead of breaking, and hence a long stitch through thick material may be made.

It will be seen that by my invention I provide a simple, noiseless, and inexpensive tension, whereby, without the readjustment of any parts, the proper amount of thread for each stitch will be afforded and the sewing of different thicknesses of material is facilitated.

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

1. In a sewing-machine, the combination, with the means for operating the needle, of a tension device, whereby at certain times during the operation of the needle one portion of the thread used in sewing is caused, directly or indirectly, to bind or act as a brake on another portion, substantially as and for the purpose specified.

2. In a sewing-machine, the combination, with a vibrating needle-arm, provided with an eye for the reception of the thread used in sewing, of a fixed arm extending from the frame of the machine and provided with two eyes for the reception of the said thread, whereby during the operation of the machine one portion of the thread is caused to directly bind or act as a brake on another portion, substantially as and for the purpose specified.

NATHANIEL A. CONKLIN.

Witnesses:

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OWEN PRENTISS.