

N. WHEELER.

TENSION RELEASING DEVICE FOR SEWING MACHINES.

No. 433,971.

Patented Aug. 12, 1890.

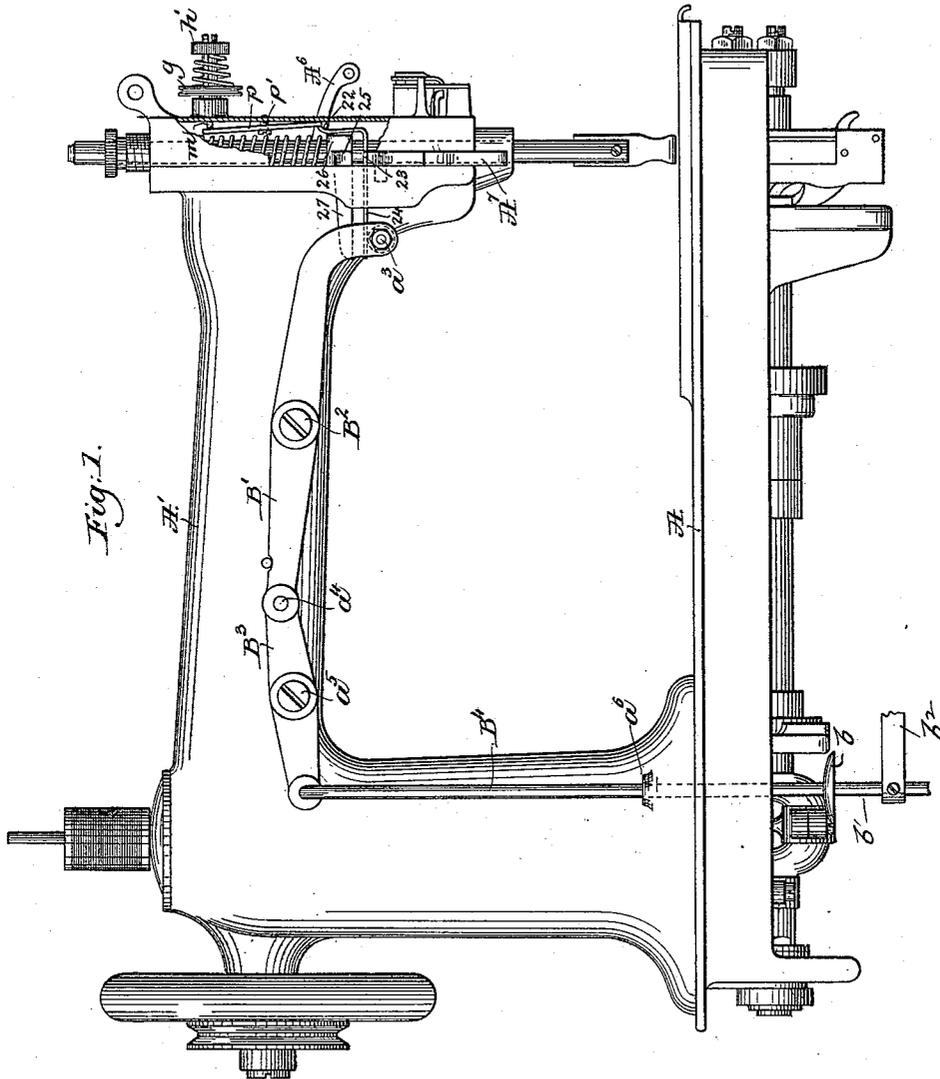


Fig. 1.

Witnesses.  
 Frederick L. Emery  
 Edgar A. Godkin

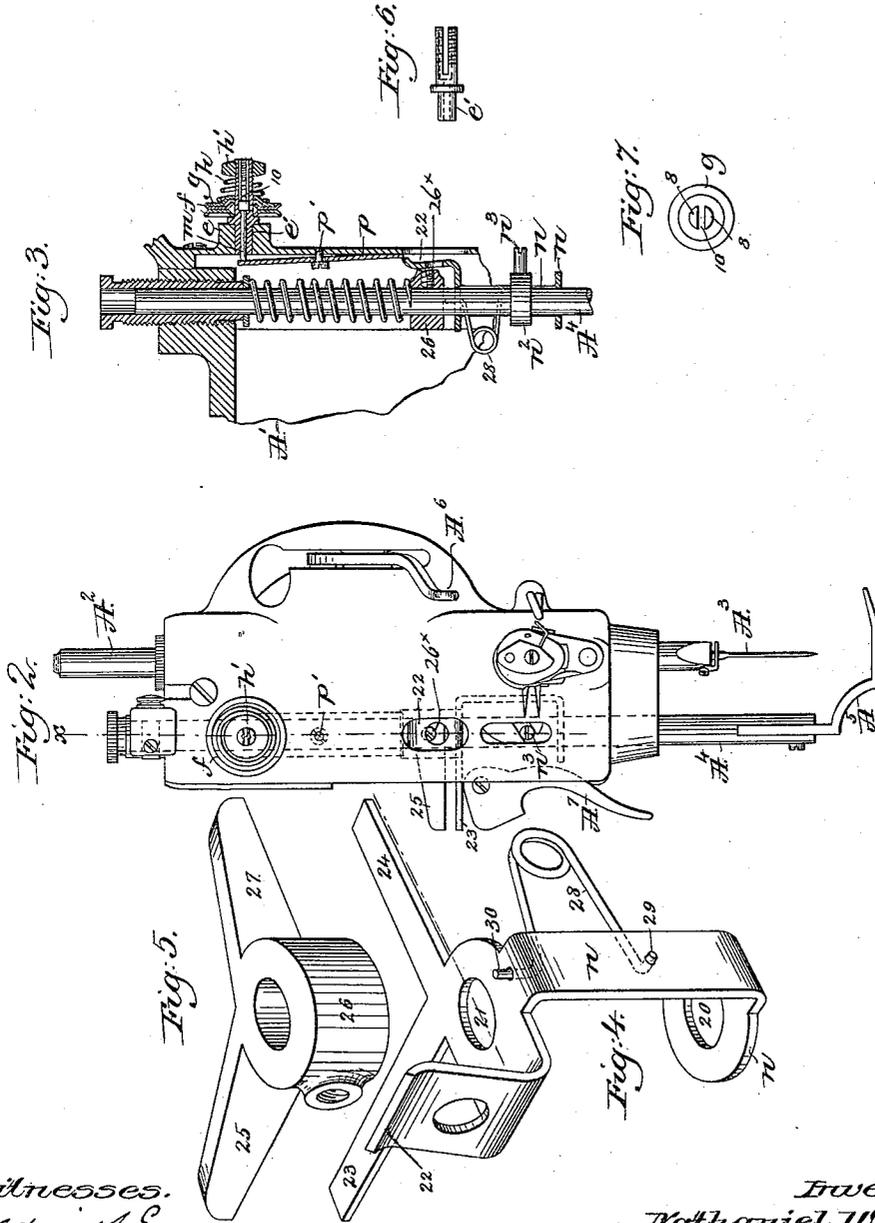
Inventor.  
 Nathaniel Wheeler,  
 by Crosby & Morgan

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# UNITED STATES PATENT OFFICE.

NATHANIEL WHEELER, OF BRIDGEPORT, CONNECTICUT.

## TENSION-RELEASING DEVICE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 433,971, dated August 12, 1890.

Application filed March 12, 1890. Serial No. 343,646. (No model.)

*To all whom it may concern:*

Be it known that I, NATHANIEL WHEELER, of Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to provide a sewing-machine with means whereby the tension on the needle-thread may be released and restored at will both by means independent of the presser-bar or of the driving mechanism of the machine and while the machine is in motion and at rest, the train of mechanism for actuating the tension device being extended to or below the bed-plate, where it is adapted to be moved by the foot or knee or by a part of the body other than the hands of the operator, thus leaving the hands free to manipulate the work.

In another application, Serial No. 321,709, made by me for United States patent, I have shown and described a slide-bar connected to and moved in unison with the presser-bar, the upper end of the said bar having an inclined surface to act against and release the hold of a spring-pressed tension device when the presser-bar is lifted beyond a certain height; but in the invention described in the said application the tension cannot be released except by raising the presser-foot above the bed-plate for a distance in excess of that due to the thickness of the work under the presser-foot.

I am aware that prior to my invention means have been provided for releasing the tension on the needle-thread by or through the driving-pulley when the machine has been stopped, but not while the sewing parts continue in operation.

My invention consists in a sewing-machine containing the following instrumentalities, viz: stitch-forming devices, a spring-pressed tension device to produce tension on the needle-thread, a bed-plate, a slide-pin to overcome the effective pressure of the spring of the said tension device, a vertically-movable block or yoke, means to guide the same in its vertical movements, actuating mechanism for the block or yoke extended below the

bed-plate and adapted to be actuated by power applied thereto below the bed-plate, and a pin-moving device intermediate the said yoke and the said sliding pin, whereby when the said yoke is lifted the tension device is released, and when lowered restored as desired.

Other features of my invention will be hereinafter described, and specified in the claim at the end of this specification.

Figure 1 is a side elevation, with the head partially broken out, of a sewing-machine embodying my present invention; Fig. 2, a partial front elevation of the same; Fig. 3, a partial section in the line *xx*, Fig. 2; Fig. 4, an enlarged detail of the vertically-movable yoke; Fig. 5, the two-armed collar attached to the presser-bar. Fig. 6 shows the hollow stud on which the tension device is placed; and Fig. 7 shows the spring lifting washer detached.

The bed-plate *A*, having the overhanging arm *A'*, the needle-bar *A<sup>2</sup>*, the eye-pointed needle *A<sup>3</sup>*, means for actuating the needle-bar, the presser-bar *A<sup>4</sup>*, the foot *A<sup>5</sup>*, the take-up *A<sup>6</sup>*, the under or shuttle-thread carrier or loop-taker to co-operate with the eye-pointed needle to form a stitch, and the presser-bar-lifting lever *A<sup>7</sup>*, are and may be all as usual, the said devices, as herein shown, being those common to the Wheeler & Wilson machine shown in United States Patent No. 405,205.

The face-plate covering the head of the overhanging arm has a hollow tube *e*, in which is fixed a hollow spindle or stud, split or bifurcated at its outer end and screw-threaded. This spindle *e'* receives upon it two like tension disks or plates *f*, between which passes the needle-thread on its way to the needle, the thread between the said disks being subjected to more or less pressure or tension as desired, by a spring *h*, acted upon by a regulating-nut *h'*. Between the spring and the outermost tension disk or plate I have applied to the spindle a spring lifting washer *g*, cut away at 8 to leave a cross-bar 10 to enter the slot in the spindle or stud when applied thereto and cross the central hole therein. The spindle receives in it loosely from its inner side a sliding pin *m*, the inner end of which normally protrudes through the spindle *e'*, as in Fig. 3.

The overhanging arm has pivoted upon it at B<sup>2</sup> a lever B', having at its end nearest the head a horizontally-extending stud a<sup>3</sup>. The rear end of the lever B' is jointed, as herein shown, at a<sup>4</sup> to a lever B<sup>3</sup>, pivoted at a<sup>5</sup>, the inner end of the lever B<sup>3</sup> in turn having attached to it a rod B<sup>4</sup>, extended through a guide a<sup>6</sup> in the frame-work and below the bed-plate, where it is shown as resting on a button b of a rod b', connected to a lever b<sup>2</sup>, so located or arranged as to be moved or lifted by the leg or knee of the operator whenever during the running of the machine it is desired to release the tension on the needle-thread and again restore it, as will be described.

The two levers and rod form what I denominate the "actuating mechanism" for the yoke n, to be described; but it is not intended to limit this invention to the exact form of actuating mechanism shown, the gist of this invention, so far as the said actuating mechanism is concerned, being in that it is adapted to be moved by the operator independently of any of the usual parts of the machine, and while the machine continues to run to release the tension on the needle-thread.

The devices so far specifically described are substantially the same as in my application referred to.

The presser-bar in this present embodiment of my invention is utilized as a guide for the vertically-movable block or yoke n, shaped as shown in Fig. 4, it having two holes 20 21 to embrace the presser-bar, and having, as shown, a beak 22 and two arms 23 24, the arm 23 falling in line with but below the arm 25 of a collar 26, attached by a screw 26<sup>x</sup> to the presser-bar, above the yoke n, the said collar having a second arm 27, which projects therefrom above the arm 24 of the yoke. A spring 28, connected at one end, as at 29, to the yoke, has its other end 30 extended up above the yoke, and so as to act against the collar 26 and normally keep the arm 23 of the said yoke pressed down on the usual presser-bar, lifting lever a<sup>7</sup>, as in Fig. 2. The pin or stud a<sup>3</sup> is extended under the arm 24 of the yoke, so that when the inner end of the lever B' is lifted by the leg or knee of the operator the said pin a<sup>3</sup> acts on the arm 24 and lifts the yoke, causing its beak 22 to act against and slide along in contact with the rear side of a plate or arm p, mounted loosely on a stop p', (shown as a screw,) against which the said plate is normally pressed by the pin m, acted upon by the spring h, the beak causing the upper end of the said plate to move the said pin m and cause it, acting on the cross-piece 10 of the washer g, to push back the spring h and release the tension on the needle-thread, the tension being restored as soon as the yoke is permitted to descend.

It will be observed that the lever B' in its movement derived from the connection B<sup>4</sup> and parts below the bed-plate acts to release the tension on the needle-thread without nec-

essarily lifting the presser-foot or its bar, as in my said application, so that the presser-foot may remain on the material when the tension is released from the needle-thread.

Any excessive or continued upward movement of the yoke by the lever B' after releasing the tension enables the presser bar and foot to be lifted.

When the usual lever A<sup>7</sup> is turned to lock or hold the presser-bar lifted, the said lever first acts on the arm 23 to lift the yoke n and release the tension on the needle-thread, and then in the further movement of the yoke the arm 23 contacts with the arm 25 of the collar 26 and lifts the presser bar and foot.

I do not claim lifting a presser-foot from devices located below the bed-plate and against which the leg or knee may work, nor do I claim means for automatically releasing the tension on the needle-thread when and only when the foot is removed from a treadle to stop the machine.

In my invention the action of the treadle to stop the machine has no effect whatever on the tension device.

By my improvements it is possible to release the tension and yet keep the presser-foot just touching the work while the operator slightly changes the position of the material or turns the same at some very difficult point in the stitching, and so, also, by disconnecting the yoke from the presser-bar the latter may rise due to the thickness of the stock without effecting the tension, yet the operator at any part of the work, as at a seam, may release the tension more or less for one or several switches.

I claim—

1. A sewing-machine containing the following instrumentalities, viz: stitch-forming devices, a spring-pressed tension device to produce tension on the needle-thread, a bed-plate, a slide-pin to overcome the effective pressure of the spring of the said tension device, a vertically-movable block or yoke having a beak to engage the within-described pin-moving device, means to guide the yoke in its vertical movements, actuating mechanism for the block or yoke extended below the bed-plate and adapted to be actuated by power applied thereto below the bed-plate, and a pin-moving device intermediate the said yoke and the said sliding pin, whereby when the said yoke is lifted the tension device is released, and when lowered restored as desired, substantially as described.

2. The presser-bar, the block or yoke mounted loosely thereon, and having a beak or projection, and an arm 23, means to move the said block or yoke vertically, and the spring-pressed tension device, the spring lifting washer and sliding pin combined with the plate p, acted upon one end by the said pin, which is kept against the said plate by the said spring, a stop to limit the movement of the plate through the action of the pin, and the lever A<sup>7</sup> to lift the said block and cause

the said beak to slide along on the said plate and push back the said pin, substantially as described.

3. The presser-bar, the block or yoke mounted loosely thereon and having a beak or projection, and an arm 23, means to move the said block or yoke vertically, the spring-pressed tension device, and the spring lifting washer and sliding pin connected with said tension device, combined with the plate *p*, acted upon at one end by the said pin which is kept against the said plate by the said spring, a stop to limit the movement of the plate through the action of the pin, the said

beak or projection acting upon the said plate to move the pin, and actuating mechanism for the yoke extended below the bed-plate and adapted to be operated by power applied thereto below the bed-plate, substantially as and for the purpose described.

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

NATHANIEL WHEELER.

Witnesses:

ISAAC HOLDEN,  
LOUIS H. BAKER.