

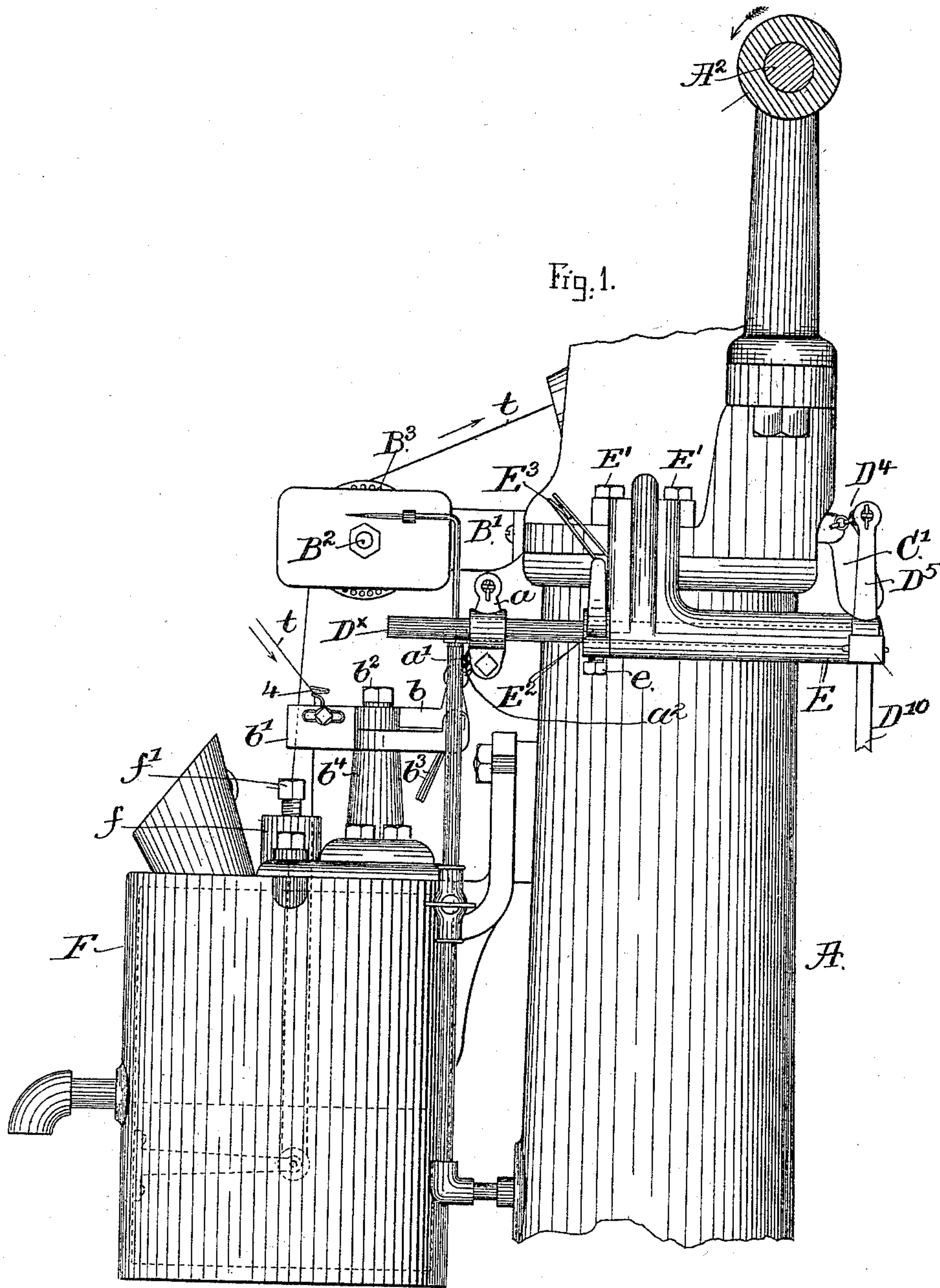
(No Model.)

H. E. COLE.  
SEWING MACHINE.

2 Sheets—Sheet 1.

No. 495,452.

Patented Apr. 11, 1893.



Witnesses.

Samuel W. Merrill  
Edward F. Allen

Inventor.

Horatio E. Cole

by Crosby & Gregory  
attys.

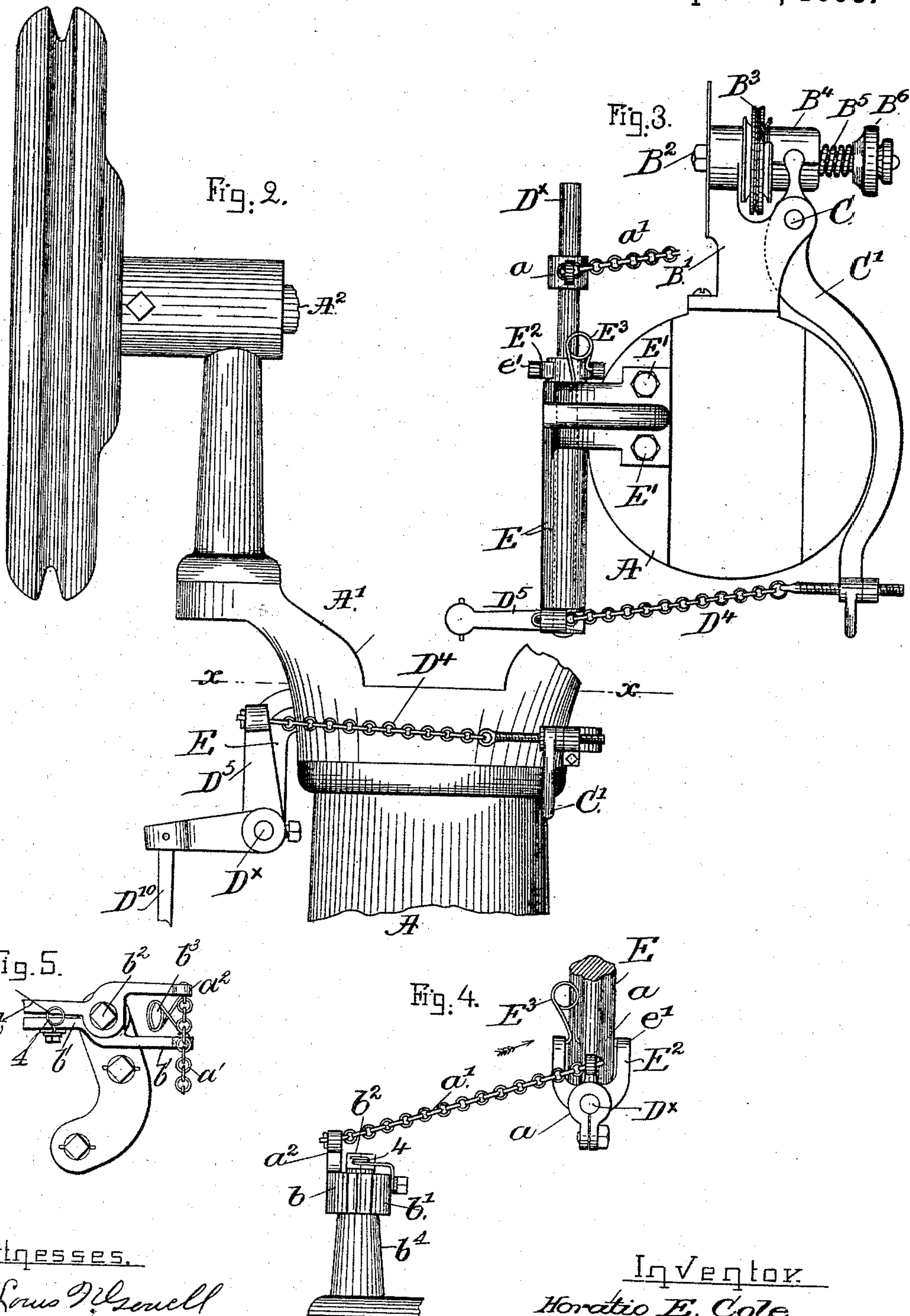
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2 Sheets—Sheet 2.

H. E. COLE.  
SEWING MACHINE.

No. 495,452.

Patented Apr. 11, 1893.



Witnesses.

Louis Wilson  
Edward F. Allen

Inventor.

Horatio E. Cole

by Crosby & Gregory  
attys.



# UNITED STATES PATENT OFFICE.

HORATIO E. COLE, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE GOOD-YEAR SHOE MACHINERY COMPANY, OF HARTFORD, CONNECTICUT.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 495,452, dated April 11, 1893.

Application filed May 31, 1892. Serial No. 434,849. (No model.)

### *To all whom it may concern:*

Be it known that I, HORATIO E. COLE, of Rochester, county of Monroe, State of New York, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The apparatus herein to be described and made the subject of this application has been devised for use more especially in connection with mechanism for stitching leather with a waxed thread.

In accordance with this invention I have combined with the tension device for controlling the tension of the waxed thread going to the needle, a clamping tension for said thread, the clamping tension, however, acting upon the said thread in its dry state on its way to the waxing device, and I have so constructed this clamping tension and combined it with other parts of the machine that when the usual tension device co-operating with the waxed part of the thread is released, the clamping tension will also be released, thus leaving the needle thread entirely free to be drawn into and through the machine to thus enable the work to be removed.

Figure 1 in side elevation, represents a sufficient portion of a sole sewing machine of the variety represented in United States Patent No. 412,704, but with my improvements added to enable this invention to be understood. Fig. 2 is a view of some of the parts shown in Fig. 1 looking at said figure from the right. Fig. 3 is a section below the line  $x$  Fig. 2, said figure showing a portion of the devices instrumental in releasing the thread tension mechanism. Fig. 4 is a detail view of some of the parts shown in Fig. 1 looking toward the said figure from the left. Fig. 5, is a top or plan view showing the clamping device for the dry thread.

Referring to the drawings, A represents a column having erected upon it a head A' containing bearings to support a main or cam shaft A<sup>2</sup>, the latter shaft in practice having a series of cams substantially as provided for in United States Patent No. 412,704, said cams serving to operate the different parts of the

stitch-forming and material feeding mechanism, said parts not being herein shown because not of my invention.

On the column referred to and as shown best in Figs. 1 and 3, I have mounted a bracket B', it receiving a stud B<sup>2</sup> on which is loosely mounted a tension device B<sup>3</sup>, it in practice being of that class which is rotated by the passage of the thread about it as the thread is being drawn through the machine.

The tension device referred to has co-operating with it a block or brake B<sup>4</sup>, said block or brake being herein represented as applied to the said stud and as having co-operating with it a spring B<sup>5</sup>, the effective force of which is regulated by means of a suitable nut as B<sup>6</sup> screwed upon a threaded portion of the said stud. This block or brake is loosely jointed to or suitably connected with a lever C' pivoted at C, and the opposite end of the said lever is connected by a chain D<sup>4</sup> or other flexible connection with an upright arm of an elbow-shaped lever D<sup>5</sup> attached to a suitable rock-shaft D<sup>x</sup>, the said elbow-lever as herein represented having its other arm connected by a link D<sup>10</sup> with a suitable treadle, not shown, by which the said rock-shaft may be partially turned whenever it is desired to release the block or brake from the tension device B<sup>3</sup> of whatever form used.

United States Patent No. 488,505, granted December 20, 1892, shows a tension device having co-operating with it a block or brake, and means for actuating a lever to control the position of the block or brake with relation to the tension device. My invention goes farther than the invention set forth in the said patent, as I will now proceed to describe, premising, however, that notwithstanding I have illustrated the elbow-lever or rock-shaft to which it is connected as being actuated through a link D<sup>10</sup>, yet the said rock-shaft may receive its motion in any other usual or suitable manner, or in other words, the lever D<sup>5</sup> common to the said application but which in this instance is fast upon the rock-shaft may be moved as provided for in the said application, but in this application broad or specific claim is not made to releasing the tension on the waxed needle thread



when the main or cam shaft has been stopped and the latter partially reversed.

The rock-shaft  $D^x$  referred to is extended through a suitable bearing in a stand E represented as secured to the head by bolts  $E'$ . The said shaft has fast upon it by a suitable set screw  $e$ , a forked block  $E^2$ , one arm of which, see Fig. 4, is acted upon by a suitable spring as  $E^3$ , so that the other arm marked  $e'$  thereof will be normally pressed against a small lug or projection on the bearing E, thus limiting the direction of movement of the rock-shaft by or through the spring, the latter yielding to permit the rock-shaft to be moved in the direction of the arrow Fig. 4. The rock-shaft also has fast upon it an arm  $a$  which by chain  $a'$  is connected to a part  $a^2$  of a movable clamping jaw  $b$  pivoted at  $b^2$  upon a suitable stand  $b^4$ , the other member of the clamping device being a jaw  $b'$  mounted on the same pivot. A suitable spring as  $b^3$  acting between the rear ends of the said jaws, serves to keep their front ends clamped together so as to pinch the needle thread in its dry or unwaxed condition on its way into the wax box, the said thread prior to entering between the clamping jaws passing through a suitable guide-eye 4, said needle thread being taken from any suitable or usual ball or spool, as commonly practiced in this class of machine. The waxed thread leaves the wax-pot F through a suitable stripper  $f$  represented partially in Fig. 1 and through the hollow screw  $f'$  forming part of the stripper, the thread after leaving the stripper being passed over the rotating tension device  $B^3$  and going to the stitch-forming mechanism in usual manner.

The wax in the wax pot will be kept warm in any usual manner and the said wax pot in practice will have a suitable roll under which the thread will be drawn to insure its passage through the body of the wax.

In operation let it be assumed that the machine is being run and sewing is being done. Now in case the machine is stopped, the rock-shaft  $D^x$  will be turned by the operator or otherwise as provided for, and the chain  $D^4$  connected to lever  $C'$  will remove the tension from the tension wheel  $b^3$  and at the same time the chain  $a'$  connected to the lug  $a^2$  of one of the clamping gears normally kept closed on the dry thread only will be opened to relieve the thread going into the wax pot from all friction.

In practice, any parts of the machine against which the wax thread passes will or may be suitably heated.

I am aware that a dry thread on its way to a needle has been subjected to the action of a clamp, and also has been acted upon by a roller tension, but prior to my invention I am not aware that a wax-thread sewing machine has ever had combined with it a clamping tension to operate upon the dry thread, nor a clamping tension which is adapted to be au-

tomatically operated and relaxed at any desired time or when the thread tension is relaxed from the waxed part of the thread, so my invention is not herein limited to the exact form of mechanism employed to carry out this result, as it is obvious the same may be variously modified by a mechanic without departing from the principle of operation of my invention.

It will be understood that the wax thread used in sole sewing is necessarily subjected to great strain by the hook of the needle and take-up in the process of setting a stitch. The action of a rubbing or clamping tension on a waxed thread distributes the wax and the fiber, and very considerable difficulty has been experienced in sole sewing machines to so distribute the tension upon the thread as to hold it in the proper shape during the stitch-forming operation.

I have found by experience that the risk of breaking the thread during sewing was reduced to the minimum by dividing the tension, *i. e.*, by dividing or distributing the tension at different points on the thread, and I found that I could get a more equable tension by acting upon the dry thread prior to its entrance into the wax pot, by clamping tension, and acting upon the wax thread between the wax pot and the stitch-forming mechanism by a rolling tension, or a tension which rotated with the thread but was frictionally restrained in its movements derived from the thread.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a sewing machine, of a clamping tension to act upon the dry thread, a wax pot into which the dry thread is led after its passage through the clamping tension, a stripper to strip the surplus wax from the waxed thread, a rolling tension device about which the waxed thread is passed, and means to frictionally restrain the rotation of the said rolling thread tension device, the combination being and operating, substantially as described.

2. A wax-pot, a clamping tension to act upon the dry thread on its way to the wax-pot, and a rolling tension to act upon the waxed thread between the wax pot and the stitch-forming mechanism of a sewing machine, combined with connecting devices between the said clamping tension and the said rolling tension whereby the same may be automatically operated in unison to release the tension from the needle thread when the machine is stopped and it is desired the thread to rend freely through the machine.

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

HORATIO E. COLE.

Witnesses:

JAMES H. CLARK,  
JOSEPH H. BUSH.