(No Model.)

D. CRAWFORD.

AUTOMATIC TENSION FOR SEWING MACHINES.

No. 358,963. Patented Mar. 8, 1887.

Fig. 1.

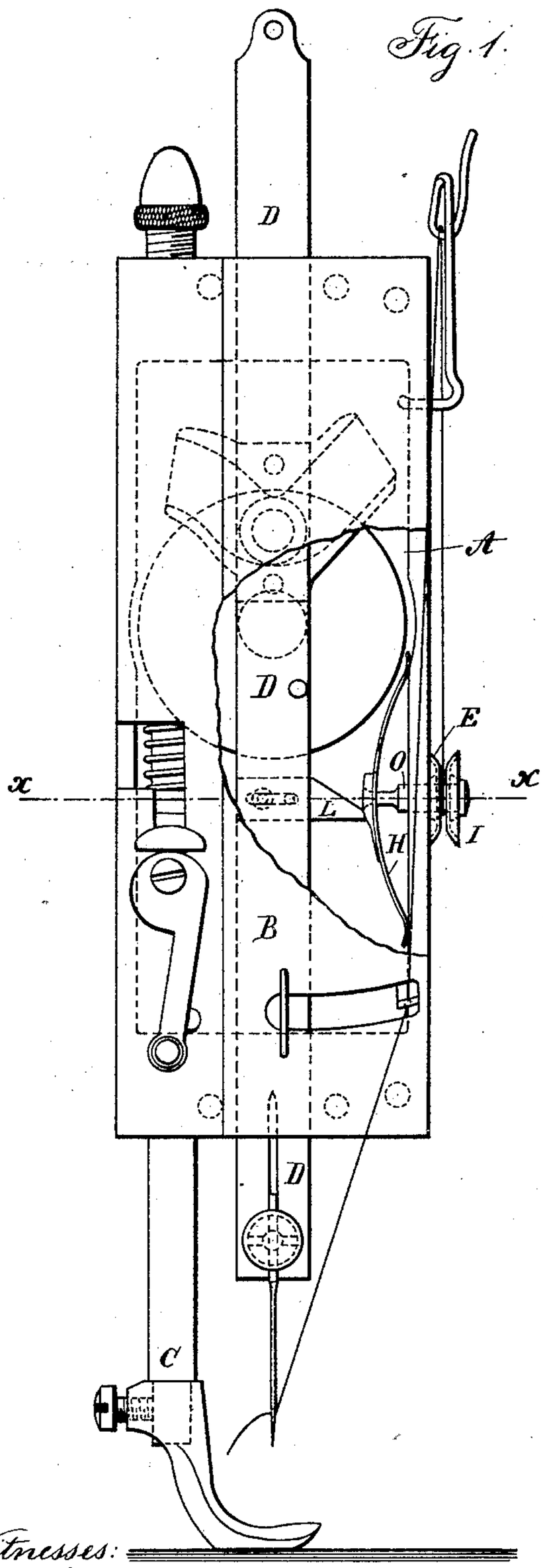
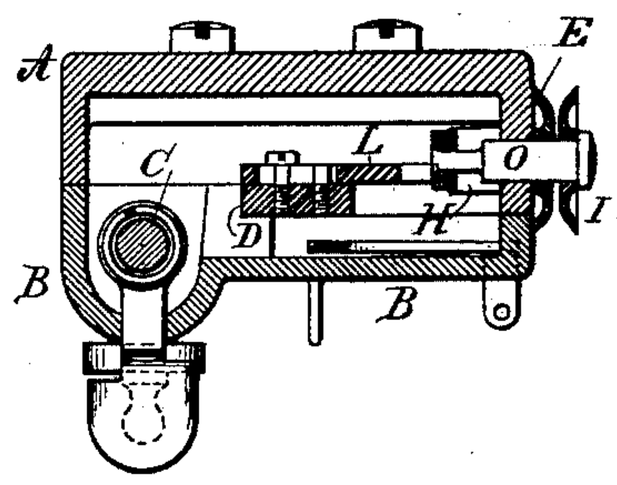


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

DAVID CRAWFORD, OF ASBURY PARK, NEW JERSEY.

AUTOMATIC TENSION FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 358,963, dated March 8, 1887.

Application filed October 12, 1885. Serial No. 179,609. (No model.)

To all whom it may concern:

Be it known that I, DAVID CRAWFORD, of Asbury Park, in the county of Monmouth and State of New Jersey, have invented an Improvement in Automatic Tensions for Sewing-Machines, of which the following is a specification.

Automatic tension devices for sewing-machines have heretofore been made in which the thread passes through between clamping-disks, and there is a cam that causes the disks to be opened when the presser-foot is elevated, and these tension-disks are opened by a connection to the presser-foot.

In my improvement the needle-bar is made to operate directly upon the automatic tension device to open the same when the needle-bar is at its extreme elevation, thus releasing the thread at this point so that it may be free to draw off the spool when the work is being changed; but at all other places the thread is clamped between two surfaces that apply the tension and allow the thread to be drawn through to the extent necessary in performing the sewing, thus simplifying the construction of the parts and rendering the machine more reliable in its operation.

In the drawings, Figure 1 is an elevation of the sewing-machine head with the cap-plate partially removed, and Fig. 2 is a sectional plan at the line *x x*.

The head A of the sewing-machine, the face-plate B, the presser-foot and bar C, and the needle-bar D are to be of any ordinary construction, as usual in this class of machines.

The automatic tension device is composed of the disks E and I, which are by preference made of thin sheet metal with flaring edges, and these are upon a pin, O, that passes through the side flange or front plate of the head A, and there is a spring, H, inside the head, into which the pin O is fastened. Upon the needle-bar is a projecting cam, L, which, by preference, is connected to the needle-bar by a screw passing through a slot in the cam, so that such cam may be adjusted to compensate for wear, and the end of this cam comes into contact with the end of the pin O, or a projection, P, on the surface of this spring H, as the needle-bar completes its upward movement, and thereby the spring H and pin O are slightly moved and the pressure of the spring taken off the thread, it being understood that the thread in its passage from the spool to the needle goes in between the disks E I and below the pin O; hence the operation of the parts will be that during the descent of the needle and its rising again the spring H and pin O will cause the tension-disk I to press the thread against the disk E and hold the same with whatever force there may be in the spring H, so that the needle and other parts in performing the sewing will draw up the stitch with the tension due to the holding power of the disks E I and spring H; but the tension device will be opened and the thread released slightly before the needle reaches its extreme upward movement. At this point, therefore, the thread is entirely free and can be drawn off or wound upon the spool, as may become necessary. Thereby the thread is free to be drawn off at a time when the work is removed from the machine or replaced, and the automatic tension is not in any manner dependent upon the presser-foot or the device for moving the same, and the thread being released from all tension each time the needle is out of the cloth, is free to contract to its normal condition between the eye of the needle and the automatic tension, and is not liable to be broken when the next stitch is taken.

I do not claim tension-plates and a cam upon the presser-foot bar to relieve the tension when the presser-foot is raised, as they have been used; neither do I claim tension-plates connected with the presser-bar and acted upon by an offset on the needle-bar at its extreme downward movement, and in some instances the tension has been relieved at the extreme upward movement of the needle-bar. With my improvement the tension-plates hold the thread firmly, except at the extreme upward movement of the needle, and being liberated at this time the thread can be drawn out at the termination of the sewing, and this can be done whether the presser-foot is either raised or not, and the stitch is always properly pulled up and the thread is not liable to be broken.

I claim as my invention—

The combination, with the needle-bar and

sewing-machine head, of a cam attached to the needle-bar, the spring H within the sewing-machine head, a projection against which the cam acts, the pin O, connected with the spring and passing through the head A, and the tension-disks I E, outside the head A and upon such head, substantially as set forth.

Signed by me this 3d day of October, A. D. 1885.

DAVID CRAWFORD.

Witnesses:
R. TENBROECK STOUT,
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