

(No Model.)

W. J. STEWART.  
TENSION FOR SEWING MACHINES.

No. 477,078.

Patented June 14, 1892.

FIG. 1.

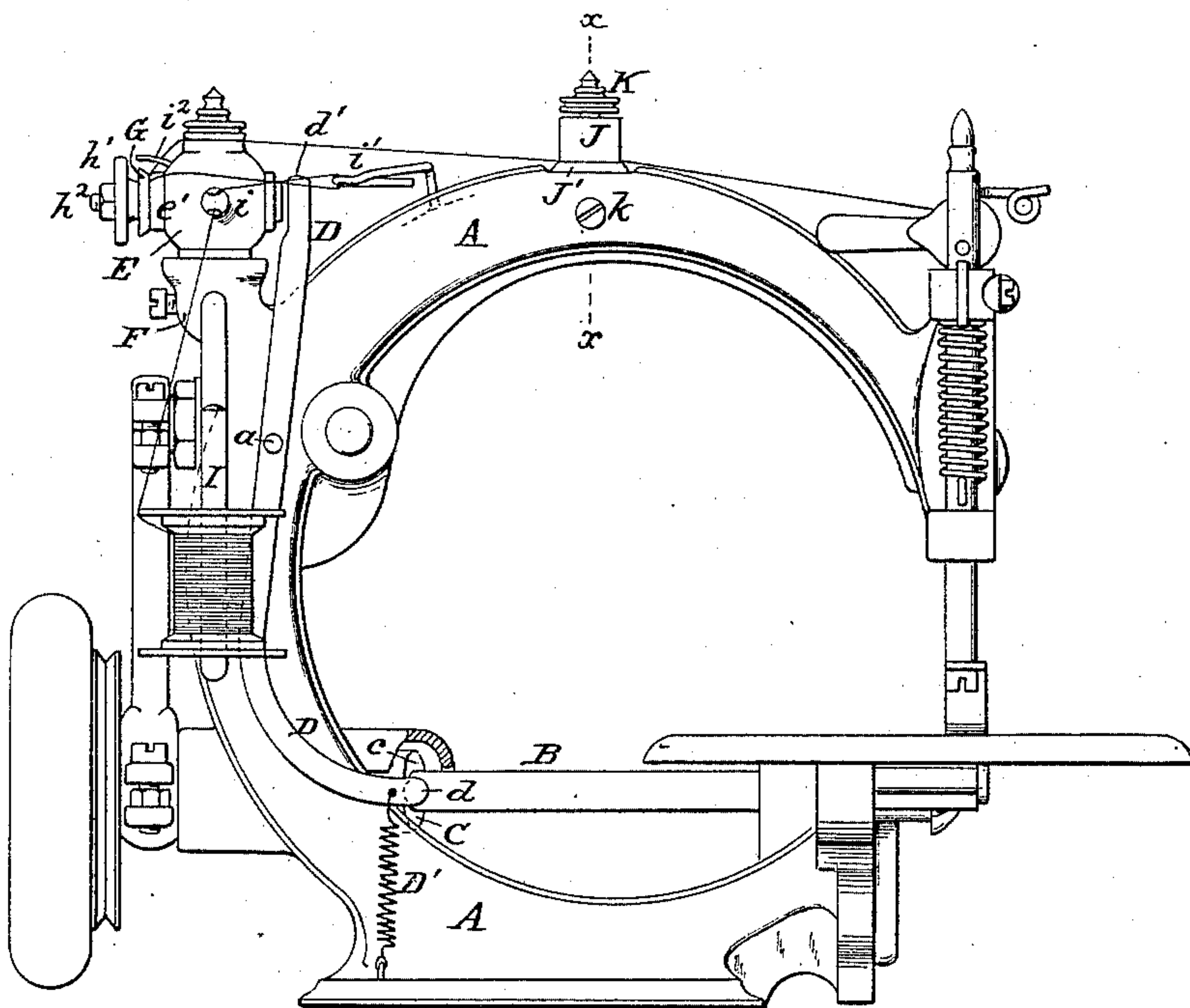


FIG. 3.

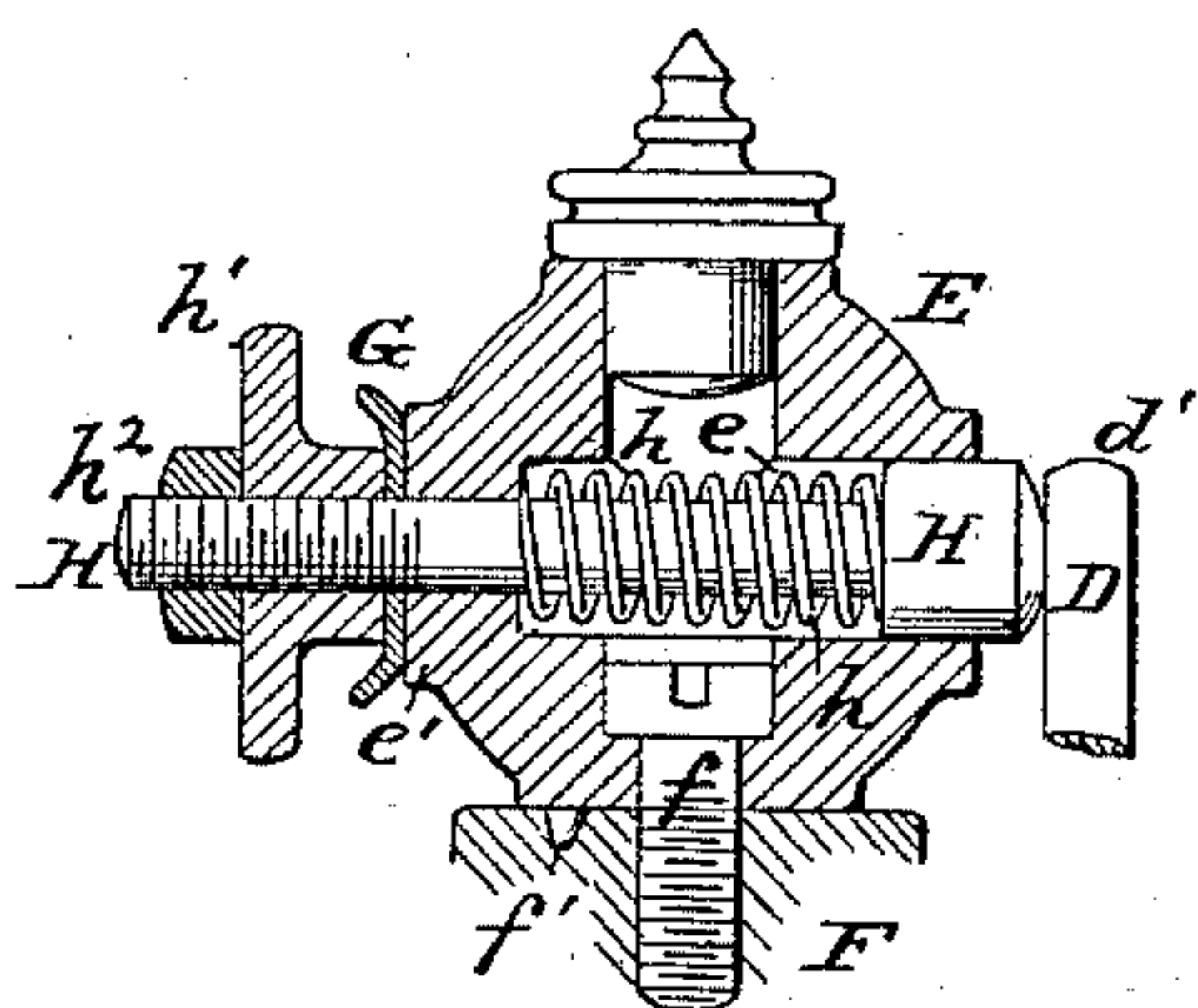


FIG. 4.



FIG. 5.

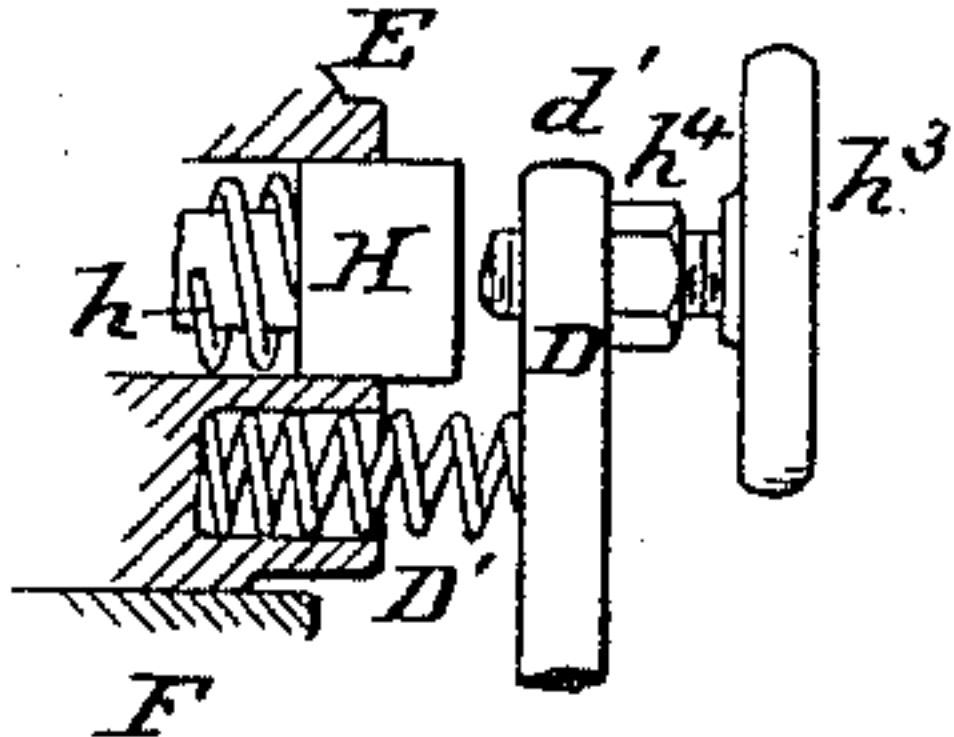
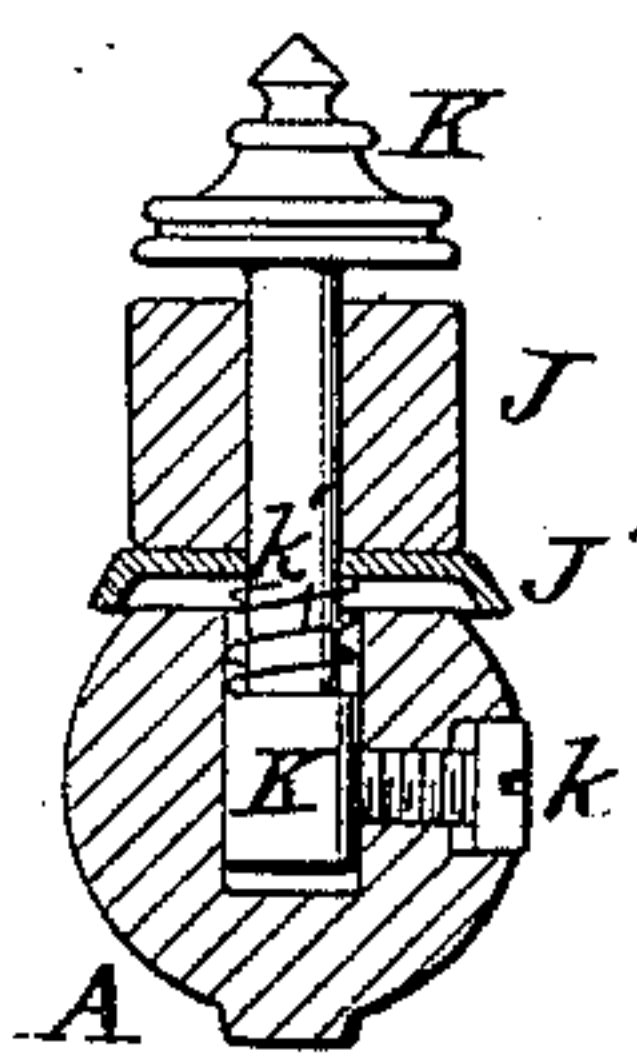


FIG. 2.



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# UNITED STATES PATENT OFFICE.

WILLIAM J. STEWART, OF CHICAGO, ILLINOIS.

## TENSION FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 477,078, dated June 14, 1892.

Application filed April 9, 1888. Serial No. 270,150. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. STEWART, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Tensions for Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to certain improvements in that type of sewing-machine tensions in which the thread is alternately clamped and released in a positive manner at predetermined intervals by a set of clamping-jaws that are positively and automatically opened and closed by a cam or eccentric upon the driving-shaft of the machine; and the present improvement has for its objects to provide an improved automatic tension appliance embodying the features of simplicity of construction, ease of adjustment, and an even and regular tension in securing a perfect stitch. I attain such objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a sewing-machine to which my invention is applied; Fig. 2, an enlarged detail cross-section at line  $xx$ , Fig. 1; Fig. 3, an enlarged detail section of the tension-head and its attachments; Fig. 4, a detail plan of the operating-lever of the tension device, and Fig. 5 a detail sectional elevation of a modified arrangement of parts.

Similar letters of reference indicate like parts in the several views.

Referring to the drawings, A represents the main arm or frame of the machine; B, the driving-shaft; C, the tension-operating cam, and D the tension-operating lever, pivoted to the side of the arm by a transversely-arranged pivot  $a$  and adapted to vibrate in a vertical plane parallel with the axis of the driving-shaft B. Such lever has its lower end bent forwardly and laterally, as shown, so as to form a cam-engaging finger  $d$ , that bears against the face  $c$  of the cam C to be operated thereby. The face  $c$  is formed at the forward end of the cam-hub and is arranged in a plane at right angles to the axis of such cam and its carrying-shaft B.

The movement of the lever D is positive in one direction through cam C  $c$ , and its movement in the opposite direction is effected by a spring D', suitably connected to the lever D and the arm of the machine.

The upper end of the arm D is bent laterally, as shown, so as to form a horizontal arm  $d'$  for operating the tension device, as herein-after described.

The tension device consists of a fixed globular head E, attached to the bracket-lug F, cast on the arm A by a screw  $f$ , passing down from the top, with its head some distance below the horizontal passage  $e$  in said head, so as not to interfere with the operation of the mechanism that is arranged within such passage.  $f'$  is a steady-pin or dowel on the head E, engaging in a recess in the lug F, to prevent the head from turning out of its proper position after the parts are attached together.

G is the movable tension-disk, supported on the rear end of a horizontally-moving piston H, arranged in the horizontal passage  $e$ , and moved in a forward direction by a coiled spring  $h$  and in a backward direction by the tension-lever D, which impinges against its forward end, as shown.

The fixed jaw or plate of the tension device is formed by a rim  $e'$  on the head E, as shown, or a loose disk may be arranged at such point, if desired.

Adjustment of the tension with relation to the duration of the time that the thread is held is effected in the construction shown in Figs. 1 and 3 by the longitudinal adjustment of the piston H within the passage  $e$ , a forward adjustment lessening the time, while a backward adjustment increases the same. Such adjustment is effected by a thumb and jam nut  $h'$   $h^2$ , screwing upon the screw-threaded rear end of the piston H back of the tension-disk G. The same adjustment of the tension can be effected by the modified arrangement of parts shown in Fig. 5, in which a longitudinal set-screw  $h^3$ , arranged horizontally in the upper end of the tension-lever D, is made adjustable in relation to the forward end of the piston H,  $h^4$  being a jam-nut by which the set-screw  $h^3$  is held to its adjustment. With this construction the movable tension-disk G can be fixedly attached to the piston end, if desired.



I is the spool-holder, *i i'* thread-guides, and *i<sup>2</sup>* a lead-wire guide for the thread to the tension-disks.

To attain a more perfect and even passage  
5 of the thread to the needle, I provide, in connection with the automatic tension appliance above described, a gravity-tension device of the following construction: J is a cylindrical weight moving vertically on a headed  
10 guide-pin K, that is made adjustable in a vertical passage in the top of the arm A, as shown, and which is held to its adjustment by a laterally-arranged set-screw *k*, as indicated in Figs. 1 and 2. The bottom of the  
15 cylinder J and a loose disk J', above which the cylinder is placed, form a tension-passage for the thread from the automatic tension to the needle, a feather-spring *k'* being preferably arranged under the disk J' to form  
20 an elastic cushion for the tension parts.

The purpose of the above-described mechanism is to regulate with great uniformity the passage of the thread to the needle when the automatic tension-jaws are in their open  
25 condition and prevent the jerking through the said tension-jaws of an unnecessary

length of thread when the machine is running at a high speed.

Having thus fully described my said invention, what I claim as new, and desire to secure 30 by Letters Patent, is—

A sewing-machine tension comprising, in combination, a pair of thread-clamping jaws or heads capable of opening to release the thread, an operating-lever D for the same 35 pivoted to the side of the machine-arm by means of a transversely-arranged pivot *a*, so as to vibrate in a plane parallel with the side of said arm, and having its lower end extended forwardly and laterally to engage the 40 operating-cam, the main driving-shaft B, carrying a hub or cam C, the operating-face of which is on the forward end of the hub, and a spring for drawing the lower end of the lever D backward in a direction opposite to 45 the cam, substantially as set forth.

In testimony whereof witness my hand this 9th day of March, 1888.

WILLIAM J. STEWART.

In presence of—

ROBERT BURNS,  
G. W. SMITH.