

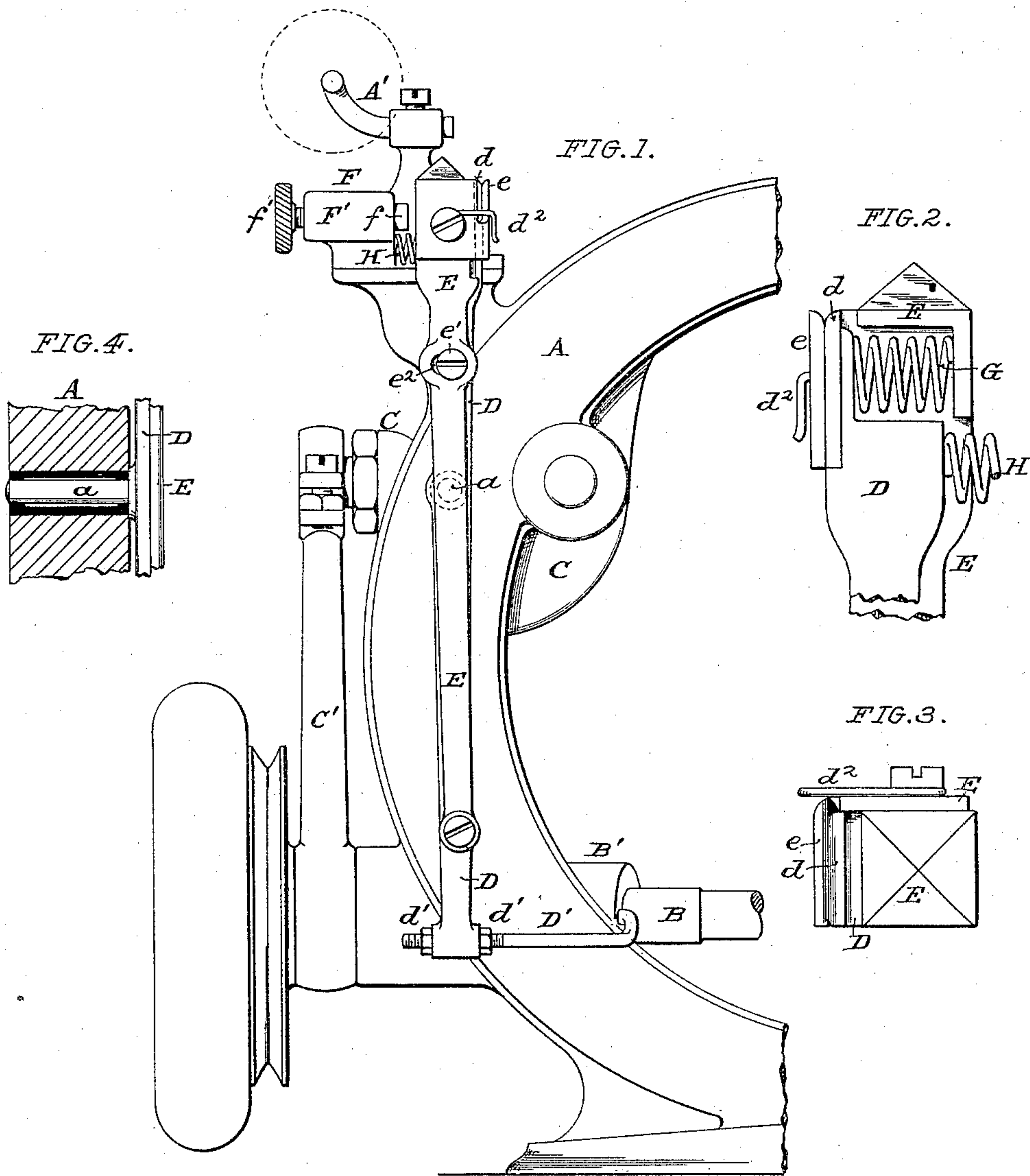
(No Model.)

W. J. STEWART.

TENSION MECHANISM FOR SEWING MACHINES.

No. 433,661.

Patented Aug. 5, 1890.



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# UNITED STATES PATENT OFFICE.

WILLIAM J. STEWART, OF CHICAGO, ILLINOIS.

## TENSION MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 433,661, dated August 5, 1890.

Application filed July 21, 1887. Serial No. 244,946. (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 class of thread-controlling devices for sewing-machines in which the thread is positively clamped and released 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 at proper points in the time or movement of the machine; and the objects of the present improvements are, first, to provide a cheap, simple, and durable device whereby the gripping and releasing of the thread at the proper moments is effected in a very perfect and automatic manner; second, to afford means by which the tension on the thread can be regulated and adjusted during the operation of the machine; and third, to furnish an improved construction whereby the tension jaws or plates will open in approximately parallel planes to each other. I attain such objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the rear part of a sewing-machine to which my improvements are applied; Fig. 2, an enlarged detail rear elevation of the tension jaws or plates of my improvement; Fig. 3, a detail top view of the same, and Fig. 4 a detail cross-section illustrating the pivot or journal of the vibrating lever of my improved mechanism.

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

Referring to the drawings, A represents the fixed arm of the sewing-machine, carrying a suitable spool-holder A'; B, the main driving-shaft, and C the vibrating needle-arm, receiving motion through connecting-rod C', from an eccentric on the main shaft, as indicated in Fig. 1.

D is a vibrating lever pivoted at *a* to the

side of machine-arm A, so as to move in a plane longitudinally therewith, its lower end being provided with a finger D', that bears against and is actuated by the revolving cam B' on the driving-shaft B, while its upper end forms or carries one of the jaws or plates *d* of the thread-controlling mechanism. The finger D' is made adjustable on the lever D by jam-nuts *d'*, so as to properly adjust or time the movement of said lever so as to be in unison with the other movements of the machine. The other jaw or plate *e* of the thread-controlling or tension device may in some cases be adjustably secured to the fixed arm of the machine; but I prefer to arrange it at the upper end of a secondary lever or arm E that is pivoted to the lever D at a point below its fulcrum *a*, and in a plane to the rear of the same, the purpose being to attain a nearly parallel movement of the one jaw away from the other. The two levers so arranged form a compound lever, the members of which move in unison until the upper end of the lever E reaches the adjustable stop F, when its movement is arrested and the jaws are caused to open and release the thread. The jaws are held together under a yielding pressure by means of a spring G, arranged within a recess formed in the upper ends of the levers D and E, as indicated in Fig. 2.

H is a spring attached to the fixed arm A, and bearing against the lever D to keep the finger D' of the same against its operating-cam B'.

The jaws *d* and *e* are arranged vertically, as shown, and the thread is guided between the same by means of a lead-wire guide *d*<sup>2</sup>, as indicated in Figs. 1, 2, and 3.

The arrangement of the springs G and H, as shown, is preferred; yet any other suitable form or location of the same may be employed without departing from the spirit of my invention.

The levers D and E are confined together at their upper ends by means of a stud-bolt *e'* passing through an elongated slot *e*<sup>2</sup> in the lever E, as indicated in Fig. 1.

The adjustable stop F—the adjustment of which determines the grip or duration of the period of tension on the thread—consists of an adjustable plunger *f*, moving in a fixed



housing F', and operated by a temper-screw f', as indicated in Fig. 1; yet any other well-known form of stop may be substituted therefor without departing from the spirit of my invention.

The pivot of the lever D consists, preferably, of a fixed journal-stud *a* on said lever working in an elongated bushing inserted in the arm A, as indicated in Fig. 4.

The actuating-face of the cam B' is arranged at right angles to the axis of the shaft B, and, owing to my improved arrangement of levers and tension-jaws, may be formed by beveling the hub at the desired angle, so that a progressively increasing and decreasing movement similar to that of a crank will be imparted to the finger D' and lever D, and as a consequence thereof the movement will require but a minimum of power and cause the parts to run very light.

Another very decided advantage of my improved mode of arranging the tension-jaws with relation to each other is the almost instantaneous clamping and releasing of the thread at the proper moments, that takes place as the lever E moves away from or moves against the adjustable stop F.

In the present case no claim is made for the general arrangement of the lever that operates the tension-jaws at the side of the machine-arm, and upon a transversely-arranged pivot, with the cam for operating the same, having its operating-face formed at its forward end at right angles to the axis of the driving-shaft, as such is substantially embraced in my pending application for Letters Patent, Serial No. 270,150, filed April 9, 1888.

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

1. A sewing-machine tension device comprising, in combination, a main lever D, pivoted at the side of the machine-arm by means of a transversely-arranged pivot *a*, and carrying at its upper end the tension-jaw *d*, and at its lower end the cam engaging finger D', the secondary lever E, pivoted on the lever D, and carrying the tension-jaw *e*, and adjustable stop, as *f*, for the upper end of the lever E, spring G, for holding the jaws together, the main shaft B, carrying the cam or hub B', the operating-face of which is at the forward end of said hub and at right angles to the axis of the shaft B, and a spring for imparting motion to the levers in a direction opposite to the cam, essentially as herein described.

2. The combination, in a tension device for sewing-machines, of the lever D, pivoted at the side of the machine-arm, lever E, pivoted on the lever D, stud *e'*, elongated slot *e''*, thread-clamping jaws *d* and *e* attached to said levers, adjustable stop, as *f*, for the lever E, spring G, for holding the jaws together, main shaft provided with an operating cam B', cam engaging finger D' on lever D, and spring H for imparting motion to the parts in a direction opposite to the cam, essentially as herein described.

In testimony whereof witness my hand this 18th day of July, 1887.

WILLIAM J. STEWART.

In presence of—

ROBERT BURNS,  
M. H. HOLMES.