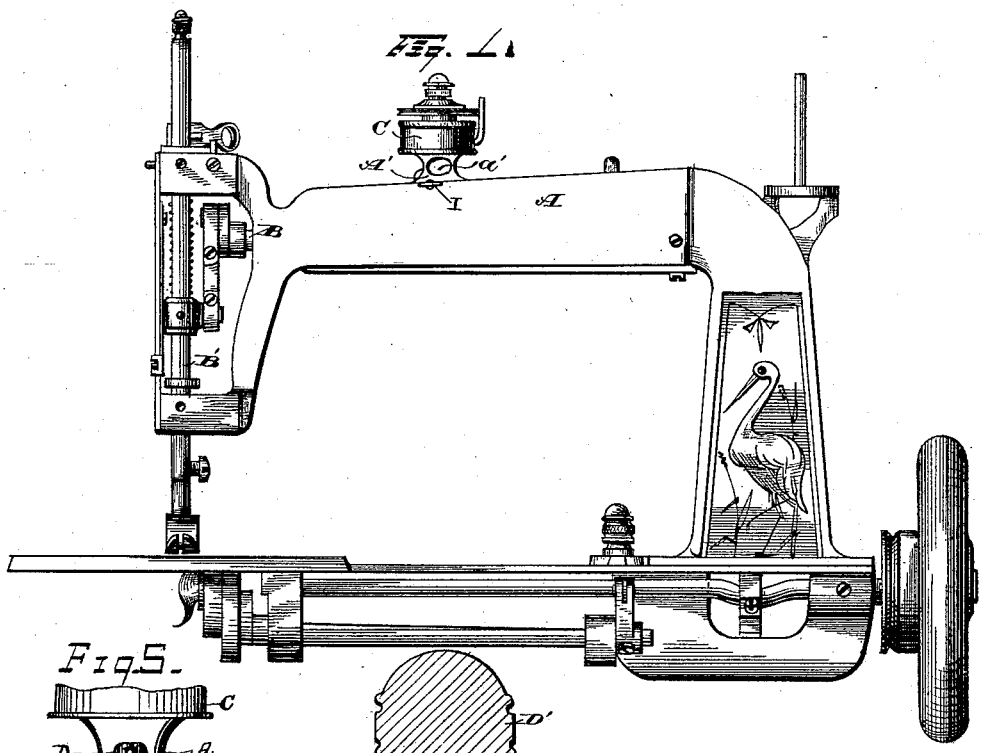
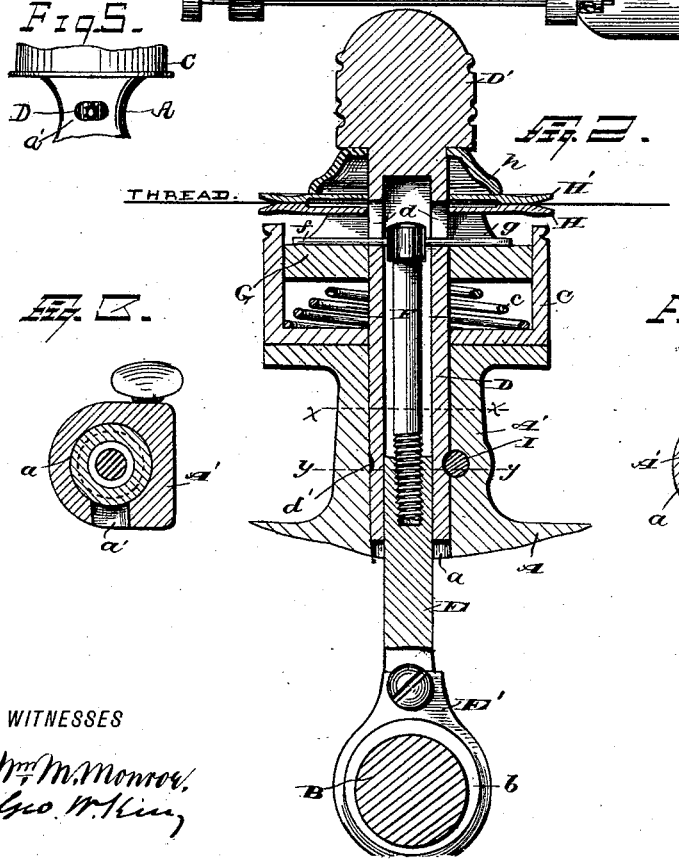
(No Model.)

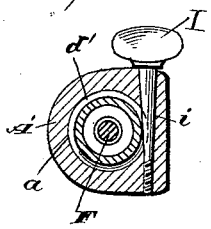
G. A. FLEHARTY.

INTERMITTINGLY ACTING TENSION.

No. 345,581. Patented July 13, 1886.







WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE A. FLEHARTY, OF CLEVELAND, OHIO, ASSIGNOR TO JOSEPH FEUSIER, OF SAME PLACE, FREDERICK K. HURXTHAL, OF CANTON, OHIO, AND SAMUEL L. BOGGS, OF PITTSBURG, PENNSYLVANIA.

INTERMITTINGLY-ACTING TENSION.

SPECIFICATION forming part of Letters Patent No. 345,581, dated July 13, 1886.

Application filed October 22, 1885. Serial No. 180,606. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. FLEHARTY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Intermittingly-Acting Tensions for Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to an improved intermittingly-acting tension for sewing-machines; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a chain-stitch sewing-machine with my improved tension mechanism attached. Fig. 2 is an enlarged elevation, in section, of the tension mechanism. Figs. 3 and 4 are horizontal sections, respectively, on the line *x x* and *y y*, Fig. 2; and Fig. 5 is a detached view showing the opening *a'* and the spindle having a mark thereon.

A represents the arm of the sewing-machine, and B the rock-shaft that operates the needle-bar B'. The arm A is provided with an upwardly-projecting boss, A', the latter having a vertical central bore, *a*, and a lateral opening, *a'*.

C is an annular casing that rests on the boss A', and in which is seated the spiral spring *c*. The casing has a central opening through the bottom thereof, through which passes the hollow spindle D. The spindle has a thumb-piece, D', for revolving the same, has lateral slots *d* leading into the central chamber, and has an annular groove, *d'*, as shown more clearly in Fig. 2. The spindle extends well down in the boss A', as shown, and at the lower end receives the rod E, the latter fitting the bore of the spindle nicely. The rod E is pivoted to the eccentric-strap E', that engages the eccentric *b* on the rock-shaft B. The upper end of the rod E has a threaded hole that receives the screw end of the bolt F. The upper end or head of this bolt has a lateral hole, in which is placed the pin *f*, that extends through the slots *d* of the spindle and into the groove *g* of the follower G. The latter is an annular block, shaped substantially as shown in Fig. 2. The follower rests upon the spring *c*, and above abuts against the lower tension-plate, H. The groove *g* is merely a deep channel across the center of the follower to accommodate the vertical movement of the pin *f*. The upper tension-plate, H', is held down by the collar *h*, the latter engaging the thumb-piece D'. The arrangement is such that in assembling the parts the spindle D is pressed down, carrying with it of course the tension-plates and follower G, so as to compress the spring *c* to such an extent that a thread between the plates H and H' is held rigidly. In such depressed position of the spindle the annular groove *d'* is engaged by the set-screw I. This set-screw (shown more clearly in Fig. 4) has a shank, *i*, that is slightly conical where it engages the groove *d'*. The threaded end, that is of considerable length, enters a threaded hole in the boss A', as shown. When this screw is turned in, the conical part *i* is pressed into the groove *d'* and locks the spindle D, and prevents the latter from turning. By backing out the screw I a trifle the spindle is released, so that it may be turned. Meanwhile the part *i*, although fitting the groove *d'* loosely, holds the spindle from vertical displacement. If the end of the set-screw engaged the groove *d'*, the latter being necessarily shallow, if the set-screw were backed out a trifle too much, the vertical adjustment of the spindle would be lost, and the recoil of the spring would probably throw the spindle entirely out of place and scatter the parts. With the arrangement shown the taper of the conical part *i* is so slight that the screw might be given several revolutions before backing it far enough to be wholly disengaged from the groove *d'*, so as to lose the vertical adjustment of the spindle. The great advantages of this arrangement will more fully hereinafter appear.

By reason of the pin *f* extending through the head of the bolt F, and also through the slots *d* of the spindle, it is evident that the bolt will turn with the spindle, and that by means of the thumb-piece D' the bolt may be turned to screw it into or out of

the rod E, so as to lengthen or shorten the connection with the eccentric-strap. This connection having been adjusted and the eccentric having been suitably adjusted on the rock-shaft B, the relation of parts is such that when a supply of thread is wanted at the needle the downward throw of the eccentric causes the pin *f* to depress the follower, thereby reducing the pressure of the disks H and H′ on the thread to a suitable tension. A reverse movement of the shaft B and eccentric causes the pin *f* to be lifted from the follower, when the recoil of the spring again presses the tension-plates firmly upon the thread, the pin *f* meantime moving up in the slots *d* and in the groove *g*.

The adjustment aforesaid, that will give a suitable tension for all ordinary work, is made at the factory, and a letter or mark is made on the spindle opposite the hole *a′*, and when such letter, mark, or character is seen through said hole it denotes that the tension device is in its normal position. Now, if for any reason a lighter tension is required, the set-screw I is loosened, (that is, backed out a trifle,) and the spindle D is turned in the direction that "screws in" the bolt F, which will of course shorten the connecting-rod, so that the throw of the cam will further depress the follower, and the disks will only grasp the cotton for a short space of time. When the screw-bolt is unscrewed more or less, then the grasp of the tension-disks extends for a longer period than that of the eccentric passing the upper dead-center—that is, it occupies the time immediately preceding the arrival of the eccentric at the upper dead-center, the time of passing it, and a certain length of time thereafter, thus allowing a longer period of tension on the thread. Such adjustments of the tension are usually only required temporarily, and to return the parts to their normal adjustment the operator has only to turn back the spindle until the mark appears in the opening *a′*. We have then a tension device automatic in its functions, that can easily be changed to give the desired tension, and can as easily be returned to its normal position and without any liability of losing the vertical adjustment of the spindle or displacement of the parts.

What I claim is—

1. In an intermittingly-acting tension for sewing-machines, the combination, with tension-plates held rigidly from above a follower and spring for supporting the plates from below, of an eccentric mounted on the rock-shaft, an eccentric-strap, and adjustable connecting-rod, said rod having a lateral pin for engaging the follower when the pin is depressed, the parts being arranged substantially as indicated, whereby the spring is more or less depressed to give the required tension, according to the length to which the connecting-rod is adjusted.

2. The combination, with the tension-plates and the spindle D, having an annular groove, *d′*, of the set-screw I, the latter having a conical shank for engaging said groove, the parts being arranged substantially as set forth.

3. The combination, with the tension-plates, the spindle D, groove *d′*, and set-screw I, arranged substantially as indicated, of the orifice *a′* and mark on the spindle to indicate, as seen through the opening, the normal position of the latter, substantially as described.

4. The combination, with the tension-plates, the spindle D, and rod E, of the casing C, a spiral spring seated therein, the follower resting on said spring, and the bolt F, adjustably secured to the rod E and engaging the follower, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 6th day of October, 1885.

GEORGE A. FLEHARTY.

Witnesses:

CHAS. H. DORER,

ALBERT E. LYNCH.