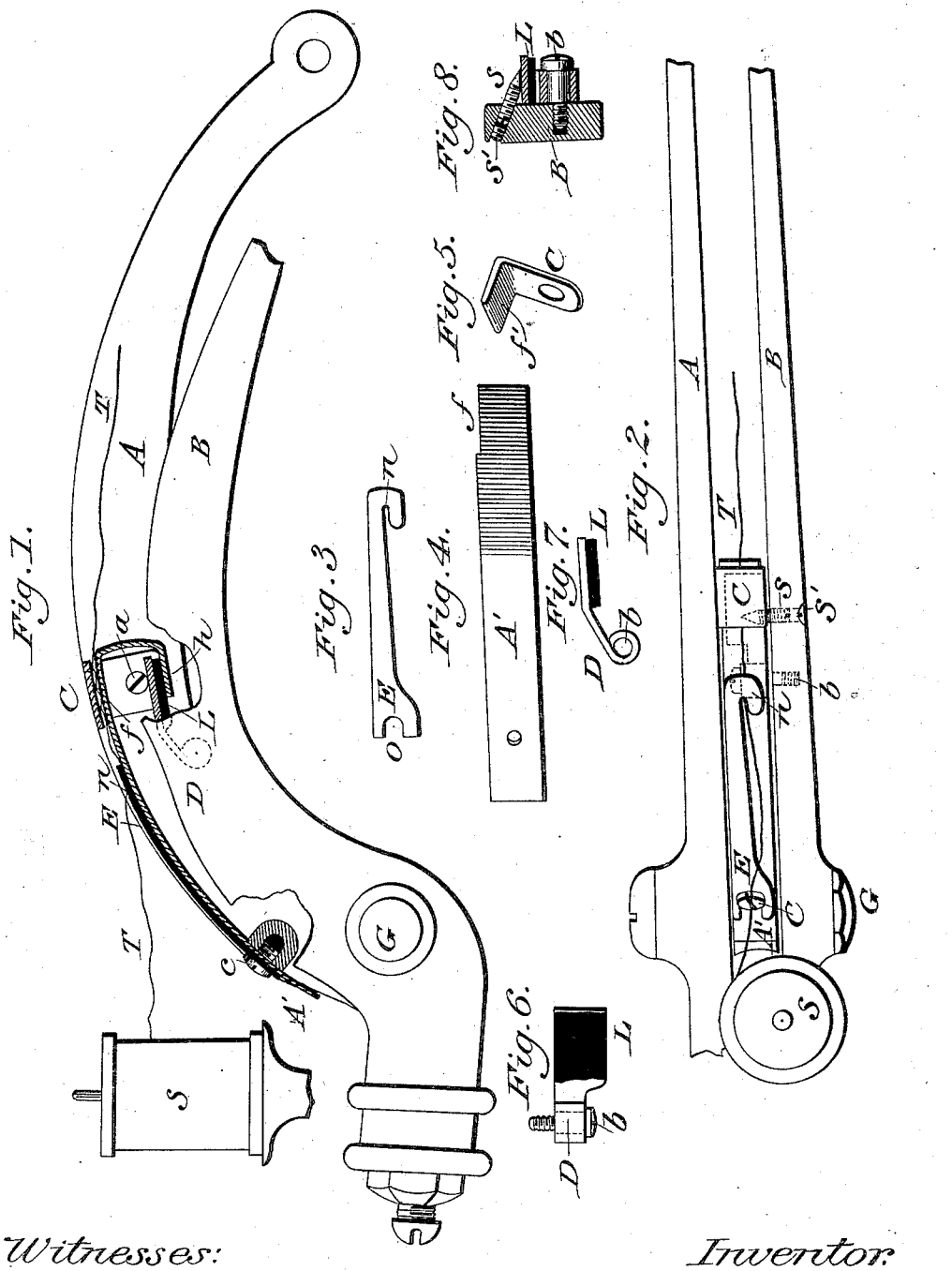
(No Model.)

A. A. BOUTON.

AUTOMATIC TENSION FOR SEWING MACHINES.

No. 344,765. Patented June 29, 1886.



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UNITED STATES PATENT OFFICE.

ARTHUR A. BOUTON, OF BROOKLYN, NEW YORK.

AUTOMATIC TENSION FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 344,765, dated June 29, 1886.

Application filed November 27, 1885. Serial No. 184,093. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR A. BOUTON, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Automatic Tension for Sewing-Machines, which invention is fully set forth and illustrated in the following specification and accompanying drawings.

The object of this invention is to provide a simple, cheap, and efficient automatic tension device for sewing-machines, by means of which the thread shall not only be taken from the spool as required for each stitch and firmly held by said device during the descent of the needle to form the stitch, but also drawn backward and tightened during the greater portion of the upward stroke of the needle, thus constituting a pull-off, tension, and take-up device all in one.

The invention consists of the parts and combinations of parts, as hereinafter described, and set forth in the claims.

In the accompanying drawings, Figure 1 shows in elevation the inner side of the vibrating or needle arm having part of the tension device secured thereto. The stationary arm is also shown broken away in parts. Fig. 2 shows in plan, each partly broken, the vibrating or needle arm and the stationary or fixed arm. Upon a center passing through said latter arm the former vibrates. Figs. 3, 4, 5, 6, 7 show details of the tension device hereinafter particularly described. Fig. 8 shows a section of the stationary arm of the machine provided with an adjusting-screw, hereinafter described.

In said figures the several parts are designated by letters, as follows: A is the vibrating arm or needle-bar of the machine; B, the stationary arm; A′, a spring-jaw secured by the screw *c* to the top of the vibrating arm A; C, a fixed jaw, forming an angle-piece, secured by the screw *a* to the inner side of the vibrating arm A, and with the spring-jaw A′ forming a clamp, between which the thread T is held when said jaws close, to effect the desired tension upon said thread.

The stop D is secured to the inner side of the stationary arm B by the screw *b*, and projects within and over the hook end *h* of the spring-jaw A′. After said stop is so secured it is accurately adjusted to the proper set to arrest the rise of (and thus to depress) the spring-jaw A′ by means of the screw-pin *s*, which is screwed into and through the arm B at an angle which causes the point of said screw to depress the stop D or permit it to be raised, depending upon the depression of the point of said screw, as is clearly shown in Fig. 8.

The auxiliary spring E is secured in place on top of the spring-jaw A′ by the same screw, *c*, which secures said jaw to the arm A, the screw *c* passing through the slot *o* in the rear end of the spring E. (Shown in Fig. 3.)

The threads of the screw-pin or set-screw *s* are jammed by the jam-screw S′, as shown in Fig. 8, so that said screw cannot turn when once set. A more important office of the screw S′, however, is to guard the screw *s*, after being properly set, from being inadvertently or otherwise turned, so as to disturb the proper adjustment of the stop D, for it is evident that the guard-screw S′ may be turned both back and forth without in anywise moving the interior adjusting-screw, *s*. The stop D has its face lined with leather, L, or some other suitable sound-deadening material, so as to prevent any noise arising from the impact of the spring-jaw A′ and said stop.

The faces of both the spring-jaw A′ and the fixed jaw C are serrated or scored by lines or indentations, so that the thread T, as it is pulled off the spool S, may be more perfectly or certainly held between said jaws without danger of slipping.

The operation of the several parts in effecting the desired tension and release of the thread is as follows: From the spool S the thread is led in the usual manner, either directly or through any suitable thread-eyes, as fair-leaders, suitably placed between the spool and the auxiliary spring E, to and under the hook *n* of said spring, thence to and between the jaws A′ C, and thence through other thread-eyes suitably placed, to the eye of the needle. (Not shown). In the position of the needle-arm A shown in Fig. 1 said arm is at its extreme upward throw, and it will be observed that in said position the hook *h* of the spring-jaw A′ is in close contact with the stop D, secured to the fixed arm B. The effect of

this impact is to depress said spring-jaw so that its serrated or roughened face *f* stands open or out of contact with and below the similarly-roughened face *f'* of its fellow or upper jaw, C. The vibrating needle-arm A is therefore now ready to descend, immediately upon commencing which descent the hook *h* of the jaw A' leaves the stop D, when said jaw reacts by its own elasticity and rises until its face *f* comes in close contact with the face *f'* of the upper jaw, C. This closing of said jaws clamps the thread T tightly between them, and as the needle descends with the arm A the needle enters the material to be sewed, and then, rising with the ascent of said arm, completes the stitch, sufficient thread having been forced through the material by the needle as supplied by the pull of the tension device upon the thread in unwinding the same from the spool S. The tension of the jaws A' C continues, however, upon the thread upon the ascent of the arm A until nearly the top of its stroke is reached, thus pulling up any slack thread in the stitch, when, as the stop D, just before the top of said stroke is reached, springs the jaw A' open, the further tension of the auxiliary spring E as the stroke is completed completes the stitch by the slight tightening or drawing effect which it induces upon the thread by its pressure upon the same during said remainder of the ascending stroke of the arm A.

It is obviously not essential to its proper function that the spring E be secured on top of the spring-jaw A' and by the same screw that secures said jaw to the arm A, so long as by said spring's combination with the jaws A' C it coacts with them to exert a further tension upon the thread after the tension of said jaws has ceased; and it is equally evident that the parts A', C, and D, as elements of the same combination, will perform their functions to effect the same unitary result so long as their proper motions are imparted to the jaws A' C from any parts of the machine having motions coincident with those of the needle itself, without in either case departing from the principle of this invention. The operation of the same, as shown, however, is preferable by reason of its efficiency and extreme simplicity. The stop D, however, instead of being made adjustable, may be a simple non-adjustable pin or lug permanently set to receive the impact of the spring-jaw, and to thereby open the same.

It will of course be understood that all usual or necessary adjuncts to the needle in perfecting the stitch in the material, will be used with the machines containing my said invention. Such details, however, not forming any part thereof, it is not necessary to herein describe or illustrate. They are therefore omitted.

This application has been filed in lieu of my former application, Serial No. 163,610, filed April 27, 1885, the same having been canceled.

Having thus fully described my said improvements, as of my invention I claim—

1. In a sewing-machine, a tension device consisting of a pair of automatic clamping-jaws, one fixed, the other resilient, combined with and operated by a vibrating arm, substantially as described, and an opening-stop for said jaws, attached to the machine, whereby said jaws remain closed upon the thread and effect pull-off, tension, and take-up throughout their stroke when not in contact with said stop, but are sprung open by impact therewith, substantially as and for the purposes set forth.

2. In a sewing-machine, an automatic tension device consisting of a spring-jaw, as A', and a fixed jaw, as C, attached to the vibrating or needle arm of the machine, and an opening-stop for depressing said spring-jaw, attached to the machine, the whole combined and arranged substantially as and for the purposes set forth.

3. In a sewing-machine, in combination with a resilient jaw, as A', and a fixed jaw, as C, forming part of the tension mechanism, an auxiliary spring, as E, located upon said part A', substantially as described, whereby a slight further tension is automatically exerted by said spring upon the thread by direct contact therewith during the completion of the stitch, after said thread has been released from the main tension mechanism, substantially as and for the purposes set forth.

4. In a tension device for a sewing-machine, in combination with vibrating jaws consisting of a spring-jaw, as A', and a fixed jaw, as C, for clamping the thread, a stationary stop, as D, and an adjusting-screw, as *s*, whereby said stop is set to receive the impact of said spring-jaw at the proper time to open the same, substantially as and for the purposes set forth.

5. In a tension device for a sewing-machine, in combination with a tension-releasing stop, an adjusting-screw, as *s*, and a lock-screw pin or jam-screw, S', whereby said adjusting-screw is guarded in place, substantially as and for the purposes set forth.

6. In a tension device for a sewing-machine, in combination with vibrating jaws consisting of a spring-jaw, as A', and a fixed jaw, as C, for clamping the thread, a stationary stop, as D, having a face provided with a lining of sound-deadening material, substantially as and for the purposes set forth.

ARTHUR A. BOUTON.

Witnesses:
FRANCIS P. REILLY,
WM. C. FINDLAY.

Correction in Letters Patent No. 344,765.

It is hereby certified that Letters Patent No. 344,765, granted June 29, 1886, upon the application of Arthur A. Bouton, of Brooklyn, New York, for an improvement in "Automatic Tensions for Sewing Machines," was erroneously issued to said Bouton as owner of the entire interest in said invention; that said Letters Patent should have been issued to *Arthur A. Bouton and Edward Beach Lansing*, said Lansing being assignee of one-half interest therein; and that said Letters Patent should be read with this correction therein that the same may conform to the record of the case in Patent Office.

Signed, countersigned, and sealed this 27th day of July, A. D. 1886.

[SEAL.]

H. L. MULDROW,
Acting Secretary of the Interior.

Countersigned:

M. V. MONTGOMERY,
Commissioner of Patents.