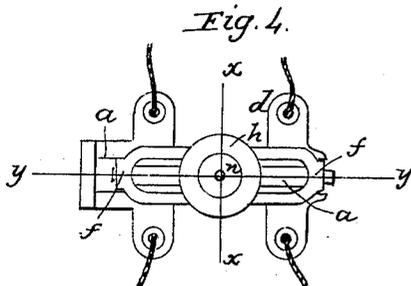
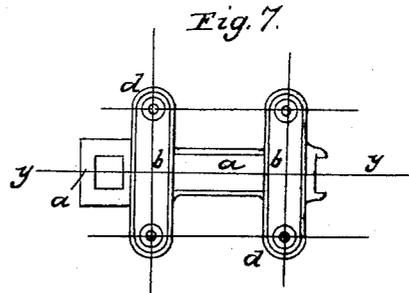
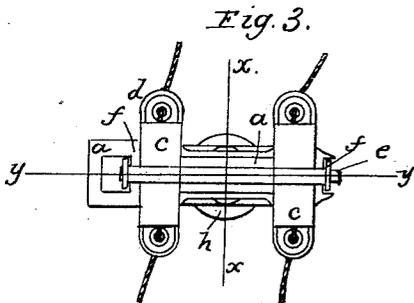
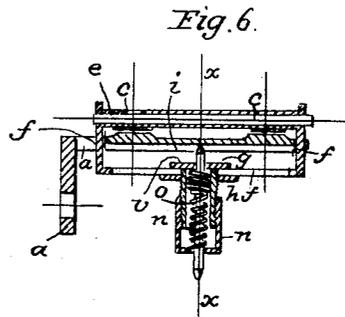
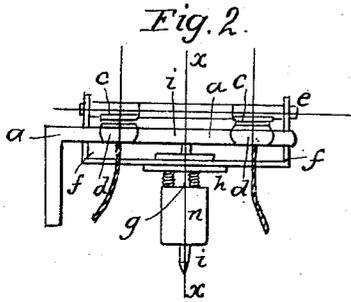
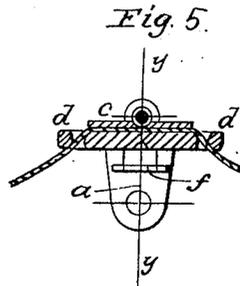
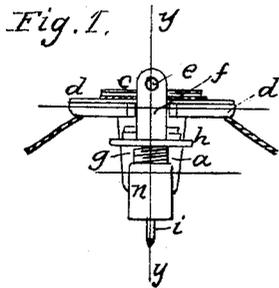


E. L. PRATT.  
Sewing Machine.

No. 35,126.

Patented April 29, 1862.



Witnesses:  
J. Frank Newman  
J. B. Crosby

Inventor:  
E. L. Pratt.

# UNITED STATES PATENT OFFICE.

E. L. PRATT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO JOHN B. COLLINS, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN THE THREAD-TENSION OF SEWING-MACHINES.

Specification forming part of Letters Patent No. 35,126, dated April 29, 1862.

*To all whom it may concern:*

Be it known that I, E. L. PRATT, of Philadelphia, in the State of Pennsylvania, and now temporarily resident in Medford, in the county of Middlesex, in the State of Massachusetts, have invented a Proportional Tension for Sewing-Machines; and I do hereby declare that the following, taken in connection with the drawings, which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention consists in so combining and arranging the tension devices which operate upon the separate threads used in a sewing mechanism forming the double chain or the Grover & Baker stitch that a relative proportion, or any desired relative proportion, of tension between the two threads operates automatically upon each thread, and is maintained operating thereupon in the same proportion without being disturbed when the total amount of pressure or tension on the threads is increased or diminished.

The drawings represent one of the various forms that my invention may be made to assume, it being that which I consider best adapted for practical use.

In said drawings, Figure 1 is an end view of this embodiment of my said invention. Fig. 2 is a side view; Fig. 3, a plan; Fig. 4, a reverse plan; Fig. 5, a cross-section taken in a plane parallel to but beyond the plane passing through lines *x x*, Figs. 2, 3, and 4; Fig. 6, a longitudinal section taken in the plane passing through lines *y y*, Figs. 1, 3, 4, 5, and 7; and Fig. 7 is a plan of the frame or main piece.

Referring to the drawings, *a* is the frame or main supporting-piece of the tension device, and it has a suitable provision by which it can be conveniently secured to a sewing-machine between the thread-spools and the needles or implements which form the stitches. The surfaces *b b* form part of and are raised above the general surface of *a*, and are smoothly finished for beds upon which the threads are pressed by the plates *c c*. Extensions *d d*, which form part of *a* and may continue the surfaces *b b*, are perforated to receive and guide the threads in passing under and from *c c*. The plates *c c* hinge upon a wire, *e*, the ends of which are

secured in the ends of the yoke or bail piece *f*, which passes up through an opening at one end of *a* and between ears projecting therefrom at the other end, and the yoke is slotted, as most clearly shown in Fig. 4, to receive and admit of the longitudinal movement of the hollow screw *g*. The check-nut *h* clamps the hollow screw in any desired position on the bail, while the cup-like nut *n* compresses a spring, *o*, which is placed around a piston, *i*, in the bore of the screw *g*, one end of which piston bears on the piece *a*, in a guide-groove formed therein.

It will be seen by the inspection of the drawings, especially Fig. 6, that compression of spring *o* by nut *n* against the stop *v* on piston or pin *i* will force pin *i* against *a*, and will tend to separate the lower or slotted portion of the bail *f* from the main piece *a*. This, it is obvious, will draw down the plates *c c* upon or toward surfaces *b b*, pinching the threads, which are placed between the said plates and surfaces *b b*; and it is also obvious that the degree of this pinching or tension depends upon the stiffness and amount of the compression of the spring *o*.

Considering the wire *e* as a beam resting on the threads passing between *c c* and *b b* for supports, and the force applied through *i* as the load upheld by said supports, it will be evident that, according to the well-known laws of statics, the pressure on each thread will be inversely as the distance of the force or load from the supports. For example, if the force is applied in the center, between the threads, the pressure on each will be equal. If applied directly beneath one of the threads, the whole of the pressure will be expended on that thread. Now, in any position of the pin *i*, it will be evident that if the nut *n* is screwed upward or backward the whole amount of tension on each thread will be changed, and that the amount on both threads will be changed, and also that the proportion of the amount will not be changed except by slackening the check-nut and changing the position of the pin *i* between the threads. The purpose, then, of the check-nut *h* is to admit of setting and securing pin *i* at the place at which force is to be applied between the presser-plates *c c*, which place may be changed at will to correspond with the requirements of the sewing; and the purpose of the nut *n* is to increase or diminish at will in accordance with the requirements of the

sewing the amount of the force applied to both threads.

In a given sewing-machine doing work upon fabrics possessed of uniform properties—such as density, thickness, hardness, &c.—with thread which is uniform, the proper position of the load upon the beam uniting the two tensions, and even the exact amount of the load, might perhaps be found by experiment, and the amount and place of the load might then be fixed; but as such conditions rarely, if ever, occur in practice, I prefer to have facilities for changing both the amount and the position of the force or load in any convenient way, that which I have specified being preferred.

I claim—

So combining and arranging the tension devices which operate upon the threads used in a sewing-machine which makes the double-chain or Grover & Baker stitch that a relative or any desired relative proportion of the whole tension upon the threads is made to be automatically operative upon each thread, and so maintained when the total tension on the threads is increased or diminished, said arrangement and combination being such that changes in the amount of the tension may be made with facility, substantially as described.

E. L. PRATT.

Witnesses:

J. FRANK NEWMAN,

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