

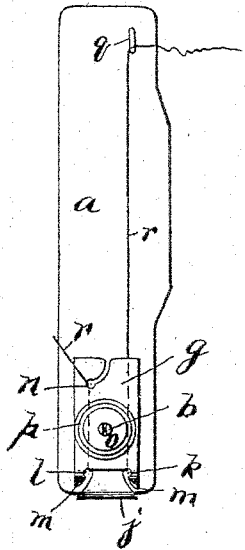
(No Model.)

G. F. RUBY.  
TENSION DEVICE FOR SEWING MACHINES.

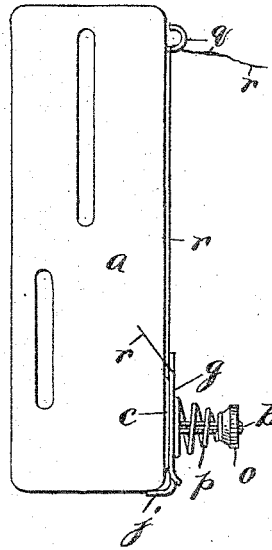
No. 491,265.

Patented Feb. 7, 1893.

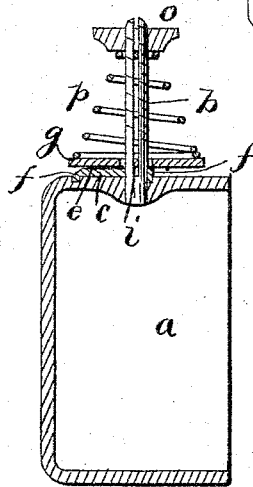
*Fig. 1.*



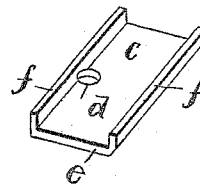
*Fig. 2.*



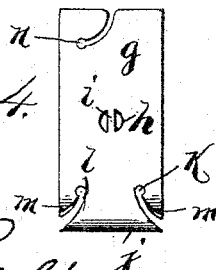
*Fig. 3.*



*Fig. 5.*



*Fig. 4.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

GABRIEL F. RUBY, OF COLUMBUS, OHIO.

## TENSION DEVICE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 491,265, dated February 7, 1893.

Application filed March 23, 1892. Serial No. 426,118. (No model.)

*To all whom it may concern:*

Be it known that I, GABRIEL F. RUBY, of Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Tension Devices for Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention relates to certain improvements in sewing machine tension devices.

Heretofore tension devices have in some instances been located on the arm of the machine and consisted of one or two plates each secured at an end and provided with an intermediate clamping screw so that the free end of the plate can be drawn down on the thread. Also in some instances disk or wheel tension devices have been located on the face plate of the machine and controlled by a spring and nut. The plate tension devices mentioned possess certain radical disadvantages encountered in practical use. The spring of the plate or plates gradually weakens; the plate or plates being secured do not permit a sufficient play or movement to permit free passage of knots or uneven portions in the thread hence the thread wears and breakage is very apt to take place. The wheel or disk tension devices are also practically imperfect, and require that the thread entering the device be under tension, hence requiring a supplementary tension device. The thread ordinarily has to be wrapped several times around the wheel or between the disks, this is a great disadvantage causing excessive friction. In the disk devices the thread wraps around the post on which the disks are mounted and because of the tension on the ingoing and outgoing portions of the thread causes the same to wear on the post.

The object of my invention is to provide a cheap simple and durable tension device composed of a minimum number of parts, and avoiding the disadvantages above set forth.

A further object of my invention is to provide a plate tension device possessing all the advantages of the disk or wheel devices and

of the old plate devices mentioned and which will avoid the disadvantages thereof by holding the thread away from the post and providing a tension plate free to rock at either end or sidewise and yieldingly held in position by a spring.

A further object of the invention is to reduce the number of parts and obviate the necessity of the supplementary tension device so that the portion of the thread entering the tension device need not be under tension and the outgoing portion only will be under tension.

A further object of the invention is to improve certain details in the arrangement and construction of parts whereby a greatly improved and highly efficient tension device will be produced.

The invention consists in certain novel features of construction and in combinations of parts more fully described hereinafter and particularly pointed out in the claims.

Referring to the accompanying drawings Figure 1, is an edge view of a face plate of a sewing machine showing the tension device in elevation. Fig. 2, is a front view of a face plate showing the tension device in edge elevation. Fig. 3, is a cross section through the face plate and tension device, enlarged. Fig. 4, is a detail top plan of the tension plate. Fig. 5, is a detail perspective view of the inner or base plate of the tension device.

In the drawings the reference letter *a*, indicates the face plate of a sewing machine. As the present invention relates to the tension device alone it is not deemed necessary to show the operative portions of a sewing machine.

*b*, indicates a slotted threaded post rigid with and extending laterally from the side or edge of the face plate.

*c*, indicates the base or inner stationary plate of the tension device. This plate is provided with the aperture *d*, near its inner longitudinal edge for the post so that the plate does not project on that side of the post. The portion of the plate projecting on the opposite side of the post forms the bearing or clamping face *e*, for the thread and over which the same passes. This plate is held stationary in any suitable manner or by suitable means. The plate is here shown provided with down-

wardly projecting longitudinal edge flanges  $f, f$ , which fit in corresponding grooves in the face plate. However I do not wish to limit myself to any such specific construction or to any specific construction of inner base or plate over which the thread travels. The edges of this plate are rounded to prevent wear on the thread and to permit easy insertion of the thread into the tension device.

$g$ , indicates the tension or movable rocking plate of the tension device provided with the approximately central aperture  $h$ , to receive the central post. A bridge or cross bar  $i$ , extends across this aperture and fits loosely in the slot of the post so that the plate can freely move longitudinally of the post or can be removed therefrom. When a thread releasing device (not here shown) is employed a rod extends longitudinally within the post and engages said bridge so that when the rod is forced in by suitable means the tension plate will be raised from the inner base. The tension plate can also be provided with the flanged or turned down end  $j$ , to engage the corner of the face plate and hold the tension plate against turning.

It should be observed that the inner longitudinal edge of the tension plate projects beyond the corresponding edge of the base  $c$ , so that a space is left between said tension plate and the face of the face plate of the machine. At the lower end of said space below the end of the base  $c$ , the tension plate is provided with the thread eye  $k$ , and a slot through the inner edge of the plate thereto, so that the thread can be easily inserted into the eye. A corresponding thread eye  $l$ , is formed directly across the plate near the outer edge of the tension plate with a slot to the outer edge of the plate. The guide fingers  $m$ , formed by said slots are turned out to assist in inserting the thread in said slots.

The thread eye  $l$ , is located at one end (lower) of the clamping or engaging portions of the base  $c$ , and tension plate  $g$ , and a thread eye  $n$ , is formed in the tension plate at its other end, so that the eyes  $l$ , and  $n$ , are located at the opposite ends of the clamping or engaging portions of the base and tension plates. This thread eye  $n$ , is also provided with an inserting slot extending through the upper end edge of the tension plate.

$o$ , indicates a thumb or adjusting nut on the outer end of the said post, having a preferably flat inner end.

$p$ , indicates a volute spring having its large end bearing and resting on the tension plate around the post and its opposite end bearing against said nut. One end of the spring is bent across the open center of the spring to enter the slot of the post and hold the spring against turning with said nut. I do not wish to limit myself to any particular form or construction of spring but prefer the form here shown.

It should be observed that the aperture  $h$ , and the bridge  $i$  are so proportioned in rela-

tion to the post that the tension plate is free to rock sidewise or at either end, and that the large end and extended bearing of the spring on said plate assists these movements. It should also be observed that a line drawn between the thread eyes  $l$ , and  $n$ , would be located a distance to the outside of the post, hence the thread guided by said eyes will be held away from the post.

In practice the thread extends down the face plate from open loop, eye or guide  $q$ , (the thread is lettered  $r$ ,) beneath the inner side or edge of the tension plate through eye  $k$ , transversely across the outside of the lower end of the tension plate, through eye  $l$ , and then longitudinally of the base and tension plate and between the clamping faces thereof and through eye  $n$ , and around to the take up of the machine not here shown. The tension is applied to the thread between the eyes  $l$ , and  $n$ , and longitudinally of the tension plate and to one side of the post so that when knots or uneven portions of the thread enter the tension device, the lower end of the tension plate can give or spring out, and as the enlarged portion passes up the plate can give sidewise and then the upper end of the plate can give out. The plate can thus give at all points and relieve itself instantly with a minimum amount of wear on the thread. The plate is free to rock in all directions, and yet can be easily and quickly adjusted to vary the tension by means of the nut and spring, also the rocking or automatic adjustment of the tension plate will permit different sizes of threads without turning the thumb nut. It should also be observed that by reason of the peculiar construction no supplementary tension device for the ingoing portion of the thread is required, but the thread merely passes through the guide  $q$ , which exerts no tension thereon.

Great advantages are attained by combining the rocking or unsecured tension plate with the spring yieldingly holding the same in position, as it permits the machine to sew a regular accurate stitch, whereas in the ordinary plate tensions where the spring plate is held down by a screw the movement of the thread was retarded when an unevenness or roughness in the thread was passing under the spring plate, as such unevenness had to be crushed down to permit its passage thereby drawing back on the thread. In my construction the thread moves under the tension plate at a constant and regular rate of speed without retardation by such plate as the plate freely rocks and permits rough or enlarged portions of the thread to slide through. Furthermore as my plate is not required to spring, but has a spring holding it in place there is no weakening as is the case where the tension plate itself has to spring and is formed of elastic material.

The extreme simplicity and great utility of this invention are obvious without further explanation.

It is evident that various slight changes might be made in the form, construction and arrangement of the parts described without departing from the spirit and scope of my invention, hence I do not wish to limit myself to exactly what is here shown and described, but

Having fully described my invention what I claim and desire to secure by Letters Patent of the United States is:—

1. In a tension device, the combination of a post, a support therefor, a base plate eccentrically mounted on the post, a tension plate loosely mounted on the post and bearing on said base on one side of the post, and provided with the thread eyes to hold the thread away from the post and longitudinally of and between the base and tension plate, and a spring yieldingly holding the tension plate in position.

2. In a tension device, the combination of a support, a base, a post, a laterally and longitudinally tilting tension plate having an enlarged aperture between its ends through which said post passes, the longitudinal clamping faces of the plate and base located to one

side of and parallel with the longitudinal axis on which the plate rocks, the spring on the post holding the plate to the base, and means substantially as described to hold the thread between said clamping faces and away from the post, substantially as described.

3. The tension device comprising a support, a base, a post, a tension plate having an aperture between its ends and side edges loosely fitted on the post to permit swing on longitudinal and transverse axes, one edge of said plate extending beyond the corresponding edge of the base, a spring on the post bearing on the plate, one end of the plate having two thread eyes, respectively, on opposite sides of the longitudinal axis of the plate and one thread eye at the other end of the plate on one side of the longitudinal axis thereof substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

GABRIEL F. RUBY.

Witnesses:

C. M. WERLÉ,  
HUBERT E. PECK.