(No Model.)

H. P. RICHARDS.

TENSION DEVICE.

No. 602,522. Patented Apr. 19, 1898.

Fig. 1.

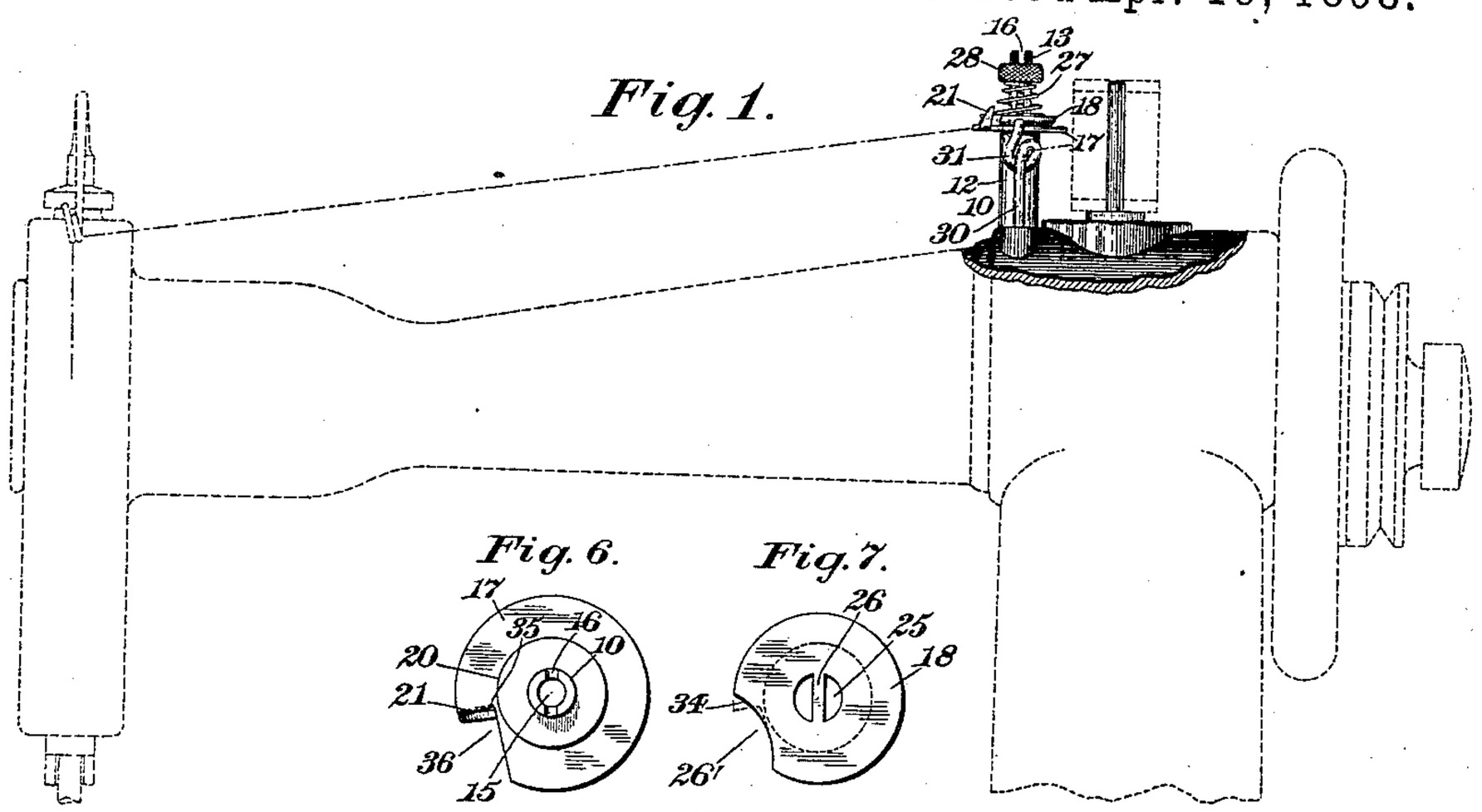


Fig. 6.

Fig. 7.

Fig. 8.

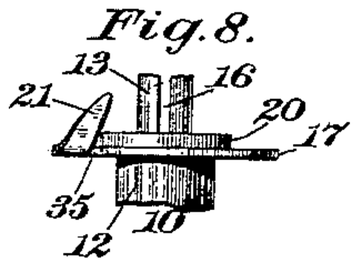


Fig. 2.

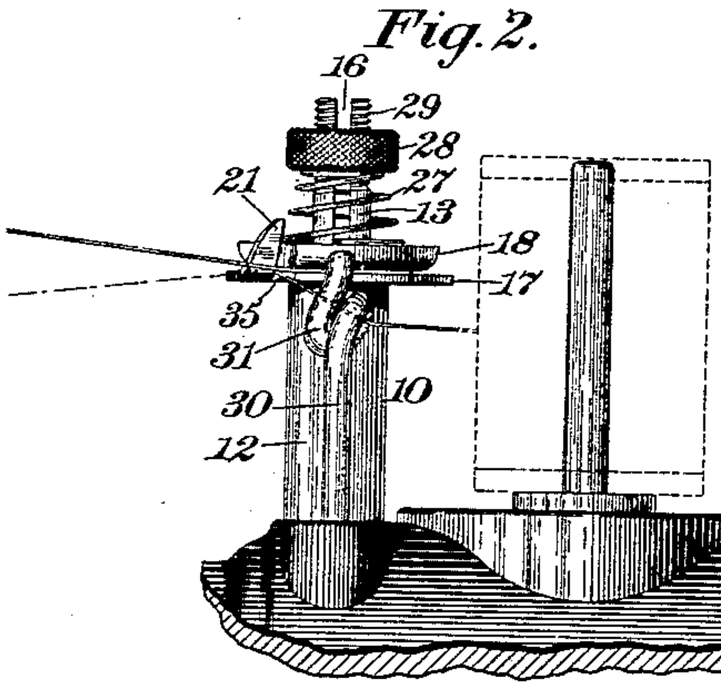


Fig. 3.

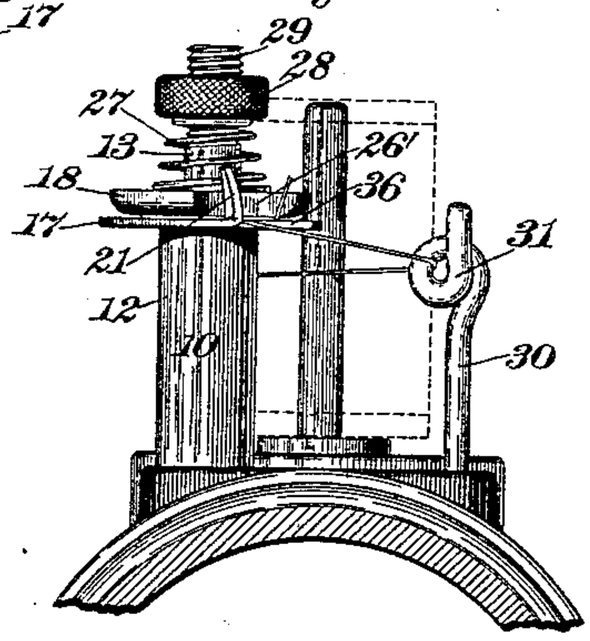


Fig. 4.

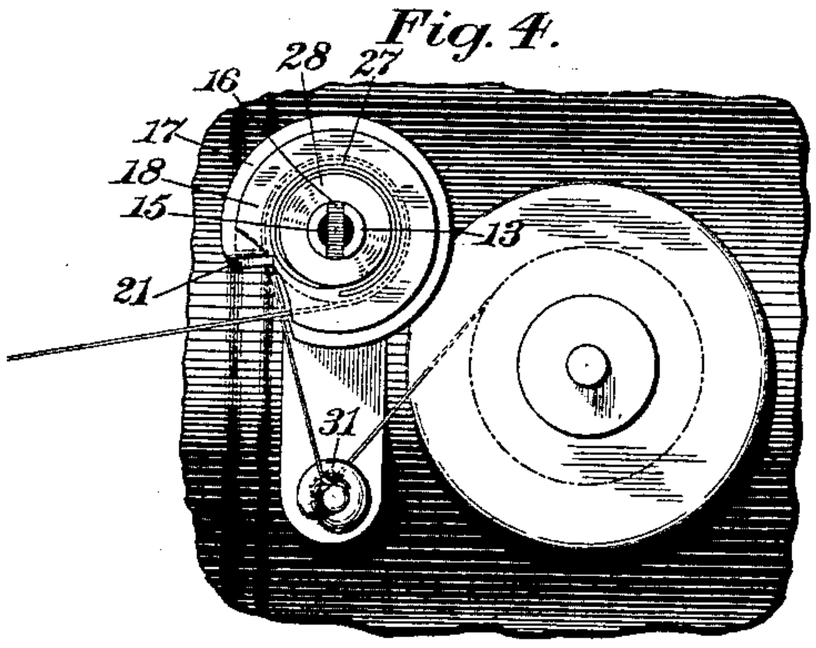
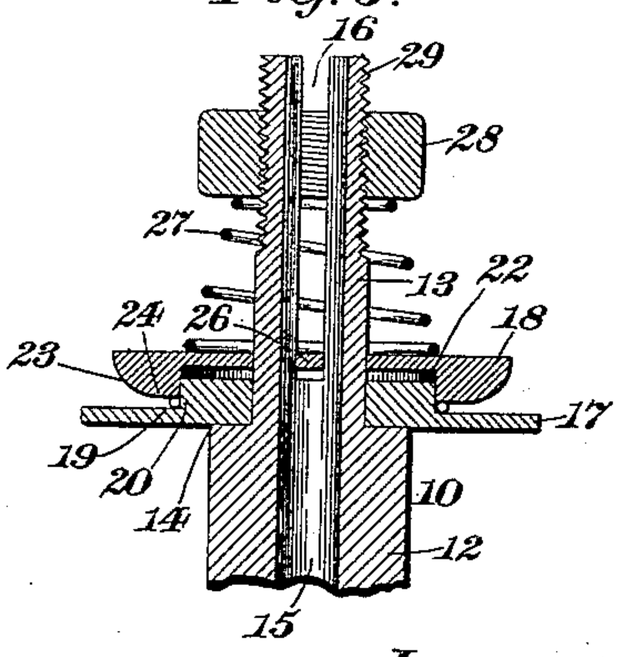


Fig. 5.



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UNITED STATES PATENT OFFICE.

HUBERT P. RICHARDS, OF NEW BRITAIN, CONNECTICUT.

TENSION DEVICE.

SPECIFICATION forming part of Letters Patent No. 602,522, dated April 19, 1898.

Application filed August 15, 1896. Serial No. 602,861. (No model.)

To all whom it may concern:

Be it known that I, HUBERT P. RICHARDS, a citizen of the United States, residing in New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Tension Devices, of which the following is a specification.

This invention relates to tension devices for sewing-machines, the object thereof being to provide an improved device of this character extremely effective in operation to secure the desired and proper tension of the thread and in the use of which the thread will not be compressed or flattened, but will be retained in its perfectly normal condition, thus preventing the improper and tight twisting of the same, due to a great extent to such flattening or compressing action of tension devices heretofore is use.

A further object of the invention is to provide a tension device which will not only secure the results above set forth, but will also be inexpensive in its manufacture, easily assembled and disassembled, neat in appearance, and not liable to get out of order during the ordinary operation of the machine.

In the drawings accompanying and forming part of this specification, Figure 1 is a dotted-line view of a portion of the supporting-arm of a sewing-machine, showing this improved tension device in position thereon. Fig. 2 is a view of a part of such supporting-arm with this improved tension device shown on an enlarged scale and having the thread-spool in dotted lines adjacent thereto. Fig. 3 is a front elevation. Fig. 4 is a top view of Fig. 2. Fig. 5 is a vertical sectional view of this improved tension device, a portion of the supporting-stem being broken away. Fig. 6 is a top view of the supporting-stem and the lower clamping or disk member, the other parts of the device being removed. Fig. 7 is a top view of the upper clamping or disk member, and Fig. 8 is a detail side view of a part of the stem and the lower clamping member or disk.

Similar characters designate like parts in all the figures of the drawings.

In the preferred form thereof herein shown and described the tension device comprises supporting means (shown as a stem 10, preferably of differential diameters, as 12 and 13) whereby a seat or recessed portion 14 is formed for the purpose hereinafter set forth. This stem is shown having a central longitudinal bore 15 and is longitudinally slotted, as at 16, from its upper or outer end. The longitudinal bore is for the reception of a rod by means of which the tension device can be operated in the usual manner by the operator, the upper end of said rod engaging the upper clamping member to thereby move the same upward against the tension of its spring when said rod is actuated by the operator.

The clamping members preferably comprise a pair of disks 17 and 18, both carried by the stem, one above the other. In the structure shown the lower clamping member 17 is fixedly secured thereto and is centrally bored to encircle that part of the stem having the smallest diameter and rests on the seat 14 of said stem. This member 17 is of differential diameters, thereby forming a pair of engaging or bearing faces for the thread, comprising a supporting-face 19 for the under side of said thread and a guiding-face 20 for the inner side thereof, and which guiding-face is shown relatively remotely disposed from the periphery of the supporting part 19 of the disk.

It will be understood that the member 17 could be formed integral with the stem, if desired, instead of independently thereof.

The member 17 is also shown having a part thereof adjacent to the periphery of its supporting-face 19 bent upward and slightly inclined inward to form a flange or projection 21, which constitutes a guide and also a stop device for the thread, as hereinafter set forth, and thus forming a space 36 between such flange and the curved peripheral edge of the member for the purpose hereinafter set forth. The other thread-clamping member or disk 18 is preferably of smaller diameter than the disk 17 and has an annular recess 22 on its under or inner side, whereby said clamping member is adapted to fit over and closely engage a part of the guide-surface 20 or that part of the member 17 having the smallest diameter. This member is provided with a curved annular under edge 23, terminating on the under side thereof in a straight annular thread engaging or bearing face 24, which extends in parallelism with the plane upper face of the

supporting-face 19 of the lower clamping member, and between which parallel faces the thread passes, said thread holding the upper disk away from engagement with the lower one. This member 18 also has a central bore 25, intersected, however, by a cross-bar 26, adapted to enter the slot 16 of the stem, whereby the curved faces of said bore 25 will encircle that part of the stem above the lower member having the smallest diameter, and said disk will be held by means of its bar firmly against movement. This disk is shown having a part or segment, as 26′, thereof cut away adjacent to the projection 21 and space 36 of the lower disk, whereby impediment to the proper reception of the thread between the disk members of the tension device is avoided.

In order to properly secure the clamping members in position relatively to each other and secure the proper tension on the thread, a preferably relatively light spiral spring 27 is disposed in position to encircle the part 13 of the stem and has its lower end resting on the upper clamping member, (such spring being shown in the nature of a cone,) whereby the lower clamping member will have a relatively large portion of its upper face engaged by said spring.

In order to secure the proper tension of the spring and thereby the disks relatively to the thread, a suitable nut 28 is disposed in position on the upper end of the stem, which is provided with exterior threads 29 for this purpose, whereby on the turning of the nut the spring will be adjusted to increase or decrease the tension of the clamping members relatively to the thread in a manner that will be readily understood.

In practice this improved tension device will preferably be disposed adjacent to the spool-supporting spindle and will also have adjacent thereto some suitable guide device adapted to guide the thread on its passage from the spool to the tension device, and which guide device in the form shown is in the nature of a bar 30, supported on the arm of the machine and having a loop 31 at its upper end, and which loop has a rounded surface for the passage of the thread. This guide device 30 is herein shown so disposed relatively to the tension device that on the passage of the thread through the same to said tension device said thread will enter intermediate of the parallel engaging faces 19 and 24 of the clamping members at the lower part of the projection or flange 21 and substantially at right angles thereto, Fig. 4, and by means of which it is held in position to engage the guiding-surface 20 of the disk 17.

The loop 31 is preferably disposed slightly below the clamping members 17 and 18, whereby the upper run of the thread after its passage around the guiding-face 20, intermediate the clamping members, will cross or pass the lower run thereof adjacent to its point of entrance and at the open space 36, formed by the upwardly-bent flange 21, but without frictional engagement therewith at any time in the operation of the machine.

The under engaging face 24 of the clamping member 18 is formed straight, whereby there will be no tendency to throw the thread away from the guiding-face 20 of the lower clamping member, and in some constructions the rear part 34 of the cut-out portion 26′ of the upper clamping member may be formed in parallelism with the rear face of the projection 21, as shown in dotted lines, Figs. 4 and 7, whereby the tendency of the curved edge of said clamping-disk 18 to throw the thread outward away from its guiding-face 20 at its point of entrace is thereby avoided. The lower clamping member has that part thereof at the inner lower edge of the flange 21 curved and rounded, as at 35, whereby the liability to fray the thread at its point of entrance is obviated.

In the use of this improved tension device the thread passes from the spool to the loop 31, through the same, and thence with an upward inclination to the tension device, entering the same adjacent to the lower inner part of the flange or projection 21, the inward inclination of which flange at the cut-away part 26′ of the upper disk not only guiding the thread into its proper position intermediate of the disks, but also preventing the same from moving upward at such cut-away portion, and thence between the clamping members, passing around the guide-face 20 of the lower clamping member and intermediate of the parallel engaging faces 19 and 24 of said clamping members 17 and 18, whereby it has an engagement with the guiding-face 20 of the lower clamping member and also with the lower and upper faces 19 and 24, respectively, of said members, thus having a frictional engagement therewith at three sides and thereby doing away with the flattening of the thread, such thread then passing from the tension device to the thread-take-up device of the needle-bar and freely across the lower run of the thread without frictional engagement therewith.

It will be understood that the portions of the disks 17 and 18 might be reversed without departure from the scope of this invention.

Having described my invention, I claim—

1. A sewing-machine tension device consisting of a disk having a cut-away portion and an inwardly-inclined projection serving as a thread-guide adjacent thereto; a second disk having a cut-away portion opposed to the cut-away portion in the other disk; and means for holding said second disk against the first-named disk.

2. In a tension device the combination with a disk having a cut-away portion and an inwardly-inclined projection, serving as a thread-guide, adjacent thereto, of a complemental disk having a cut-away portion op-

posed to the cut-away portion in the other disk; means for holding said second disk with yielding pressure against the first-named disk; and means for directing the thread between said disks at the point where the cut-away portions and projection are located.

3. A sewing-machine supporting-arm having thread-tension means thereon comprising a supporting-stem; a fixed member of differential diameters, whereby it forms a pair of thread-bearing faces, said member having a projection or flange forming a thread-guide; a movable member having a cut-away part adjacent to said projection and a part thereof extending in parallelism with one of the bearing-faces of said fixed member; means for holding said members in operative positions relatively to each other; and a thread-guide disposed on said machine-arm below said fixed and movable members, for guiding the thread on its passage from its spool to the tension device, whereby the thread will enter intermediate said disks and at right angles to said flange or projection and have three of its sides in bearing engagement with said device, and thence pass therefrom and across the lower run of the thread adjacent to the entrance part thereof without frictional engagement therewith.

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