No. 875,610. PATENTED DEC. 31, 1907.

W. N. PARKES.

THREAD CONTROLLING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED MAR. 26, 1903.

Fig. 1.

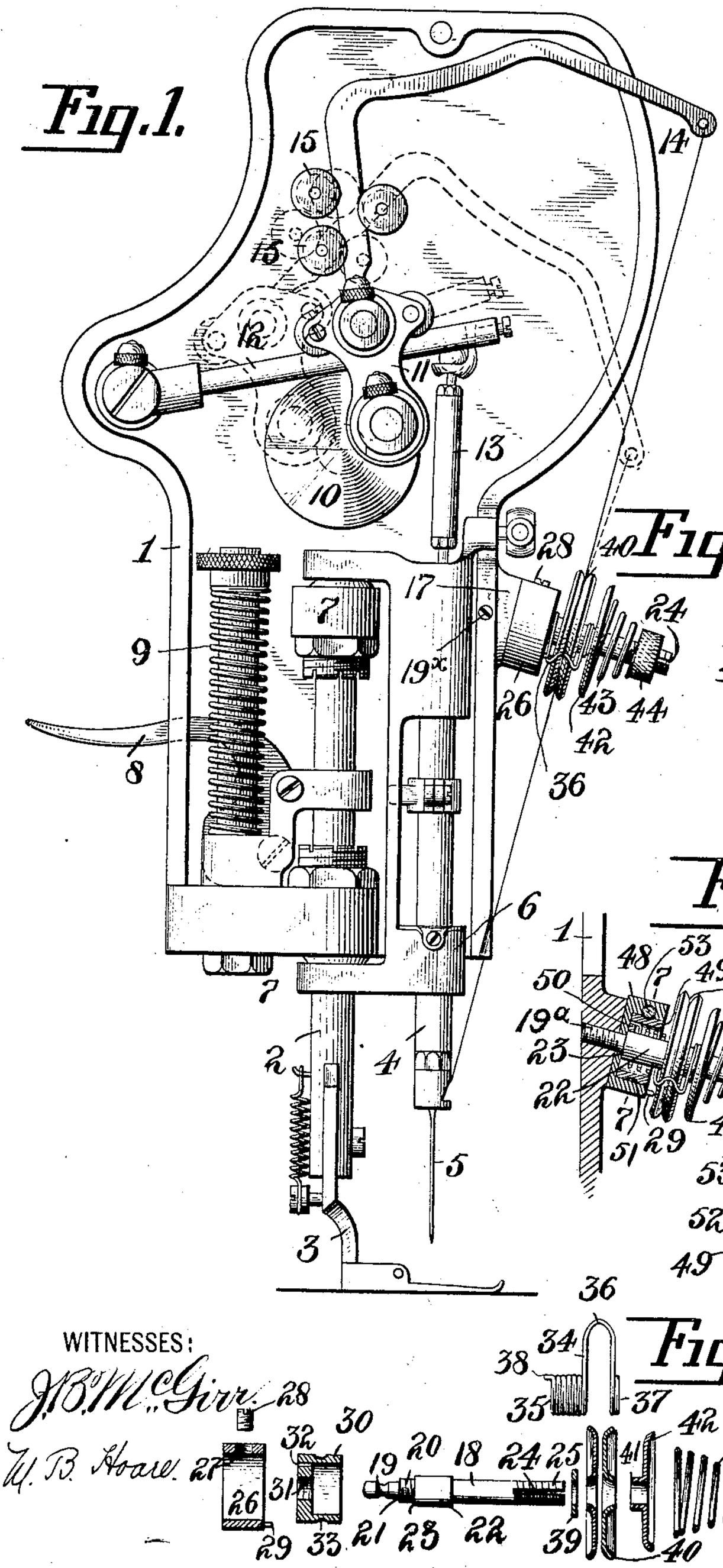

Fig. 2.

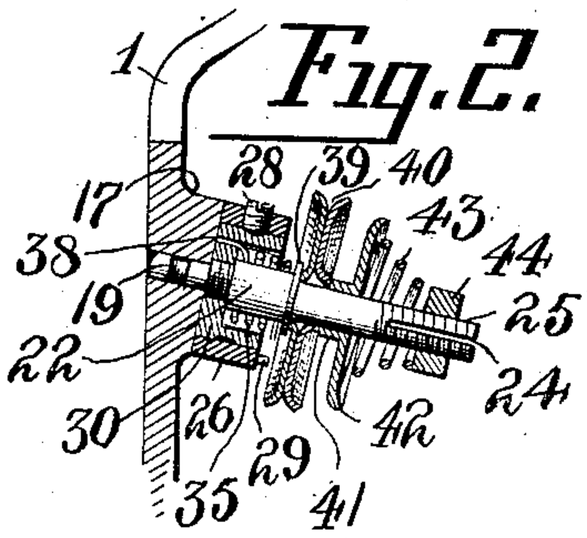

Fig. 3.

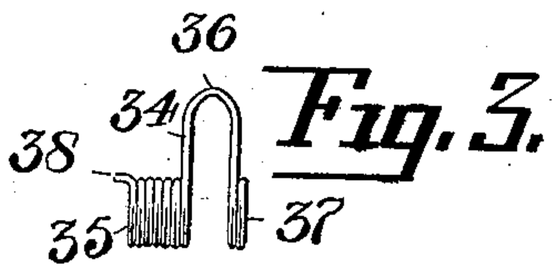

Fig. 4.

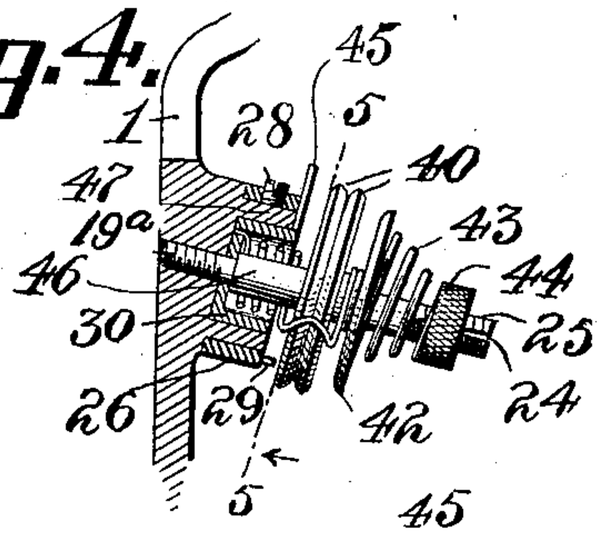

Fig. 5.

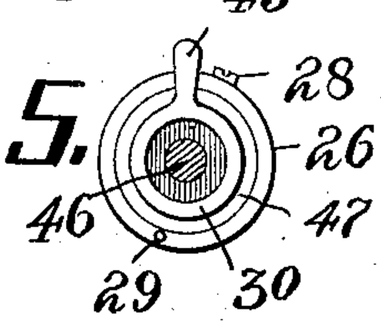

Fig. 6.

Fig. 7.

Fig. 8.

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THREAD-CONTROLLING MECHANISM FOR SEWING-MACHINES.

No. 875,610. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed March 26, 1903. Serial No. 149,661.

To all whom it may concern:

Be it known that I, WILLIAM N. PARKES, a citizen of the United States, residing in Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Thread-Controlling Mechanism for Sewing-Machines, of which the following is a description.

This invention relates to the thread tension and slack thread controlling mechanism for sewing machines.

One of its main objects is to provide a simple compact thread tension and controlling mechanism, that may be readily adjusted to change the tension on the thread, the extent of the movement of the controlling device and the tension of the same.

It is also an object to adapt all of said mechanism to be mounted on a single carrying stem which may be readily secured in any suitable place in the machine.

With the above and other objects in view, my invention consists of the parts and combination of parts as described in the specification, and specifically set forth in the claims.

In the drawings: Figure 1 is an end elevation of the head of the sewing-machine, the face-plate being removed, showing the location and disposition of my invention relatively to the other essential elements of a stitch-forming organization; Fig. 2 is a vertical sectional view of my thread-controlling mechanism, including that portion of the machine head upon which the same is supported; Fig. 3 is an elevation of the controller spring. Fig. 4 is a vertical sectional view, similar to Fig. 2, showing another form of my invention; Fig. 5 is a vertical section taken on the line 5—5 of Fig. 4, the spring being omitted, showing the means by which the spring-housing may be adjusted; Fig. 6 is a vertical sectional view, similar to Fig. 2, showing a third form of my invention; Fig. 7 is a section on the line 7—7 of Fig. 6, the spring being omitted; and Fig. 8 is a vertical sectional view of the thread-controlling device shown in Fig. 2, the parts being separated but shown in their assembling relation.

The numeral 1, indicates the head of the machine; 2, the presser-bar; 3, the presser-foot; 4, the needle-bar; 5, the needle; 6, a vibrating-gate in which the needle may reciprocate; 7, adjustable bearings for said needle-gate; 8, the presser-foot lifter; 9, the pressure-spring for said presser-bar; 10, the driving-disk on the end of the main shaft; 11, an actuator carried by the crank-pin on said disk; 12, a vibrating lever driven by the actuator and suitably connected by a link 13, to the needle-bar 4; 14, the take-up operatively connected to the actuator 11; and 15, the guide-rolls and fulcrum device for said take-up. All these parts may be of usual construction, or may be substantially the same as the mechanism shown and described in my application filed March 6, 1903, Serial No. 146,468.

The thread-controlling mechanism is suitably supported, as shown in the several figures, on the head of the machine, in the line of the lead of the thread between the needle and the take-up. As shown, the frame is provided with a projection or boss 17,—though this is not necessary,—in which is suitably supported the pin or stem 18, of the tension device, the same being smooth at its inner end and grooved at 19, for the reception of a binding screw 19×, passing through the frame, in Fig. 1. Next to the grooved portion, is an enlarged screw-threaded portion 20, providing a shoulder 21, which limits the extent to which the stem 18, may be screwed into the frame. Next to the screw threaded portion 20, is a still larger smooth portion 22, providing a shoulder 23, for the purpose of holding the housing or bushing 30, hereinafter described, on the stem. Next to the smooth portion 22, the stem is reduced and, at its outer end, is provided with a transverse saw-cut 24, and is also externally screw-threaded at 25.

26, is a cylindrical, tubular collar, having a transverse screw-threaded bore 27, for teh reception of a short screw 28. The collar 26, is also provided with a short projecting pin 29, extending from its face parallel with the stem 18. Pin 29, determines the normal position of the slack-thread take-up, hereinafter described.

30, is a cup shaped housing, having through its closed end a screw-threaded bore 31, and a smooth bored aperture 32. In its periphery the housing 30, is provided with a circumferential groove 33, designed for the reception of the end of the screw 28, by means of which the collar may be adjusted circumferentially on the housing without becoming displaced, it being understood that when the collar is so adjusted the groove serves as a guide for keeping the collar in place on the housing. Said screw 28, also

acts as an adjusting medium by which the slack-thread take-up may be held adjusted with reference to the tension necessary to be applied to the needle-thread.

The thread controller spring consists of a spring wire coiled so as to provide a cylindrical body portion 35, having a looped extending part 34, the end 36 of which is adapted to be engaged directly by the thread. The said controller spring at one end terminates into a supporting coiled portion 37, and at its other end into a short straight end 38, that extends at right angles to the body coiled portion of the spring. A washer 39 is located on the stem 18 next to the hub 22, and next to said washer are thread tension disks 40. On the stem next to said tension disks is a disk 42 provided with a hub 41, the latter being intermediate one of the tension disks 40 and said disk 42. Next to the disk 42 is a thread tension spring 43, a nut 44 being provided to regulate the pressure of the spring on the disk 42, and through it the tension of the disks 40 on the thread, it being understood that all of these disks are free to move on the smooth portion of the stem 18, where they are located. When all these parts described are assembled, the body portion 35, of the controller spring surrounds the stem 18 within the housing of the cup shaped part 30, and the end 38 of said spring extends into the aperture 32, thereby preventing the said end from turning relative to said housing. The body portion of the controller spring is located between the collar 39, and the bottom of the housing 30, and the said body portion is retained within the housing, and the end 38 in the aperture 32 by said collar. It is thus seen that the body portion of the controller spring is located on the enlarged portion or hub 22 of the stem 18. The tension disks 40 are located intermediate the limbs of the looped portion of the controller spring, and the coiled end portion 37 of said spring is located on the hub 41 of the disk 42, and is adapted to turn freely on said hub. One of the limbs of the looped portion of said spring rests on the extending pin 29. It is thus seen that by the circumferential adjustment of the collar 26, that carries the spring 29, the tension of the extending portion 36 of the controller spring may be increased or decreased. And that by the circular adjustment of the stem 18 the working position of the part 36 of the spring about the axis of said stem may be determined.

In the form of my invention shown in Figs. 4 and 5, the bushing or housing 30, is provided with a manipulating handle 45; and the housing is held to the frame of the machine by means of an enlarged portion 46, of the stem 18, bearing upon the inner side of the end thereof and forcing the same against the frame. The collar 26, in this form of my invention, which carries the limiting pin 29, is connected by means of the screw 28, to a reduced portion 47, of the frame 1. The stem 18, is screw-threaded at its inner end 19^a, and is screwed into an aperture in the frame. In other respects the thread-controlling mechanism, in this form of my invention, is substantially the same as the form portrayed by Figs. 2 and 8. Adjustment of the slack thread take-up, in this form of my invention, is obtained by loosening the stem 18, in the frame, to free the housing 30; then the housing is turned by the handle 45, until the proper degree of tension is obtained,—the stem 34, of loop 36, being in contact with pin 29,—when the stem 18, is screwed into the frame to set the housing. The pin 29 in this form of my invention it will be noted, is in the collar 26, as in the first described form, but it will be observed that the housing 30 is adjusted circumferentially to increase or decrease the tension of the thread engaging part 36 of the controller spring. The function of the said collar in this form is the adjustment of the limiting pin, which it carries, about the axis of the stem 18, and thereby the working position of the said part 36, while in the other form the function of this collar is to increase the tension of the controller spring on the thread. In this second form of my invention the tension of the said controller spring may be adjusted without changing the location of the pin 29, or without disturbing the collar 26 that carries said pin at all, while in the first form the adjustment of the collar to change the tension of the spring changes the location of said pin 29, and then the stem 18 must be adjusted to again locate said pin in its previous position, so that the working position of the end 36 of the controller spring will be properly located.

In Figs. 6 and 7 is shown a third form of my invention. In this form a housing 48 has a bore formed in its end which serves as a cup shaped housing for the body portion of the controller spring, as does the housing 30, but this housing 48 is different from the housing 30, as will be seen. The bottom of said housing has a smooth bore centrally through its bottom for the passage of the stem 18, which latter is screw threaded at 19^a, and is held thereby in a threaded bore in the frame of the machine. The shoulder 23, of the enlarged portion 22, of the stem 18, bears directly upon the inside of the bottom of the housing 48, thereby binding the same between the frame 1 and said shoulder 23. A bushing 49, is located in the cup of the housing 48, which is provided at its inner end with a web 50, having an aperture therein for the reception of the end 38, of the thread controller spring. Said bushing is also provided on its periphery with a circumferential groove 51, and with worm teeth or threads 52, which latter are engaged by a worm

screw 53, located in a smooth bore formed in an enlarged portion of the housing 48. The worm screw extends tangentially to the periphery of the bushing 49, and at its outer end is provided with a screw cut or slot by means of which it may be turned by a small screw driver. Said screw is provided at its inner end with a smooth reduced portion 54, which fits freely in a smooth bore in the housing as shown in Fig. 7. The limiting pin 29 in this third form of my invention is carried by the housing 48, the body portion of the controller spring is located within the bushing 49 and the end 38 of said spring is located in the aperture in the web 50 of said bushing. In this form of my invention the strain of the controller spring, it will be observed, by the connection between its end 38 and the bushing 49 is such, that causes it to tend to turn said bushing in a direction that pushes the worm screw 53 in its bore and thereby keeps the reduced portion 54 of said screw in its bearing. It will thus be understood that the tension of the controller spring is utilized to keep the regulating screw 53 in its bore or housing, and this tension is always strong enough to perform this function, and also to keep the said screw from turning.

It will be evident from the foregoing that in the third form of my invention the tension of the controller spring may be regulated without disturbing any of the other elements of the mechanism. By turning the screw 53 the bushing 49 is turned, and as the end 38 of the controller spring is located in an aperture in the said bushing it is evident that by this means the tension of the controller spring may be increased or decreased. If it is desired to change the working position of the extending end 36 of the controller, in this form of my invention, the carrying stem is unscrewed from its seat in the frame sufficiently for the housing 48 to be adjusted around the desired extent on said stem, when the said housing is again secured in position by the said stem as before.

It is to be noted that the thread controller spring, and the thread tension device are the same in all of the three forms of my invention as described, and also that the hub or support 41 on the disk 42 serves as a support for the end 37, of the thread engaging part of the controller in all three of said forms. And it is also to be noted that the difference in the forms illustrated lie in the different means, or modifications of the adjustments of the tension of the controller spring and the working position of the thread engaging part 36 of the controller. In sewing machines it is desirable to adjust these parts for different kinds of work, especially if the machine is to be run at a very high rate of speed. For example it is desirable that the action of this controller spring should reach the limiting pin just previous, or at the time the needle reaches the work, so of course if very thin material is being stitched it is advantageous to adjust the action of the controller differently from the adjustment it is under when very heavy material is being stitched as the needle reaches the work earlier when heavy material is being stitched than when light material is being stitched as is well known. And for various kinds of special work, and in the use of different kinds and sizes of thread it is desirable to have these parts under different adjustments, hence the reason for making these parts so they can be readily adjusted. It is important in these controller springs, when the machine is to be run at a very high rate of speed, that there should be as much life as possible in the thread engaging part of the spring, to the end that it will act as quickly as possible. The manner in which my controller spring is carried and supported is to be noted, the end 37 being mounted to turn freely on the hub 41, and the body coiled portion 35 being advantageously housed, and all of said spring being well balanced adds to its efficiency. The compactness of mounting all the tension device, the slack thread controller device, and the means for regulating these elements on a single supporting stem is to be noted.

It will be evident that other modifications than those shown may be made in my invention without departing from the spirit of the same, therefore it is to be understood that I do not wish to be limited to the exact forms herein described.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. A thread controlling mechanism for sewing machines comprising a supporting stem, a housing surrounding said stem and held adjustably fixed thereby, a part carried in said housing, means for circularly adjusting said part relative to the housing, a controller spring the coiled body of which is located in said part, and an extending end of the same in engagement with said part, said controller spring provided with a thread engaging part, and a support provided for said thread engaging part.

2. A thread controlling mechanism for sewing machines comprising a supporting stem, a controller spring, means for supporting said controller spring and for regulating the stress of the same on the thread comprising two parts one of which is supported by the other, and a worm connection between said parts by means of which the stress of the controller spring is regulated.

3. A thread controller mechanism for sewing machines comprising a supporting stem, a housing surrounding said stem and adjustably held fixed thereto, a bushing located in said housing, a worm connection between the

housing and the bushing by means of which the bushing may be circularly adjusted relative to the housing, a controller spring having a coiled body portion located in said bushing, said controller spring provided with a thread engaging part, and a connection between the spring and the bushing.

4. A slack-thread controller, comprising a spring or coiled wire having a thread engaging extension, a stem supporting the same, means for adjusting the tension of the controller to regulate its stress upon the thread including a bushing, by which the coiled portion is housed and to which the controller is connected, supported by said stem, and means for adjusting the bushing circumferentially of the stem.

5. A thread-controlling mechanism for sewing machines, comprising a supporting stem, a collar surrounding said stem and held fixed thereby, a bushing inclosed by the collar and surrounding said stem, means for adjusting the bushing relatively to the collar, a slack-thread controller connected to the bushing at one end and supported by the stem at the other end, a tension device supported by said stem, and means for regulating the stress of the tension device on the thread.

6. A thread-controlling mechanism comprising a supporting stem, a collar supported thereby, a bushing also supported thereby within the collar, a spring surrounding said stem within the bushing and connected to the latter, said spring having a thread-engaging arm, a tension device carried by the stem having a portion embraced by said arm, and independent means carried by said stem for adjusting said arm and tension device whereby to regulate the stress of each upon the thread.

7. A thread controlling mechanism for sewing machines comprising a supporting stem, a housing carried by said stem, a controller spring having a coiled body portion that is located in said housing, a tension device supported by said stem, the controller spring provided with a thread engaging part that is looped over the tension disks of said tension device, an auxiliary disk having a hub on which the end of the outer limb of said looped portion is mounted, said hub in engagement with the thread tension disks, and a tension spring in engagement with said auxiliary disk.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM N. PARKES.

Witnesses:

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M. B. HOARE.