B. DYSART.

SPRING TENSION REGULATOR.

APPLICATION FILED SEPT. 3, 1908.

973,641. Patented Oct. 25, 1910.

Fig. 1.

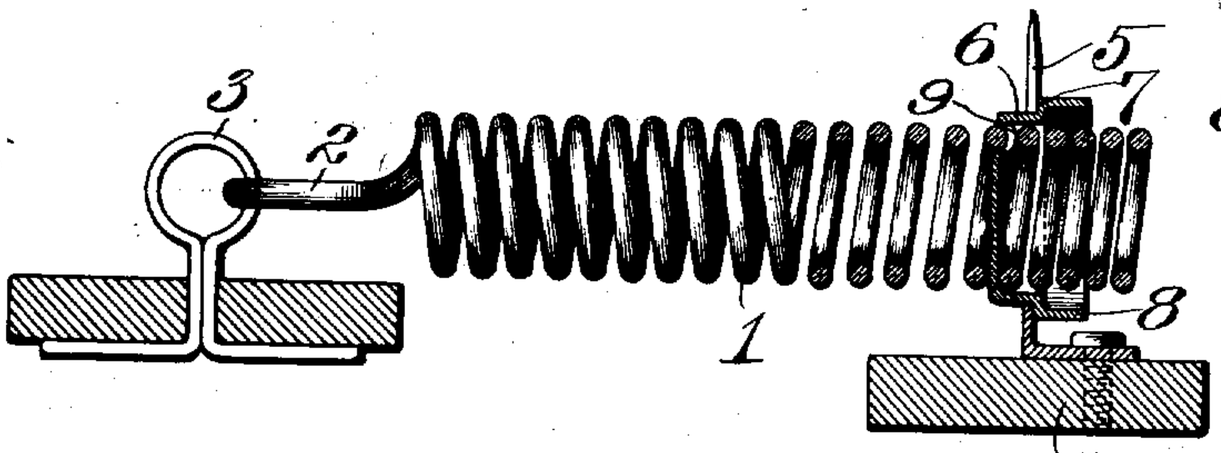


Fig. 3.

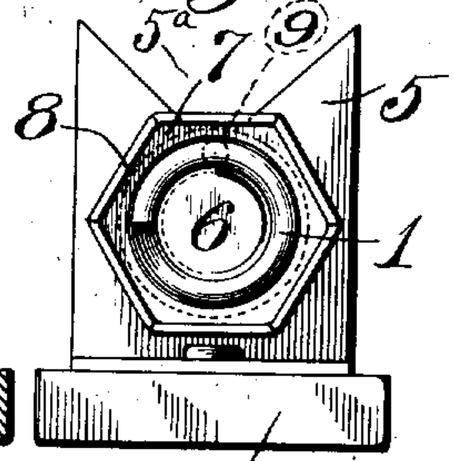


Fig. 2.

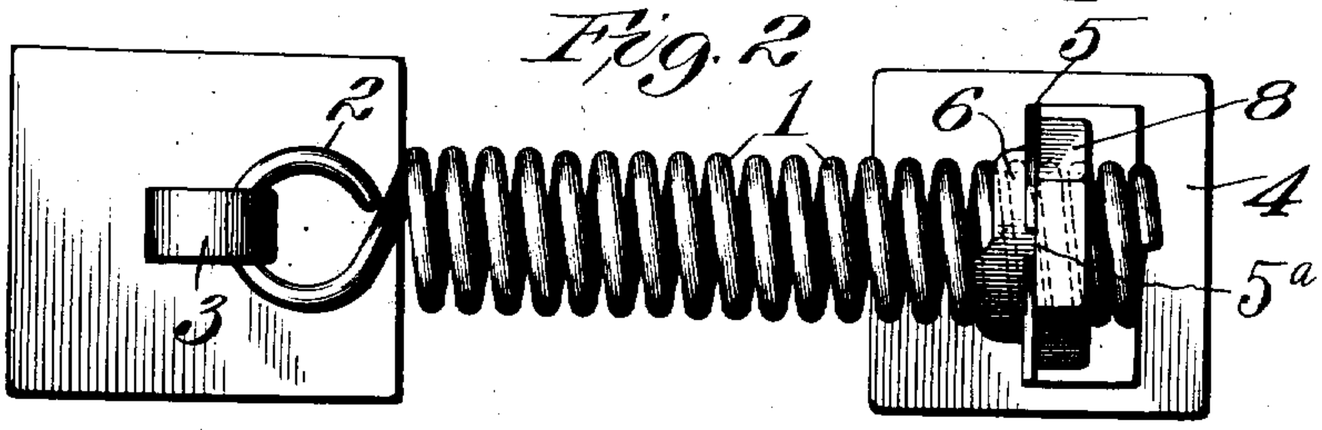


Fig. 4.

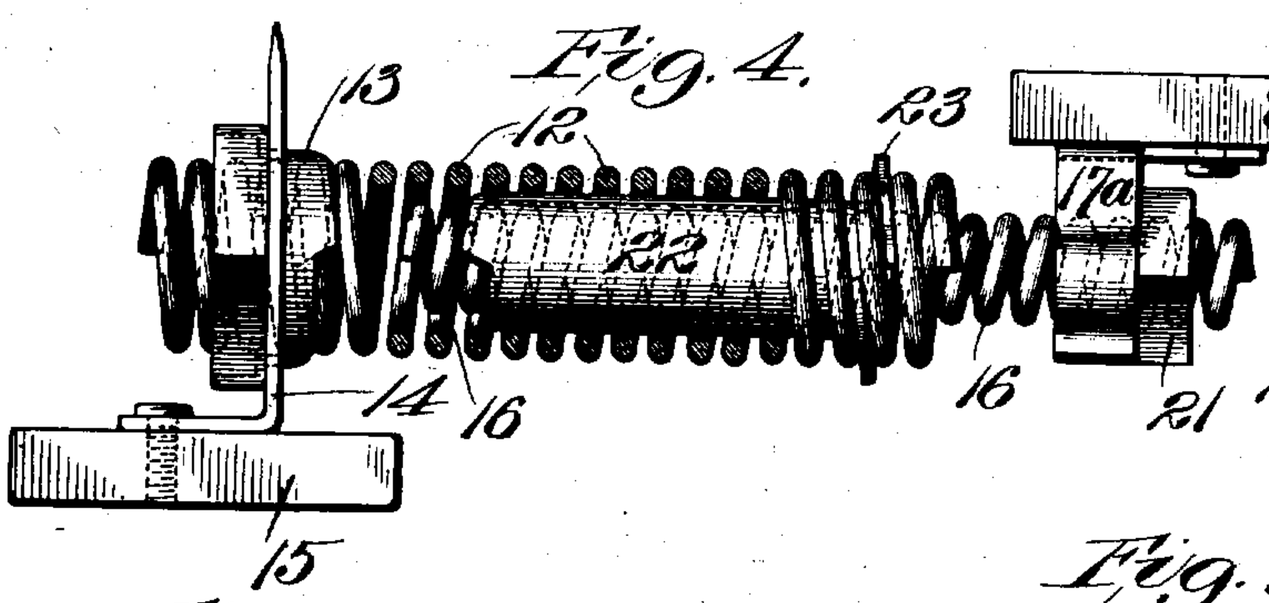


Fig. 5.

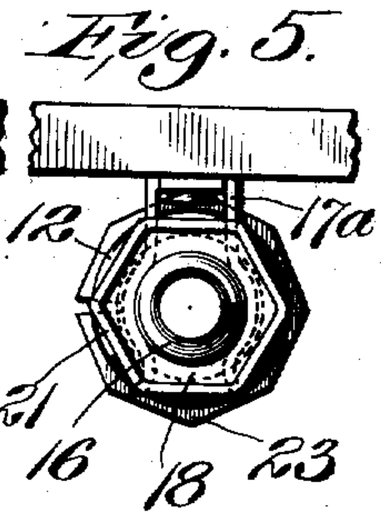


Fig. 8.

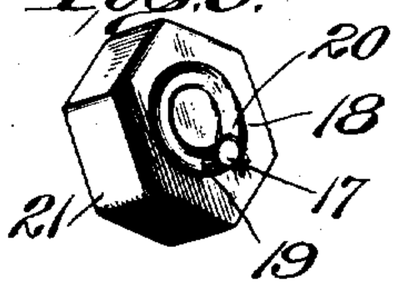


Fig. 6.

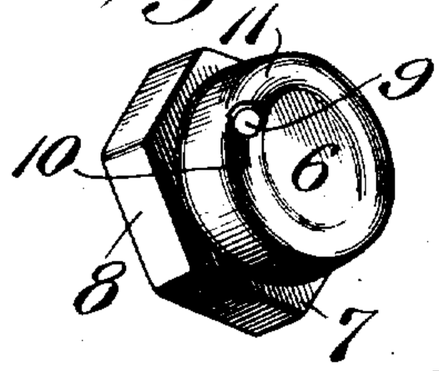
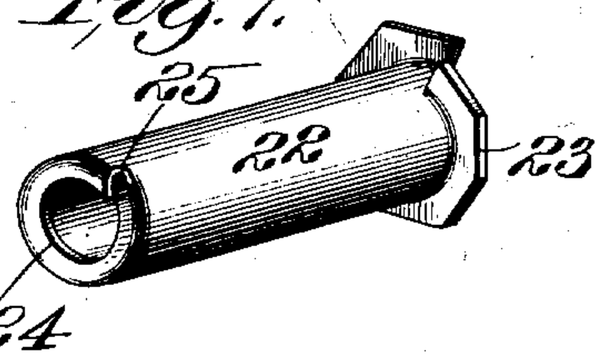


Fig. 7.



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Atty.

UNITED STATES PATENT OFFICE.

BIRNEY DYSART, OF ST. LOUIS, MISSOURI, ASSIGNOR TO ADDING TYPEWRITER COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

SPRING-TENSION REGULATOR.

973,641. Specification of Letters Patent. Patented Oct. 25, 1910.

Application filed September 3, 1908. Serial No. 451,606.

To all whom it may concern:

Be it known that I, BIRNEY DYSART, a citizen of the United States, residing at St. Louis, Missouri, have invented a new and useful Spring-Tension Regulator, of which the following is a specification.

This invention relates to spring tension regulators of the type whereby the tension of helical springs can be regulated to any desired extent without detaching the spring from its connections.

The object of the invention is to produce means for use in connection with helical springs constituting the fastening means for one or both ends of the springs and operable to draw out or compress the springs to any desired extent without removal or separation of the springs from their supports or connections, thereby rendering it possible to adjust the springs to uniform tension or resistance while said springs are attached to their supports, and to do this without changing the windings of the springs.

Figure 1 is a view, partially in section, showing the construction of the adjusting device and the method of its engagement with the spring. Fig. 2 is a plan view thereof. Fig. 3 is an end view showing the spring protruding through the adjusting device. Fig. 4 shows another embodiment of the invention including two springs of unequal size, with means for increasing the tension of either of said springs, or both, as desired. Fig. 5 is an end view showing the smaller of the two springs protruding through the adjusting device. Fig. 6 is a perspective view of that adjusting device which is shown in Figs. 1, 2, and 3. Fig. 7 is a perspective illustration of the uniting element or coupling whereby the two springs shown in Fig. 4 are connected and which is capable of adjustment with respect to either of said springs, or both at the same time, as desired. Fig. 8 is a perspective view of the adjusting device shown in connection with the small spring, being a modification of the device shown in Fig. 6.

The helical spring 1 (Figs. 1, 2, and 3) is of the retractile type and may be connected to one of the members with which it is used in any suitable way, such, for instance, as by a loop 2 engaging with some suitable part 3 on said member. It will be understood, of course, that any other suitable means of connection may be used since many are well known, and the specific connection used for this purpose is immaterial. Where only one of the members with which the spring is used is movable it is preferable that a connection of the character described be with that member. The other member 4, which constitutes a support for the other end of the spring, carries a hanger 5 having a notch 5^a opening into a hole therein. A plate, shaped to form a tubular part 6 of a diameter sufficient to encircle the spring 1 and provided with a partially closed end, extends through the hole in the hanger 5, and has a flange 7 bearing against said hanger. The device thus constituted is provided with a polygonal head 8 formed by upturned edges of the flange 7, affording means for engagement for the rotation of the device.

A hole 9 is formed through the end of the tubular part 6, of a size sufficient to permit passage of the coils of the spring 1, the said end being indented, as shown at 10 (Fig. 6), to conform to the body and curve of the coil, and constituting means to guide and direct the end of the spring properly through the hole in the primary assembling of the parts. That part of the end of the part 6 against which the coil of the spring engages as it enters the hole 9 is swaged outwardly, as shown at 11, to conform to the shape of the spring and assist in guiding the spring when the parts are being connected.

The opening of the notch 5^a into the hole in the hanger 5 is sufficient to permit passage of an extended coil of the spring 1 in placing or removing the connecting device from the hanger. Connection or detachment may be effected by extending the spring and sliding the device 6 along the hanger and causing an extended coil of the spring to pass through the opening from the hole to the notch 5^a.

The tubular part 6, constructed of plate metal substantially as shown and described, constitutes an attachment for one end of the spring. The spring is threaded through the hole 9, passing in the indentations or

swaged portions 10 and 11 and, in further movement, rubbing against the smooth interior surface of the tubular part 6 which holds the spring in proper position and prevents wavering or wiggling of the spring during its operation.

The parts having been assembled or connected in this manner, the tension of the spring may be regulated to any desired extent without detaching the spring from its connections, or changing the windings of the spring. By the latter is meant that effect upon the spring which would be caused by turning or twisting the end of the spring to thread it in either direction through the hole 9 while the other end of the spring is in connection with the part 3. These undesirable results and features are avoided by this construction in which the spring can be drawn out or compressed to any desired extent by either manually or instrumentally rotating the member 6 which, acting on the coils of the spring, produces the desired result. Being of plate or sheet metal the member 6 can be produced economically in quantities, and does not require the exactness of proportions that is required of threaded members which have also been used for these purposes and to which I do not make claim.

In Figs. 4 and 5 there is shown a spring 12 attached at one end by a member 13, similar to the member 6, mounted on a projection 14 attached to a support 15. A smaller spring 16 has one end threaded through a hole 17 in a plate 18 mounted against a support 17ª through and by which the spring 16 is guided, said plate being indented as shown at 19, and swaged outwardly as shown at 20, thereby affording means for guiding and holding the coils of the spring in proper position. The plate 18 has a polygonal head 21 formed by the upturned edges of said plate and constituting means for manual or instrumental engagement therewith. The spring 12 encircles a tubular member 22 having a flange 23 arranged helically at one end and embraced between the coils of the spring in the manner of being screwed therein. The smaller spring 16 extends into the spring 12 and into the tubular member 22 at the inner end of which is an internal flange 24, arranged helically to conform generally to the spirals of the spring 16, and with sufficient space 25 between its two ends to admit a spring coil. Said spring is threaded through the space 25 and the flange 24 holds the spring in position. The flange 23 is polygonal and projects beyond the surface of the spring 12, constituting means for engagement so that both springs may be simultaneously tensioned by rotation of the member 22. This construction provides a yielding connection of increasing resistance as the connected parts are moved apart. This can be effected by using one spring of less resistance than the other, in which instance the resistance will gradually increase as the springs expand. Independent adjustment of the springs can be effected by turning the connecting parts 13 and 18.

I am aware that there may be variations in the construction and arrangement of the adjusting devices, and that they are capable of use in many combinations, without departing from the principle of the invention. I do not restrict myself to identical features of construction or uses, but

What I claim and desire to secure by Letters Patent is—

1. A spring, a second spring forming a continuation of said first-named spring, a device encircling a part of one of said springs operable to vary the combined length of said two springs, and an adjustable attaching device connected to one of said two springs, substantially as specified.

2. A spring, a second spring, and an adjustable member incased within one of said springs connecting said two springs together, whereby they are formed into a connected series which is longer than either of said springs alone, substantially as specified.

3. A spring, a second spring extending into said first-named spring, supports for the outer ends of said two springs, and adjustable means connecting said two springs together.

4. Actuating means comprising two springs one of which extends into the other, and an element for adjusting the tension of said two springs while they are in operative position.

5. Actuating means comprising two springs one of which extends into the other, an element operable to adjust the tension of said two springs at their telescoping ends, and a device operable to draw out or compress the outer end of one of said springs, substantially as specified.

6. A spring, a plate having a hole therein and a notch opening into said hole, and a tubular member resting in said hole and engaging with the coils of said spring, substantially as specified.

7. A spring, a plate having a hole therein and a notch opening into said hole, a tubular member incasing a part of said spring and engaging with the coils thereof, and a polygonal portion on said tubular member, substantially as specified.

8. The combination with a helical spring, of a tubular member incasing a part of said spring, a flange closing a relatively large portion of said tubular member and having a notch or open space through which the spring is threaded, and a support against which said tubular member is revolubly mounted, substantially as specified.

9. A spring tensioning device comprising a tubular portion, an internal flange in said tubular portion arranged helically and extending a relatively great distance inwardly, an external flange on said tubular portion, and a support constituting a bearing engaging with said external flange, substantially as specified.

In testimony whereof I have hereunto set my hand and affixed my signature this 22 day of August, 1908.

BIRNEY DYSART.

In presence of—
FRANKLIN MILLER,
J. D. RIPPEY.