V. ROYLE.

TENSION DEVICE.

APPLICATION FILED AUG. 22, 1914.

1,142,531. Patented June 8, 1915.

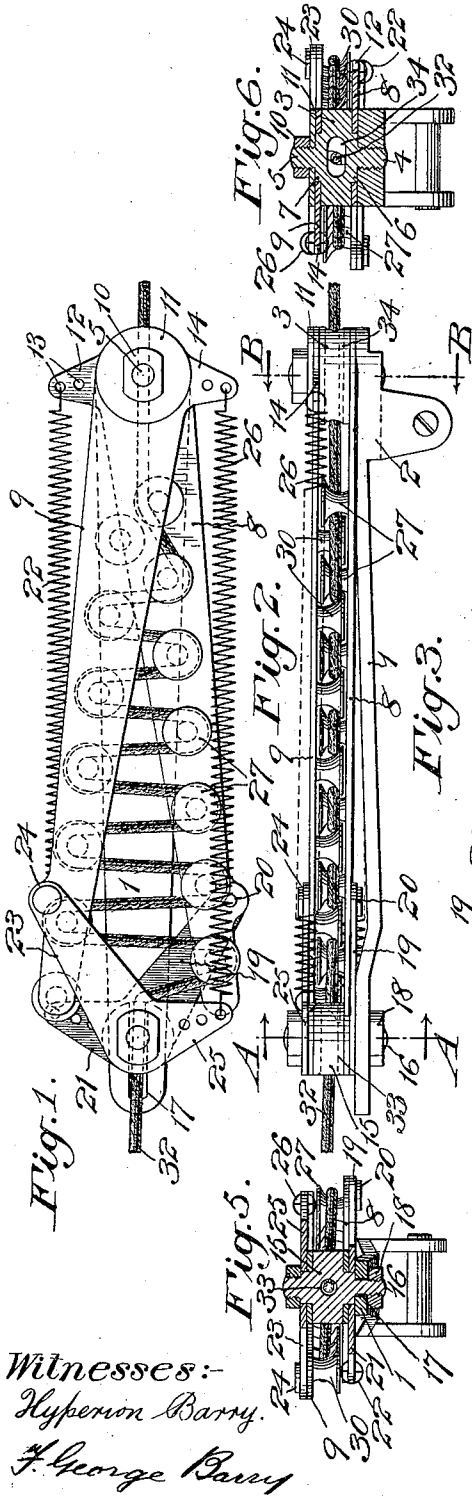


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Witnesses:-
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UNITED STATES PATENT OFFICE.

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TENSION DEVICE.

1,142,531. Specification of Letters Patent. Patented June 8, 1915.

Application filed August 22, 1914. Serial No. 858,109.

To all whom it may concern:

Be it known that I, VERNON ROYLE, a citizen of the United States, and resident of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Tension Device, of which the following is a specification.

My invention relates to a tension device for use in connection with a loom, cop winder or wherever it is desired to place a uniform tension or take-up upon a thread. It is essentially a compensating tension and is made in unit form so as to admit of its sale and application independent of the particular machines to which it may be attached.

In the accompanying drawings, Figure 1 is a front view, Fig. 2 is an edge view, Fig. 3 is a back view, Fig. 4 is a longitudinal section from side to side, Fig. 5 is a transverse section taken in the plane of the line A—A of Fig. 2, looking in the direction of the arrows, and Fig. 6 is a transverse section taken in the plane of the line B—B of Fig. 2, looking in the direction of the arrows.

The frame of the device consists in the present instance, of a flat bar 1, provided near one end with a bracket 2 for convenience in attaching the device to a machine.

A combined spacing and bearing piece 3, consisting in the present instance of a disk, is provided with a screw 4 projecting from one side thereof and a screw 5 projecting from the opposite side thereof. The piece 3 is also provided with a circular trunnion 6 projecting from one side thereof and a circular trunnion 7 projecting from the opposite side thereof, the screws 4 and 5 in the present instances, projecting from the centers of the trunnion portions 6 and 7.

On the trunnion 6, one end of an arm 8 is mounted to rock and on the trunnion 7 one end of an arm 9 is mounted to rock. These parts are assembled by first passing the trunnion 6 through the opening in the arm 8 and then screwing the piece 3 into the bar 1, then placing the arm 9 on the bearing trunnion 7 and securing the parts in position by screwing a nut 10 on to the screw 5, a washer 11 being interposed between the nut and the trunnion. The arm 8 has an ear 12 projecting laterally from its pivoted end, the ear being provided with several perforations 13 for purposes which will hereinafter appear. The arm 9 also in like manner has a perforated ear 14 projecting laterally from its pivoted end in a direction opposite that in which the ear 12 projects.

At or near the opposite end of the frame 1, a combined bearing and spacing piece 15 is located, the said piece 15 being provided at its opposite ends with bearing trunnion projections similar to those already described on the piece 3, a screw 16 from one side of the piece 15, projecting through an elongated slot 17 in the frame 1 and permitting the piece 15 and parts attached thereto to move to a limited extent longitudinally along the frame 1. The piece 15 is held to the frame 1, by means of a nut 18.

On the trunnion portion of the piece 15, adjacent to the frame 1, there is mounted a bell crank lever, the long arm 19 of which is pivotally secured to the arm 8 at 20, and the short arm 21 of which is attached to the perforated ear 12 on the arm 8, by a coil spring 22. In like manner a bell crank lever is mounted on the trunnion on the opposite side of the piece 15, the long arm 23 of said lever being pivotally attached at 24 to the arm 9 and the short arm 25 of said lever being connected by a coil spring 26 with the ear 14 at the opposite end of the arm 9. The short arms 21 and 25 of the bell crank levers are each provided with a series of perforations located at different distances from the pivotal axis of the lever for the purpose of increasing or diminishing the tension effect of the spring upon the lever and hence upon the arm to which the lever is pivotally connected. In like manner the perforations in the ears 12 and 14 serve to attach the coil springs nearer to or farther away from the pivotal axis of the arms on the piece 3, and hence to vary the effect of the spring upon the arm. The arm 8 is provided with a series of grooved faced sheaves 27 mounted on stems or spindles 28 projecting from the face of the arm inwardly toward the plane of the opposite arm, and in like manner the arm 9 is provided with a series of sheaves 30 mounted on stems or spindles 31 projecting inwardly toward the plane of the arm 8. The sheaves 30 are placed in staggered relation to the sheaves 27.

The yarn or thread, denoted by 32, to which tension is to be applied, passes through an opening 33 in the piece 15, thence successively around first a sheave 27

on the arm 8, and then around a sheave 30 on the arm 9, until it finally passes through an opening 34 in the piece 3.

In operation, the springs 22 and 26 tend to spread the arms 8 and 9, while resistance in the passage of the thread or yarn 32 tends to draw the arms toward each other against the tension of the springs 22 and 26. This tendency to draw the arms toward each other is, however, compensated for by a gradual straightening of the yarn or thread as the sheaves approach the sheaves on the opposite arm, thereby permitting the yarn or thread to move more freely than when the arms are spread to their full extent apart. The arms, therefore, are caused in practice to float intermediate their extreme open and closed positions.

The question of how much or how little tension shall be applied to the yarn or thread is determined not only by locating the springs 22 and 26 at different distances from the axes of rotation of the arms and the bell crank levers but also by the number of sheaves on the two opposite arms around which the thread is made to pass, and this may vary from passing it around one sheave on each of the arms to passing it around seven on each side, as the structure is illustrated in the drawings, but it is obvious that the number of sheaves may be increased at pleasure. It, therefore, follows in practice that having determined the amount of resistance employed, the device hereinabove described may be set so that tension shall remain constant even though there be a tendency from time to time for the yarn or thread to bind on the tension device since such tendency will promptly draw the arms toward each other and thereby allow the thread to render more freely until such abnormal resistance on the yarn or thread is removed.

The device is a simple one; it has proved in practice equal to all emergencies within reason and it may be readily applied to machines of different character wherever a uniform tension is desired on the thread or yarn.

What I claim is:

1. A tension and take-up device comprising a pair of arms pivoted to swing toward and away from each other and provided with guides for passing a thread or yarn back and forth from one arm to the other, springs tending to open the arms, and levers connecting the swinging ends of the arms and springs whereby the arms are caused to float intermediate of their extreme outward and inward positions.

2. A tension and take-up device comprising arms pivoted to swing toward and away from each other, sheaves provided on the arms for guiding a thread or yarn back and forth from one arm to the other, springs tending to hold the arms swung apart, and levers connecting the free ends of the arms with the springs for holding the arms in a floating position intermediate of their extreme open and closed positions.

3. A tension and take-up device comprising arms pivoted to swing toward and away from each other, the arms being provided with thread guides for passing a thread or yarn back and forth from one arm to the other, bell crank levers each having one arm connected with one of the sheave carrying arms and springs connecting the other arms of each of the bell crank levers with the sheave carrying arms at their pivoted ends.

4. A tension and take-up device comprising arms mounted to swing toward and away from each other, the said arms being each provided with a series of sheaves for receiving a thread or yarn, the sheaves on one of the arms being arranged in staggered relation to the sheaves on the other arm, bell crank levers each having an arm connected with one of the sheave carrying arms and springs connecting other arms of the bell crank levers with the sheave carrying arms.

5. A tension and take-up device comprising a pair of arms mounted to swing toward and away from each other, each arm being provided with a laterally projecting ear and with a series of yarn or thread guides, bell crank levers each having an arm connected with the thread guide carrying arm, and springs connecting other arms of the bell crank levers with said ears on the thread guide carrying arms.

6. A tension and take-up device comprising arms mounted to swing toward and away from each other, each arm being provided with a series of thread guides and with ears extending laterally therefrom, bell crank levers connected with the swinging ends of said arms and springs connected with the bell crank levers and ears, said ears and bell cranks being provided with means for attaching the springs to the levers and ears respectively at different distances from the pivotal connections of the arms and levers.

7. A tension and take-up device comprising a frame, a piece provided with trunnions on its opposite sides secured to the frame, swinging arms pivoted on said trunnions and provided with series of thread guides, levers connected with the opposite sides of said arms and springs connecting the levers with said arms.

8. A tension and take-up device comprising a frame, a piece provided with trunnions on its opposite sides secured to the frame, arms mounted on said trunnions to swing toward and away from each other, a second piece provided with trunnions on its opposite sides, bell crank levers mounted on said trunnions, and springs connecting the bell

crank levers with said swinging arms, the said swinging arms being provided with guides for directing the thread back and forth from one arm to the other.

9. A tension and take-up device comprising a frame, a piece provided with trunnions on its opposite sides and secured to the frame, swinging arms mounted on said trunnions, a second piece provided with trunnions on its opposite sides, levers mounted on said trunnions, a spring connecting the levers with said swinging arms, the said swinging arms being provided with guides for directing a thread or yarn back and forth between the swinging arms and the said trunnion pieces being provided with perforations for directing a thread centrally therethrough.

10. A tension and take-up device comprising a frame, arms mounted to swing toward and away from each other on the frame, each carrying a series of thread guides, bell crank levers mounted to move bodily along the frame, said levers being pivotally connected with the swinging arms and springs connecting the said bell crank levers with said swinging arms.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this twenty-ninth day of July, 1914.

VERNON ROYLE.

Witnesses:
HEBER ROYLE,
FRANK J. BRADLEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."