To all whom it may concern:

Be it known that I, CHARLES W. YOUNG, a citizen of the United States of America, residing at Killingly, in the county of Windham and State of Connecticut, have invented certain new and useful Improvements in Tension-Control Indicators, of which the following is a specification.

This invention relates to indicators adapted to be placed upon twisters or any other machines where yarns are twisted from beams upon spools or any other similar devices, so that if there is too great or too little tension upon the strands of yarn, which are being twisted from the beam or other apparatus upon spools or any similar device, the indicator will register the fact so that the tension may be regulated properly.

After yarns are spun, they are run upon beams and there may be a large number of ends of yarn upon a single beam. These beams may then be put upon twisters and a certain number of ends of single yarn are taken from the beam and twisted and wound upon a spool or other similar device, so that from one beam there may be numerous ends of yarn being unwound at the same time upon numerous other similar devices. As the beam unwinds, there has to be sufficient checking of its speed, by friction applied or otherwise, so that each end will be kept taut as it is unwound; otherwise, the yarn will kink or snarl. Hitherto, there has never been any process for measuring the tension of the yarn as it is being unwound from the beam, and if too great tension is applied, it stretches the yarn so that when it is woven into a fabric or otherwise used it will be weak and not of as great strength as it should be. This is especially true of yarn which goes into fabrics that are used in the manufacture of automobile tires, as the greatest strength possible is needed in such fabrics, whether it be a closely woven fabric or the cord fabric, so called. To aid in producing a uniform tension on the ends as they are unwound from the beam, there has been disclosed in this application the tension control indicator which will indicate any increase above or decrease below the normal or proper tension, so that friction upon the beam may be immediately lessened or increased and the tension at once restored to normal.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same.

Figure 1 shows in dotted lines a fragmentary elevational view of a twister or other similar machine, while operatively associated therewith and illustrated in elevation is the complete tension control indicator embodying this invention.

Figure 2 illustrates in elevation, partly broken away, a tension or rock bar which forms a part of the standard type of twister to which this tension control indicator is attached.

Figure 3 is a fragmentary elevational view of the tension control indicator.

Figure 4 is a vertical sectional view taken upon line IV—IV of Fig. 3.

Figure 5 is a vertical sectional view taken upon line V—V of Fig. 4.

Figure 6 is a detail perspective view of the main stand bracket, forming a part of the tension control indicator, and

Figure 7 is a fragmentary perspective view of a tension lever which forms a part of the indicator.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of this invention, the numeral 5 designates in its entirety a twister, or other similar machine, which employs a tension or rock bar 6, shown in detail in Fig. 2.

This tension or rock bar 6 is formed of wood and consists of a hexagonal body portion 7 and journal portions 8 at the ends thereof. The hexagonal body portion 7 is provided with a row of wire eyelets 9 which may be provided in any desired number and spaced any suitable distance and are employed for having the ends of yarn passed therethrough from a beam, upon which the
yarn is wound, but which is not shown in this case, to the spools carried by the twister. This tension or rock bar 6 is journaled in the frame of the twister, shown in dotted lines and designated by the numeral 5.

The tension lever 10, shown in detail in Fig. 7, is provided with a clamp structure 11 at one end by means of which the lever may be secured to one end of the tension or rock bar 6 so that rotation of the bar in either direction will cause similar movement of the tension lever. This lever is provided with a depending, L-shaped extension 12 having the foot portion 12a, as best illustrated in Fig. 7.

The extremity of the tension lever 10 is provided with an aperture 13 by means of which the weight 14 is fastened to the lever. Arranged in respect to the twister 5, as best illustrated in Fig. 1, is a stand 15 having mounted on the upper end thereof a substantially U-shaped main stand bracket 16, as illustrated. This bracket is provided with two pairs of aligned openings 17 and 18 respectively, as best illustrated in Fig. 6.

A pinion stud 19 is journaled in the openings 17 and is retained in place by the collars 20. This pinion stud has suitably keyed therein a pinion 21 which meshes with the segmental gear 22 keyed to the rock stud 23 journaled in the apertures 18 formed in the main stand bracket 16. This segmental gear 22 is provided with a laterally projecting lever 24 which is intended to bear against the upper edge of the foot portion 12a of the L-shaped extension 12 carried by the tension lever 10 and to be moved upwardly when the said lever moves in a similar manner and to move downwardly of its own weight.

Suitably mounted upon one end face of the U-shaped main stand bracket 16, as by the screws 25, is a dial 26 having the scale lines 27 formed thereon with suitable indicia associated therewith. An indicator hand 28 is fastened to the end of the pinion stud 19 by means of the screw 29 which is threaded into the opening 30 formed in the said stud.

The operation of this tension control indicator may be described as follows:

It is to be understood that the ends of yarn, the tension of which this indicator is intended to register, are passed thru the wire cycles 9 in the tension or rock bar 6. Any increase or decrease in tension upon the strands of yarn will cause the tension or rock bar 6 to rotate in the proper direction the rotation caused by the increase in tension upon the yarn being in a direction for causing upward movement of the tension lever 10, while a decrease in tension upon the yarn ends will cause the tension or rock bar 6 to rotate for moving the tension lever downwardly. It will now be understood that any upward movement of the tension lever 10 will cause the lever 24 of the segmental gear 22 to be moved upwardly for causing rotation of the pinion 21 and pinion stud 19 to produce movement of the indicator hand 28 in a counter-clockwise direction for producing a notification of the increase in tension upon the yarn. Any decrease in tension upon the yarn will permit the tension lever to move downwardly, due to the existence of the weight 14, for permitting the lever 24 of the segmental gear 22 to move downwardly also. This downward movement of the lever 24 will cause the segmental gear 22 to rotate for rotating the pinion 21 and pinion stud 19 to move the indicator hand 28 toward the scale line 27 bearing the indicia 1.

It will now be apparent that the slightest change in tension on the yarn ends will be instantly registered upon the dial 26 by movement of the indicator hand 28 and the operator of the twister, or other similar machine with which this indicator is associated, may take proper steps for re-establishing the tension at the desired degree or restore it to normal.

It is to be understood that the form of this invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:

1. In a twister or the like, the combination with a tension bar, of a tension lever clamped thereupon, said tension lever having a depending extension, an indicator element, and means for operatively connecting the element with said depending extension for causing movement of the extension to produce movement of the indicator element.

2. In a twister or the like, the combination with a tension bar, of a tension lever clamped on said bar, a depending L-shaped extension carried by said lever, a support, a movable indicator hand carried by said support, and a train of mechanical elements operatively connecting said indicator hand and the depending extension for causing movement of the extension to produce movement of the indicator hand.

3. In a twister or the like, the combination with a tension bar, of a tension lever fastened thereto, a depending extension carried by the free end portion of said lever, a stand, a bracket mounted on said stand, a pair of studs supported by said bracket and adapted to rotate, an indicator hand carried by one stud, a lever carried by the remaining stud operatively associated with the depending extension carried by said tension lever, and means for connecting the studs to cause ro-
tation of the same in opposite directions, whereby movement of the tension bar will cause movement of the indicator hand carried by one stud.

4. In a twister or the like, the combination with a stand, a dial carried by the stand, and a pointer movable over the dial, of a tension bar, a laterally extending lever carried by the bar, an L-shaped extension depending from the free end of the lever, and means for causing the rise of the foot of the extension to move the pointer.

In testimony whereof I affix my signature.

CHARLES W. YOUNG.