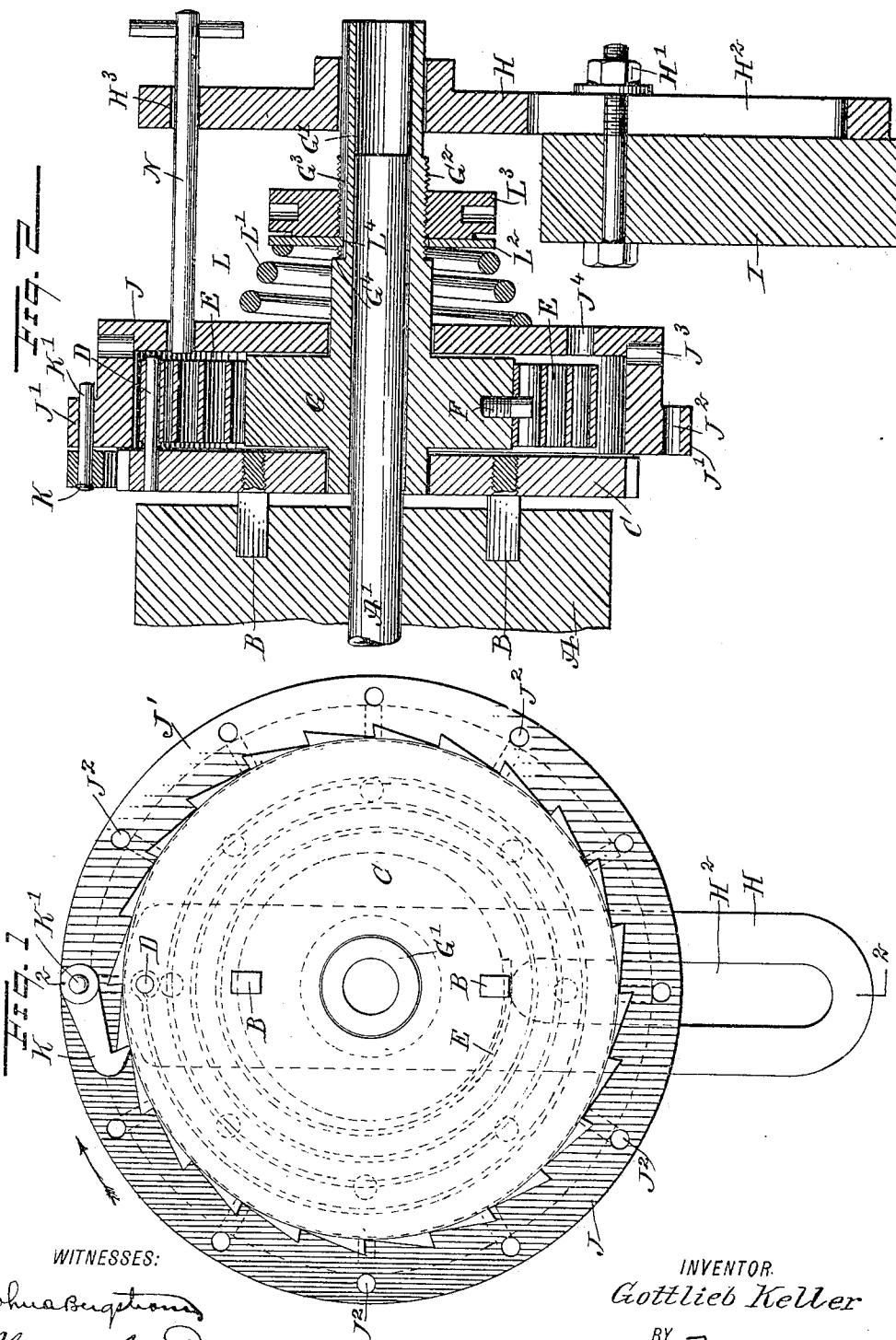


No. 818,829.

PATENTED APR. 24, 1906.

G. KELLER.
TENSION DEVICE FOR WARP BEAMS.
APPLICATION FILED JUNE 13, 1905.



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UNITED STATES PATENT OFFICE.

GOTTLIEB KELLER, OF NEW YORK, N. Y., ASSIGNOR TO KELLER MACHINE COMPANY, A CORPORATION OF NEW YORK.

TENSION DEVICE FOR WARP-BEAMS.

No. 818,829.

Specification of Letters Patent.

Patented April 24, 1906.

Application filed June 13, 1905. Serial No. 264,988.

To all whom it may concern:

Be it known that I, GOTTLIEB KELLER, a citizen of the Republic of Switzerland, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Tension Device for Warp-Beams, of which the following is a full, clear, and exact description.

The invention relates to tension devices for warp-beams—such, for instance, as shown and described in Letters Patent of the United States No. 801,595, dated October 10, 1905.

The object of the present invention is to provide a new and improved tension device for warp-beams or warp-carrying spools arranged to permit minute and convenient regulation for producing the desired tension on the warp, according to the nature thereof, and to provide a long range of movement of the beam.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a rear face view of the improvement; and Fig. 2 is a transverse section of the same as applied to the warp-beam, the section being on the line 2 2 of Fig. 1.

One end of the warp-beam A is engaged by studs B, projecting from the rear face of a wheel C, preferably in the form of a ratchet-wheel and provided with a transverse pin D, engaging the outer end of a spiral spring E, fastened with its inner end to a stud F, projecting from the peripheral surface of a wheel G, the hub G' of which forms a bearing for one end of the shaft A' of the warp-beam A, the other end of the shaft being journaled in the usual manner in a suitable bearing on the frame of the loom. The hub G' is journaled in a bearing on a bracket H, held adjustable on one side I of the loom-frame by the use of a bolt H', engaging the side I and extending through an elongated slot H², formed in the bracket H.

The spring E is contained within a spring-casing J, mounted to rotate on the hub G' of the wheel G, and the rim of the said casing is

provided with an annular flange J', having a plurality of spaced transverse apertures J², the top one of which is adapted to be engaged by a pivot-pin K' of a pawl K, adapted to engage the teeth of the ratchet-wheel C.

The wheel G forms a resistance member for the spring E, and in order to give the desired resistance to this wheel a tension device L is provided, preferably consisting of a coil-spring L', resting with one end on the outer face of the casing J and abutting with its other end on a washer L², engaged by a nut L³, screwing on the threaded portion G² of the hub G' of the resistance-wheel G. By screwing up or unscrewing the nut L³ more or less tension is given to the spring L', so that the resistance-wheel G is forced at its web with more or less force in contact with the inner surface of the casing J to give the wheel G more or less resistance—that is, to cause it to resist the turning action of the spring E.

As shown in the drawings, the washer L² is preferably provided with a tongue L⁴, projecting into a longitudinal groove G³, formed on the threaded portion G² of the hub G', to cause the washer L² to turn with the hub G' of the resistance-wheel G. The inward movement of the washer L², and consequently the screwing-up motion of the nut L³, is limited by a stop-shoulder G⁴, formed on the hub G'. (See Fig. 2.)

In order to wind up the spring E until the resistance of the resistance-wheel G is overcome, so that the latter turns with the wheel C and the warp-beam A, it is necessary to turn the casing J, and for this purpose the rim thereof is provided with spaced apertures J³, adapted to be engaged by a spanner-wrench or like tool for turning the casing, and with it the tension device L and the wheel G, until the spring E is wound up to the desired degree—that is, to the tension required by the warp on the beam A. When this has been done, a key N, fitted to slide in a bearing H³ on the bracket H, is engaged with one of a series of apertures J⁴, formed in the outer face of the casing J to hold the latter against rotation, as illustrated in Fig. 2.

The operation is as follows: When the several parts are in the position as illustrated in Fig. 2, then the spring E is wound up to such a degree that it gives the desired tension to the warp on the warp-beam A, and when the loom is in action and the usual pull

is exerted on the warp and the warp-beam A is turned in the direction of the arrow, Fig. 1, then the wheel C in rotating with the warp-beam carries along the spring E, as well as the resistance-wheel G, as the resistance offered by the latter to the spring E by the tension device L is approximately equal to the tension required on the warp. When it is desired to give more tension to the warp, it is only necessary for the operator to screw up the nut L³ to increase the resistance of the wheel G relative to the spring E, and when less tension on the warp is required the nut L³ is correspondingly unscrewed on the threaded portion G². As the casing J is held against turning by the key N and the pawl K is in engagement with the teeth of the ratchet-wheel C, it is evident that the latter, as well as the warp-beam A, are held against accidental return movement. When it is desired to let off the warp-beam for unwinding the warp a desired length, then the operator applies a spanner-wrench or like tool to the apertures J³ to give sufficient turning movement to the casing J for convenient withdrawal of the key N to permit the whole device to rotate with the warp-beam A—that is, the wheel C, casing J, resistance-wheel G, spring E, and tension device L move together in unison without the several parts changing their relative positions to each other—and when the warp has been unwound the desired distance and it is again desired to restart it is only necessary for the operator to engage the key N with one of the apertures J⁴, so that the casing J is held against turning movement, and the turning of the warp-beam A can now proceed with the same amount of tension on as it had before and to which the device is set. In some cases it is desirable to hold the casing J against turning while letting off the warp-beam A, and in such cases it is only necessary for the operator to throw the pawl K out of engagement with the ratchet-wheel C to allow the parts to turn in unison with each other, with the exception of the casing J, at the same time retaining, however, the tension of the spring E.

The pawl K should be at all times at the top of the casing within convenient reach of the operator, and for this purpose I provide a plurality of openings J² to receive the pivot-pin K' of the pawl.

The device shown and described is very simple and durable in construction, is not liable to get easily out of order, and any desired amount of tension can be given to the warp-beam A by winding up the spring E correspondingly; and the tension can be increased or decreased while the machine is running by adjusting the tension device L to increase or decrease the resistance given by the wheel G to the turning motion of the spring E.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. A tension device for warp-beams, comprising two rotatable members, a spiral spring connected at its ends with the said members, one of the members rotating with the warp-beam, an adjustable tension device for the other member, and means for locking the warp-beam member against return movement.

2. A tension device for warp-beams, comprising a warp-beam member rotating with the warp-beam, a resistance member having independent rotating motion relative to the said warp-beam member, a spiral spring connecting the members with each other, and a tension device for governing the rotating movement of the said resistance member, and a releasable connection between the tension device and the warp-beam member.

3. A tension device for warp-beams, comprising a warp-beam member rotating with the warp-beam, a resistance member having independent rotating motion relative to the said warp-beam member, a spiral spring connecting the members with each other, a tension device for governing the rotating movement of the said resistance member, a casing for the spring engaged by the said tension device, and a releasable connection between the casing and the warp-beam member.

4. A tension device for warp-beams, comprising a warp-beam member rotating with the warp-beam, a resistance member having independent rotating motion relative to the said warp-beam member, a spiral spring connecting the members with each other, a tension device for governing the rotating movement of the said resistance member, a rotatable casing for the said spring, and a releasable connection between the casing and the warp-beam member.

5. A tension device for warp-beams, comprising a warp-beam member rotating with the warp-beam, a resistance member having independent rotating motion relative to the said warp-beam member, a spiral spring connecting the members with each other, a tension device for governing the rotating movement of the said resistance member, a casing for the said spring adapted to turn with the said resistance member, and means for locking the casing against turning.

6. A tension device for warp-beams, comprising a warp-beam member rotating with the warp-beam, a resistance member having independent rotating motion relative to the said warp-beam member, a spiral spring connecting the members with each other, a tension device for governing the rotating movement of the said resistance member, a casing for the said spring, and a pawl-and-ratchet connection between the said casing and the said warp-beam member.

7. A tension device for warp-beams, com-

prising a ratchet-wheel turning with the warp-beam, a resistance-wheel mounted to turn independent of the said ratchet-wheel, a spiral spring connecting the ratchet-wheel with the said resistance-wheel, a revoluble casing for the said spring, and a pawl on the casing for engaging the said ratchet-wheel.

8. A tension device for warp-beams, comprising a ratchet-wheel turning with the warp-beam, a resistance-wheel mounted to turn independent of the said ratchet-wheel, a spiral spring connecting the ratchet-wheel with the said resistance-wheel, a revoluble casing for the said spring, a pawl on the casing for engaging the said ratchet-wheel, and a tension device for the said resistance-wheel.

9. A tension device for warp-beams, comprising a ratchet-wheel turning with the warp-beam, a resistance-wheel mounted to turn independent of the said ratchet-wheel, a spiral spring connecting the ratchet-wheel with the said resistance-wheel, a revoluble casing for the said spring, a pawl on the casing for engaging the said ratchet-wheel, and manually-controlled means for locking the casing in position.

10. A tension device for warp-beams, comprising a ratchet-wheel turning with the warp-beam, a resistance-wheel mounted to

turn independent of the said ratchet-wheel, a spiral spring connecting the ratchet-wheel with the said resistance-wheel, a revoluble casing for the said spring, a pawl on the casing for engaging the said ratchet-wheel, and a tension device for the said resistance-wheel and engaging the said casing for winding up the spring on turning the casing.

11. A tension device for warp-beams, comprising a ratchet-wheel turning with the warp-beam, a resistance-wheel mounted to turn independent of the said ratchet-wheel, a spiral spring connecting the ratchet-wheel with the said resistance-wheel, a revoluble casing for the said spring, a pawl on the casing for engaging the said ratchet-wheel, a tension device for the said resistance-wheel and engaging the said casing for winding up the spring on turning the casing, and manually-controlled means for locking the casing against movement.

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

GOTTLIEB KELLER.

Witnesses:

THEO. G. HOSTER,
JNO. M. RITTER.