No. 693,164. Patented Feb. 11, 1902.

H. K. SEITZ & C. H. HANNIGAN.

TENSION DEVICE FOR LOOM SHUTTLES.

(Application filed Aug. 14, 1901.)

(No Model.)

Fig. 1.

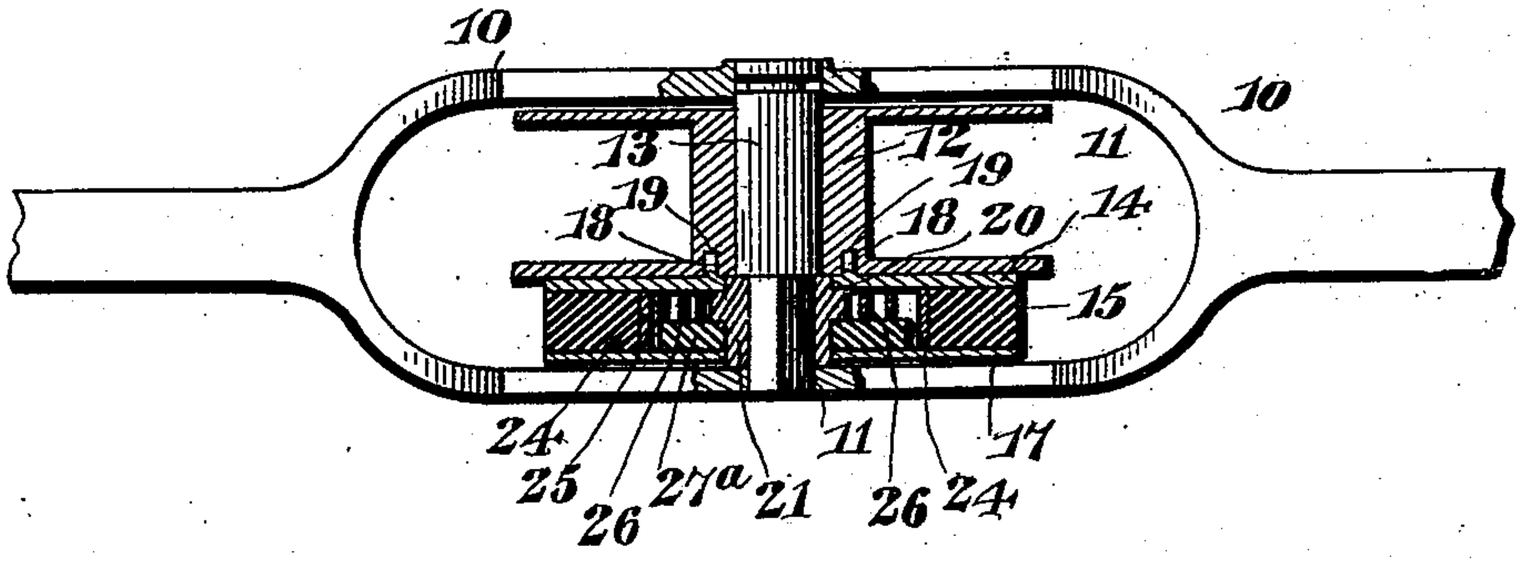


Fig. 2.

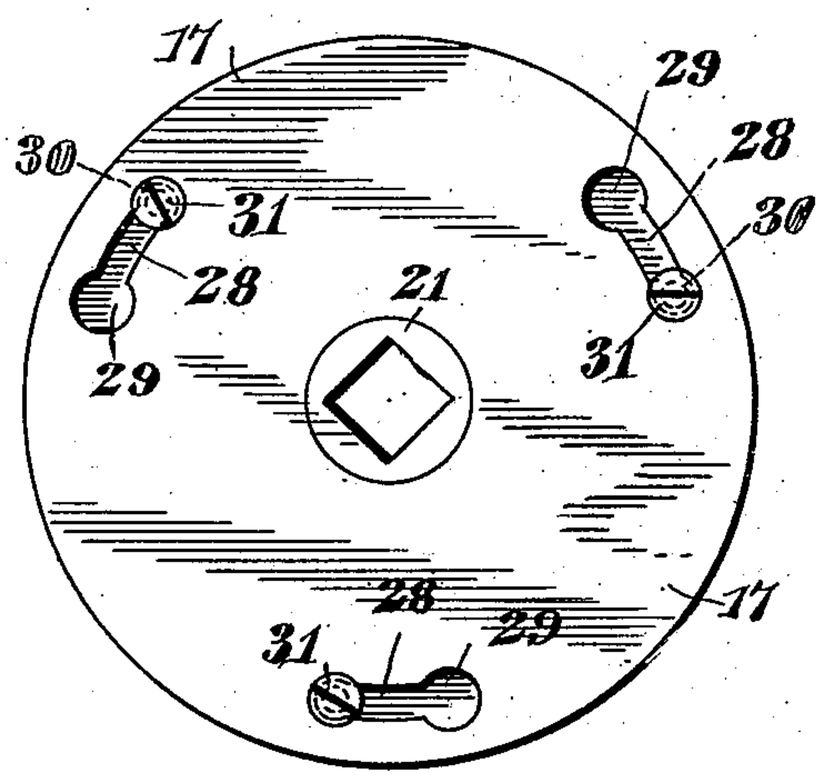


Fig. 3.

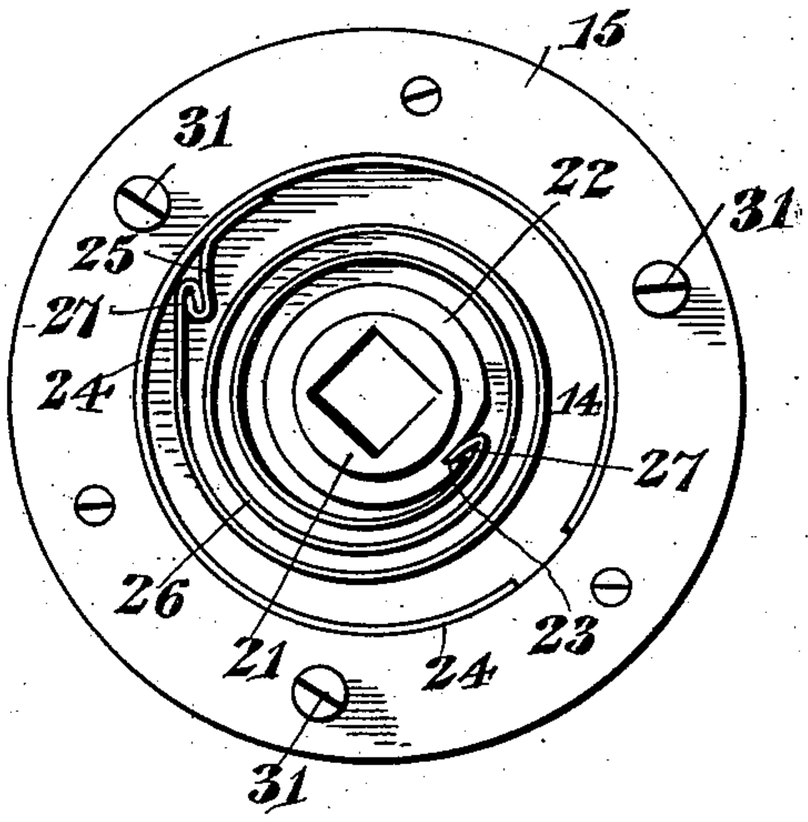


Fig. 4.

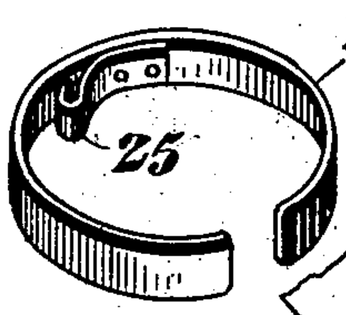


Fig. 5.

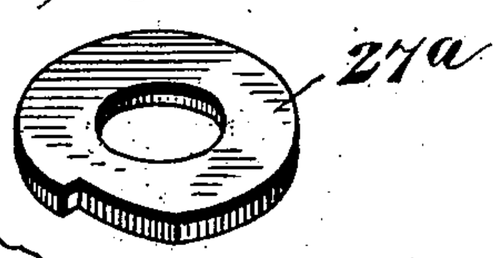
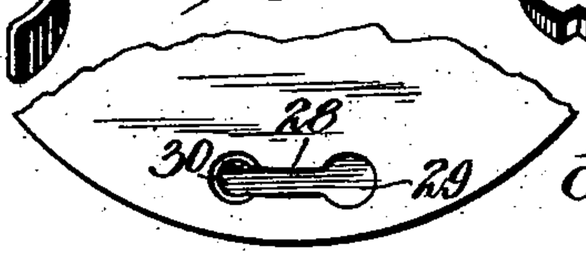


Fig. 6.



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UNITED STATES PATENT OFFICE.

HOWARD K. SEITZ AND CHARLES H. HANNIGAN, OF GLENROCK, PENNSYLVANIA.

TENSION DEVICE FOR LOOM-SHUTTLES.

SPECIFICATION forming part of Letters Patent No. 693,164, dated February 11, 1902.

Application filed August 14, 1901. Serial No. 72,062. (No model.)

To all whom it may concern:

Be it known that we, HOWARD K. SEITZ and CHARLES H. HANNIGAN, citizens of the United States, residing at Glenrock, in the county of York and State of Pennsylvania, have invented a new and useful Tension Device for Looms, of which the following is a specification.

The present invention relates to improvements in tension devices for loom-shuttles, and particularly to that class employing a tension-spring which will automatically take up the slack in the strand caused by the momentum of the bobbin at the end of the shuttle-stroke.

The object of the invention is to greatly simplify the structure in this class of devices and at the same time provide mechanism which is reliable in operation, having a minimum number of elements which are not liable to derangement, but which are readily accessible for the purpose of repair or replacement should such action become necessary.

In the accompanying drawings there is illustrated an embodiment of the invention which is at present considered preferable, and the construction and operation thereof are fully described in the following specification. The invention, however, is not to be limited to the exact form shown and described, but is open to such modifications and changes as are allowed by the scope of the appended claims.

In the drawings, Figure 1 is a sectional view through a portion of a shuttle, showing the bobbin and the improved tension device located thereon. Fig. 2 is a side elevation of the outer face of the tension device. Fig. 3 is a similar view with the cap-plate and the retaining-washer removed. Fig. 4 is a perspective view of the friction-spring, and Fig. 5 is a perspective view of the retaining-washer. Fig. 6 is a detail view of a portion of the cap-plate, illustrating the configuration of one of the slots.

Similar numerals of reference designate corresponding parts in all the figures of the drawings.

In order to clearly illustrate the application of the present invention, a portion of a shuttle is shown and designated 10, having an opening 11 therein, in which is rotatably mounted a bobbin 12 by means of a spindle 13, that extends transversely across the opening. These several elements are all old and well known to the art. In themselves, therefore, they form no part of the present invention, which relates to the improved tension device for the bobbin.

The tension device, as shown, comprises a casing consisting of a base-plate 14, to the outer edge of which is secured a friction-collar 15, thus leaving an open side which is normally closed by a cap-plate 17, detachably secured to the collar 15. The base-plate 14 is preferably made of metal and is provided on its outer face with pins 18, that engage in sockets 19 in the adjacent face of the bobbin, so that said casing will revolve therewith. The base-plate is furthermore provided with a central opening 20, through which the spindle 13 passes, said spindle at this point being angular in cross-section and having a hub 21, which is located within the casing fitted thereon. This hub is provided with an annular flange 22, having a notch in its periphery which forms a holding-shoulder 23. The friction-collar 15 is preferably composed of compressed fibrous material and has its inner face circular, as clearly shown in Fig. 3.

Fitting within the casing and bearing firmly against the inner face of the collar 15 is a circular expansible friction-spring 24, provided upon its inner face with a hook 25, riveted or otherwise secured thereto. A coiled tension-spring 26, having terminal hooks 27, is located within the casing, with one of said hooks interlocking with the hook 25 of the friction-spring and the other in engagement with the holding-shoulder 23 of the hub-flange. This latter connection is so constructed that when the casing is revolved in one direction the hook and shoulder will engage and be held against independent movement; but when revolved in the other direction said hook and shoulder will disengage and the end of the spring will rotate freely about the hub-flange. A retaining-washer 27ª is preferably arranged between the tension-spring and the cap-plate 17.

The cap-plate 17 is preferably made of material similar to the base-plate, and the manner of securing it to the casing is clearly shown in Fig. 2. It is provided with slots 28,

that are concentric to the spindle 13, and said slots are provided at their opposite ends with enlarged openings 29 and 30, the openings at one end being larger than those at the other and the smaller openings being preferably countersunk, all of which is shown in Fig. 6. Fastening devices in the form of screws 31 pass through these slots and engage in the friction-collar 15. Assuming the cap is removed from the casing and it is desired to place it upon the same, it is only necessary to pass the heads of the screw-fasteners through the larger openings of the slots and rotate said cap until the fasteners are located in the smaller openings. Said fasteners are then screwed tightly down and their heads will be flush with the face of the cap, thus securing the same in place and positively locking it against retrograde movement.

The operation of the device will be readily apparent to those skilled in this art. As the strand is unwound from the bobbin during the stroke of the shuttle, the bobbin and the casing being secured together, both will turn simultaneously, and as a consequence the coiled spring 26 will be wound about the hub until the tension overcomes the frictional resistance between the spring 24 and the collar 15, whereupon said friction-spring will remain substantially stationary, while the casing will revolve about it. As the end of the stroke is reached the momentum of the shuttle will create a slack in the strand, whereupon the friction-spring 24 and the friction-collar 15 will be relatively stationary, while the tension-spring 26 is free to react. As a consequence the bobbin is rotated in an opposite direction, so that the slack will be rewound thereon. Should this reverse rotation have sufficient momentum to carry the casing past the normal position of the tension-spring, the inner hooked end will disengage from the holding-shoulder 23, and said casing will be free to revolve.

By this construction it will be seen that an exceedingly simple device is provided, in which the several parts or elements are reduced to a minimum, and as the only frictional engagement is between the spring 24 and the inner face of the collar 15 and said spring will expand, all wear at this point will be taken up. Outside of this, however, the frictional resistance can be varied by bending the spring inwardly or outwardly, as desired. The removable cap-plate of the construction set forth permits of ready access to the interior of the casing, and should the tension-spring become broken or injured from any cause said spring may be removed without deranging or in any other manner affecting the other elements.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a tension device of the class described, the combination with a spindle, of a bobbin rotatably mounted upon the spindle, a collar rotatable with the bobbin, a spring having a frictional engagement with the collar, and a yielding connection between an intermediate portion of the spring and the spindle.

2. In a tension device of the class described, the combination with a spindle, of a bobbin rotatably mounted upon the spindle, a collar rotatable with the bobbin, a spring having a frictional engagement with the collar, and yielding connection between the spring and spindle, said connection having a detachable engagement with the spring.

3. In a tension device of the class described, the combination with a spindle, of a bobbin rotatably mounted on the spindle, a collar arranged at one side of the bobbin and rotatable therewith, an expansible spring having its expansible portion in frictional engagement with the inner face of the collar, and a tension-spring connecting the spindle and the friction-spring.

4. In a tension device of the class described, the combination with a spindle, of a bobbin rotatably mounted thereon, a casing connected to the bobbin and rotatable therewith, an expansible friction-spring located within the casing and having its expansible portion bearing against the same, and a tension-spring connected to the spindle and the friction-spring.

5. In a tension device of the class described, the combination with a spindle, of a bobbin rotatably mounted thereon, a casing connected at one side to the bobbin and rotatable therewith, said casing being provided with an annular collar, a hub located within the casing and fixed with relation to the spindle, an expansible spring having its expansible portion in direct frictional engagement with the inner face of the collar, and a coiled tension-spring arranged within the casing and yieldably connecting the hub and friction-spring.

6. In a tension device of the class described, the combination with a spindle, of a bobbin rotatably mounted on the spindle, a casing connected at one side to the bobbin and having its other side open, said casing being rotatable with the bobbin and provided with an annular collar, a hub located within the casing and rotatable with the spindle, an expansible spring having a frictional engagement with the inner face of the collar, a coiled tension-spring arranged within the casing and yieldably connecting the hub and friction-spring, and a cap covering the open side of the casing and detachably secured thereto.

7. In a tension device of the class described, the combination with a spindle, of a bobbin rotatably mounted on the spindle, a casing connected at one side to the bobbin and rotatable therewith, said casing being provided with an annular collar, a hub located within the casing and rotatable with the spindle, said hub having a shoulder upon its periphery, an expansible circular spring having a frictional engagement with the inner face of the collar and provided with a hook, and a coiled tension-spring arranged within the casing and having terminal hooks that respectively engage the shoulder of the hub and the hook of the friction-spring.

8. In a tension device of the class described, the combination with a spindle, of a bobbin rotatably mounted on the spindle, a collar arranged at one side of the bobbin and rotatable therewith, an expansible spring having a frictional engagement with the inner face of the collar, and a tension-spring connecting the spindle and an intermediate portion of the friction-spring.

9. In a tension device of the class described, the combination with a spindle, of a bobbin rotatably mounted on the spindle, a collar arranged at one side of the bobbin and rotatable therewith, an expansible spring having a frictional engagement with the inner face of the collar, and a tension-spring having detachable connections at its ends with the spindle and an intermediate portion of the friction-spring.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

HOWARD K. SEITZ.
CHARLES H. HANNIGAN.

Witnesses:
WILLIAM H. PETERMAN,
URIAH S. DISE.