No. 680,682. Patented Aug. 20, 1901.

A. BALDWIN.

TENSION DEVICE FOR LOOM SHUTTLES.

(Application filed Jan. 30, 1900. Renewed Apr. 2, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

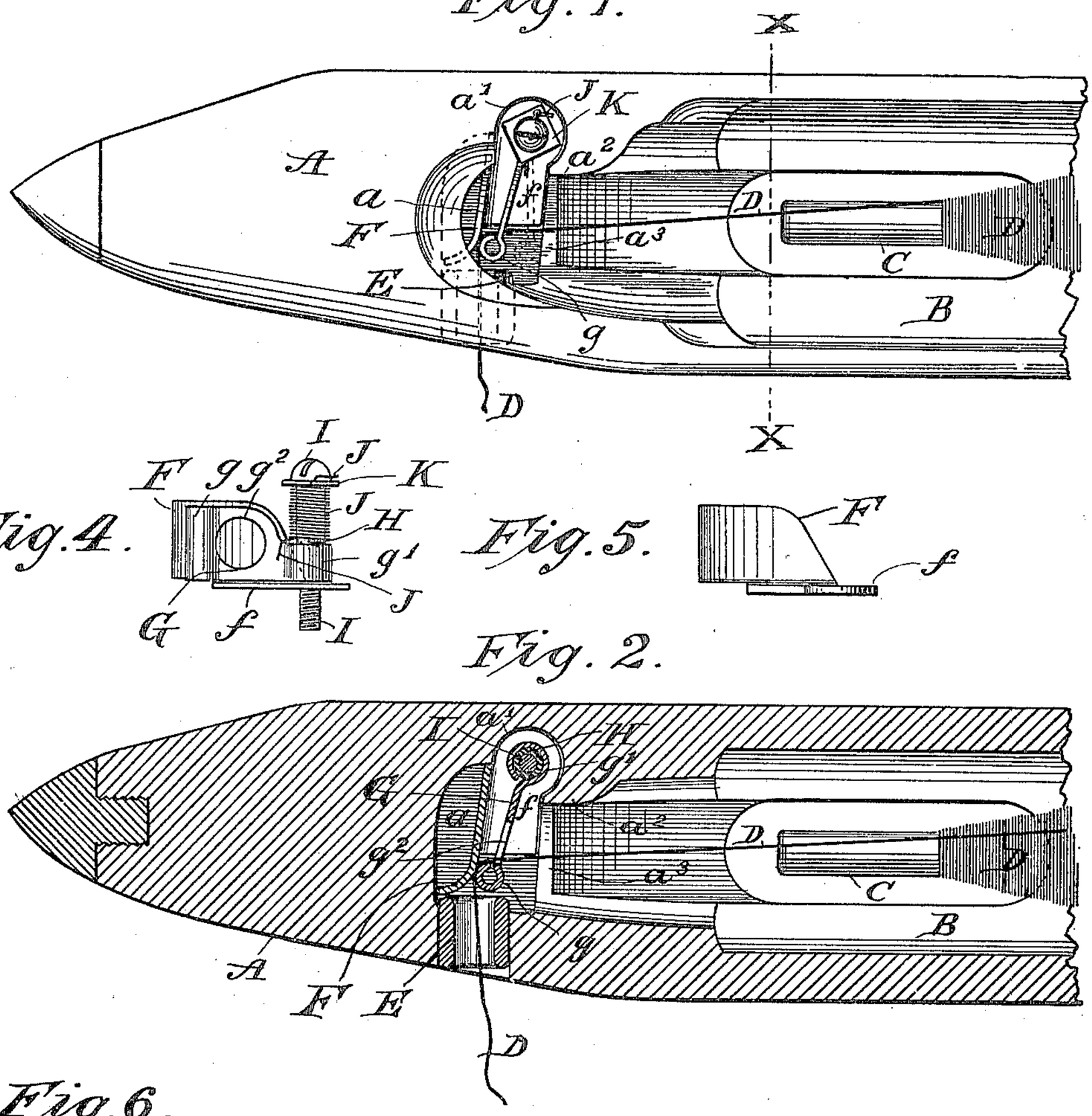


Fig. 4.

Fig. 5.

Fig. 2.

Fig. 6.

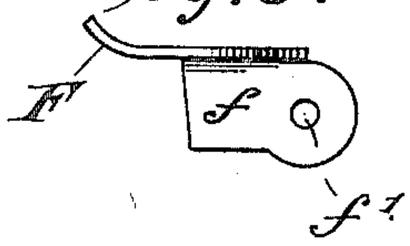


Fig. 3.

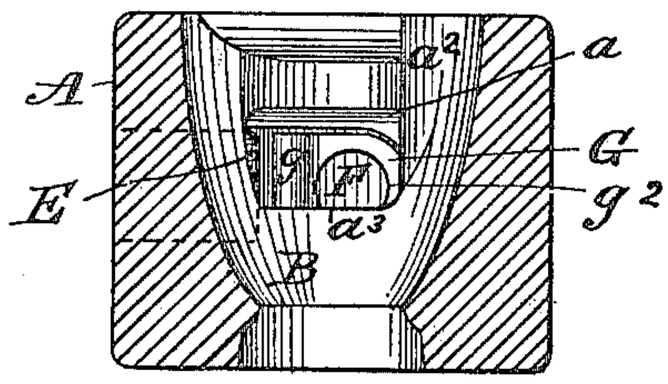


Fig. 7.

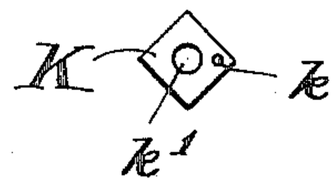
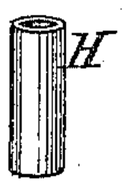


Fig. 8.



Witnesses

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No. 680,682.

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2 Sheets—Sheet 2.

Fig. 9.

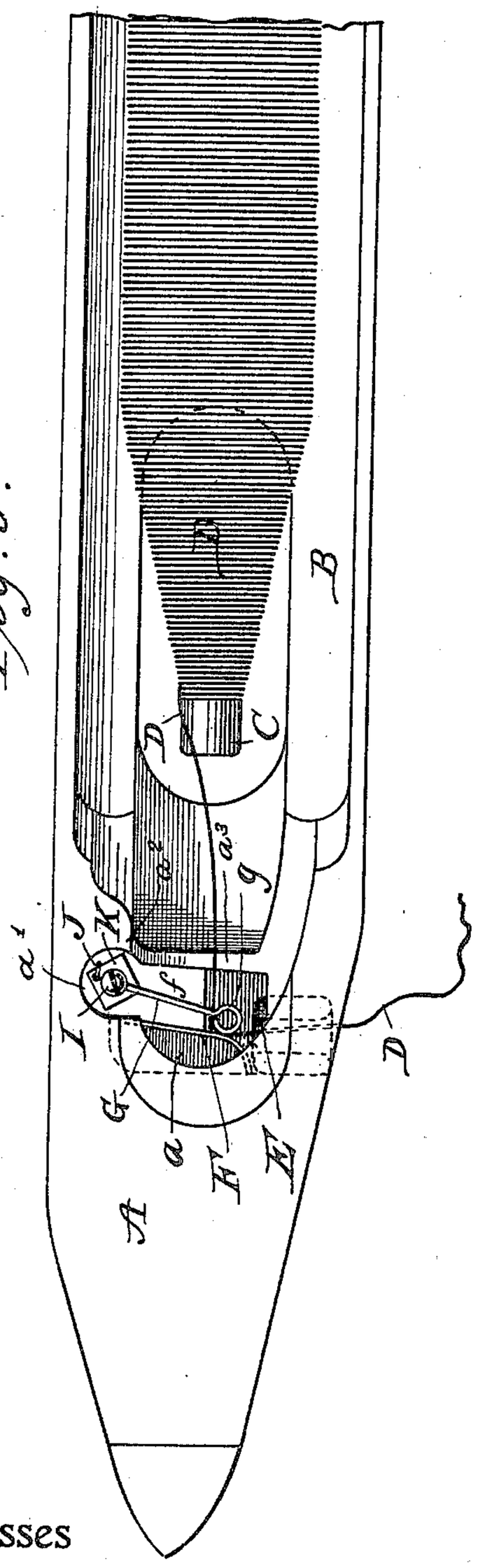
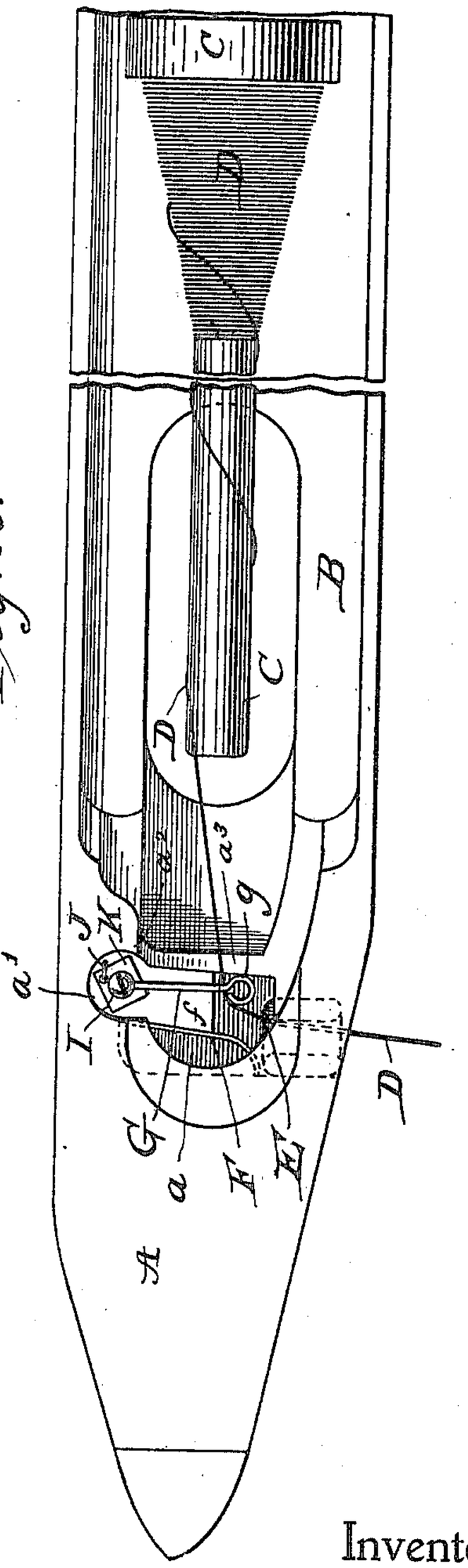


Fig. 10.



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ALFRED BALDWIN, OF GOFFS FALLS, NEW HAMPSHIRE.

TENSION DEVICE FOR LOOM-SHUTTLES.

SPECIFICATION forming part of Letters Patent No. 680,682, dated August 20, 1901.

Application filed January 30, 1900. Renewed April 2, 1901. Serial No. 54,074. (No model.)

To all whom it may concern:

Be it known that I, ALFRED BALDWIN, a citizen of the United States, residing at Goffs Falls, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Automatic Tension Devices for Loom-Shuttles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates and applies to that portion of a loom-shuttle adjacent to the inner terminal of the eye of said shuttle, the object of the invention being to provide a more even and uniform tension and of a construction whereby said tension is adapted to be released by contact of the filling-thread when any dangerous increase of the natural tension is encountered, and hence the invention comprises an automatic tension device for loom-shuttles so constructed as to gradually decrease or increase as the requirements of the yarn or thread on a bobbin may demand.

It may be well to here explain the necessity for such a device.

As the shuttle moves back and forth the thread is gradually but nevertheless rapidly removed from the bobbin, the latter becoming gradually bare, and as this continues the natural tension of the yarn or thread increases by reason of the rapid motion of said thread and its friction against the increasing bare portion of the bobbin. With a full bobbin the tension-lever will be maintained normally in contact with the friction-plate; but as the yarn or thread gradually leaves the bobbin the natural tension is increased, and the tension-lever will then vibrate slightly upon the friction-plate, and as the quantity of yarn or thread on the bobbin further diminishes the vibrations of the tension-lever against the yarn passing between said lever and friction-plate gradually increases in speed and severity until the natural tension caused by the yarn or thread striking or curling around the bobbin as it is unwound therefrom, as seen in Figure 10, increases to that extent that the said lever is held from contact with said friction-plate and the separation of the two at such time may be said to be constant. To overcome this difficulty, I provide a tension-lever of proper construction to perform its function under normal conditions only, any extra natural tension of the thread serving to withdraw the tension-lever from its friction-plate. One means for accomplishing this result is shown in the accompanying drawings, in which the thread passing from the bobbin to the eye of the shuttle passes between a friction-plate and a spring-actuated tension-lever, the thread passing first through a perforation in said lever, and hence as the natural tension increases the extra strain causes the free end of the tension-lever to automatically move away from its friction-plate, thus automatically relieving the thread of any mechanical tension, thereby insuring a more even tension for the entire length of said bobbin and preventing rowey goods and filling from breaking, and as soon as the shuttle crosses the shed to the opposite shuttle-box or stops its motion the tension-lever automatically resumes its place against the friction-plate and holds the thread firmly until the shuttle is again called, the action of said lever being so sensitive that knots or bunches in the filling-thread are permitted to pass through it without breaking and without requiring guide-fingers to keep the thread in proper place. In accordance with my invention the yarn leaving the bobbin is passed on its way to the usual delivery-eye of the shuttle-body over a spring-controlled lever. The free end of the lever sustains the yarn, and normally when the yarn is running freely from the bobbin the lever forces the yarn frictionally against a friction-plate. As the tension increases, due to the greater resistance offered the yarn as the diameter of the yarn load on the bobbin decreases, the strain on the yarn turns the lever supporting the yarn away from the friction-plate, so that the latter exerts no tension upon the yarn. In this way when the tension on the yarn is excessive and the shuttle is in its flight the yarn does not contact with the friction-plate; but whenever the shuttle reaches the box the lessened strain on the yarn permits the lever to move and press the yarn against the plate.

My improved tension device is very simple in construction, readily within the comprehension of an ordinary operative, very easily

regulated, and not easily gotten out of repair, as will be fully set forth in the following specification and claims and clearly illustrated in the drawings accompanying and forming a part of the same, of which—

Fig. 1 shows in plan an end portion of a shuttle to which my improved tension device is applied. Fig. 2 is a sectional plan view of the same. Fig. 3 is a cross-section taken on line X X of Fig. 1 looking to the left. Fig. 4 is an elevation showing the friction-plate, the tension-lever, the sleeve or bushing upon which the latter is mounted, and the retaining-screw with the spring-regulating plate, Figs. 5, 6, 7, and 8 being details. Fig. 9 is a broken elevation showing a portion of my improved shuttle, illustrating the slack condition of the yarn or thread and the normal position of my improved tension-lever with a full bobbin, Fig. 10 being a similar view which is broken through the shuttle and bobbin, it showing the tension-lever as removed from contact with the friction-plate, as when the tension is excessive.

Similar reference-letters designate corresponding parts in all the views.

A represents a portion of a shuttle-body.

B is the bobbin-chamber, and C is a bobbin having wound upon it the filling-thread D. The usual porcelain eye E is inserted in the shuttle-body, as shown, and terminates in a horizontal recess *a*, formed in the toe of the bobbin-chamber, said recess being adapted to accommodate the friction-plate F, which has a base *f*, provided with a perforation *f'*.

G is the tension-lever, which is preferably formed of sheet metal and bent into the shape shown, (lower at one end than at the other,) each end being bent to form a cylinder, the longer cylinder *g* being designed simply to form a curved surface for the thread to pass over, while the shorter cylinder *g'* serves the purpose of an eye or bearing for mounting said lever upon the sleeve or bushing H, which rests upon the base *f* of the wear-plate F and receives the adjusting or retaining screw I, which passes through said sleeve and the perforation *f'* of the base of said wear-plate and into the shuttle-body. The tension-lever G is provided with a perforation g^2, through which the thread D will pass in its course between the cylindrical end *g* of the tension-lever and the wear-plate F and through the shuttle-eye E.

Any convenient form of spring may be used to actuate the tension-lever; but in the drawings I show a helical spring J, mounted upon the bushing H, one end of said spring being caused to bear against and normally press the tension-lever G against the wear-plate F and the other end entering a perforation *k*, formed for the purpose in an adjusting-plate K, said plate having a central perforation *k'*, through which the screw I may pass and being adapted to be clamped between the top of the bushing H and the under surface of the head of said screw. Thus it will be seen that the tension may be readily adjusted by the use of any convenient tool for rotating said plate, or by the use of a screw-driver the screw I may be loosened, the plate rotated as desired, and said screw again tightened.

In order to avoid any liability of the thread or yarn becoming tangled or mixed up with the head of the screw I or the ends of the spring J, the shuttle-body is perforated for the reception of the screw close to one edge, as at *a'*, thus forming the projection a^2 for shielding said parts, and the bridge a^3, extending from said projection to the opposite side of shuttle-chamber, is designed to limit the movement of the tension-lever.

Having described my improvements, what I claim is—

1. An automatic tension device for loom-shuttles, comprising a curved friction-plate having a base provided with a perforation, a tension-lever provided with a perforation for the passage of yarn and having a cylindrical portion at one end and the other end suitably curved for contact with the curved portion of said friction-plate, a tube or bushing upon which the cylindrical portion of said lever is mounted, a retaining-screw passing through said bushing and the perforation in the base of said friction-plate and into the shuttle-body, and a suitable spring for normally holding the tension-lever in contact with the friction-plate.

2. A tension device for loom-shuttles, comprising a friction-plate, a tension-lever, a tube upon which said tension-lever is pivoted, a helical spring upon said tube and connected at one end to said lever and at the other end to an adjustable washer mounted upon a retaining-screw between the head thereof and the top of said tube, the said washer, and said retaining-screw passing through said washer and tube and threaded to the shuttle-body.

3. A loom-shuttle body having in the toe of its bobbin-chamber a horizontal recess in which one end of the shuttle-eye terminates, a stationary plate having one end curved and adjacent to said eye, a horizontally-movable spring-actuated tension-lever having a limited movement within said recess, said lever being adapted to press the filling-thread against the curved portion of said stationary plate and having a perforation through which said filling-thread passes before entering the shuttle-eye, a screw for pivoting the tension-lever to said shuttle-body, a suitable spring adapted to press the lever against the stationary plate, and means for adjusting said spring, substantially for the purpose set forth.

4. In an automatic tension device for loom-shuttles, means whereby any undue strain upon the filling-thread will separate the tension-lever from its friction-plate, thus removing all mechanical tension, said means comprising a horizontally-movable friction-plate, and a spring-actuated tension-lever having a perforation through which the thread passes to its position between said friction-

plate and lever, whereby said lever is separated from its friction-plate.

5. A loom-shuttle body provided with an automatic tension device and having near its eye a lateral bridge for limiting the movement of the spring-actuated tension-lever, and having above said bridge at one end thereof a lateral projection adapted to partially hide the spring and pivotal screw of the tension-lever, whereby the liability to entanglement of the yarn or thread with the spring and pivot of said tension-lever may be avoided.

6. In a loom-shuttle, an automatic tension device comprising a friction-plate, and a spring-pressed lever to sustain and guide at its free end next said plate the yarn between the bobbin and the usual thread-delivery eye of the shuttle-body, increase of strain on the yarn leaving the bobbin acting only on the free end of the lever around which the yarn passes and turning the lever and taking with it the yarn, thus removing the yarn from contact with the friction-plate, the said lever supporting the yarn in all positions of the lever and under the varying tensions of the yarn and guiding the same to the delivery-eye.

7. In a loom-shuttle, a plate against which the yarn about to leave the shuttle may be borne frictionally, a spring-controlled lever sustaining and guiding the yarn between the bobbin and the usual thread-delivery eye of the shuttle-body, strain on the yarn in excess of the normal tension desired acting only on the free end of the lever and turning said lever away from said plate taking with it the yarn so that it is entirely free from contact with said plate, the said lever supporting the yarn in all positions of the lever and under the varying tensions of the yarn and guiding the same to the delivery-eye.

8. In a loom-shuttle, a plate against which the yarn may be pressed, a spring-pressed lever to sustain and guide the yarn between the bobbin and the usual delivery-eye of the shuttle-body, said lever holding the yarn pressed against said plate whenever the shuttle is in the shuttle-box, variations in strain on the yarn as the shuttle is being moved to deliver the yarn acting to turn said lever and positively carry the yarn away from said plate, and guide the same to the delivery-eye.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED BALDWIN.

Witnesses:
J. B. THURSTON,
EMILE H. TARDIVEL.