April 13, 1926. 1,580,960

G. M. CHENEY

YARN TENSIONING DEVICE FOR LOOM SHUTTLES

Filed August 6, 1923 2 Sheets-Sheet 1

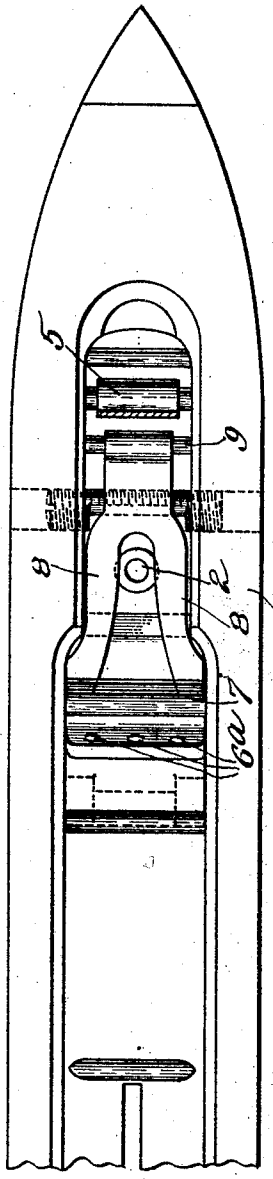


Fig. 1.

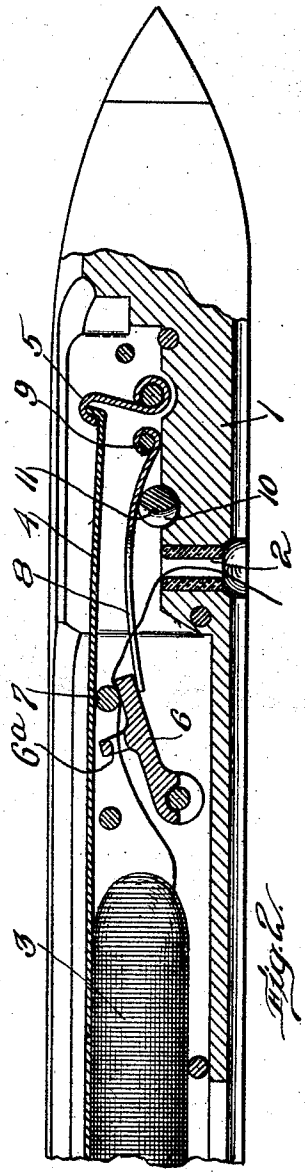


Fig. 2.

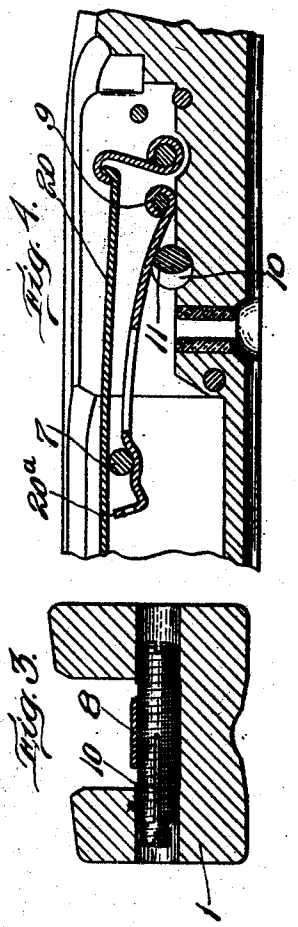


Fig. 4.

Fig. 3.

Inventor:
George M. Cheney
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YARN TENSIONING DEVICE FOR LOOM SHUTTLES

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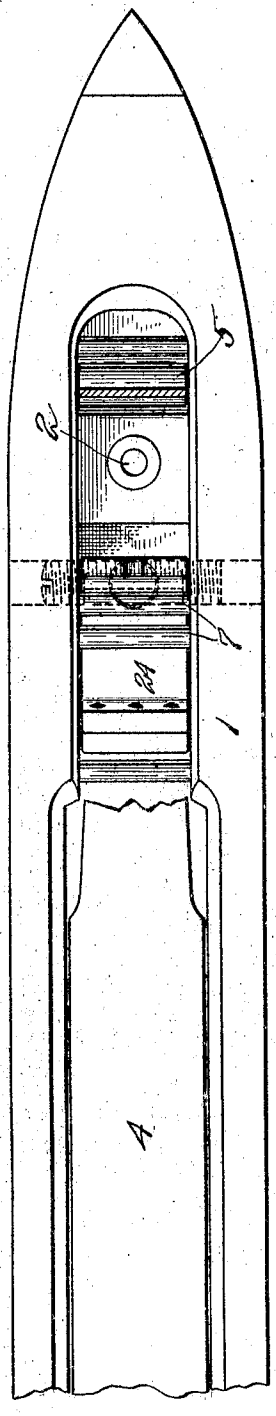


Fig. 5.

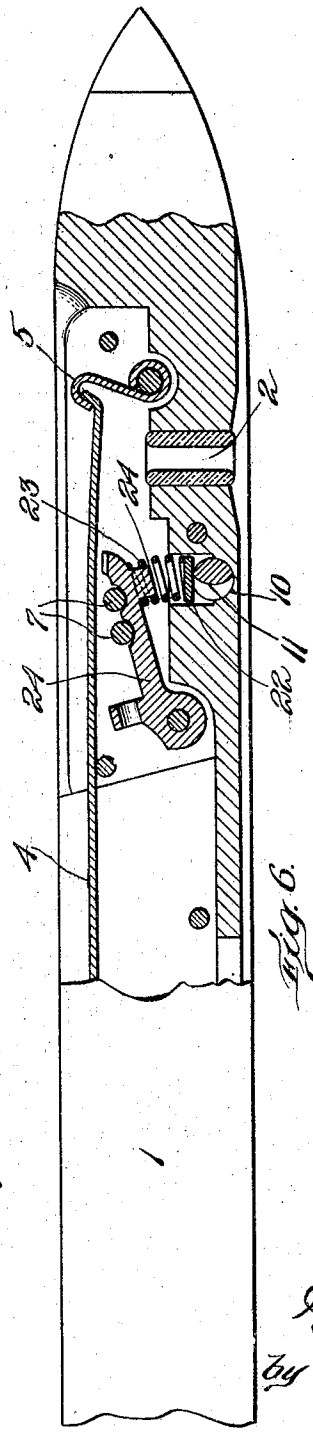


Fig. 6.

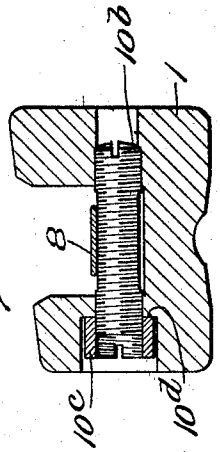


Fig. 8.

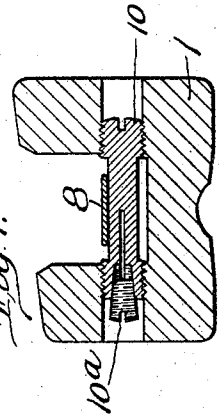


Fig. 7.

Inventor:
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Patented Apr. 13, 1926. 1,580,960

UNITED STATES PATENT OFFICE.

GEORGE M. CHENEY, OF SOUTHBRIDGE, MASSACHUSETTS, ASSIGNOR TO LITCHFIELD SHUTTLE COMPANY, OF SOUTHBRIDGE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

YARN-TENSIONING DEVICE FOR LOOM SHUTTLES.

Application filed August 6, 1923. Serial No. 656,025.

To all whom it may concern:

Be it known that I, GEORGE M. CHENEY, a citizen of the United States, and resident of Southbridge, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Yarn-Tensioning Devices for Loom Shuttles, of which the following is a specification.

This invention relates to shuttles for weaving and is intended to provide an improved yarn-tensioning device which shall permit adjustment of the yarn tension to any desired degree by convenient and easily accessible means which shall be reliable, certain and durable and will not readily become loosened by the repeated shocks to which the shuttle is subjected in the weaving operation.

Heretofore it has been the practice to use a spring-pressed yarn-engaging member with an adjusting screw passed through the bottom of the shuttle with its inner end or point in engagement with the tension spring, but as the bottom of the shuttle is formed of very thin stock owing to the necessary recessing of the shuttle, it affords a very short grip on the adjusting screw with the consequent result that the screw speedily works loose and either looses its proper tensioning adjustment or else drops out of the shuttle entirely.

The present invention is intended to overcome these practical difficulties and consists essentially in the combination with a spring actuated yarn-tensioning member of a tension-adjusting cam member mounted in the shuttle so as to be secured against loosening while presenting its cam surface or offset face in such relation to the tensioning spring that the pressure on the yarn may be varied to any desired degree.

The invention will be more particularly explained in the following specification and will be defined in the claims hereto annexed.

In the drawings I have illustrated several modes of utilizing the principles of this invention, in which:

Figure 1 is a plan view of the forward or delivery end of a shuttle equipped with my improvement.

Figure 2 is a vertical central section thereof.

Figure 3 is a cross section through the shuttle body on the line of the tension adjusting member.

Figure 4 is a longitudinal central section showing a modified arrangement of tensioning device.

Figure 5 is a plan view of another modification employing an end thrust tension spring.

Figure 6 is a longitudinal section through the modified arrangement shown in Figure 5.

Figures 7 and 8 are cross section details of different forms of frictionally locked adjusting screws.

In the forms illustrated in the drawings the device is applied to a shuttle 1, of well known construction in the bottom of which, at the forward or delivery end of the shuttle, is mounted a thread-eye 2, of suitable material such as porcelain. The yarn cop 3, is kept in position by the spring-retaining arm 4, whose front hooked end is engaged by a short pivotal hook or latch 5.

A yarn-engaging member 6, provided with the usual eyes 6^a for guiding the yarn, is mounted about a transverse axis with its free end adapted to swing or bear against a transverse cooperating yarn-engaging member or pin 7 so that the yarn, in passing from the cop to the thread-eye, will be pinched between the two opposed yarn-engaging members.

A leaf spring 8, in this case with its middle portion cut away to form a slot for the passage of the yarn, is mounted for pivotal support upon a fulcral pin 9, and the free end of the spring acts to press the movable yarn-engaging tension member 6 against the cooperating member 7.

The tension-adjusting member comprises a screw threaded member 10 whose middle portion is cut away to form a concentric intermediate cam portion 11, disposed to engage the under side of the spring 8 so that by the lateral thrust of its cam surface the spring is caused to exert a greater or less tension against the yarn-engaging member according to the rotative adjustment of the cam part of a screw 10. Obviously, when that portion of the cam part of the screw nearest the central axis of the screw is in contact with the spring the lightest pressure will be exerted while adjustment to cause contact with the highest portion of the cam,

that is, the part most remote from the central axis will produce the maximum of tension on the yarn.

Since the transverse arrangement of the cam screw makes it possible to use a long screw with a relatively large area of surface contact with the body of the shuttle, it will be seen that if the transverse bore through the shuttle which receives the screw is made small enough so that the screw turns very hard the working loose of the screw is largely prevented. To minimize this trouble however I provide special means for locking the adjusting screw against accidental rotation, as hereinafter described.

In Figure 4 I have shown a modified form of construction in which the separate pivotal yarn-engaging member of the form shown in Figures 1 and 2 is eliminated and the spring itself forms the yarn-engaging and the yarn-guiding member. To this end the spring arm 20 is mounted upon the fulcral pin 9 and is extended rearwardly so as to engage the fixed yarn-engaging member or pin 7, its free end being upturned to form a lip 20^a provided with yarn-guiding perforations so that the yarn may be passed directly between the spring arm 20 and the pin 7. With this arrangement I employ the same form of cam screw as that described above.

In the form shown in Figures 5 and 6 the transverse cam screw 10 is mounted in a somewhat deeper recess in the bottom of the shuttle and above it is placed a disk or spring-supporting plate 22 upon which is seated a helical spring 23 whose upper end thrusts against the lower side of a pivoted tensioning member 24 which preferably has a downwardly extending boss 24^a to engage the interior of the spring to prevent lateral displacement thereof. This form shows two yarn-engaging pins 7 arranged in parallelism across the body of the shuttle. The cam action is precisely the same in this case as in the others since the higher portion of the cam surface produces maximum tension on the yarn while operative contact with the lower portion of the cam surface produces a light pressure on the yarn.

It will therefore be seen that the principle is applicable to springs of different types and that the tension spring itself may serve as the yarn-engaging member instead of acting through a separate yarn-engaging member.

I prefer for additional security to provide the tension-adjusting member or screw 10, with means for locking it against accidental rotation. One form of such locking or securing means embraces an expanding or tapered screw 10^a which is inserted in the recessed split end of the screw 10 so that when the adjusting screw 10, is set to the desired position it may be secured there by tightening the expansion screw 10^a until the split end of the screw 10, is firmly expanded against the surrounding wood of the transverse bore in the shuttle.

In Figure 8 of the drawings I have shown a modified form of locking means in which the screw 10^b, instead of being split, is provided at one end with a check nut 10^c which is inserted into a countersunk recess in the wall of the shuttle so as to be tightened firmly against the vertical annular shoulder 10^d, to frictionally secure the screw against rotative movement.

What I claim is:

1. In a tensioning device for a loom shuttle, the combination with a pivotally mounted spring-pressed yarn-tensioning member arranged to engage the yarn as it passes from the yarn-cop, of a tension-adjusting member arranged transversely of the shuttle and provided with a laterally offset cam face arranged to vary the tension exerted on the yarn according to the adjustment of said cam face, substantially as described.

2. In a tensioning device for a loom shuttle, the combination of a pivotal yarn-engaging and tensioning member, a spring arranged to press the tensioning member against the yarn, and a screw-threaded member arranged transversely of the shuttle and provided with a lateral cam face located to engage said spring and when rotated to cause the spring to exert greater or less pressure upon the yarn according to the relative adjustment of the cam face, substantially as described.

3. In a loom shuttle having its yarn-delivery eye in its bottom, the combination with a spring-pressed yarn-engaging and tensioning member arranged to exert a yielding pressure against the yarn between the cop and said eye, a transversely arranged tension-adjusting member adjustably supported in opposite sides of the shuttle to transmit a variable pressure to the yarn-tensioning member, substantially as described.

4. In a loom shuttle having a yarn-delivery eye in its bottom, the combination of a yarn tensioning and guiding member pivotally mounted to swing about a transverse axis and pinch the yarn against an opposed yarn-engaging member, a forked spring arranged to exert a yielding upward pressure against said tensioning member while allowing the yarn to pass through the fork to the eye, and a tension-adjusting cam arranged transversely of the shuttle to engage said fork and rotatable about a transverse axis to vary the tension of the fork against the yarn-tensioning member.

5. In a loom shuttle having a yarn-delivery eye in its bottom, the combination of a transversely arranged yarn-engaging member secured in the shuttle body between the forward end of the yarn cop and said

eye, a tensioning arm pivotally mounted to swing in a vertical plane about a transverse axis with its free end yieldingly pressing against the under side of said pin to pinch the yarn passing toward the eye, and a tension adjusting cam-member mounted in a transverse bore of the shuttle forepart to permit rotation about a transverse axis to vary the upward thrust against said tensioning member in order to vary the tensioning pressure against the yarn.

6. In a loom shuttle having a yarn delivery eye in its bottom, the combination of a transversely arranged yarn-engaging member secured in the shuttle body between the forward end of the yarn cop and said eye, a tensioning arm pivotally mounted to swing in a vertical plane about a transverse axis with its free end yieldingly pressing against the under side of said pin to pinch the yarn passing toward the eye, a tension-adjusting cam-member mounted in a transverse bore of the shuttle forepart to permit rotation about a transverse axis to vary the upward thrust against said tensioning member in order to vary the tensioning pressure against the yarn, and means located within said transverse bore to lock the cam member against accidental rotation.

7. A tensioning device for a loom shuttle embracing in combination, a yarn-engaging tensioning member fulcrumed on a transverse axis with its forwardly extending free end normally pressed into engagement with a transverse pin to pinch the yarn against said pin, a spring-arm fulcrumed at its forward end in advance of said pin and having its free spring end extending rearwardly to engage and press said tensioning member against the pin, a rotatable cam member mounted transversely of the shuttle to have adjusting engagement with said spring-arm whereby the pressure of the tensioning member is adjusted at will, substantially as described.

8. A tensioning device for a loom shuttle embracing in combination, a shuttle body having a delivery eye in its bottom, a yarn-engaging pin extending across the shuttle, a yarn-tensioning spring-arm fulcrumed on a transverse axis to produce a yielding pressure on the yarn against said pin, said arm overhanging said delivery eye and being slotted to permit the yarn to pass to the eye, an adjusting cam arranged transversely of the shuttle in engagement with the under side of said spring-arm and rotatable on its transverse axis to vary the tensioning pressure of said arm, substantially as described.

In witness whereof, I have subscribed the above specification.

GEORGE M. CHENEY.