J. V. CUNNIFF & C. RAFFERTY.

LOOM SHUTTLE.

APPLICATION FILED OCT. 19, 1908.

955,583. **Patented Apr. 19, 1910.**

Fig. 1.

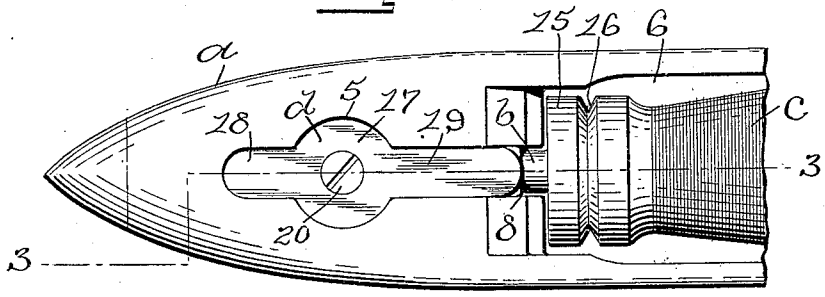


Fig. 2.

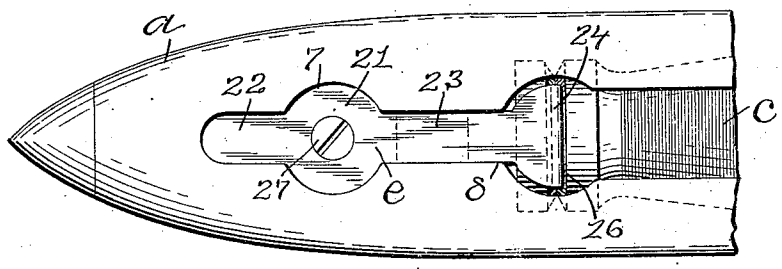


Fig. 3.

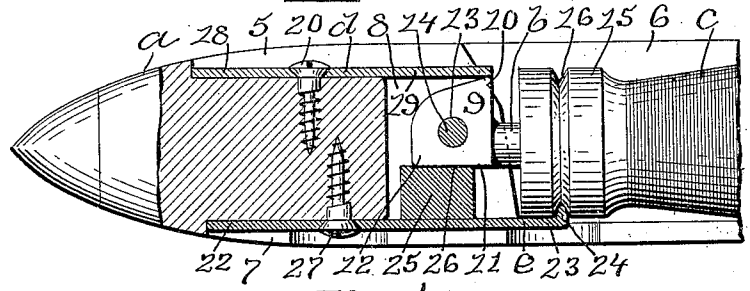
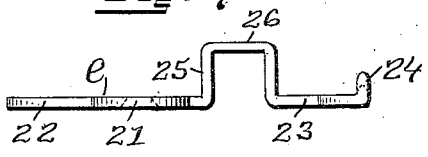


Fig. 4.



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LOOM-SHUTTLE.

955,583. Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed October 19, 1908. Serial No. 453,487.

To all whom it may concern:

Be it known that we, JOHN V. CUNNIFF and CHARLES RAFFERTY, citizens of the United States, residing at Fall River, county of Bristol, and State of Massachusetts, have invented a new and useful Improvement in Loom-Shuttles, of which the following is a specification.

This invention has reference to an improvement in loom shuttles and more particularly to an improvement in the construction of spindle spring holding mechanisms of loom shuttles.

The object of our invention is to improve the construction of a loom shuttle, whereby the spindle is held more securely under spring tension in the shuttle than has heretofore been done, thereby eliminating the liability of the spindle jumping out of the shuttle and smashing the warp threads of the loom.

Our invention consists in the peculiar and novel construction of a loom shuttle having a flat spring bearing on the top of the spindle heel, a flat spring having a projection bearing on the bottom of the spindle heel, a lip adapted to engage with the usual annular groove in the head of the bobbin, and details of construction as will be more fully set forth hereinafter and claimed.

Figure 1 is a top plan view of the spindle spring end of a loom shuttle provided with our improvement. Fig. 2 is a bottom plan view of the spindle spring end of the shuttle. Fig. 3 is a vertical longitudinal sectional view taken on line 3 3 of Fig. 1, and Fig. 4 is an edge view of a modified form of locking spring.

In the drawings, *a* indicates the spindle spring end of a loom shuttle body, *b* the spindle, *c* the bobbin, *d* the upper spindle spring, and *e* the lower spindle and bobbin locking spring.

The spindle spring end of the shuttle body *a* is constructed to have an upper recess 5 shaped to receive the upper spindle spring *d* and extending into the bobbin cavity 6, a lower recess 7 shaped to receive the locking spring *e* and extending into the bobbin cavity 6, and an opening 8 connecting the recesses 5 and 7 and opening into the bobbin cavity 6 for the heel 9 of the spindle, as shown in Fig. 3, otherwise the shuttle body may have the construction of any of the well known forms of loom shuttles.

The spindle *b* has the heel 9 adapted to fit in the opening 8 in the shuttle body and shaped to have an upwardly-extending off-center portion 10, a flat bottom 11 which with the back of the heel forms an off-center bottom portion 12, and a transverse hole 13 by which the heel of the spindle is pivotally secured in the opening 8 by a pin 14 driven through the hole 13 and the shuttle body, as shown in Fig. 3.

The bobbin *c* has the usual head 15 in which is an annular groove 16, as shown in Figs. 1 and 3.

The upper spindle spring *d* is shaped to have a circular body portion 17 from which extends a short arm 18 which bears on the bottom of the recess 5 and an oppositely-disposed long arm 19 the free end of which bears on the off-center portion 10 of the spindle heel 9. This spring *d* is secured in the recess 5 by a screw 20 through a central hole in the body 17 of the spring, as shown in Fig. 3.

The lower spindle and bobbin locking spring *e* is shaped to have a circular body portion 21 from which extends a short arm 22 which bears on the bottom of the recess 7, and an oppositely-disposed long arm 23 having the upwardly-turned lip 24 on its free end adapted to engage with the annular groove 16 in the head 15 of the bobbin, and an upwardly-extending square projection 25 having a flat top 26 adapted to engage with the flat bottom 11 of the spindle heel 9, as shown in Fig. 3. This locking spring *e* is secured in the recess 7 by a screw 27 through a central hole in the body 21 of the spring. The projection 25 may be in the form of a solid block secured to the spring by solder or other means, as shown in Fig. 3, or it may be formed integral with the spring by bending the spring, as shown in the modified form in Fig. 4.

The spindle is raised out of the bobbin cavity by the operator against the tension of the springs *d* and *e* into the usual position for removing or replacing the bobbins. The off-center portion 10 of the spindle heel 9 now raises the spring *d*, and the off-center portion 12 on the heel depresses the spring *e*, thereby releasing the lip 24 on the spring from the groove 16 in the bobbin head 15, when the spindle is raised. The spindle is held in the shuttle by the tension of the upper spring *d* bearing on the top of the spindle heel and the tension of the lower spring *e* bearing on the bottom of the

spindle heel, thereby reducing the liability of the spindle jumping out of the shuttle to a minimum.

In practice we find that by the use of our improved construction in loom shuttles the factor of safety is increased about one hundred per cent. as it is extremely improbable for both springs to break simultaneously, and if one spring should break the other spring would have sufficient tension to check the tendency of the spindle in the shuttle to fly out therefrom until the broken spring is noticed and replaced. Furthermore, the construction of the leaf spring *e* with the block or projection 25, which bears against the face of bottom 11 substantially in line with the spindle *b* and closely adjacent the fulcrum of the heel 9, causes said leaf spring *e* to be raised with a quicker movement, when the spindle is swung outwardly, than is the case when the spring bears on a heel which projects to or approaches the outer side of the spindle. The elements of the spring *e*, therefore, have the coöperative functions of maintaining the spindle more firmly in its normal axial position, and effecting a quicker and more satisfactory release of the bobbin retaining lip from the bobbin when it is desired to remove the latter and the spindle is moved outwardly.

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

A loom shuttle spindle lock, comprising, in combination with a shuttle and a spindle pivoted therein, a heel for said spindle having a flat lower side close to the pivot point and lying close to the axis of the spindle, an angular offset on the upper side of said heel, a leaf spring recessed in said shuttle and bearing against said angular offset, a second leaf spring recessed in the opposite side of said shuttle and terminating in an inwardly projected lip for engagement with a bobbin, and a projection carried by said second spring, said projection extending inwardly toward the axis of said spindle and having its inner surface flat and bearing closely against said flat lower side of said heel, whereby to offer the resistance of said second spring substantially at said pivot point and permit a quicker release of said lip from the bobbin.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN V. CUNNIFF.
CHARLES RAFFERTY.

Witnesses:
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