(No Model.)

M. F. FIELD.

LOOM SHUTTLE.

No. 343,579. Patented June 15, 1886.

Fig. 1

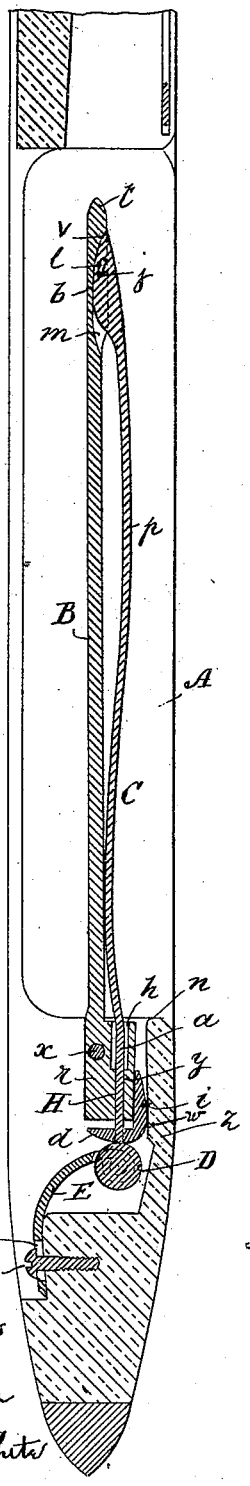
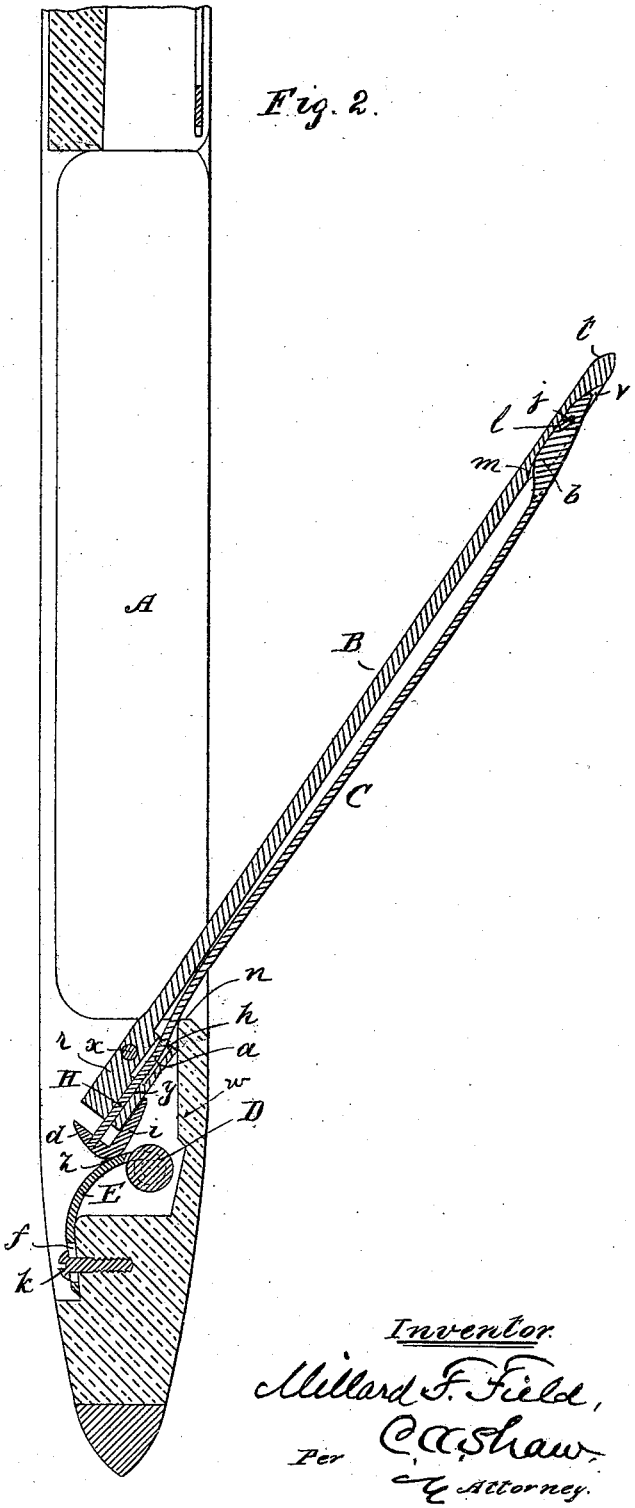


Fig. 2.



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LOOM-SHUTTLE.

SPECIFICATION forming part of Letters Patent No. 343,579, dated June 15, 1886.

Application filed June 18, 1885. Serial No. 169,104. (No model.)

To all whom it may concern:

Be it known that I, MILLARD F. FIELD, of Chelsea, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Loom-Shuttles, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of a shuttle embodying my improvement, the spindle being represented as closed, expanded, and locked; and Fig. 2, a like view, the spindle being represented as opened, collapsed, and locked. In each of said views one end of the body of the shuttle is represented as broken off.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates more especially to that class of loom-shuttles which are provided with expansible spindles; and it consists in a novel construction and arrangement of the parts as hereinafter more fully set forth and claimed, the object being to produce a more effective and otherwise desirable article of this character than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the body of the shuttle; B, the main portion or body of the spindle; C, the spring of the spindle; D, the roller; E, the roller-spring, and H the shank or extension of the spring C. The spindle B is pivoted at *x* in the body A, and provided on the upper side, near its point *t*, with an elongated groove, *m*, the bottom of said groove being inclined or curved upwardly at its forward end, as shown at *v*. The spring C is flattened at its point, as shown at *b*, the flattened portion being curved downwardly at the forward end on its inner or lower edge to correspond with the curve *v* and fitted to slide in the groove *m*. A socket, *h*, is formed in the shank *r* of the main spindle, and extending from the bottom of said socket outwardly through the end of the said shank there is a hole, *y*, the spring C being elongated or extended, as shown at H, and fitted to work in said hole.

Attached to the inner end of the spring C and standing at a right angle thereto is an L-shaped head, *d*, the arm *i*, of which projects forward in the direction of the spindle over the upper side of the shank *r*, in parallelism with the extension H of the spring C, and at a right angle to the head *d*. The head *d* and arm *i* are rounded or curved at the corner or angle *z*, where they unite to enable them to pass readily over the roller D as the spindle is opened and closed. The spring E is curved upwardly and provided with a slot, *f*, through which the attaching-screw *k* passes, the roller D being journaled in its outer or free end. The flattened end *b* of the spring C is provided with a diagonally-arranged slot, *l*, and is kept in the slot *m* by a pin, *j*, which passes transversely through the spindle B and the slot *l*, the inclination of the last-named slot to the longitudinal axial line of the spindle B corresponding with the inclination of the bottom of the groove *m* at its forward end, *v*. A projection, *w*, formed in the body of the shuttle acts as a stop for said spindle when it is closed, the shoulder *n* serving as a stop when it is opened; but any other suitable means may be employed for stopping the spindle, if preferred.

In the use of my improvement the spindle being opened and collapsed, as shown in Fig. 2, if a cop or bobbin is placed on the same and the spindle closed the arm *i* and head *d* will be brought into forcible contact with the roller D, and as the rounded corner *z* passes said roller the spring C will be forced forward, causing its flattened end *b* to ride up the incline *v* until its forward movement is stopped by the end of the slot *l* bringing up against the pin *j*, after which it will be bent outwardly, as shown at *p*, thereby expanding the spindle, considered as a whole, and securing the cop or bobbin thereon in a manner which will be readily obvious without a more explicit description. As the pivot *x* is disposed below the longitudinal axial line of the extension H, and the roller D so arranged that when the spindle is closed said roller will press on the

head *d* nearly opposite said extension, it will be obvious that the spring E and wheel D will act to lock the spindle when closed or to prevent it from being accidentally opened, as shown in Fig. 1. It will also be obvious that when the spindle is opened the curved or rounded corner *z* will ride down over the roller D and pass below its axial line, thereby enabling the spring E and said roller to lock the spindle in that position, as shown in Fig. 2.

The object of the incline *v* is to expand the spindle laterally at or near its point, the point of the spring as it is pushed forward riding up this incline until stopped by the pin *j*, as above described, and producing that result.

The object of the socket *h* is to prevent the portion *a* of the spring C from "cramping" or binding where it enters the shank *r* when pressure is exerted upon it by the spring E and roller D. The socket may, however, be dispensed with by changing the form of said spring C somewhat where it enters the shank *r*.

I do not confine myself to constructing and connecting the spindle and spring as shown, as they may be constructed and connected in a different manner, provided they perform substantially the same functions.

The extension H is fitted to slide longitudinally in a hole, *y*, in the shank *r;* but any suitable ways or guides may be provided for said extension at the shank of the spindle.

It will be understood that the spring C is sufficiently flexible to bend readily when pushed forward, as described; also, that the slot *f* and screw *k* enable the spring E and roller D to be adjusted with respect to said spindle as desired.

I am aware that shuttle-spindles have heretofore been provided with springs adapted to slide in the shanks thereof and to bear upon devices for retaining such spindles in open or closed position when the latter were closed; but in the present invention one member of an L-shaped head is rigidly fastened to the inner end of said spring, and the devices for retaining the spindle in open or closed position exert a longitudinal pressure upon said spring through the head referred to when said spindle is closed.

Having thus explained my invention, what I claim is—

1. The spindle B, provided with the groove *m* on its upper side near its point, said groove having the incline *v* at its outer end and the transverse pin *j* within said groove, in combination with the spring C, its outer end resting in said groove and provided with a slot engaging said pin, and means for exerting longitudinal pressure upon said spring, substantially as described.

2. The spindle B, provided with the groove *m* on its upper side near its point, said groove having the incline *v* at its outer end and the transverse pin *j* within said groove, in combination with the spring C, its outer end resting in said groove and provided with a slot engaging said pin, said slot being parallel with the incline *v*, and means for exerting longitudinal pressure upon said spring, substantially as described.

3. A shuttle-body, a spindle pivoted therein provided with a longitudinal hole, *y*, in its shank, a spring, C, secured at its outer end to said spindle and sliding at its inner end in said hole, and a head larger than said hole rigidly secured to the inner end of said spring, in combination with a spring, E, provided with a roller, D, for holding said spindle in open or closed position, said spring exerting longitudinal pressure upon the spring C through said roller and head when the spindle is closed, substantially as described.

4. A shuttle-body, a spindle pivoted therein provided with a longitudinal hole, *y*, in its shank, a spring, C, secured at its outer end to said spindle and sliding at its inner end in said hole, and an L-shaped head one member of which is rigidly secured to the inner end of said spring, while the other member is adapted to slide upon the upper face of the spindle-shank, in combination with a spring, E, provided with a roller, D, for holding said spindle in open or closed position, said spring exerting longitudinal pressure upon the spring C through said roller and head when the spindle is closed, substantially as described.

5. A shuttle-body, a spindle pivoted therein provided with a longitudinal hole, *y*, in its shank, and with a groove, *m*, in its upper face near the point, said groove having the incline *v* at its outer end, a transverse pin, *j*, within said groove, a spring, C, having its outer end provided with a slot for engaging said pin, and its body sliding in said hole, and an L-shaped head one member of which is rigidly secured to the inner end of said spring, while the other member is adapted to slide upon the upper face of the spindle-shank, in combination with a spring, E, provided with a roller, D, for holding said spindle in open or closed position, said spring exerting a longitudinal pressure upon the spring C through said roller and head when the spindle is closed, substantially as described.

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