

I. F. MAYNARD.
Loom-Shuttles.

No. 150,174.

Patented April 28, 1874.

Fig:5.

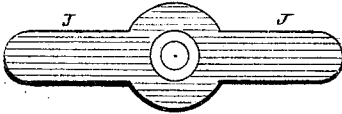


Fig:4.

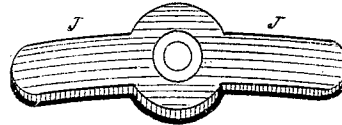


Fig:6.



Fig:3.

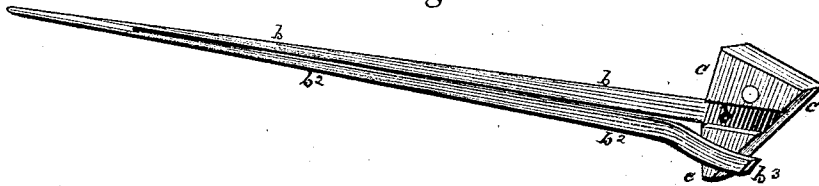


Fig:2.

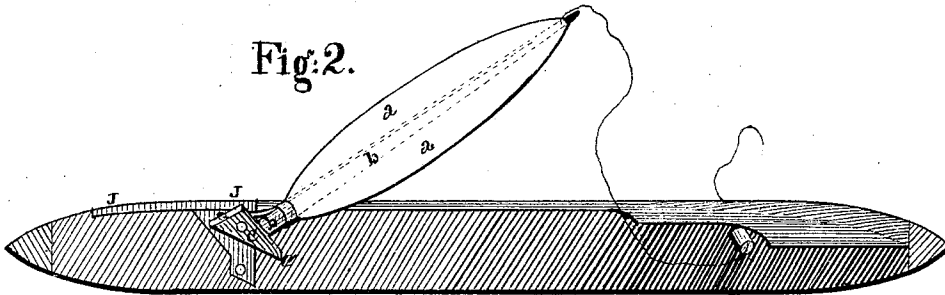
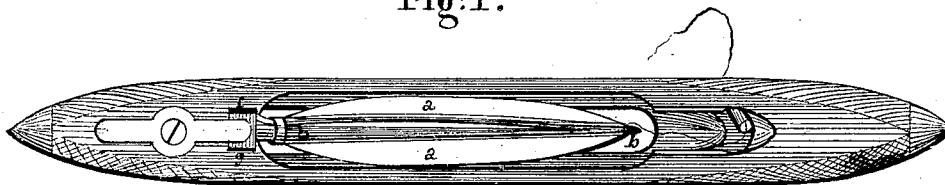


Fig:1.



Witnesses.

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UNITED STATES PATENT OFFICE.

ISRAEL F. MAYNARD, OF NASHUA, NEW HAMPSHIRE.

IMPROVEMENT IN LOOM-SHUTTLES.

Specification forming part of Letters Patent No. **150,174**, dated April 23, 1874; application filed May 22, 1873.

To all whom it may concern:

Be it known that I, ISRAEL F. MAYNARD, of Nashua, New Hampshire, have invented certain Improvements in Weavers' Shuttles, of which the following is a specification:

My invention relates to certain improvements in weavers' shuttles, and consists in the peculiar construction of the spindle of the shuttle, whereby an improved and important result is produced in preventing the waste of the thread filling in the operation of weaving, either by hand or power looms.

To more fully explain the nature of my invention, Figure 1 (drawn to half of full size) represents a top view of a wooden shuttle, with the cop of woof-thread *a a* cut through longitudinally, exposing the spindle *b b* in its horizontal position.

In sectional Fig. 2 the spindle is thrown upward, exposing to view the peculiar angular-shaped head *c c c*, the small circle indicating the hinged axis or pivot of the spindle.

In Fig. 3 the spindle is represented of full size, and is shown formed of a long, neatly tapering rigid half, *b b*, formed flat on the inner side and rounding on the off side. To this rigid half is neatly welded a tapering, half-round, flexible or spring-like half, *b² b²*, with curved or slightly-bent butt end *b³*, the rigid half being securely attached to, or formed with, the triangular head *c c c*, through one side of which is formed a groove or seat, *d*. The small circle represents the hole through which passes a suitable pivot or axis pin, which holds the spindle in its place, as shown in Figs. 1 and 2.

Fig. 4 represents a top and edge view of a full-sized reversible spring, somewhat curved, as shown.

Fig. 5 represents a top view of the same spring, both views showing a circular hole for the insertion of a suitable screw to hold the spring in position, as shown in Fig. 1, at left-hand end of shuttle. Such springs can be readily struck out of suitable flexible metal, and having two arms, *J J*, are reversible, so that when one end wears too much the other end can be substituted.

Fig. 6 represents a full-sized piece of plate metal of the shape shown, about one-half of its length being beveled, as at *e e*, the two small

circles (not lettered) indicating holes through which pass two suitable wire pins to hold the plate in position within a mortise formed in one end of the shuttle, as shown in Fig. 1. Letter *f* indicates the plate in position; and letter *g* marks a smaller, thinner side plate, used as a guard to prevent the wear of the mortise.

When the spindle is in its upright position to receive or remove the cop, the bent portion of the spring *b²* will be clear of side plate *f*, and the spring will be relaxed. The act of depressing it to its weaving position will carry the end of the bent portion against the beveled face of the side plate, force the elbow of spring *b²* against the rigid arm *b*, and by means of that leverage thus gradually distend the spring until the bent end passes beyond the bevel, when the spring will be held at its distention. The spring being distended and held by side pressure upon its bent end, when the spindle is in its weaving position there will be no tendency to throw the spindle up out of its position, as is the case where the distention of the spring is caused by back-pressure upon the end.

The small tube (not lettered, but shown inserted on inside of the recess or mortise of the shuttle, as in Figs. 1 and 2) is the orifice through which the thread of the cop passes.

The operation of my improved spindle is as follows, viz: To insert the cop in the shuttle the spindle is thrown up, as in Fig. 2, the letters *b b* and dotted lines showing the spindle, the cop *a a* in said position being readily slipped over the spindle, or taken off when desired; but when the cop and spindle are pushed or turned down in position, as in Fig. 1, the butt end *b³* of the flexible half *b² b²* strikes or presses against the bevel surface *e e* of the plate, Fig. 6, and in pressing against the flexible part bulges or swells out in shape of a slight curve or bow, Fig. 1. This bulge pressing on the inner circumference of the short paper quill and the body of the cop, holds the cop in secure position, thus preventing the cop from slipping off or turning on the spindle. The curved butt end *b³* of the flexible spring closes into the channel or recess *d* of the head *c' c' c'*, Fig. 3.

By the expanding or opening out, and also the closing or compressing together of the flexible or spring part *b² b²* of the spindle, Fig. 3,

the quill or sheath over which the woof-thread of the cop is wound, is not liable to mash or break, but is kept in shape; consequently the cop is readily slipped on in place, as in Fig. 2, and when down in position is retained or held securely, as in Fig. 1, the thread unwinding with great regularity and equality of tension.

What I claim as new, and desire to have secured by Letters Patent, is—

In a shuttle-spindle, the combination of the rigid arm *b* with the elbowed spring-arm *b*² and beveled side plate *f*, when arranged and operating substantially as and for the purpose specified.

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Witnesses:

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