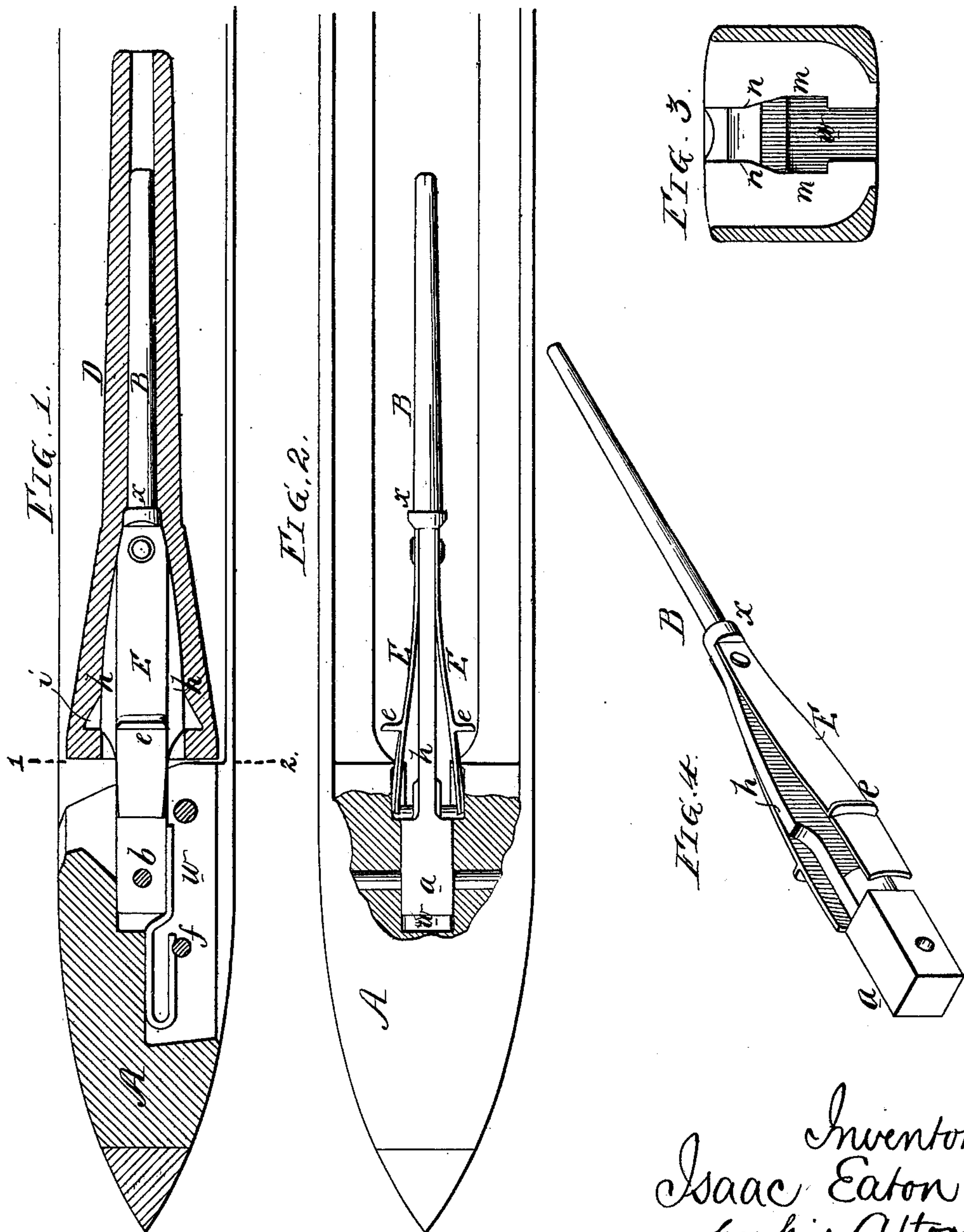


I. EATON.  
Shuttle.

No. 231,288.

Patented Aug. 17, 1880.



Witnesses *Henry Howson Jr.*  
*Harry Smith*

Inventor  
*Isaac Eaton*  
by his Attorneys  
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# UNITED STATES PATENT OFFICE.

ISAAC EATON, OF NASHUA, NEW HAMPSHIRE.

## SHUTTLE.

SPECIFICATION forming part of Letters Patent No. 231,288, dated August 17, 1880.

Application filed October 16, 1879.

*To all whom it may concern:*

Be it known that I, ISAAC EATON, of Nashua, New Hampshire, have invented a new and useful Improvement in Shuttles, (Case A,) of which the following is a specification.

My invention relates to improvements in shuttles for receiving bobbins provided with internal grooves. An early example of a bobbin of this class is shown in the English Patent No. 5,524 of 1827, in which also appears a spring-catch for retaining an internally-grooved bobbin on and releasing it from a spindle.

It may be remarked here that substantially the same device has been applied to a shuttle-spindle, but has proved to be objectionable, owing to the tendency of the catch to tear away the wood, this tendency being due to the bearing of the catch on the bobbin at one point and to the effect of the shocks to which the bobbin is subjected—a defect which I overcome by my invention.

In the accompanying drawings, Figure 1 is a sectional view of part of the shuttle and of the bobbin, the spindle being in elevation; Fig. 2, a plan view of Fig. 1, showing part of the shuttle-body; Fig. 3, a vertical section on the line 1 2, and Fig. 4 a perspective view of the shuttle-spindle.

The body A of the shuttle is of the usual form, and has the ordinary elongated opening for receiving the spindle and bobbin.

D is the bobbin, having an enlarged cone-shaped end, in the cone-shaped interior of which is an annular groove, *i*.

The shuttle-spindle B is flattened from the butt *a* to the point *x*, and the flattened portion is made of such a shape that the edges will fit snugly in the enlarged conical end of the bobbin for a purpose rendered apparent hereinafter. From the point *x* to the extreme end of the spindle the latter is made round and preferably with a slight taper, this portion of the spindle being arranged to fit freely in the interior of the smaller portion of the bobbin, as shown in Fig. 1.

To each side of the flattened portion of the spindle is secured a spring, E, provided near its outer free end with a lip or projection, *e*, which, under the circumstances explained hereinafter,

enters the annular groove *i* in the interior of the enlarged end of the bobbin.

The butt *a* of the spindle fits snugly, but so as to move freely, in a slot, *w*, made in the body of the shuttle, and a spring, *f*, tends to maintain the spindle in either of the two positions to which it may be moved, as in ordinary shuttles. A portion of this slot *w* is enlarged, as shown in Fig. 3, the ends of the spring E E being contained between the opposite parallel sides *m m*, of the enlarged portion of the slot when the spindle has been turned down into the body of the shuttle. These parallel sides *m m* of the slot merge into the inwardly-inclined sides *n n*, so that when the spindle is turned outward from the shuttle the ends of the springs E E, coming under the influence of the said inclined sides, will be drawn toward each other and will permit a bobbin to be placed on the spindle, as shown in Fig. 1.

On turning the spindle down into the body of the shuttle the ends of the springs will leave that portion of the slot *w* which is bounded by the inclined sides *n n*, and will enter the enlarged portion of the slot, and there will consequently be an outward recoil of the springs, so that the lips or projections *e e* will enter the annular groove *i* of the bobbin, and the latter will be retained on the spindle.

A spindle has been heretofore made with a spring-catch on one side to engage an internal groove of a bobbin, this being shown in the aforesaid English patent, and the same kind of spindle with single spring-catch adapted to an internally-grooved bobbin has been applied to a shuttle; but as the spring is on one side only it cannot serve to hold the bobbin steadily and centrally on the spindle; whereas in my improvement the bobbin is steadied and maintained in a true position by the bearing of the spring-catches in opposite directions, steadiness being further assured by the flattened portion *h* of the spindle, the edges of which, as before remarked, fit snugly in the enlarged tapering interior of the bobbin.

In bobbins of the class to which my invention is applied the annular recess for receiving the retainer is generally near the extreme end of the bobbin, and consequently there is such little strength in the portion of the bobbin

where it is held by a single retainer that the wood is apt to break away under the influence of the shocks to which all shuttles are subjected, and this liability is increased by any unsteadiness of the bobbin on the spindle.

When two retainers are used, however, the liability of the bobbin to fracture is decreased, because the wood is held at opposite points and the bobbin is held truly on the spindle.

I wish it to be understood, however, that in this application I do not desire to claim, broadly, the combination of the body of a shuttle with the pivoted spindle having two spring-catches arranged on opposite sides of the spindle and adapted to engage the internal groove of the bobbin, as this combination forms the subject of a separate application for a patent filed by me on the 10th day of July, 1880.

I claim as my invention—

1. The shuttle-spindle having the flattened

part *h*, adapted to fit the conical interior of the bobbin and provided with two springs, *E E*, having projections *e*, adapted to engage with a groove in the interior of a bobbin, substantially as specified.

2. The combination of the spindle having the flattened portion *h* and retaining-springs adapted to engage a groove in the interior of the bobbin with a shuttle-body having a slot bounded partly by parallel and partly by inclined sides, whereby the retaining-springs are disengaged from the bobbin on moving the spindle outward, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ISAAC EATON.

Witnesses:

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C. D. PARKER.