I. EATON.

Spindle for Cop-Shuttle.

No. 220,362. Patented Oct. 7, 1879.

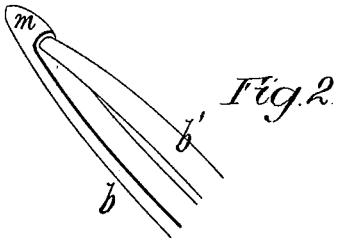


Fig. 2

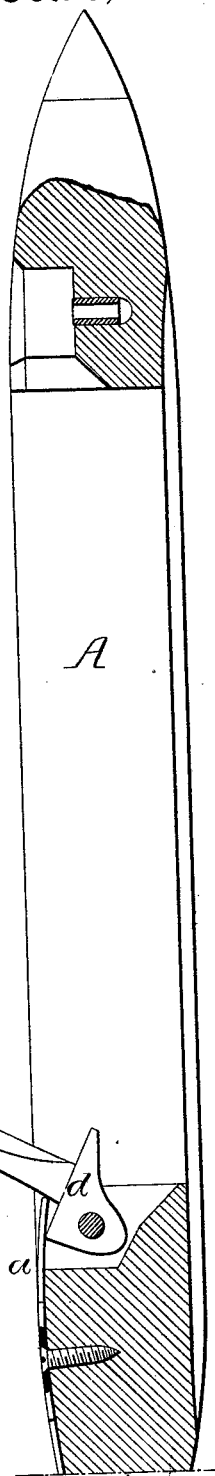


Fig. 1

Fig. 4

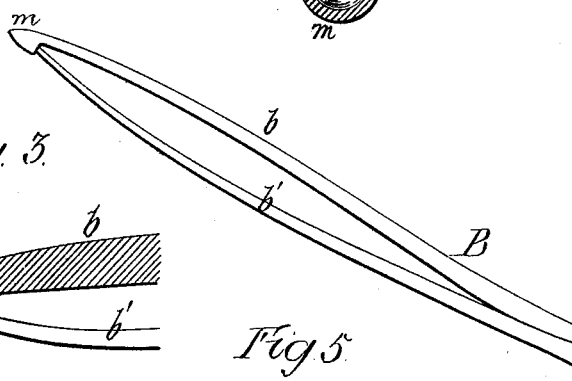


Fig. 3.

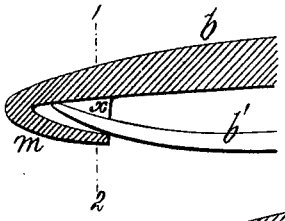
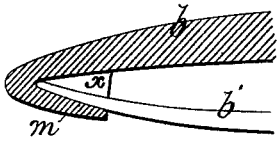


Fig 5



WITNESSES

Henry Howson Jr.

Harry Smith

INVENTOR

Isaac Eaton

by his Attorneys

Howson and Sons

UNITED STATES PATENT OFFICE.

ISAAC EATON, OF NASHUA, NEW HAMPSHIRE.

IMPROVEMENT IN SPINDLES FOR COP-SHUTTLES.

Specification forming part of Letters Patent No. **220,362**, dated October 7, 1879; application filed March 6, 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 Spindles for Cop-Shuttles, of which the following is a specification.

My invention relates to certain improvements in the shuttle-spindle for which Letters Patent No. 192,692 were granted to James Hamilton on the 3d day of July, A. D. 1877, the objects of my improvements being to lessen the cost of manufacturing the spindle, to prevent the stabbing of the cop by the same, to obviate the catching and breaking of the threads by the spindle when the shuttle is in use, and to lessen the waste of cops.

In the accompanying drawings, Figure 1 is a sectional view of a shuttle with my improved spindle; Fig. 2, a perspective view of the end of the spindle; Fig. 3, an enlarged sectional view of the same; Fig. 4, a section on the line 1 2, Fig. 3; and Fig. 5, a modification.

The body A of the shuttle is of the usual form and construction, and the spindle B is hinged to the body and acted on by a spring, *a*, in the ordinary manner.

The spindle is composed of two bowed and elastic arms, *b b'*, welded together at the butt near the head *d*.

On the end of the arm *b* is formed an enlargement, *m*, and in this enlargement is formed a recess or socket, *x*, for the reception of the pointed end of the arm *b*, so that when the cop is placed on the spindle and the arms *b* and *b'* are pressed toward each other the end of one arm shall be longitudinally free from that of the other arm.

It is not essential that the end of the arm *b'* should slide in the socket *x*, however. In Fig. 4, for instance, the end of the arm *b'* fits snugly in the socket; but I prefer the plan shown in Fig. 3.

In the patented spindle of Hamilton, above referred to, the two arms of the spindle are pivoted to the shuttle independently of each other, and the outer end of one arm is free to slide in a groove near the end of the other arm.

The objection to this arrangement is that the ends of the two arms are at liberty to be sprung apart, or to slip laterally on each other, so that when the cop is applied to the spindle the ends of the arms penetrate the same and disarrange and otherwise injure the threads, or prevent the proper application of the cop to the spindle until the arms have been readjusted.

Another objection to the Hamilton spindle is, that when the cop is reduced by drawing off the thread the outer portions of the spring-arms are exposed, and the jarring of the shuttle is sometimes sufficient to cause the lateral displacement of the ends of the arms, so that they are liable to catch and break the threads as the shuttle is thrown.

By forming a socket on one arm and adapting the end of the other arm to this socket, I effectually overcome the objections above mentioned.

Furthermore, the use of a single head and pivot-pin in place of the arrangement shown in Hamilton's patent enables me to make the improved spindle stronger and at less expense than the said patented spindle.

A single head and pivot-pin are not new in themselves, but have been used in connection with spindles having their spring-arms welded together at the point. Such spindles, however, are objectionable, owing to the fact that the welded joint is apt to be fractured if any undue strain is exerted upon the spring-arms—an objection to which my improved spindle is not subject.

It will be observed that the enlargement at the end of the arm *b* is very short, so that the two spring-arms *b b'* exert a tension upon the cop up to the very point of the same. This is an important improvement on Hamilton's shuttle-spindle, for one of the arms of the latter projects beyond the other arm to such an extent that much of the thread must be drawn from the end of the cop before the shuttle is ready for use, whereas the cop remains entire on my improved spindle.

I am aware that a shuttle-spindle has been made in which the end of one arm is provided with a socket to receive the point of the other

arm. This feature, however, has not been used in connection with a shuttle-spindle having two arms rigidly connected to the butt.

I claim as my invention—

A shuttle-spindle consisting of two bowed spring-arms, *b b'*, rigidly connected together at the butt or head, the arm *b* having at the outer end an enlargement, *m*, in which is a socket, *x*, for receiving and protecting the point of the arm *b'*, all substantially as and for the purpose herein set forth.

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

ISAAC EATON.

Witnesses:

WILLIAM J. COOPER,

HARRY SMITH.