

J. Eaton. Shuttle.

N^o 21,068.

Patented Aug. 3, 1858.

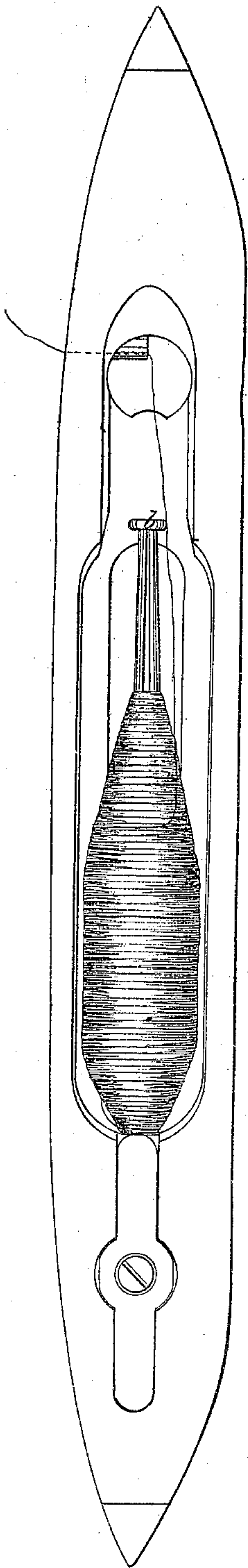
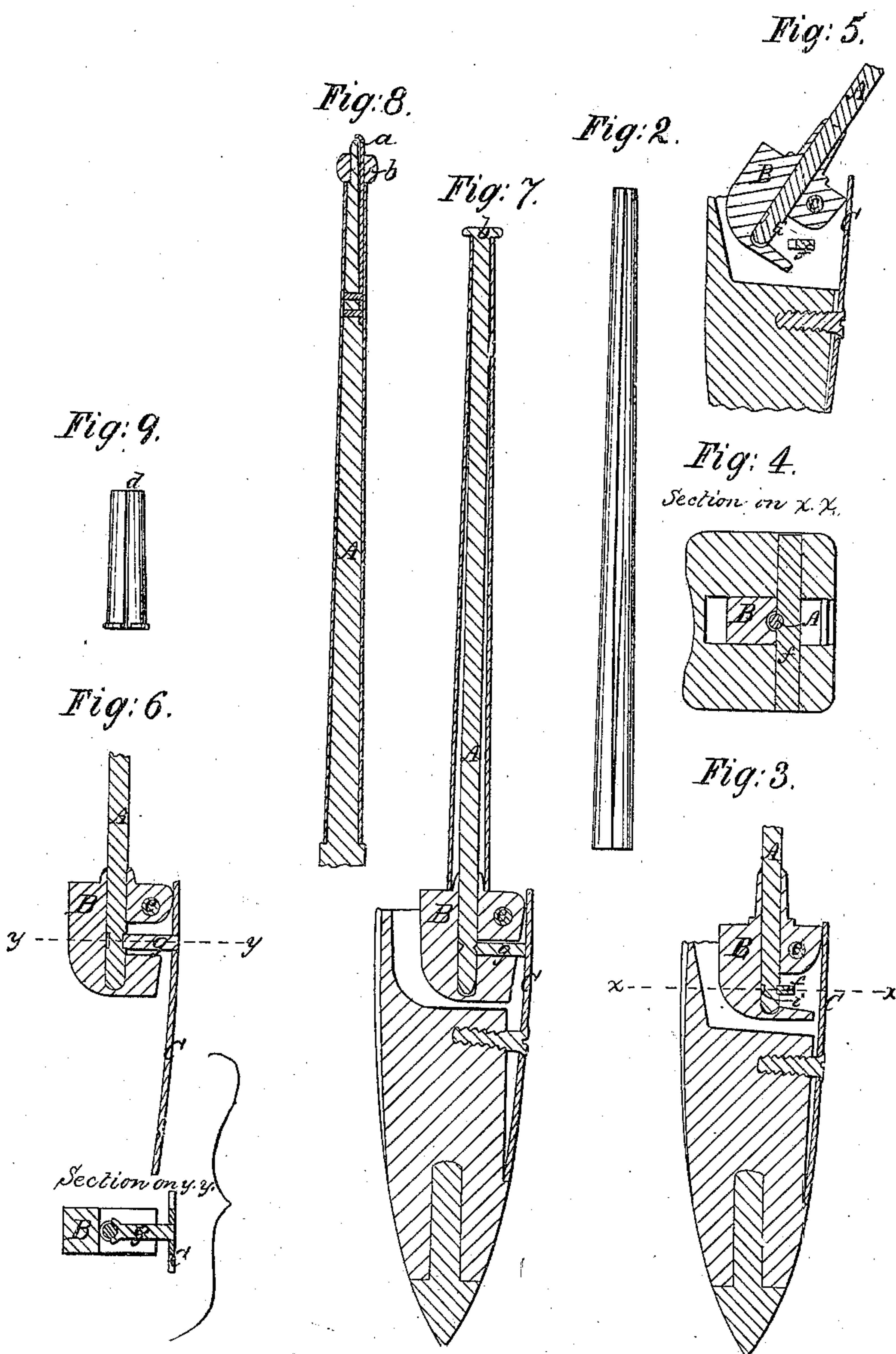


Fig: 1.



UNITED STATES PATENT OFFICE.

JAS. EATON, OF TOWNSEND HARBOR, MASSACHUSETTS.

COP-TUBE FOR SHUTTLES.

Specification of Letters Patent No. 21,068, dated August 3, 1858.

To all whom it may concern:

Be it known that I, JAMES EATON, of Townsend Harbor, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Cop-Tubes and in the Method of Securing the Same to the Shuttle-Spindles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a view of a shuttle with my improvements attached; Fig. 2, a view of my improved cop tube; Fig. 3, a longitudinal section through the shuttle and spindle; Figs. 4, 5, 6, 7, 8, 9, details to be referred to hereafter.

My invention has for its object to remedy the defects to which cop tubes as heretofore constructed have been liable and to economize the cop waste caused by their employment. This waste results principally from three causes—1st. The yarn at the base of the cop lies so near to the spindle in the shuttle that it is apt to wind around it as it is drawn off and by the friction thus produced the thread is broken and the remaining portion of the cop is often wasted. This same difficulty occurs in a degree through nearly the whole length of the cop with that portion of it that lies directly in contact with the spindle. 2nd. The yarn as it renders from the ordinary short tube is liable to catch in the corner of the metal *d* (Fig. 9) and the tube together with the yarn which may remain upon it is drawn to the other end of the shuttle and a further amount of waste is thus made. 3rd. Only the base of the cop is protected and held in place by the ordinary short metallic cop tube, the balance of it being wound directly upon the spindle upon which it is spun—from this spindle it is taken and passed onto that in the shuttle, and by this operation the interior coils of the cop are entangled with each other so as to cause the thread to break as it is drawn off and a portion of the cop is often thus wasted. The attempt has been made to remedy the first of these causes of waste by making the tubes of a conical form, but this is not practicable with metallic tubes and has only partially remedied the evil, for that portion of the yarn which lies nearest to the spindle still wraps around it as it is drawn off and breaks, and this is

more or less liable to occur through a considerable portion of the cop.

My present improvements are calculated to remove all the above mentioned causes of waste and my invention consists, firstly, in the employment of a button upon the end of the shuttle spindle which holds off the yarn a sufficient distance from the end of the spindle to prevent it from wrapping around it, and thus I accomplish the removal of the first cause of cop waste; and my invention also consists, secondly, in the employment in combination with the above of a metallic tube of the entire length of the cop whereby I avoid the 2d and 3d causes of waste above enumerated, and, 3dly, in the employment in combination with the button and long cop tube of a removable spindle suitably secured to the shuttle, as will now be more fully described.

To enable others skilled in the art to understand my invention I will proceed to describe the manner in which I have carried it out.

In the accompanying drawings Figure 1 represents a shuttle having my improvements attached, the spindle having a small metallic disk or button *b*, secured to its extremity. The tube which I employ is seen in Fig. 2. It is of sheet metal and may be made either with or without a flange at its base. It is of a length sufficient to hold the entire cop which is formed directly upon it, and as is obvious is not exposed to the disturbances of its threads either by handling before it reaches the shuttle or by being placed upon the shuttle spindle. The spindle is of a size that will permit it to enter the small end of the cop tube and is secured to the shuttle in the following manner (Figs. 3, 4 and 5): The block B, which is pivoted as usual at *e* and held in place by the spring C, is bored to receive the spindle A in the lower end of which is turned a groove *i*.

f is a stationary bar or pin which passes transversely through the shuttle in such a position that when the spindle is in its place within the shuttle the bar shall enter the groove *i* and lock the spindle firmly to the shuttle.

When the cop tube is to be withdrawn from the shuttle and a fresh cop put in its place, the block B is turned as in Fig. 5, by which the spindle is unlocked from the sta-

tionary bar *f* and may then be withdrawn. It is then passed through the tube having the fresh cop and returned to the block and on the latter being again turned down as in the Fig. 3 the spindle is locked to the shuttle as before. This method of securing the removable spindle to the shuttle is the one which I prefer, but there are various other ways of accomplishing this end which are but obvious equivalents of the one above described. For instance in Fig. 6 a pin or bolt *g* attached to the spring C enters the groove in the lower end of the spindle and is withdrawn therefrom when the block is revolved as in Fig. 5 for the purpose of removing the spindle. In Fig. 7 the pin *g* is not attached to the spring but plays loosely within the block B and permits the spindle to be removed and replaced when the pressure of the spring C is taken from it by the revolution of the block B.

The extreme end of the shuttle spindle is furnished with a button (*b*) which serves to hold off the yarn from the spindle and prevent it from wrapping and winding around it as it is drawn off. This button also serves to hold the cop and tube in their place upon the spindle.

In Fig. 8 is represented a spindle arranged to embody certain features of my invention and calculated to secure a portion of the benefits which I seek to realize. The spindle is fast in the shuttle and is of a size that shall just fill the cop tube which is secured to it by the button *b*. This button may be attached to the spindle by a screw or by a spring catch *a* upon the end of the spindle.

It is obvious that to place the button permanently upon the end of the cop tube and secure the latter to the spindle by a catch at its base would be but a modified employment of the button and long cop tube.

With a cop tube and spindle arranged as above described the following advantages will be realized: 1st, the thread being held off from the point of the spindle by the but-

ton will not be wound around it as it is drawn off and broken; 2d, the thread will not be liable to be broken nor the tube to be drawn to the other end of the spindle by the catching of the yarn in the point *d* (Fig. 9) of the cop tube; 3rd, the cop remaining undisturbed upon its tube until it is used may be handled without damage, while its inner threads are not disturbed or misplaced and entangled with each other either by withdrawing the cop from the spindle upon which it is spun or by slipping it upon that in the spindle; 4th, when the sheet metal tube is employed a split spindle becomes necessary to hold the cop from slipping. This spindle soon spreads the tube so that it will not retain its place upon the spindle when the cop is nearly drawn off, but is drawn to the opposite end of the spindle and a waste, as before stated, results. With the long tube above described a solid shuttle spindle may be used which is more economical in the first instance and does not spread or destroy the tube.

I do not claim the use of a cop tube of the entire length of the spindle, when used alone and unconnected with the button, or its equivalent to guide the yarn over the point of the spindle; but

What I do claim as my invention and desire to secure by Letters Patent is—

1. The employment of a button upon the end of the spindle or of the cop tube for the purpose specified.

2. In combination with the above I claim a cop tube of a length sufficient to hold the entire cop as set forth.

3. I claim a removable spindle in combination with the button and long cop tube operating in the manner substantially as set forth.

JAMES EATON.

Witnesses:

P. E. TESCHEMACHER,
SAM. COOPER.