(No Model.)

J. E. TYNAN.

SPINNING SPINDLE AND SUPPORT THEREFOR.

No. 411,878. Patented Oct. 1, 1889.

Fig. 1.

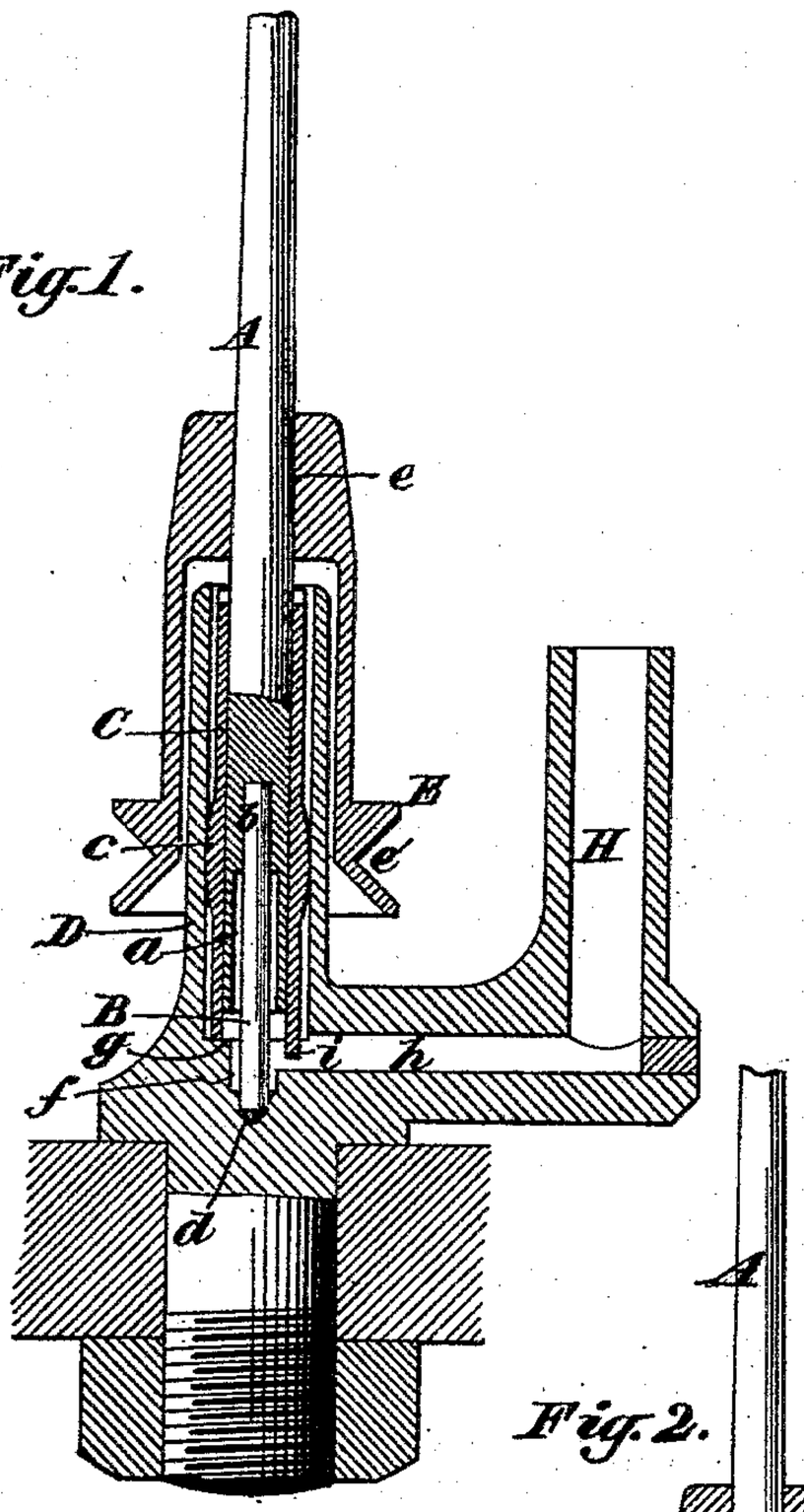


Fig. 3.

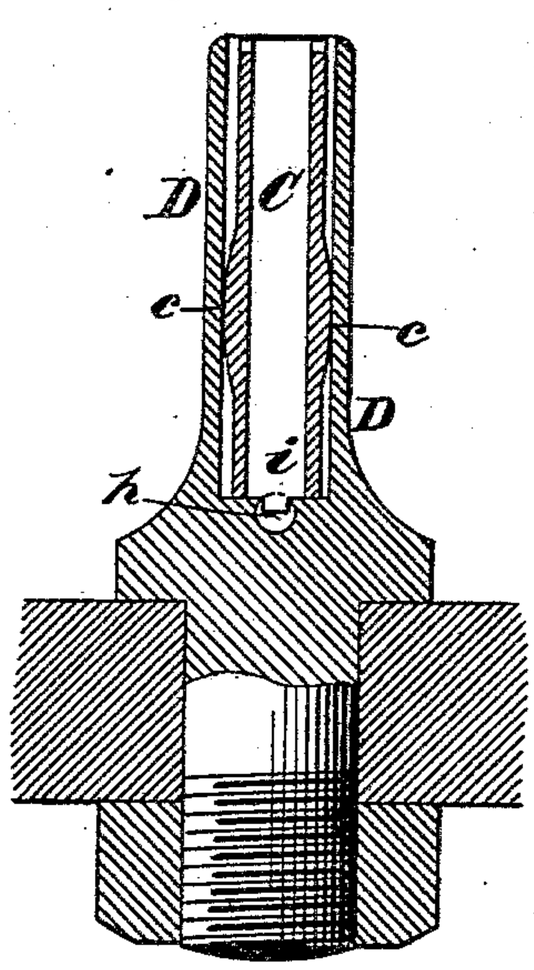
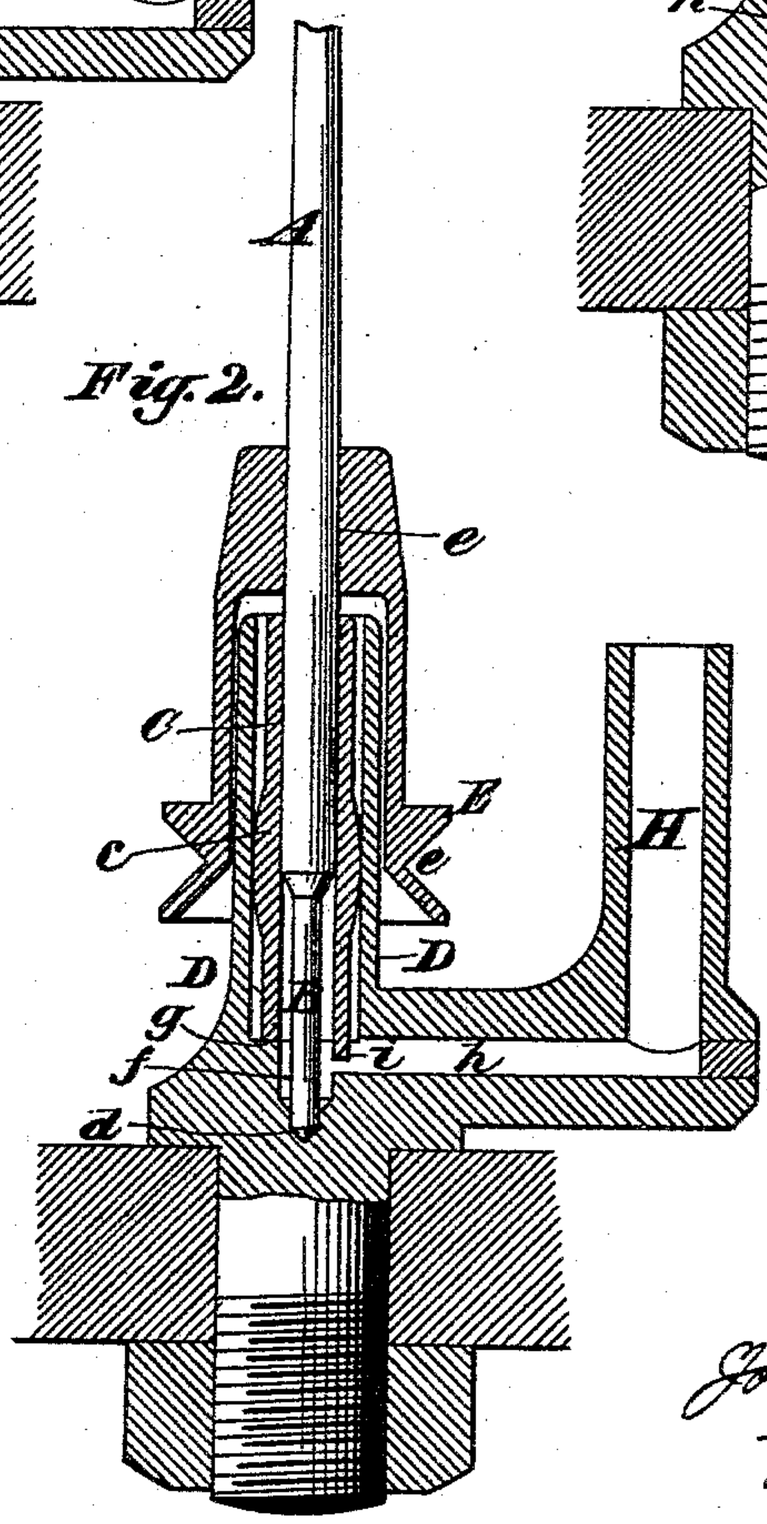


Fig. 2.



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JOSEPH E. TYNAN, OF PATERSON, NEW JERSEY.

SPINNING-SPINDLE AND SUPPORT THEREFOR.

SPECIFICATION forming part of Letters Patent No. 411,878, dated October 1, 1889.

Application filed June 7, 1888. Serial No. 276,377. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. TYNAN, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Spinning-Spindles and Supports therefor, of which the following is a specification.

The object of this invention is to enable a spindle upon which is an untrue bobbin to find, when in motion, its proper center of rotation.

I will first describe spindles and their supporting devices embodying my invention, and then proceed to point out the novelty by claims.

In the accompanying drawings, Figure 1 is a central sectional view of a spindle, its bolster and bolster-supporting tube, and a portion of the spindle-rail of a spinning-frame illustrating one example of my invention. Fig. 2 is a similar view illustrating another example of my invention. Fig. 3 is a transverse sectional view of the bolster and its supporting-tube and a portion of the rail at right angles to Figs. 1 and 2.

Similar letters of reference designate corresponding parts in the several figures.

In the example of my invention represented in Fig. 1 the spindle is constructed in two parts A B, the upper part A, upon which the bobbin is carried, being fitted in the usual or any suitable manner to a bolster C, and having a central chamber *a* provided in its lower end, and the lower part B consisting of a wire small enough to be flexible and being rigidly secured to the upper portion A, as shown at *b* in the drawings, above the chamber *a*. The said part B may be secured in the part A by driving the said part B into a hole provided centrally in the part A above the chamber *a*. The chamber *a* is of a caliber so much larger than the exterior of the lower flexible-wire portion B of the spindle as to allow the said portion B to bend within it when an unbalanced load on the spindle requires it. The normal condition of the part B is straight and concentric and in alignment with the part A, and it is made elastic, so that it will always assume this normal position when not subjected to the bending influence of an unbalanced bobbin on the part A.

D designates the supporting-tube, having within its lower part a step-bearing *d* for the bottom of the spindle—that is to say, for the lower end of the flexible portion B thereof, the said lower end being confined laterally in said step. The bolster C is externally swelled for a portion of its length, as shown at *c*, this swelled portion being somewhat rounded in its axial profile, and the largest portion of it fitting to the interior of the supporting-tube D. Above and below this swelled portion *c* the exterior of the bolster is smaller than the interior of the supporting-tube D, so that there is a space surrounding them to allow the bolster to rock lengthwise within the said tube, and thus permit the inclination of the spindle with the bending of the flexible portion *a*. The spindle-pulley E is secured firmly to the spindle at *e* above the bolster and the tube D; but it overlaps the exterior of the tube D, so that its band-groove *e'* may be opposite the swelled portion *c* of the bolster. The flexible portion B of the spindle commences below the center of the length of the swelled portion *c* of the bolster, with the swelled portion, owing to its position opposite the band-groove of the spindle-pulley, made to receive the pressure exerted on the spindle by the driving-band and prevent the spindle from being pulled from its upright position by the tension of said band. The interior of the supporting-tube D is bored smaller at its lower part, as shown, in order to form a shoulder *g* for the bolster to rest upon. This shoulder is formed opposite the lateral oil-passage *h*, through which oil is supplied to the spindle and bolster from a reservoir H, attached to the bolster-supporting tube, the said shoulder being preferably immediately below the upper surface of the said oil-passage, as shown in Figs. 1 and 3, so that the bore of the oil-passage *h* will leave a small opening in the said shoulder. There is a projection *i* on the bottom of the bolster-which enters through this opening into the oil-passage *h*, and by contact with the sides of said opening prevents said bolster from turning in the supporting-tube.

In the example of my invention shown in Fig. 2 the spindle is all made in one piece, but with the lower portion B smaller than the

upper portion A, the said lower portion being made small enough to be flexible, so that it may bend to allow the spindle to accommodate itself to an unbalanced load. The lower portion B of this spindle, which is the equivalent of the lower portion A, is represented in Fig. 1 as made of a separate piece, and is fitted in the same way to a step-bearing at *d* in the supporting-tube D. In all other respects this example of my invention is like that represented in Fig. 1.

In both examples of my invention the portion B of the spindle bends and the bolster C rocks on its swelled portion *c*, so that the spindle will find its proper center of rotation in case of the load upon it being unbalanced.

I prefer the form of spindle shown in Fig. 1, because there is more bearing-surface for the spindle within the bolster than in the form shown in Fig. 2. Moreover, the spindle in the first example being in two parts enables me to use a more elastic material for the lower portion B of said spindle than that of which spindles are usually composed. I find also that when I use a piece of elastic steel wire for the said portion B the spindle is more durable than when the body of the spindle itself is reduced to form the elastic part.

I am aware that spindles have heretofore been made with an elastic portion connecting two non-elastic portions, and I am also aware that spindles have been made with their lower parts reduced in diameter and to run in bearings of elastic material. I am also aware that spindle-bolsters have been made with an enlarged part to fit a supporting-tube for the purpose of allowing the bolster to rock under pressure of the spindle when the spindle carries an untrue bobbin; but I am not aware that spindles have hitherto been made with an elastic lower portion, the extremity of said elastic lower portion bearing and being confined laterally in a step, and said step being contained within the said bolster-supporting tube, while the spindle is surrounded by a bolster having a swelled portion, which portion only fits the supporting-tube.

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

1. The combination of a bolster-supporting tube having a fixed step-bearing at the bottom thereof, a spindle the lower end of which enters and is confined laterally in said bearing, and which is flexible, unconfined laterally, and free to bend immediately above said bearing, and a bolster fitting the said spindle and having an externally-swelled portion, which alone fits the supporting-tube, substantially as herein described.

2. The combination, with a spindle for spinning, a supporting-tube therefor having a step-bearing for the spindle in its lower part, a lateral oil-passage communicating with said step-bearing, and a shoulder opposite to said tube for supporting a bolster, of a bolster having a projection at its bottom entering said oil-passage, substantially as herein described.

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