W. E. NICHOLS.

RING SPINNING-FRAMES.

No. 195,154. Patented Sept. 11, 1877.

Fig. 1.

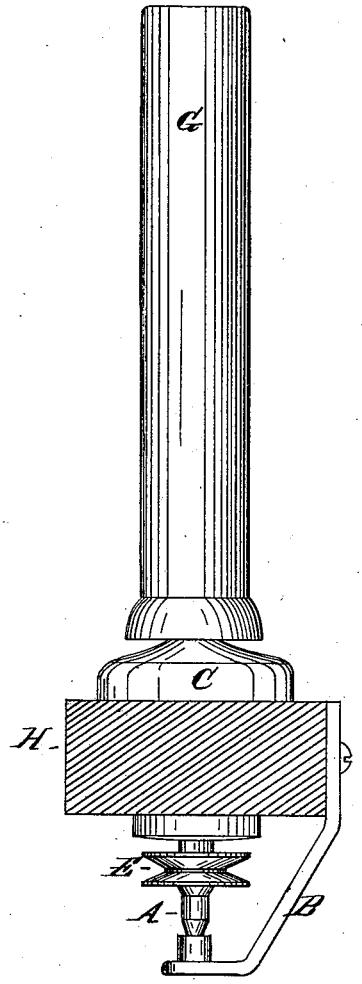
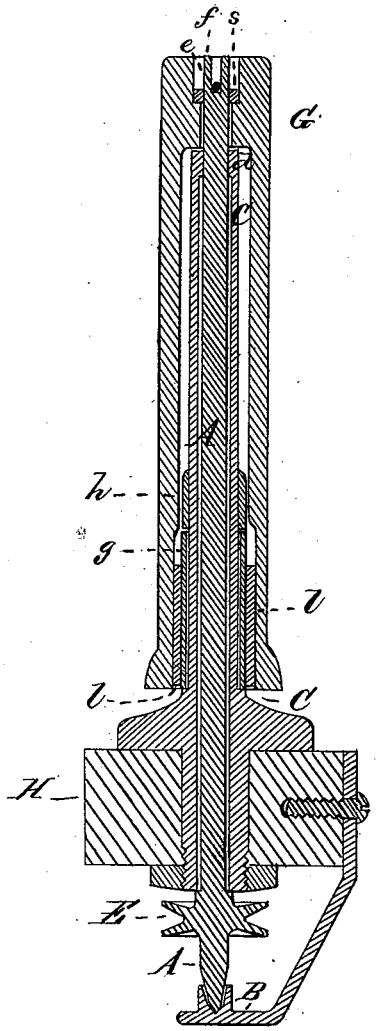


Fig. 2.



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WILLIAM E. NICHOLS, OF EAST HADDAM, CONNECTICUT.

IMPROVEMENT IN RING-SPINNING FRAMES.

Specification forming part of Letters Patent No. **195,154**, dated September 11, 1877; application filed April 28, 1877.

To all whom it may concern:

Be it known that I, WILLIAM EBENEZER NICHOLS, of East Haddam, in the county of Middlesex and State of Connecticut, have made an invention of certain new and useful Improvements in Ring-Spinning Frames; and that the following is a full, clear, and exact description and specification of the same.

The object of this invention is to enable the spindles of ring-spinning frames to be constructed of light weight and to be driven at a high speed, it being well understood among spinners that the less the weight of spindles the faster they can be driven, and also that the power required to drive spindles of different weights at equal speeds diminishes as the spindles are less in weight.

To this end my invention consists of certain combinations of the bobbin or cop-tube, the spindle-bobbin, and spindle-bearings, whereby the spindle is relieved from a large portion of the strain incident to supporting the bobbin, while the latter is supported at its lower end independently of the spindle by a revolving or live box, which runs upon a fixed support, and which has motion imparted to it by the bobbin itself.

The several combinations of devices which constitute my invention are set forth at the close of this specification. In order that they may be fully understood, I have represented in the accompanying drawing, and will proceed to describe, a portion of a ring-spinning frame embodying my invention in the best form thus far devised by me, it being understood that the other parts of the ring-spinning frame are the same as those in general use.

Figure 1 represents a cross-section of the bolster-rail, with one spindle and its appurtenances in elevation. Fig. 2 represents a vertical central section through the spindle.

The spindle A, represented in the said drawing, is stepped at its lower end in a bracket-bearing or step, B, and it is maintained in its upright position by the fixed tubular bolster C, the bore of whose upper end *d* forms the fixed upper bearing of the spindle. The spindle is thus supported at its two ends, and is free of any strain between its two bearings other than that due to the whirl E and the driving-band applied thereto.

The point *f* of the spindle projects slightly above its fixed bearing, and is forked to form a driving-head for the bobbin G, which is fitted with a cross-bar, *e*, to engage with said driving-head.

The bobbin is fitted at its upper end to the driving-head of the spindle, and is bored out so as to pass freely over the fixed tubular bolster without touching its surface.

The lower end of the bobbin fits upon a short live box or revolving bearing, *g*, which may be of metal or other suitable material, and is fitted to revolve upon the exterior of the fixed bolster C, near the bolster-rail H. This live box or tube transmits to this fixed bolster any lateral strains that may be applied to the lower end of the bobbin, which is thus firmly supported independently of the spindle, while the box or live tube which runs upon this fixed bolster, being of short length, is connected with the spindle only through the intervention of the bobbin, and is thus driven by the bobbin itself.

In order that the bobbin may be readily connected with the short live tube or box *g* without risk of slipping thereon, and may be readily disengaged, the live box or tube *g* is fitted at its exterior with an elastic sleeve or cushion, *l*, which may be of vulcanized rubber or other suitable material; and in order that the live tube or box *g* may not be withdrawn from the fixed bolster C when the bobbin is removed, a collar, *h*, is driven upon the said fixed bolster C, above the live tube *g*. In order that the upper end of the bobbin may be always centered upon the spindle A, the bobbin is fitted with a narrow internal ring-bearing, *s*, made of metal or other material that is not affected by atmospheric variations as wood is. This upper ring-bearing, being narrow, does not bind the bobbin longitudinally to the spindle; consequently the bobbin is free to adjust itself to its two supports, which are the point *d* of the spindle and the live tube *g*, which runs upon the fixed bolster C.

The above-described system of constructing spindles and bobbins and their respective bearings furnishes a firm and reliable support for each end of the bobbin. As the support of the upper end of the bobbin is the

point of the spindle, close to the tubular bearing thereof, there is much less tendency to cause the spindle to tremble or vibrate than there is when the spindle is constructed to protrude sufficiently above its upper bearing to sustain the bobbin wholly. On the other hand, the support of the lower end of the bobbin is independent of the spindle, thus relieving the latter of a great portion of the lateral strain. The employment of the narrow internal bearing or box *s*, at the upper end of the bobbin, relieves the spinning mechanism from the cramping and binding of the head of the bobbin upon the spindle that would ensue from variations that occur in the heads of wood bobbins from atmospheric changes. The cross-bar *e*, or some equivalent therefor, at the upper end of the bobbin, forms a positive connection between the driving-head of the spindle and the bobbin, which, while compelling the bobbin to revolve with the spindle, permits the bobbin to hang loosely on the spindle-head, so that the box at the lower end of the bobbin can adapt itself to the tubular bolster without pressing unduly at one side thereon. The short live tube *g*, for the lower end of the bobbin, relieves the spinning mechanism of the cramping and binding of the bobbin upon its fixed bolster that would ensue from variations in the lower ends of wood bobbins from atmospheric changes. The elastic sleeve *l* prevents all chattering between the lower end of the bobbin and its live tube or box, and adjusts the live tube or box to small variations in the bores of different bobbins. The driving of the live box *g* by the bobbin itself simplifies the mechanism by dispensing with any other connection between that box and the driving mechanism of the spinning-frame.

I claim as my invention—

1. The combination, substantially as before set forth, of the spindle having a driving-head at the upper end to carry and drive the bobbin, the fixed tubular bolster, and the short live box or bearing for the lower end of the bobbin, constructed to revolve upon the exterior of said bolster near the bolster-rail.

2. The combination, substantially as before set forth, of the spindle, the fixed bolster, the short live box for the lower end of the bobbin, constructed to revolve upon the exterior of said bolster near the bolster-rail, and the elastic sleeve for the said short live box.

3. The combination, substantially as before set forth, of the spindle having a driving-head for the bobbin, the fixed bolster, the short live box for the lower end of the bobbin, constructed to revolve upon the exterior of said bolster near the bolster-rail, and the bobbin fitted at its upper end with a cross-bar that engages with the driving-head of the said spindle.

Witness my hand this 26th day of April, A. D. 1877.

WILLIAM EBENEZER NICHOLS.

Witnesses:
CATHARINE H. GILLETT,
EVERETT E. SWAN.