No. 791,436. PATENTED MAY 30, 1905.

A. S. BROWNE.

SPINDLE.

APPLICATION FILED DEC. 7, 1904.

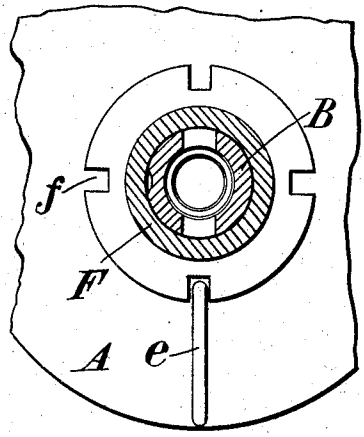


Fig. 2.

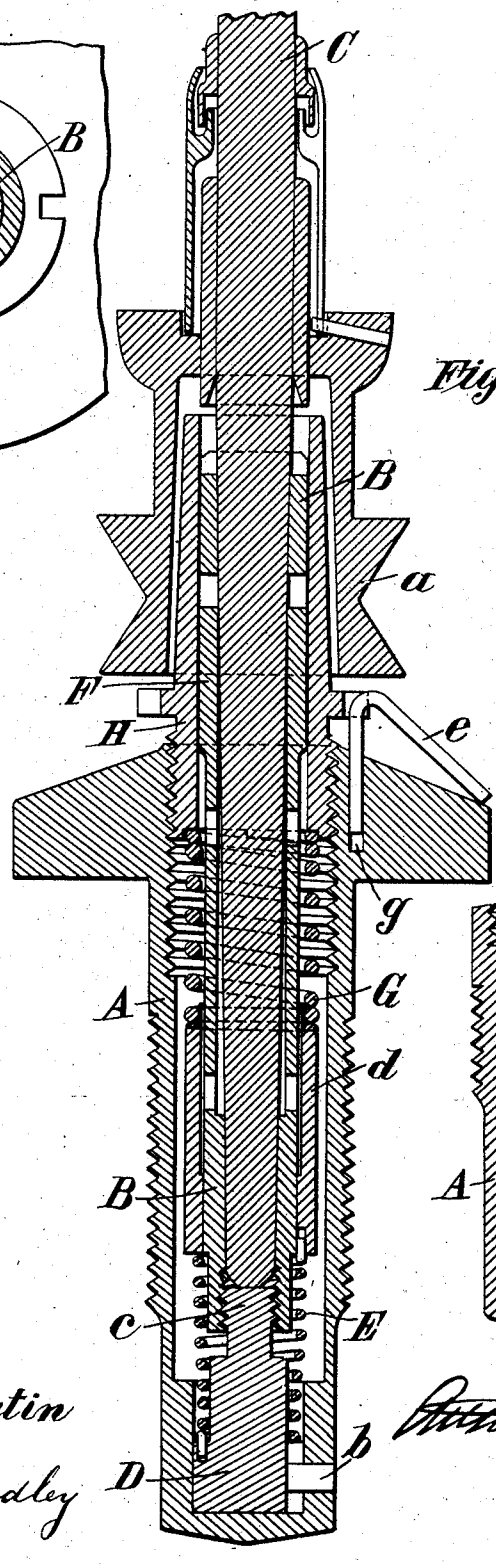
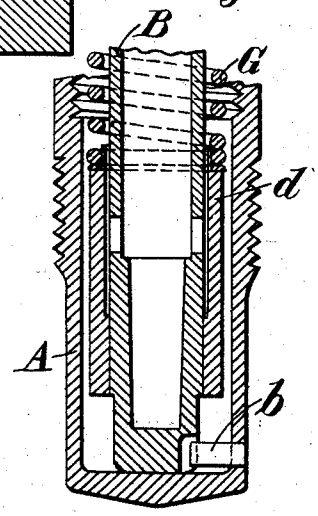


Fig. 1.

Fig. 3.



Witnesses:

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No. 791,436. Patented May 30, 1905.

UNITED STATES PATENT OFFICE.

ARTHUR S. BROWNE, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO SAWYER SPINDLE COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

SPINDLE.

SPECIFICATION forming part of Letters Patent No. 791,436, dated May 30, 1905.

Application filed December 7, 1904. Serial No. 235,836.

To all whom it may concern:

Be it known that I, ARTHUR S. BROWNE, of the city of Washington, in the District of Columbia, have invented certain new and useful Improvements in Spindles, of which the following is a specification.

The objects of the present invention are to increase the steadiness of spinning-spindles and to maintain their axes of rotation as nearly constant as practicable, while preserving the valuable characteristics of an existing type of spindles.

The present improvements are illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of a spindle. Fig. 2 is a cross-section, and Fig. 3 is a vertical section, of a modification.

The spindle shown in Fig. 1 is one especially adapted for ring-spinning, and it embodies the improvements set forth in United States Patents of Draper, No. 378,877, dated March 6, 1888, and of Day, No. 490,245, dated January 17, 1893. As in said patents, there are a bolster-case A, bolster B, spindle-blade C, with sleeve-whirl *a*, and step D. The step D rests on the bottom of the bolster-case and is restrained from rotation by a slot and pin, as shown at *b*. The step screws into the bottom of the bolster by screw *c* in order to properly adjust the spindle-blade in the bolster, and the screw connection is a loose one to permit the gyration of the foot of the bolster in case of an unbalanced load. Preferably the step fits closely within the bolster-case, but may be readily inserted and withdrawn. A coiled spring E, attached at opposite ends to the step and bolster, respectively, prevents the continuous rotation of the bolster, putting a restraint thereon, but permits a sufficient rotation to automatically free the spindle-blade in case it sticks or binds. The bolster at its upper end has an exterior portion F, which bears against the inner adjacent wall of the bolster-case and which will be identified as the "bolster-bearing." The exterior of the bolster-bearing is parallel with the interior surface of the bolster-case, (preferably both are cylindrical,) and the bolster-bearing extends both above and below the plane of the band-pull exerted upon the sleeve-whirl *a*, which embraces the upper ends of both bolster and bolster-case. There is enough clearance between the bolster-bearing and the bolster-case to permit gyration due to an unbalanced load; but the gyration is small at this point. The parallel surfaces between the bolster and bolster-case opposite the plane of the band-pull maintains the axis of the spindle as nearly constant as practicable, and hence serves to keep the spindle central within the ring. The weight of the spindle-blade with its load and of the bolster is borne by the step, and hence at the bottom of the bolster. All of these existing features are retained, together with the present improvements.

In accordance with the present invention a coiled spring G under compression surrounds the bolster within the bolster-case between the bolster-bearing F and the foot of the bolster. The bolster has near its lower end an external flange *d*, upon which the lower end of the spring G seats, and the upper part of the bolster-case is a vertically adjustable and removable sleeve H, which screws into the fixed part of the bolster-case, bears upon the upper end of the spring, and maintains it under the desired tension. This flange, as shown, has a sleeve rigidly secured to the lower part of the bolster, being conveniently secured by a driving fit. The bolster-bearing F is within the sleeve. This sleeve when adjusted is maintained in place by the removable locking-pin *e*, which enters one of the notches *f*, Fig. 2, of the sleeve and a hole *g* in the fixed part of the bolster-case. This spring G is stronger than the spring E, so that the latter is maintained under compression. The tension of the spring G forces the bolster down upon its solid bottom support, (in this case the step D,) thus affording a substantial though yielding resistance at the foot of the bolster. The bolster is thus held laterally but yieldingly at the foot. This suppresses vibration and facilitates steadiness of running, while permitting a modified gyration in case of need. In spindles of this character as heretofore commonly constructed the center of gravity is above the whirl and rises as the spinning continues, thus necessi-

tating increased clearance at the bolster-bearing F, and hence augmenting the difficulty of keeping the spindle centered in the ring. The effect of the down-pressing spring G is substantially equivalent to lowering the center of gravity, so that a minimum clearance is possible at the bolster-bearing. This enables the bolster-bearing to extend a substantial distance both above and below the whirl, thereby facilitating the maintenance of the axis of the spindle in its true place.

Ample provision is made for holding and distributing oil in the usual manner.

Although the present improvements have especial coöperation and utility when combined with the other features shown in Fig. 1, they may, with benefit, be applied to other spindles. In Fig. 3 the bolster itself carries the step-bearing for the spindle, so that it rests directly on the bottom of the bolster-case, being solidly supported thereby, and is directly prevented from rotation. In other respects the construction is the same as in Fig. 1. The bolster in this modification is loose at its bottom within the bolster-case, as in Fig. 1, so that it can move laterally at its bottom as far as may be required by an unbalanced load.

I claim as my invention—

1. A spindle having, in combination, a bolster-case having at its top a vertically adjustable and removable sleeve; a bolster laterally loose at its bottom within the bolster-case, supported at its bottom, having an external flange near its bottom, and having a bolster-bearing near its top parallel with the interior adjacent wall of said sleeve; a spring interposed below the bolster-bearing between said adjustable sleeve and said flange, surrounding the bolster, and maintained under tension by said sleeve; and a spindle-blade fitting in the bolster and having a sleeve-whirl embracing said sleeve and bolster-bearing, said bolster-bearing extending both above and below the whirl.

2. A spindle having, in combination, a bolster-case having at its top a vertically adjustable and removable sleeve; a bolster supported at its bottom within the bolster-case having a bolster-bearing near its top parallel with the interior adjacent wall of said sleeve; a spring below the bolster-bearing and said adjustable sleeve surrounding the bolster, bearing down upon the lower part of the bolster and maintained under tension by said sleeve; and a spindle-blade fitting in the bolster and having a sleeve-whirl embracing said sleeve and bolster-bearing.

3. A spindle having, in combination, a bolster-case having an adjustable sleeve, a bolster supported at its bottom within the bolster-case having a bolster-bearing near its top, a spring below the bolster-bearing and said sleeve bearing down upon the lower part of the bolster and maintained under tension by said sleeve, and a spindle-blade turning in the bolster.

4. A spindle having, in combination, a bolster-case, a bolster supported at its bottom within the bolster-case having a bolster-bearing near its top, a spring below the bolster-bearing pressing the bolster down, and a spindle-blade turning in the bolster.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ARTHUR S. BROWNE.

Witnesses:

LAURENCE A. JANNEY,

FRANK C. HALL.