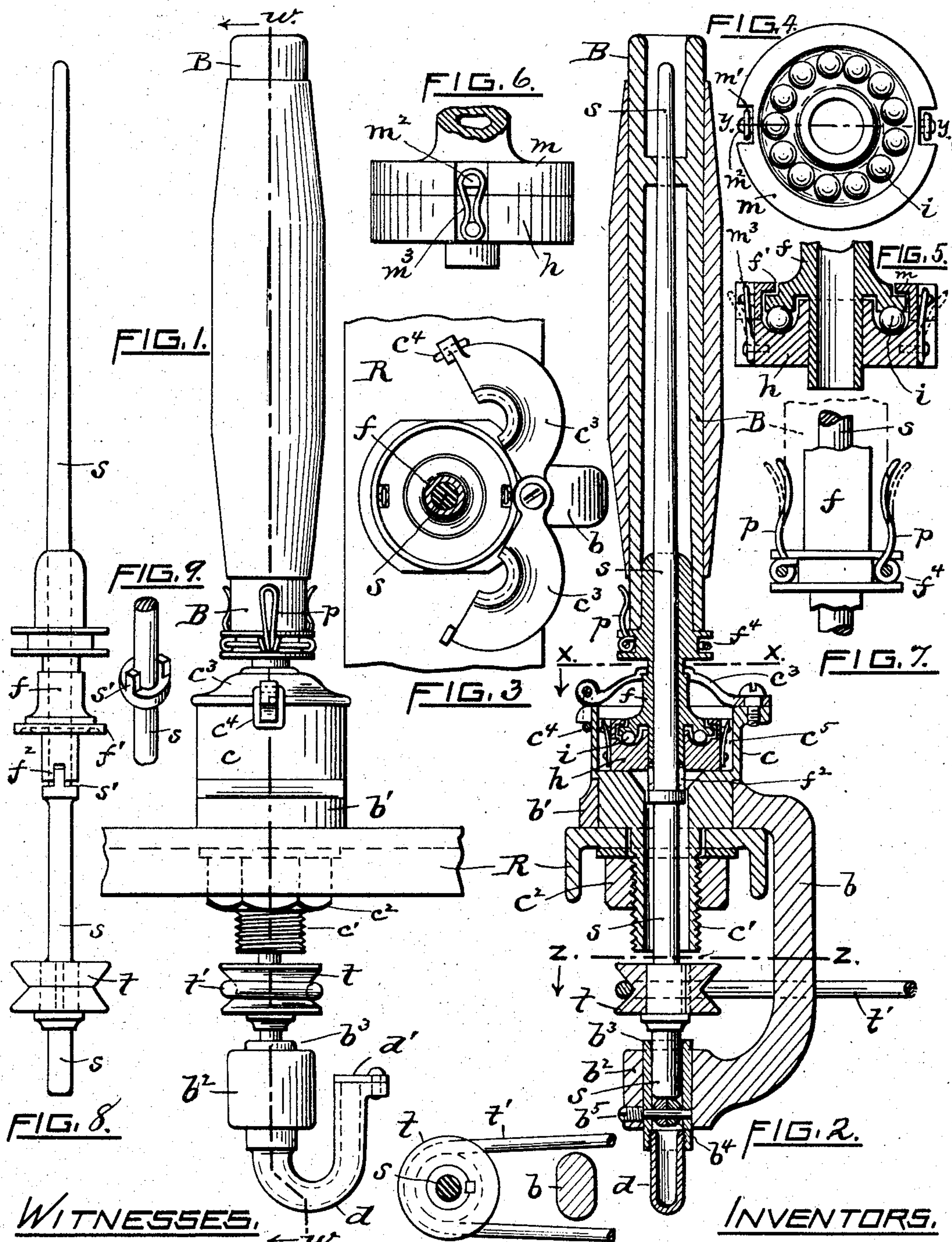


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SPINDLE AND BEARING.  
APPLICATION FILED JAN. 6, 1904.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## SPINDLE AND BEARING.

SPECIFICATION forming part of Letters Patent No. 778,246, dated December 27, 1904.

Application filed January 6, 1904. Serial No. 187,974.

*To all whom it may concern:*

Be it known that we, JAMES J. HUGHES and HENRY E. HUGHES, citizens of the United States, residing at Central Falls, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Bearings for Spindles, of which the following is a specification.

The invention forming the subject of this application for patent comprises a spindle and bearing or support; and the object sought to be attained is to provide spinning-spindles with improved means whereby they are adapted to run true and with a minimum degree of friction at any practical rate of speed. Another advantage attained is that the spindle is supported in the bolster at points both above and below the usual spindle-rail, the whirl itself being secured to the lower portion of the spindle and between the rail and step.

In carrying out the foregoing the invention consists of a yoke-shaped bolster having its upper portion secured to or integral with a member supporting the main spindle-bearing and fixed to the rail, said bearing having a bobbin-carrying sleeve member locked to and driven by the spindle and revoluble on anti-friction-balls contained in the other or normally stationary casing member of said bearing.

It further consists in providing the step or lower part of the bolster with a removable lubricating device in direct open communication with the bottom of the step-chamber and extending upwardly therefrom to form an oil holder or fountain.

It also consists in securing the driving-whirl to the lower part of the spindle at a point contiguous to said step and below the rail, all as more fully hereinafter set forth and claimed.

In the accompanying sheet of drawings, Figure 1 is a front elevation of a spinning-spindle, bearings, &c., embodying our invention. Fig. 2 is a corresponding vertical central sectional view taken on line *ww* of Fig. 1. Fig. 3 is a horizontal sectional view taken on line *xx* of Fig. 2. Fig. 4 is a plan view, in enlarged scale, showing the base member

of the upper bearing of the bolster. Fig. 5 is a vertical sectional view taken on line *yy* of Fig. 4, a portion of the other or revoluble member being shown. Fig. 6 is a front elevation of the same. Fig. 7 is a side view of a means for holding the bobbin. Fig. 8 is a side elevation of the spindle and its members detached from the bolster, &c. Fig. 9 is a perspective view of the portion of the spindle which interlocks with and rotates the bobbin-holder, &c.; and Fig. 10 is a horizontal section taken on line *zz* of Fig. 2.

The following is a detailed description of the invention and the manner of its operation.

It may be stated in advance that the construction of the spindle-rail *R* and bobbin or yarn-holder *B* is or may be made substantially as usual.

As drawn, the bolster-casting *b* is substantially U-shaped, its upper portion or arm *b'* being bored or adapted to receive therein the casing *c*, which latter forms a support and housing for the main bearing. The lower arm *b''* of said casting *b* is bored or drilled to receive a steel bushing *b'''*, which in turn forms a bearing for the lower part of the spindle *s*. The weight of the spindle is borne by disks or members *b<sup>4</sup>*, revolubly mounted on a pin *b<sup>5</sup>*, the whole forming a step for the spindle. A bent oil-tube *d* is secured into the lower end of said bushing *b'''*. The other part of the tube extends upwardly and is protected by a swinging cap or lid *h'*. This tube constitutes an oil-fountain. The said casing *c* is drilled longitudinally to freely receive the spindle, its lower portion *c'* being reduced in diameter and screw-threaded, the same passing loosely through the rail *R* and being secured in position to the rail by a nut *c<sup>2</sup>* in a well-known manner. The top of the casing is provided with a two-part laterally swinging or hinged cover *c<sup>3</sup>*, having a central opening there-through for the revoluble spindle *f*. The said cover when closed is held in place by a swinging hasp or link *c<sup>4</sup>*. The upper or main bearing for the spindle consists, essentially, of the said sleeve *f* and the lower disk-shaped member *h*, resting on the bottom of the casing-chamber *c<sup>5</sup>*, as clearly shown in Fig. 2.



The upper surface of the member *h* has a concentric groove therein containing a series of antifriction-balls *i*, the radius of said groove transversely being somewhat greater than that of the balls. The lower portion of the sleeve *f* is enlarged to form a flange *f'*, its under side or face being grooved to rest upon and be supported by the balls *i*. The sleeve extends downwardly through the member *h*, its end having oppositely-disposed notches *f''*, adapted to receive and interlock with corresponding lugs *s'*, secured to or integral with the spindle itself. (See also Figs. 8 and 9.) Thus it will appear that the rotation of the spindle imparts a corresponding and concurrent movement to the sleeve *f* and the members carried by it. In order that the freely-revoluble member *f* may have sufficient play longitudinally and at the same time be prevented from rising too far when in action, the said ball-carrying disk *h* is provided with a revoluble cap-ring *m*, having oppositely-located notches *m'* and pins *m''*, the latter being engaged by spring-catches *m'''*, secured to the disk. The sleeve *f* may be readily detached when desired by simply springing the members *m'''* rearwardly, (see dotted lines in Fig. 5,) followed by removing the cap-ring.

The upper portion of the sleeve *f* is adapted to receive and carry a bobbin *B* or other analogous member on which the yarn is wound. The bobbin may be held in position by means of spring clips or fingers *p*. These may be made of suitably bent and supported wire mounted in a peripheral groove or recess *f''*, formed in a flange integral with the sleeve, all as clearly shown. The spindle itself extends downwardly through the bobbin, sleeve *f*, casing *c*, and into the step therefor formed in the lower arm of the bolster-casting *b*. In this construction and arrangement the belt-driven whirl *t* is secured to the spindle at a point intermediate the said step and lower end of the annular extension *c'* of the casing, the driving belt or band *t'* having the bolster between its two sides. (See Fig. 10.)

The manner of operation is as follows: The bolster-casting *b*, with its connected casing *c*, is first secured in position upon the rail by means of the nut *c''*. The spindle *s* is next passed through the lower bore formed in the bolster-casting *b* to receive the bushing *b''*, thence through the whirl *t* and securing it thereto, after which the bushing *b''* is inserted in the bolster-casting *b*, which is provided with a screw-threaded opening to receive a screw-thread formed on the pin *b'''*, and said pin passes through the bushing *b''* to impinge against and hold the same to the bolster-casting *b*. The disk or base member *h* is next brought over the projecting portion of the spindle and inserted within the casing *c*, and this is followed by the sleeve *f*, whose lower extremity interlocks with the lugs *s'* of the

spindle, after which the cap-ring *m* is mounted on the flange of the sleeve *f*, so as to have its pins engage with the spring-catches of the disk *h*. The cover members *c''* are next closed and secured in place by the latch *c'''*. The yarn-holding bobbin or quill is readily applied to the spindle and held in position by means of the yielding fingers or clips *p*.

By means of this improvement the spindle will run with a greater degree of steadiness. There is less lateral deflection, owing to the location of the whirl being intermediate the upper and lower bearings. The spindle, &c., are kept in position during the doffing operation by means of the cover *c''*, the latter also effectually excluding dust, lint, &c., from the bearing.

We claim as a novel and useful invention and desire to secure by Letters Patent—

1. In a spindle-support, the combination with a yoke-shaped bolster having a bolster-casing mounted in the upper portion of its yoke, and a spindle-bearing or step fixedly secured in its lower portion thereof, of a spindle revolubly mounted in the casing and step of said bolster and having opposite integral lugs; a driving-whirl secured on said spindle and situated in the yoke of said bolster; a disk mounted in said casing and having suitable spring-catches; a sleeve loosely mounted on said spindle and having an integral annular flange at its middle portion and provided at its lower portion with slotted openings to receive the lugs of said spindle; antifriction-balls interposed between said disk and flange of said sleeve; and a cap-ring mounted on said sleeve and having pin projections to receive the spring-catches of said disk, substantially as described.

2. In a spindle-support, the combination with a yoke-shaped bolster having its opposite portions bored coaxially of each other, of a bolster-casing mounted in the upper bore of said bolster; a spindle bearing or step fixedly secured in the lower bore of said bolster; a spinning-spindle loosely mounted in said casing and supported by said step; a driving-whirl made fast on said spindle intermediate said casing and said step; a disk mounted in said casing and having a concentric groove in its upper face; a series of antifriction-balls mounted in the groove of said disk; a spindle-driven sleeve in engagement with and supported by said balls; and a cap-ring removably secured to said casing and arranged to maintain said sleeve in its normal working position, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES J. HUGHES.  
HENRY E. HUGHES.

Witnesses:

D. E. LOCKE,  
WILLIAM H. PECK.