

(No Model.)

L. W. CAMPBELL.

SPINDLE AND SPINDLE SUPPORT FOR SPINNING MACHINES.

No. 598,669.

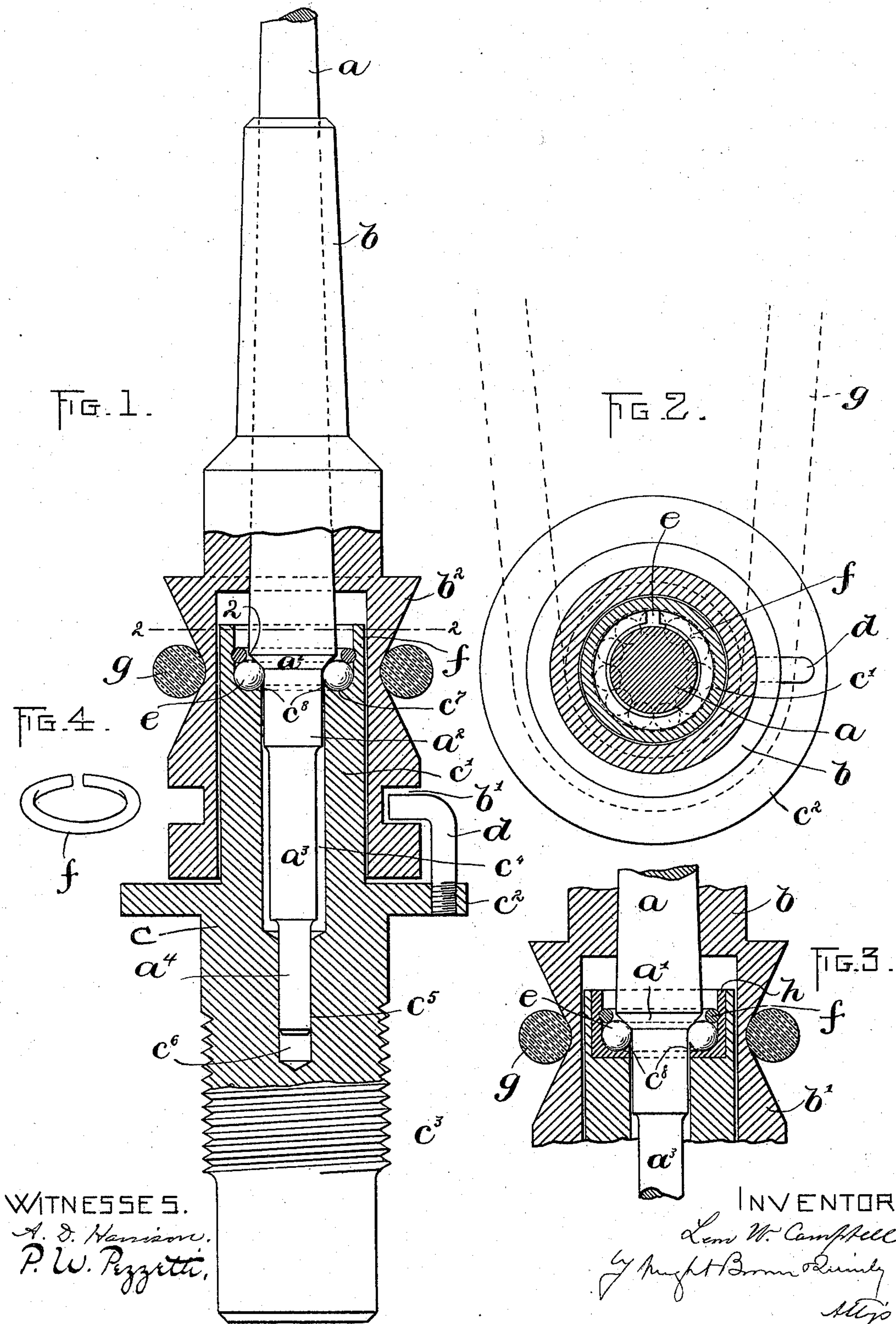
Patented Feb. 8, 1898.

FIG. 1.

FIG. 2.

FIG. 4.

FIG. 3.



WITNESSES.
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UNITED STATES PATENT OFFICE.

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SPINDLE AND SPINDLE-SUPPORT FOR SPINNING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 598,669, dated February 8, 1898.

Application filed January 20, 1897. Serial No. 619,908. (No model.)

To all whom it may concern:

Be it known that I, LEON WILLIAM CAMPBELL, of Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Spindles and Spindle-Supports for Spinning-Machines, of which the following is a specification.

This invention has relation to spindles and spindle-supports for spinning-machines, and has for its object such improvements in the same as will overcome the friction heretofore encountered in running them and permit their being rotated at a high rate of speed with a minimum of power, this object being attained by the novel devices and formations illustrated upon the drawings and now to be described in detail, and then pointed out in the claims hereto annexed.

Reference is to be had to the accompanying drawings and to the letters and figures marked thereon, forming a part of this specification, the same letters and figures designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 shows in vertical section a spindle and its support embodying my invention. Fig. 2 is a transverse section of the same on the line 2 2 of Fig. 1. Fig. 3 shows a slightly-modified form of my invention. Fig. 4 illustrates a split ring which is employed for maintaining the antifriction-balls in their bearings.

It has been proposed heretofore to manufacture a spindle-support in which the spindle was held against lateral vibration by means of antifriction-balls placed between the support and the spindle, and it has likewise been proposed to support the spindle vertically by means of antifriction devices; but so far as I am aware such constructions as heretofore proposed have been defective on account of the liability of the antifriction-balls to drop into the cavity in the bolster-case upon removing the spindle.

By my invention the spindle is supported vertically upon the antifriction-balls and is likewise held from lateral vibration by the same, the balls being mounted in bearings and held therein by a split ring, so that when the spindle and sleeve-whirl are removed there

is no danger of the balls being displaced or lost. Again, in my invention the balls are placed in such relation to the sleeve-whirl that the thrust of the driving-band is borne directly by them.

Referring to the drawings, the spindle *a* has its upper portion tapering from the end to the point indicated at 2, where it is beveled inward, as at *a'*, its lower portion being formed cylindrically, as at *a²* *a³*, and reduced at the end *a⁴*. Secured to the tapering portion of the spindle is the sleeve-whirl *b*, which extends down over the tubular portion *c'* of the bolster-case *c* and is held from slipping longitudinally by a detent *d*, threaded into the flange *c²* of the said case, and extends into a groove *b'* in said sleeve-whirl.

The bolster-case is threaded at *c³* to secure it to the rail (not shown) and is formed with a central aperture *c⁴* to receive the spindle, the said aperture being reduced at *c⁵*, so that the end *a⁴* of the spindle will fit therein without being prevented from freely rotating. The lower portion of the aperture forms a well or pocket *c⁶* to receive a suitable lubricant. The aperture is increased in diameter at the upper end of the tubular portion of the bolster-case, and on the inner walls thereof is formed a groove *c⁷* to receive a ring of antifriction-balls *e*, the wall of the groove being extended upward, as at *c⁸*, to prevent the balls from rolling into the aperture in the case. The bevel *a'* of the spindle rests loosely upon the balls, which therefore not only support the spindle, but also form a lateral support for it.

A split ring *f* of wire is slipped into a groove in the upper reduced end of the tubular portion of the bolster-case and coacts with the wall *c⁸* of the groove *c⁷* in holding the balls against displacement, the distance from the said wall *c⁸* to the periphery of the ring *f* being less than the diameter of each ball.

The balls *e* are arranged in that transverse plane of the whirl *b²* which passes through the center of the groove which receives the driving-band *g*, so that the entire thrust of the latter is borne evenly by the said balls and is not above or below them.

Now from the foregoing it will be observed that the antifriction-balls not only carry the

weight of the spindle, but support it laterally, and that the spindle may be readily removed without danger of their being displaced or becoming lost. If desired, the split ring may
 5 be quickly and readily removed for the purpose of replacing or cleaning the balls and then as easily put in place. Hence, although I refer in the claims to the balls being "permanently" detained in place, it will be under-
 10 stood that they are only maintained in position when the spindle is removed and may be removed when desired.

The lower end of the spindle is held against lateral vibration in the reduced portion of
 15 the aperture, the cylindrical portion of the cylinder between the said end and the bevel a' being considerably less in diameter than the aperture.

Instead of forming the groove or track for
 20 the antifriction-balls in the tubular portion of the case I may employ a ring of relatively hard steel h , as shown in Fig. 3, and form the groove or track therein, the split ring fitting in a groove therein.

25 Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use,
 30 I declare that what I claim is—

1. The combination with a bolster-case having a central aperture, and an internal groove, a ring of antifriction-balls in said groove, and means for detaining the balls permanently
 35 therein, of a spindle arranged in the central

aperture of the bolster-case, and supported entirely by said antifriction-balls, said spindle being readily removable independently of the balls.

2. The combination with a freely-remov- 40
 able spindle having a bevel, of a bolster-case formed with a reduced aperture to receive the lower end of the spindle, and having an internal groove, a series of antifriction-balls in
 said groove and on which the said bevel rests 45
 and is supported, means for detaining the said balls in place when the spindle is removed, and a sleeve-whirl attached to the spindle and arranged in such way that the
 driving-band is in the plane of the balls, 50
 whereby the thrust of the said band is borne by said balls.

3. The combination with a freely-remov-
 able spindle having a bevel, of a bolster-case
 formed with a reduced aperture to receive the 55
 lower end of the spindle, and having an internal groove, and a ring of antifriction-balls in said groove, said bevel resting loosely upon and supported entirely by said balls, being
 also held against lateral vibration by said 60
 balls.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 9th day of January, A. D. 1897.

LEON WILLIAM CAMPBELL.

Witnesses:

M. CAMPBELL,
 EDGAR C. RICH.