

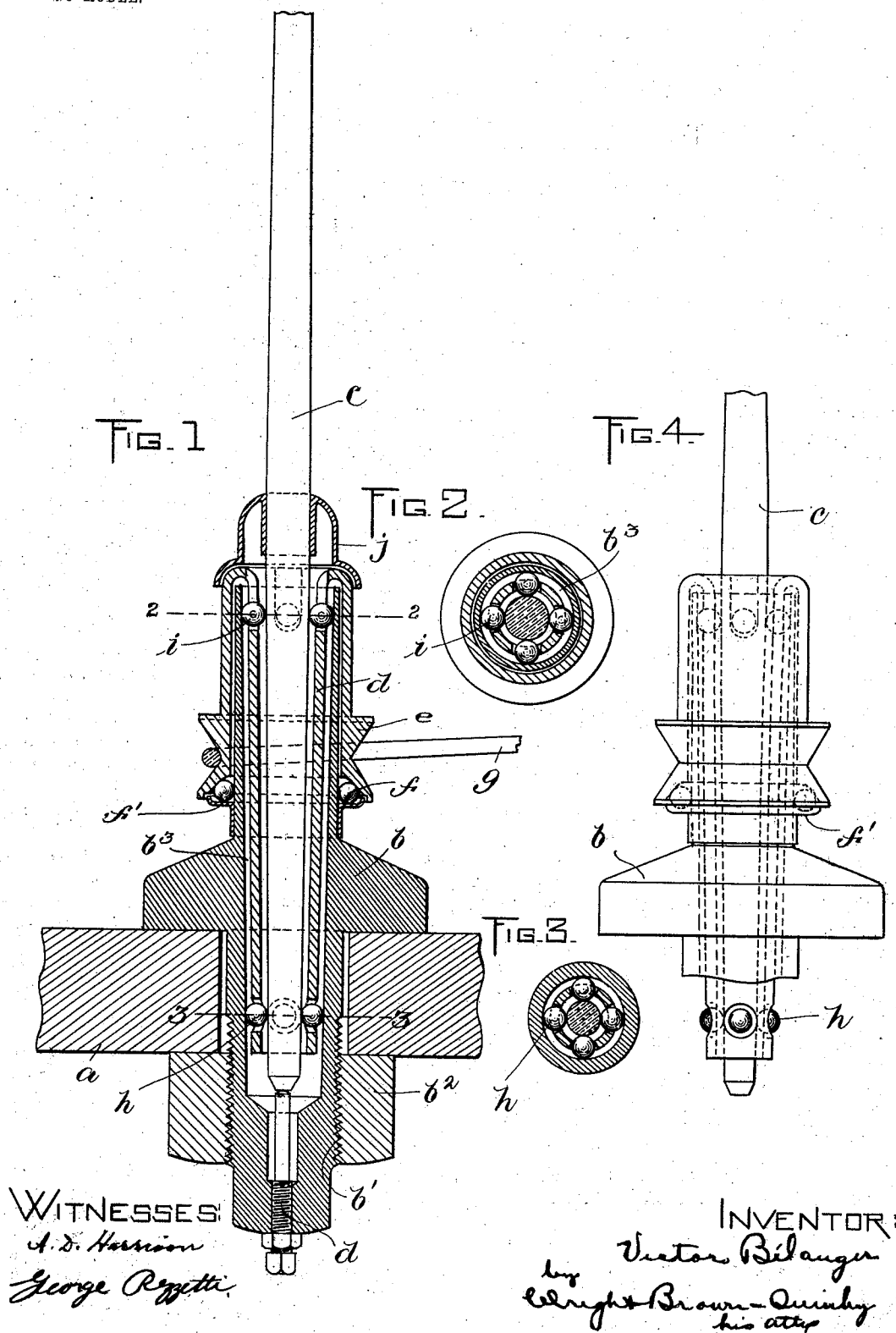
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V. BÉLANGER.
SPINDLE.

APPLICATION FILED MAR. 17, 1902.

NO MODEL.



UNITED STATES PATENT OFFICE.

VICTOR BÉLANGER, OF SEAVIEW, MASSACHUSETTS.

SPINDLE.

SPECIFICATION forming part of Letters Patent No. 768,555, dated August 23, 1904.

Application filed March 17, 1902. Serial No. 98,537. (No model.)

To all whom it may concern:

Be it known that I, VICTOR BÉLANGER, of Seaview, in the town of Marshfield, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Spindles, of which the following is a specification.

This invention relates to spinning or twisting machines, and more particularly to the spindles which are employed therein. In such machines the spindle is provided with a whirl which is driven by a tape or cord from a rapidly-rotating drum or cylinder, and the degree of speed at which the drum must be rotated to impart to the spindle the proper number of rotations per minute causes a vibration of the entire frame, which vibration increases as the bearings for the drum become worn and the drum itself works out of true. The vibration of the frame is a serious detriment to the production of the yarn, as it varies the tension of the top rolls upon the yarn and destroys the evenness of the feed or supply of the roving to the spinning mechanism, and therefore the spun yarn is uneven and weaker at one point than at another.

The object of this invention is to provide an improved spindle whereby it may be driven at a high rate of speed with less power and with a greater reduction in the speed of the driving-cylinder than has ever before been possible.

By the provision of this invention I am enabled to reduce the power necessary to operate the spinning or twisting frames, and thereby effect a saving in the cost of running or operating the cotton-mill. On the other hand, if it be desired to rotate the drum at a high rate of speed, such as that at which the same is now rotated, I am enabled by my invention to greatly increase the rapidity of rotation of the spindle, and thereby effect an increase in the production of the frame.

On the accompanying drawings, Figure 1 represents in section a spindle embodying my invention. Fig. 2 represents a section on the line 2-2 of Fig. 1. Fig. 3 represents a section on the line 3-3 of Fig. 1. Fig. 4 represents the spindle with parts broken away.

Referring to said drawings, the spindle-rail

is indicated at *a* and is apertured to receive the stationary member *b* of the spindle. This member corresponds to the usual bearing, and it is threaded at *b'* for the reception of the locking-nut *b''*, by which it is secured to the rail *a*. The said member is provided with a tapering aperture or socket *b''*, being substantially hollow, with an open upper end and a lower closed end, as shown.

c indicates the blade of the spindle, whose lower end is tapering, as usual, and which is adapted to rest at its lower end upon the end of an adjustable screw-pin *d*, passed into the lower end of the member *b*. Between the blade *c* and the inner walls of the bearing or member *b* is interposed a sleeve *d*. The said sleeve projects above and laterally beyond the upper end of the bearing and then extends downwardly to inclose the upper portion of the same, being provided or formed with a whirl *e*, as shown. This sleeve is supported by a series of balls *f* in a race *f'*, formed on or attached to the exterior of the member *b*. Around this whirl is passed the usual cord or driving-tape *g*, which forms the power-transmitting mechanism from the drum to the whirl. The sleeve *d* is provided at its upper and lower ends with apertures for the reception of balls *h* and *i*, respectively, which balls engage the periphery of the blade *c* and the inner wall of the member *b*. The sleeve acts as a separator for said balls and maintains them loosely in position.

From this description it will now be apparent that when the whirl *e* is rotated, so as to rotate the sleeve *d*, the balls *h* and *i* will be revolved about the axis of the said sleeve. Inasmuch, however, as said balls rest against the stationary member *b*, they will be rotated in addition to being revolved. Therefore as the blade *c* is free it will be rotated at a speed equal to the speed of rotation of the sleeve plus the additional speed caused by the rotation of the balls about their individual axes. By this simple contrivance I am able to rotate the spindle at a speed two or three times as great as the speed of the whirl, and therefore while the whirl may be driven at a relatively low speed the spindle will be driven at a high speed.

The bearing may be lubricated or not, as desired, and the member *a* may be provided with the usual latch for engaging the upper portion of the whirl and preventing it from rising. I have not shown the latch or the means for supplying oil or other lubricant, as they are so well known as not to need illustration.

This invention may be said to include the stationary member *b*, the driving member *d*, the blade, and means between the driving member and the blade for imparting to the blade a speed of rotation greater than the speed of rotation of the driving member, or, again, the invention may be said to provide a blade and friction planetary mechanism for rotating the said blade. The balls, as will be seen, have a planetary movement, the sleeve operating as a driving member, the blade as the driven member, and the casing or bearing *b* as the stationary member. It is evident that in lieu of the balls their mechanical equivalents—to wit, rolls or other devices—may be used.

By this particular description of my invention I do not mean to limit myself to any of the details of construction which I have seen fit to illustrate, as it will be apparent that the invention, broadly considered, may be embodied in various other ways and that I may employ all known mechanical equivalents without departing from the spirit and scope of the invention.

It is not essential that the parts should be tapering, as shown, although I find that in practice this construction is highly desirable.

To prevent the entrance of dust and lint into the bearing, the blade may be provided with a suitable cap or cover *j*, which closes the aperture at the top end of the sleeve or member *d*. This cap or cover is bell-shaped, as shown, so as to extend down part way beyond the end of the said sleeve.

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

1. A spindle comprising a blade, a whirl, and means whereby the blade is rotated by the whirl at a greater rate of speed than the whirl.

2. A spindle for spinning or analogous machines, comprising a whirl adapted to be rotated, a blade within the whirl, and mechanism intervening between the whirl and the blade, by which the rotation of the whirl effects the rotation of the blade in the same direction but at a higher speed.

3. A spindle comprising a blade, a hand-driven whirl, and power-transmitting mechanism interposed between said whirl and said blade, by which the blade is rotated by said whirl at a speed greater than that of the whirl.

4. A spindle comprising a blade, a hand-driven whirl, and speed-multiplying power-transmitting mechanism actuated by said whirl for imparting an accelerated rotation to said blade.

5. A spindle comprising a blade, and friction planetary mechanism for rotating said blade.

6. A spindle comprising a stationary hollow casing, a blade, a series of balls between said casing and said blade, and provisions whereby said balls rotate said blade.

7. A spindle comprising a stationary member, a blade, a whirl, a plurality of balls contacting with said blade and said member, and means whereby said balls are revolved by said whirl.

8. A spindle comprising a stationary hollow member, a blade, a sleeve between said blade and said member, balls located in apertures in said sleeve and contacting with said stationary member, and with the blade, and a whirl connected to said sleeve.

9. A spindle comprising a stationary member having a tapering bore, a blade having a tapering lower end, a tapering sleeve between said blade and said member, balls carried by said sleeve and frictionally contacting with the blade and stationary member, and a whirl connected to said sleeve.

10. A spindle comprising a hollow stationary member, a sleeve in said member, and having an outer portion encircling said member, a whirl on said outer portion of the sleeve, a blade in said sleeve, and balls located in apertures in said sleeve and located between said stationary member and said blade.

11. In combination, a stationary member having an interior frictional surface, a driven member having an exterior frictional surface, balls located between the two frictional surfaces, and a driving member arranged within the stationary member, said driving member having sockets for the reception of said balls, whereby when said driving member is rotated, a planetary movement is imparted to said balls and said driven member is rotated thereby.

In testimony whereof I have affixed my signature in presence of two witnesses.

VICTOR BÉLANGER.

Witnesses:

MARCUS B. MAY,
A. D. HARRISON.