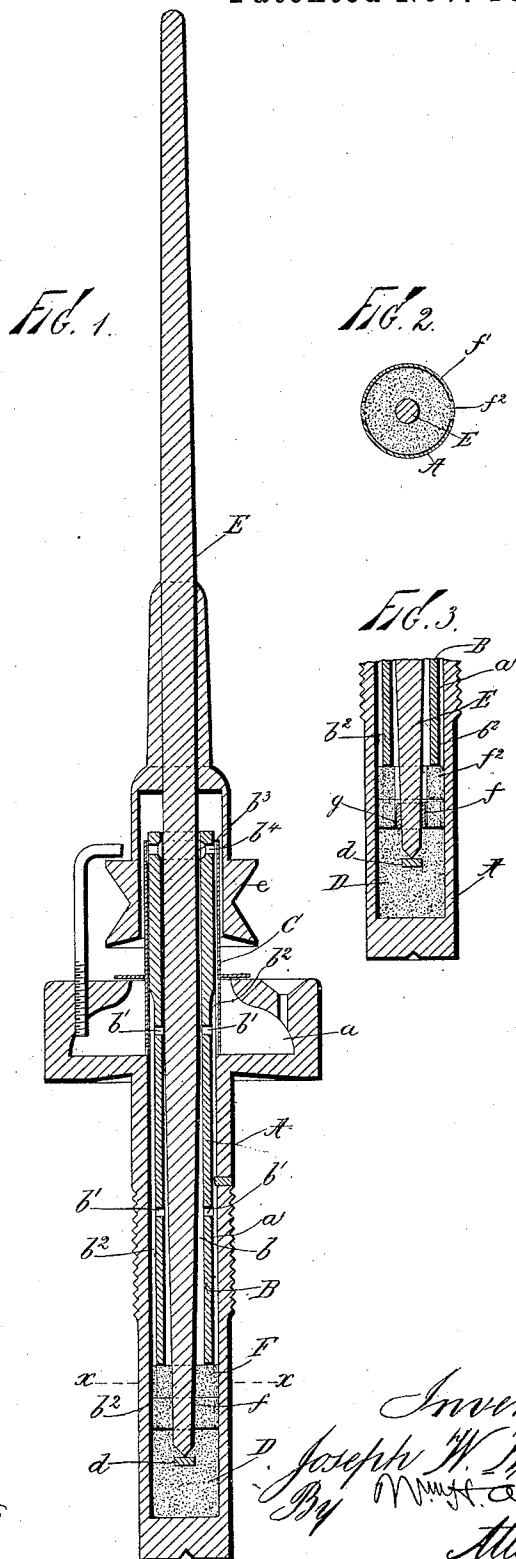


(No Model.)

J. W. WATTLES.  
SPINDLE SUPPORT.

No. 463,114.

Patented Nov. 10, 1891.



Witnesses:  
John Bucklin,  
George P. Appleton.

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 #  
 Inventor:  
 P. Joseph W. Mattles,  
 By Wm. H. Cassin,  
 Attorney.

# UNITED STATES PATENT OFFICE.

JOSEPH WARREN WATTLES, OF CANTON, MASSACHUSETTS.

## SPINDLE-SUPPORT.

SPECIFICATION forming part of Letters Patent No. 463,114, dated November 10, 1891.

Application filed December 11, 1890. Serial No. 374,316. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH WARREN WATTLES, a citizen of the United States, and a resident of Canton, county of Norfolk, and State of Massachusetts, have invented certain new and useful Improvements in Spindle-Supports, of which the following is a specification.

My invention relates to that class of spindle-supports in which the lower end of the spindle is permitted to move laterally under the influences of an unbalanced load, while the portion supported by the bolster is restrained from such movement, and has for its object to provide means whereby the lower end of the spindle, while left to travel laterally and gyrate within certain limits when acted upon by an unbalanced load, shall be restrained from exceeding those limits and be returned to its original position when the disturbing forces have been removed.

To these ends the invention consists in a yielding and elastic sleeve or guard, which is arranged within the lower portion of the bolster-tube around the lower end of the spindle, by which means, when the latter is thrown to one side and caused to gyrate under the necessities of a load, the sleeve or guard will yield to its action within certain limits and then not only oppose any further lateral movement of the spindle, but return the spindle to its original position when the forces causing its divergence have been removed, all as will hereinafter more fully appear.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a vertical section of a spindle and its bearings, with a sleeve or guard constructed in accordance with my invention applied in connection therewith, the section being taken axially of the spindle; Fig. 2, a transverse section of such parts, taken in the plane  $xx$  of Fig. 1; and Fig. 3, a vertical central section of a bolster-tube and step and a holder therefor, with a spindle and sleeve or guard of slightly-modified constructions applied in connection therewith, the upper portion of the spindle, the bolster-tube, and its holder being broken away.

In all figures like letters of reference are employed to designate corresponding parts.

A indicates the bolster-holder, by means of

which the spindle and its bearings are secured to the rail or other appropriate part of the spinning-machine. This holder is provided in its upper end with a reservoir  $a$  for reception and storage of the lubricant when supplied thereto, and also with a chamber  $a'$ , extending downward from the bottom of the reservoir, all as shown.

Fitted to the chamber  $a'$  is the bolster-tube B, which is constructed with a properly-shaped orifice  $b$ , extending axially of the same, and with a series of ducts  $b'$ , passing through the walls of the tube and intersecting at their outer ends the longitudinal grooves  $b^2$ , formed in the outer surface thereof, the object and purpose of which ducts and grooves being to insure a free circulation of the lubricant and the escape of the air contained in the tube when the spindle is in operation. In addition to these ducts and grooves, the bolster-tube is also equipped with a circumferential groove  $b^3$  on its interior near its upper end and with ducts  $b^4$ , leading therefrom to the outside of the tube, to further aid in the circulation of the lubricant, and, with the assistance of the sleeve C, insure its return to the reservoir as it rises up along the spindle during the rotation thereof.

Located below the bolster-tube in the bottom of the chamber  $a'$  is the step-bearing D, which is preferably constructed of an appropriate soft, yielding, and elastic material, and is provided with a hard and unyielding plate  $d$ , disposed therein parallel to and at the proper distance from its upper end. As thus constructed the step is held in place by the bolster-tube B pressing down upon the same and compressing it between the lower end of such tube and the bottom of the chamber  $a'$ .

Resting upon the plate  $d$  in the step-bearing D, and arranged to rotatively fit the upper end of the bolster-tube B, is the spindle E. In the construction of this spindle any of the well-known forms may be adopted. I prefer, however, to make it of tapering form from its middle outward toward both its ends and to provide it with a sleeve or other appropriate whirl  $e$ , whereby its rotation may be effected.

The parts as thus far described possess no novelty in themselves, but are or may be of the same construction as the corresponding parts shown and described in the United

States Letters Patent No. 449,341, which were granted to me March 31, 1891, to which reference may be had.

Disposed in the chamber  $a'$  above the steps 5 D, is the yielding and elastic sleeve or guard F, by means of which the lateral or gyratory movement of the lower end of the spindle beyond certain limits is restrained and the return of the spindle to its normal position insured when such disturbing forces have been removed. This sleeve or guard may be made of various substances. I prefer, however, to employ felt or other soft, yielding, and elastic filamentous material, and to make it in the 10 form of a disk of the proper diameter and thickness, with an orifice  $f$  extending axially of the same, and of approximately the same diameter as the surface in connection with which it is to co-operate.

As thus constructed the sleeve or guard 20 may be secured either between the lower end of the bolster-tube and the top of the step-bearing or in a chamber formed in the lower end of the bolster-tube. This latter arrangement, however, I prefer in practice, as provision is thereby made for more securely holding the step from rotation than when the lower end of the bolster-tube presses thereon. To this end I counterbore the lower end of 30 the bolster-tube to the proper distance, forming thereby an enlarged annular chamber  $f'$  around the spindle, the circumference of which extends outward sufficiently far to connect with the grooves  $b^2$ , as shown more fully in Fig. 2. Into this annular chamber  $f'$  the sleeve or guard is placed with the walls of the orifice through its center carried inward into close proximity to the surface with which it is to co-operate, and in order to prevent its 40 rotation when the spindle or other surface is brought into contact with it I provide the sleeve or guard with a wing or wings  $f^2$ , which extend outwardly through the grooves  $b^2$ , and, engaging therewith, serve as stops to hold it at all times in a quiescent condition.

In Fig. 1 I have shown the sleeve or guard applied in connection with a spindle which is unprovided with a collar at its lower end, and with this form of spindle it will extend 50 inward toward the same sufficiently far to bring the walls of the central orifice into or nearly into contact with the outer surface thereof, while in Fig. 3 I have shown it applied in connection with a spindle that is equipped with a collar  $g$ . When this latter 55 form of spindle is employed, the sleeve or guard, instead of being provided with an orifice that is made of the proper size to approximately fit the lower end of the body of the spindle, will be made of the proper dimensions to approximately fit the circumference of the collar, and will co-operate directly therewith and not with the surface of the body of the spindle, as in the former instance, 60 the collar in effect, however, forming a part of the spindle and being so considered herein.

The parts being constructed and arranged

as above described, whenever from any cause the spindle is deflected from its normal position or caused to gyrate through the influences of an unbalanced load the sleeve or guard will yield to the action of the spindle thereon and will continue to yield until a certain limit is reached, when its yielding quality will cease and the spindle be held from 70 further deflection. In this position or within this limit of elasticity the spindle will be held until the disturbing forces have been removed, when it will be returned to its original position by the elasticity of the sleeve or guard and there 75 held until again deflected or gyrated, when the same operations will be again repeated. It will thus be seen that by the use of a yielding and elastic sleeve or guard under the arrangements above specified I provide a simple and efficient means whereby the deflection and gyration of the spindle beyond certain limits is not only prevented and the return of the spindle to its original position insured when the disturbing forces are removed, but the movements of the spindle 80 within such limits permitted to bring its center of rotation into coincidence with the center of gravity of the load.

In the foregoing I have described the best 85 means contemplated by me for carrying my invention into practice; but I wish it distinctly understood that I do not limit myself strictly thereto, as it is obvious that I may modify the same in various ways without departing from the spirit thereof. Moreover, while in the above I have described the sleeve or guard as applied in connection with a yielding or elastic step-bearing, which is the construction I prefer in practice, it is obvious that the same may be applied in connection with many of the forms of metal step-bearings and operate with equal efficiency. Such modifications, therefore, I consider within the scope of my invention. 90 95 100 105 110

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, with a bolster, a bolster-holder, and a spindle, of a step-bearing 115 which permits of the lower end of the spindle moving laterally under the influences of an unbalanced load and a yielding and elastic sleeve or guard for acting against the lower portion of the spindle to restrain such 120 movements within certain limits, substantially as described.

2. The combination, with a bolster, a bolster-holder, and a spindle, of a yielding and elastic step-bearing which permits of the 125 lower end of the spindle moving laterally under the influences of an unbalanced load and a yielding and elastic sleeve or guard for acting against the lower end of the spindle to restrain such movements within certain limits, substantially as described. 130

3. The combination, with a bolster having an enlarged annular chamber in its lower end, a bolster-holder, and a spindle, of a yield-

ing and elastic step-bearing and a yielding and elastic sleeve or guard arranged in such chamber to act against the lower end of the spindle to restrain its lateral movement within certain limits and return it to its former position when the disturbing forces are removed, substantially as described.

4. The combination, with a bolster having an enlarged annular chamber at its lower end and connecting grooves, a bolster-holder, and a spindle, of a yielding and an elastic step-bearing and a yielding and elastic sleeve or guard arranged in such chamber and provided with wings which extend outwardly into said grooves, substantially as described.

5. A sleeve or guard for co-operating with a spindle to restrain its lateral movements within certain limits, consisting of a disk-shaped body formed from felt or other soft, yielding, and elastic filamentous material and provided with an orifice extending axially of the same and with an outwardly-extending wing, substantially as described.

In testimony whereof I have hereunto set my hand this 28th day of November, 1890.

JOSEPH WARREN WATTLES.

Witnesses:

ARTHUR S. WATTLES,  
GEO. A. P. CODWISE.