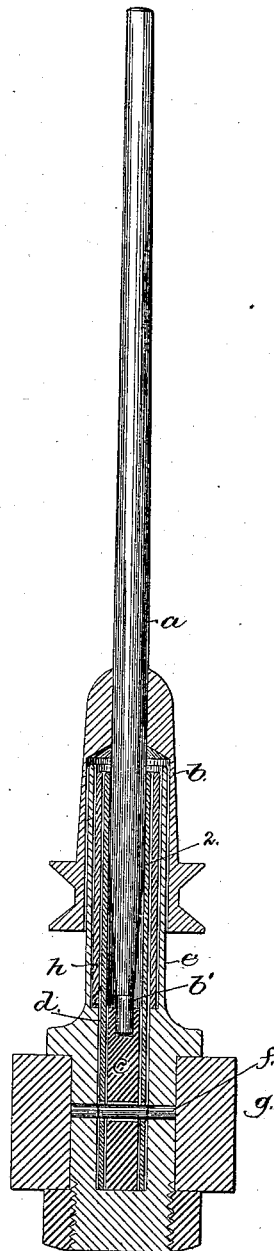


(No Model.)

G. H. ALLEN.
SPINDLE BEARING.

No. 264,054.

Patented Sept. 12, 1882.



Witnesses.
John F. C. Prinkert
Fred A. Powell

Inventor:
George H. Allen
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UNITED STATES PATENT OFFICE.

GEORGE H. ALLEN, OF AYER, MASSACHUSETTS.

SPINDLE-BEARING.

SPECIFICATION forming part of Letters Patent No. 264,054, dated September 12, 1882.

Application filed April 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. ALLEN, of Ayer, county of Middlesex, State of Massachusetts, have invented an Improvement in Spindle-Bearings, of which the following description, in connection with the accompanying drawing, is a specification.

This invention has for its object to provide means whereby a loaded or unbalanced spindle may move at its lower end to find its true center of rotation, thus avoiding the effects due from gyration, and is shown as embodied in a sleeve-whirl spindle, but may obviously be applied to any spindle.

My invention consists essentially in a spindle and supporting-tube combined with a bolster-tube located therein, a step placed loosely in the said bolster-tube, and a pin or holder fitting the said step loosely to prevent it from rotating with the spindle, yet permit the step to move in the bolster-tube as the foot of the spindle travels to find its true center of rotation. If desired, the bolster-tube may also be fitted loosely into the opening or oil-well of the supporting-tube, and be restrained from rotation by a pin entered loosely through it transversely. The bolster-tube at its upper end in this my present invention, where the reduced lower end of the spindle enters a socket in the step, touches and steadies the spindle upward for a short distance from a point about opposite the upper end of the whirl; or it might be from a point opposite the smallest diameter of the whirl, and I am enabled to reduce the diameter of the spindle, or taper it from such point down to its small end, where it enters the step.

To reduce the vibration of the upper end of the spindle in case of an unusually unbalanced load, I have provided a restraining-bushing, which may be used, if desired, the said bushing being inserted between the bolster-tube and supporting-tube.

The drawing represents in partial vertical section a sufficient portion of a sleeve-whirl spindle, supporting-tube, bolster-tube, step, metal bushing, step-rail, and bobbin to illustrate my invention.

The spindle *a*, provided with a sleeve-whirl *b*, has its lower end, *b'*, reduced in diameter and entered into a hole or socket at the upper end of the step *c*, placed loosely into the bol-

ster-tube *d*. In practice this bolster-tube will preferably be placed loosely into the central opening of the supporting-tube *e*; but, if desired, the said bolster-tube may fit the inner walls of the chamber of the supporting-tube *e*, where the said chamber is of smallest diameter. The pintle of the spindle from about the point 2 near the top of the whirl, or, it may be, from a point opposite the smallest diameter of the whirl, is reduced in diameter or tapered down to its smallest portion *b*, which enters the step *c*, thus affording a very small bearing-surface at the lower end of the pintle. The bolster-tube from the point 2 upward affords a lateral bearing for the spindle. The step and the bolster-tube have transverse holes made through them, which receive loosely a pin, *f*. This pin *f*, besides preventing the bolster-tube and step from rotating with the spindle, and also from being lifted when the spindle is lifted, also permits the bolster-tube and step to slide and move laterally with relation to the said pin.

To obviate undue deflection of the bolster-tube by reason of strain on the spindle, I have placed between the bolster-tube and supporting-tube a restraining-bushing, *h*, of metal, in practice nearly touching both the said tubes, the one externally and the other internally.

By leaving the bolster-tube loose to move in the supporting-tube with the spindle as the latter is moved to find its true center of rotation, and also leaving the step loose to slide or move in like manner on or in and with the bolster-tube, I am enabled, as it were, to compound the movements of the parts and gain excellent results as to the steadiness with which the spindle may be rotated.

By dividing or distributing the movement of the various parts as described, I am enabled to obtain an easy delicate movement not heretofore attainable.

I do not herein claim broadly a loose bolster-tube held loosely by a pin, as that is shown and claimed in application No. 53,789, made by me and filed April 19, 1882.

Instead of extending pin *f* through the shank of the supporting-tube, the said pin may be made of a length (see dotted lines on the said pin) corresponding with the diameter of the axial hole in the supporting-tube, and, being

placed in the holes made in the bolster-tube and step, may be crowded down into place in the supporting-tube with the bolster-tube and step, the friction of the ends of the said pin 5 in the inner walls of the supporting-tube preventing rotation of the bolster-tube and step.

I claim—

1. The spindle, supporting-tube, bolster-tube, and the step fitted loosely into the bolster-tube, 10 and adapted to receive within it the end of the spindle, combined with the pin *f*, to also hold the step loosely, as and for the purposes set forth.

2. The spindle, the supporting-tube, the bolster-tube placed loosely therein, and the step 15 placed loosely in the bolster-tube, combined with the pin *f*, adapted to hold the said bolster-tube and step loosely and permit the said

tube and step to move both independently and together, as and for the purpose set forth. 20

3. The supporting-tube, the bolster-tube and step, means to prevent them from rotating with the spindle, and the spindle, combined with the restraining metallic bushing inserted between the bolster-tube and supporting-tube, 25 all substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE H. ALLEN.

Witnesses:

GEO. W. GREGORY,

B. J. NOYES.