(No Model.)

J. KILBURN.

SPINDLE BEARING.

No. 590,319. Patented Sept. 21, 1897.

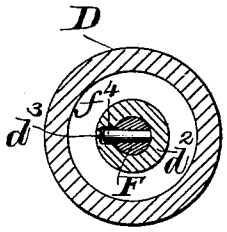

FIG. 3.

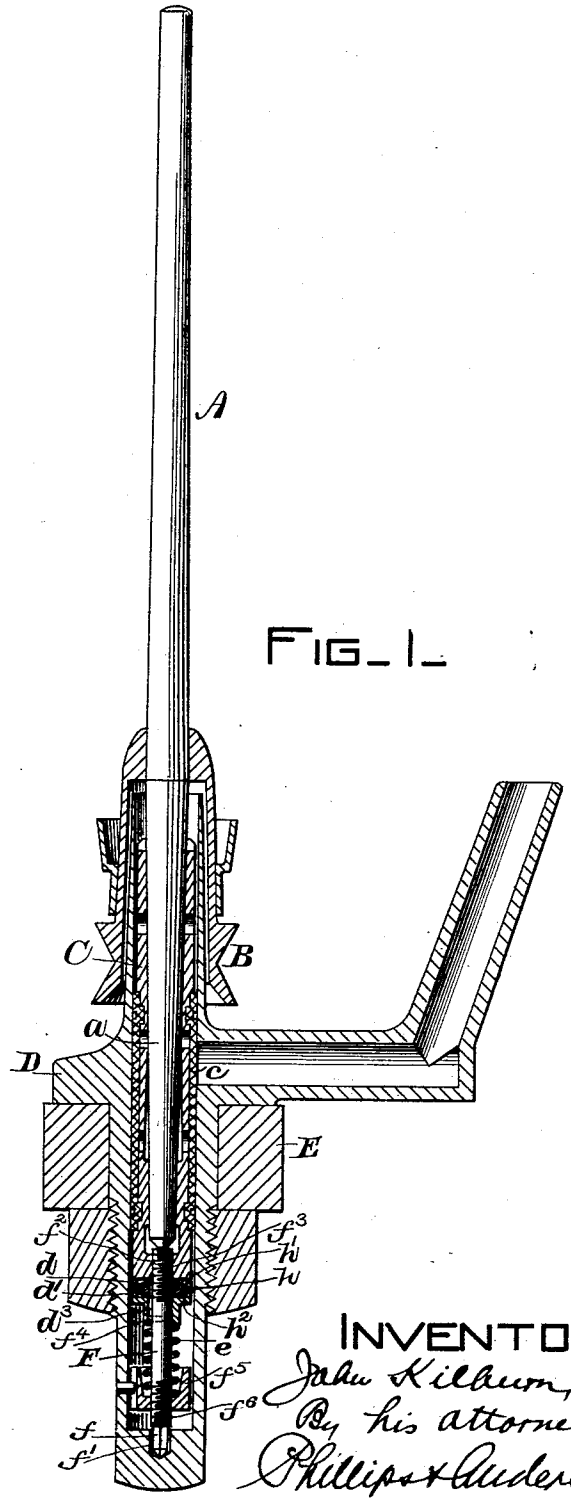

FIG. 1.

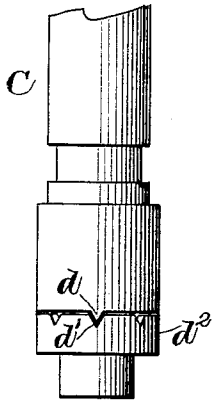

FIG. 2.

WITNESSES

C. E. Wright.

John J. Collins.

INVENTOR

John Kilburn,

By his attorneys,

Phillips & Anderson

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN KILBURN, OF BELMONT, MASSACHUSETTS.

SPINDLE-BEARING.

SPECIFICATION forming part of Letters Patent No. 590,319, dated September 21, 1897.

Application filed December 2, 1896. Serial No. 614,255. (No model.)

To all whom it may concern:

Be it known that I, JOHN KILBURN, a citizen of the United States, residing at Belmont, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Spindle-Bearings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Spindles of the "self-centering" or "top" type are commonly provided with a tapered pintle, and the bolster or tubular support within which the pintle rotates is commonly correspondingly interiorly tapered, and a rest or step is provided near the base of the bolster upon which the lower end of the pintle rests.

It has been found in practice that as the lower end of the pintle wears away or wears into the step the spindle will drop in the bolster and its pintle will bind upon the inclined inner walls of the bolster and rotate with increased friction.

In an application for Letters Patent of the United States filed herewith, Serial No. 614,251, I show and describe a device whereby when the effort to rotate the bolster caused by the friction developed by the rotation of the spindle therein is sufficient to raise the weight of the bolster and other supported parts by means of certain inclined teeth, as described in said application, the relative longitudinal position of the step and bolster is adjusted to raise the pintle of the spindle in the bolster and to decrease the friction developed by the rotation of the spindle in the bolster.

In another application also filed herewith, Serial No. 614,252, I have shown an improvement upon the devices above designated whereby before a rotation or partial rotation of the bolster can be accomplished by the friction developed by the rotation of the spindle to secure the adjustment above suggested the effort exerted must be sufficient to overcome the tension of a suitably-placed spring in addition to the weight of supported parts.

In my present invention I have provided means whereby the friction developed between the bolster and spindle acts to adjust the relative longitudinal position of the bolster and step to raise the spindle in the bolster and decrease said friction, and in addition thereto, and as an improvement thereon, I have provided means whereby the amount of friction required to secure the movement of parts to effect such adjustment may be regulated or adjusted as desired.

A preferred form of the present invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section through a spindle-support embodying the present invention, showing portion of the spindle and other parts in elevation. Fig. 2 is an elevation of the lower end of the bolster and the clutch collar or sleeve. Fig. 3 is a horizontal section showing details of construction.

Similar letters of reference refer to similar parts in the several views.

In the drawings, A represents a spindle having the usual tapered pintle *a* and sleeve-whirl B.

C represents the bolster, which is provided with the usual wicking or other elastic packing *c*.

D represents the bolster-case, and E the spindle-rail.

All of the parts above designated, except as hereinafter specified, may be of any usual or convenient construction, and a variation either in their form or arrangement would constitute no departure from any essential feature of the present invention.

As shown in the drawings, the pintle *a* rests upon the upper end of a pintle F, which carries the step. The lower end *f* of pintle F is conveniently polygonal in section or of any convenient shape other than round and engages a correspondingly-shaped aperture in the base of the bolster-case D, or the pintle F may be otherwise held from rotation by a suitable and convenient means.

The upper portion f^2 of the pintle F is threaded and engages correspondingly-threaded bearings f^3 in the base of the bolster C. For the purpose hereinafter stated the threaded connection of the bolster C with the pintle F is made loose to allow a slight play of the bolster upon the pintle.

Upon the base of the bolster C is formed

the upper member d of what I have herein termed a "regulating" or "clutch" mechanism. As shown in the drawings, the upper clutch member d consists of one or more V-shaped downwardly-projecting teeth formed upon the base of the bolster C. It may, however, consist of any suitable means for securing the results hereinafter stated. The lower clutch member d' consists of a series of notches corresponding in shape to the teeth upon the upper clutch member d and formed upon a collar or sleeve d^2, surrounding the pintle F. The lower clutch member may, however, consist of any suitable device which will coöperate with the upper clutch member for the purpose hereinafter specified.

The sleeve or collar d^2 is free to reciprocate along the pintle F, but is held from rotation thereon, preferably by a pin f^4, which is projected from the pintle F and engages a vertical slot d^3 in the collar or sleeve d^2.

The collar or sleeve d^2 is supported upon the pintle F by a suitably-placed spring, conveniently by the coiled spring e, which surrounds the pintle F, bearing at one end against the sleeve d^2 and at the other end against the threaded washer or nut f^5 on said pintle F. The nut or washer f^5 is interiorly threaded and engages the threaded portion f^6 of the pintle F, so that by a rotation of the pintle F or of the nut f^5 thereon the nut f^5 may be moved longitudinally along the pintle F to increase or diminish the tension of spring e, as hereinafter described.

To provide for a limited gyrating or wabbling movement of the bolster to allow the spindle to find its true center of rotation under an unbalanced load, I prefer to provide a rocker-washer h, which may conveniently be of the form described in my said other applications and which is interposed between the sleeve d^2 and base of the bolster C, which may conveniently be provided with the recesses h' and h^2 to receive said washer. The washer is of such thickness that while it permits the notches upon clutch member d' to engage the teeth upon the upper clutch member d it so far separates said members that said teeth do not firmly bottom in said notches, and since the threaded portion f^3 of the bolster C is loosely engaged by the threaded portion f^2 of the pintle F the bolster C is left free to gyrate to allow the spindle to center itself under an unbalanced load. Any suitable arrangement of the bolster to secure the result above suggested may, however, be substituted for the devices of the drawings, as the same is not an essential feature of the present invention.

The operation of my invention in the form shown in the drawings is described as follows: The compression of the spring e is first adjusted to give the desired amount of resistance to the rotation of the bolster, for the purposes hereinafter described, by means of the nut or washer f^5, and the bolster C and pintle F and its attached devices are then dropped into the bolster-case D, the lower portion of the pintle F engaging recess f' in the case D. When the spindle-pintle has worn away or worn into the step and the spindle rotates with increased friction, as soon as the effort to rotate the bolster C produced by said friction is capable of further compressing the spring e by means of the inclined teeth in the clutch members the clutch member d will turn over the clutch member d' and will allow the bolster C to rotate and by means of its threaded connections with the pintle F to travel down upon said pintle and to fall on the spindle until the friction developed by its rotation is insufficient to produce a further rotation of the bolster C, at which time the spring e will engage the clutch members d and d' to hold the bolster in its adjusted position. It will be noted in this connection that in the present construction the operation of the clutch members d and d' is not effected by the weight of bolster C or supported parts, but depends entirely upon the amount of the force exerted by the spring e, so that by adjusting the tension of the spring e, as before described, the amount of friction developed by the rotation of the spindle before a rotation or partial rotation of the bolster will occur to decrease such friction may be regulated as desired, a feature which I consider of the very greatest importance in the art.

When the clutch members are provided with V-shaped teeth, as shown, the bolster may have either a left or right hand rotation, so that the device may be adjusted to receive a new spindle without removal from the case.

Having thus described my invention and its mode of operation, I desire to say that I do not consider the same as limited to the details of mechanism herein shown and described; but

I claim as novel and desire to secure by Letters Patent of the United States—

1. The combination, with a spindle, its bolster and step, of means actuated by an increase of friction developed between the spindle and its bolster, acting to adjust the relative longitudinal position of the bolster and step, and means for regulating the amount of friction required to effect such adjustment, substantially as described.

2. The combination, with a spindle, its bolster and step, of means actuated by an increase of friction developed between the spindle and its bolster, acting to adjust the relative longitudinal position of the bolster and step, mechanism for retaining the bolster and step in their adjusted position, and means for regulating the amount of friction required to effect such adjustment, substantially as described.

3. The combination with a spindle, its bolster and step, of a pintle upon which the step is formed and a spring-supported sleeve, upon said pintle, engaging the bolster to control its rotation, substantially as described.

4. The combination with a spindle, its bolster and step, a loose threaded connection between the bolster and step, spring-controlled means for controlling the rotation of the bolster, arranged to retain it after such rotation, in its adjusted position, substantially as described.

5. The combination with a spindle, its bolster and step, means for adjusting the relative longitudinal position of the bolster and step, a spring arranged to control said adjustment and means for retaining the bolster and step in their adjusted position, substantially as described.

6. The combination with a spindle, its bolster and step, mechanism for adjusting the relative longitudinal position of the bolster and step, a spring controlling said mechanism, and means for adjusting the tension of said spring, substantially as described.

7. The combination with a spindle, its bolster and step, a pintle upon which is formed the step, means to restrain said pintle from rotation, a spring-controlled clutch member movable along the pintle and engaging the bolster, and a threaded connection between the bolster and step, substantially as described.

8. The combination with a spindle, its bolster, and means for controlling the rotation of the bolster, of a pintle upon which is formed the step, and which supports the bolster and the means for controlling the rotation of the bolster, substantially as described.

9. The combination with a bolster, of a clutch member carried thereby having an inclined projection, a spring-controlled clutch member provided with notches arranged to be engaged by said projection, substantially as described.

10. The combination with the bolster, of inclined elastically-supported bearings therefor, and means for supporting the bolster independent of said bearings, substantially as described.

11. The combination with a bolster, of a sliding clutch member controlling the rotation of the bolster, and a spring supporting said clutch member, substantially as described.

12. The combination with a bolster, of a sliding clutch member controlling the rotation of the bolster, and a spring supporting said clutch member, and means for adjusting said spring, substantially as described.

13. The combination with a bolster, and its case, of a threaded bearing in the base of the bolster, a threaded step-pintle loosely engaging said bearing, a recess in the bottom of the bolster-case engaged by the lower portion of said pintle, and acting to restrain it from rotation, substantially as described.

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

JOHN KILBURN.

Witnesses:
A. E. WHYTE,
A. O. ORNE.