No. 616,020. Patented Dec. 13, 1898.

E. H. RYON.

SPINDLE AND SUPPORT.

(Application filed Feb. 20, 1897.)

(No Model.)

Fig. 1

Fig. 2.

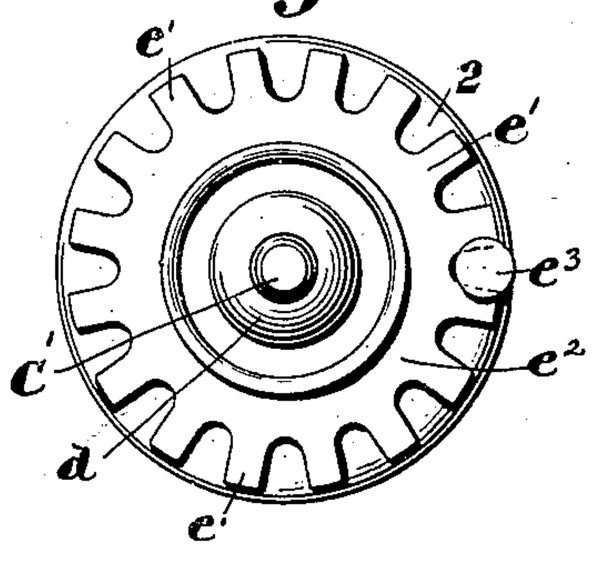
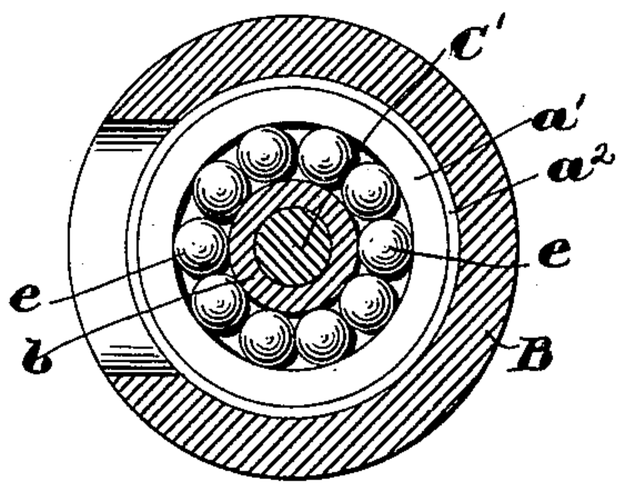


Fig. 3.



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UNITED STATES PATENT OFFICE.

EPPA H. RYON, OF WALTHAM, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO A. M. GOODALE, OF SAME PLACE.

SPINDLE AND SUPPORT.

SPECIFICATION forming part of Letters Patent No. 616,020, dated December 13, 1898.

Application filed February 20, 1897. Serial No. 624,392. (No model.)

To all whom it may concern:

Be it known that I, EPPA H. RYON, of Waltham, county of Middlesex, State of Massachusetts, have invented an Improvement in Spindles and Supports, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

In this invention I employ a spindle provided above and below the whirl with inclined surfaces which run against a series of balls or rolling surfaces surrounding the spindle, such construction enabling me to dispense with the use of a bolster for the reception of the pintle of the spindle, my improved spindle not requiring any oiling.

Figure 1 in partial vertical section shows a spindle and its support embodying my invention; Fig. 2, a top or plan view of the spindle shown in Fig. 1; Fig. 3, a section below the dotted line *x*, Fig. 1.

The spindle-rail A receives upon it a supporting-case B, it being confined in place by a suitable nut B′. This supporting-case is shown as entirely open at its lower end and as cut out at one side for the passage of the usual driving-band about the whirl C of the spindle C′.

The pintle *a* of the spindle is extended loosely through a hole in a cup *a*′, surrounded by a packing a^2, and then through the open shank of the supporting-case, as shown, and above the said cup the spindle has fixed to it a tapered surface *b*, then a whirl C, and a second tapered surface *b*′, and a threaded sleeve b^2, the said sleeve having screwed upon it the conical seat *d*, which enters or contacts with the lower end of the usual bobbin, (not shown,) which will be carried by the blade of the spindle.

The inclined surface *b* rests on a series of balls or rolling surfaces *e* in the cup, while the tapering surface *b*′ supports a series of balls or rolling surfaces *e*′, acted upon by a flange of a ring e^2, screwed into the upper end of the supporting-case, said ring having a series of notches 2, one of which is entered by a locking-pin e^3. These tapering surfaces, made as collars, are suitably connected with the spindle, so as to project outwardly therefrom above and below the band-groove of the whirl. They may be shrunk onto the spindle or be secured in place in any suitable manner.

The cup may have a slight lateral play or slip due to the packing to so prevent any jarring in running.

It will be noticed that the set of balls *e*′, supported by the tapering surfaces *b*′, occupying a position wholly above the upper edge of the band-groove of the whirl, have a constant tendency to sink or roll down the said tapered surface against the inner wall of the flanged ring, and consequently the said wall always presents a rolling surface between the said tapering surface fixed to the spindle and the outer surrounding stationary ring, and so, also, the set of balls *e*, sustaining the weight of the spindle, are acted upon by the tapering surface *b*, connected with the spindle at a point entirely below the lower edge of the band-groove of the whirl, and said tapering surface, notwithstanding any wear between it and the balls, will always by gravity keep firm contact with the balls and will force them outwardly against the flange of the cup *a*′.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A supporting-case, a cup therein, a packing interposed between said cup and said case, a series of balls *e* located in said cup, combined with a spindle having a whirl, and an inclined surface located thereon and projected therefrom below the under side edges of the band-groove of said whirl, and extended from said whirl downwardly toward the surface of the spindle and running on said balls, substantially as described.

2. A supporting-case, and a spindle carrying a whirl and provided with two inclined surfaces, the larger diameter of one of said inclined surfaces extending from the lower edge of the band-groove of the whirl downwardly and inwardly toward the spindle, the other of said inclined surfaces extending upwardly and inwardly from the upper edge of the band-groove of said whirl toward the spindle; combined with a flanged cup supporting said spindle and located within the lower portion of said supporting-case, and a

flanged ring adjustably mounted in the upper end of said supporting-case, and two sets of rolls, one set occupying a position between one of said tapering surfaces and said flanged cup, while the other set occupies a position between the other of said tapering surfaces and the said flanged ring, substantially as described.

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

EPPA H. RYON.

Witnesses:
GEO. W. GREGORY,
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