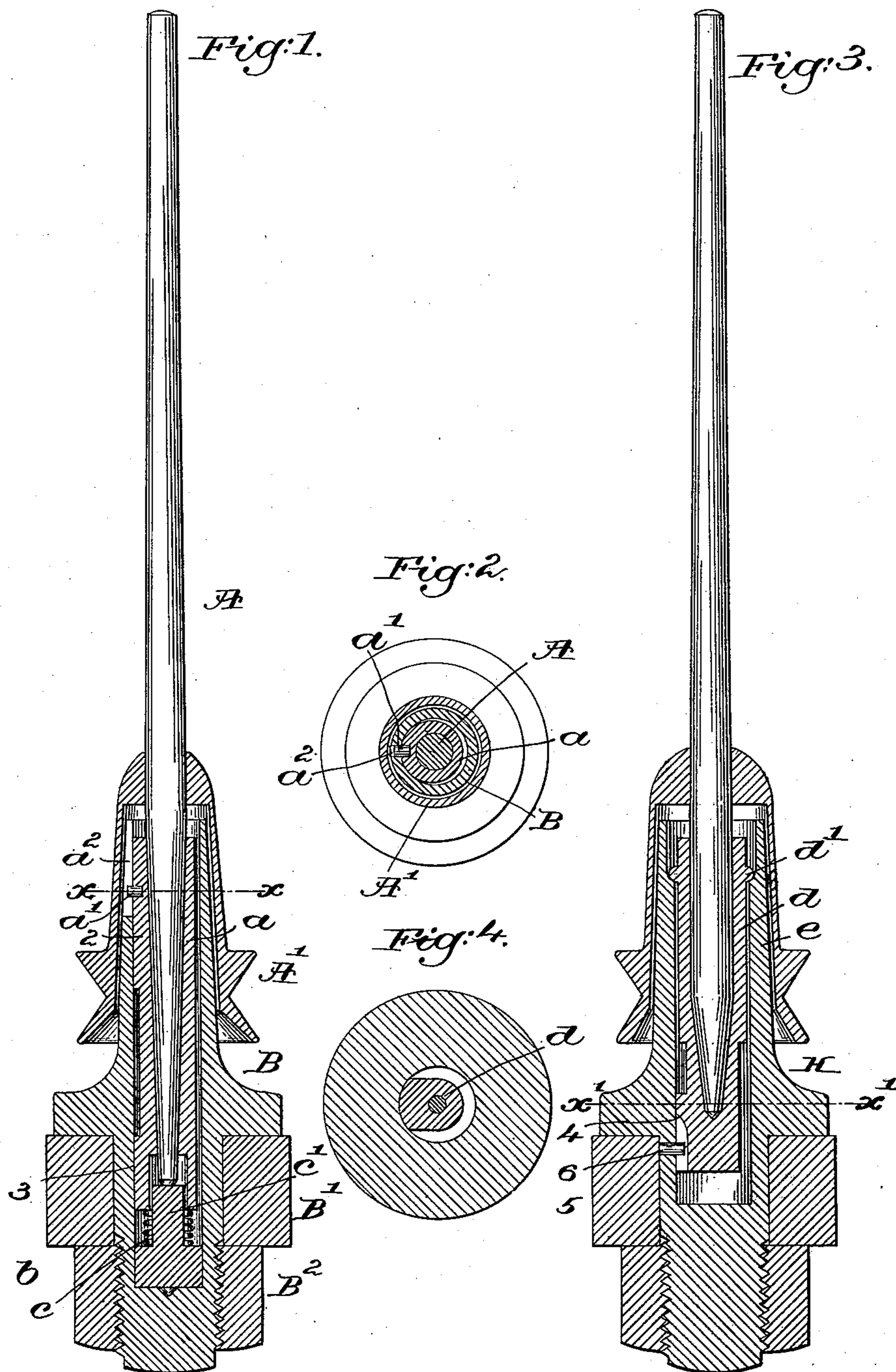


(No Model.)

G. O. DRAPER.  
SPINDLE BEARING.

No. 507,355.

Patented Oct. 24, 1893.



Witnesses  
Fred S. Grunhof  
Louis W. Lowell

Inventor:  
George O. Draper  
by Crosby & Gregory  
attys.

# UNITED STATES PATENT OFFICE.

GEORGE O. DRAPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO GEORGE DRAPER & SONS, OF SAME PLACE.

## SPINDLE-BEARING.

SPECIFICATION forming part of Letters Patent No. 507,355, dated October 24, 1893.

Application filed May 12, 1893. Serial No. 473,974. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE O. DRAPER, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Spindle-Bearings, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 The bearings of high speed spindles are commonly so applied within their outside supports as to provide for sufficient looseness to obviate the jars and shocks due to gyration and unequal loading, yet while looseness is  
15 very desirable its extent is limited by reason of the fact that the pull of the band is always in a fixed direction, and consequently the band strain pulls the center of the spindle out of center with relation to the usual spinning ring for a distance equal to the looseness provided for.

My invention has for its object an improved construction of bolster or lateral bearing for a spindle whereby the spindle may be kept  
25 central with relation to the usual surrounding ring, and also whereby the lateral bearing may have any desired extent of looseness while preserving its central position with relation to the ring.

30 In my invention the bolster is so constructed that the strain of the band on the whirl will normally keep the spindle vertical and properly centered with relation to the usual spinning ring, and yet allow for greater looseness  
35 when desired by abnormal circumstances, greater looseness than possible with usual bolsters.

My improved bolster or lateral bearing has its spindle receiving opening eccentric to its  
40 outside so that a given cross-section of the bolster or lateral bearing will present one side wall thicker than the other. A bolster or lateral bearing having such construction may move against the band pull in every direction yet not be pulled out of the center by the  
45 band pull.

In order that the bolster or bearing may move with the spindle when it assumes varying positions, it is necessary that the fit of  
50 the spindle in the bolster be close, but not so close as to bind the spindle and thereby

consume power. I have tapered the bolster or lateral bearing internally and supported it upon a light spiral spring which will hold it to its fit upon the spindle, take up wear, 55 and otherwise work to advantage.

My invention may be practiced either in a construction wherein the step is a separate detached piece or in one piece with the bolster or lateral bearing, so my invention is not  
60 limited to the special shape shown for the bolster or lateral bearing, so long as it presents somewhere at one side between its upper and lower ends a lump or projection eccentric to the center of rotation of the spindle and  
65 leaves the bolster or lateral bearing proper or necessary lateral movement in other directions than in the line of the band pull.

Figure 1 in vertical section shows a spindle and bolster or lateral bearing therefor embodying one form of my invention. Fig. 2  
70 is a section below the line  $x$  Fig. 1. Fig. 3 shows a modified form of my invention, and Fig. 4 is a section thereof in the line  $x'$ , of Fig. 3.

75 The spindle A having a sleeve whirl A', and the supporting case B mounted and kept in place on the rail B' by the nut B<sup>2</sup>, are and may be all as usual.

In accordance with my invention as here-  
80 inbefore outlined, the bolster or lateral bearing  $a$  has its spindle receiving opening eccentric to its outer periphery or the walls at opposite sides the longitudinal center line of the spindle receiving opening are of different  
85 thickness, said thickened, or it may be eccentric part of the said bolster or lateral bearing extending for more or less of its length, said thickened part or side being adapted to be kept interposed between the spindle and the  
90 interior of the supporting-case or outside support in the line of the band pull, such increase in thickness of a part of the bolster or lateral bearing making a surface to resist the strain of the band pull and enable the  
95 spindle to be maintained more nearly central with relation to the spinning ring.

In Figs. 1 and 2, the increase in thickness in the bolster or lateral bearing  $a$  is shown at 2, 3, and to prevent rotation of the bolster or  
100 lateral bearing I have provided a pin  $a'$  in a slot  $a^2$ , the pin being preferably carried by

the bolster or lateral bearing. The bolster or lateral bearing in Figs. 1 and 2 is circular externally at its points of greatest diameter; and the spindle receiving bore is eccentric to said bolster exterior, and it could therefore rotate with the spindle if not restrained and thus do more harm than good.

In Fig. 1 the pintle of the spindle is tapered externally, and the bore in the bolster or lateral bearing is correspondingly tapered internally, and to keep the bolster or lateral bearing up to insure a proper running fit between it and the pintle, I have, employed a coiled spring *b*, it acting against the lower end of the bolster or lateral bearing, the lower end of the spring resting in the shown embodiment of my invention on a flange *c* of a step block from which rises a step *c'* on which turns the end or foot of the pintle of the spindle.

Preferably the step block will be held firmly in the bottom of the chamber of the supporting case, but the relative diameter of the step part and the inner bore of the bolster or lateral bearing will preferably be such as to let the bolster or lateral bearing move laterally without restraint from the step.

While supporting the bolster on a spring presents some material advantages, yet my invention would not be departed from by supporting it in other ways, as, for instance, by suspending the bolster as represented in the modification Figs. 3 and 4, wherein the bolster *d* has an annular projection *d'*, preferably semi-spherical in cross section which rests on a concaved seat or shoulder formed in the bolster-case *e*, and in said modification the step is shown as connected to or forming a part of the bolster or lateral bearing, and they may be in a single casting, the lower end of the casting having a thicker or eccentric part 4 to contact with the interior of the supporting case *H*, said portion 4 being located between the spindle and the supporting-case in the line of strain of the band.

I have shown the lateral bearing as having a slot 5 to receive a pin 6, by which to restrain its rotation with the spindle.

Prior to my invention I am not aware that a bolster or lateral bearing having its pintle receiving bore located eccentrically with relation to some portion of its exterior has ever been mounted loosely in a surrounding supporting case and restrained therein from rotation with the spindle, the bolster being free to move in other directions than that of the band pull, and hence this invention is not limited to the exact construction shown for the bolster, nor to the exact shape shown for the supporting case or lateral bearing, so long as the bearing is loose as described in the supporting case.

Having described my invention, what I

claim, and desire to secure by Letters Patent, is—

1. The bolster-case, the spindle having a tapering pintle, the bolster having a tapered bore to fit the taper of said pintle, means to restrain the rotation of the bolster, and a step disconnected from the bolster, combined with a spring to act against the bolster and keep it pressed upwardly to insure proper running fit between the bolster and pintle, substantially as described.

2. The bolster case, the spindle having a tapering pintle, and a bolster having a tapered bore to fit the said pintle, combined with a spring to act against the bolster and keep it pressed upwardly to insure proper running fit between the bolster and pintle, and with a step at the lower end of the bolster, the step leaving the bolster free to move laterally without restraint from it, substantially as described.

3. A spindle having a whirl to receive a band by which to rotate it, a bearing for the spindle, said bearing having its wall at one side made thicker than its other side, and a support in which the bearing is allowed lateral movement, combined with a device to restrain the rotation of the bearing in the said support, the thicker side of the bearing acting to prevent the lateral movement thereof in the direction of the band tension, substantially as described.

4. A spindle, a bearing therefor having its pintle receiving bore located eccentrically, and a lateral support for the bearing, said bearing having greater lateral movement within the support in one than in the other direction, substantially as described.

5. An outside support, and a contained bearing having an exterior made eccentric with relation to the bore therein and adapted to yield laterally in all directions except that of the greatest eccentricity, substantially as described.

6. A spindle having a tapering bearing portion, a lateral bearing tapered internally to fit the taper of the spindle, a supporting case to receive the lateral bearing, a suitable step, means to restrain the rotation of the bearing in the supporting case, combined with a spring acting upon the bearing to move the same vertically and keep it always pressed upwardly with the proper fit against the tapering spindle, substantially as described.

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

GEORGE O. DRAPER.

Witnesses:

GEO. W. GREGORY,  
LAURA MANIX.