(No Model.)

G. O. DRAPER.

COMBINED BEARING FOR SPINDLES.

No. 518,447. Patented Apr. 17, 1894.

Fig. 1.

Fig. 2.

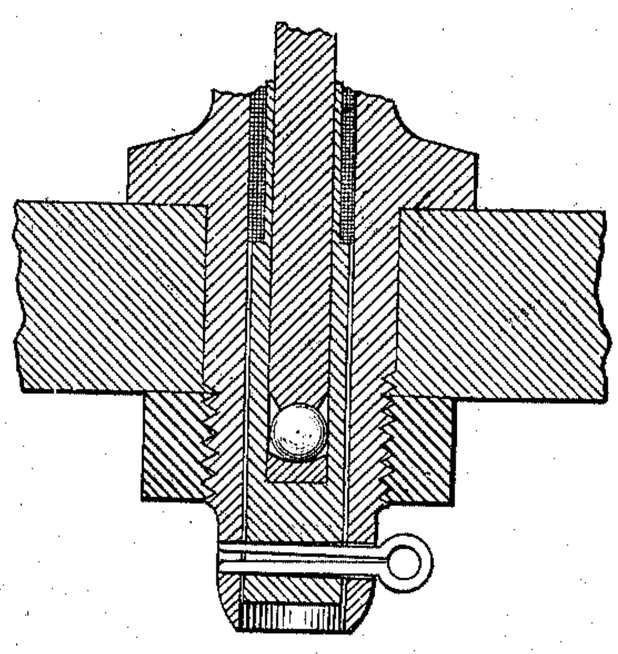
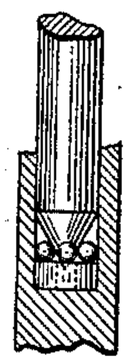


Fig. 3.



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

COMBINED BEARING FOR SPINDLES.

SPECIFICATION forming part of Letters Patent No. 518,447, dated April 17, 1894.

Application filed January 31, 1893. Serial No. 460,208. (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 Combined Bearings for Spindles, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

High speed spindles in spinning and twisting frames are commonly run in bolster or lateral bearings and on steps in the presence of oil, the oil being necessary as it obviates the heating of the bearing and spindle. The bearings in this class of spindles have frequently to be oiled, and in practice the oil escapes from the bolster or lateral bearing, and ultimately, in various ways, gets onto the yarn, to its great detriment. So also the escaping oil gets on the whirl and thence on the band driving the whirls so that they fail to work properly; and further, the mill floor and the step rail become saturated with oil, adding to the dangers of fire, and greatly to the detriment of cleanliness.

Manufacturers have long sought to avoid the use of oil in this class of machinery, and numerous attempts have been made in that direction, but none, to my knowledge, have proven successful or practical. In these efforts it has been proposed to employ for the bolster and its step a material softer than the spindle, a material which need not be lubricated with oil, but in practice the soft material embodied in the step soon wears through, thus destroying the step, and the friction and weight of the spindle on the step,—the foot of the spindle moving laterally—, besides wearing a hole, result in requiring more power to rotate the spindle. In my experiments to produce a spindle bearing and step which can be run practically without oil, I have combined a non-metallic lateral bearing tube and the pintle of the vertical spindle, and a metallic step presenting a spherical surface, and by which the weight of the spindle is sustained, said step being located within the bolster or lateral bearing, the latter affording lateral support for the pintle of the vertical spindle close to the step.

Metallic bolsters or lateral bearings containing oil have frequently to be cleansed and repaired, and to effect this it is commonly the practice to remove the spindle from its bearings, and to thereafter remove the bolster or lateral bearing from the supporting-case surrounding it; and to do this especial tools are usually required, and much time is wasted in such manipulation.

I have so constructed and supported the bolster or lateral bearing that it may be readily and quickly removed without disturbing the spindle and without removing any nuts or screw threaded part. To effect this, the supporting-case is left open at its lower end for the withdrawal of the bolster or lateral bearing and step, but this would not really be practicable with a metallic bolster or bearing requiring oil between it and the side of the pintle of the spindle, for in practice, the oil in which the pintle rotates would rise between the said pintle and bolster and run over the top of the latter and escape through the opening at the bottom of the supporting-case. In my invention, however, wherein the bolster is non-metallic and does not need oil, it becomes, for the first time, practicable to withdraw the bolster and step together from the lower end of the supporting-case, and no provision is therefore necessary to be made to guard against escape of oil, for oil not being used there is none to escape. The non-metallic material of the bolster or lateral bearing, cannot, however, be made of sufficient strength and toughness to withstand the wear of the lower end or foot of the spindle so I interpose a spherical surface in the shape of a steel ball or balls to receive the wear of the end of the spindle, and to sustain its weight, and the ball or balls used will preferably lie on a hard surface to further avoid friction. The oil which usually surrounds a spindle in its metallic lateral bearing acts as a cushion to lessen or prevent jar, and inasmuch as my bearing does not contain oil I preferably provide an external fibrous elastic packing which is interposed between the bearing and the interior of the bolster case to form a cushion.

Figure 1 in elevation and section shows a spindle-bearing and spindle embodying my invention. Figs. 2 and 3 are modifications.

The spindle *a* with its attached sleeve whirl *a'*, and the pintle a^2 are all as usual. The rail A receives the hollow shank of the bolster case B shown as threaded externally to receive the nut B' which keeps the said case seated on the said rail. The bolster case receives within it the non-metallic, preferably wooden, lateral bearing C having a closed bottom, said bearing receiving within it the lower end of the spindle. Between the bearing and the interior of the bolster case I have provided a fibrous or elastic packing *d* which takes up the jars, &c., and acts as a cushion or lateral support for the said bearing. The bearing C is shown as sustained on a pin-like support *e*, represented as a "cotter-pin" extended through the case and the bearing, the cotter-pin owing to its forked body maintaining itself in the position in which it is left, and serves, as shown, as a locking device to lock the bearing and bolster together. The wooden non-metallic bearing is not sufficiently tough to sustain the weight of the spindle and the thrust of its lower end, so to provide for this I supply the bearing C at its lower end with a suitable spherical bearing, as *f*, and to reduce the friction between the spherical bearing and the bottom of the chamber of bearing C to the minimum I prefer to employ a hard steel or glass disk or foundation *g*. In Fig. 2 I have shown the foundation as concaved at its top side, and the foot of the spindle as concaved to fit the spherical surface.

This invention is not limited to the particular shape shown for the non-metallic or wooden bearing, nor to the particular number of spherical surfaces or balls, and instead I may employ balls in any usual form or arrangement.

In the modification Fig. 3 I have shown several spherical surfaces, and the foundation has a hole in line with the end of the spindle. Nor is this invention limited to the exact shape of the foundation plate on which the spherical surface or surfaces rest.

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

1. A whirl spindle; a supporting-case open at its bottom, a bolster or lateral bearing therein adapted to sustain the spindle at the line of the band pull; and a metallic step located within said bolster or lateral bearing; combined with a locking device to lock said bearing and bolster together, substantially as described.

2. A spindle; a supporting-case; a bolster or lateral bearing therein for said spindle; and a cushion interposed between the said bolster or lateral bearing and the interior of said supporting-case; combined with a locking device adapted to both lock the bearing and case together and to support the weight of said bearing, and the spindle within it, substantially as described.

3. The combination of a supporting case open at its bottom, a non-metallic bolster or lateral spindle bearing tube inserted in and removable from said case from its open bottom, means to connect said case and bearing, a spindle and a loose ball bearing for said spindle within said bearing tube, substantially as described.

4. The combination of a supporting case open at its bottom, a non-metallic bolster or lateral spindle bearing tube inserted in and removable from said case from its open bottom, means to connect said case and bearing, a foundation plate of hard substance in the bottom of said bearing, a ball bearing placed upon said foundation plate and a spindle supported upon such ball bearing, substantially as described.

5. The bolster-case and spindle, and a non-metallic bearing closed at its lower end, and a support to sustain the weight of said bearing, and a spherical bearing to sustain the spindle, combined with an elastic or yielding packing interposed between the lateral bearing and the interior of the bolster-case, substantially as described.

6. A supporting case open at its bottom, a non-metallic bolster or lateral bearing inserted therein from its lower end, a spindle to enter said bolster and means to connect the said bolster or lateral bearing and said supporting case, combined with a ball bearing composed of an appropriate number of balls contained within said bolster or lateral bearing and directly supporting the weight of said 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:

FREDERICK L. EMERY,

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