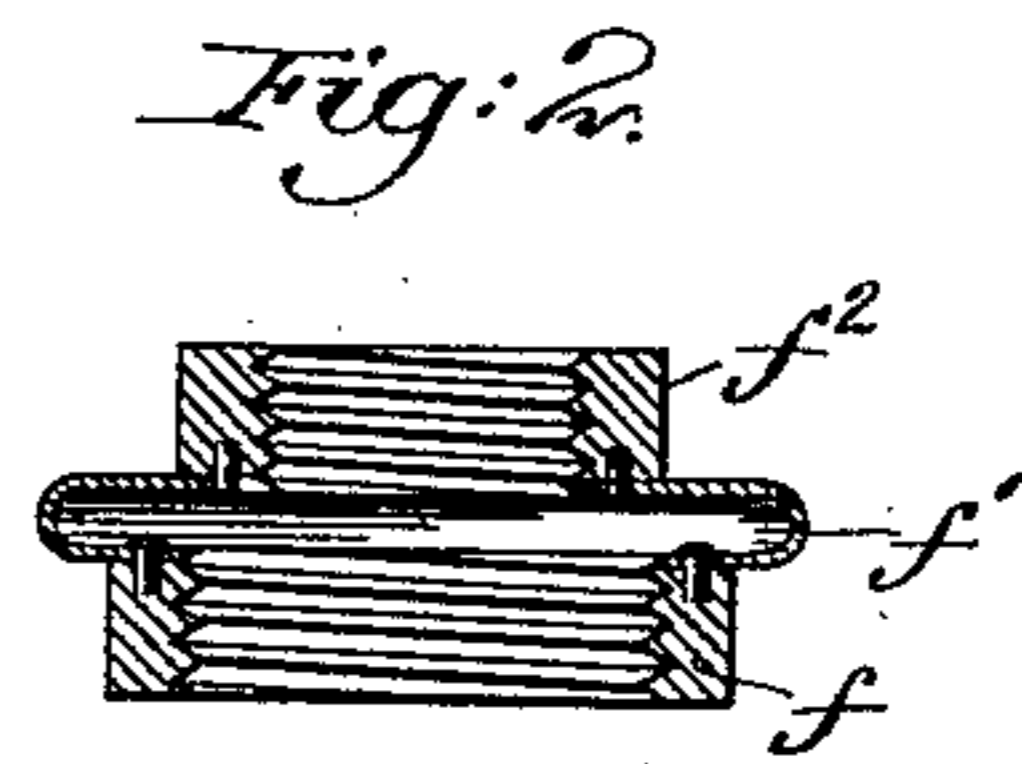
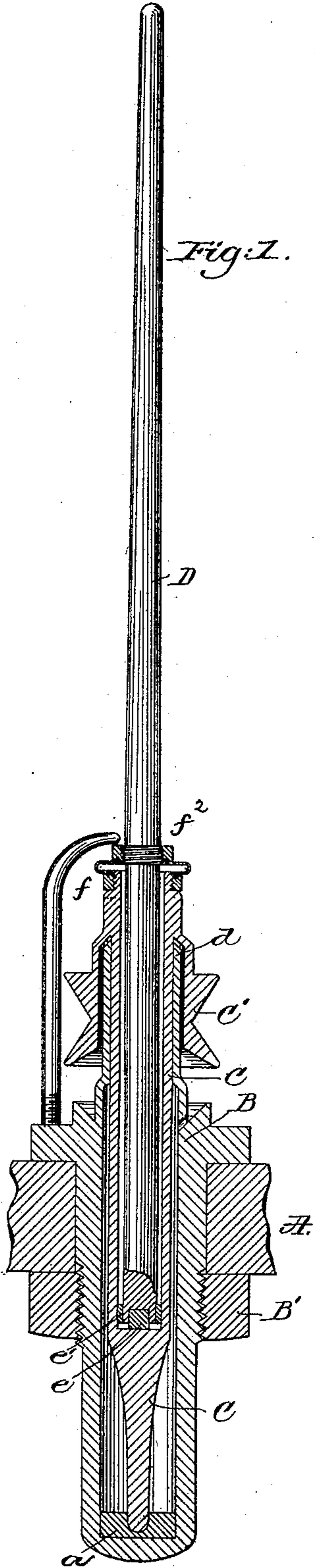
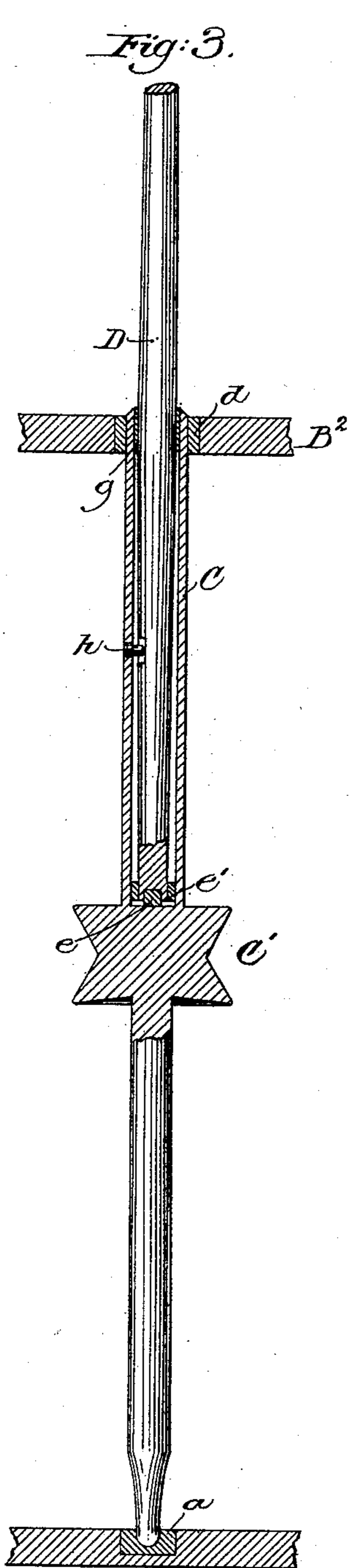


(No Model.)

J. LEES.
COMPOUND SPINNING SPINDLE.

No. 410,982.

Patented Sept. 10, 1889.



Witnesses.
Fred. S. Grumbleaf
Frederick L. Emery

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UNITED STATES PATENT OFFICE.

JAMES LEES, OF LUCKNOW, ONTARIO, CANADA, ASSIGNOR TO GEORGE DRAPER & SONS, OF HOPEDALE, MASSACHUSETTS.

COMPOUND SPINNING-SPINDLE.

SPECIFICATION forming part of Letters Patent No. 410,982, dated September 10, 1889.

Application filed June 5, 1889. Serial No. 313,167. (No model.)

To all whom it may concern:

Be it known that I, JAMES LEES, of Lucknow, county of Bruce, Province of Ontario, Canada, have invented an Improvement in Compound Spinning-Spindles, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the construction of an improved spindle capable of being run at high speed with an unbalanced load.

My improved spindle, which I denominate a "compound spindle," consists, essentially, of a socketed section having an attached whirl, and therefore denominated a "whirl-section," and a bobbin-carrying section, the lower end of which is mounted loosely in the whirl-section, the bobbin-carrying section deriving its motion from the whirl-section, the foot of the bobbin-carrying section being free to move laterally on or with relation to the whirl-section as the bobbin-carrying section adapts itself to the center of gravity of the load.

Figure 1, in partial section and elevation, represents a spindle embodying my invention and a bearing therefor. Fig. 2 is an enlarged detail of part of Fig. 1; and Fig. 3 is a modified form of my invention, showing it as adapted to two rails rather than to one rail.

Referring to Fig. 1, A represents a rail, and B a supporting case or holder attached thereto by a nut B'.

The supporting case or holder B receives within it and forms a bearing for the whirl-section C, the lower end of which rests upon and rotates on or in a suitable or usual step-block, as *a*, of any usual or suitable material and construction. The whirl-section is chambered to leave a tubular portion, in which is inserted loosely the lower end of the bobbin-carrying section D. The whirl-section has an attached whirl C'.

The whirl-section, at a point above the lower end of the bobbin-carrying section, has an upper bearing *d*, preferably made rigid.

The lower end of the bobbin-carrying section is provided with a friction-pad *e*, of rubber, leather, cork, wood, or other usual ma-

terial, capable of acting as a drag on the whirl-section as the lower end of the bobbin-carrying section is moved laterally to compensate for an unbalanced load.

The lower end of the bobbin-carrying section is represented as surrounded by an elastic or yielding packing, as *e'*, which will preferably fill the space between the lower end of the bobbin-carrying section and the interior of the whirl-section.

Referring to Fig. 1, the upper end of the whirl-section is represented as having applied to it a collar *f*, and this latter collar is united by a flexible or spring section *f'* to a collar *f*². The collar *f* is connected to the upper end of the whirl-section, while the collar *f*² is connected to a portion of the bobbin-carrying section, the said connection being, as herein represented, by means of screw-threads, so that the bobbin-carrying section may be readily removed from the whirl-section when desired.

The flexible section *f'* of the connecting device between the said whirl-section and the bobbin-carrying section will preferably be made of thin sheet-steel or spring metal, the section *f'* and collars *f f*² being united together in any usual or suitable manner. The part *f'* may, however, be composed of leather or other suitable material.

Referring to Fig. 3, showing a modification of my invention, the bearing for the upper end of the whirl-section is in a second rail B², and between the whirl-section and the bobbin-carrying section I have interposed a piece of leather or equivalent material, as *g*, which, under most circumstances, will, by its adhesion to the bobbin-carrying section, drive the latter with the whirl-section; but I may, if desired, and I preferably will, employ a pin, as *h*, which will be passed through the tubular part of the whirl-section into a slot in the bobbin-carrying section.

I claim—

1. The socketed or chambered whirl-section and bearings therefor, combined with a bobbin-carrying section mounted loosely in the socket of the whirl-section, and a friction-block interposed between the lower end of

the bobbin-carrying section and a part of the whirl-section on which the bobbin-carrying section rests, substantially as described.

2. The socketed or chambered whirl-section
5 and bearings therefor, combined with a bobbin-carrying section mounted loosely in the socket of the whirl-section, and with a friction-block *e*, and a flexible or yielding packing, as *e'*, interposed between the said whirl-section
10 and bobbin-carrying section, substantially as described.

3. The combination, with the chambered whirl-section and bearing therefor, and a
15 bobbin-carrying section mounted loosely in the socket of the whirl-section, of the flexible

section connected at one end positively to the chambered whirl-section and at its other end to the bobbin-carrying section, and having an intermediate flexible section *f'* to permit the bobbin-carrying section to tip freely 20 laterally in any direction, substantially as described.

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

JAMES LEES.

Witnesses:

THOMAS PLUNKETT,
WM. B. TOWLER.