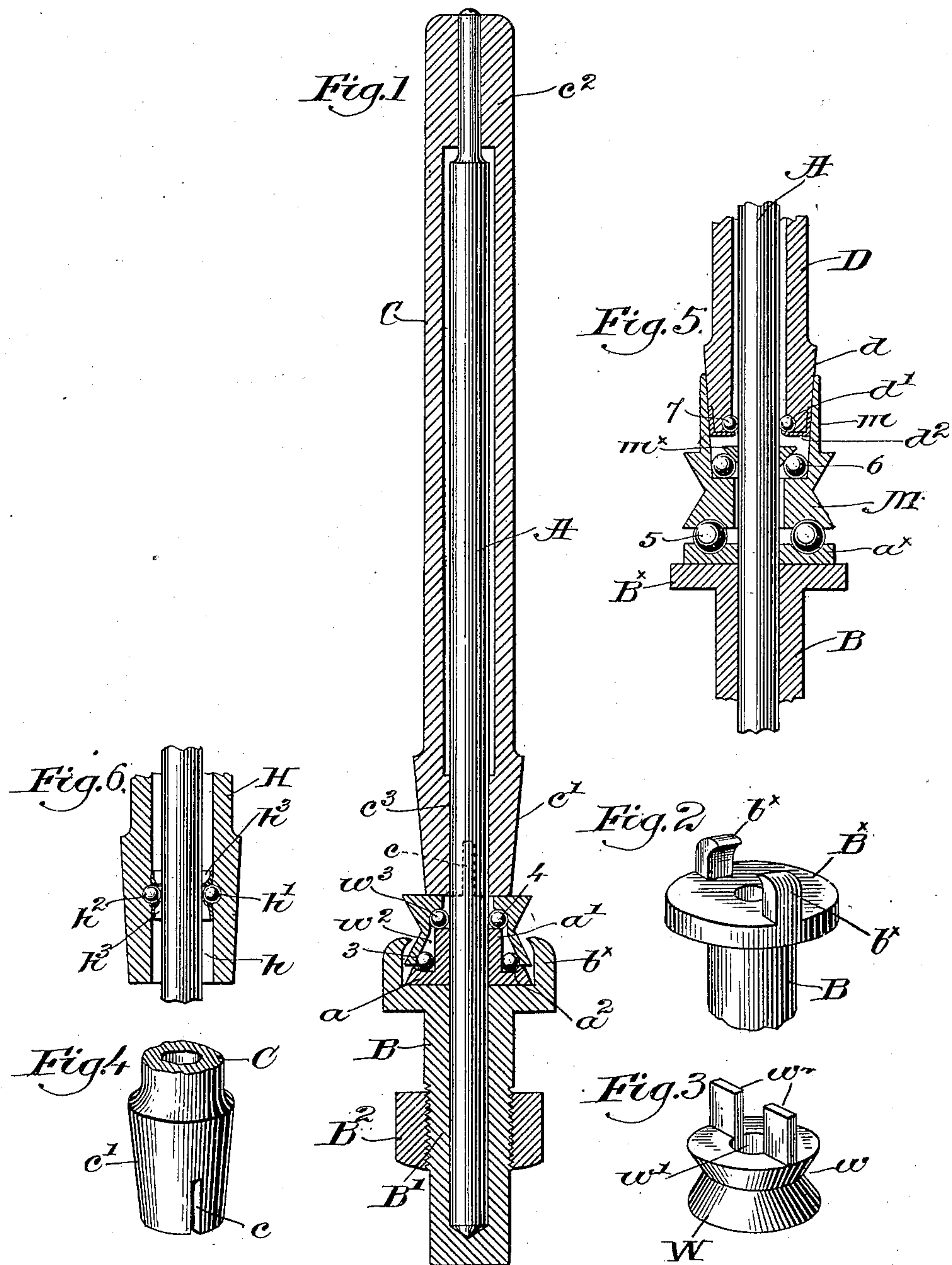


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Patented Dec. 11, 1900.

G. O. DRAPER.
SPINNING APPARATUS.
(Application filed Oct. 23, 1899.)

(No Model.)



Witnesses:

A. C. Harmon
Walter O. Lombard

Inventor:

George O. Draper.
by Crosby & Morgan
attys.

UNITED STATES PATENT OFFICE.

GEORGE O. DRAPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE
DRAPER COMPANY, OF SAME PLACE AND PORTLAND, MAINE.

SPINNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 663,738, dated December 11, 1900.

Application filed October 23, 1899. Serial No. 734,427. (No model.)

To all whom it may concern:

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

10 This invention relates to apparatus for spinning yarn; and it has for its object the production of simple and light-running apparatus at a low cost of production.

15 In my present invention the yarn carrier or bobbin is mounted to rotate directly upon an axial support or dead-spindle, rotation being imparted to the yarn-carrier by a whirl mounted on ball-bearings.

20 Figure 1 is a vertical longitudinal section of spinning apparatus embodying my invention, the yarn-carrier being shown in operative position. Fig. 2 is a perspective view of the top of the spindle-holder, showing the seat for the whirl-bearing. Fig. 3 is a like view 25 of the whirl detached. Fig. 4 is a perspective view of the lower end or base of the yarn-carrier shown in Fig. 1, and Figs. 5 and 6 illustrate modified forms of my invention to be described.

30 Referring to Fig. 1, I have shown the axial support or dead-spindle A as fixedly supported at its lower end in a holder B, having a threaded shank B' for a suitable nut B², by which the holder is attached to the usual rail. 35 The holder is enlarged at its upper end to form a circular head B^x, Fig. 2, having diametrically-located upright lugs b^x thereon intumed at their upper ends to extend part way into the band-groove of the whirl to prevent withdrawal of the latter. This head B^x 40 forms a seat for a hardened-steel collar a, tightly fitting the spindle and having an upturned hub a', the upper face of the collar being annularly grooved, as at a², to form a 45 raceway for a series of antifriction members, shown herein as balls 3. A whirl W, Figs. 1 and 3, provided with a band-receiving groove w, has a central bore w' larger than the spindle A to avoid contact therewith, the 50 bore tapering outwardly, as at w², Fig. 1, to travel upon the balls 3, while an interior an-

nular raceway w³ receives a second series of balls 4, which latter travel upon the upper end of the hub a' and the adjacent part of the dead-spindle. The balls 4 sustain the 55 whirl and its load vertically and in connection with the balls 3 position it axially as it is rotated. Upturned lugs or projections w⁴ on the top of the whirl are adapted to enter transverse slots c in the base c' of the yarn 60 carrier or bobbin C, preferably made of wood or other suitable non-metallic material, and having at its upper and lower ends internal bearing portions c² c³ to engage the dead-spindle with a running fit. It will be evident that 65 the weight of the yarn-carrier, its load, and the whirl will be supported on the ball-bearings of the latter, and, if desired or necessary, the bearings c² c³ may be impregnated with some antifriction compound to still further decrease the friction. The whirl is freely 70 rotatable around the spindle, but out of contact therewith, and a yarn-carrier can be withdrawn from or placed upon the spindle A easily and rapidly to travel directly thereupon. 75

When assembling the parts, the collar a is slipped sidewise into the head B^x between the lugs b^x, and then the whirl is positioned on the balls 3, the balls 4 being inserted through the bore w' of the whirl, after which the spindle A is passed through whirl and collar and 80 fixed in the holder B.

Referring to the construction shown in Fig. 5, the whirl M rests upon a series of antifriction-balls 5, which travel in an annular race- 85 way or groove in the preferably hardened steel plate a^x, the whirl at its top having a cup-like extension m, with tapered inner walls to receive the correspondingly-tapered base d of the yarn-carrier D. A second series of 90 balls 6 are seated in the bottom of the extension m and are held in position by an inverted conical collar m^x, driven tightly onto the spindle A. This collar also acts to prevent the whirl from rising and prevents its displacement 95 when the yarn-carrier is disengaged therefrom, it being clear from the drawings that the bottom of the whirl is annularly grooved for the balls 5. By driving the collar m^x down on the spindle wear may be taken 100 up as is necessary and the whirl rotates between two series of antifriction-balls. I have

also shown in Fig. 5 that the yarn-carrier D does not contact at its base with the dead-spindle A, but travels on a ball-bearing formed by antifriction-balls and held in an annular recess d' in the yarn-carrier, retained therein by a cap d^2 on the lower end of the yarn-carrier, the exposed parts of the balls resting upon the spindle. At its upper end the yarn-carrier may be provided with a contained bearing similar to that shown at c^2 , Fig. 1, or any other desired form of bearing may be employed.

Another form of ball-bearing for the yarn-carrier is shown in Fig. 6, the yarn-carrier H having a large axial bore h , which is socketed, as at h' , to receive antifriction-balls h^2 , held in place by annular bent-over keepers h^3 , which can be forced into the bore, the balls traveling upon the spindle A when the yarn-carrier is rotated.

Various changes may be made in the construction and arrangement herein shown and described without departing from the spirit and scope of my invention.

The term "ball" or "ball-bearing" as here-

in used and hereinafter used in the claim is intended to cover all revolving devices for the purpose, whether in the shape of spheres, cylinders, or other well-known shape used for such purposes.

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

A dead-spindle, a concentric ball-support having an annular raceway and an upturned hub, a whirl having its bore shaped to form upper and lower ball-raceways, and two series of antifriction-balls interposed between the whirl and the hub and raceway of the ball-support, the upper series of balls traveling upon the upper end of the hub and the adjacent portion of the spindle.

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

GEORGE O. DRAPER.

Witnesses:

JOHN C. EDWARDS,
AUGUSTA E. DEAN.