

No. 609,371.

F. W. SCHROEDER.
BALL BEARING.

Patented Aug. 16, 1898.

(Application filed Dec. 23, 1896.)

(No Model.)

Fig. 1.

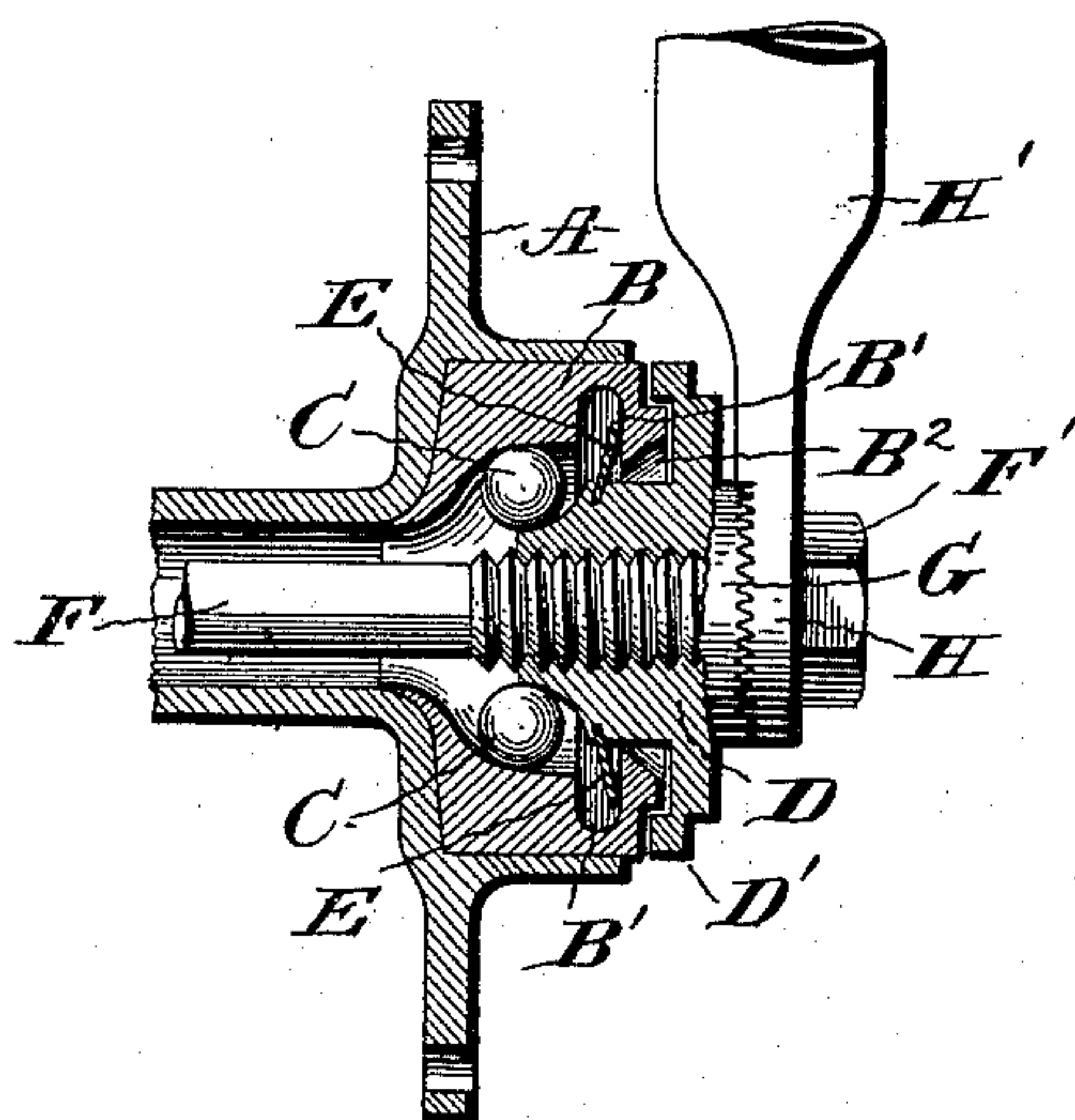


Fig. 2.

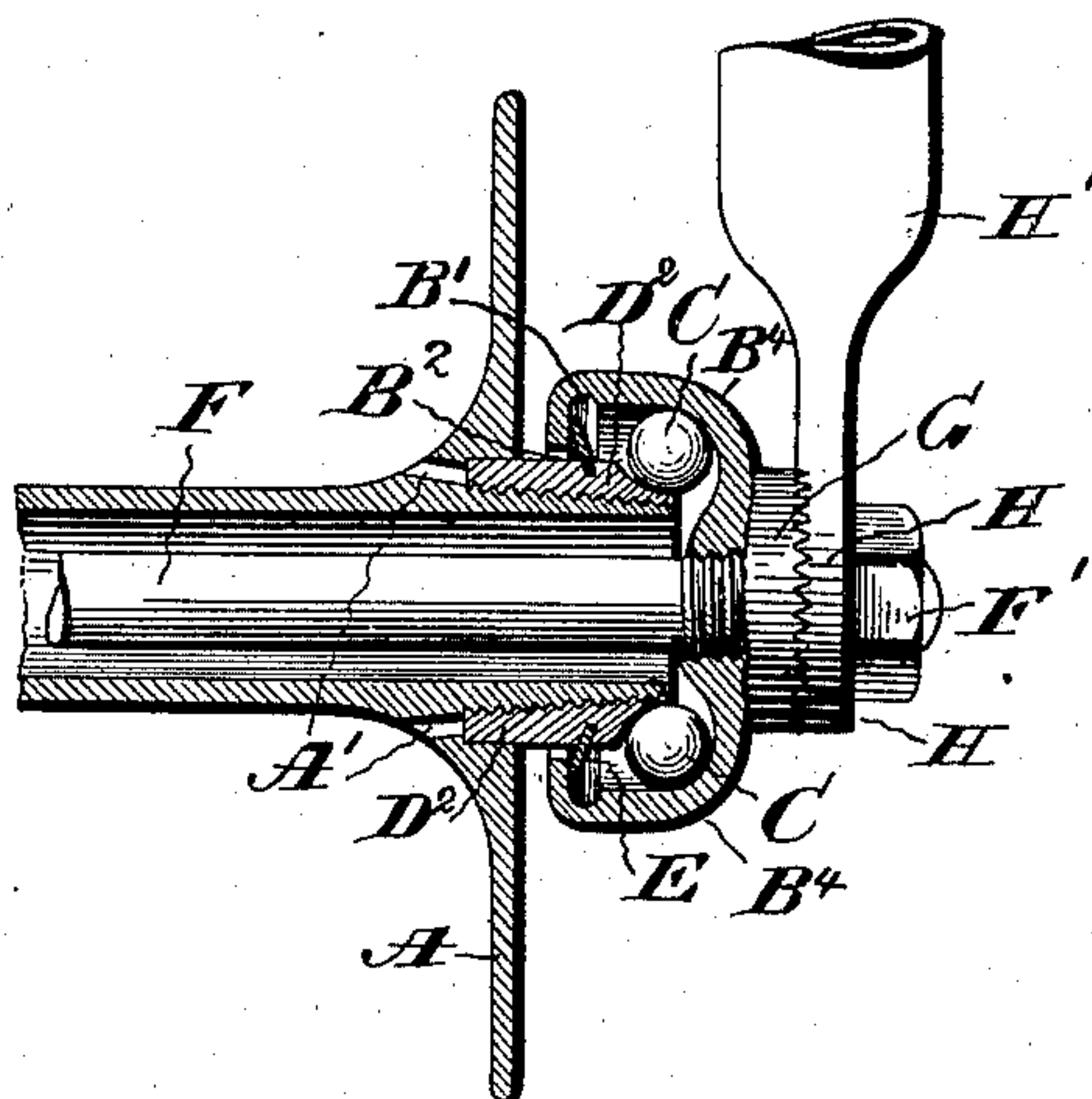
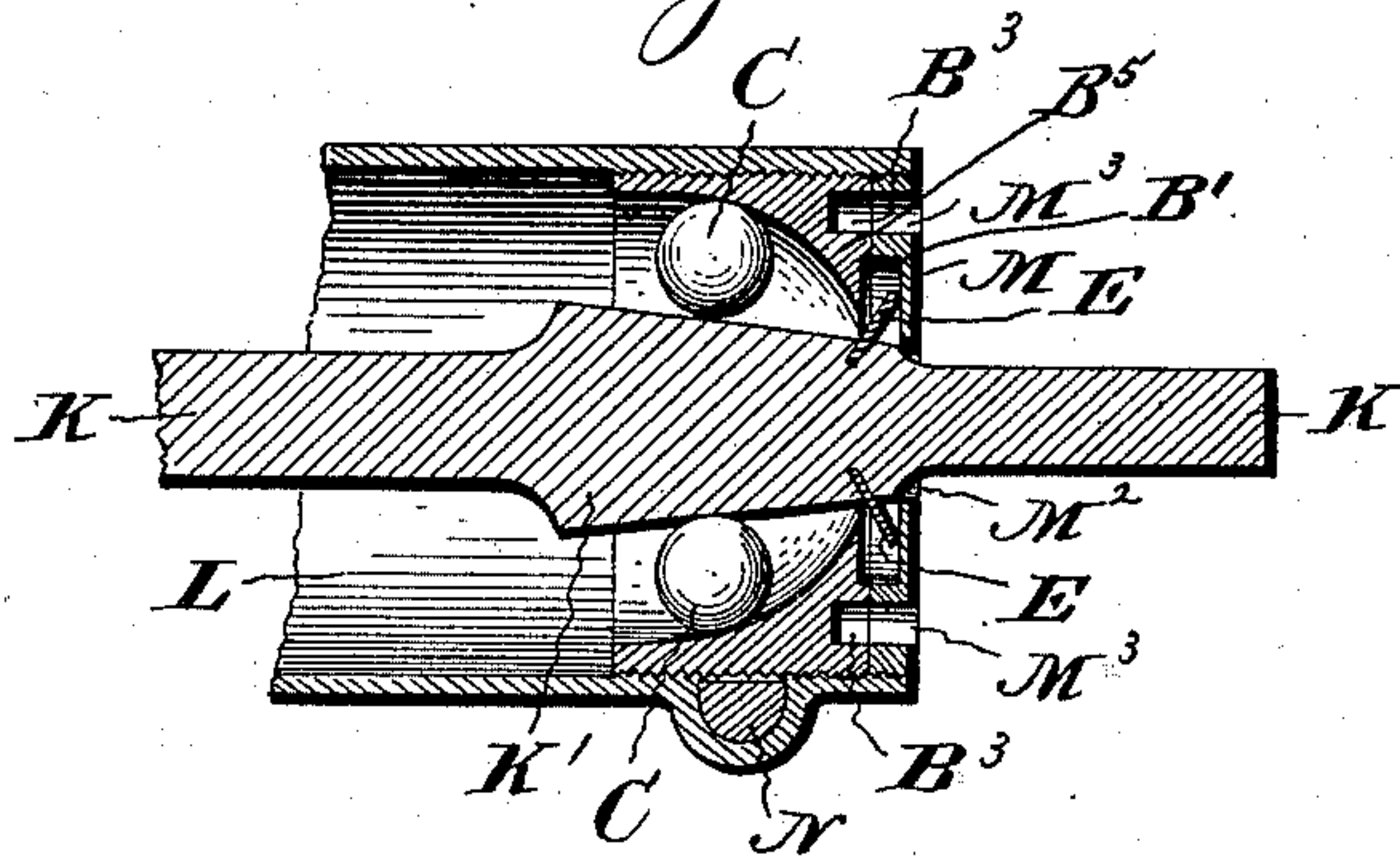


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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BALL-BEARING.

SPECIFICATION forming part of Letters Patent No. 609,371, dated August 16, 1898.

Application filed December 23, 1896. Serial No. 616,769. (No model.) Patented in New South Wales November 23, 1896, No. 7,075; in Victoria November 25, 1896, No. 13,734; in Queensland November 25, 1896, No. 3,642; in South Australia November 25, 1896, No. 3,477; in New Zealand December 3, 1896, No. 9,090; in West Australia December 3, 1896, No. 1,409; in England December 29, 1896, No. 29,926; in Belgium January 4, 1897, No. 125,551; in France January 4, 1897, No. 262,779; in Canada February 11, 1897, No. 54,964, and in Austria February 3, 1898, No. 855/48.

To all whom it may concern:

Be it known that I, FREDERICK WILLIAM SCHROEDER, engineer, a subject of the Queen of Great Britain, residing at Newman street, Newtown, near Sydney, in the British Colony of New South Wales, have invented new and useful Improvements in Ball-Bearings, (for which Letters Patent have been granted in New South Wales, No. 7,075, dated November 23, 1896; in Victoria, No. 13,734, dated November 25, 1896; in Queensland, No. 3,642, dated November 25, 1896; in South Australia, No. 3,477, dated November 25, 1896; in New Zealand, No. 9,090, dated December 3, 1896; in West Australia, No. 1,409, dated December 3, 1896; in Great Britain, No. 29,926, dated December 29, 1896; in Canada, No. 54,964, dated February 11, 1897; in Belgium, No. 125,551, dated January 4, 1897; in France, No. 262,779, dated January 4, 1897, and in Austria, No. 855/48, dated February 3, 1898,) of which the following is a specification.

This invention relates to improvements in ball-bearings and devices for adjusting and lubricating the same, which, though particularly devised for the purpose of being utilized on the axles or spindles of cycle-wheels, on the driving-spindle of cycle-gears, and on the spindles of cycle-pedals, are of great utility when applied to those purposes where spindles have to run in bearings and where journals have to revolve around spindles.

The invention consists in features of construction and novel combinations of parts in a ball-bearing, as hereinafter described and claimed.

In order that this invention may be clearly understood, reference will now be made to the drawings herewith, in which—

Figure 1 is a central sectional elevation of one end of a wheel-hub and spindle in the fork of a bicycle, showing these improvements applied thereto. Fig. 2 is a similar view of a modified construction of the adjusting and lubricating devices according to this invention. Fig. 3 is a central sectional elevation of the driving

or pedal spindle and bracket of a cycle having adjusting and lubricating ball-bearings constructed according to this invention.

A is the casting of the hub or boss of the bicycle-wheel, in which is fitted by sweating or otherwise the ball race or way B.

F is the axle or spindle, having at the one end (not shown) a sweated cone and a screwed cone or a solid cone adapted to take against the balls C in a similar race or way to that marked B. The adjusting-cone D carries, fitted within a groove in its body, an elastic or semiflexible washer E, made, preferably, of leather, or, say, of elastic or semiflexible metal, and it has a cover-piece D', the outermost face of which carries serrations G, adapted to fit in like serrations H, stamped or otherwise made in the end of the fork H' of a cycle. The ball race or way B has a groove or enlargement B', hereinafter called the "lubricant-keep," and a contracted mouth B² only sufficiently large to allow for the passage therethrough of the washer E when contracted or folded. It is easily understood that the other end (not shown) of the hub or boss and of the spindle similar to these pointed out has a cone, such as D, either solid or adjustable, an elastic washer E in such cone, and a lubricant-keep, such as B', in the ball-race, and that it also has a contracted mouth B², a cap or cover D', and, if necessary, serrations G and H. Now it will be seen that the contracted mouth B² and the washer E, whose normal position is, as shown, just bearing on the inside of the overhang of the contracted mouth B², will effectually prevent the egress or escape of the lubricant and will also prevent the entrance of any dust or dirt. To adjust this bearing, it is only necessary to unscrew the nut F', slightly prize the fork or solid support H' outwardly until the serrations G and H are clear, and then turn, by means of a turn-screw or spanner, the cap or cover D' of the cone D to the extent required to adjust the bearing to the requisite degree, which may be done the more minutely, as the

serrations G and H are made smaller. Then, allowing the fork H' to spring inwardly, the nut F' is tightened and locks the bearings in their new adjustment.

5 Referring to Fig. 2, it is to be understood that this shows one end only of a hub or boss of a wheel, whose other end (not shown) is exactly similar. Instead of the cone D² being screwed thereon it may be driven on a
10 taper, in which case the holes A' would be convenient for driving it off for replacement when worn out. Said cone D² might, however, be sweated on or it might be made solid with the casting of the hub A. In the cone
15 is a groove for holding the elastic or semiflexible washer E. The ball race or way B⁴ screws onto the end of the spindle F and has contracted mouth B², which passes over the washer E and then allows said washer to bear
20 up against its internal overhang above the lubricant-keep B'. The outer face of this ball-race has serrations G, and the rigid support or fork H' has corresponding serrations H, the spindle having a tightening-nut F'.
25 As may be seen, the washer E in this case also prevents the exit of the lubricant and at the same time forms a dust and dirt proof barrier. The adjustment is achieved by loosening nut F', separating the serrations G and
30 H, revolving the race or way B⁴ as required, and securing the serrations G and H tightly together by means of the nut F'.

Referring to Fig. 3, the revolving spindle K has a cone part K', against which bear the
35 balls C, kept and adjusted to their position by means of the race or way B⁵, screwed into the bracket or rigid support L. The cone K' has grooves, in which is fixed the elastic or semiflexible washer E, which runs in a lubricant-keep B', formed by the end of the race
40 or way B⁵, and a cover or cap M. The race or way B⁵ has sockets B³ therein for the purpose of taking the end of a spanner or turn-screw, and the cover or cap M has corresponding
45 through-holes M³, and it also has a contracted mouth M². It is to be seen that the washer E by bearing up against the internal overhang of the mouth M² excludes the dust and dirt from entering the bearing and prevents

the exit of oil or lubricant from the keep B². 50
In adjustment the pintles or pins of a turn-screw or spanner are placed in holes M³ and the jam of the cover or cap M on the race or way B⁵ slackened until holes M³ are in juxtaposition with sockets B³, when the pins of the 55
turn-screw or spanner may be pushed through said holes M³ into the sockets B³, and the cover M and the race or way B⁵ both move backward or forward in their screw-thread in the bracket L, as is desired for adjustment. Then 60
the lock of the cotter-screw N being fastened, as well understood, the pins of the turn-screw or spanner are withdrawn from sockets B³ into holes M³ and the cover M screwed up on the race or way B⁵ as a jam-nut. 65

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, what is claimed is—

1. In a ball-bearing, the combination of a 70
ball race or way provided internally with a circumferential oil-keep having a contracted mouth, a spindle having thereon a cone provided with an inclined circumferential groove, an elastic and semiflexible washer se- 75
cured obliquely in said groove, the said washer being adapted to be passed through the said contracted mouth and then assume its normal position to close the contracted mouth, thereby preventing the egress of oil and entrance of 80
dust, and the balls located between the said ball-race and cone, substantially as described.

2. In a ball-bearing, the combination of a
spindle, a ball race or way provided with a circumferential oil-keep having a contracted 85
mouth, an adjusting-cone having an inclined circumferential groove, an elastic and semiflexible washer secured in said cone-groove to guard the contracted mouth of the oil-keep, a set of balls between the said race and cone, 90
and means for locking the parts together, substantially as described.

Dated this 13th day of November, 1896.

FREDERICK WILLIAM SCHROEDER.

Witnesses:

FRED WALSH,
PERCY NEWELL.