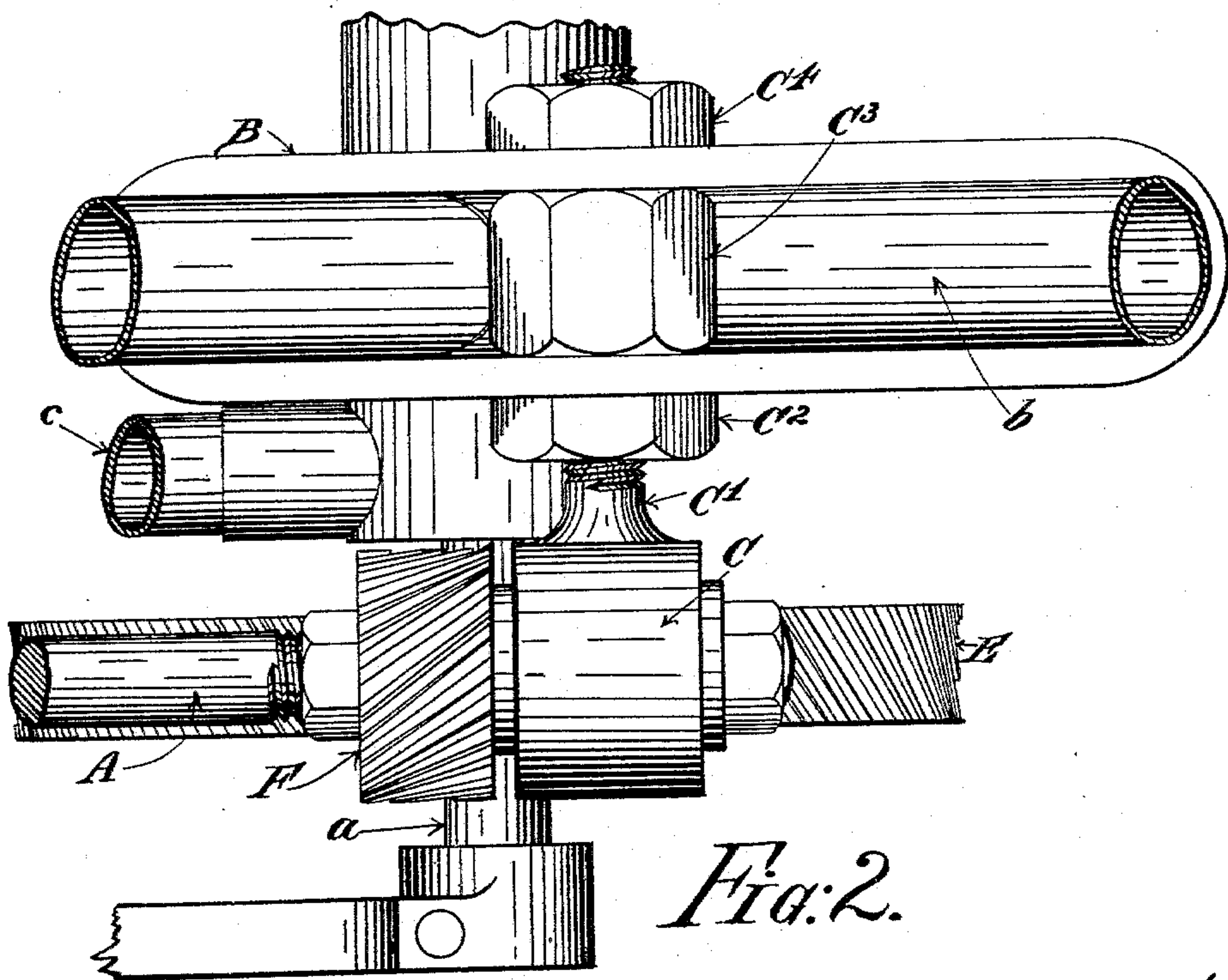
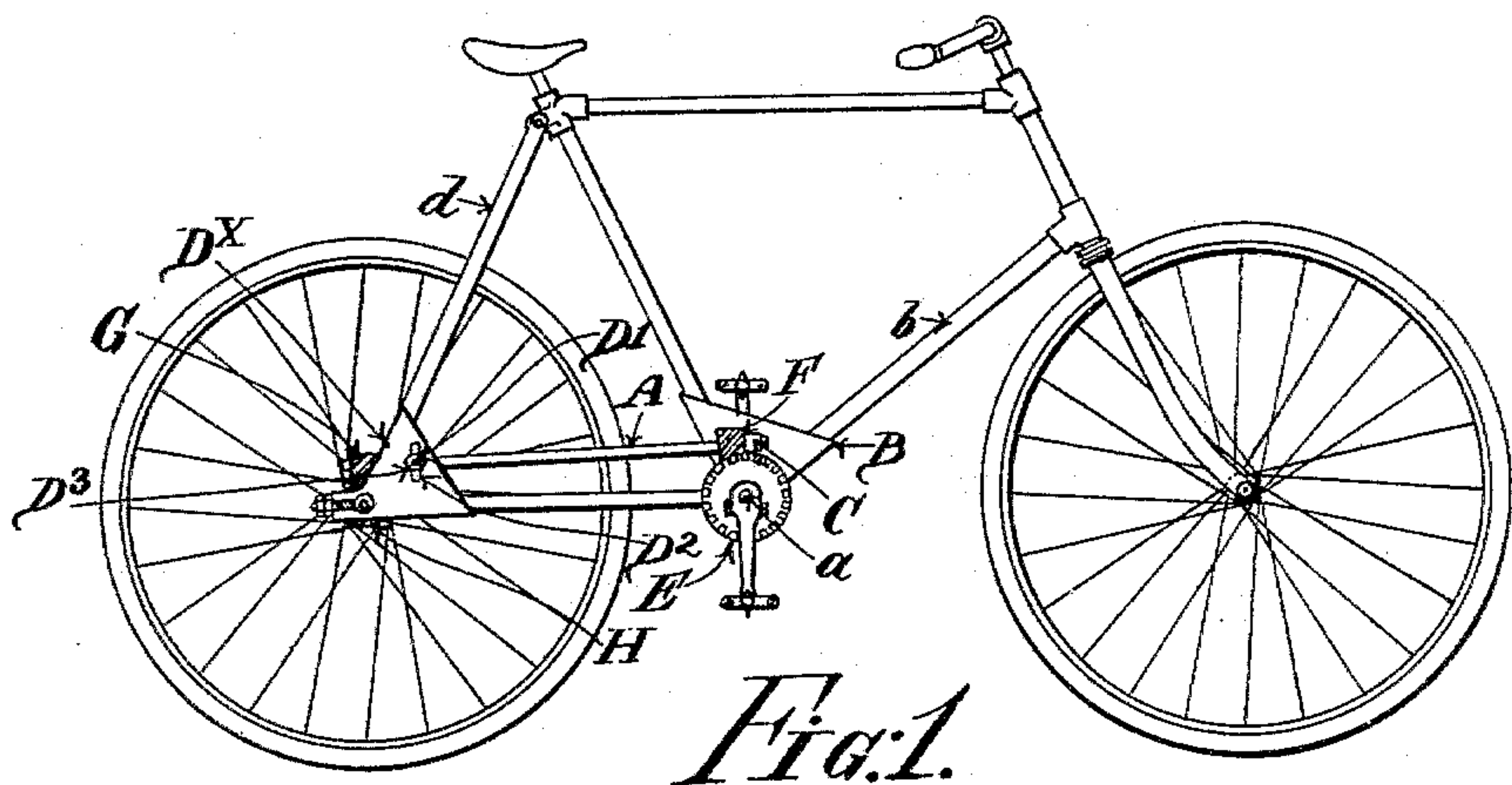


2 Sheets—Sheet 1.

No. 597,963.

Patented Jan. 25, 1898.



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(No Model.)

2 Sheets—Sheet 2.

J. DREDGE.
DRIVING MECHANISM FOR CYCLES.

No. 597,963.

Patented Jan. 25, 1898.

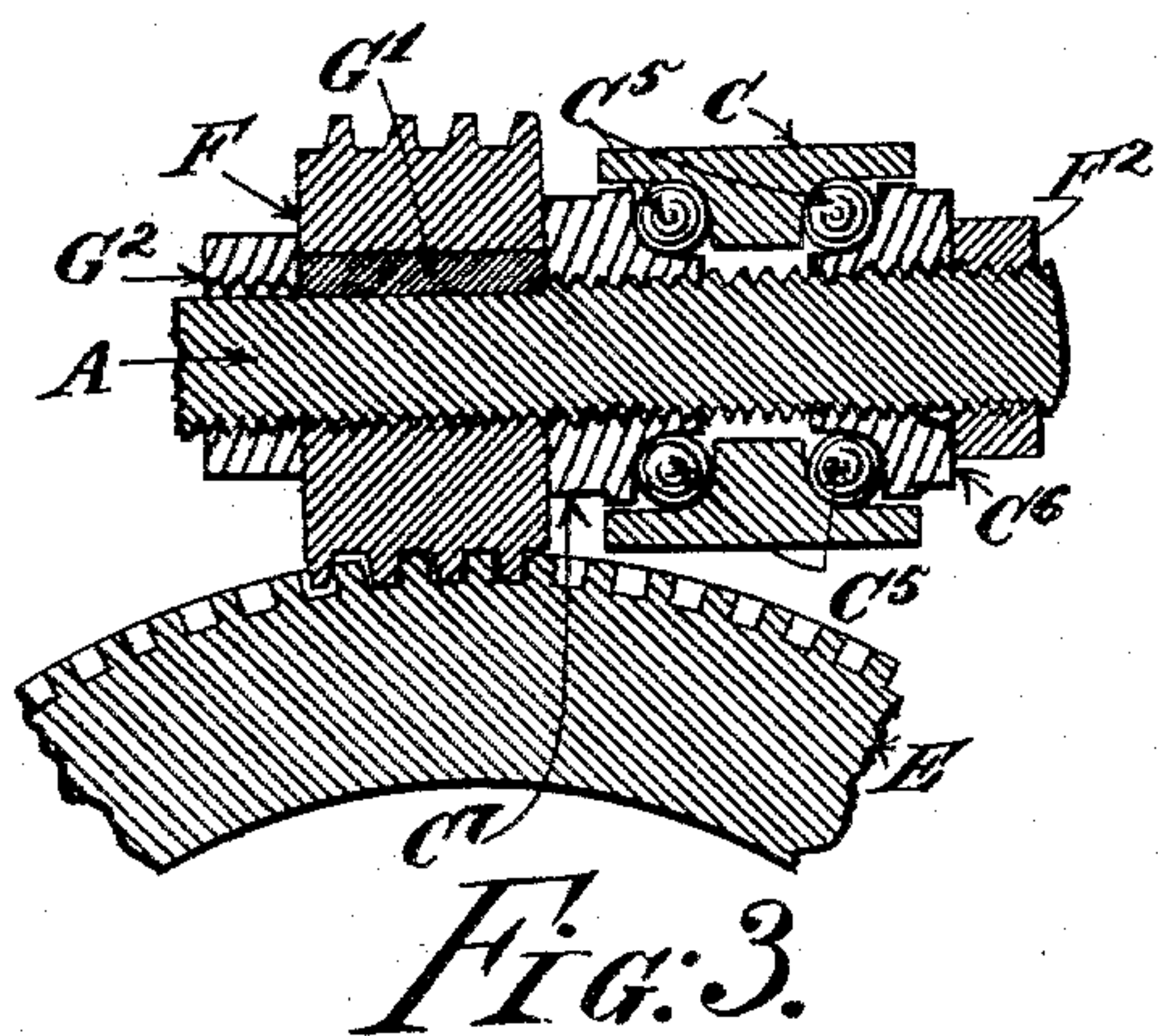


Fig. 3.

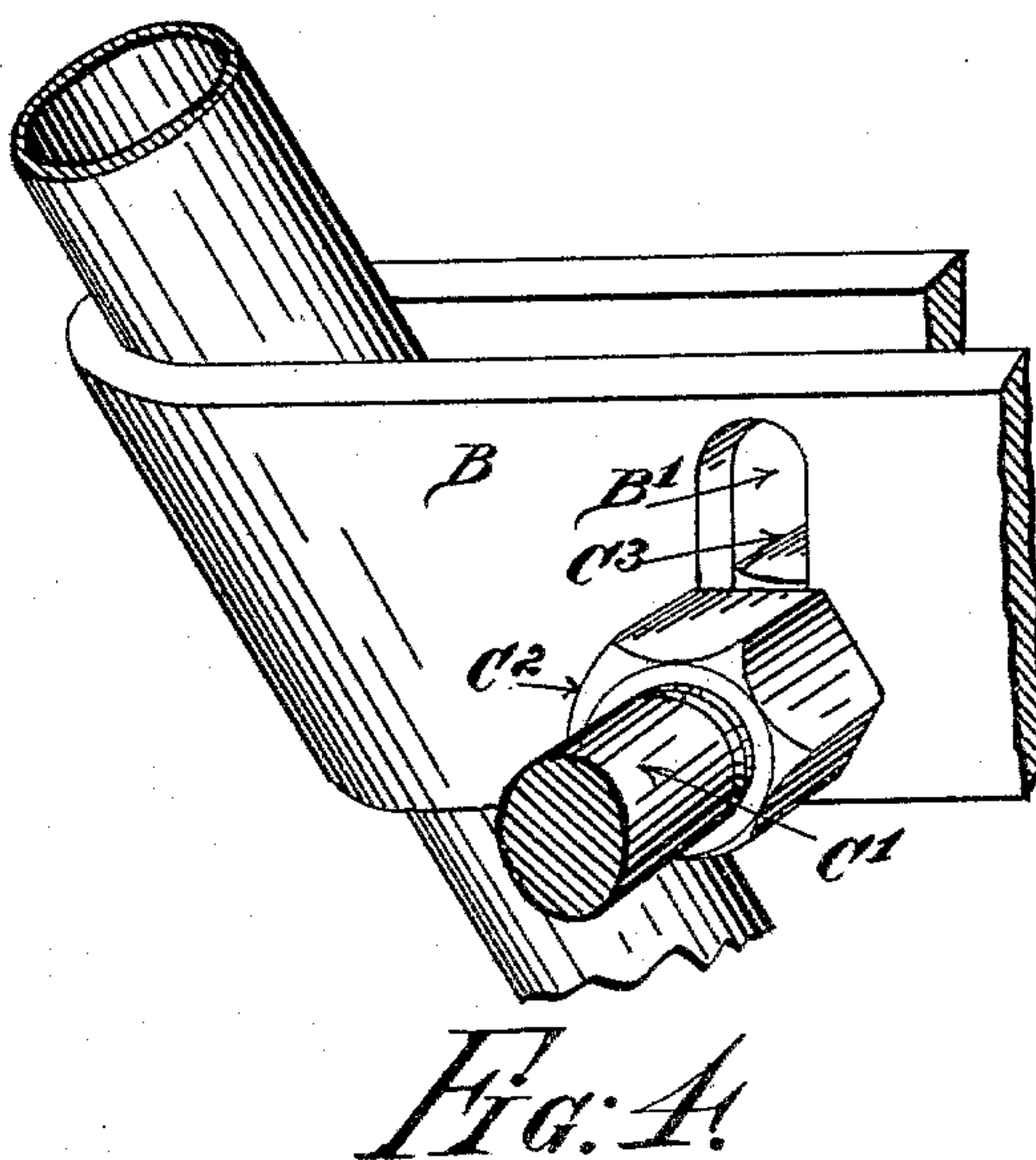


Fig. 4.

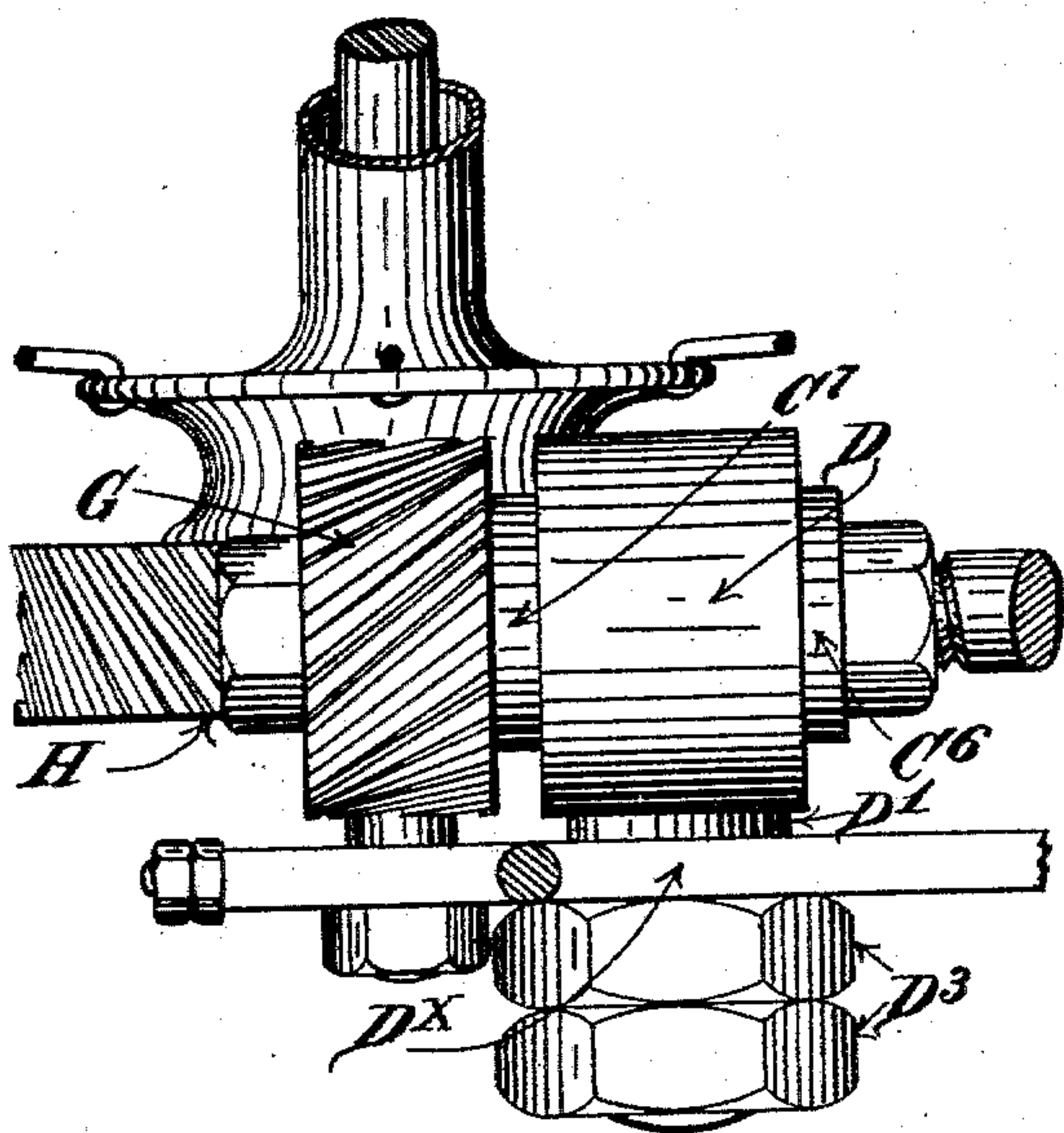


Fig. 5.

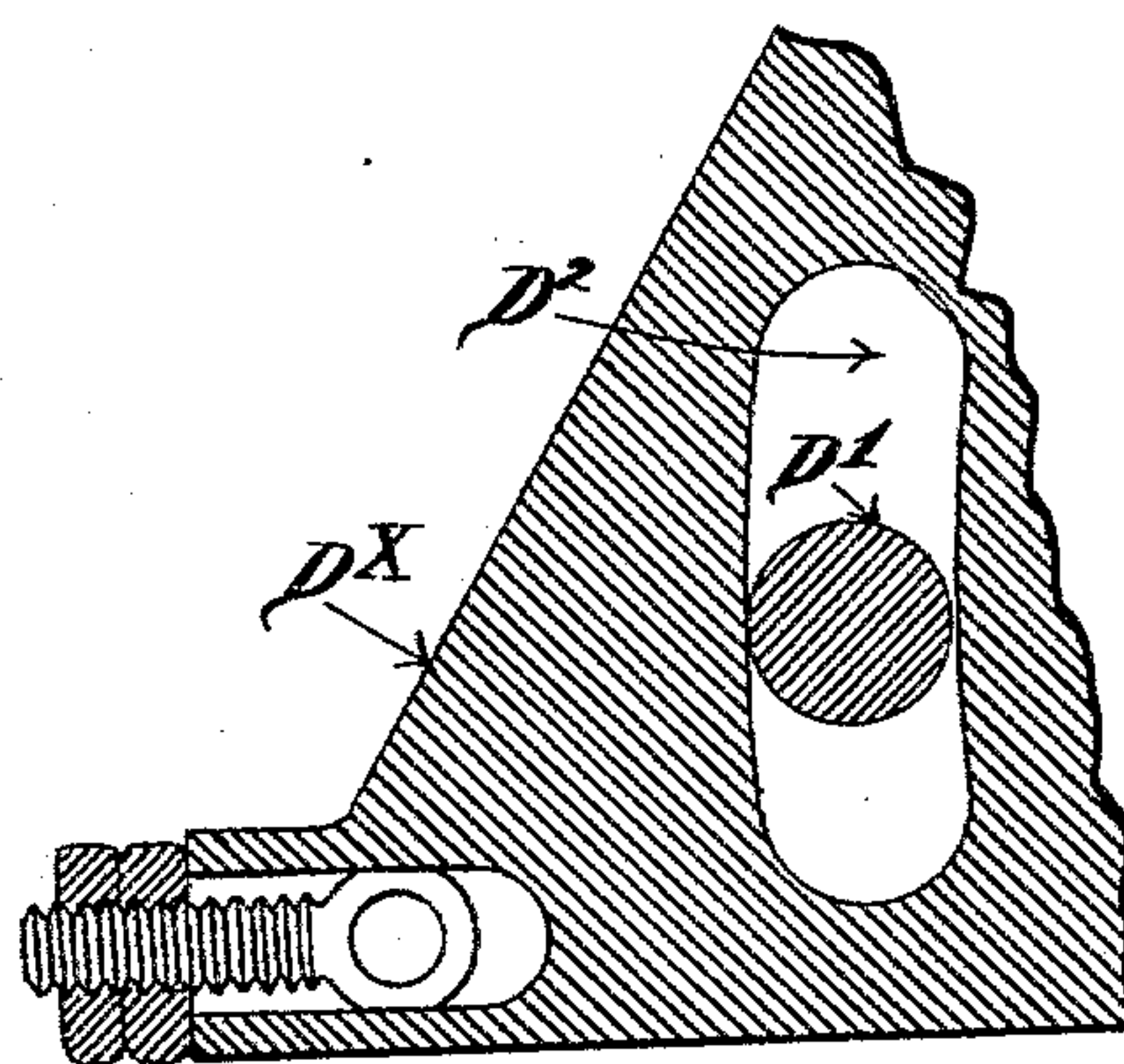


Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN DREDGE, OF NEWTOWN, NEW SOUTH WALES, ASSIGNOR TO JAMES WELSH, OF SAME PLACE.

DRIVING MECHANISM FOR CYCLES.

SPECIFICATION forming part of Letters Patent No. 597,963, dated January 25, 1898.

Application filed February 16, 1897. Serial No. 623,733. (No model.)

To all whom it may concern:

Be it known that I, JOHN DREDGE, engineer, a subject of the Queen of Great Britain, residing at King Street, Newtown, near Sydney, in the British Colony of New South Wales, have invented new and useful mechanism entitled Improved Driving Mechanism for Cycles and the Like, of which the following is a specification.

This invention relates to driving mechanism for cycles and the like, by means of which the motion of the driving-spindle is transmitted to the driving wheel or wheels in an easy and sure manner without the interposition of a pitch or other chain or of bevel-toothed wheels. Though specially suitable for what are known as "safety-bicycles," yet these improvements are applicable to multi-cycles and such kinds of velocipedes and to power-driven cycles and the like.

The invention consists in the construction, combination, and arrangement of parts hereinafter described, and particularly pointed out in the claims following the description, reference being had to the accompanying drawings, forming a part of this specification.

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

Figure 1 is a side elevation of a safety or rear driving-wheel bicycle to which this invention is applied. The other figures are details thereof on a larger scale, Fig. 2 being a plan of the driving-spindle end of the driving mechanism, and Fig. 5 a similar view of driving-axle end of the same, both showing such portions of the bicycle-frame as are necessary to illustrate one method of affixing the mechanism thereto. Fig. 3 is a vertical longitudinal section of the driving-spindle end of the mechanism, showing the bearing of the longitudinally-set spindle of the intermediate frusto-helical or screw wheels, hereinafter termed the "gear-spindle;" and Fig. 4 is a perspective view of the gear-spindle-bearing attachment to the frame. Fig. 6 is a vertical section of the junction of the back fork and side stays of the bicycle, showing the bearing of the driving-axle and the gear-spindle-bearing attachment thereto.

As illustrated, the bicycle is constructed as

ordinarily with a "diamond" frame, a front steering-wheel, and a rear driving-wheel. The pedal or driving-spindle *a* is in bearings at the junction of the front stay *b* and side stays *c*, and at this junction, which has brazed thereto an angle-piece or strap B, (or which may be forged solid or otherwise for the purpose,) is adjustably affixed one bearing C (preferably a ball-bearing, as shown in Fig. 3) of the gear-spindle A. At the junction of the back fork *d* and the side stays *c*, forged solid, as shown, (or having brazed thereto an angle-piece or strap for the purpose,) is adjustably affixed the other bearing D (preferably also a ball-bearing) of said gear-spindle A. In the angle-piece or strap B are slots B', through which passes the screwed end or tang C' of bearing C, having thereon nuts C², C³, and C⁴, the middle one for strengthening the strap B and stiffening the tang C' and the other two for holding and jamming said tang C' and the bearing C in the desired adjusted position. The slots B' allow of adjustment to regulate the "bite" of the frusto-helical or screw wheels and also allow within limits for the use of different sizes of said wheels. The bearing D has a screw end or tang D', which passes through slot D² in the junction-piece D^x and is fastened to said piece in the desired adjusted position by jam-nuts D³. The slot D² serves exactly similar purpose to the slots B' hereinbefore mentioned.

The bearings C and D are both preferably constructed alike, and in describing the former (shown in Fig. 3) the latter will be understood.

The spindle A is screwed, preferably, in reverse direction to its go-a-head revolution, and the balls C⁵ set in raceways, against which they are adjusted by the cone C⁶, the other cone C⁷ serving as a stop and adjuster for the position of the frusto-helical or screw wheel, as hereinafter mentioned.

The pedal or driving-spindle has keyed or otherwise firmly affixed thereon the frusto-helical or screw wheel E, while similarly fixed upon the driving-axle (or axle of the rear wheel) is a like frusto-helical or screw wheel H.

Frusto-helical or screw wheels or pinions F and G are screwed on the threaded ends of the gear-spindle A, and after they have been

properly adjusted thereon are held against longitudinal movement by cones C⁷ (most clearly shown in Fig. 3) and jam-nuts F² and G² and are prevented from turning independently of the gear-spindle by keys G¹.

It will be seen that the position and bite of the wheels or pinions F and G on the wheels E and H may be varied and accurately adjusted by the fastenings on the tangs or screw ends of the bearings hereinbefore described; and, further, if desired, the same devices will allow within limits of the use of smaller or larger screw wheels or pinions, as F and G, on the gear-spindle at either end or of larger or smaller screw-wheels, as E and H, on the driving-spindle and driving-axle, respectively, so that with a set of change screw wheels or pinions the cycle might be "geared," as it is termed, to different sizes of driving-wheels. These screw-wheels may, when desired, have their faces reversed and so prolong their life after one set of contact parts have worn out. It will be seen that the mechanism being fixed in order, as hereinbefore described, the power exerted in revolving the pedal or driving-spindle is transmitted to the driving-axle by the frusto-helical or screw wheels and so propels the velocipede or cycle or the like.

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

1. The combination with the driving-spin-

dle and driving-axle and frusto-helical or screw wheels E and H mounted thereon, of the fixed strap slotted as shown, the bearing C provided with a threaded tang C¹ adjustably arranged in the slotted strap, nut C³ arranged on the tang between the sides of the strap, nuts C² and C⁴, arranged on said tang on each side of said strap, a gear-spindle A journaled at one end in the bearing C and at its other end in a similar bearing, and frusto-helical or screw wheels F and G mounted on the opposite ends of said gear-spindle and gearing with the screw-wheels E and H, substantially as described.

2. The combination with the driving-spindle and driving-axle and frusto-helical or screw wheels E and H mounted thereon, of the fixed support D^x slotted as shown, the bearing D provided with a threaded tang D¹ adjustably arranged in the slotted support, jam-nuts D³ screwed over the threaded end of said tang and operating to lock the bearing in its adjusted position, a gear-spindle A journaled in said bearing and in a similar bearing C, and frusto-helical or screw wheels F and G mounted on the opposite ends of said gear-spindle, substantially as described.

Dated this 9th day of January, 1897.

JOHN DREDGE.

Witnesses:

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PERCY NEWELL.