

No. 702,948.

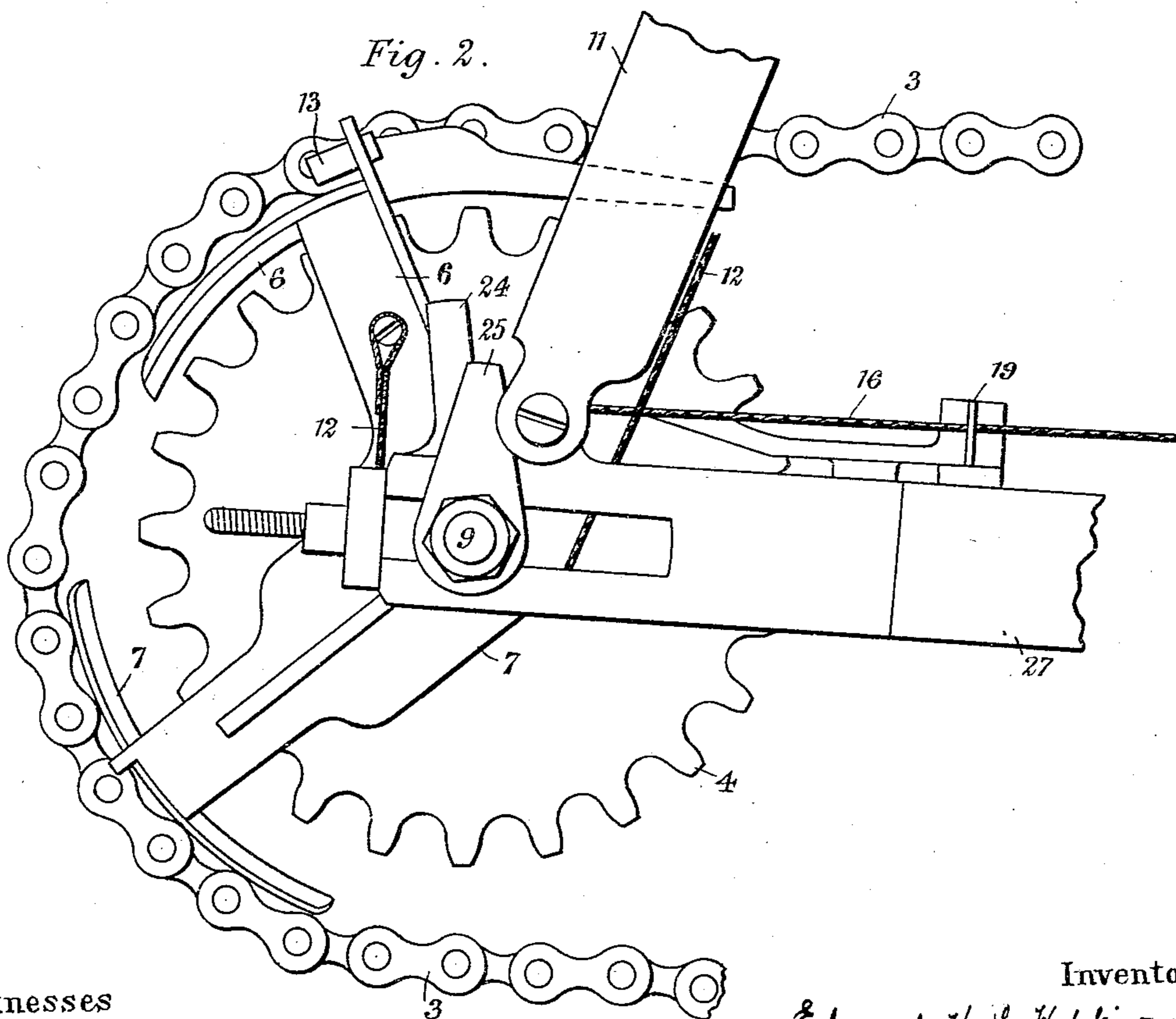
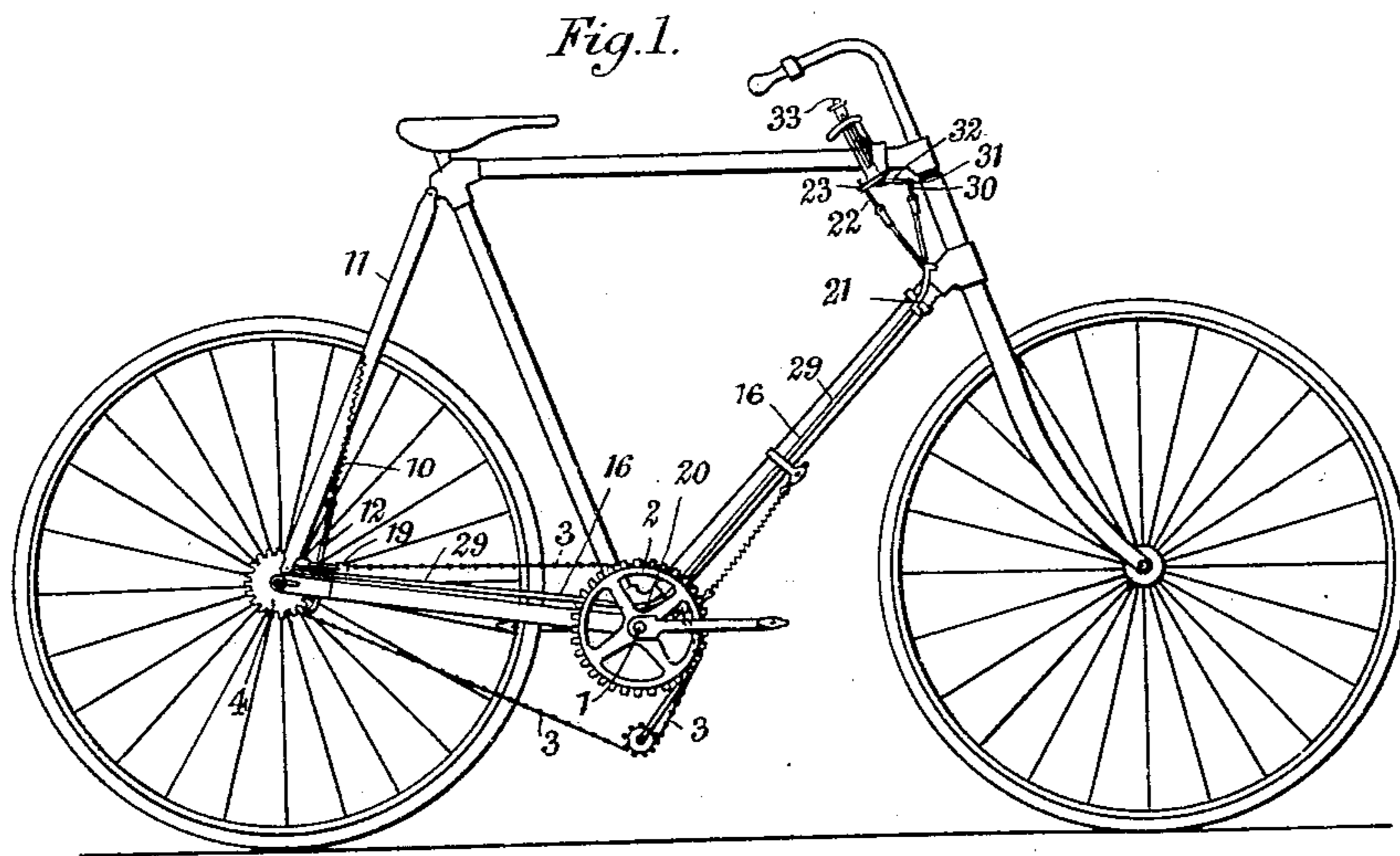
Patented June 24, 1902.

E. H. HODGKINSON.
BELT, ROPE, OR CHAIN GEARING.

(Application filed Nov. 7, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses

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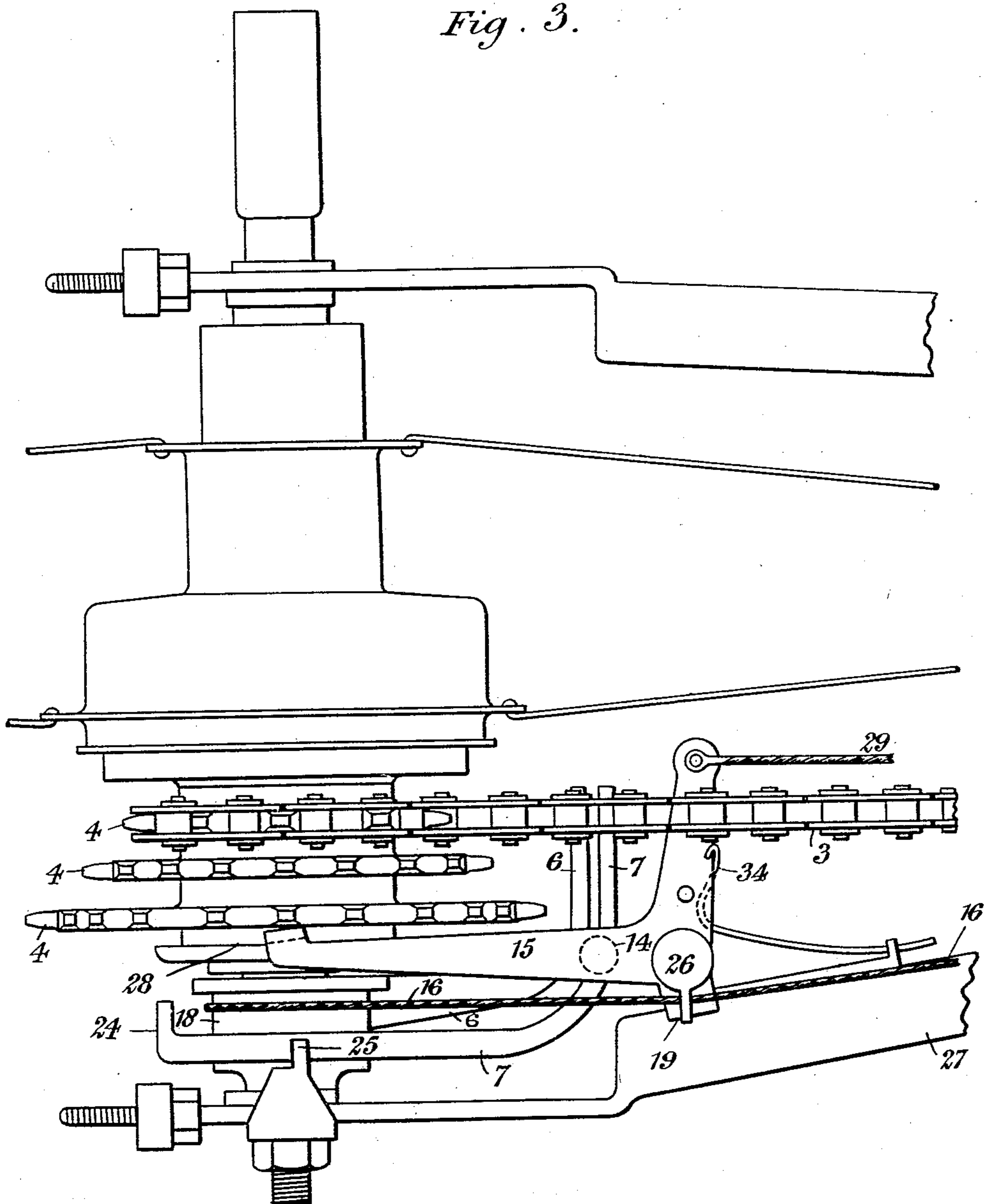
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Fig. 3.



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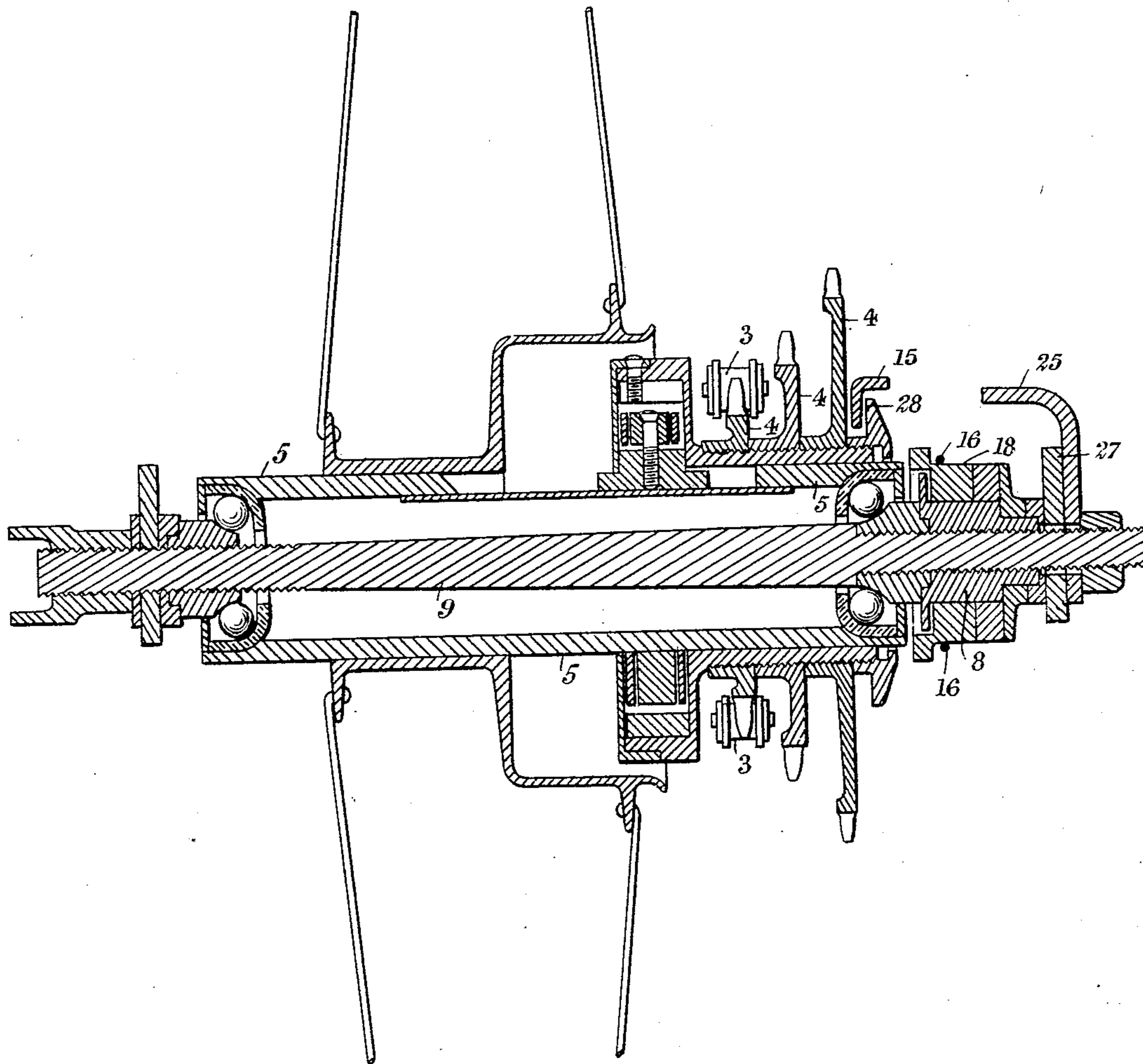
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Fig. 4.



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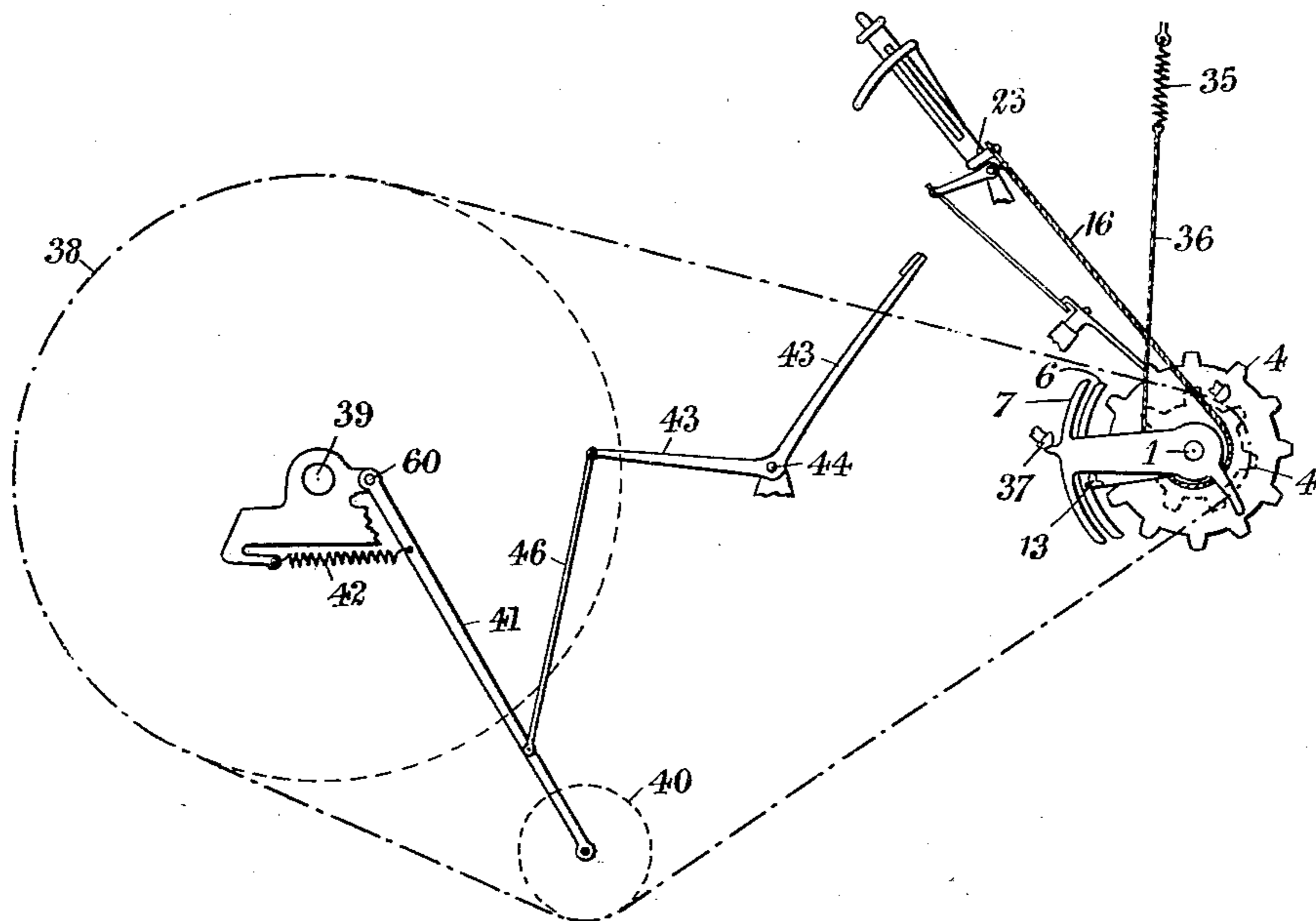
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Fig. 5.



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UNITED STATES PATENT OFFICE.

EDMUND HUGH HODGKINSON, OF MIDDLESEX COUNTY, ENGLAND.

BELT, ROPE, OR CHAIN GEARING.

SPECIFICATION forming part of Letters Patent No. 702,948, dated June 24, 1902.

Application filed November 7, 1901. Serial No. 81,451. (No model.)

To all whom it may concern:

Be it known that I, EDMUND HUGH HODGKINSON, gentleman, a subject of the King of Great Britain, residing at 8 Lancaster Gate, in the county of Middlesex, England, have invented certain new and useful Improvements in Chain-Shifters for Bicycles, &c., of which the following is a specification.

In the specifications of my prior patents, Nos. 617,572 and 619,572, I described a chain-lifter for lifting the driving-chain from a driving-wheel of a bicycle or the like. In the arrangement described in the specifications of these patents it was necessary to reverse the movement of the chain before the chain-lifter could be operated. Also it was found that the lifter was sometimes crushed between the chain and the pinion. According to this invention to obviate these disadvantages the chain-lifter is so fitted as to turn downward and engage with the slack portion of the chain. It is also found that in applying this invention to motor-cars the chain-pinions of different sizes are usually applied to the driving-wheel and also that the pressure of the jockey-wheel on the chain is so strong that means have to be supplied for regulating this pressure and for disengaging the jockey-wheel from the chain.

In the drawings, Figure 1 shows a side elevation of a bicycle embodying my improvements. In this figure the driving-chain is shown as being on the smallest pinion. Fig. 2 is a view, on an enlarged scale, of the chain-lifter and some of the parts associated therewith. In this figure the chain-lifter is shown in position lifting the chain from the pinions. Fig. 3 is a plan view, on an enlarged scale, of a portion of the chain-lifter and some of the devices associated therewith. Fig. 4 shows a vertical transverse section of the devices shown in Fig. 3. Fig. 5 is a diagram illustrating the manner of applying my improvements when the pinions are on the driving-shaft.

1 is the pedal-axis, on which is the driving-chain wheel 2.

3 is the driving-chain, of which the lower portion is normally slack.

4 4 4 are three driven-chain pinions sliding on the tubular spindle 5 of the driven road-wheel.

6 and 7 are the two limbs of the chain-lifter turning on a boss 8 on the solid spindle 9 of the same wheel. A spring 10, attached to the upper backstay 11, is connected by a cord 12 to the leading limb 6 and retains the chain-lifter when closed, a buffer 13 on the leading limb pressing the following limb 7 against a stop 14 on the lever 15.

The cord 16 for operating the chain-lifter is attached to the limb 6 and is lapped partially around the boss 18 of the limb and passes through guides 19, 20, and 21 to an adjusting-screw 22 on the slider 23. When the slider is pulled up, the limb 6 opens downward toward the normally slack or lower portion of the chain, and as it turns strikes against a catch 24 on the limb 7 and carries it around until the catch 24 engages with a stop 25 on the frame. The pinions 4 can now be moved laterally by means of the lever 15, pivoted at 26 to the lower backstay 27 and engaging with an annular groove 28 on the pinion-block. The lever 15 is actuated by a cord 29, which passes through the guides 20 and 21 and is attached to an adjusting-screw 30, pivoted at 31 to the arm 32 of the speed-lever 33 for shifting the pinions.

A spring 34, engaging with the lever 15, always tends to put the inside pinion in gear.

In Fig. 5 the pinions 4 are mounted and can slide laterally on the driving-shaft 1 or on a sleeve upon it.

The limbs 6 and 7 of the chain-lifter are pivoted on a fixed projection on the frame. A spring 35, attached to the frame, is connected by a cord 36 to the limb 6 and retains the chain-lifter when closed, a buffer 13 pressing the limb 7 against a stop 37 on the frame. The cord 16 for opening the chain-lifter is attached to limb 6 and to the slider 23, as before.

Before opening the chain-lifter the driving-shaft is stopped or reversed, or when the shaft is continuously driven the pinions are disconnected from the shaft by a clutch.

The driven pinion chain wheel 38 is connected to the driven shaft 39 by a clutch which drives only in the forward direction or by a disconnecting clutch which is disconnected before opening the chain-lifters.

In some cases it is found necessary to lessen the pressure of the jockey-wheel 40. In the

arrangement shown in Fig. 5 the jockey-wheel is mounted on a lever 41, pivoted to the frame at 60, and is kept pressing against the chain by the spring 42. One end of a bell-crank lever 43, pivoted to the frame at 44, is attached to the lever 45 by a flexible connection 46. The other end of the bell-crank lever 43 is pressed downward by the driver when it is desired to lessen the pressure on the chain.

What I claim is—

1. The combination of a driving-wheel, means for operating it, a wheel to be driven, chain-pinions of different sizes connected with one of said wheels, a chain engaging with the pinions, a chain-lifter, means for turning the chain-lifter downward during the first part of its motion, and means for shifting the pinions.

2. The combination of a driving-wheel, means for operating it, a wheel to be driven, chain-pinions of different sizes connected with the wheel to be driven, a chain connecting the driving-wheel with the pinions, a chain-lifter formed in two parts, means whereby one part after moving independently actuates the other part, means for turning the first part downward during the first part of its motion and means for shifting the pinions.

3. The combination of a driving-wheel, means for operating it, a wheel to be driven, chain-pinions of different sizes connected with the wheel to be driven, a chain connecting the driving-wheel with the pinions, a chain-lifter formed in two parts, mounted inside the frame of the machine, means for turning the first part of the chain-lifter downward during the first part of its motion to cause it after moving for a time independently, to actuate the other part, and means for shifting the pinions.

4. The combination of a driving-wheel, means for operating it, a wheel to be driven, chain-pinions of different sizes connected with one of said wheels, a chain engaging with the pinions, means for changing the chain from one pinion to another, a jockey-wheel engaging with the chain, and means under the control of the rider, for moving the jockey-wheel away from the chain in order to relieve the pressure thereof, and permit the chain-changing means to operate easily.

EDMUND HUGH HODGKINSON.

Witnesses:

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