

No. 641,465.

Patented Jan. 16, 1900.

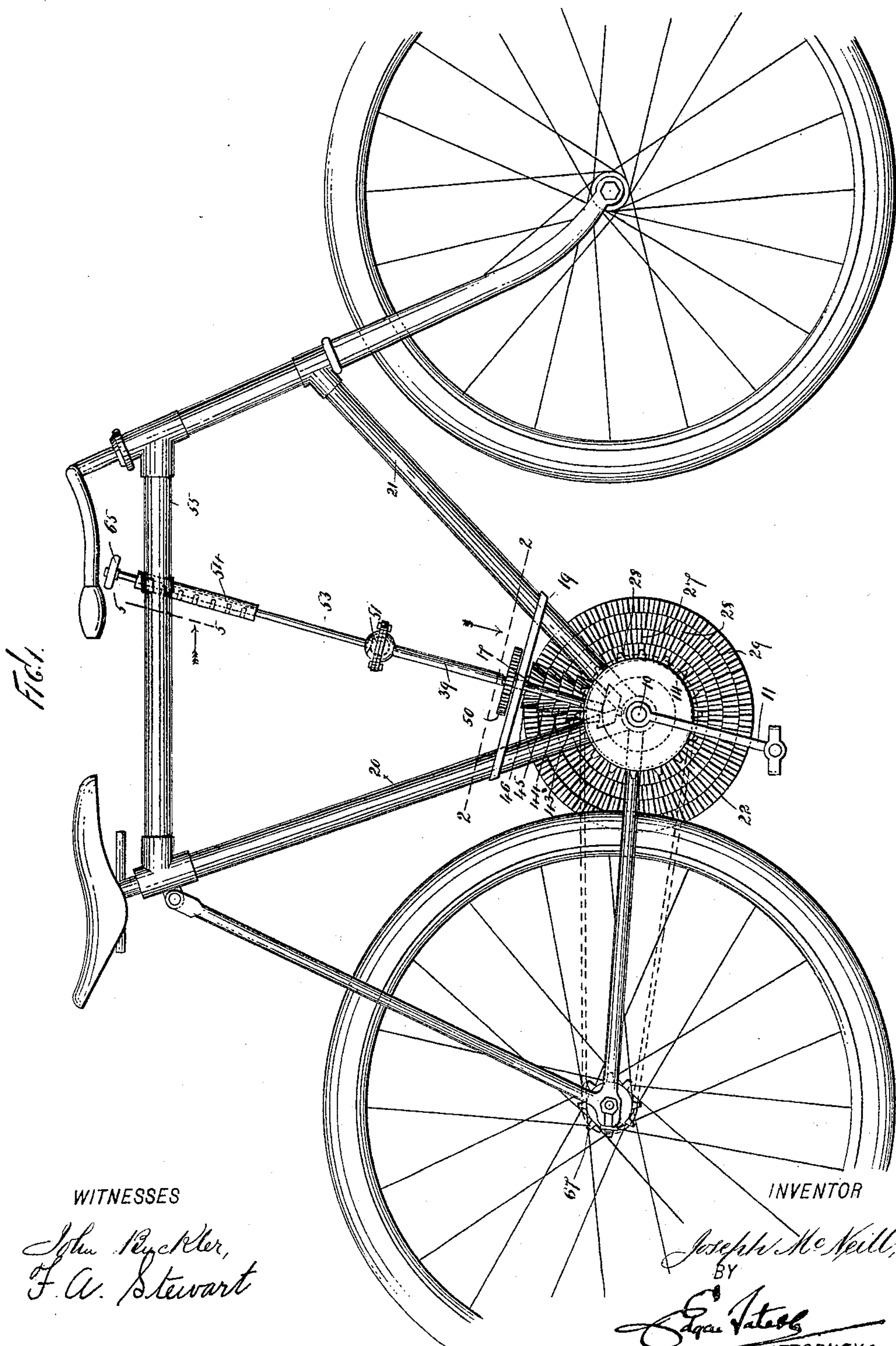
J. McNEILL.

PROPELLING MECHANISM FOR BICYCLES.

(Application filed Apr. 4, 1899.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES

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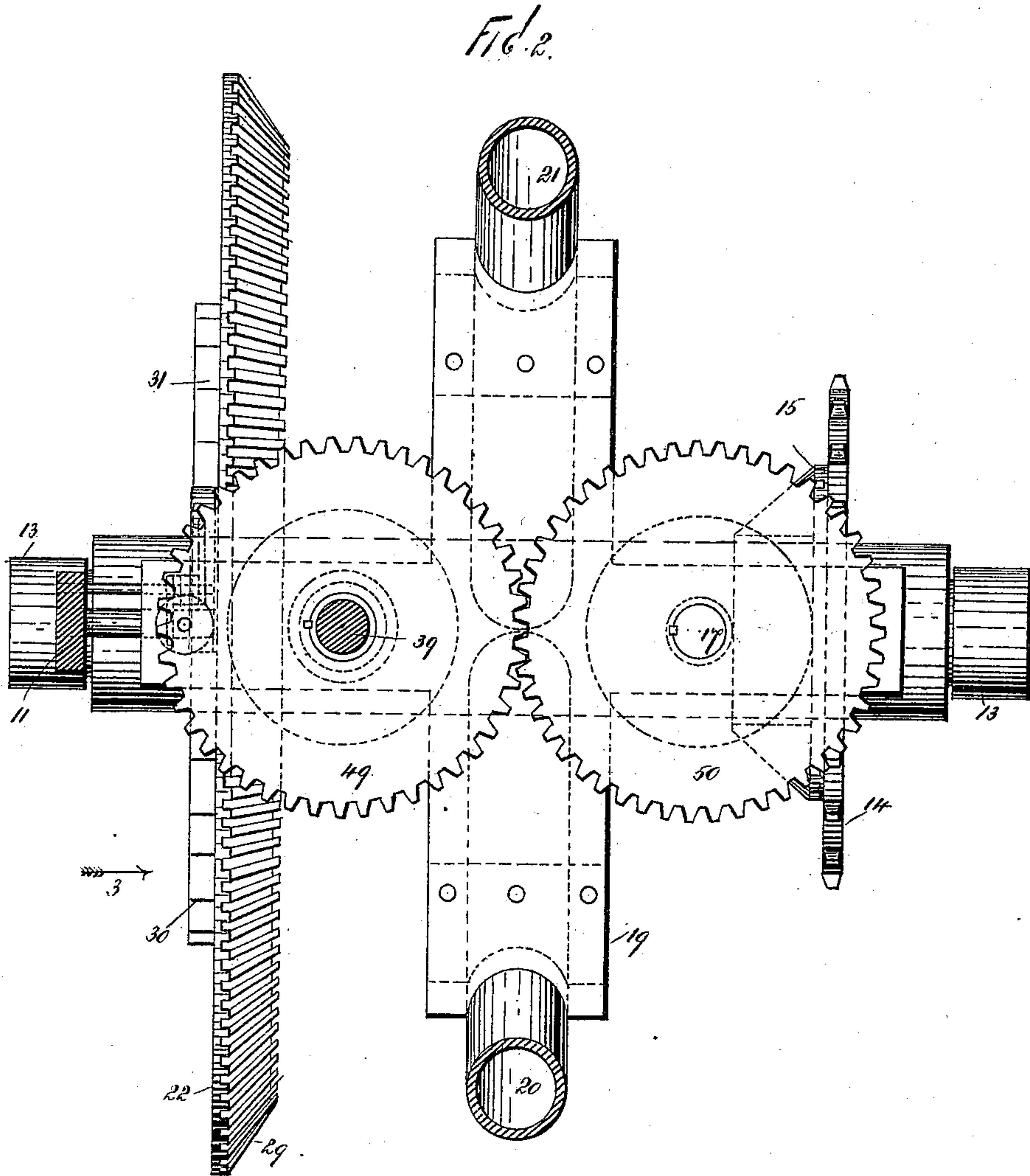
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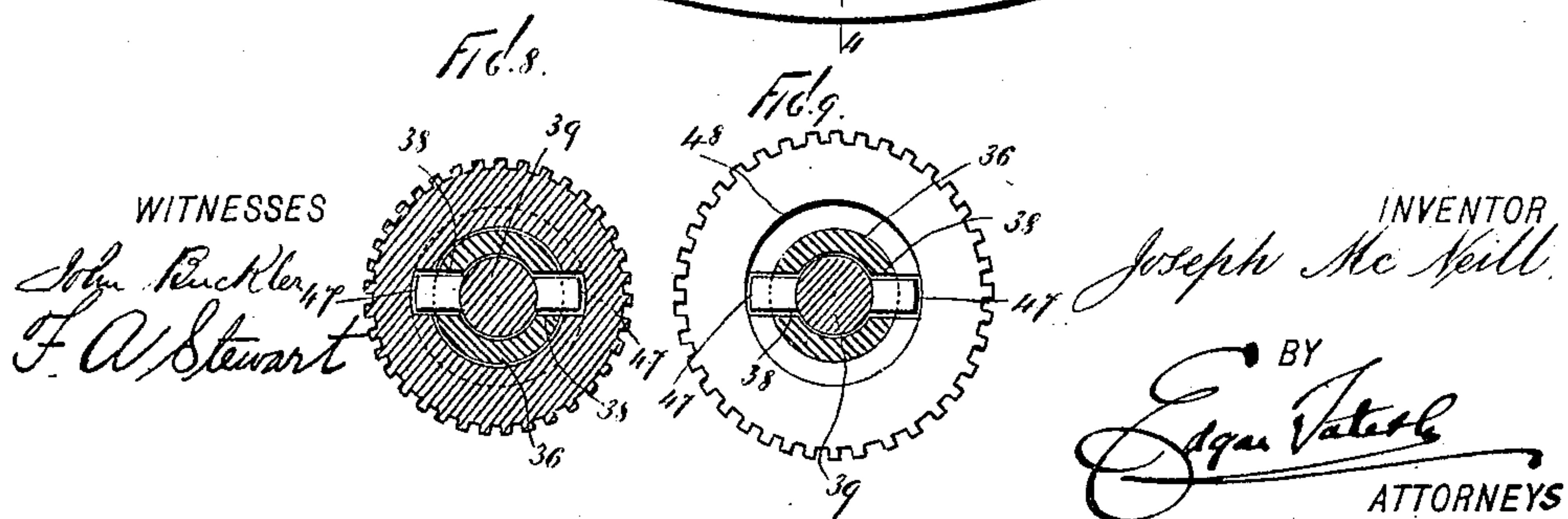
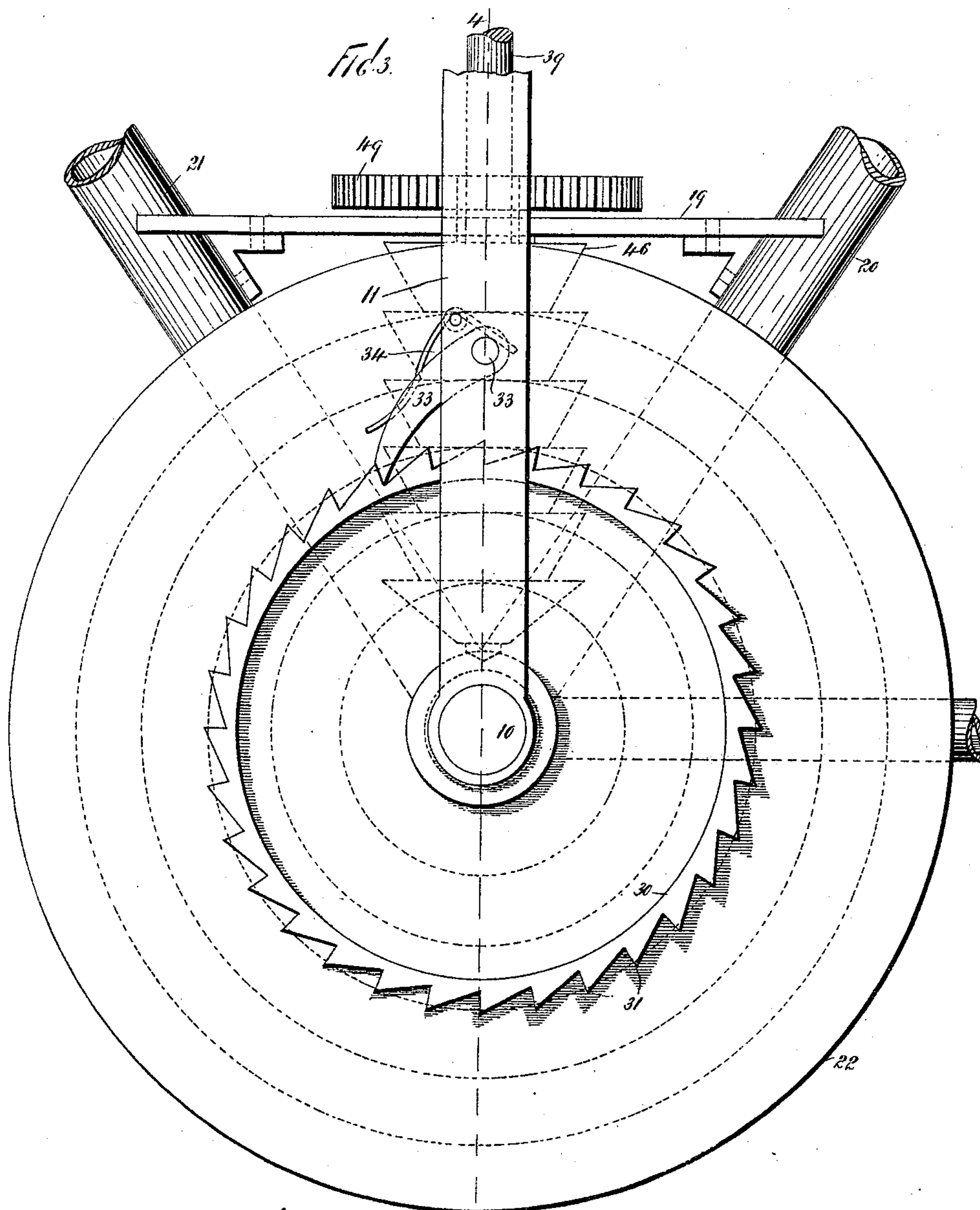
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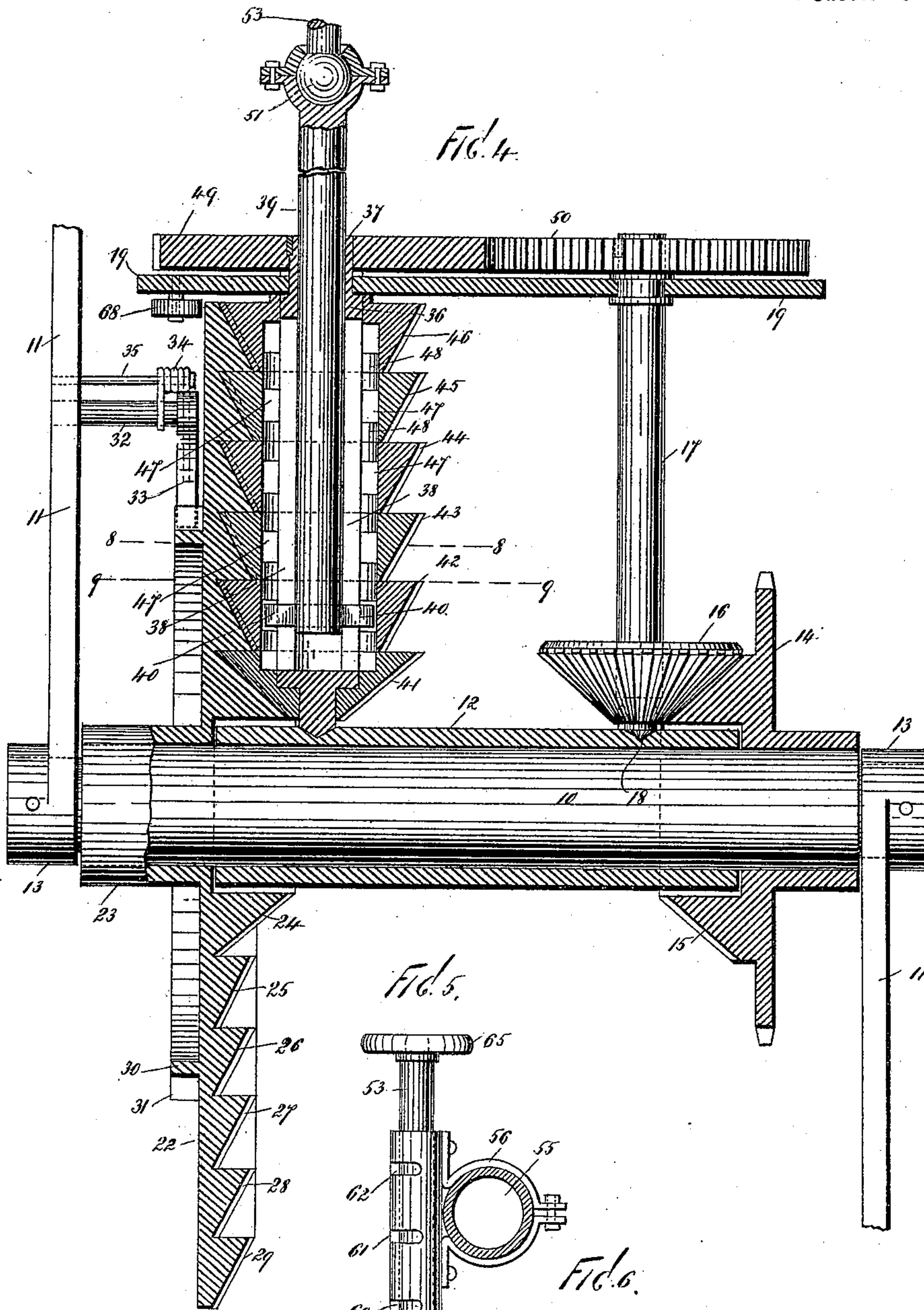


FIG. 5.

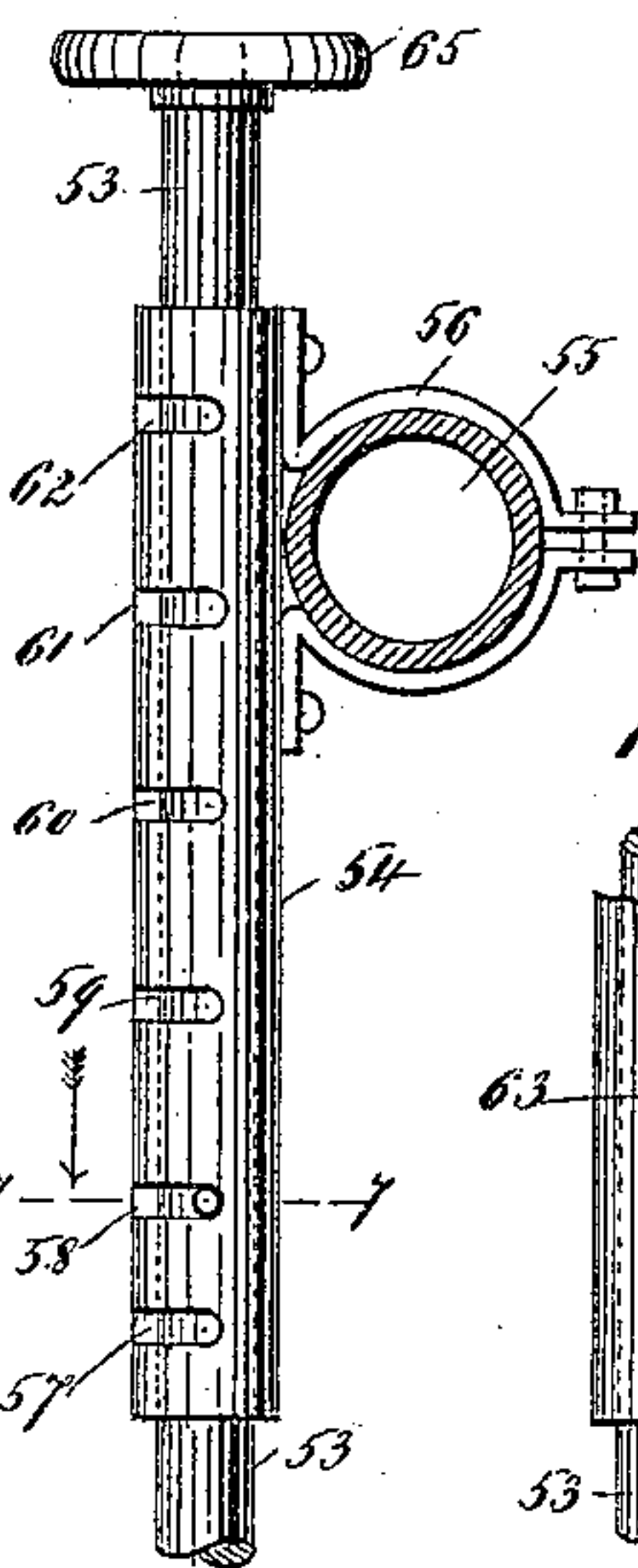


FIG. 6.

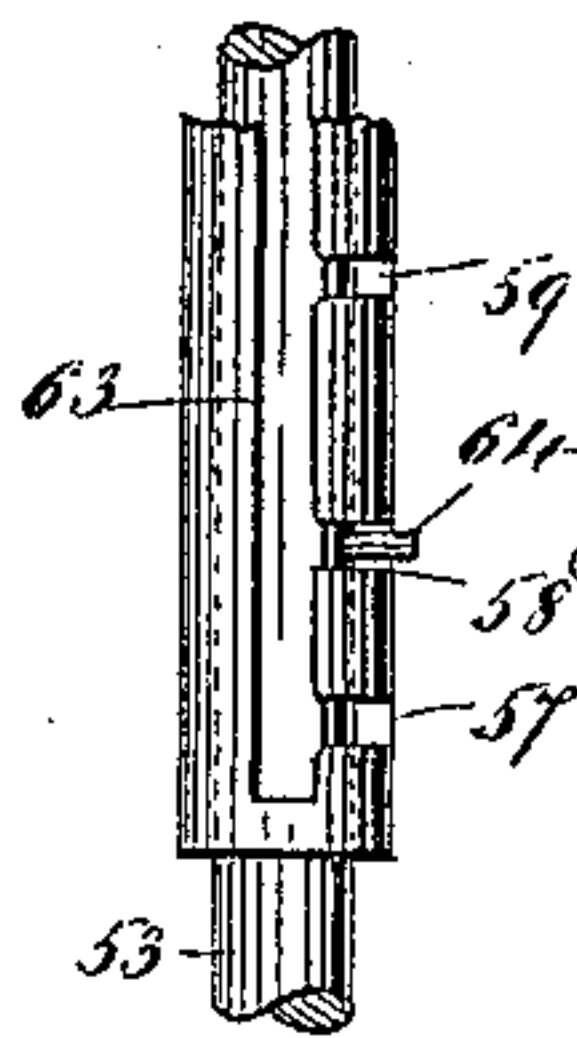
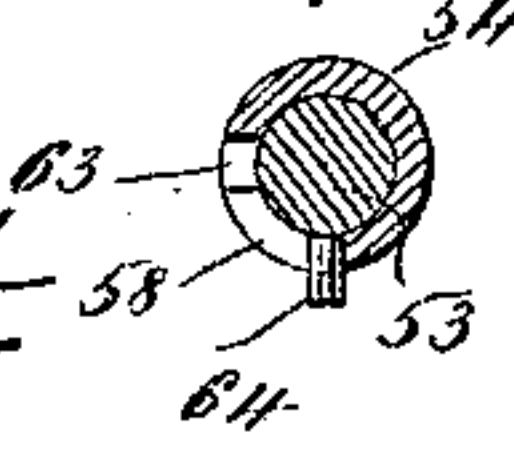


FIG. 7.



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JOSEPH MCNEILL, OF NEW YORK, N. Y.

PROPELLING MECHANISM FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 641,465, dated January 16, 1900.

Application filed April 4, 1899. Serial No. 711,696. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH MCNEILL, a subject of the Queen of Great Britain, residing at New York, (Brooklyn,) in the county of Kings and State of New York, have invented certain new and useful Improvements in Propelling Mechanism for Bicycles and Similar Vehicles, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to propelling mechanism for bicycles and similar vehicles; and the object thereof is to provide an improved mechanism for this purpose, whereby the speed of the vehicle may be regulated as desired, a further object being to provide a mechanism of the class described which is so constructed and arranged that the speed of the vehicle may be quickly and easily decreased whenever desired, as when going uphill or over rough roads, and correspondingly increased when on level and smooth roads.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a side view of a bicycle provided with my improved propelling mechanism; Fig. 2, a plan view of the mechanism, taken on the line 2 2 of Fig. 1, said mechanism being on an enlarged scale; Fig. 3, a side view looking in the direction of the arrow 3 of Fig. 2; Fig. 4, a section on the line 4 4 of Fig. 3; Fig. 5, a section on the line 5 5 of Fig. 1; Fig. 6, a partial view of the device shown in Fig. 5, taken at right angles to said figure; Fig. 7, a section on the line 7 7 of Fig. 5; Fig. 8, a section on the line 8 8 of Fig. 4, and Fig. 9 a section on the line 9 9 of Fig. 4.

In the drawings forming part of this specification the separate parts of my improvement are designated by the same numerals of reference in each of the views, and in said drawings, reference being made to Fig. 1, I have shown an ordinary bicycle provided with the usual pedal-shaft 10 and pedal-cranks 11. The shaft 10 passes through the usual tubular casing or support 12, as shown in Fig. 4, and which forms a rigid part of the stationary frame of the vehicle, and said shaft 10 is also preferably reduced in size at the end, and the pedal-cranks 11 are provided with tubular

heads 13, by which they are connected with said shaft.

Mounted loosely on one end of the pedal-shaft 10 is the usual sprocket-wheel 14, which is provided on its inner side with a conical gear 15, and said sprocket-wheel is operated by a beveled gear 16, keyed to a shaft 17 or formed integrally therewith, an end of which is pivoted on the tubular casing or support 12 at 18, and the other end of which passes through a support 19, secured to the frame of the vehicle, as shown in Figs. 1 and 3. The support 19 in the form of vehicle shown in the drawings is secured to the rods 20 and 21, which lead from the support of the pedal-shaft upwardly to the seat-support and outwardly and forwardly to the tubular head of the frame through which the stem of the front fork passes; but said support may be connected with the frame of the vehicle in any desired manner, the manner of making this connection depending upon the form of the frame employed.

Mounted loosely on the end of the pedal-shaft 10, opposite the sprocket-wheel 14, is a large gear-wheel 22, provided with a hub 23, and said gear-wheel is provided on its inner side with a plurality of concentric beveled gears 24, 25, 26, 27, 28, and 29, these beveled gears, as shown in the drawings, being six in number and increasing in diameter from the center outwardly. In the construction shown in the drawings the gear-wheel 22 is also provided at its outer side and about midway from the center with an annular flange 30, provided with ratchet-teeth 31, and the pedal-crank 11 adjacent to said wheel is provided with an inwardly-directed pin or support 32, on which is pivoted a spring-depressed pawl 33, which operates in connection with the ratchet-teeth 31, and said pawl is depressed by a spring 34, secured to a support 35, connected with the pedal-crank 11, with which the pin or support 32 is connected. I also provide a tubular sleeve 36, (see Figs. 4, 8, and 9,) which is pivoted on the tubular casing or support 12, through which the pedal-shaft passes, adjacent to the gear-wheel 22, and the outer end of which is provided with a reduced extension 37, which passes through the support 19, and the sleeve 36 is provided on its opposite side with longitudinal slots 38, and passing

through said sleeve is a shaft 39, which is free to move longitudinally in said sleeve and which is provided at its lower or inner end with side lugs or projections 40, which pass through the slots 38 in the sleeve 36.

Mounted on the sleeve 36, between the support 19 and the tubular casing or support 12, through which the pedal-shaft 10 passes, are beveled gear-wheels 41, 42, 43, 44, 45, and 46, which correspond, respectively, with the beveled gears 24, 25, 26, 27, 28, and 29 on the wheel 22, and each of these beveled gear-wheels is provided in the opposite sides of the central bore thereof with notches or recesses 47, adapted to receive the lugs or projections 40 on the lower or inner end of the shaft 39, and between these notches or recesses 47 are formed annular spaces 48, said annular spaces being formed in the adjacent sides of the adjacent beveled gear-wheels, as clearly shown in Figs. 4, 8, and 9.

Mounted on the screw-threaded extension 37 of the sleeve 36 and keyed thereto is a gear-wheel 49, which operates in connection with a corresponding gear-wheel 50 on the end of the shaft 17, and the outer or upper end of the shaft 39 is connected, by means of a ball-and-socket joint 51, with the lower end of a shaft 53, the upper end of which passes through a sleeve 54, secured to the upper horizontal rod 55 of the frame of the vehicle by means of a clamp 56.

The sleeve 54 is provided at one side with transverse slots 57, 58, 59, 60, 61, and 62, and these slots correspond, respectively, with the gear-wheels 41, 42, 43, 44, 45, and 46, which operate, respectively, in connection with the gears 24, 25, 26, 27, 28, and 29, on the gear-wheel 22.

The sleeve 54 is provided at one side with a longitudinal slot 63, with which the transverse slots 57 to 62, inclusive, communicate, and the shaft 53 is provided with a pin 64, which is adapted to move in the slot 63 and to be turned into the slots 57 to 62, inclusive.

In the forward movement of the pedal-cranks 11 the pawl 33 engages the ratchet-teeth 31 and turns the gear-wheel 22, and the shaft 53 is also provided at its upper end with a handle 65, which may be of any desired form, and the operation of my improved propelling mechanism will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following statement thereof.

The shaft 53 is free to turn on the shaft 39, and by pulling the shaft 53 upwardly through the sleeve 54 the lugs or projections 40 at the lower end of the shaft 39 may be made to engage with either of the gear-wheels 41 to 46 on the sleeve 36, and either of said gear-wheels may thus be locked to the sleeve 36 and caused to turn said sleeve, it being understood that the gear-wheel 22 when turned by the adjacent pedal-crank 11 will turn either of the gear-wheels 41 to 46, as may be desired.

By moving the shafts 53 and 39 inwardly or

downwardly to the limit of their movement the lugs or projections 40 may be made to engage with the inner or lower gear-wheel 41, and in this position of the parts the wheel 22 will operate the gear-wheel 41 to turn the sleeve 36. The wheels 49 and 50 will also be operated, the shaft 17 will be turned, and the gear-wheel 16 will operate the sprocket-wheel 14. It will be understood that the sprocket-wheel 14 is in practice geared in connection with a corresponding sprocket-wheel 67 on the hub of the drive-wheel, as indicated in Fig. 1, and the vehicle will be propelled in the usual manner. When the gear-wheel 41 on the sleeve 36 is thus locked, the lowest degree of speed of which my improved propelling mechanism is capable will be obtained.

By moving the shafts 39 and 53 outwardly the gear-wheel 42 may be locked to the sleeve 36, as shown in Fig. 4, and a higher degree of speed may be thus secured. In this way the speed may be increased by moving the shafts 53 and 39 outwardly, so as to successively lock the wheels 43, 44, 45, and 46, and at each movement of said shafts outwardly and as said wheels are successively locked to the sleeve 36 the speed will be correspondingly increased, and the speed of the vehicle may be thus regulated as desired, it being understood that the lugs or projections 40 may be moved from the inner gear-wheel 41 to the outer one 46 at one movement or so as to engage either of the wheels 41 to 46, if desired.

It will be seen that the shafts 43 and 49 are locked in the desired position by simply turning the shaft 53 so that the pin 64 will engage with any one of the transverse slots 47 to 62 in the sleeve 54.

The conical gear 15 on the sprocket-wheel 14 projects inwardly and incloses the corresponding end of the tubular casing or support 12, through which the pedal-shaft passes, and the beveled gear-wheel 24 on the wheel 22 is similar in form to the gear 15 and incloses the corresponding end of said casing or support, and all dust is thus excluded from or prevented from entering said casing or support.

A wheel or roller 68 is mounted beneath the support 19 adjacent to the perimeter of the wheel 22 and at the outer side thereof and serves as a frictional bearing for said wheel 22 and aids to retain the perimeter of said wheel in proper position.

It will also be seen that by the construction herein described I provide means to enable the rider of the vehicle to "coast" without removing his feet from the pedals, as the wheel 22 and the sprocket-wheel 14 and the parts in operative connection therewith will continue to revolve when the pedal-shaft is held stationary, this result being accomplished by the pawl 33 moving freely over the ratchet-teeth on the flange or rim 30 when the pedal-shaft is held stationary.

The entire apparatus is simple in construction and operation and perfectly adapted to accomplish the result for which it is intended,

and it will be apparent that changes in and modifications of the construction described may be made without departing from the spirit of my invention or sacrificing its advantages.

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

In a propelling mechanism for bicycles and similar vehicles, a pedal-shaft passing through a stationary support, a sprocket-wheel loosely mounted on one end thereof, a main gear-wheel mounted on the opposite end and adapted to turn therewith, said gear-wheel being provided on its inner side with a plurality of concentrically-arranged beveled gears, a sleeve mounted radially of the inner side of said gear-wheel, supplemental beveled gear-

wheels loosely mounted on said sleeve, a shaft mounted radially of said sprocket-wheel and on the inner side thereof, a gear-wheel connected with said shaft for operating said sprocket-wheel, said sleeve and said shaft being also geared in connection, and means for locking the said supplemental beveled gear-wheels to the said sleeve, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 3d day of April, 1899.

JOSEPH MCNEILL.

Witnesses:

F. A. STEWART,
V. M. VOSLER.