

No. 654,986.

Patented July 31, 1900.

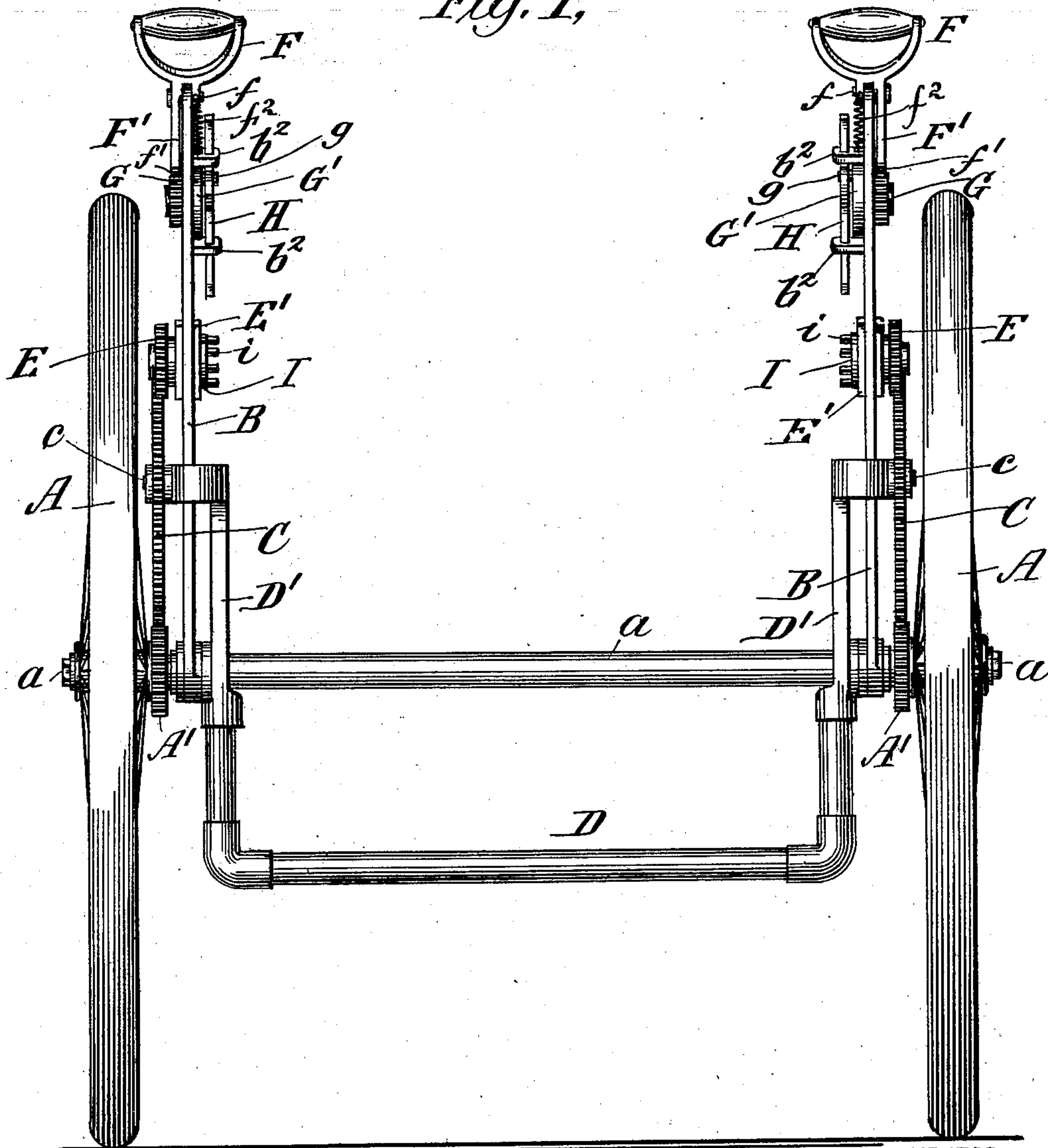
T. F. KRUEGER.
HAND OPERATED MOTOR.

(Application filed Nov. 20, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1,



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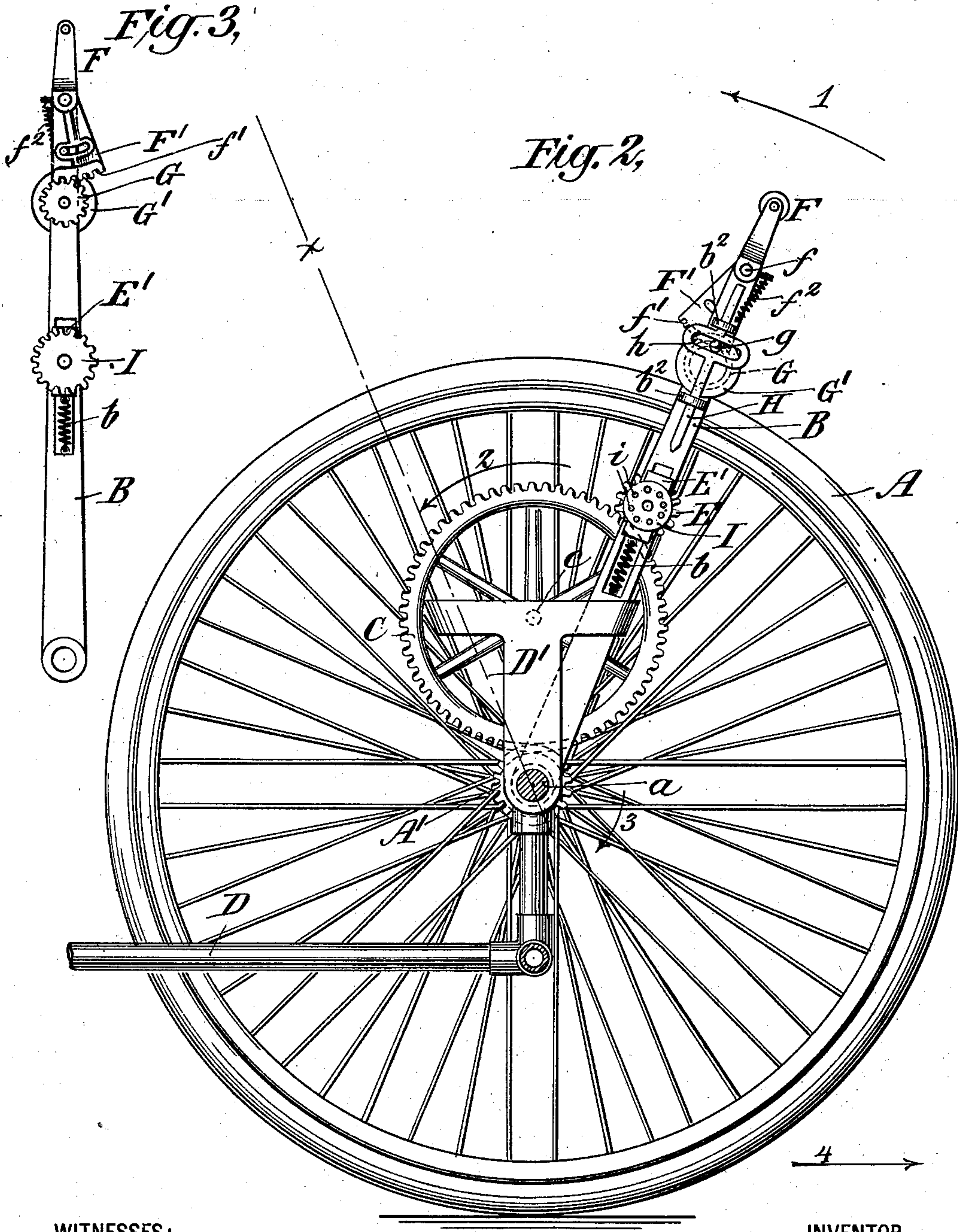
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

THEODORE F. KRUEGER, OF NEW YORK, N. Y.

HAND-OPERATED MOTOR.

SPECIFICATION forming part of Letters Patent No. 654,986, dated July 31, 1900.

Application filed November 20, 1899. Serial No. 737,573. (No model.)

To all whom it may concern:

Be it known that I, THEODORE F. KRUEGER, a citizen of the United States of America, and a resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Hand-Operated Motors, of which the following is a specification.

This invention has reference to motors, and more particularly to hand-operated motors, in which the rider by means of a novel mechanism effects a continuous rotary motion and thereby locomotion.

The invention consists especially in a novel motor or driving mechanism characterized by a semiflexible joint or connection forming part of the movable lever through which the motion of the vehicle is initiated.

It consists, further, in certain various novel features and in the arrangement and combination of the mechanical elements composing the motor.

My new hand-operated motor is principally applied to tricycles and similar small and light vehicles which are used for outdoor pleasure trips. They are safe and convenient for children and afford a great commodity during convalescence.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a view looking toward the rear of the cycle fitted with a hand-motor embodying my invention. Fig. 2 is a transverse section of the same, and Fig. 3 is a detail view of certain portions of the motor or driving mechanism.

Similar letters of reference denote like parts in all the drawings.

The drawings illustrate the bottom portion of the cycle. It is preferably a tricycle; but there may be any number of wheels as may be desired. I have shown two hand-motors comprising suitable driving mechanism, one fitted to each of the large driving-wheels A, of which two are shown. I will now proceed to describe one of said motors or driving mechanisms, it being understood that the one shown on the opposite side of the machine is a duplicate thereof.

B designates a lever loosely mounted upon the axle *a* of the driving-wheel A.

A' designates a pinion secured to rotate with the drive-wheel A.

C designates a spur-gear loosely mounted on a stud or pin *c*, secured to an uprising portion D' of the frame D.

E is a driving-pinion mounted upon a block E', which slides longitudinally inwise in the lever B. A spring *b* tends to pull the block E' downwardly and retain the pinion E in mesh with the spur-gear C.

The lever B is provided with a handle or hand-piece F, which is pivoted to the said lever at the point *f*. The handle F has an extension F' on the opposite side of the pivot, which is provided with gear-teeth *f'*, forming a segment of a gear. This segment engages with a pinion G, arranged on the same side of the lever as is the pinion E. Upon the opposite side of the lever, but mounted upon the same stud upon which the gear G is mounted, and hence adapted to rotate with same, is a crank-disk G'. This crank-disk carries a wrist-pin *g*. The wrist-pin *g* engages with a slot *h*, arranged in the locking-bar H, as shown. The locking-bar H is mounted and arranged to slide in suitable bearings *b*² upon the lever B. I is a disk mounted upon the same stud upon which the pinion E is mounted and upon that side of the lever B as the crank-disk G'. The disk I has a plurality of pins or projections *i*, being just about sufficient to receive the locking-bar H. The disk I being secured to the stud upon which is mounted the pinion E is of course arranged to rotate with same and when locked against rotation will prevent the rotation of the said pinion.

*f*² is a spring which tends to return the handle F to its normal position after it has been moved out of such position and released and to hold it in position against accidental displacement.

The above-described arrangement and construction of the handle F and the bar B causes the joint *f* to become a flexible connection. When the handle F is grasped and pulled in the direction of the arrow 1, the resistance in

the gearing is sufficient to overcome the tension of the spring f^2 and the gear G, and the crank-disk G' is caused to rotate, forcing the locking-bar H downwardly and causing the end of same to enter between two of the pins or projections i upon the disk I and to lock the said disk, and consequently the gear E, from rotation. A further pull of the handle F in the direction of the arrow 1 will move the lever B in the direction of said arrow and by reason of the fact that the gear E is locked will cause the complete rotation in the direction of the arrow 2 of the spur-gear C. This will transmit motion in the direction of the arrow 3 to the pinion A', and the said pinion being fast upon the driving-wheel A will drive the said wheel forwardly in the direction of the arrow 4. While the lever B is passing from the position shown in the drawings in Fig. 2 to the position illustrated by the dotted line X across the center line in said figure, the pinion E, consequent upon the difference in the arc described by the lever B from its center a and the top of the spur-gear C from its center c , will be given a motion longitudinally upon the bar B against the tension of the spring b . This motion does not interfere with the locking engagement of the bar H, the said bar being arranged to slide freely between the pins or projections i upon the disk I. When the lever has completed its stroke and is ready to return, the first movement on the opposite side of the arrow, it will cause the handle F and the segment of the gear secured thereto to return to its normal position and will withdraw the locking-bar H from between the pins and projections i upon the disk I. This will free the pinion E, and during the return movement of the lever B the said pinion will rotate freely, and the continued movement of the spur-gear C in the direction of the arrow 2, consequent upon the momentum of the driving-wheel A, will be permitted, fresh driving force being again exerted upon the said spur-gear upon following the movement of the lever B in the direction of the arrow 1.

The locking-bar H is arranged, as shown, to move such a distance that it will clear the pins or projections i upon the disk I when out of engagement therewith at any point of movement longitudinal upon the lever of the pinion E.

In the described manner a hand-operated motor or driving mechanism is produced which is simple and very effective and which permits of the use of the most advantageous proportions in transmission-gearings.

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

1. A hand-operated motor composed of a pinion secured to the axle of the driving-wheels, a spur-gear mounted loosely on a stud

contained in an uprising portion of the frame and meshing the pinion, a lever with handle mounted loosely on the driving-axle, a driving-pinion mounted upon a block which slides longitudinally in ways in the lever, a spring below the block tending to retain the driving-pinion in mesh with the spur-gear, a disk mounted upon the stud of the driving-pinion provided with projections, and a driving-pinion-locking device coöperating with said projections, substantially as described.

2. In a hand-operated driving mechanism, a lever mounted loosely upon the driving-axle and provided with a semiflexible joint composed of a handle pivoted to the top of the lever, a spring below the handle tending to return same to its normal position when released, a downward handle extension on the opposite side of the pivot forming below a segment of gear-teeth, a gear-pinion meshing with the toothed segment, a driving-pinion mounted upon a block which slides longitudinally in ways in the lever, a spur-gear meshing with the sliding pinion, a disk secured on the stud of the sliding pinion and provided with projections, a sliding-pinion locking device coöperating with said projections, and a connection between the gear-pinion and said locking device for operating the latter by the movement of the handle relative to the lever, as specified.

3. In a hand-operated driving mechanism, a lever mounted loosely upon the driving-axle and provided with a semiflexible joint composed of a handle pivoted to the top of the lever, a spring below the handle tending to return same to its normal position when released, a downward handle extension on the opposite side of the pivot forming below a segment of gear-teeth, a gear-pinion meshing with the toothed segment, a driving-pinion mounted upon a block which slides longitudinally in ways in the lever, a spur-gear meshing with the sliding pinion, a disk secured on the stud of the sliding pinion provided with projections, and a sliding-pinion locking device coöperating with said projections composed of a locking-bar with slot sliding in suitable bearings upon the lever, a crank-disk mounted on the stud of the gear-pinion and rotating with same, and a wrist-pin carried by the crank-disk and engaging with the slot, so that upon operating the handle the locking-bar descends between the projections, thereby stopping the rotation of the sliding pinion until released, as specified.

4. In a hand-operated driving mechanism, a lever mounted loosely upon the driving-axle and provided with a semiflexible joint composed of a handle pivoted to the top of the lever, a spring below the handle tending to return same to its normal position when released, a downward handle extension on the opposite side of the pivot forming below a

segment of gear-teeth, a gear-pinion meshing with the toothed-segment, a crank-disk mounted on the stud of the gear-pinion and rotating with same, a wrist-pin carried by the
5 crank-disk, and a locking-bar sliding in suitable bearings upon the lever and having a slot with which the wrist-pin engages, so that upon operating the handle the locking-bar descends and ascends and the pinion is locked

or unlocked by the movement of the bar, as is specified.

Signed by me at New York, N. Y., this 18th day of November, 1899.

THEODORE F. KRUEGER.

Witnesses:

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