

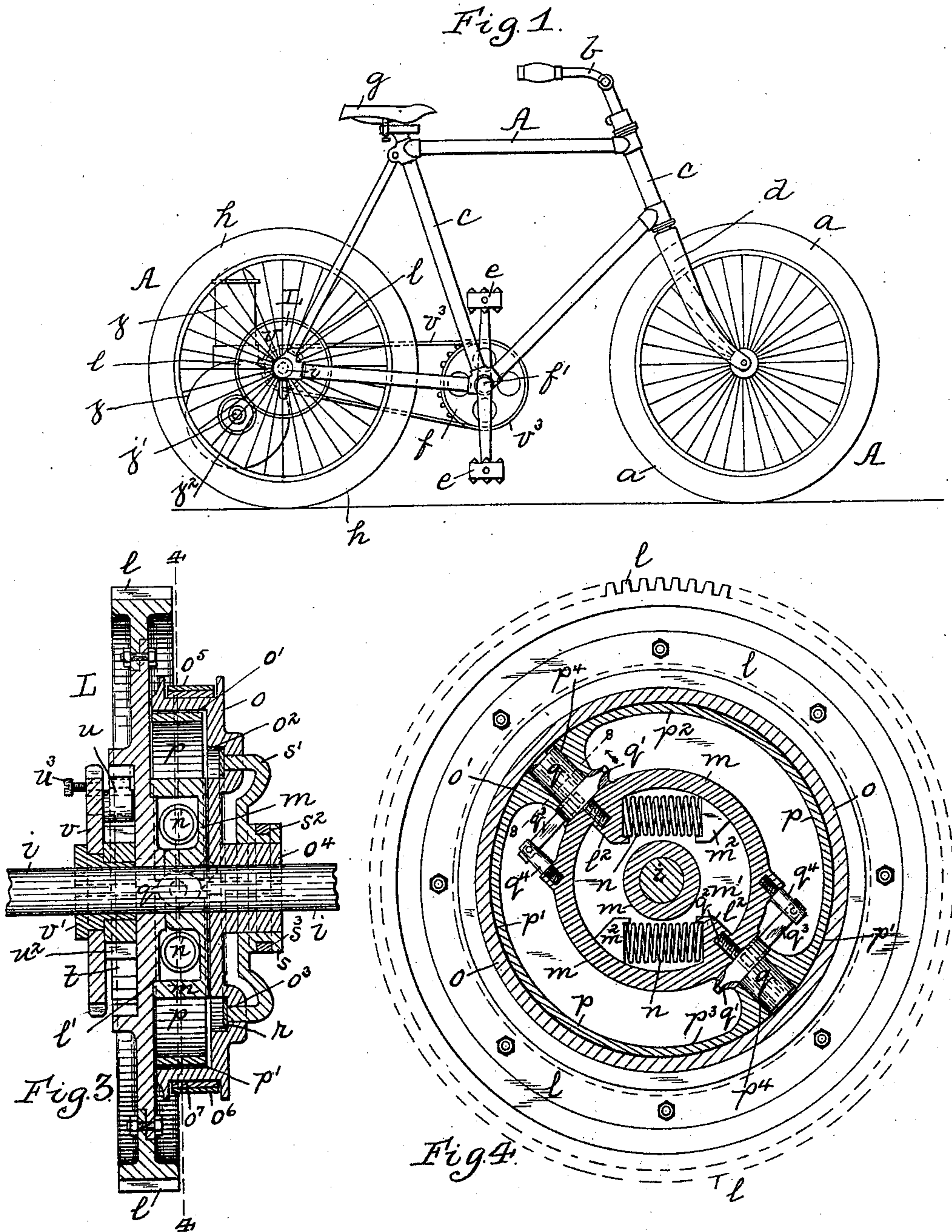
(No Model.)

3 Sheets—Sheet 1.

L. S. CLARKE, W. MORGAN & W. S. GORDON.
MOTOR VEHICLE.

No. 602,283.

Patented Apr. 12, 1898.



Witnesses:

J. B. Switzer
W. H. Blakeley

Inventors.

Louis S. Clarke.
William Morgan.
William S. Gordon.
By J. H. Cooke
Attorney.

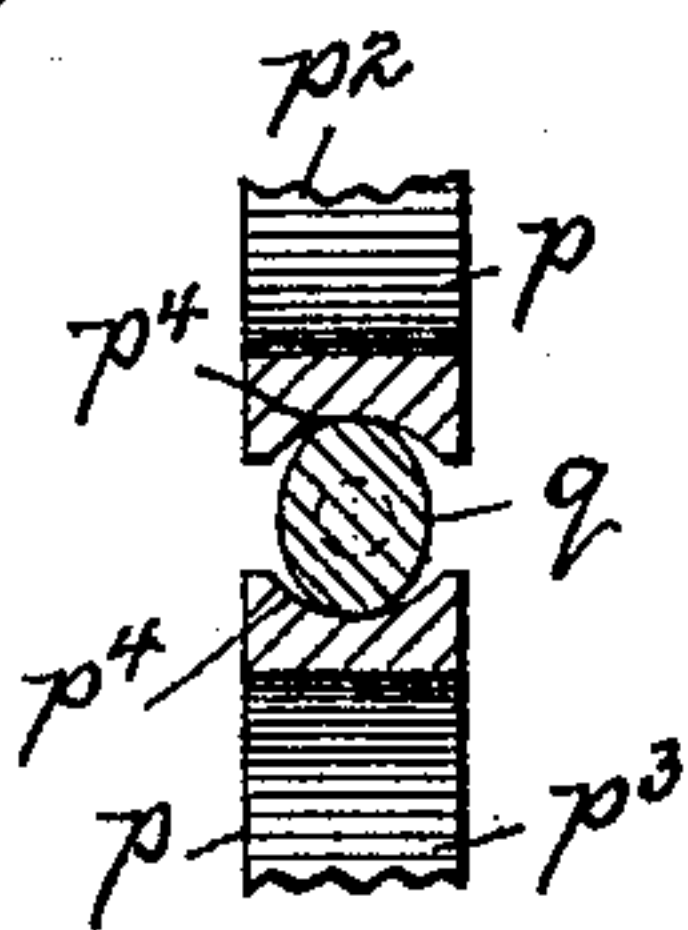
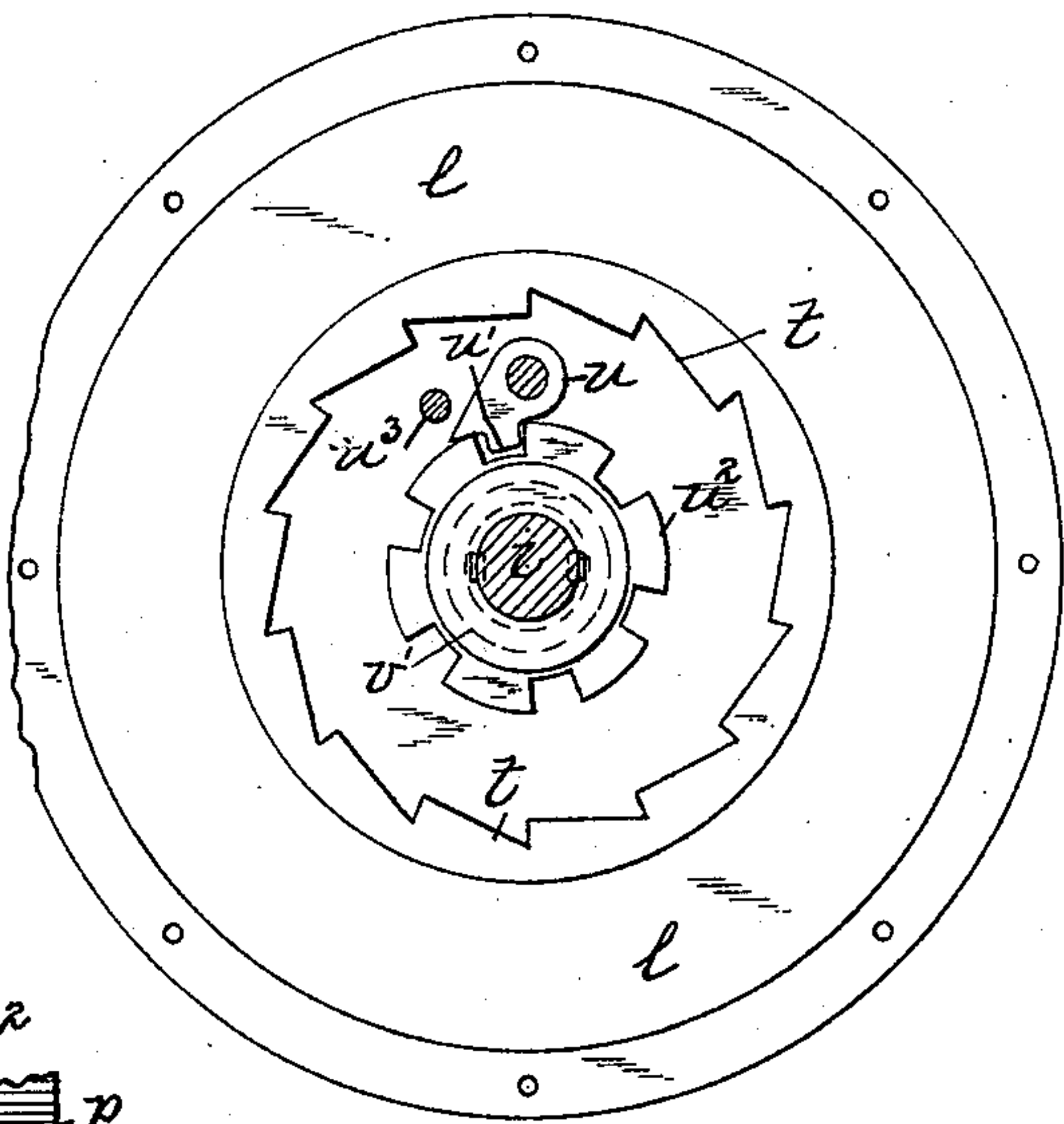
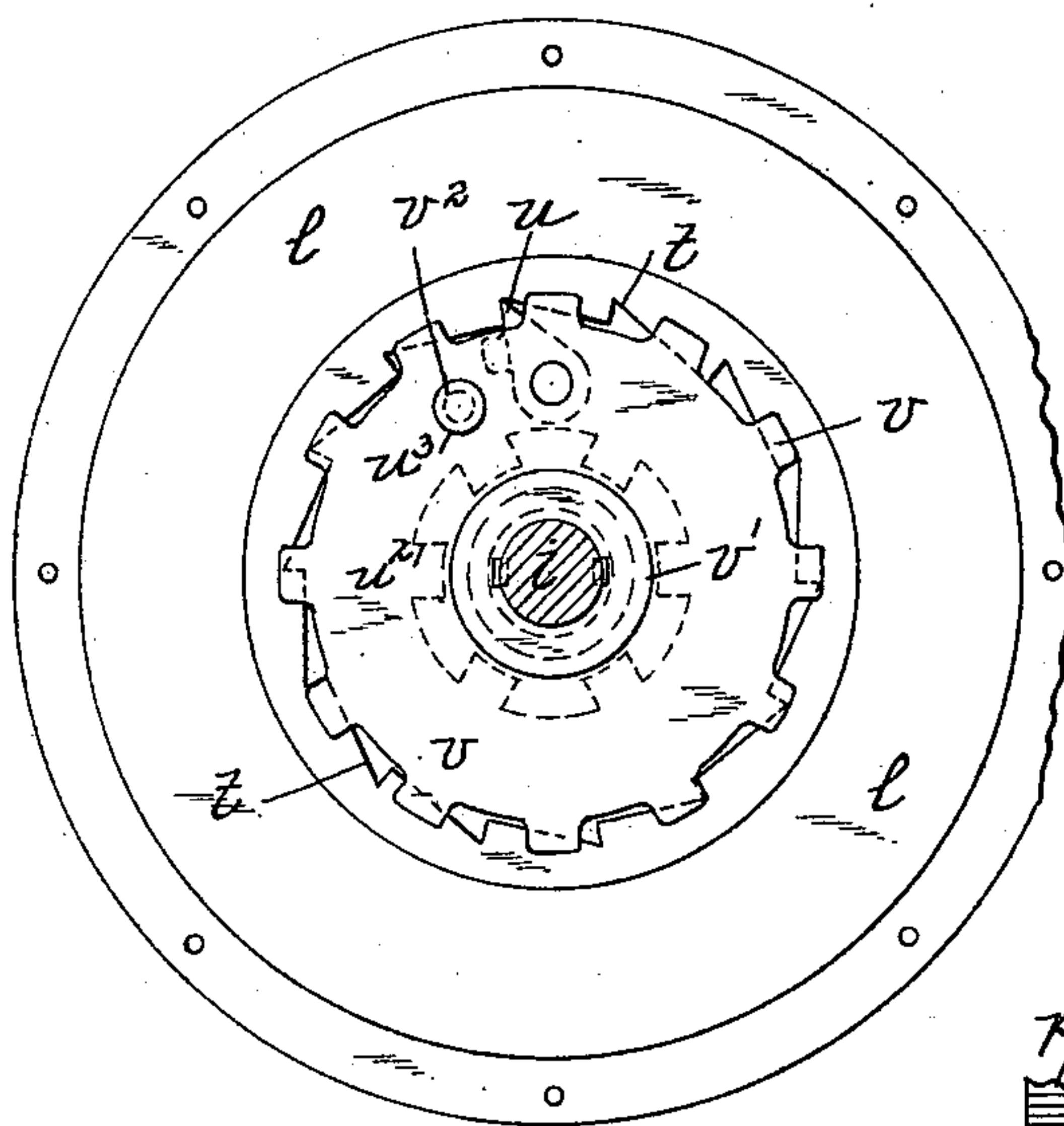
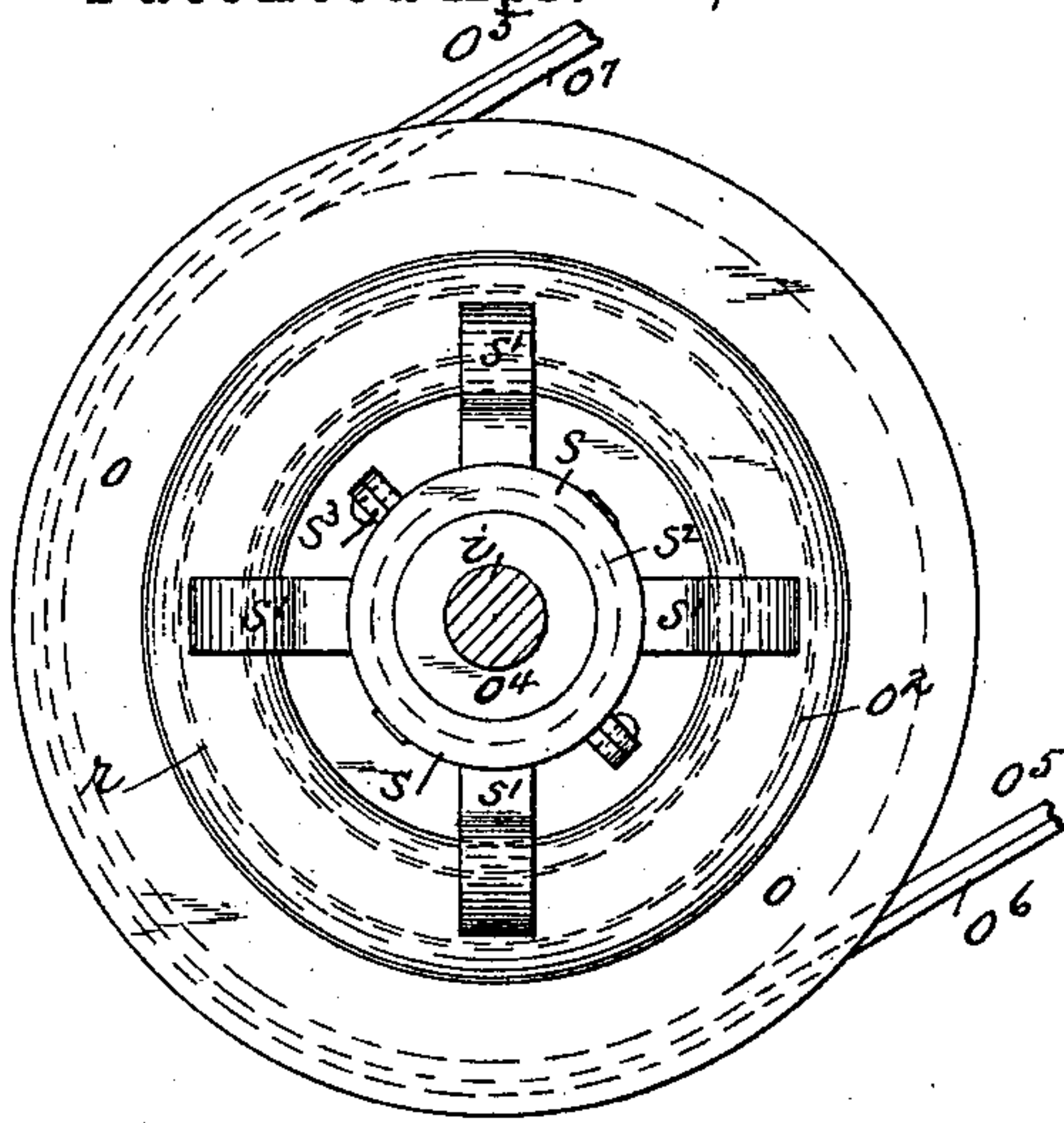
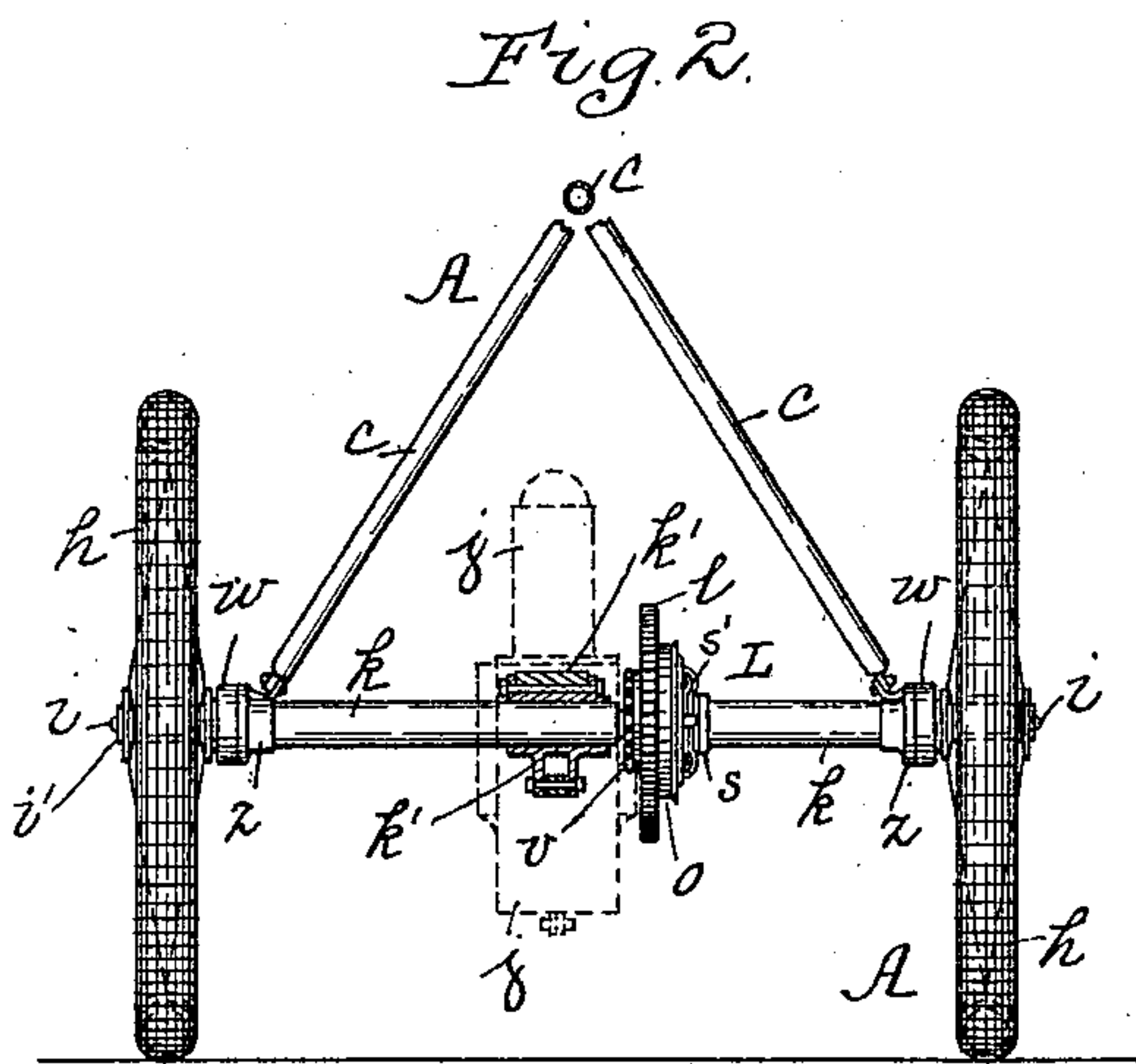
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3 Sheets—Sheet 2.

L. S. CLARKE, W. MORGAN & W. S. GORDON.
MOTOR VEHICLE.

No. 602,283.

Patented Apr. 12, 1898.

Sicknesses:

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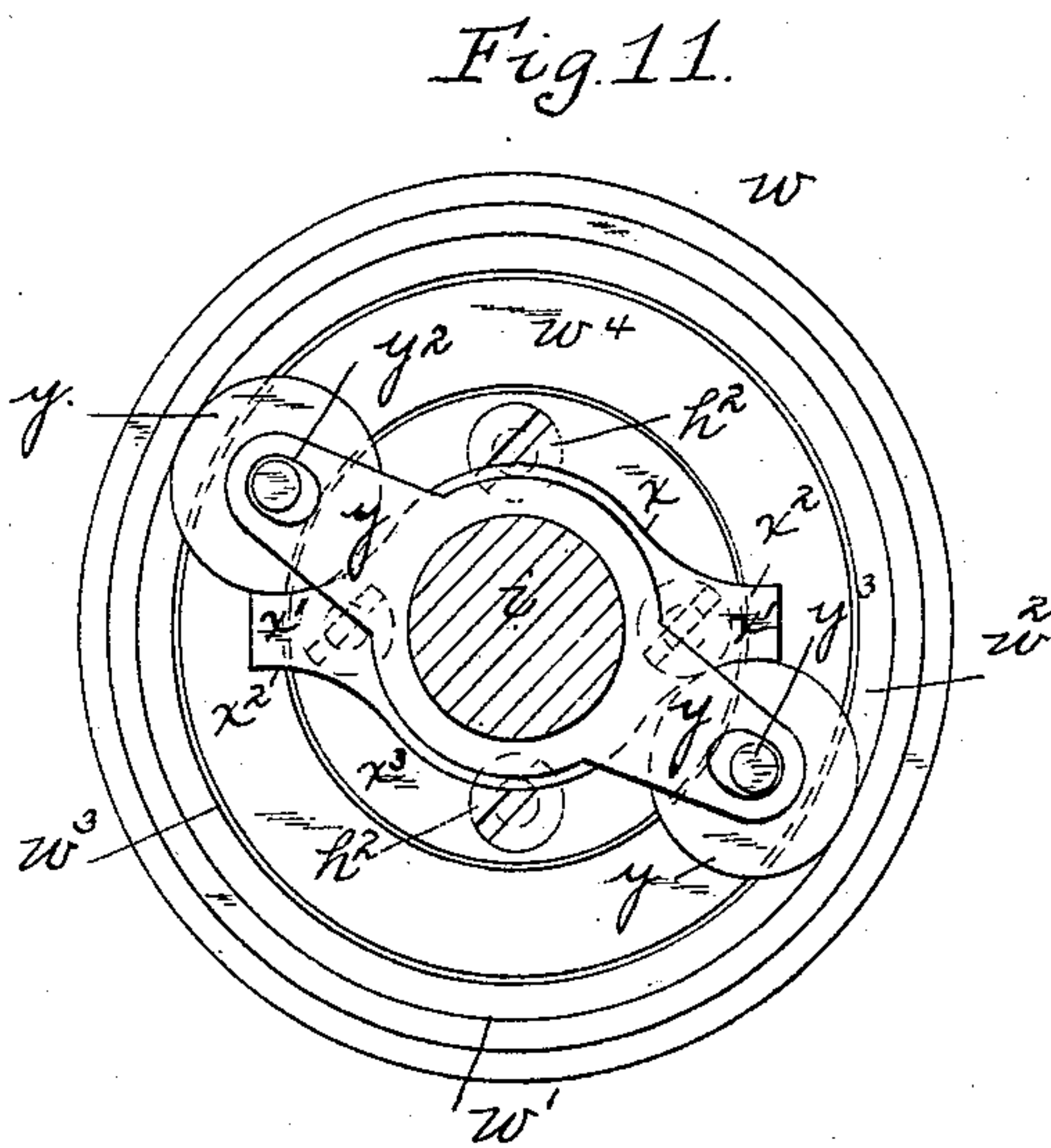
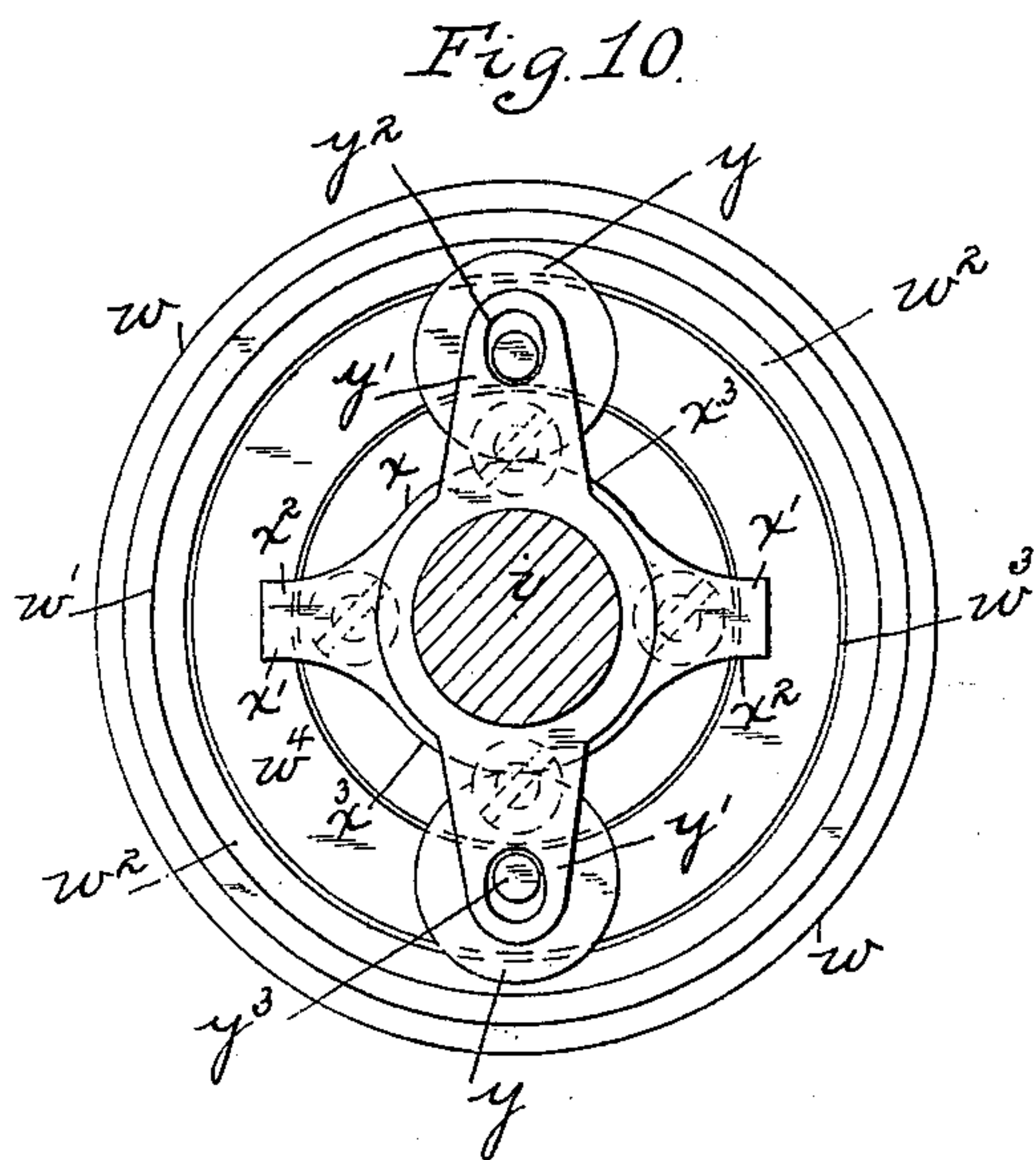
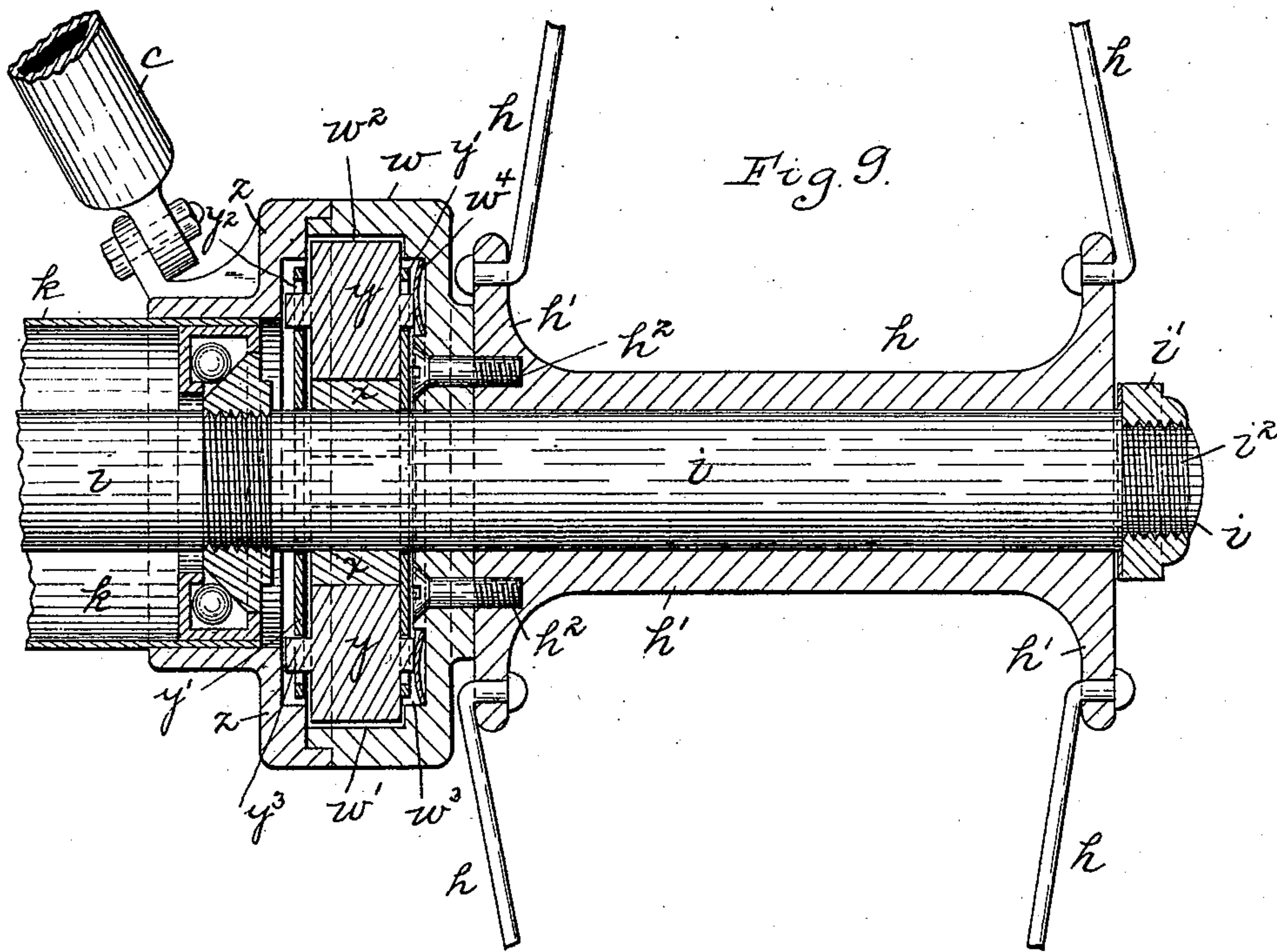
(No Model.)

3 Sheets—Sheet 3.

L. S. CLARKE, W. MORGAN & W. S. GORDON.
MOTOR VEHICLE.

No. 602,283.

Patented Apr. 12, 1898.



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UNITED STATES PATENT OFFICE.

LOUIS S. CLARKE, WILLIAM MORGAN, AND WILLIAM S. GORDON, OF
PITTSBURG, PENNSYLVANIA, ASSIGNORS TO THE PITTSBURGH MOTOR
VEHICLE COMPANY, OF SAME PLACE.

MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 602,283, dated April 12, 1898.

Application filed December 16, 1897. Serial No. 662,103. (No model.)

To all whom it may concern:

Be it known that we, LOUIS S. CLARKE, WILLIAM MORGAN, and WILLIAM S. GORDON, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Motor-Vehicles; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to motor-vehicles.

The object of our invention is to provide a simple and effective device for starting and driving the motor-vehicle which will easily and quickly turn the shaft upon which the driving-wheels are mounted and at the same time will prevent the sudden starting of the vehicle when the driving mechanism is applied.

A further object of our invention is to provide such a form of starting and driving mechanism as will enable a person to operate the driving-wheels of the vehicle from the pedals in case of any mishap or accident to the motor or any part of the mechanism for propelling the vehicle or when it is desired to do so at any time; and a still further object of our invention is to provide a clutching mechanism for the loosely-mounted driving-wheels which will allow them to be held and be operated from the axle or shaft when the vehicle is running straight ahead and one that will hold the inside driving-wheel to the shaft when the vehicle is turning corners or around and at the same time will allow the outside driving-wheel to be free from the axle or shaft, so that the traction of the vehicle can be exercised thereon.

Our invention consists, generally stated, in the novel arrangement, combination, and construction of parts, as hereinafter more specifically set forth and described, and particularly pointed out in the claims.

To enable others skilled in the art to which our invention appertains to construct and use the motor-vehicle, we will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side view of a motor-vehicle in tricycle form, showing the application of our invention thereto. Fig. 2 is a rear view

thereof. Fig. 3 is a vertical section through the axle or shaft, showing the starting and driving mechanism. Fig. 4 is a cross-section of the same on the line 4 4, Fig. 3. Fig. 5 is a side view of the starting and driving mechanism, looking in the direction of the clutch. Fig. 6 is a like view of the opposite side, looking in the direction of the sprocket-wheel and showing the parts in their normal position for starting the vehicle. Fig. 7 is a like view with the sprocket-wheel removed, showing the parts in another position after the vehicle has started. Fig. 8 is a detail section of one of the cams and partible ring. Fig. 9 is a longitudinal section through the hub of one of the driving-wheels, showing the automatic clutching mechanism applied thereto. Fig. 10 is a face or side view of the clutching mechanism with the clamping-plate removed and showing the parts in their normal position, and Fig. 11 is a like view showing the parts in their frictional or clutching position.

Like letters herein indicate like parts in each of the figures of the drawings.

Our invention is illustrated as applied to a motor-vehicle of tricycle form and operated by a motor or gas-engine, although it is evident that the same can be applied and used upon any form of motor-vehicles and operated by any kind of propelling power. The motor-cycle A is provided with the front or steering wheel *a*, which is operated by the handle-bars *b*, journaled in the frame *c*, connected to the fork *d*, mounted around the axle of the front wheel *a*. The pedals *e* and sprocket-wheel *f* are mounted upon a shaft *f'* in the frame *c*, and a seat or saddle *g* is removably secured upon the frame *c* above the pedals *e* and sprocket-wheel *f*. The rear or driving wheels *h* of the cycle A are loosely mounted around the rear axle or shaft *i*, and the motor or gas-engine *j* is secured in the rear of shaft *i* by means of brackets *k'*, connected to the tubing *k*, which encircles the shaft *i*. The shaft *j'* of the gas-engine *j* is provided with a pinion *j²* thereon, which is adapted to mesh with a gear-wheel *l*, loosely mounted around the shaft *i*, and is connected to and forms part of the starting and driving mechanism L of the cycle A, which is secured

around the shaft i . Fitting loosely around the shaft i and against the flange l' on the side of the gear-wheel l is the hollow collar or ring m , having an annular space m' therein for the reception of spiral springs n , which are held therein by means of lugs l^2 on the gear-wheel l and lugs m^2 on the hollow ring m . Rigidly secured to the shaft i , around the ring m , is the hollow band-wheel o , within which is located the partible friction-ring p , the outside face of which, p' , is adapted to bear against the inside face o' of the band-wheel o . The partible friction-ring p is formed in two sections p^2 p^3 , having bearing-surfaces p^4 between them, within which are located the cams q , provided with lugs q' thereon. The cams q are secured to the ring m by means of screw-pins q^2 thereon, and leaf-springs q^3 are adapted to fit against the cams q and are held within posts q^4 , secured in the ring m . Formed within the band-wheel o is the annular seat o^2 , within which is located the annular ring r , which is adapted to engage with the lugs q' on the cams q and is operated by means of arms s' , passing through openings o^3 in the band-wheel o to bear against the annular ring r . The arms s' are secured to and form part of the spider-clutch s , which fits loosely around the sleeve o^4 , formed on the band-wheel o and encircling the shaft i . The spider-clutch s is provided with an annular seat s^2 in its outer face for the reception of a yoke s^3 , which is connected to any suitable mechanism to be operated from the cycle A. Fitting around the band-wheel o is the band-brake o^5 , which is formed of a steel band o^6 , having a bearing-surface o^7 , formed of leather or other suitable material, the said band-brake o^5 being connected to the frame c of the cycle A and operated in any suitable manner from the cycle A.

Formed on the opposite side of the gear-wheel l is the ratchet-face t , which is adapted to be engaged by a dog or pawl u , pivoted on the inner face of a sprocket-wheel v , which is loosely mounted around a collar v' , keyed to the shaft i . The pawl u is provided with a lug u' thereon, which is adapted to engage with the gear-wheel or pinion u^2 , secured to the collar v' . A screw-bolt u^3 engages with a hole v^2 in the sprocket-wheel v and acts to hold the lug u' on the pawl u in engagement with the pinion u^2 when screwed to place. A sprocket-chain v^3 is adapted to pass around the sprocket-wheel v on the shaft i and the sprocket-wheel f on the pedal-shaft f' for operating the engine j and shaft i when desired.

The driving-wheels h are held in place upon the shaft i by means of nuts i' , fitting against the hubs h' of the wheels h and engaging with the threaded ends i^2 of the shaft i . Secured to the inside of the hubs h' on each one of the wheels h by means of bolts h^2 is the hollow cap w , which is provided with a bearing-face w' and an annular space w^2 therein for the reception of a bearing-block or cam x , rigidly secured to the shaft i in any suitable manner.

The cam x is provided with the projections x' thereon, which extend out on each side and opposite to each other and are provided with the curved bearing-faces x^2 thereon, which connect with the curved bearing-faces x^3 around the cam x . Fitting loosely around the shaft i on each side of the cam x are the standards or supports y' for carrying the friction-wheels y , which are adapted to travel over the curved faces x^2 and x^3 on the projections x' and cam x and are journaled within slotted holes y^2 in the supports y by the studs y^3 , formed thereon. An annular seat w^3 is formed in the hollow cap w for the reception of a leaf-spring w^4 , which bears against the inner standard or support y' . A clamping-plate z is secured to the tubing k over the shaft i and is removably secured to the hollow cap w for holding the parts together and in place within the cap w .

The operation of our improved motor-vehicle is as follows: When it is desired to operate the gas-engine, the operator, mounted or seated upon the saddle g , places his feet upon the pedals e and moves the same, so turning the sprocket-wheel f on the pedal-shaft f' , and, through the sprocket-chain v^3 , passing around the sprocket-wheel f and sprocket-wheel v on the shaft i , will act to start the gas-engine j through the medium of the pawl u , engaging with the ratchet wheel or face t on the gear-wheel l , which meshes with the pinion j^2 on the shaft j' of the engine j . When the engine j has started and exceeds the speed of the pedals e , the pawl u will free itself and drop down out of engagement with the ratchet-face t and be held on the screw-bolt u^3 out of the pinion u^2 , so allowing the pedals e , chain v^3 , and sprocket-wheels f and v to remain stationary and the pedals e to assist in supporting and resting the operator. While the engine is thus running and it is desired to move the cycle A, (which up to this time has remained stationary,) the operator throws in the clutch s by means of the yoke s^3 , which causes the arms s' on the clutch s to force or press the annular ring r against the lugs q' on the cams q , so turning the large ends of the cams q into contact with the bearing-surfaces p^4 on the sections p^2 p^3 of the friction-ring p and expanding such sections p^2 p^3 , so that the outer surface p' of the friction-ring p will bind against and make frictional contact with the inner face o' of the band-wheel o , which being keyed or rigidly secured to the shaft i will revolve the same and start the cycle A. When the cycle A has moved or started, the spiral springs n , being connected to the gear-wheel l and hollow ring m by means of the lugs l^2 and m^2 , will act to prevent any sudden starting or moving of the cycle A caused by the explosion or impulse of the engine j , so allowing the cycle A to move off gradually and evenly at all times and take up any sudden vibration of the engine. In case of accident or mishap, so that the cycle A cannot be propelled by the en-

gine j , or in case any of the parts composing the mechanism for operating the cycle A break or get out of order and it is desired to move or propel the cycle A by the operator, all that is necessary is to unscrew the bolt u^3 and allow the pawl u to drop with its lug u' into the pinion u^2 and then to screw in the screw-bolt u^3 over the top of the pawl u to hold the lug u' in engagement with the pinion u^2 on the collar v' , secured to the shaft i , thereby cutting out the engine and driving mechanism, so that the operator can propel or move the cycle A by moving the pedals e and causing the sprocket-wheel v , secured on the collar v' , to revolve the shaft i and move the cycle A through the medium of the sprocket-chain v^3 , connected to the sprocket-wheel v , and the sprocket-wheel f on the pedal-shaft f' , as in ordinary bicycle-chain construction. When the clutch s and ring r are thrown out of engagement with the partible ring p , the cams q will return to place through the springs q^3 , and the ring-sections p^2 p^3 will assume their normal positions, as shown in Figs. 3 and 4, while the engine j will still continue to operate and turn the gear-wheel l . When it is desired to stop the cycle A or decrease the speed thereof, the band-brake o^5 can be brought into play and tightened around the band-wheel o by the operator, while the partible ring p is clutched against the band-wheel o or when it is in its normal position, and in either case the engine j will still operate and move the gear-wheel l .

While the cycle A is still moving forward in a straight line or path, the friction wheels or rollers y in the hollow cap w will assume the position shown in Fig. 11 by traveling up the bearing-faces x^2 on the projections x' of the cams x and bearing against the inner bearing-faces w' of the hollow cap w , which will allow the driving-wheels h around the shaft i to travel with the shaft i on account of the cam x being rigidly connected to the shaft i . When it is desired to turn the cycle A around corners or around in a circle, the friction-rollers y in the hollow cap w on the inside driving-wheel h will bind against the bearing-face w' of the cap w , so connecting the inside driving-wheel h to the shaft i , and the friction-rollers y in the hollow cap w on the outside driving-wheel h will assume the position shown in Fig. 10, by turning on the bearing-surface x^3 of the cam x , so freeing the rollers y' from contact with the inner bearing-face w' of the hollow cap w and permitting the outside driving-wheel h' to run loosely around the shaft i at will, according to the amount of traction exercised thereon. When the cycle A rights itself to move in a straight line or path, the friction-wheels y will again travel along the bearing-faces x^2 on the projections x' of the cams x and bear against the bearing-face w' of the hollow cap w so as to form a rigid connection from the shaft i to the driving-wheels h' , and the greater the resistance on the wheels h' the tighter

the rollers y' will bear against the hollow cap w .

It will thus be seen that our improved motor-vehicle is cheap and simple in its construction and mode of operation, and as the parts are strong and durable they will not get out of order. The device will overcome the sudden starting of the vehicle when the power is applied, and when the mechanism will not operate to be propelled by power or lack of the same from any cause it can easily and quickly be arranged and adjusted so that the operator can propel or pedal the same home or to a convenient repair-place when it is necessary. The driving mechanism can be thrown in and out of engagement with the engine or motor without interfering whatever with the operation of the engine or motor, which can be run at all times, if necessary. The clutching mechanism on the driving-wheels will allow the cycle to be operated or propelled while turning corners or around and is automatic in its action to the shaft and wheels.

Various modifications in the construction and design of the various parts of the motor-vehicle mechanism covered by our invention may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In motor-vehicles, the combination of an axle or shaft having supporting and driving wheels mounted thereon, a motor or engine supported adjacent to said shaft, a gear-wheel loosely mounted around said shaft and connected to the motor, and mechanism connected to said gear-wheel and shaft for starting and driving the vehicle, substantially as set forth.

2. In motor-vehicles, the combination of an axle or shaft having supporting and driving wheels mounted thereon, a motor or engine supported adjacent to said shaft, a gear-wheel loosely mounted around said shaft and connected to the motor, a cap or collar fitting loosely around the shaft and having a spring connection with the gear-wheel, and mechanism connected to said cap or collar for starting and driving the vehicle, substantially as set forth.

3. In motor-vehicles, the combination of an axle or shaft having supporting and driving wheels mounted thereon, a motor or engine adjacent to said shaft, a gear-wheel loosely mounted around said shaft and connected to the motor, a cap or collar fitting loosely around the shaft and having a spring connection with the gear-wheel, a band-wheel rigidly secured to said shaft, a friction-ring formed in sections adapted to engage with the band-wheel, and mechanism connected to said cap or collar and band-wheel for starting and driving the vehicle, substantially as set forth.

4. In motor-vehicles, the combination of an axle or shaft having supporting and driving

wheels mounted thereon, a motor or engine adjacent to said shaft, a gear-wheel loosely mounted around said shaft and connected to the motor, a cap or collar fitting loosely around the shaft and having a spring connection with the gear-wheel, a band-wheel rigidly secured to said shaft, a friction-ring formed in sections adapted to engage with the band-wheel, and mechanism connected to said cap or collar, band-wheel and friction-ring for starting and driving the vehicle, substantially as set forth.

5. In motor-vehicles, the combination of an axle or shaft having supporting and driving wheels mounted thereon, a motor or engine adjacent to said shaft, a gear-wheel loosely mounted on said shaft and connected to the motor, a cap or collar fitting loosely around the shaft and having a spring connection with the gear-wheel, a band-wheel rigidly secured to said shaft, a friction-ring formed in sections adapted to engage with the band-wheel, cams fitting between the sections of the friction-ring and connected to the cap or collar, and means on said band-wheel adapted to engage with said cams for starting and driving the vehicle, substantially as set forth.

6. In motor-vehicles, the combination of an axle or shaft having supporting and driving wheels mounted thereon, a motor or engine adjacent to said shaft, a gear-wheel loosely mounted on said shaft and connected to the motor, a cap or collar fitting loosely around the shaft and having a spring connection with the gear-wheel, a band-wheel rigidly secured to said shaft, a friction-ring formed in sections adapted to engage with the band-wheel, cams fitting between the sections of the friction-ring and connected to the cap or collar, and a clutch around said shaft having arms thereon adapted to engage with a ring bearing against the cams for starting and driving the vehicle, substantially as set forth.

7. In motor-vehicles, the combination with a shaft having pedals thereon, of an axle or shaft having supporting and driving wheels mounted thereon, a motor or engine adjacent to said axle or shaft, a gear-wheel loosely mounted on said axle or shaft and connected to the motor, and means connected to said pedals or shaft and gear-wheel for revolving said axle or shaft to start the motor, substantially as set forth.

8. In motor-vehicles, the combination with a shaft having pedals thereon, of an axle or shaft having supporting and driving wheels mounted thereon, a motor or engine adjacent to said axle or shaft, a gear-wheel loosely mounted on said axle or shaft and connected to the motor, a ratchet-wheel having a pawl engaging therewith connected to said gear-wheel, and means connected to said pedals or shaft and the pawl for revolving said axle or shaft to start the motor, substantially as set forth.

9. In motor-vehicles, the combination with a shaft having pedals thereon, of an axle or

shaft having supporting and driving wheels mounted thereon, a motor or engine adjacent to said axle or shaft, a gear-wheel loosely mounted on said axle or shaft and connected to the motor, a ratchet-wheel connected to said gear-wheel, a sprocket-wheel rigidly secured to said axle or shaft having a pawl mounted thereon for engaging with the ratchet-face, and connections from said sprocket-wheel to the pedals or shaft for revolving said axle or shaft to start the motor, substantially as set forth.

10. In motor-vehicles, the combination with a shaft having pedals thereon, a motor or engine adjacent to said axle or shaft, a gear-wheel loosely mounted on said axle or shaft and connected to the motor, connections from the pedals or shaft to the axle or shaft, and means on said axle or shaft for permitting the vehicle to be propelled from the pedals or shaft, substantially as set forth.

11. In motor-vehicles, the combination with a shaft having pedals thereon, of an axle or shaft having supporting and driving wheels mounted thereon, a motor or engine adjacent to said axle or shaft, a gear-wheel loosely mounted around said axle or shaft and connected to the motor, connections from the pedals or shaft to the axle or shaft, a gear-wheel or pinion secured on said axle or shaft, and means connected to said pedals or shaft and gear-wheel or pinion for permitting the vehicle to be propelled from the pedals or shaft, substantially as set forth.

12. In motor-vehicles, the combination with a shaft having pedals thereon, of an axle or shaft having supporting and driving wheels mounted thereon, a motor or engine adjacent to said axle or shaft, a gear-wheel loosely mounted around said axle or shaft and connected to the motor, a gear-wheel or pinion secured on said axle or shaft, a sprocket-wheel loosely mounted on said axle or shaft and connected to the pedals or shaft, and a dog or pawl mounted on said sprocket-wheel adapted to be held in engagement with the gear-wheel or pinion for permitting the vehicle to be propelled from the pedals or shaft, substantially as set forth.

13. In motor-vehicles, the combination with a shaft having pedals thereon, of an axle or shaft having supporting and driving wheels mounted thereon, a motor or engine adjacent to said axle or shaft, a gear-wheel loosely mounted around said axle or shaft and connected to the motor, a gear-wheel or pinion secured on said axle or shaft, a sprocket-wheel loosely mounted on said axle or shaft and connected to the pedals or shaft, a dog or pawl mounted on said sprocket-wheel, and a movable bolt or pin on said sprocket-wheel adapted to engage with the gear-wheel or pinion for permitting the vehicle to be propelled from the pedals or shaft, substantially as set forth.

14. In motor-vehicles, the combination with an axle or shaft, of supporting and driving

wheels loosely mounted around said axle or shaft, hollow caps secured to said wheels around the axle or shaft and provided with bearing-surfaces therein, cams or bearing-
5 blocks secured to said axle or shaft, and rollers loosely mounted in standards loosely mounted around the axle or shaft, said rollers being adapted to travel on the cams or bearing-
10 blocks and engage with the bearing-surfaces on the hollow caps for permitting the wheels to be automatically secured to and be freed from said axle or shaft, substantially as set forth.

15 15. In motor-vehicles, the combination with an axle or shaft, of supporting and driving wheels loosely mounted around said axle or shaft, hollow caps secured to said wheels around the axle or shaft and provided with bearing-surfaces therein, cams or bearing-
20 blocks secured to said axle or shaft, rollers

loosely mounted in standards loosely mounted around the axle or shaft, said rollers being adapted to travel on the cams or bearing-
blocks and engage with the bearing-surfaces in the hollow caps for permitting the wheels 25 to be automatically secured to and freed from said axle or shaft, and clamping-plates fitting around the axle or shaft and adapted to be removably secured to the hollow caps for confining the parts within the hollow caps, substantially as set forth. 30

In testimony whereof we, the said LOUIS S. CLARKE, WILLIAM MORGAN, and WILLIAM S. GORDON, have hereunto set our hands.

LOUIS S. CLARKE.

WILLIAM MORGAN.

WILLIAM S. GORDON.

Witnesses:

JAMES K. CLARKE,

J. N. COOKE.