No. 657,899.

Patented Sept. 11, 1900.

C. J. COLEMAN.

MOTOR VEHICLE.

(Application filed Dec. 8, 1899.)

(No Model.)

3 Sheets—Sheet 1.

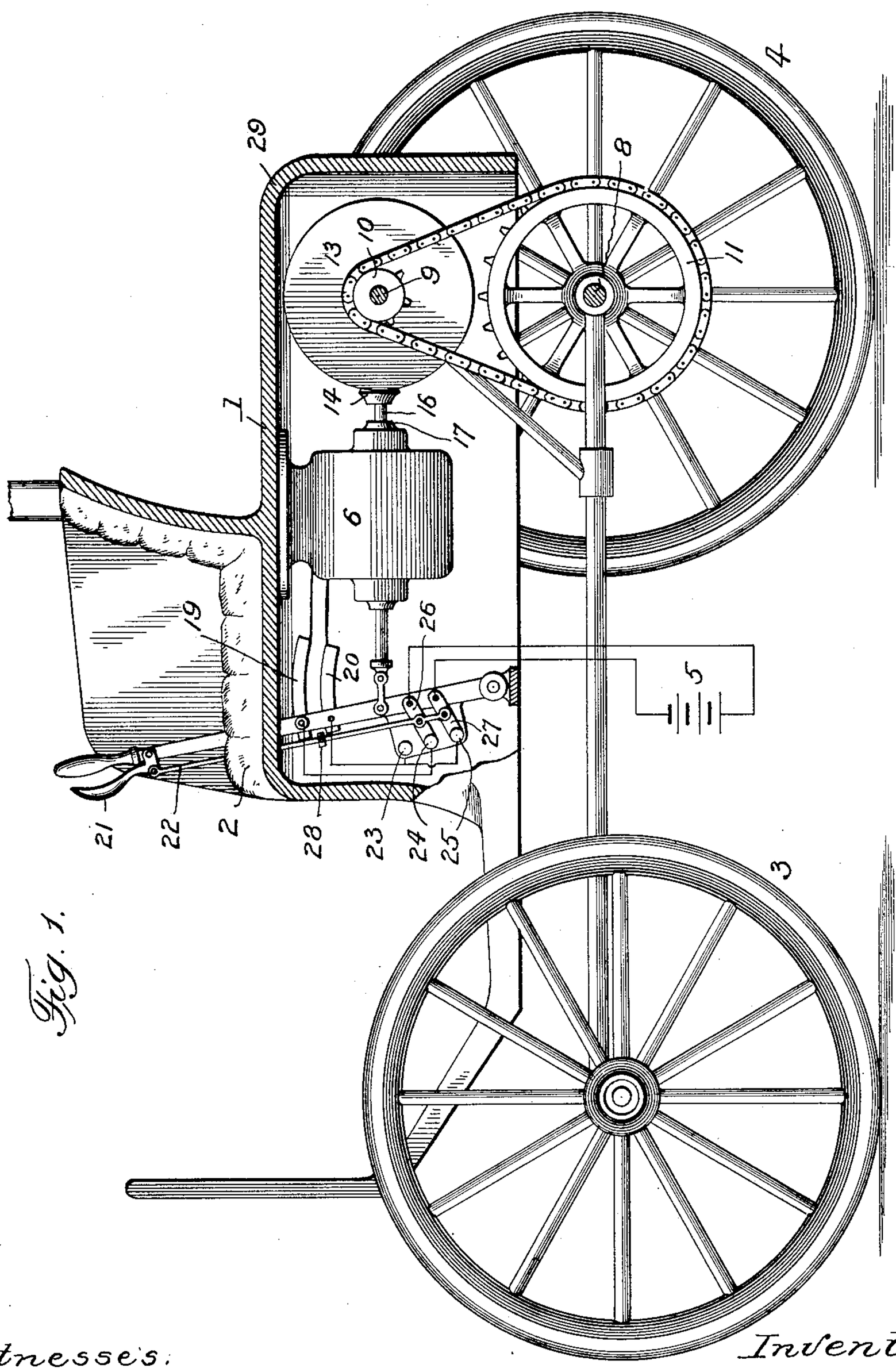

Fig. 1.

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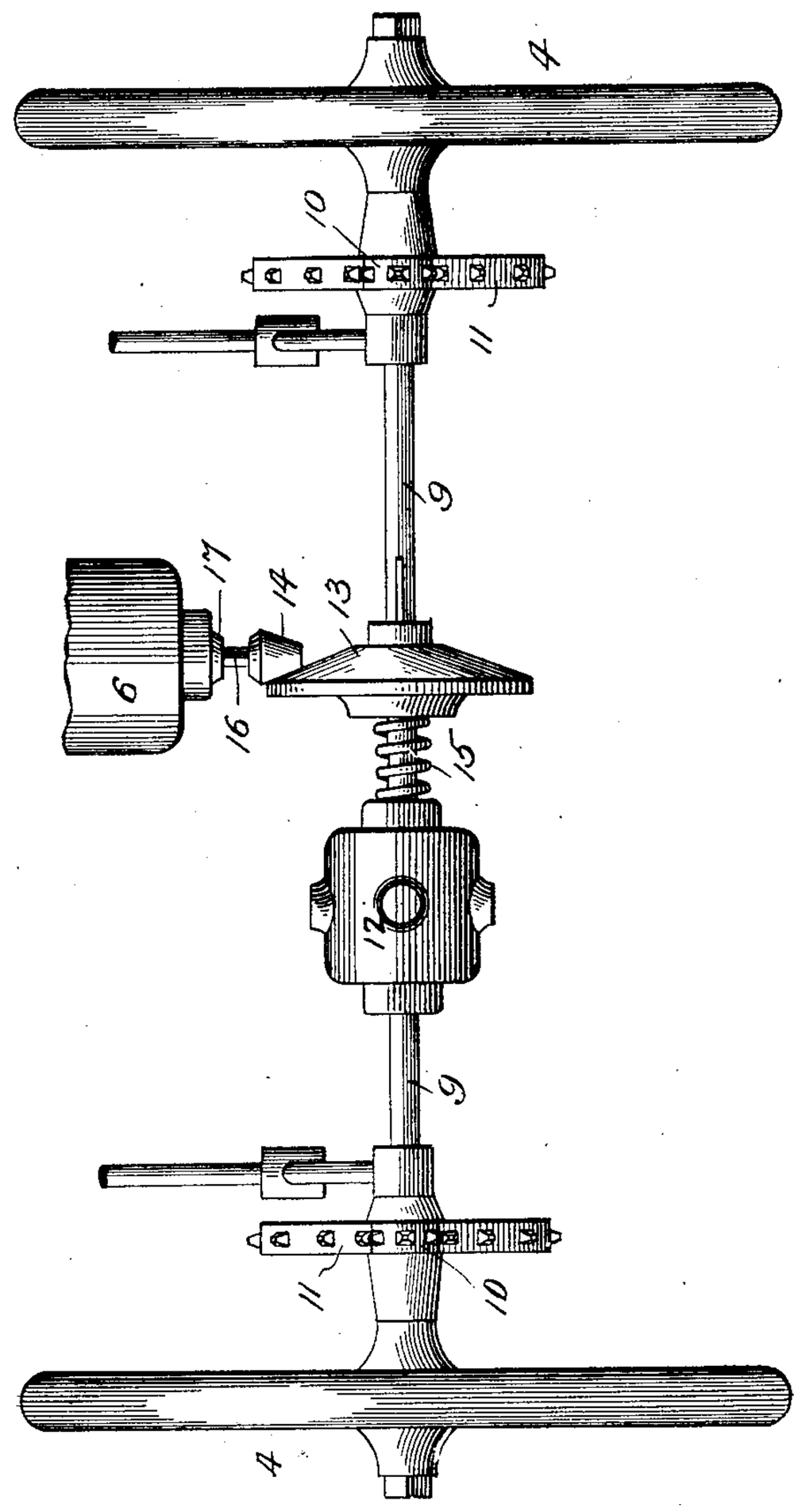

Fig. 2.

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Fig. 4.

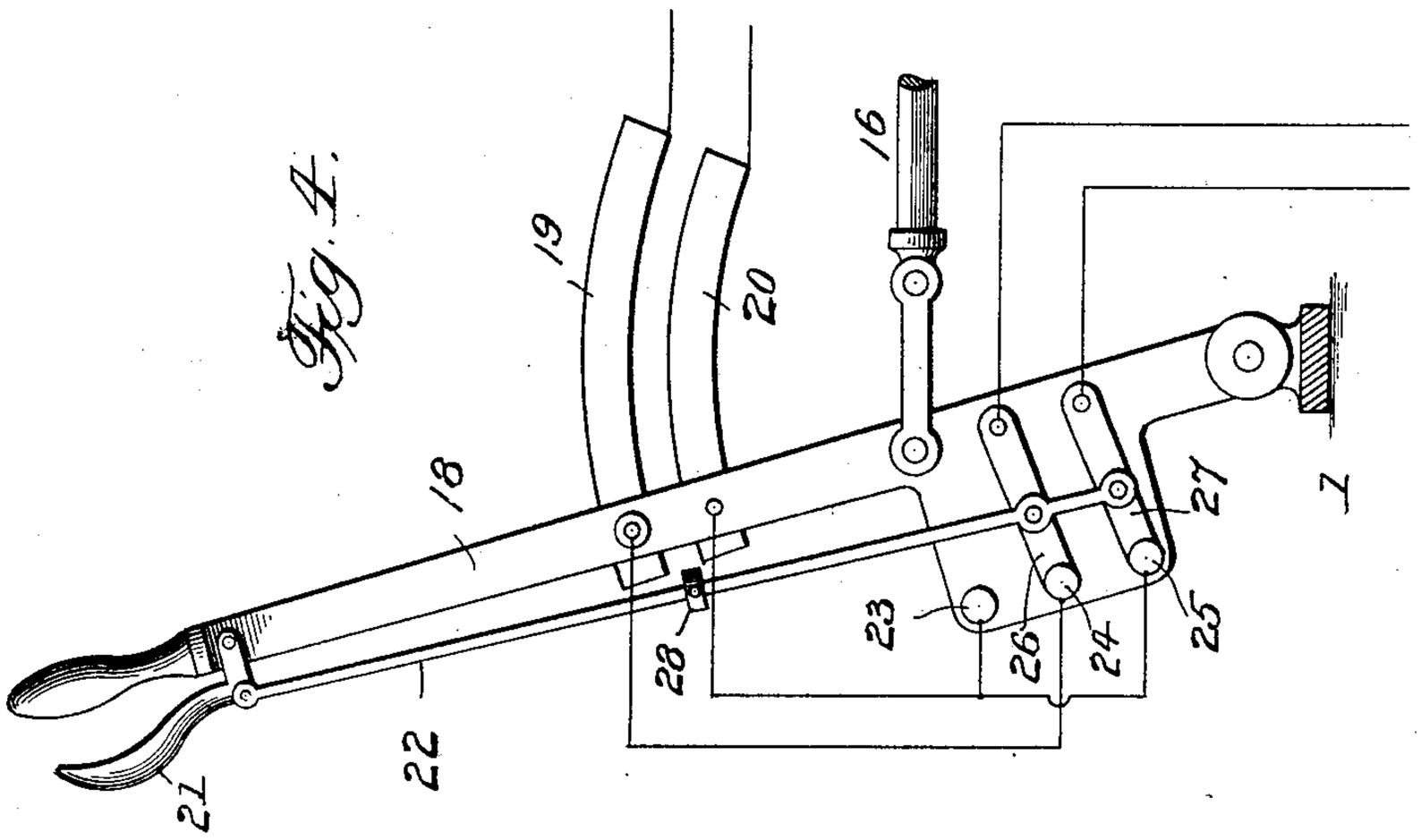
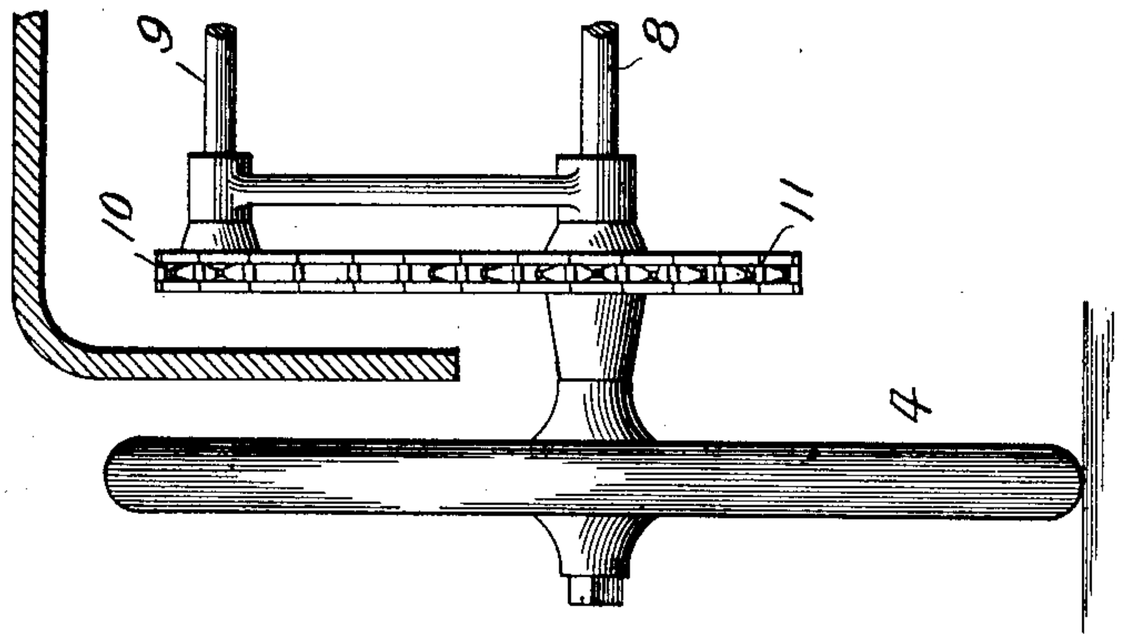


Fig. 3.



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UNITED STATES PATENT OFFICE.

CLYDE J. COLEMAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO THOMAS J. RYAN, OF NEW YORK, N. Y.

MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 657,899, dated September 11, 1900.

Application filed December 8, 1899. Serial No. 739,727. (No model.)

To all whom it may concern:

Be it known that I, CLYDE J. COLEMAN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Motor-Vehicles; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

The present invention relates to a variable-speed driving mechanism for motor-vehicles, and more particularly to that type of such motor-vehicles in which electricity is employed as the motive power.

The present improvement has for its objects, first, to provide a simple and efficient combination and arrangement of the current-controlling, current-reversing, and speed-changing mechanisms in which such different mechanisms are adjusted and controlled by a single operating-lever and with which a reversal of the motive current is prevented at all times other than when the torque of the electric motor is at its minimum; second, to provide a durable and effective intermediate changeable-speed mechanism between the single driving-motor of a motor-vehicle and the driving counter-shaft, by which the driving-wheels are in turn driven, and, third, to provide a simple, strong, and compact arrangement of the intermediate connections between the driving-motor and the driving-wheels of the vehicle, all as will hereinafter more fully appear and be more particularly pointed out in the claims. I attain such objects by the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a view, mainly in longitudinal section and partly in side elevation and partly in diagram, of a motor-vehicle embodying the present invention; Fig. 2, a detail plan view of the connections between the driving-motor and the driving-wheels of the vehicle; Fig. 3, a fragmentary transverse section illustrating the connections between the driving counter-shaft and the driving-wheels; Fig. 4, an enlarged detail view of the main operating hand-lever and the immediate connections thereof.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents the body portion of the vehicle, having the usual seat portion 2 and mounted in any usual manner upon the front and rear wheels 3 and 4, such rear wheels in the present construction constituting the driving-wheels by which the motor-vehicle is impelled.

5 represents diagramatically the storage battery or other source of electrical power; 6, the single electric motor by which the vehicle is impelled; 8, the fixed axle carrying such driving-wheels and upon which the said wheels are adapted to have independent rotation.

9 is a sectional counter-shaft mounted in bearings in stationary standards attached to the fixed rear axle 8 and provided on its respective outer ends with sprocket-pinions 10, connected by a sprocket-chain with a sprocket-wheel 11, secured in any usual manner to the rear driving-wheels 4. The respective sections of the driving counter-shaft 9 are connected together by the usual incased equalizing-gear 12, common to motor-vehicles, so as to admit of independent rotation of either section of the said driving counter-shaft, and in the present invention one section of said shaft will carry a coned friction-disk 13, which has surface engagement with and is driven by a coned pulley 14, that in turn receives motion from the electric motor 6, as hereinafter described. In the present construction the driving coned pulley 14 will move to or from the axis of the coned friction-disk 13 in effecting a change of speed, and such coned pulley 14 and its carrying-shaft must accordingly be capable of longitudinal or endwise movement along their axis of rotation, and in addition thereto the present construction requires that either the coned disk 13 or the coned pulley 14 must have a lateral movement to and from the other in the different adjustments of the parts to effect different changes of speed, and the scope of this part of the present invention involves any usual and suitable construction and arrangement of the parts that will permit of such last-mentioned relative movement between the

pulley and the disk. In the construction shown in Fig. 2 of the drawings as illustrative of this part of the present invention the coned friction-disk 13 is mounted in any usual manner upon the counter-shaft 9, so as to be capable of a sliding movement thereon and yet incapable of rotation independent thereof, the movement of such disk 13 with relation to the driving cone-pulley 14 being effected and frictional engagement maintained during the varying adjustments of the parts by the abutment-spring 15 behind said friction-disk, the tendency of which spring is to maintain the coned members at all times in frictional surface contact.

In my preferred construction, as illustrated in the accompanying drawings, the shaft 16, carrying the cone driving-pulley 14, will be of any usual non-circular formation and will pass through a similarly-formed bore in the armature-shaft 17 of the electric motor 6, so as to be capable of independent endwise movement through such armature-shaft, yet incapable of independent rotation therein. The shaft 16 extends entirely through the armature-shaft and at its forward end is operatively connected to the hand-lever 18, arranged adjacent to the seat portion 2 of the vehicle, so as to be convenient of operation by the occupant of the seat.

The current-controller of the present invention comprises a pair of fixed segmental contact-plates 19 and 20 and a pair of movable and insulated contacts carried by the hand-lever 18, the construction being such that the operating electric circuit will be maintained at all times, except when such lever is at its extreme forward position, when a breakage of the circuit is effected.

In the present invention the current-reversing switch mechanism is separate from the current-controlling mechanism and both mechanisms are operatively combined with the variable-speed mechanism to operate in unison and form an interdependently-operating mechanism as a whole in which the current can only be reversed when the torque of the motor is at a minimum. In the accomplishment of such results an auxiliary means capable of independent actuation is attached to the main operating-handle 18 and having operative link or other equivalent connection with the current-reversing switch. In the particular construction shown in Figs. 1 and 4 of the drawings as illustrative of one means of carrying out this part of the present invention a bell-crank handle or lever 21 is pivoted to the lever 18 near its upper or grip end, so as to be capable of operation by the same hand of the operator that manipulates the said lever to operate the current-controlling and speed-varying mechanisms.

22 is a connecting-link extending from the short arm of the lever 21 to the reversing switch mechanism, which may be of any usual form and construction. As shown, such current-reversing mechanism comprises three insulated contact-points 23, 24, and 25, arranged upon a side extension of the lever 18, and a pair of insulated contact-links 26 and 27, pivoted at one end to the main lever 18 and adapted to contact alternately with different pairs of the three contact-points 23, 24, and 25, as usual in this type of electrical appliances, the circuit's connections being of the usual form and as illustrated in Figs. 1 and 4 of the drawings.

In the present construction the connections are such that the variable-speed mechanism will be in that position in which a minimum torque or load is on the motor and preferably with the operating-circuit broken before a movement of the current-reversing switch can be effected to attain a reversal of the motor, the purpose being to prevent any danger of burning of the motor-windings due to a reversal of the current with a maximum load or torque upon the motor. In the mechanism illustrated in the accompanying drawings for accomplishing such result, 28 is a laterally-projecting pin or lug on the connecting-link 22, adapted to engage either the upper or the lower surface of a segmental confining-bar, usually one of the contact-plates 19, to hold the current-reversing mechanism in either of its positions in a positive manner, the construction being such that said locking pin or stud 28 can only be shifted from the top to the bottom of the segmental confining-plate, and vice versa, when the operating hand-lever 18 is in its forward or starting position.

With the present improved construction and arrangement of parts the operating mechanisms are arranged wholly above the axle and in a location in which they can be readily housed from view by means of a rear skirt extension 29 of the vehicle body, as illustrated in Figs. 1 and 3.

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

1. In a system of propulsion for motor-vehicles, the combination of an electric motor, a friction-pulley having operative engagement with the armature of the motor, and adapted to have longitudinal movement with relation to such motor, a shaft adapted to operate the driving-wheels of the vehicle, a friction-disk carried by said shaft, means for maintaining frictional engagement between the friction pulley and disk, an operating-lever for imparting movement to the friction-pulley, and a current-controller for the electric motor carried by said lever, substantially as set forth.

2. In a system of propulsion for motor-vehicles, the combination of an electric motor, a coned friction-pulley having operative engagement with the armature of the motor and adapted to have longitudinal movement with relation to such motor, a shaft adapted to operate the driving-wheels of the vehicle, a coned friction-disk carried by said shaft,

means for maintaining frictional engagement between the friction pulley and disk, an operating-lever for imparting movement to the friction-pulley, and a current-controller for the electric motor carried by said lever, substantially as set forth.

3. In a system of propulsion for motor-vehicles, the combination of an electric motor, a friction-pulley having operative engagement with the armature of the motor, and adapted to have longitudinal movement with relation to such motor, a counter-shaft formed in sections that have independent connections with the driving-wheels of the vehicle, an equalizing-gear connecting the counter-shaft sections together, a friction-disk carried by one section of the counter-shaft, means for maintaining frictional engagement between the friction pulley and disk, an operating-lever for imparting movement to the friction-pulley, and a current-controller for the electric motor carried by said lever, substantially as set forth.

4. In a system of propulsion for motor-vehicles, the combination of an electric motor, a friction-pulley having operative engagement with the armature of the motor and adapted to have longitudinal movement with relation to such motor, a shaft adapted to operate the driving-wheels of the vehicle, a friction-disk carried by said shaft, and adapted to have longitudinal movement thereon, a spring arranged to impart longitudinal movement to such disk and maintain frictional engagement between the same and the friction-pulley, an operating-lever for imparting movement to the friction-pulley, and a current-controller for the electric motor carried by said lever, substantially as set forth.

5. In a system of propulsion for motor-vehicles, the combination of an electric motor, a friction-pulley having operative engagement with the armature of the motor, and adapted to have longitudinal movement with relation to such motor, a counter-shaft formed in sections that have independent connections with the driving-wheels of the vehicle and are arranged in a vertical plane above the same, an equalizing-gear connecting the counter-shaft sections together, a friction-disk carried by one section of the counter-shaft, means for maintaining frictional engagement between the friction pulley and disk, an operating-lever for imparting movement to the friction-pulley, and a current-controller for the electric motor carried by said lever, substantially as set forth.

6. In a system of propulsion for motor-vehicles, the combination of an electric motor, a friction-pulley having operative engagement with the armature of the motor and adapted to have longitudinal movement with relation to such motor, a counter-shaft formed in sections that have independent connections with the driving-wheels of the vehicle, and arranged in a vertical plane above the same, an equalizing-gear connecting the counter-shaft sections together, a friction-disk carried by one section of the counter-shaft, means for maintaining frictional engagement between the friction pulley and disk, an operating-lever for imparting movement to the friction-pulley, and a current-controller for the electric motor carried by said lever, and the vehicle-body provided with an open-bottomed rearwardly-extended skirt inclosing said mechanism, substantially as set forth.

Signed by me at Washington, District of Columbia, this 5th day of December, 1899.

CLYDE J. COLEMAN.

Witnesses:
ROBERT BURNS,
M. H. HOLMES.