No. 649,689. Patented May 15, 1900.

R. M. GAY.

MOTOR CARRIAGE.

(Application filed Jan. 31, 1900.)

(No Model.) 2 Sheets—Sheet 1.

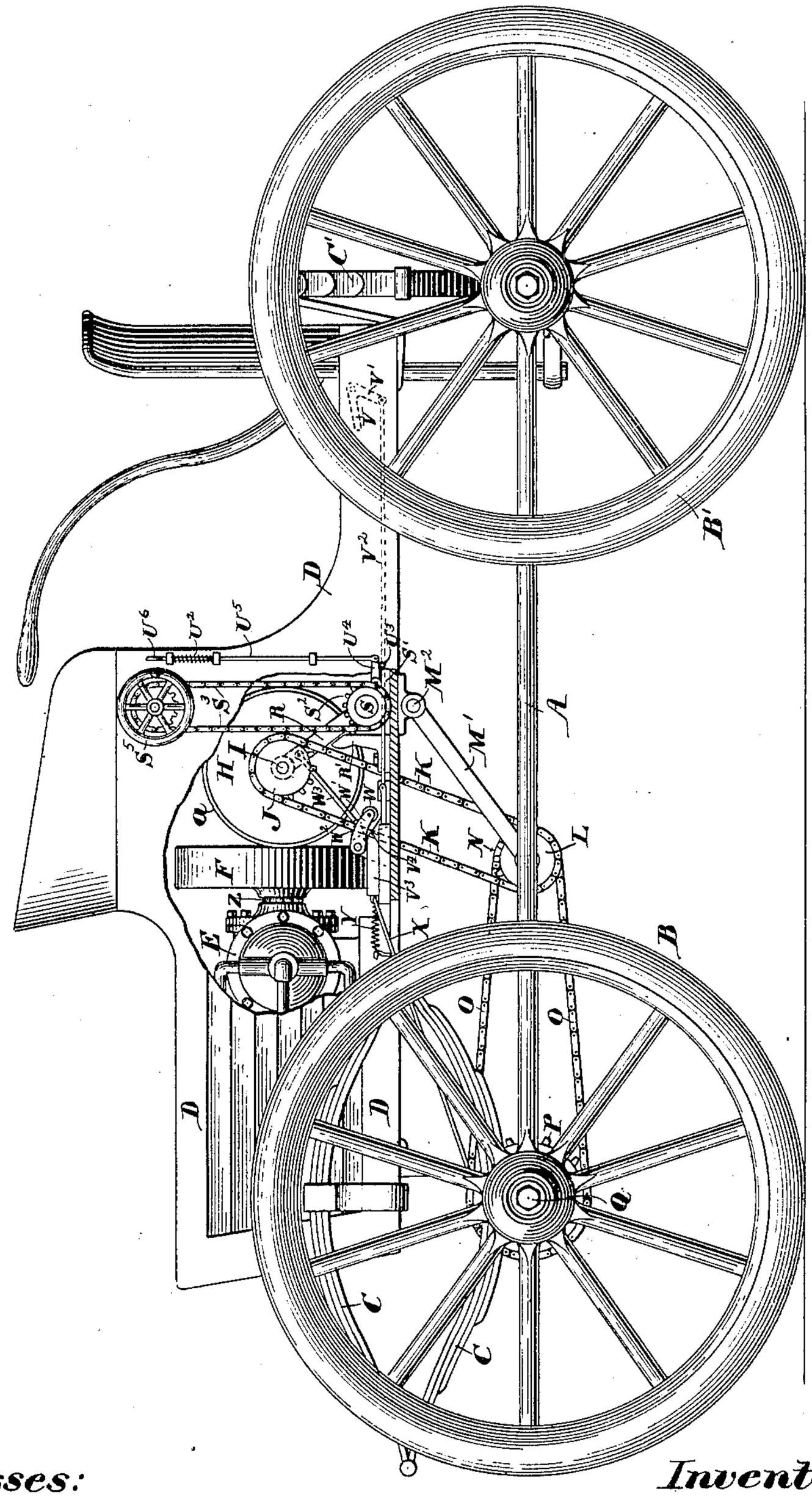

Fig. 1.

Witnesses:

L. Viola Lombard.

William Montgomery

Inventor:

Robert M. Gay,

by Walter E. Lombard,

Atty.

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Fig. 2.

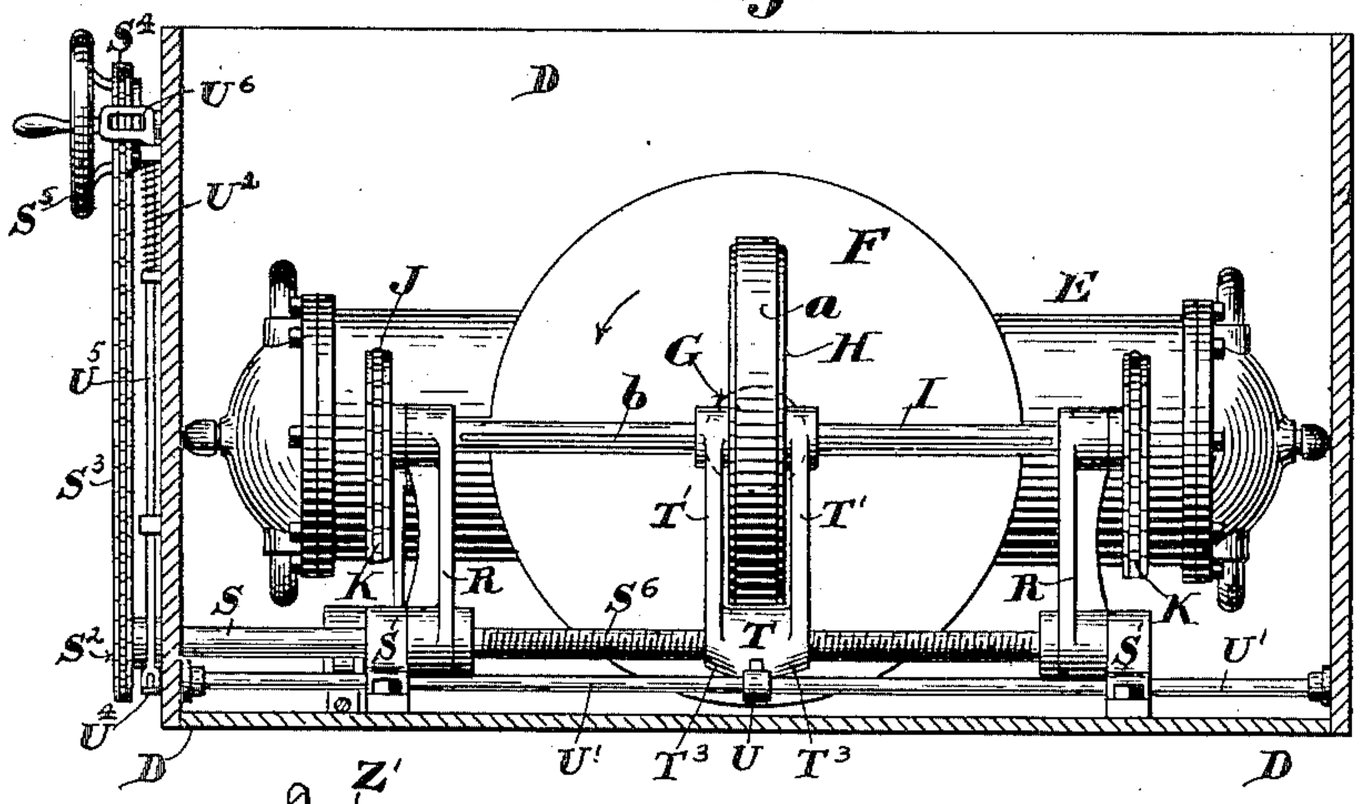


Fig. 7.

Fig. 3.

Fig. 4.

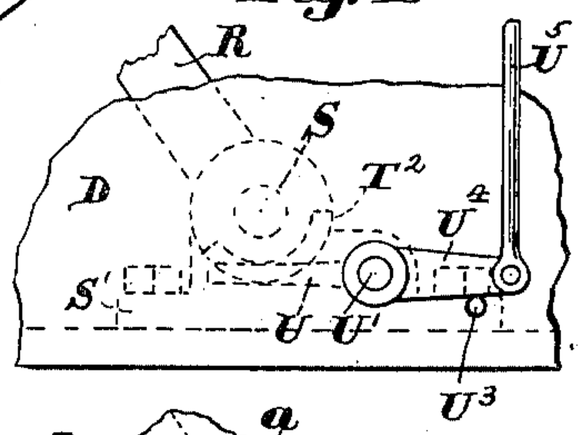


Fig. 6.

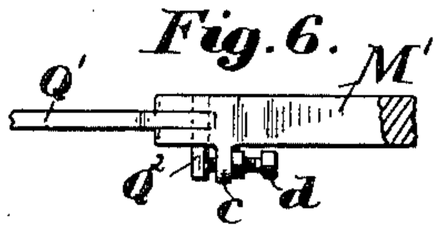
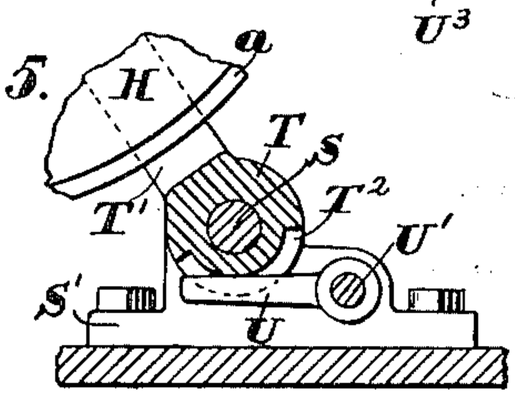


Fig. 5.



Witnesses:

L. Viola Lombard.

William Montgomery

Inventor:

Rubert M. Gay.

by Walter E. Lombard Atty.

UNITED STATES PATENT OFFICE.

RUBERT M. GAY, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO WILLIAM H. RICKER, OF SAME PLACE.

MOTOR-CARRIAGE.

SPECIFICATION forming part of Letters Patent No. 649,689, dated May 15, 1900.

Application filed January 31, 1900. Serial No. 3,413. (No model.)

To all whom it may concern:

Be it known that I, RUBERT M. GAY, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Motor-Carriages, of which the following is a specification.

My invention relates to motor-carriages, and has for its object the production of a serviceable carriage in which the power from the motor is transmitted to the driving-wheels by a simple mechanism permitting the speed to be readily regulated by the driver to any degree during either the forward or backward movement of the carriage and permitting the power-transmitting devices to be reversed or to be entirely stopped without changing the movement or speed of the motor; and it consists of several new and useful devices and combinations of parts which produce these results and which will be more readily understood by reference to the description of the drawings and the claims to be hereinafter given.

Of the drawings, Figure 1 represents a side elevation of a motor-carriage, a portion of the side of the body being broken away and showing my devices applied thereto. Fig. 2 represents a section through the carriage-body looking to the rear. Fig. 3 represents a side elevation of the power-transmitting devices. Figs. 4 and 5 represent, respectively, an elevation and a section of the device for locking the power-transmitting devices when the carriage is at rest. Fig. 6 represents a detail of the adjusting device for tightening the driving-chain, and Fig. 7 represents a detail of the devices for taking the strain off the balance-wheel.

In the drawings, A is the main frame, mounted on the wheels B B′ and having secured thereto any suitable springs C C′, upon which is mounted the carriage-body D, of any convenient construction. In a chamber in said carriage-body D is mounted a motor E, of any well-known construction, the driving-shaft of which is provided with a suitable balance-wheel F. The outer face of the balance-wheel F is perfectly flat, with the exception of the central depression G, the object of which will be hereinafter described, and against this face of the balance-wheel F the friction-wheel H acts to transmit power from said motor to the driving-wheels B. The friction-wheel H is provided with a frictional ring *a*, of rawhide or similar material, the object of which is to insure a better frictional contact between the wheels H and F, and it is mounted on a shaft I, splined, as at *b*, or otherwise constructed to permit a free movement of said wheel H endwise of said shaft, while its rotary movement will be imparted to said shaft I and to the sprocket-wheels J J on the outer ends thereof and through the medium of which and the chains K K the motion is imparted to the sprocket-wheels L L and the shaft M, on which said sprocket-wheels L L are mounted. The shaft M is provided with a third sprocket-wheel N, connected by chain O to the sprocket-wheel P on the driving-shaft Q, on the ends of which are mounted the driving-wheels B. The shaft M is mounted in the arms M′, hinged at M^2 to the under side of carriage-body D, and is kept at the proper distance from the driving-shaft Q by the distance-bars Q′, one end of which is freely mounted on said shaft Q, while the other end is provided with a pin Q^2, which projects into the slot M^3 in the arms M′. To take up the slack in the chain O, the arms M′ are each provided with a boss *c* and an adjusting-screw *d*, the end of which bears against the pin Q^2, to increase or decrease the distance between the shafts Q and M in an obvious manner.

The shaft I is mounted on the arms R R, loosely mounted on the shaft S, mounted in bearings S′ S′, and provided at one end with a sprocket-wheel S^2, connected by a chain S^3 with another sprocket-wheel S^4, secured to the hand-wheel S^5, which is placed in such a position as to be convenient to the operator, and by means of which the shaft S may be rotated to permit the screw portion S^6 thereof to act upon the nut T, mounted thereon, and move it and through the arms T′ T′ the friction-wheel H endwise of said shaft S. This movement of the friction-wheel H permits it to be moved across the face of the balance-wheel F, and it is obvious that it will thereby receive a positive rotation in one direction when on one side of the center of said wheel

F and a similar rotation in the reverse direction when on the other side of the center, the speed varying with the distance of said wheel H from the center of the wheel F in an obvious manner.

The depression G in the wheel F is for the purpose of preventing the wheel H coming in contact with the wheel F when the wheel H reaches the center of said wheel F in order that the carriage may be brought to a stop, the wheel H being prevented from entering the depression G by means of the adjustable stops R′ R′ in the plane of movement of the arms R R.

In the bottom of nut T is a pocket T^2, on either side of which is an inclined surface T^3, and at the center of the carriage is a pawl or arm V, attached to a rocker-shaft V′, which is adapted to be moved by said inclined plane T^3 when the nut T nears the center of the carriage against the tension of the spring U^2 and away from the stop U^3 until it is in the plane of said pocket T^2, when it will enter the same to lock said nut T from further movement in either direction until said arm is again removed. This is accomplished by means of the lever U^4 on the outer end of said shaft, the rod U^5, and handle U^6, by which the locking-arm V may be withdrawn from said pocket T^2 to permit of the movement of the nut T in either direction.

At the front of the carriage-body in a convenient position to be operated upon by the foot of the operator is pivoted a treadle V, having an arm V′ connected by a rod V^2 to a slide V^3, having a cam-surface V^4, which in its forward movement occasioned by the depression of the treadle V is engaged with the roller W in the end of the lever W′ and lifts the same, thereby straightening the toggle-links W^2 and W^3 and moving the arms R R and friction-roll H away from the balance-wheel F. To the rear of the slide V^3 is connected a rod X, the opposite end of which is fastened to an ordinary band-brake X′, which operates upon a suitable friction-wheel X^2 in any well-known manner. This construction causes the contact between the friction-wheel H and the balance-wheel F to be broken whenever the brake is applied to the driving-wheels, which is an obvious advantage. A spring Y returns the parts to their normal positions when the power is removed from the treadle V.

Between the hub of the balance-wheel F and the hub of the motor E is interposed a suitable thrust-bearing Z, and on either side is mounted a roller Z′, which takes the strain when the friction-wheel H is near the edge of the wheel F.

In the operation of the carriage the hand-wheel is turned toward the front of the carriage, and the friction-wheel is thereby moved to the right of Fig. 2, thus transmitting slight power to said wheel H from the motor-wheel F and slowly starting the carriage, the speed being increased by a further movement of said hand-wheel in the same direction. Should it be desired to stop the carriage, the hand-wheel is turned in the opposite direction and the wheel H is moved to the center until it reaches the depression G, when it will be unable to contact with said wheel F on account of the stops R′ acting upon the arms R, and the transmission of power to the driving-wheels will be stopped and the carriage will come to a standstill. Should it become necessary to suddenly stop the carriage, it may be done by the treadle V without moving the wheel H to the center, as the depression of the treadle will straighten the toggles W^2 W^3 and break the contact between the wheels F H, thus preventing further transmission of power, while at the same time the brake X′ will act to retard the momentum of the carriage in an obvious manner. When the wheel H is moved to the center, it is locked in that position and prevented from moving past the center, and thereby cause a movement of the carriage in the opposite direction when it is desired to simply come to a standstill. Should it be desired, however, to pass the center without locking, it can be accomplished by holding the handle U^6 in raised position until the wheel H has passed the center.

The motor may be run constantly in one direction at any desired speed when the carriage is at rest or in motion in either direction, and with this mechanism it is obvious that the carriage will always be started at its lowest speed, and the speed may then be increased or varied, as desired. It is also obvious that the greater the pull on the driving-wheels the harder the friction-wheel will press against the driving-plate, thus preventing any slipping.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a motor-carriage the combination with a wheel-driving axle and a motor-driven rotary friction-plate, of mechanism connecting the two and consisting of the following instrumentalities: a threaded shaft parallel with the working face of said friction-plate; means by which said threaded shaft may be revolved by the operator; arms loosely mounted upon said shaft; a second shaft also parallel with the face of the friction-plate and mounted in the free ends of said pivoted arms; means connecting the latter shaft with the driving-axle; a friction-wheel mounted upon and revoluble with said latter shaft; and a nut mounted upon and adapted to be moved endwise of said threaded shaft by the rotation thereof and so constructed and arranged as to transmit a lateral movement to said friction-wheel and thus regulate its passage across the rotating plate at the will of the operator.

2. In a motor-carriage the combination with a wheel-driving axle and a motor-driven rotary friction-plate the working face of which is parallel with the front of the carriage; of mechanism connecting the two and consisting of the following instrumentalities: swing-

ing arms pivoted at a point in front of and below the center of said rotating plate; a revoluble shaft mounted in the free ends of said arms; a friction-wheel mounted upon and revoluble with said shaft, the perimeter of which is adapted to contact with the working face of said rotating plate and receive therefrom a rotary motion; mechanism connecting said driving-axle and said revoluble shaft whereby the motion of the latter will be transmitted to the former; and mechanism under the control of the operator whereby said arms may be swung about their pivot to break the frictional contact between the friction devices to disconnect the wheel-driving mechanism from the main motive power.

3. In a motor-carriage the combination with a wheel-driving axle and a motor-driven rotary plate, of mechanism connecting the two and consisting of the following instrumentalities: swinging arms pivoted at a point in front of and below the center of said rotating plate a revoluble shaft mounted in the free ends of said arms and parallel with the face of said plate; a friction-wheel mounted upon and revoluble with said shaft the perimeter of which is adapted to contact with the working face of said rotating plate and receive therefrom a rotary motion; mechanism connecting said driving-axle and said revoluble shaft whereby the motion of the latter is transmitted to the former; a toggle mechanism connecting said arms with the body of the carriage and means of operating said toggle mechanism to make or break the frictional contact between the friction devices at the will of the operator.

4. In a motor-carriage the combination with a wheel-driving axle and a motor-driven rotating friction-plate, the working face of which is parallel with the front of the carriage, of mechanism connecting the two consisting of the following instrumentalities: a pair of swinging arms pivoted in front and below the center of said rotating plate; a shaft revoluble in the free ends of said arms and parallel with the working face of said rotating plate; a friction-wheel mounted upon and revoluble with said shaft the perimeter of which is adapted to contact with the working face of said rotating plate; means of connecting said revoluble shaft with the driving-axle; a brake to retard or stop the wheel-driving mechanism and a device arranged to be worked by the operator to act upon said brake to retard or stop the driving mechanism and at the same time cause said pivoted arms to be moved about their axes to break the contact between the friction devices.

5. In a motor-carriage the combination with a wheel-driving axle and a motor-driven rotating friction-plate, the working face of which is parallel with the front of the carriage, of mechanism connecting the two consisting of the following instrumentalities: a pair of swinging arms pivoted in front and below the center of said rotating plate; a shaft revoluble in the free ends of said arms and parallel with the working face of said rotating plate; a friction-wheel mounted upon and revoluble with said shaft the perimeter of which is adapted to contact with the working face of said rotating plate; means of connecting said revoluble shaft with the driving-axle; a brake secured upon said driving-axle; a cam-shaped slide mounted upon the body of the carriage, a connection between said slide and said brake, a device to move said slide in one direction at the will of the operator, a spring to return it to its normal position, a toggle mechanism interposed between said swinging arms and the body of the carriage and a truck-carrying arm forming a part of said toggle mechanism and constructed and arranged so that said truck will lie in the path of said cam-slide and be acted upon thereby in its forward movement to staighten the toggle, thereby breaking the frictional contact between the friction devices at the same time the same forward movement of said slide is acting upon the brake to retard or stop the driving mechanism.

6. In a motor-carriage, the combination with a wheel-driving axle and a motor-driven revoluble shaft, of mechanism connecting the two and consisting of the following instrumentalities: a sprocket-wheel secured to said driving-axle; a sprocket-wheel secured to said motor-driven revoluble shaft; an arm pivoted to the body of the carriage; a pair of sprocket-wheels mounted in the free end of said arm; two sprocket-chains connecting these sprocket-wheels with those on the motor-driven shaft and the driving-axle; all so arranged that the spring of said carriage will be taken up by said pivoted arm; and a distance-rod loosely mounted upon the driving-axle and adjustably connected to the free end of said pivoted arm and arranged to take up the stretch of both chains by a single adjustment.

7. In a motor-carriage the combination of a motor, a rotating plate operated thereby, a screw-threaded shaft mounted in suitable bearings in the body of said carriage, two arms loosely mounted thereon, a shaft mounted in bearings in the free end of said arms, a friction-wheel mounted upon said shaft so as to revolve therewith but be free to move endwise thereof, power-transmitting mechanism connecting said friction-wheel shaft with the driving-wheels, a nut mounted upon the threaded portion of said threaded shaft and adapted to be moved endwise thereof by its revolution therein and provided with a device transmitting an endwise movement to said friction-wheel and thereby regulating its passage across the face of said rotating plate, a hand-wheel convenient for use by the operator and mechanism connecting said hand-wheel with said threaded shaft so that the latter may be at all times under the control of the operator for the purpose of regulating the speed and movement of the carriage.

8. In a motor-carriage the combination of a motor, a rotating plate operated thereby, a

friction-wheel the perimeter of which is arranged to move across the face of said rotating plate in a diametrical line and thereby receive a rotary motion in either direction at a varying speed, a shaft rotated by said friction-wheel, mechanism connecting said shaft with the driving-wheels of the carriage, a second threaded shaft parallel with the friction-wheel shaft and controlled by the operator, a nut mounted upon and adapted to be moved endwise of said shaft by its rotation and provided with a device arranged to transmit a lateral motion to said friction-wheel and thus regulate its passage across the rotating plate at the will of the operator, a mechanism for automatically locking said nut in the center of its movement and mechanism controlled by the operator whereby said locking-bolt may be withdrawn to permit of further movement of said nut.

9. In a motor-carriage the combination of a motor, a rotating plate operated thereby, a friction-wheel the perimeter of which is arranged to move across the face of said rotating plate in a diametrical line and thereby receive a rotary motion in either direction at a varying speed, a shaft upon which said friction-wheel is mounted and to which it transmits its rotary motion, a sprocket-wheel mounted upon said shaft, a swinging arm hinged to the body of said carriage and carrying at its free end two sprocket-wheels, a sprocket-wheel secured to the driving-shaft and two chains connecting the sprocket-wheels upon the friction-wheel shaft and the driving-shaft with those at the free end of said swinging arm.

Executed at Boston, Massachusetts, this 27th day of January, 1900.

RUBERT M. GAY.

Witnesses:
W. H. RICKER,
WALTER E. LOMBARD.