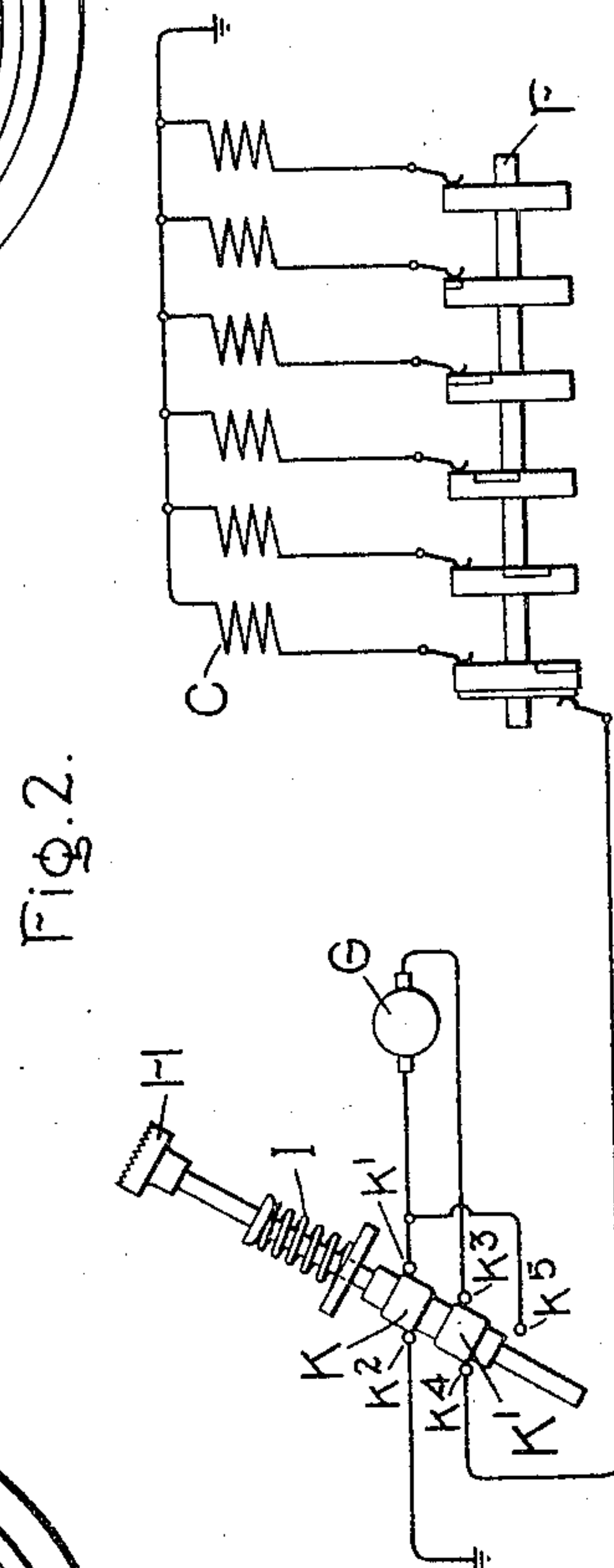
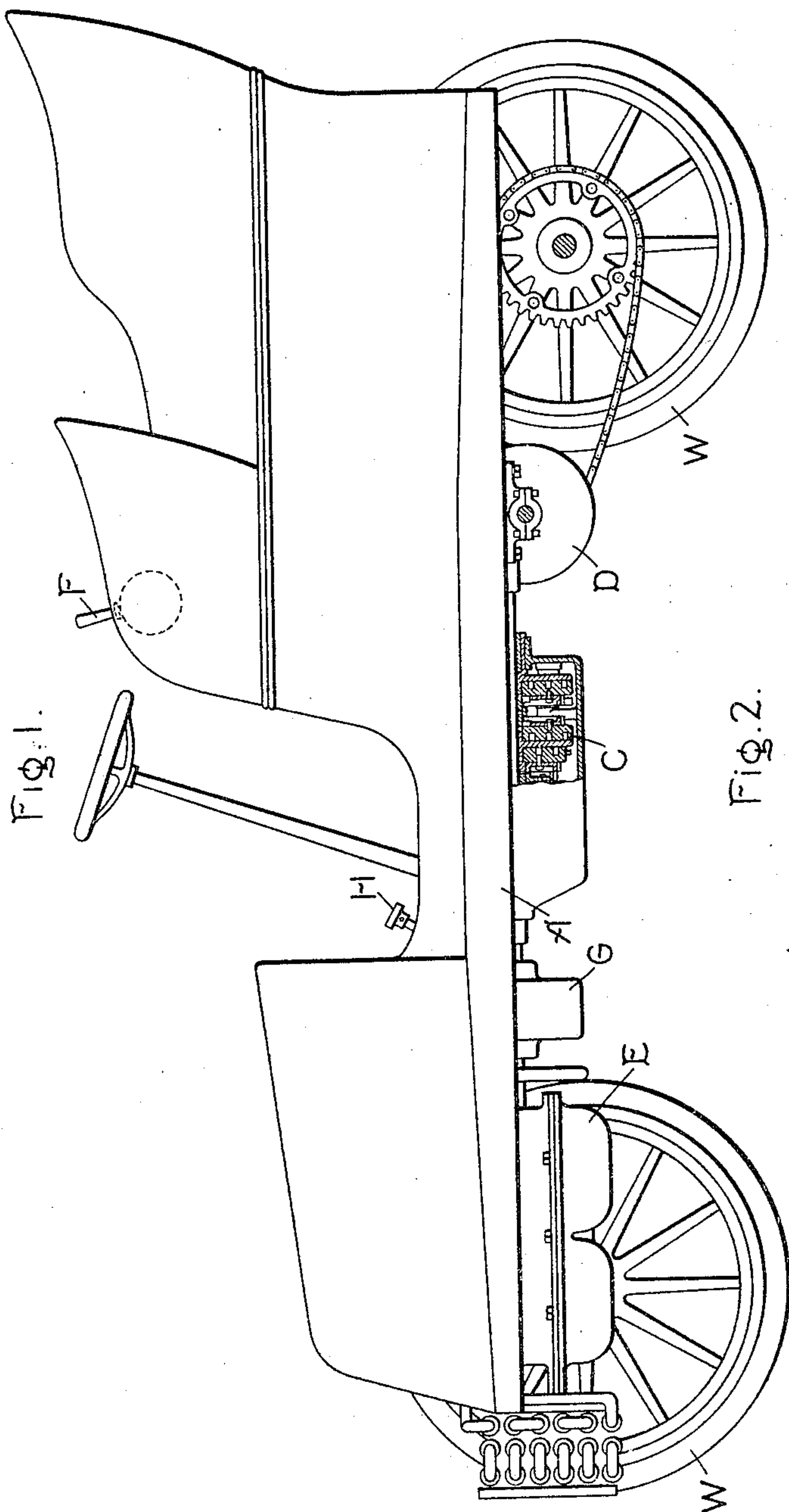


No. 798,396.

PATENTED AUG. 29, 1905.

A. G. DAVIS.
CONTROL OF SELF PROPELLED VEHICLES.
APPLICATION FILED FEB. 10, 1905.



Witnesses.

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CONTROL OF SELF-PROPELLED VEHICLES.

No. 798,396.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed February 10, 1905. Serial No. 244,998.

To all whom it may concern:

Be it known that I, ALBERT G. DAVIS, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Control of Self-Propelled Vehicles, of which the following is a specification.

My invention relates to self-propelled vehicles provided with electromagnetic clutches for controlling the speed; and its object is to provide novel controlling means for the clutches whereby the flexibility of control is increased and all shocks due to throwing the power off and on quickly at high speeds is eliminated. Electromagnetic clutches possess certain advantages as power-transmitting mechanism for vehicles, owing not only to the ease of control, but also to the smoothness with which transition may be made from one speed to another. When the vehicle is running at full speed, however, and it is desired to throw the power off suddenly, either to coast or to bring the vehicle to rest, it is necessary with the controlling devices as ordinarily arranged to connect the low-speed clutches momentarily in circuit in moving the controller to the off position, and this tends suddenly to reduce the speed of the vehicle, and thereby to produce a certain amount of shock. By my invention auxiliary means are provided for opening the circuit of the clutches regardless of the position of the controller, so that it is not necessary to move the controller through the low-speed positions; but the circuit may be broken and reestablished without moving the controller at all. Thus if the vehicle is running at high speed the prime mover may be instantaneously disconnected from the driving-wheels and the vehicle allowed to coast. Then the prime mover may be again connected to the driving-wheels through the same gears as before without the necessity of passing through the low speeds. Thus by my invention the flexibility of the control is increased and all shocks in throwing the power off and on at high speeds are eliminated.

My invention consists in the combination, with the electromagnetic speed-controlling mechanism, of a self-propelled vehicle and the controlling-switch therefor, of auxiliary means for breaking the clutch-circuit regardless of the position of the controller.

More specifically speaking, my invention comprises, in combination with the above elements, a movable member, such as a pedal, provided with contacts included on the clutch-circuit normally held in closed-circuit position by a spring or other similar means, but arranged when moved against the pressure of the holding means to open the clutch-circuit regardless of the position of the controller.

My invention will best be understood by reference to the accompanying drawings, in which—

Figure 1 shows a side elevation of a motor-car with two wheels removed provided with controlling means arranged in accordance with my invention, and Fig. 2 is a diagram showing the circuit connections of the clutches, controller, and auxiliary switch.

In Fig. 1, A represents the frame of the car, to which are secured in the usual manner the bearings for the wheels W. Supported on the frame A is the prime mover E, which may be of any suitable type, such as an internal-combustion engine. Mounted on the engine-shaft is a small generator G, which supplies power for the clutches and for the ignition devices of the engine. C represents the electromagnetic clutches by means of which the prime mover E may be connected through different speed ratios to the differential D, and the speed and torque of the vehicle thereby controlled. These clutches in construction and arrangement may be of any well-known type, the particular form of magnetic clutch employed being in no way essential to my present invention. The differential D is shown connected to the driving-wheel W through a sprocket-chain in the usual manner. F represents an electric circuit-controller placed conveniently for operation by the driver and arranged to connect the windings of the several magnetic clutches successively in circuit with the generator G, so as to vary the speed and torque of the vehicle at will. H represents a pedal normally held raised in the position shown and carrying contacts which are included in the clutch-circuit. When the pedal H is depressed, the clutch-circuit is opened regardless of the position of the controller F, but when released its spring returns it to the position shown, automatically closing the clutch-circuit.

The connections of the circuits are shown in Fig. 2, in which C represents the windings

of the several clutches which are connected to the controller F. G represents the generator, which is connected, through contacts on the pedal H, to the controller F. I represents
 5 a spring, which normally holds pedal H raised, as shown. The pedal carries two movable contacts K and K' and is provided with five stationary contacts k^1 to k^5 . With the pedal in its normal position, as shown, the left-hand
 10 terminal of the generator G is connected, through contact k^1 , K, and k^2 , to ground, while the right-hand terminal is connected through contacts k^3 , K', and k^4 to the controller F. If pedal H is depressed, the clutch-circuit will be
 15 opened regardless of the position of the controller F by contact K leaving contact k^1 and contact K' leaving contact k^3 . As the downward movement of pedal H is continued contacts k^2 and k^3 will be momentarily connected
 20 through contact K, and contacts k^4 and k^5 will at the same instant be connected through contact K'. This connects the right-hand terminal of generator G to ground and the left-hand terminal to the controller F, and conse-
 25 quently sends momentarily a current in the opposite direction through the clutch-windings c. This momentary current acts as a demagnetizing-current to insure the complete release of its armature by the clutch that has
 30 been in circuit. As the downward movement of pedal H is further continued the clutch-circuit is again and finally broken by contact K leaving contact k^2 and contact K' leaving contact k^4 . The clutch-circuit is maintained
 35 open as long as pedal H is maintained depressed; but whenever the pedal is released spring I will return it to its normal position, closing the clutch-circuit again and again connecting the prime mover to the wheels with-
 40 out passing through the low-speed-gear connections.

The construction and arrangement of the auxiliary switch may be modified as desired, and the circuit connections of the clutch wind-
 45 ings and controller may be varied without departing from the spirit of my invention. A battery may be substituted for the generator G, if desired.

Accordingly I do not desire to limit myself
 50 to the particular construction and arrangement of parts herein described, but aim in the appended claims to cover all modifications which are within the spirit and scope of my invention.

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

1. In a self-propelled vehicle, a prime mover, magnetic clutches for transmitting the torque of the prime mover to the wheels of the
 60 vehicle, a source of current for energizing said clutches, a circuit-controller for connecting

said clutches successively to said source to vary the speed and torque of the vehicle, and a movable contact member included in the clutch-circuit and adapted to open said circuit
 65 independently of said controller.

2. In a self-propelled vehicle, a prime mover, magnetic clutches for transmitting the torque of the prime mover to the wheels of the
 70 vehicle, a source of current for energizing said clutches, a circuit-controller for connecting said clutches successively to said source to vary the speed and torque of the vehicle, a movable contact member included in the clutch-circuit and adapted to open said circuit inde-
 75 pendently of said controller, and means for holding said contact member normally in closed-circuit position.

3. In a self-propelled vehicle, a prime mover, magnetic clutches for transmitting the
 80 torque of the prime mover to the wheels of the vehicle, a source of current for energizing said clutches, a circuit-controller for connecting said clutches successively to said source to vary the speed and torque of the vehicle, a movable contact member included in the clutch-circuit and adapted to open said circuit inde-
 85 pendently of said controller, and a spring for returning said contact member to closed-circuit position when released.

4. In a self-propelled vehicle, a prime mover, magnetic clutches for transmitting the torque of the prime mover to the wheels of the
 90 vehicle, a source of current for energizing said clutches, a circuit-controller for connecting said clutches successively to said source to vary the speed and torque of the vehicle, and a movable contact member included in the clutch-circuit adapted to open said circuit inde-
 95 pendently of said controller and arranged to send a momentary demagnetizing-current through the clutch-circuit when opening said circuit.

5. In a self-propelled vehicle, a prime mover, magnetic clutches for transmitting the
 100 torque of the prime mover to the wheels of the vehicle, a source of current for energizing said clutches, a circuit-controller for connecting said clutches successively in circuit with said source to vary the speed and torque of the
 105 vehicle, a pedal, a spring for holding said pedal normally raised, and contacts carried by said pedal adapted to open the clutch-circuit regardless of the position of the controller when
 110 said pedal is depressed.

In witness whereof I have hereunto set my hand this 9th day of February, 1905.

ALBERT G. DAVIS.

Witnesses:

BENJAMIN B. HULL,
 HELEN ORFORD.