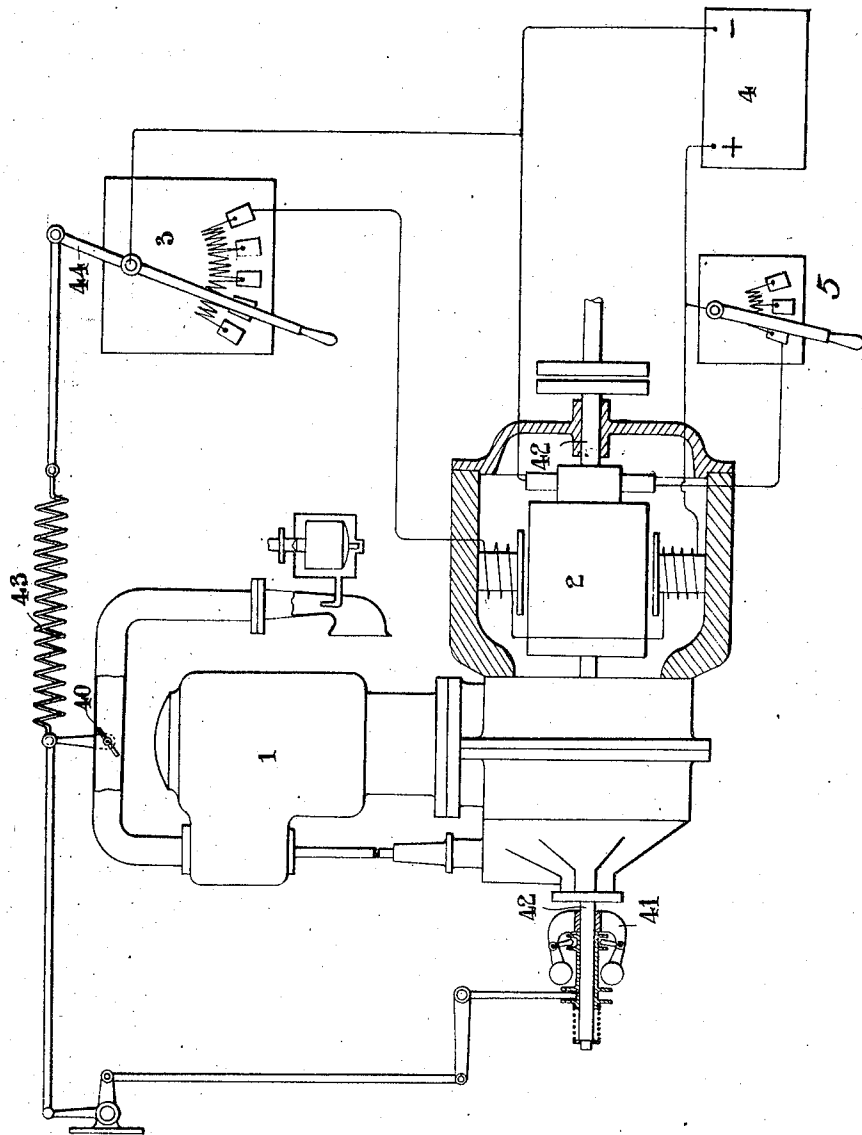


H. PIEPER.
MOTOR VEHICLE.

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1,058,899.

Patented Apr. 15, 1913



Witness:
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UNITED STATES PATENT OFFICE.

HENRI PIEPER, OF LIEGE, BELGIUM.

MOTOR-VEHICLE.

1,058,899.

Specification of Letters Patent.

Patented Apr. 15, 1913.

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To all whom it may concern:

Be it known that I, HENRI PIEPER, a subject of the King of Belgium, and residing at 18 Rue des Bayards, Liege, Belgium, have invented certain new and useful Improvements in and Relating to Motor-Vehicles, of which the following is a specification.

This invention relates to motor vehicles and their propulsion plants and is particularly applicable to those working on the mixed principle as set forth in my Patent No. 913,846.

It will be obvious that in vehicles employing a dynamotor working in conjunction with a buffer battery there will be a certain difference of speed according as to whether the dynamotor, is working as a dynamo or motor, corresponding to the difference in the E. M. F. required to properly charge the battery over that of discharge. For ordinary lead accumulators, for example, the former may have a value of 2.6 volts per cell, which drops almost immediately to about 2.0 volts when the dynamotor runs as a motor. Between these values therefore the power developed by the engine should also be fully controlled in such a manner as to obtain proper running of the car without overcharging the accumulators, or running them below the proper voltage.

The main object of my invention therefore is to obtain the advantages set forth above.

My invention consists in controlling the power developed by the engine by means depending on the equilibrium setting of the controller and the speed of the dynamotor shaft.

My invention also consists in the arrangements hereinafter described.

The accompanying diagrammatic drawings show one manner of carrying the invention into effect.

These drawings are not necessarily to any definite scale but are so arranged as to show clearly the chief features of the invention.

In carrying the invention into effect according to the form illustrated I control the power developed by the engine 1 according to the actual speed of the shaft of the dynamotor 2 acting in conjunction with the particular equilibrium speed for which the controller is set.

As has been before pointed out, in order to charge the battery 4 an E. M. F. of about 2.6 volts per cell must be impressed thereon,

which E. M. F. drops to about 2.0 volts practically immediately when any current is taken from the battery. As it is desired that the normal state of the battery should be that of full charge, it follows that when the speed is such as to correspond to an E. M. F. of 2.0 volts only, the power developed by the engine should be a maximum, that is, in the form illustrated, the throttle should be fully open at this point. Moreover it is quite evident that to prevent overcharging the batteries power developed by the engine should be a minimum, or the throttle fully closed, when the speed corresponds to an E. M. F. of 2.6 volts per cell; and it is between these points that control must be effected and a number of different equilibrium speeds obtained. Now with the controller set for the lowest equilibrium speed the throttle must be fully open at a speed corresponding to 2.0 volts per cell, and in the highest equilibrium speed it must be fully shut at a speed corresponding to 2.6 volts per cell. But it is quite evident that in the first case it must be fully shut some time before the 2.6 volts speed is reached and in the latter it must be fully open before the speed drops to this value. It therefore follows that with the car running at its top equilibrium speed the throttle must be more heavily controlled than that of the lowest speed, and the control must be progressive with respect to intermediate equilibrium speeds. In the form illustrated this is effected by acting on the throttle valve by means connected with a shaft governor and controlled according to the particular equilibrium speed for which the car is set. Thus the engine throttle valve, 40, is operated through links connected to any suitable governor, 41, on the dynamotor shaft, 42, according to the instantaneous speed of the motor. This operation, however, is in the present form of the invention controlled according to the particular equilibrium speed at which the car is running, as explained above, by a spring, 43, connected to the controller handle, 44, so that when set for highest speed the spring is most extended and therefore exerts greater control on the valve operation than at low speeds.

It will be understood that the lowest notch on the controller 3 does not necessarily correspond to the lowest equilibrium speed but may be lower than that for use when starting, the throttle being at such setting always

fully open. However, the starting is usually controlled by a series controller 5 leaving the control of the equilibrium speeds to the shunt controller, 3.

5 Although I have herein described and illustrated one form of my invention it will be clear that modifications not described or illustrated can be made if desired by any one skilled in the art or arts to which my
10 invention relates.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a propulsion set, in combination, an
15 engine, means controlling the power developed by said engine, a governor, means controlling the speed of said engine, a connection between said governor and said engine
20 power controlling means, and a connection between said speed controlling means and said engine power controlling means; as set forth.

2. In a propulsion set, in combination, an
25 engine, means controlling the power developed by said engine, a governor, means controlling the speed of said engine, a connection between said governor and said engine power controlling means, and spring means
30 connecting said speed controlling means with said engine power controlling means; as set forth.

3. In a propulsion set, in combination, an
35 engine, a throttle valve to said engine, a governor, means controlling the speed of said engine, a connection between said throttle valve and said governor, and a connection

between said speed controlling means and said throttle valve; as set forth.

4. In a propulsion set, in combination, an engine, means controlling the power developed by said engine, a governor, electrical
40 means controlling the speed of said engine, a connection between said governor and said engine power controlling means and a connection between said electrical means and
45 said engine power controlling means; as set forth.

5. In a propulsion set of the mixed type, an engine, means controlling the power developed by said engine, a governor, means
50 controlling the speed of said engine, a connection between said governor and said engine power controlling means, and a connection between said speed controlling means and said engine power controlling means; 55 as set forth.

6. In a propulsion set, in combination, an engine, a dynamo motor connected therewith, an engine admission valve, an electric
60 controller controlling said dynamo motor, a manually operated lever for said controller, a spring connecting said lever and the engine valve, an engine governor, and means connecting the engine valve and said
65 governor; as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRI PIEPER.

Witnesses:

JOSEPH PIETKIN,
EMILE HEPTERL.