

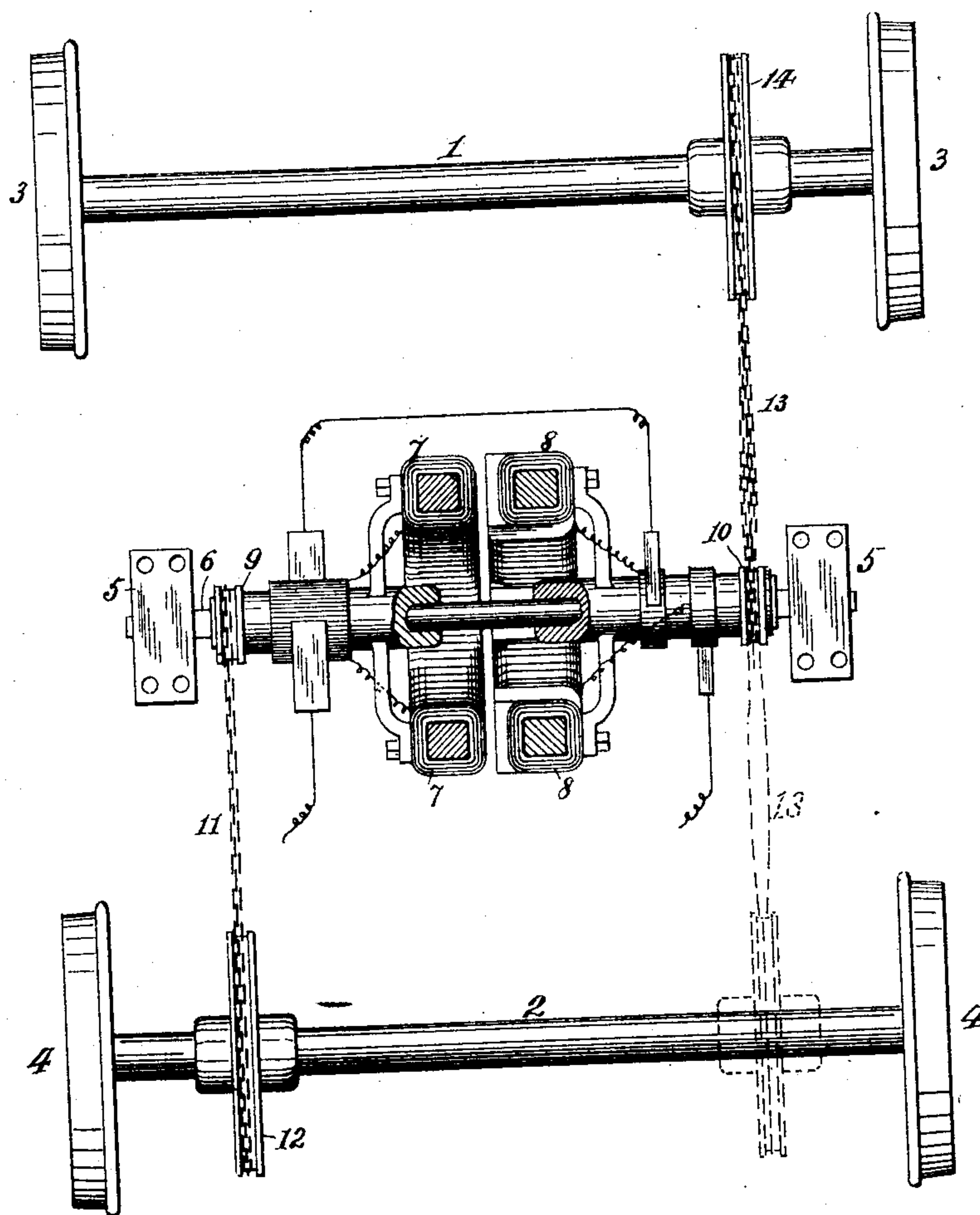
(No Model.)

F. A. PERRET.  
ELECTRIC RAILWAY MOTOR.

No. 424,818.

Patented Apr. 1, 1890.

Fig. 1.



WITNESSES:

*E. S. Myers*  
*S. E. Field*

*Frank A. Perret*, INVENTOR

BY  
*W. Fisher Worthington*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

FRANK A. PERRET, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE ELEK-  
TRON MANUFACTURING COMPANY, OF NEW YORK.

## ELECTRIC-RAILWAY MOTOR.

SPECIFICATION forming part of Letters Patent No. 424,818, dated April 1, 1890.

Application filed September 2, 1889. Serial No. 322,651. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK A. PERRET, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric-Railway Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the construction of electric motors for the purpose of adapting them to the driving of street-cars or other vehicles, wherein the rate of revolution of the wheels of the vehicle is comparatively low.

The object of the invention is twofold: First, to obtain a means of independently driving both axles of the car by means of one motor only; secondly, to reduce the difference in speed between the driving-pinions of the motor and the axles of the vehicle, so that less intermediate gearing will be required and at the same time to retain the moderately-high speed of armature, as related to the field-magnet, which is necessary to obtain high efficiency.

To these ends my invention consists in the arrangement and combination of parts, substantially as hereinafter fully described and claimed.

In the drawing which forms part of this specification, the figure 1 is a plan view illustrating the principles of my invention.

Various forms of electric motor may be utilized to carry my invention into practical effect, as may also various patterns of gearing or methods of transmitting the power of the motor to the axles of the car; and I therefore do not confine the scope of this invention to any particular form of motor or any particular style of gearing. I illustrate a simple form, however, for the purpose of disclosing the nature of my invention, which is as follows: 1 and 2 represent the respective axles of the car or other vehicle, and 3 and 4 the wheels. At an intermediate point I attach to the frame or body of the car, or, better still, to the truck, the hangers 5, and in these I support a stationary axle or shaft 6. Upon the shaft 6, as a journal, I place the armature

7 and the field-magnet 8 of the electric motor, using such collars or other interposed mechanism as will prevent the armature from striking the field-magnet in the construction shown. It will thus be seen that both the armature and field-magnet are free to revolve under the influence of the exciting-current, and this they will do in opposite directions.

The armature structure carries with it a suitable power-transmitting device—such, for instance, as the sprocket-wheel 9—and the field-magnet structure likewise is fitted with a similar wheel 10. By means of the chain 11 and the sprocket-wheel 12 on axle 2 the motion of the armature is made effective for the purpose of rotating the axle 2 and wheels 4. A similar chain 13 and wheel 14 on axle 1 serves to transmit the motion of the field-magnet 8 to the axle 1 and wheels 3. Obviously one of these chains 11 or 13 should be twisted so as to cause the rotation of the two axles 1 and 2 to take place in the same direction. In the drawing I have shown the chain 13 thus twisted. The practical effect of this is that the actual speed of either member of the system is only half what it would be were the other member stationary, and the ratio of gearing to the wheels is correspondingly reduced, while at the same time the relative speed between the two is the same as if one were stationary and the other revolving.

The independent relations existing between the motor members and the two axles is important under many circumstances incidental to the practical use of a railway-car or other vehicle propelled by an electric motor, the chief advantage being the greatly-increased tractive effort due to independent driving of the axles, to secure which it has heretofore been necessary to use two motors.

It will of course be understood that without departing from the principles of the invention as hereinbefore set forth, substantially the same result will follow by constructing and arranging the two members of the electric motor as already described, so that each can rotate independently of the other, and instead of gearing them to the two axles of the car, as shown by the full lines in the drawing, they may be geared both to a single axle and still have the independent action already set forth.



Such construction is indicated in the drawing by the dotted lines, which shows the arrangement that would be adopted in gearing both members to the same axle.

5 I claim as my invention—

1. In an electrically-propelled vehicle, the combination, with the running-gear thereof, of an electric motor having its armature and field-magnet adapted to rotate in opposite  
10 directions and each independently connected to the running-gear of the vehicle.

2. In an electrically-propelled vehicle, the combination, with two axles thereof, of an

electric motor having its armature and field-magnet adapted to rotate in opposite direc- 15  
tions, the said field-magnet being geared to and arranged to communicate rotation to one axle and the said armature being geared to and adapted to communicate rotation to the other axle, substantially as described. 20

In testimony whereof I affix my signature in presence of two witnesses.

FRANK A. PERRET.

Witnesses:

JAMES J. FERRY,

JAMES F. MADIGAN.