(No Model.)

T. A. EDISON.

ELECTRO MAGNETIC RAILWAY SYSTEM.

No. 273,490. Patented Mar. 6, 1883.

Fig. 1.

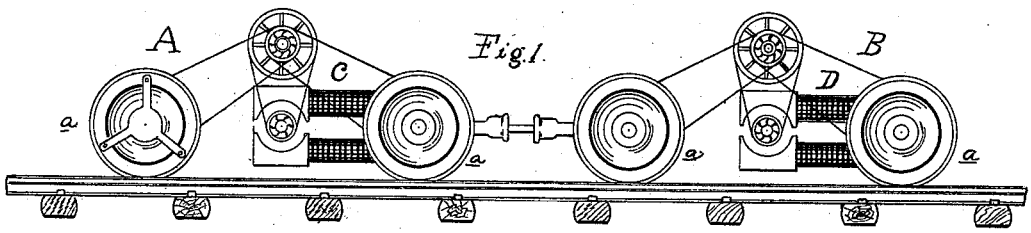


Fig. 2.

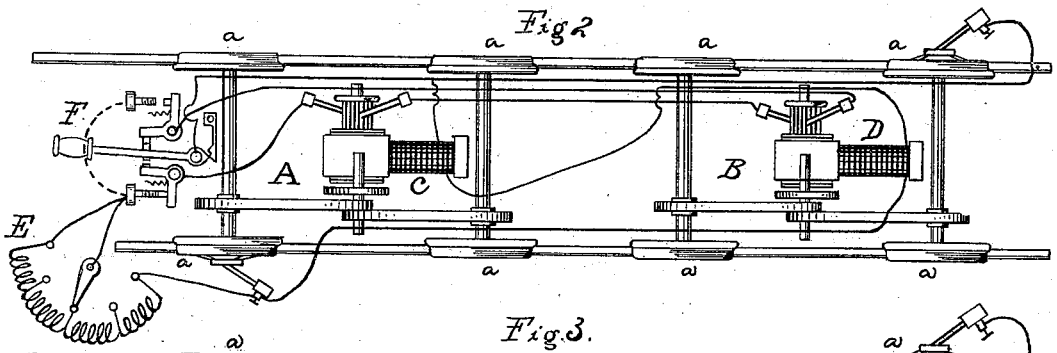


Fig. 3.

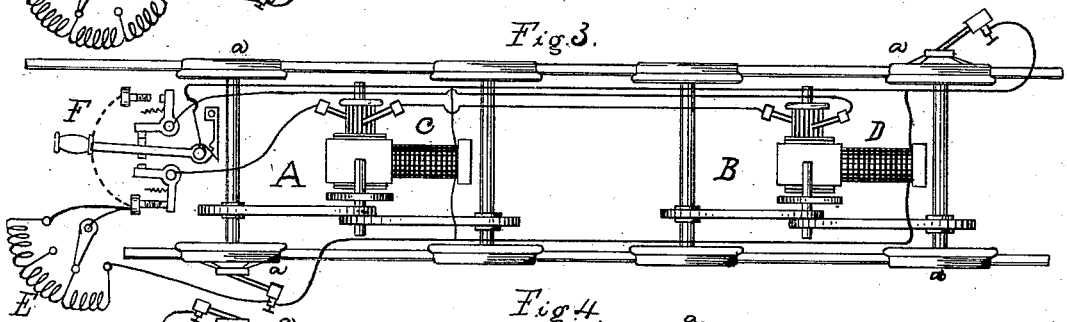
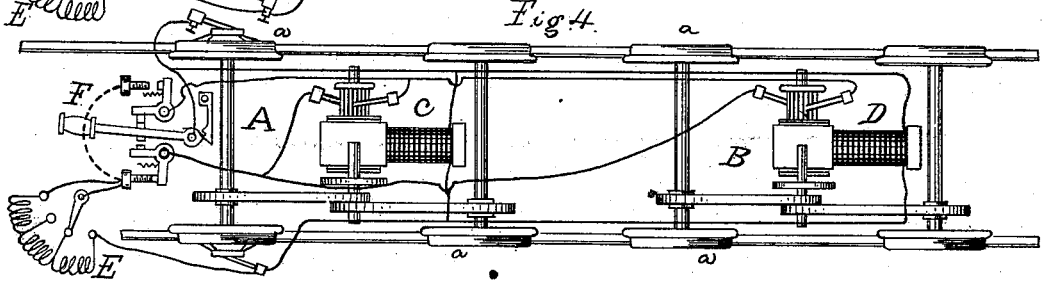


Fig. 4.



E. C. Rowland
W. W. Seely

INVENTOR:
T. A. Edison
BY Richd. N. Dyer.
ATTORNEY.

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

ELECTRO-MAGNETIC RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 273,490, dated March 6, 1883.

Application filed August 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Electro-Magnetic Railway Systems, (Case No. 431;) and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to letters of reference marked thereon.

My invention relates to electric railways; and it consists primarily in utilizing the weight of all the cars of a train, or of two or more of such cars, for giving drawing-power, while the whole train is still controlled from a single point. An electric locomotive is usually very light compared with those in which steam is used, and therefore exerts but little adhesive force upon the rails, therefore when a heavy train is in use the driving-wheels are likely to slip, and the full benefit of the tractive power is not obtained. To obviate this is the object of my invention. The preferable way of accomplishing this object is as follows: Each car, or each truck of a car, is provided with two or more electro-dynamic motors, whose armatures are connected mechanically with the axles of the cars, so as to transmit motion thereto. All the armature-coils and all the field-magnet coils of the motors on the train are connected either in series or in multiple arc. The brushes which take current from the wheels on one side of the train may be on the forward car and those of the other side on the rear car, or both sets of brushes may be on the forward car. The current is preferably taken from two or more wheels of a car (instead of from one wheel) for each pole of the motor, the brushes used for this purpose being carried by an insulating-arm, along which the conductors run. The adjustable resistance for slowing down the train and the circuit controllers and reversers for all the circuits are placed on the forward car, so that the entire train may be controlled from that point. Instead of providing all the cars with motors, only certain cars of the train may be so constructed; or all the cars may be provided with motors, and only the motors of enough cars to give the necessary adhesive and tractive power connected up. The coupling devices for completing the electrical circuits will preferably be located at the ends of the cars, and will be so constructed and arranged that the simple coupling of opposing parts will complete the necessary circuits.

In the accompanying drawings, Figure 1 is a side elevation, showing two cars provided with motors. Figs. 2, 3, and 4 are top views, showing the electrical connections in diagram of the preferred form of my invention. The frame-work of the two cars is omitted in these figures for the sake of clearness.

A and B are the two cars. C and D, Figs. 1, 2, 3, and 4, are electro-dynamic motors mounted upon said cars, and having their armatures properly connected with the car-axles. The wheels *a* of the cars may all be constructed with rims insulated from their hubs, or only those on one side of a car need be so constructed.

In Figs. 2 and 3 the brushes or springs which take current from the wheels are placed one on the front, the other on the rear car, while in Fig. 4 both brushes are on the first car. In Fig. 2 the armature-coils of the motors are all in series, and so are the field-magnet coils. In Fig. 3 the armature-coils are in series, and the field-magnet coils in multiple arc, while in Fig. 4 both the armature-coils and the field-coils are in multiple arc. The armature-coils could of course be placed in multiple arc and the field-coils in series, if desired.

On one car, A, of a train are placed the adjustable resistance E and circuit controller and reverser F, which are fully explained in another application made by me. They are so arranged as to affect all the circuits of the train.

What I claim is—

1. The combination, in an electric railway-train, of electro-dynamic motors mounted on two or more cars of such train, and connected with the axles thereof, and means for controlling all such motors situated on one of said cars, substantially as set forth.

2. The combination, in an electric railway-train, of electro-dynamic motors mounted on two or more cars of such train, and connected with the axles thereof, and a circuit controller and reverser mounted on one of such cars and adapted to control or reverse the circuits of

all of said motors simultaneously, substantially as set forth.

3. The combination, in an electric railway-train, of electro-dynamic motors mounted on two or more cars of said train, and connected with the axles thereof, and a circuit controller and reverser, and an adjustable resistance situated on one of said cars and connected with the circuits of all of said motors, substantially as set forth.

This specification signed and witnessed this 9th day of June, 1882.

THOS. A. EDISON.

Witnesses:
RICHD. N. DYER,
EDWARD H. PYATT.