(No Model.) 2 Sheets—Sheet 1.

B. CADE.

ELECTRIC RAILROAD.

No. 419,314. Patented Jan. 14, 1890.

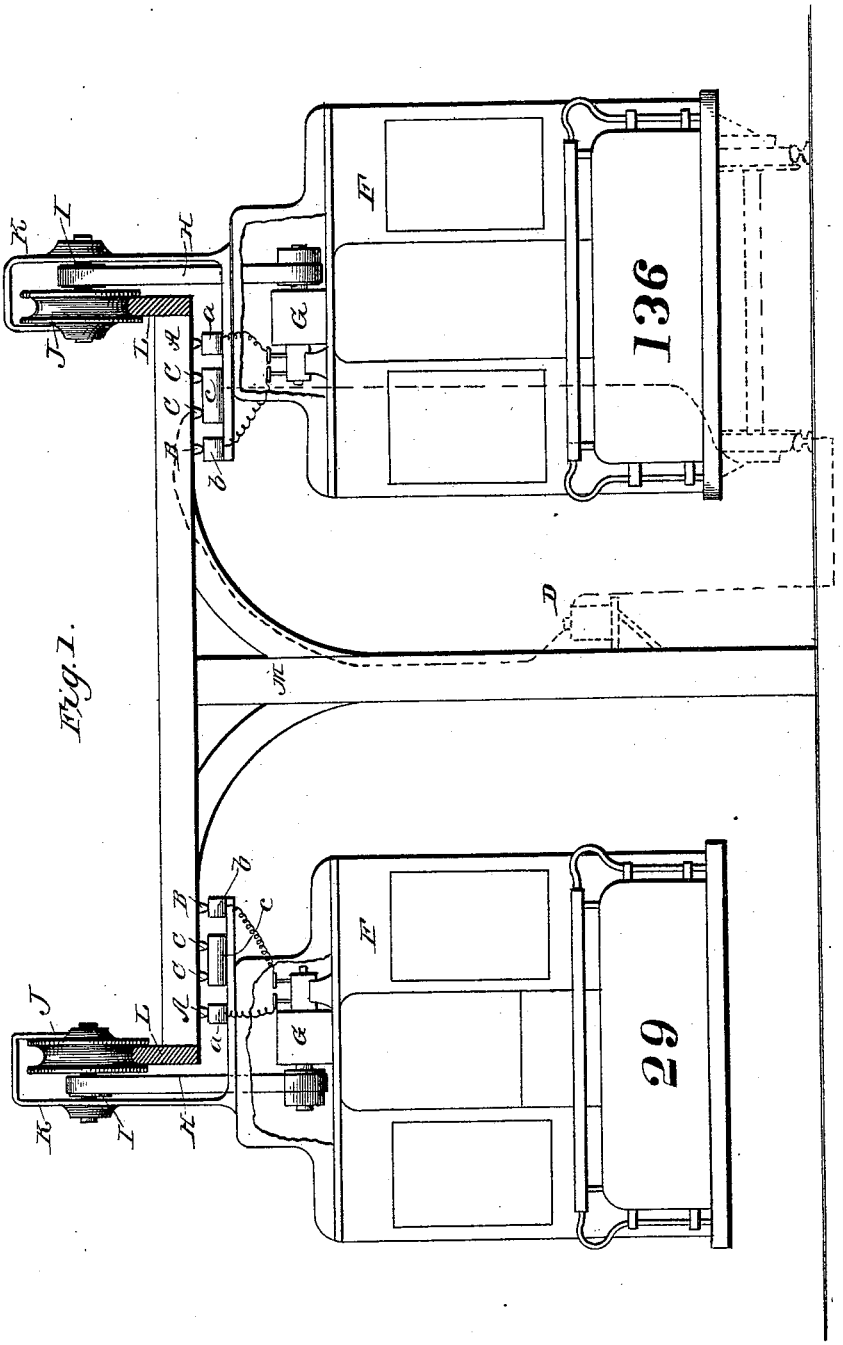

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

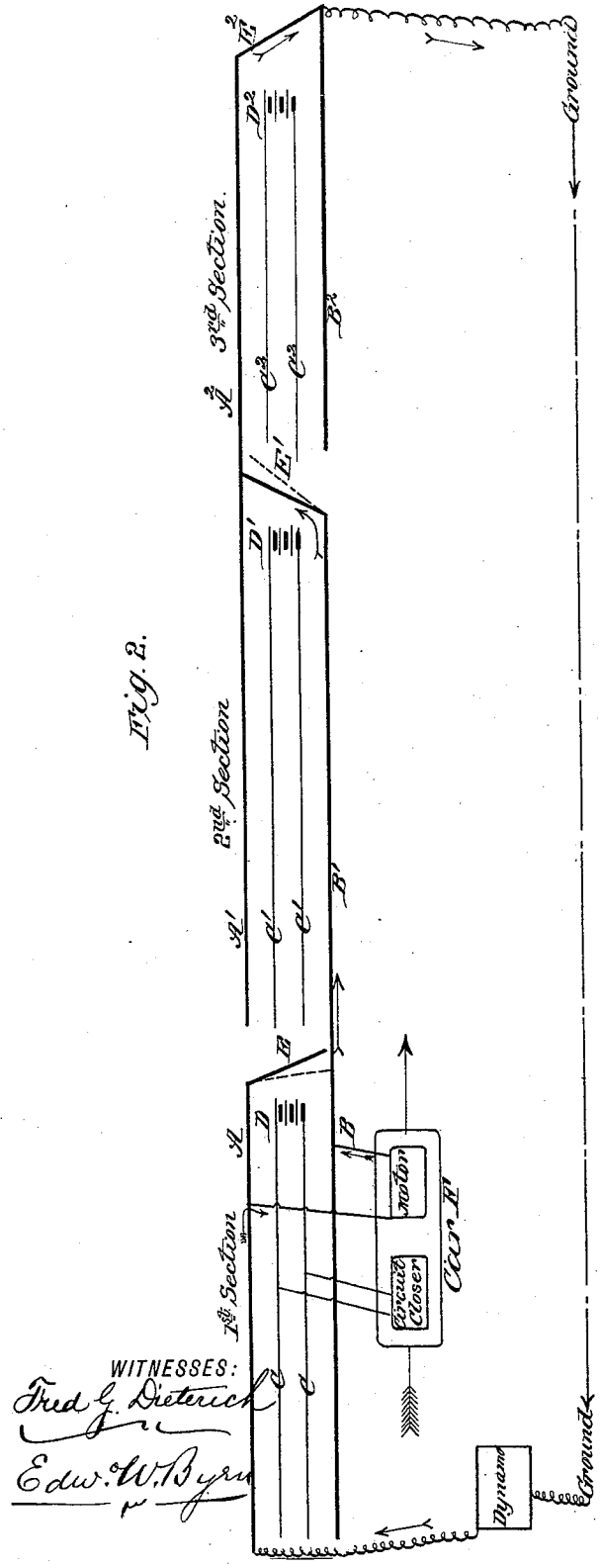


Fig. 4.

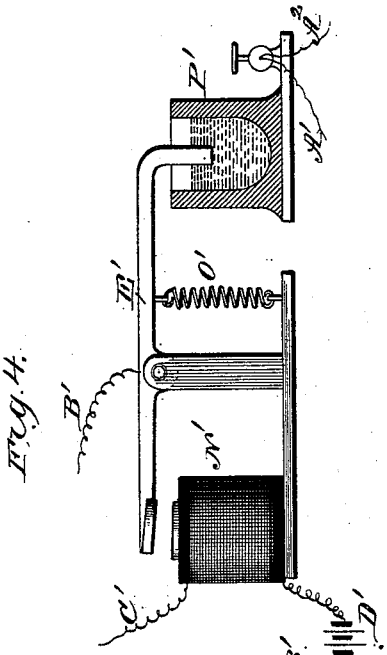
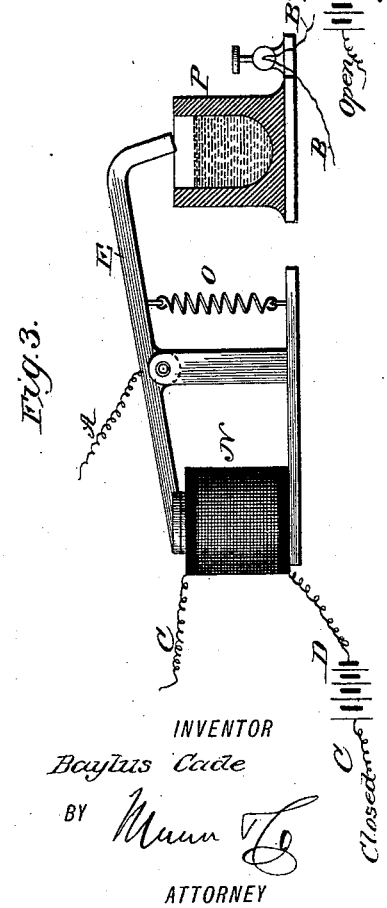


Fig. 3.



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UNITED STATES PATENT OFFICE.

BAYLUS CADE, OF LOUISBURG, NORTH CAROLINA.

ELECTRIC RAILROAD.

SPECIFICATION forming part of Letters Patent No. 419,314, dated January 14, 1890.

Application filed August 9, 1889. Serial No. 320,266. (No model.)

To all whom it may concern:

Be it known that I, BAYLUS CADE, of Louisburg, in the county of Franklin and State of North Carolina, have invented a new and useful Improvement in Electric Railroads, of which the following is a specification.

My invention relates to electric railroads, and especially to that class of electric railroads in which the car is suspended from a single overhead rail.

It consists in the peculiar construction and arrangement of the circuit wires or conductors in sections, in connection with a local battery and circuit for each section, and the contact-surfaces of the car, as will be hereinafter fully described.

Figure 1 is a transverse section through the overhead rails as arranged for a double track, with the cars suspended therefrom. Fig. 2 is a diagrammatic representation of the conductors with which the car makes sliding contact, and of the local battery and circuit for each section of the road. Figs. 3 and 4 are detail views of the instrument for automatically opening and closing the circuit of the main conductor, the position of Fig. 3 showing the circuit open and Fig. 4 showing it closed.

Referring to Fig. 1, the track is mounted upon strong standards M, which carry at the top a rail L upon one or both sides of the same. The car F is provided with hangers K, which carry supporting-wheels J in front and rear that travel upon the rail L. On the same axis with one of the wheels J is fixed a band-pulley or chain-pulley I, which is connected by a belt or chain H to the driving-pulley of the electric motor G. The two poles of the motor are connected, respectively, to the sliding spring-contacts *a* and *b* on the car, which slide along the conductors A and B, that are secured upon some portion of the track and extend the full length of the line. Between the conductors A B there are two other parallel conductors C C, which are electrically connected by a sliding contact *c* on the car, and which serve to automatically work the circuit-breaker of the main conductors, as hereinafter described.

The conductors, which are shown at A C C B in Fig. 1, are arranged in sections throughout the entire line, as shown diagrammatically in Fig. 2. The conductors are arranged in lengths, which extend past two sections of the road—*i. e.*, the sections A′ A^2 are in one length, B B′ are in one length, and so on, and these lengths are alternated, so as to lap half-way past each other, and the end of one length is normally connected to the middle of the alternating length by a circuit-breaker (indicated diagrammatically at E E′ E^2.) This circuit-breaker is controlled in its action by a local battery D at the end of each section of road, the two poles of which battery are connected to the parallel conductors C C, which extend along the line the full length of each section. These two conductors C C are disconnected and the battery-circuit is open except when a car is on that section of the road, and when a car is on that section of the road the two conductors C C are electrically connected, as in Fig. 1, and the closure of this battery-circuit is made to open the switch or circuit-breaker E, which is shown diagrammatically in Fig. 2 and fully in Fig. 3. Thus in Fig. 3 wire A is connected to conductor A, Fig. 1, and wires B B′, Fig. 3, represent the line-section B B′, Fig. 2, and the armature-lever E, Fig. 3, represents the diagrammatic switch or circuit-breaker E of Fig. 2. The local battery D, Fig. 2, controls a magnet N, Fig. 3, which is located between the sections, and with spring O makes and breaks contact between lever E and mercury-cup P, and consequently between conductor A on one side and B B′ on the other.

The operation is as follows: When there is no car on the road, all the local batteries D D′ D^2 are open, and consequently all the switches E E′ E^2 are closed and in the position shown in Fig. 4, so that the current from the dynamo has an uninterrupted passage over the conductor, passing from A through (closed) switch E to conductor B′, thence over switch E′ to conductor A^2, and so on to the end of the line, and thence to the ground and back again to the dynamo, as indicated by the arrows. Now if a car (represented diagrammatically at F, Fig. 2) enters upon the first section of the road the spring *c*, Fig. 1, makes contact between the conductors C C and closes the battery-circuit through the magnet N, Fig. 3, and in throwing the switch-lever E out of the mercury-cup breaks the main dy-

namo-circuit between A and B B′ and compels the dynamo-current to pass from conductor A to the motor on the car, and thence to the conductor B, and thence on through the closed line. It will thus be seen that each car closes the local battery of the section on which it may be moving, and thus opens the dynamo-circuit between the main conductors and compels the dynamo-current to pass through the motor of the car, thus energizing the same to propel the car on the track. This arrangement of conductors and circuits permits the cars to travel in either direction upon the track, and also causes the current to pass through all the cars on all of the sections.

Instead of using two conductors C C for the local circuits, I may use only one and close the local battery-circuit by grounding it through the car, as shown in dotted lines on the right-hand side of Fig. 1, in which D represents the same section-battery shown at D in diagram Fig. 2.

Having thus described my invention, what I claim as new is—

1. In an electric railroad, the combination, with a car having sliding contacts and an an electric motor, of a series of conductors B B′ and A A′, made of the length of two sections and arranged parallel to and alternately lapping past each other, a circuit-breaker for connecting the end of one conductor with the middle of the alternating conductor, and a local battery and conductor for each section, arranged, as described, to be closed by the car to open the circuit-breaker of the section of the main circuit upon which the car is passing, substantially as shown and described.

2. In an electric railroad, the combination, with a car having sliding contacts a c b, and an electric motor connected with a b, of a series of conductors B B′ A′ A^2, made each of the length of two sections and arranged parallel to and lapping past each other, a circuit-breaker for connecting the end of one conductor with the middle of the alternating conductor, a local battery controlling said circuit-breaker for each section, and two conductors C C, connected to the opposite poles of each local battery and extending the full length of each road-section, substantially as shown and described.

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Witnesses:
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