No. 617,837. Patented Jan. 17, 1899.

E. B. W. REICHEL.

ELECTRIC RAILWAY SYSTEM.

(Application filed Oct. 3, 1898.)

(No Model.)

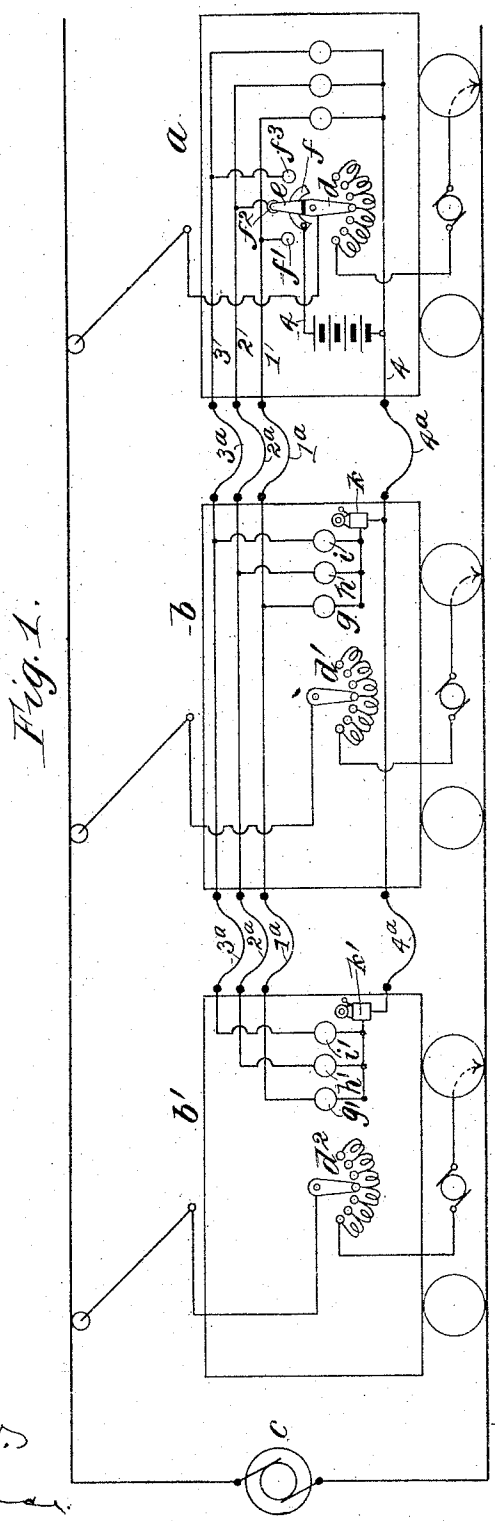


Fig. 1.

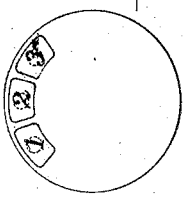


Fig. 2.

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EMIL BERTHOLD WALTER REICHEL, OF BERLIN, GERMANY, ASSIGNOR TO THE SIEMENS & HALSKE ELECTRIC COMPANY OF AMERICA, OF CHICAGO, ILLINOIS.

ELECTRIC-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 617,837, dated January 17, 1899.

Application filed October 3, 1898. Serial No. 692,539. (No model.)

To all whom it may concern:

Be it known that I, EMIL BERTHOLD WALTER REICHEL, a subject of the Emperor of Germany, residing at Berlin, Germany, have invented a certain new and useful Improvement in Electric-Railway Systems, (Case No. 168,) of which the following is a full, clear, concise, and exact description.

My invention relates to electric-railway systems, and particularly to those systems in which each train contains a plurality of motor-cars, each motor-car being attended by a motorman.

My invention has for its object the provision of improved means for guiding the assistant motormen in the operation of their controllers, so that they may be informed of the condition of use of the controller in charge of the chief motorman upon the first car of the train. The assistant motormen are thus enabled to place their controller-handles in positions similar to that occupied by the controller-handle manipulated by the chief motorman.

The invention in its preferred embodiment comprises a signal-circuit including a signal upon each motor-car contained in the train in addition to the leading motor-car, a switch-arm mechanically connected with the controller handle or lever operated by the chief motorman being employed for governing the signal-circuit.

I will explain my invention more particularly by reference to the accompanying drawings, which illustrate one embodiment thereof.

Figure 1 of the drawings is a diagrammatic view showing three motor-cars assembled into a single train, the apparatus of my invention being diagrammatically illustrated. Fig. 2 is a plan view of a set of signals provided for the use of each of the assistant motormen.

Like letters and numerals refer to like parts in both views.

In the drawings I have illustrated a motor-train comprising a leading motor-car a and two additional motor-cars b b', each motor-car being provided with a motor and supplied with current from a generator c in a well-known manner. Upon cars a b b' are provided suitable controllers, as the controlling-rheostats d d' d^2. In this particular instance I have illustrated a supplemental contact-arm e mechanically connected with the controller-arm of rheostat d, whereby the arm e is actuated upon the actuation of said controller-arm. The arm e is preferably insulated from the contact-lever of the controller and engages a segmental plate f and successively contact-buttons f' f^2 f^3. The contact-buttons and the contact-plate f form terminals upon the car a of conductors 1, 2, 3, and 4, respectively. These conductors extend to the cars b b'. Signals g g' upon cars b b' are connected between conductors 1 and 4, signals h h' are connected between conductors 2 and 4, and signals i i' are connected between conductors 3 and 4. The signals are placed within sight of the assistant motormen. Circuit is closed successively through the signals as the switch-arm e is moved, the signals being suitably designated to indicate to the assistant motormen the position of the controller-lever upon car a. The signals upon each car are preferably grouped as shown in Fig. 2, which illustrates in plan view a circular face having three openings, preferably covered by ground glass, behind which the signals, which are preferably incandescent lamps, are disposed. These lamps are successively lighted as the controller-lever upon the leading car is rotated. The assistant motorman changes the position of his controller-lever upon the extinguishment of a lamp to the position indicated by the lamp next caused to glow. Each group of signals constitutes an indicator for showing the position of the controller-lever operated by the chief motorman.

If it is desired, supplemental audible signals k k' may be provided upon the cars b b'. The number of signals upon the motor-cars may be varied, as desired. The conductors 1, 2, 3, and 4 are in sections, which are united between the cars by flexible links 1^a 2^a 3^a 4^a when the motor-cars are assembled into a train.

The group of lamps located near each controller to be within the presence of the motorman operating the controller constitutes a graduated indicator, serving to inform the motorman of the position to which he should

move his controller, the switch operated by the chief motorman constituting a graduated means for operating the graduated indicator. Signals may be provided near that controller which serves to govern the signals upon the remaining cars; but they are not absolutely essential, as the signals or indicators are provided for the information of the motormen upon the rear motor-cars. It may be desirable, however, to provide the signals upon the first motor-car in order that the motorman upon that car may know that the signaling-circuits are in proper working condition. I do not wish to be limited to the precise disposition of the signals herein set forth.

It is obvious that other controlling devices than those herein diagrammatically illustrated may be employed in governing the motor-circuits. Other arrangements of signal-circuits and signaling apparatus may also be employed without departing from the spirit of the invention. I do not therefore desire to be limited to the precise system and apparatus shown; but,

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

1. In an electric-railway system, the combination with a plurality of motor-cars in a single train, of motor-controllers upon said cars, an indicator upon one of the motor-cars, and means governed by the motor-controller upon another car for operating said indicator, substantially as described.

2. In an electric-railway system, the combination with a plurality of motor-cars in a single train, of motor-controllers upon said cars, a signal-circuit between the cars, an indicator upon one of the motor-cars in said circuit, and switching apparatus operated by the motor-controller upon another car for governing the said signaling-circuit, substantially as described.

3. In an electric-railway system, the combination with a plurality of motor-cars in a single train, of motor-controllers upon said cars, a plurality of signals upon one of the cars, and means for operating said signals governed by the motor-controller upon another car, substantially as described.

4. In an electric-railway system, the combination with a plurality of motor-cars in a single train, of motor-controllers upon said cars, a plurality of visual signals upon one of the cars, and means for operating said signals governed by the motor-controller upon another car, substantially as described.

5. In an electric-railway system, the combination with a plurality of motor-cars in a single train, of motor-controllers upon said cars, a plurality of signal-circuits between the cars, a signal in each of said circuits located upon one of the cars, and a switch for successively opening and closing said circuits operated by the lever of the motor-controller upon another car, substantially as described.

6. In an electric-railway system, the combination with a plurality of motor-cars in a single train, of motor-controllers, one upon each of said motor-cars; an indicator located near one motor-controller to be within the presence of the motorman operating the latter controller, and means governed by another of said motor-controllers for operating said indicator, substantially as described.

7. In an electric-railway system, the combination with a plurality of motor-cars in a single train, of motor-controllers, one upon each of said cars; a graduated indicator located near one motor-controller to be within the presence of the motorman operating the latter controller, and graduated means for operating said graduated indicator, said means being governed by another of said motor-controllers, substantially as described.

In witness whereof I hereunto subscribe my name this 13th day of September, A. D. 1898.

EMIL BERTHOLD WALTER REICHEL

Witnesses:
C. H. DAY,
W. HAUPT.