No. 618,054. Patented Jan. 24, 1899.

F. E. CASE.

TRAIN TRACTION SYSTEM.

(Application filed June 22, 1898.)

(No Model.)

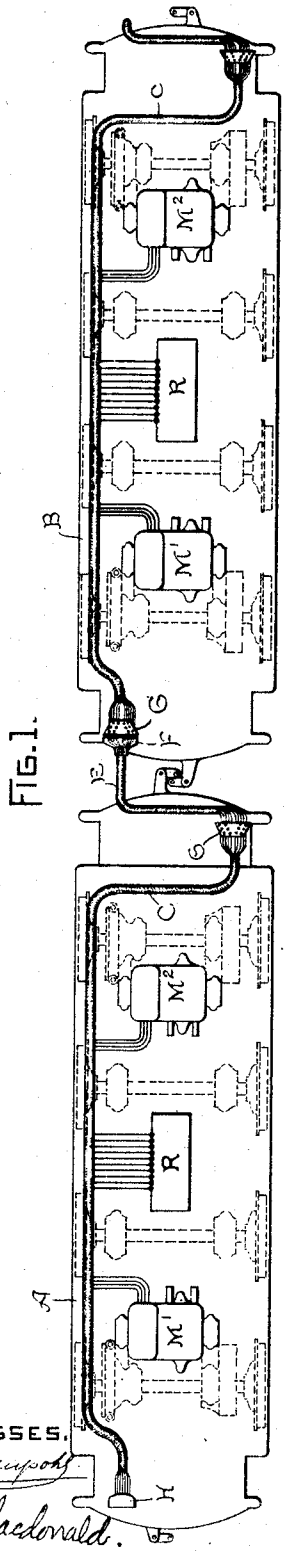


FIG. 1.

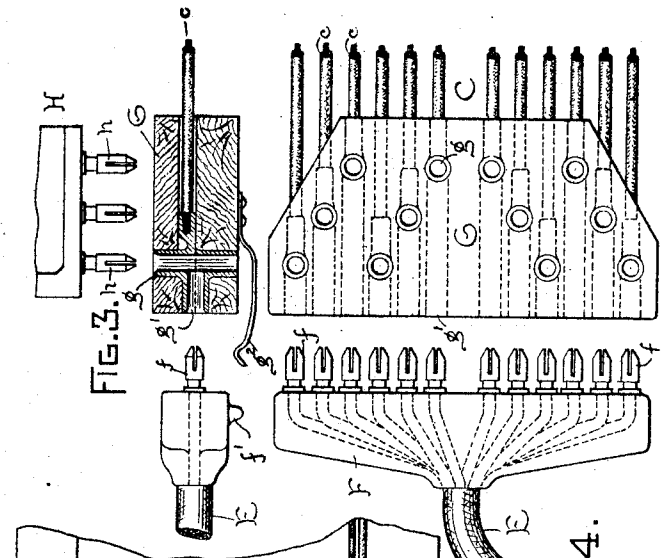


FIG. 3.

FIG. 4.

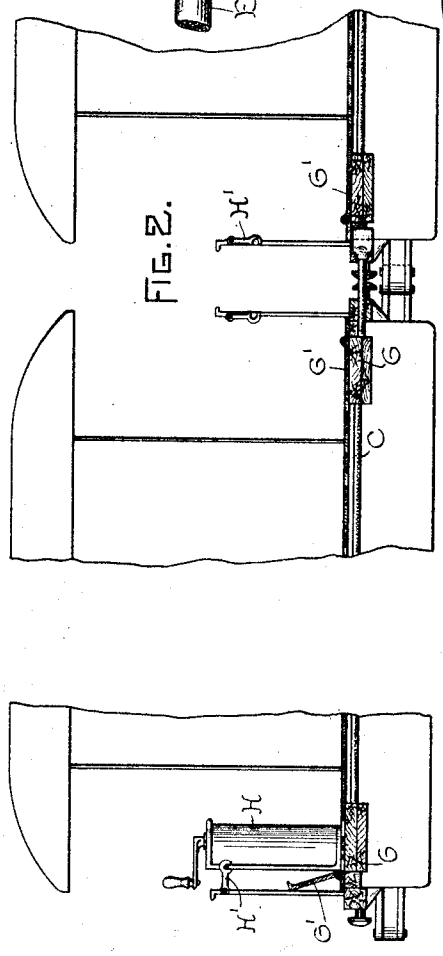


FIG. 2.

WITNESSES.

E. Attenpohl

A. F. Macdonald.

INVENTOR.

Frank E. Case.

by Albert G. Davis

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK E. CASE, OF SCHENECTADY, NEW YORK, ASSIGNOR TO THE GENERAL ELECTRIC COMPANY, OF NEW YORK.

TRAIN TRACTION SYSTEM.

SPECIFICATION forming part of Letters Patent No. 618,054, dated January 24, 1899.

Application filed June 22, 1898. Serial No. 684,120. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. CASE, a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Train Traction Systems, (Case No. 764,) of which the following is a specification.

My present invention relates to systems of control for electrically-operated trains, and has for its object to provide a convenient method of equipping such systems. In many of the systems which have been proposed and are now known in this art each car is capable of operation as a separate unit, being provided with its own motor or motors, controller, regulating-resistances, &c., and in general these cars are also provided with what are called "master-controllers," the office of the latter piece of apparatus being to regulate any number of cars which may be conveniently brought together in a train by simultaneously moving the controller upon each of the cars, which thus in turn regulates the motors upon that car. The arrangement is such that any one of the master-controllers may be selected as the operating-point from which the entire train is controlled.

It is the object of the present invention to substitute for the master-controllers in the systems above outlined certain connection-boards, with which a single separable controller may register and act upon the other controllers and motors of the train, as already explained, it being designed to have these connection-boards interchangeable, so that the controller may be taken from one car to another, as may be most convenient. This arrangement enables me to dispense with a part at least of the expensive apparatus required in the ordinary systems and also prevents any trouble from interference of one master-controller with another, which might occur with some systems which have been proposed.

In the ordinary operation of the train a single master-controller would be all that was needed, though, if desired, duplicates could be carried upon the same train.

While the invention has thus been described in its application to train systems in which master-controllers are employed, it is manifestly possible to apply it to the ordinary conditions in which a motor-controller regulates directly the motors upon a particular car or upon more than one car. This would not ordinarily be so good a way of operating the invention as that described, because controllers designed to work with such currents as are ordinarily supplied to electric motors would be comparatively large and heavy; but it is nevertheless a feasible method under some circumstances, and I aim to include it in the claims.

The invention also aims to provide for each car connection-boards of peculiar construction, such that the cars may be coupled electrically and the controller connected to the motor-leads by the same connection-board. For this purpose I provide in each connection-board a peculiar form of socket for the plug-terminals, which I prefer to use. One of these sockets is connected to each of the leads embraced in the cable ordinarily employed to carry the connecting-wires.

The accompanying drawings show my invention in one of its forms.

Figure 1 is a plan view of the trucks of two cars with the invention applied thereto. Fig. 2 is a side elevation, partly in section and partly broken away, showing the platforms with one of the controlling devices in position and the coupling between the cars. Fig. 3 is a side elevation, partly in section and broken away, of a connection-board, showing the bottom of the controller and the connecting-cable; and Fig. 4 is a plan of the connecting-cable and connection-board.

In the drawings, A B are the cars, each provided with the motor-controllers R R and the motors M' M^2. A cable C leads through each car, which may carry the ordinary wires for motor and controller connections. The cable is provided at each end with a connection-block G, to be more fully described hereinafter. The cars are connected by a short piece of cable E, provided on a coupling F with contacts registering with sockets in the connection-board G. The construction of this part of my invention will be better under-

stood from Figs. 3 and 4. The connection-board in Fig. 4 is shown in plan and is provided with sockets *g*, with each of which a plug *h* of the controller H (see Fig. 3) registers. As shown, there are twelve of these sockets and twelve plugs, although, of course, the number may vary, each socket being attached to one of the leads *c* embraced in the cable C, the leads being shown separated in Fig. 4 for clearness of illustration. The form of these sockets will best be seen from the section in Fig. 3, where one of the leads *c* is shown attached to it. Here the socket *g* is shown as registering with the left-hand one of the plugs *h*, and an additional socket *g'*, formed in one with each of the sockets *g*, registers with a plug *f* on the end of the connecting-cable E. The end of the connecting-cable is provided with one of the plugs *f* for each of the wires or leads composing the cable, as will be readily understood. It will be seen that when the controller H is placed on the connection-board each of the leads *c* will be connected to a controller-contact, which may be of any desired system, and that as the cars are made up into the train when the connecting-cable E is applied the heads F thereof will connect the different connection-boards G G, so that the cable C will be electrically united throughout the train, wires of the cable on one car being united to similar ones upon another. A further detail of Fig. 3 shows how the cable E is kept in place by the lug *f'* passing over the rounded end of the spring g^3. If the train should break apart for any reason, this attachment would give way and the cable E would pull out.

In Fig. 2 I show the controller H in side elevation. The controller being placed upon the connection-board G is kept in place by the links H', which hook over studs on the side of the controller-case. Hinged plates G' cover the connection-boards when the controller is not placed over them.

The construction and connection of the master and motor controllers may be such as that shown in my former application, Serial No. 671,994.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a system of train control for electrically-propelled vehicles, the combination of a cable extending through the train, having connection-boards at intervals, with a controlling device adapted to register with any one of the connection-boards.

2. In a system of train control, the combination of a number of cars having motors and resistances with connecting-leads, with a single controlling device for all the motors, and means for connecting it to the motors and resistances at different points in the train.

3. The combination of a controller with plug-terminals upon its base and a connection-board provided with sockets with which the terminals register, and leads extending from the sockets.

4. A connection-board for the cable of an electrically-propelled train, provided with contacts registering with terminals upon the controller, and other contacts registering with an electrical connection between the cars.

5. In an electrically-propelled train, the combination of a cable extending through the train, with connection-boards situated at intervals, a controlling device adapted to register with any of the connection-boards, and connecting-cables between the cars also registering with the different connection-boards.

6. In an electrically-propelled train, the combination of a cable, a connection-board upon each platform for the cable, and covering-plates for the connection-boards.

7. The combination of a controlling device having exterior terminals, and a connection-board with which the terminals register.

8. The combination, in a train system, of a single movable controlling device, with a number of similar connection devices in different locations, with any one of which the controlling device may register to control the entire train.

9. The combination, in a train system, of a single movable master-controller with a number of "unit" cars each provided with its own motor or motors and controlling devices, and connection devices in one or more locations upon each car with any one of which the master-controller may register, and from which, when in position, it may control the entire train.

In witness whereof I have hereunto set my hand this 20th day of June, 1898.

FRANK E. CASE.

Witnesses:
B. B. HULL,
A. H. ABELL.