

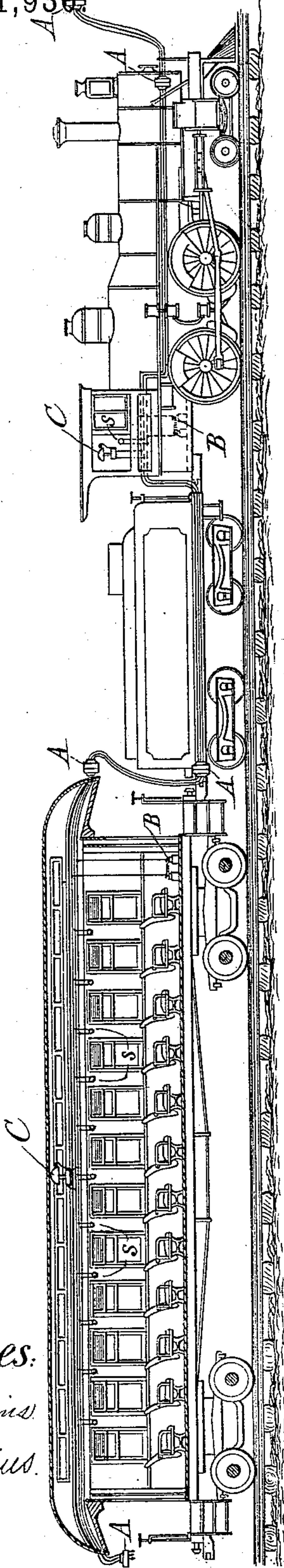
(No Model.)

W. S. GREENE.
ELECTRIC RAILWAY TRAIN SIGNALING.

No. 551,930

Patented Dec. 24, 1895.

Fig. 1.



Witnesses:
E. H. Perkins
A. M. Perkins

Fig. 2.

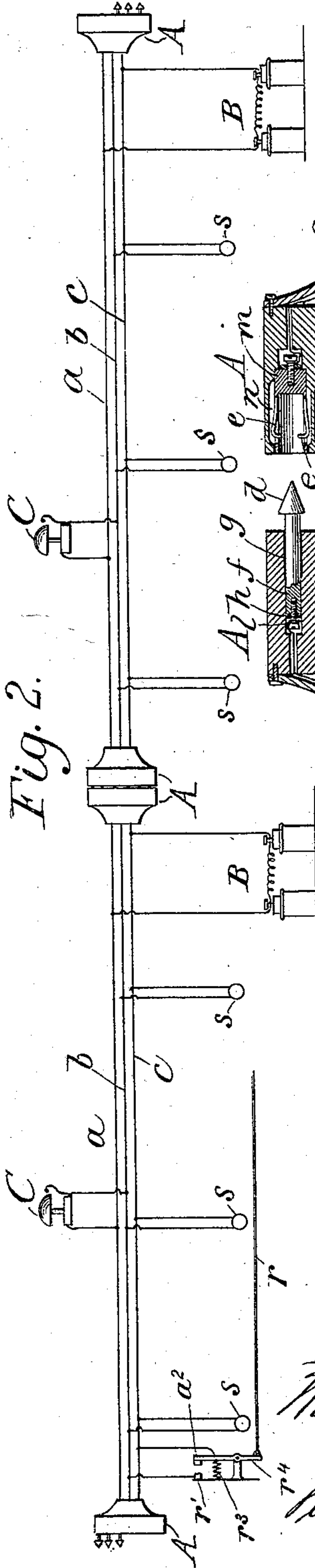
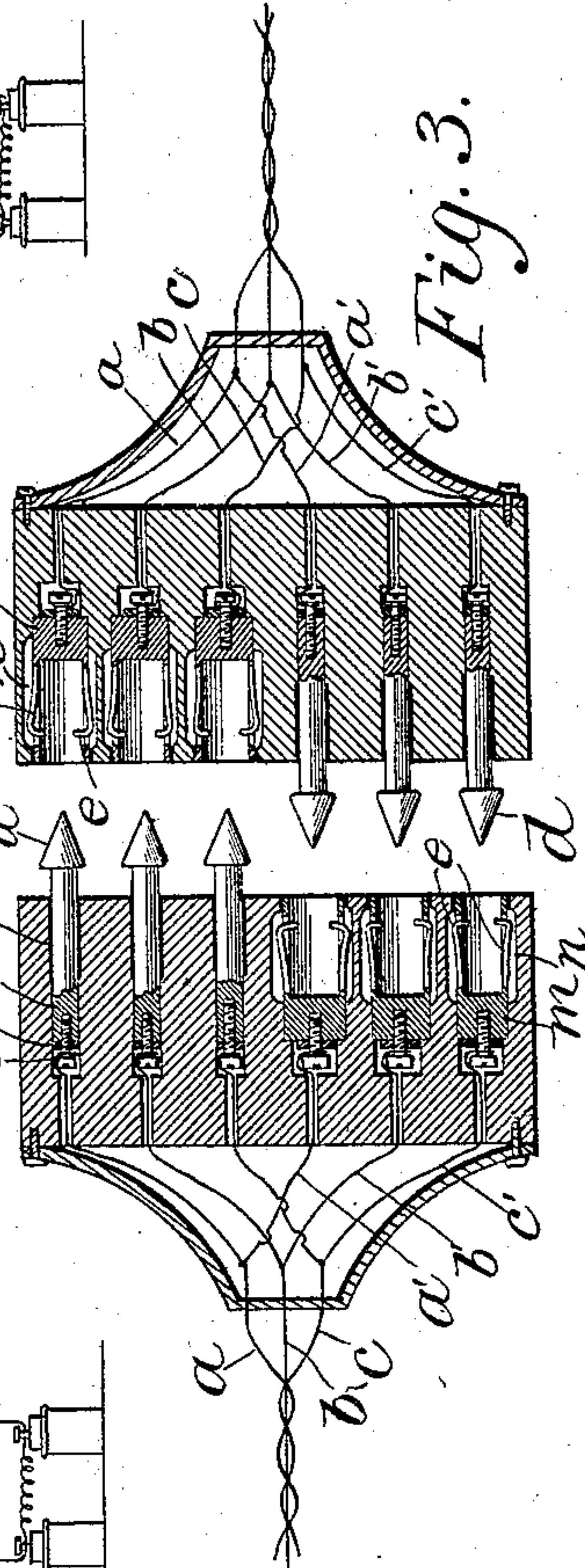


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ELECTRIC RAILWAY-TRAIN SIGNALING.

SPECIFICATION forming part of Letters Patent No. 551,930, dated December 24, 1895.

Application filed September 3, 1895. Serial No. 561,293. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. GREENE, a citizen of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Electric Railway-Train Signaling; 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.

My invention relates to certain new and useful improvements in electric train signaling, and particularly to means, as hereinafter described and claimed, for establishing electrical communication between the engine-cab and the several cars of the train in such manner that an electric signaling-bell or other annunciator can be actuated in the engine-cab from any car of the train, and so that a return-signal can be sent from the engine-cab to actuate like electric signal-bells or annunciators in the several cars. It is likewise characteristic of my invention that from any car in the train a signal can be simultaneously given in all of the remaining cars of the train, as well as in the engine-cab, so that in case of an emergency the entire crew of the train can be instantly summoned to any particular car. The preferred construction whereby I attain these results is illustrated in the accompanying drawings, wherein—

Figure 1 represents a railway-train equipped with my improvements, the passenger-car being shown in longitudinal section. Fig. 2 represents, diagrammatically, the signaling-circuits in their relation to the electrical couplings; and Fig. 3 represents, partly in section and partly in elevation, my preferred form of signaling-circuit coupler.

Similar letters of reference indicate similar parts throughout the several views.

In the drawings I have illustrated the invention as applied to a train having but a single car; but it will, of course, be understood that it is applicable to a train made up of any number of cars.

In carrying out my invention, I establish throughout the train a three-wire system of electrical conductors extending from the engine to the rearmost car of the train. To this end, for practical purposes, I provide each

car with three electrical wires or conductors *a b c*, having the usual insulating covering and secured from end to end of the car in any approved manner. For purposes of convenience, I preferably locate these wires at the top of the car-body, as indicated in Fig. 1. In like manner, I provide three signaling-wires for the tender and cab, said wires extending from the rear end of the tender through the cab and to the pilot end of the engine, so that connection may be readily established between said wires and the wires of the cars whichever end of the engine is adjacent to the cars.

In order to couple together the wires *a b c* of the several cars with each other and with the wires of the engine so as to insure absolute electrical connection thereof throughout the entire train, I employ coupling devices of the kind illustrated in detail in Fig. 3, and which I will designate as an "electrical" coupler. In the construction shown in Fig. 3, the coupler consists of two blocks A of vulcanite, hard india-rubber or like insulating material, suitably recessed for the reception of the coupling-contacts. These contacts are made up of interlocking arrow-heads *d* and retaining-springs *e*, adapted to engage with each other so as to unite the two blocks A electrically and mechanically, so that they will not be jarred apart by the swaying or jolting of the train when in motion. The arrow-heads *d* are, however, rounded off at their bases so that by the exertion of a reasonable degree of force they may be drawn apart when it is desired to uncouple the connection.

The arrow-heads *d* and their shanks *f* are preferably made of copper or like good conducting metal, and the shanks are located within recesses in the block A and are secured therein by means of cement, as indicated at *g*. At their inner ends they are provided with a washer *h* and are screw-threaded for the reception of a set-screw *l*. The bare ends of the wires may thereby be securely connected to the shanks *f*, as indicated. The blocks A are also provided with recesses for the reception of the hollow shells *m*, which are provided at their inner ends with like washers and set-screws for electrical connection with branch wires *a' b' c'*, connected respectively at their other ends to the wires *a b c*. The shells *m*

are adapted to be held in their recesses by cement, as shown, and are made of copper or similar good conducting metal and of an internal diameter corresponding to the external diameter of the arrow-heads d , so that when the arrow-heads are inserted within the shells the shells and arrow-heads are in electrical connection. The recesses within which the shells m are cemented are enlarged at n , so as to accommodate the movement of the springs e in connecting and disconnecting the coupling device.

It will be observed that, because of the fact that each of the blocks A is provided with arrow-heads and shells or sockets, it will only be possible to connect the two blocks A in such manner as to insure the proper coupling—*i. e.*, so that the wires $a b c$ of each car will necessarily be connected, respectively, with the wires $a b c$ of the other cars throughout the train. In this manner it will be impossible for a careless or ignorant trainman to fail to make the proper connection in coupling up the signaling-wires.

Additional advantages of the duplicate series of arrow-heads and sockets are that there is a double-contact connection for each of the wires $a b c$, and also that adjacent coupling-blocks A are always adapted to be connected by reason of the fact that they always present parts capable of being interlocked, which would not be the case if the one block were provided merely with arrow-heads and the other with sockets and the cars were brought together so as to present arrow-heads to arrow-heads or sockets to sockets, as would frequently happen in shifting the cars end for end.

Within each of the cars and within the cab I locate an electric battery consisting preferably of two cells B, and I connect the opposite poles of these batteries with two of the wires respectively—for instance, the wires a and c . In multiple arc to the third wire b and to one of the other wires, as a , I insert in each of the cars and in the engine-cab an electric annunciator, preferably a magneto-electric bell C, having the usual make-and-break armature and bell-clapper. In multiple arc to the third wire b and the wire c I locate circuit-closing devices in the engine-cab and in the several cars of the train. These circuit-closing devices are normally open and may be of any familiar type—as, for instance, the push-buttons s , located in such convenient position as to be readily accessible; or instead of employing the push-buttons, or in addition thereto, I may provide a circuit-closing device operated by a signaling-cord r and consisting of contacts $r^1 r^2$ normally held apart by a spring r^3 and adapted to be brought into electrical connection by pulling the bell-cord r and thereby rocking the pivoted lever r^4 upon its fulcrum until the two contacts come together.

The mode of operation of the invention

will be apparent from the construction illustrated and described. Thus by pulling upon the bell-cord the conductor or trainman can bring the contacts r^1 and r^2 together, thereby ringing the bell in the engineer's cab and simultaneously ringing the bells in all of the cars on the train. The same effect is produced by closing the contacts by pushing in any one of the push-buttons. In like manner the engineer by operating the push-button in the engine-cab can give a return signal, and this signal will be given in each one of the cars of the train.

It is evident that by determining upon a suitable code of signals the trainmen will be advised as to the meaning of the signal sent and the particular place from which it is sent—*i. e.*, whether from the cab or from one of the cars—and can instantly respond as occasion may require.

Having thus described my invention, what I claim is—

1. An electric railway train signal, comprising electric annunciators for the engine and cars between which communication is desired, circuit closers also for each of said engine and cars, a three-wire system of electrical conductors extending through the train, and an electric generator whose poles are connected respectively to two of said wires, the annunciators being connected up in multiple to one of the generator wires and the third wire, and the circuit closers being connected up in multiple to the other generator wire and said third wire, and said wires being formed in sections corresponding in number to the number of cars of the train and connected up in divided circuit with coupling devices; substantially as described.

2. An electric railway train signal, comprising magneto-electric bells for the engine and cars between which communication is desired, circuit closers for each of said engine and cars, a three-wire system of electrical conductors extending through the train, and an electric battery whose poles are connected respectively to two of said wires, the magnet coils of the bells being connected up in multiple to one of the battery wires and the third wire, and the circuit closers being connected up in multiple to the other battery wire and said third wire, and said wires being formed in sections corresponding in number to the number of cars of the train and connected up in divided circuit with coupling devices; substantially as described.

3. In an electric railway train signal, a three-wire system made up of three wires for each member of the train between which communication is desired, and couplers for connecting corresponding wires throughout the train electrically and mechanically, said couplers having duplicate sets of contacts connected up in divided circuit to the three wires; substantially as described.

4. In an electric railway train signal, a three-

wire system made up of three wires for each member of the train between which communication is desired, and couplers for connecting corresponding wires throughout the train
5 electrically and mechanically, said couplers being provided with sockets and projections connected up in divided circuit to the three wires; substantially as described.

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

WALTER S. GREENE.

Witnesses:

JOHN C. PENNIE,
WARREN D. HOUSE.