

(No Model.)

A. G. WARREN.
ELECTRIC RAILWAY SIGNAL.

No. 323,243.

Patented July 28, 1885.

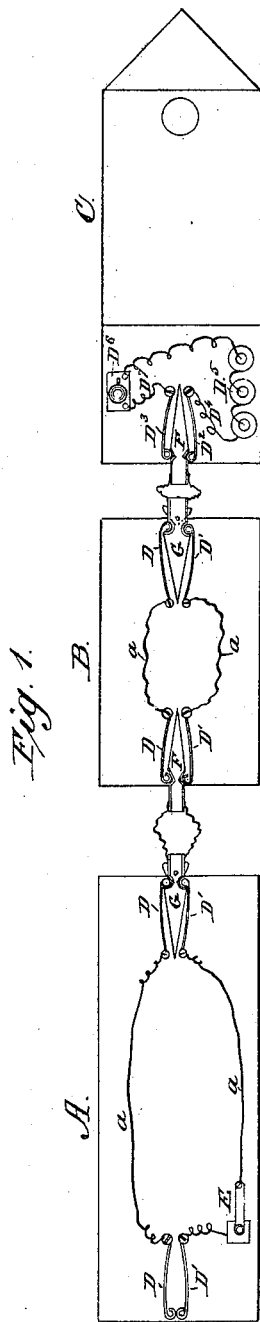


Fig. 1.

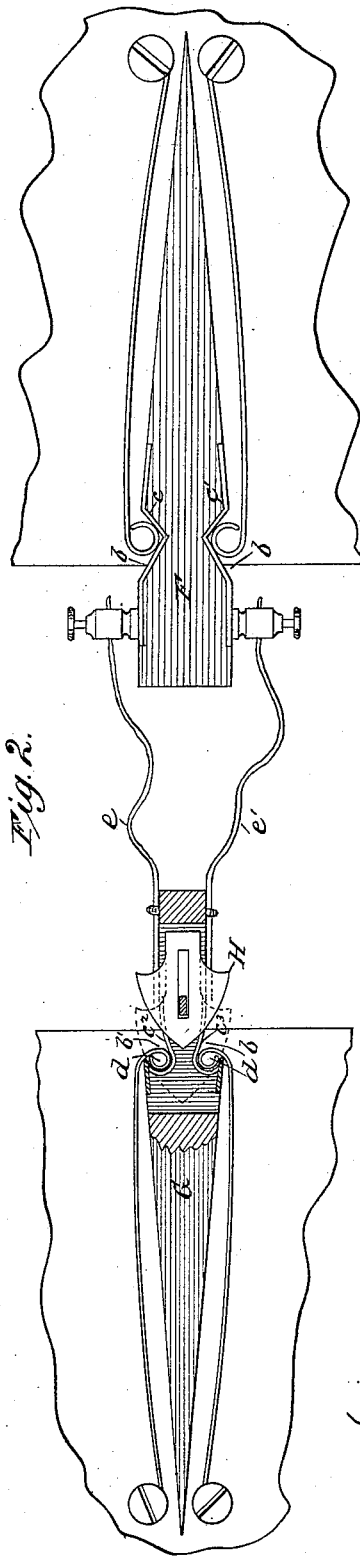


Fig. 2.

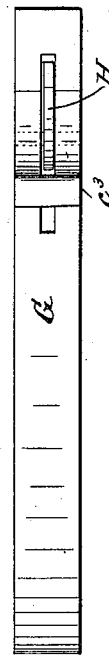


Fig. 3.

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UNITED STATES PATENT OFFICE.

ALBERT G. WARREN, OF MAYESVILLE, SOUTH CAROLINA, ASSIGNOR OF
ONE-FOURTH TO ALFRED A. STRAUSS, OF SAME PLACE.

ELECTRIC RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 323,243, dated July 28, 1885.

Application filed September 16, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALBERT G. WARREN, a citizen of the United States, residing at Mayesville, in the county of Sumter and State of South Carolina, have invented certain new and useful Improvements in Electric Signals for Railway-Trains, of which the following is a description.

Figure 1 is a diagram view of a locomotive-tender and one car. Fig. 2 is an enlarged plan view, partly in section, of the connection between the cars, and Fig. 3 is a side view of the plug G.

The object of my invention is to provide an electric circuit on railway-trains with connections for same between cars, which will enable the engineer to be signaled by the conductor from any part of the train, and which also will automatically transmit a signal to the engineer in the event of any break in the train.

It consists in the peculiar construction and arrangement of connections for making a continuous circuit through the train, in combination with keys, a battery, and bell, as will be hereinafter fully described.

In the drawings, A represents one of the cars of a train. B is the tender, and C is the engine.

On each end of each car, and also on the tender, there are pairs of spring-jaws, D D', which at their outer ends rest in contact with each other, but may be separated by an insertible wedge or plug. The jaw D' on one side of each pair is connected with a corresponding jaw on the same side of the pair at the other end of the car by an insulated wire, a, or by a continuation of the spring, forming an electrical conductor. Jaws D are also similarly connected. In one of these wires or conductors is interposed a key, E, by which the circuit may be opened or closed at will. One of said keys may be on every car, and suitably located for easy access, and, if desired, connected with a cord that runs the full length of the car, so that the key may be operated by the conductor at any point in the car.

On the locomotive or tender is arranged a similar pair of spring-jaws, D² D³, which are connected, the one, D², to a circuit-wire, D⁴, connecting with a battery, D⁵, on the engine,

and the other, D³, with a circuit-wire, D¹, that connects through a bell, D⁶, on the engine with the other pole of the battery.

For electrically connecting the tender with the next car and all the other cars to each other in a continuous circuit, I employ two wedge-shaped plugs, F and G, of which the front one, F, has notches *b b* on each side, with inclined sides, which notches are faced with metal plates *c c'*, and which plugs are made of dry wood or some other non-conductor of electricity, which insulates the plates *c c'* from each other. The rear plug, G, is also made of a similar non-conducting material, with notches *b' b'*, faced with metal plates *c² c²*. These notches are, however, of a different shape from those on the other plug, being hook-shaped or undercut, so as to catch and retain the rounded projection *d* on the ends of the spring-jaws, and compel the cars, when they separate from a breakage in the train, to pull out the front plug from the spring-jaws, instead of the rear one, for the purpose hereinafter described.

Between the plugs F and G there are two flexible insulated conducting-wires or connections, *e e'*, one of which, *e*, connects the plates *c* and *c²* on one side of the two plugs, and the other of which, *e'*, connects the plates *c' c²* on the other side of the two plugs. Between the other cars of the train a similar set of plugs and connections is arranged.

The operation of the devices is as follows: When the cars are all coupled together, and the plugs F G inserted in the spring-jaws, the rear car having no plug in the rear set of spring-jaws, these spring into contact and maintain a closed circuit from the battery, and through the bell on the engine down the spring-jaws, wires, and plugs on one side, and up on the other side. To signal to the engineer, it is only necessary to open and close the circuit by one of the keys E, or by pulling the front plug out until its notch-plates leave the spring-jaws and the latter come together again. As the circuit is thus opened and immediately closed the bell-magnet is first demagnetized, and the bell-hammer drawn back by the spring, and is instantly magnetized again, causing the hammer to strike the bell. In the same way,

if the train parts the front plug pulls out automatically, and as the spring-jaws pass off the plates of the plug to the non-conducting end of the wedge the circuit is broken and then closed again and the signal given. The object in compelling the connection to be broken by the front plug instead of the rear one is to allow the spring-jaws of the car next in front of the break to close and maintain the circuit again for the portion of the train in front, still leaving this in operative condition for signaling; for if the rear plug should pull out the plates of the rear plug would constitute the terminals of the circuit, which could not be brought together to complete the circuit for the front portion of the train.

In order to disconnect the hooked notches of the rear plug from the spring-jaws, a sliding wedge shape cam, H, is arranged horizontally in a slot in the middle of the rear plug, and is made of hard rubber or non-conducting material, so that it will not close connection between the notch-plates of the plug. This cam is slotted and retained in place by a bolt passing through its slot, and it serves, when forced against the spring-jaws, to expand the ends of the same and throw the projections on the ends of the latter out of the notches, so that the rear plug can be withdrawn when desired.

In applying my invention I may arrange it upon the inside of passenger-cars, on the top of box-cars, and underneath flat cars, or in any other desired or convenient relation.

Should "foreign" cars or cars not having this connection occur in the train, one or two in a place, they may be bridged over by wires of sufficient length between two plugs. Some plugs may have binding-screws to connect any length of wire.

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

1. The combination, with an electric circuit with key, a bell and battery mounted on the engine or tender, of spring-jaws at the ends of the car connected with the electric circuit and arranged to spring together, and two tapering notched plugs or wedges having conducting-plates in the notches and connecting circuit-wires from the plate of one plug to the corresponding plate of the other plug, the front plug being arranged to pull out and the rear one to remain seated, as and for the purpose described.

2. The non-conducting tapered rear plug, G, having hook-shaped notches faced with metal, and sliding cam H, in combination with the spring-jaws having projections *d*, the circuit wires, and the front plug having beveled notches faced with metal, as and for the purpose described.

ALBERT G. WARREN.

Witnesses:

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