(No Model.) 2 Sheets—Sheet 1.

# C. K. HALL.

## ELECTRIC RAILWAY SIGNAL.

No. 482,306. Patented Sept. 6, 1892.

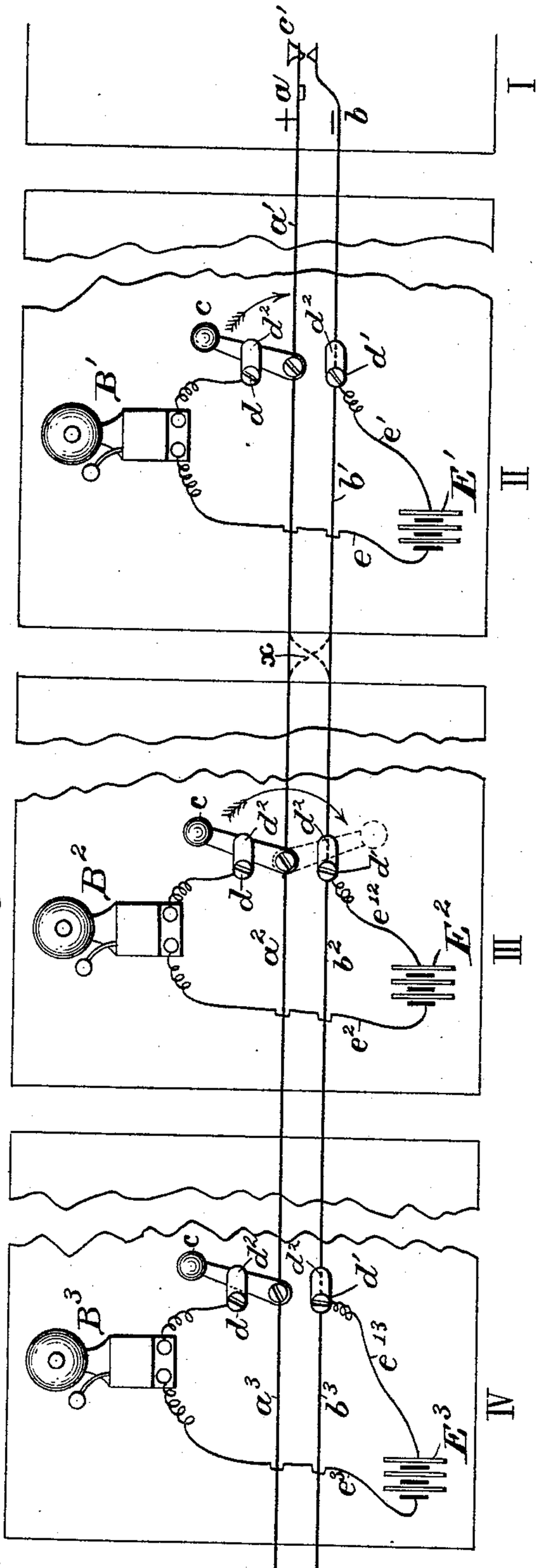


Fig. 1.

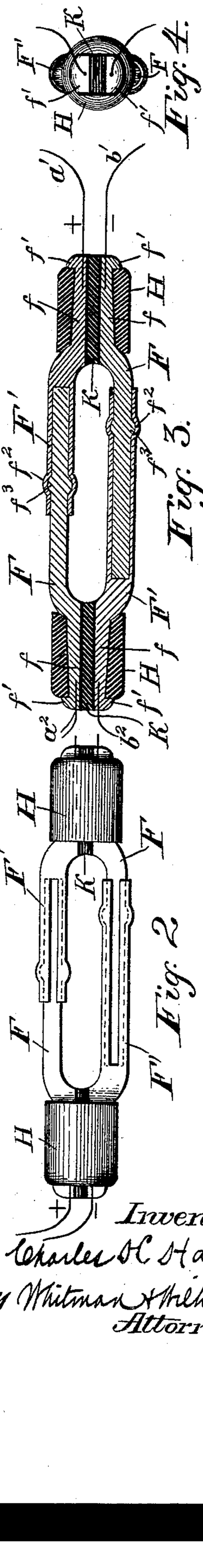


Fig. 2.




Fig. 3.




Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

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## ELECTRIC RAILWAY SIGNAL.

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*Fig. 5.*

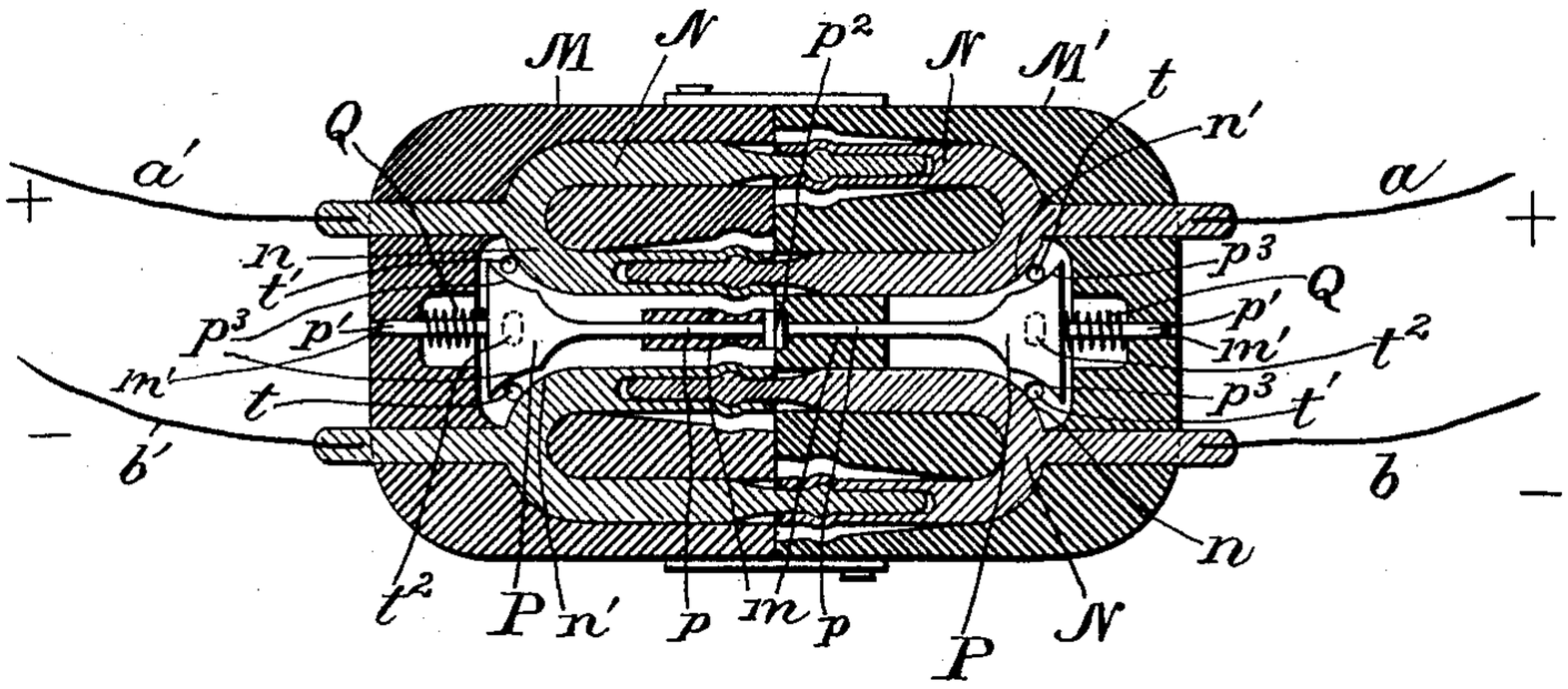



*Fig. 6.*

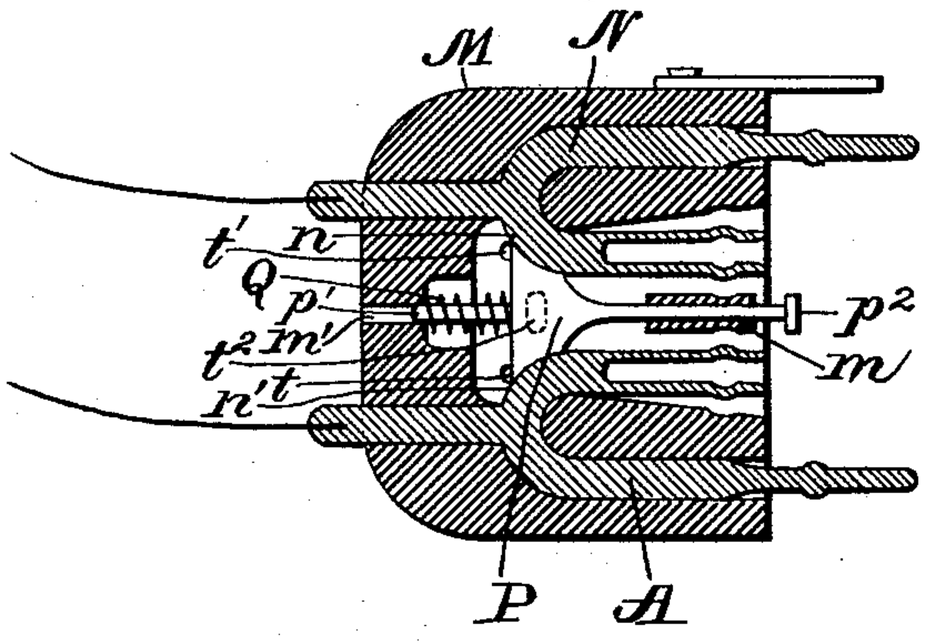
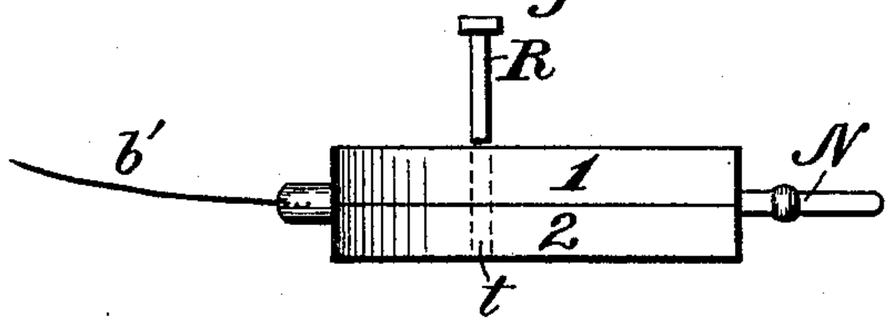



*Fig. 7.*




Witnesses;
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John A. Wilkinson

Inventor;
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# UNITED STATES PATENT OFFICE.

CHARLES K. HALL, OF NEW ORLEANS, LOUISIANA, ASSIGNOR OF FORTY-NINE ONE-HUNDREDTHS TO WILLIAM B. LILLARD, OF SAME PLACE.

## ELECTRIC RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 482,306, dated September 6, 1892.

Application filed April 4, 1892. Serial No. 427,728. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES K. HALL, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Electric Railway-Signals; 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 signaling from one car to another or to all the other cars in a railway-train, and is specially designed to warn the persons in the various cars that something is wrong in one of the cars.

My invention is designed, primarily, to signal to persons in the various cars that train-robbers are in control in a particular car without at the same time making any audible signal in said particular car.

Reference is had to the accompanying drawings, wherein the same parts are indicated by the same letters.

Figure 1 represents a diagrammatic view of my signaling apparatus in a train composed of three cars and an engine. Fig. 2 represents a plan view of one form of coupler for connecting the wires from car to car. Fig. 3 represents a central longitudinal section of the coupler shown in Fig. 2. Fig. 4 represents an end view of the said coupler. Fig. 5 represents a central horizontal section of another form of coupler with automatic circuit-closing device fitted thereto, two of the couplings being represented as coupled together. Fig. 6 represents a similar section of one of the said couplers when the coupling is broken, and Fig. 7 represents a side view of the same.

I represents the engine.

II represents the express-car, and III and IV represent two of the passenger-cars in a train.

Insulated wires $a$ $a'$ $a^2$ $a^3$ and $b$ $b'$ $b^2$ $b^3$ run throughout the train and are connected together from car to car by suitable couplers.

$c'$ represents a push-button in the engine, and $c$ represents a switch, of which each car has one.

$d$ and $d'$ represent binding-posts having contact-strips $d^2$ attached thereto for making contact with the switch $c$.

E′, E², and E³ represent any source of electricity, preferably a battery on each car, but in electric cars may be a wire in shunt with the main circuit. $e$ and $e''$, $e^2$ and $e^{12}$, and $e^3$ and $e^{13}$ represent wires leading from this source of electricity to the bells B′ B² B³, which are in open circuit and ring when the circuit is closed.

In coupling the wires together from car to car the device shown in the patent to Lillard, No. 468,086, granted February 2, 1892, or those shown in Figs. 2 to 7, may be adopted.

In the device shown in Figs. 2, 3, and 4, F represents a solid limb having tapering shank $f$, catch $f'$, and lug $f^3$, and F′ represents a hollow limb having tapering shank $f$, catch $f'$, and recess $f^2$ to receive the lug $f^3$. K represents a flat piece of rubber or other insulating material, and H represents a ring of rubber, ebonite, celluloid, or other suitable insulating material, preferably ebonite. The interior of this ring is preferably made slightly tapering. The rubber piece K is made of such thickness that when this ring H is forced over the shanks $f$ of the two limbs F and F′ the rubber will be compressed, and after the ring has passed the catches $f'$ on the said shanks the rubber will expand and push the catches $f'$ behind said ring and hold it in place. Thus a firm joint will be made and the two limbs will be insulated from each other. The wires $a'$ and $b'$, &c., are connected to these limbs F and F′ in any convenient way.

In the device shown in Figs. 5, 6, and 7, M and M′ are two blocks of wood or other insulating material, preferably made of two superimposed pieces 1 and 2, as shown in Fig. 7, and glued or otherwise secured together. These blocks are scored out to receive two of the couplings N described in the patent to Lillard, No. 468,086. Secured between the limbs $n$ and $n'$ of two adjacent couplings the spring-plunger P is placed. This spring-plunger is normally pressed forward by the spring O, so as to short-circuit between the two couplings in the same block. The spring-plunger is guided by the parts $p$ and $p'$, which pass through the holes or grooves $m$ and $m'$ in the

wooden block. When two of the couplings are coupled together, as shown in Fig. 5, the buffers $p^2$ on the ends of these spring-plungers press the faces $p^3$ clear of the faces $n$ and $n'$ of the two contiguous arms of the two couplings in the same block, and the short circuit between said couplings is broken. By placing plugs R in the holes $t$ and $t'$ when the spring-plungers are pressed back or by having a hole through the block to register with the hole $t^2$ in the plunger when it is pressed back in the position it occupies when the wires are coupled together and putting a plug through this hole the plunger may be prevented from moving forward into the short-circuiting position when the two parts of the coupling become detached, as in uncoupling cars. Since the circuit is at all times intended to be kept open except when an alarm is being given, the last wire-coupling in the rear car should always have its spring-plunger held away from the arms $n$ by the said plug or plugs.

The operation of the device is as follows: The switches $c$ being normally in the position shown in Fig. 1, if the train-robbers enter the engine the engineer presses the button $c'$, which should be arranged so that he may touch it with his foot or knee or lean against it. The circuit will then be closed through all the bells throughout the train, and the persons in the various cars will be warned of the impending danger and will be enabled to make preparations to meet it. Now suppose the robbers to enter the car III. The switch $c$ in that car, (which should also be placed where it may be moved by the foot or knee, the hands being ordinarily otherwise engaged at such time) is moved by any one in proximity thereto into the position shown in dotted lines, and a signal is made to all the other cars in the train; but the bell in car III remains mute. It will be noted that in every case no audible signal is made in the car giving the alarm. It will be obvious that a bell, switch, and attachments like those in cars II, III, and IV may be set up in car I, and in the engine, instead of the push-button $c'$, and the engineer may be given notice if any of the cars to his rear are entered by robbers. It will be seen that it is immaterial whether the insulated wires be crossed between any of the two cars, as might readily happen in shifting cars end for end. Thus suppose $a^2$ to be coupled to $b'$ and $b^2$ to $a'$, as shown in dotted lines at $x$ in Fig. 1, and suppose, also, the switch in car III be swung around, as shown in dotted lines, as in signaling the other cars. The circuit through bell $B^2$ will be open and that bell will remain mute; but the circuit from $E'$ and $E^3$ will be closed through the bells $B'$ and $B^3$. Again, the circuit being open and the switches arranged in their normal position, as in Fig. 1, suppose the wires to be crossed at $x$ and the push-button $c'$ to be pushed down. The current from $E'$ will ring the bell $B'$ and the currents from $E^2$ and $E^3$ will flow through $a^2$, $b'$, $c'$, $a'$, and $b^2$, ringing the bells $B^2$ and $B^3$. With the form of wire-coupler herein shown, this crossing of the wires could not happen; but with various other forms of wire-coupler which might be used with my invention this might readily happen. Now suppose the train-robbers uncouple any car—say car III. The circuit will be closed on both sides of the break and immediately all the bells in the train will ring. The same would happen if any car accidentally broke loose; but if the train-hands wish to uncouple any car, by putting in the plugs R in the wire-couplings on either side of the proposed brake they will lock the spring-plungers, and so prevent any alarm from being sounded. It will be seen that the system of wires is or should be in open circuit at all times and that when cars are taken on or dropped from a train that the wire-coupler described in Figs. 2 to 4 will always keep the rear ends of the wires in the last cars of the train insulated from each other, and this will also happen with the wire-coupler shown in Figs. 5 to 7 if the plugs are put in.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. An apparatus for signaling from car to car on railway-trains, having two continuous conductors insulated from each other and connected from car to car throughout the train, an electric bell and a source of electricity in each car, electrically connected together and having one terminal connected to a contact-strip connected to one of said conductors and the other terminal connected to a contact-strip insulated from both conductors, and a switch in each car, adapted to connect either the second continuous conductor to said insulated contact-strip or to connect the two continuous conductors together, substantially as and for the purposes described.

2. An apparatus for signaling from car to car on railway-trains, having two continuous conductors insulated from each other and connected from car to car throughout the train, a contact-maker in the engine, adapted to electrically connect said conductors, and an electric bell and a source of electricity in each car, electrically connected together and having one terminal connected to a contact-strip connected to one of said conductors and the other terminal connected to a contact-strip insulated from both conductors, and a switch in each car, adapted to connect either the second continuous conductor to said insulated contact-strip or to connect the two continuous conductors together, substantially as and for the purposes described.

3. In an apparatus for signaling of the character described, the combination, with a block of insulating material M, having two wire-couplings N secured therein, of the metallic spring-plunger P, having guide-piston $p'$, engaging in said block, and having curved surfaces $p^3$, adapted to come into contact with said wire-couplings, and a buffer $p^2$ to press

said curved surfaces back clear of said couplings when the wires are connected to the next car, and the spring Q, tending to press said plunger forward and hold said curved surfaces against said wire-couplings, substantially as and for the purposes described.

4. In an apparatus for signaling of the character described, the combination, with a block of insulating material M, having two wire-couplings N secured therein, of the metallic spring-plunger P, having guide-piston $p'$, engaging in said block, and having curved surfaces $p^3$, adapted to come into contact with said wire-couplings, and a buffer $p^2$ to press said curved surfaces back clear of said couplings when the wires are connected to the next car, and the spring Q, tending to press said plunger forward and hold said curved surfaces against said wire-couplings, and a pin for holding said spring-plunger clear of said wire-couplings, substantially as and for the purposes described.

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

CHARLES K. HALL.

Witnesses:

F. RIVERS RICHARDSON,

LEWIS GUIDO.