

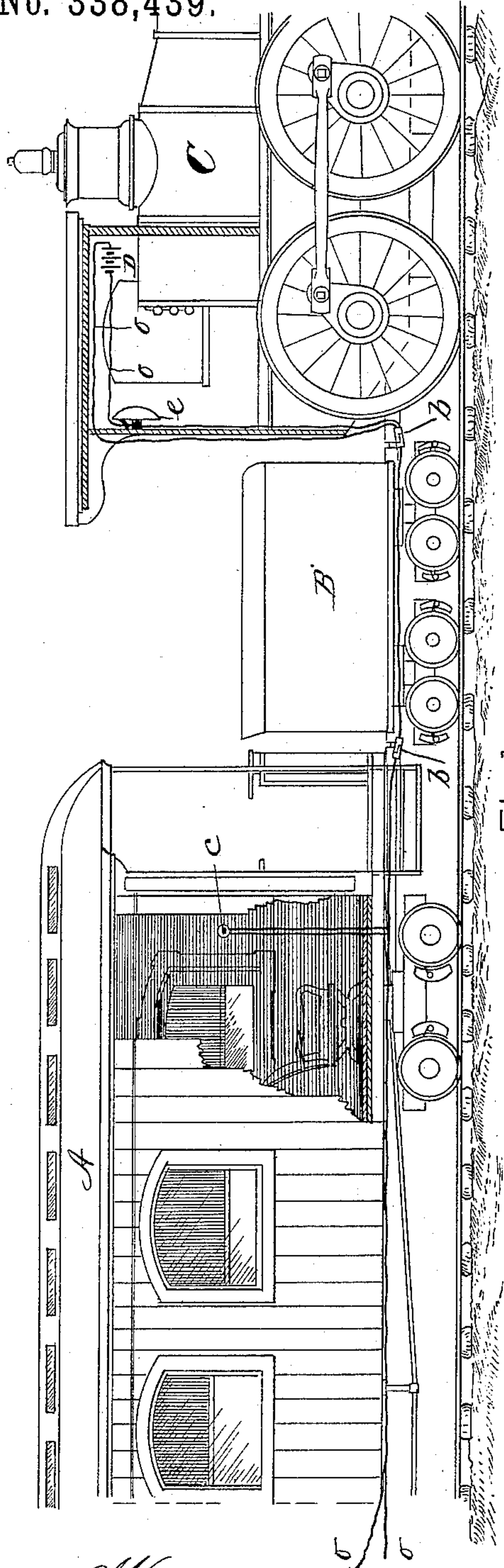
(No Model.)

W. F. RAY.

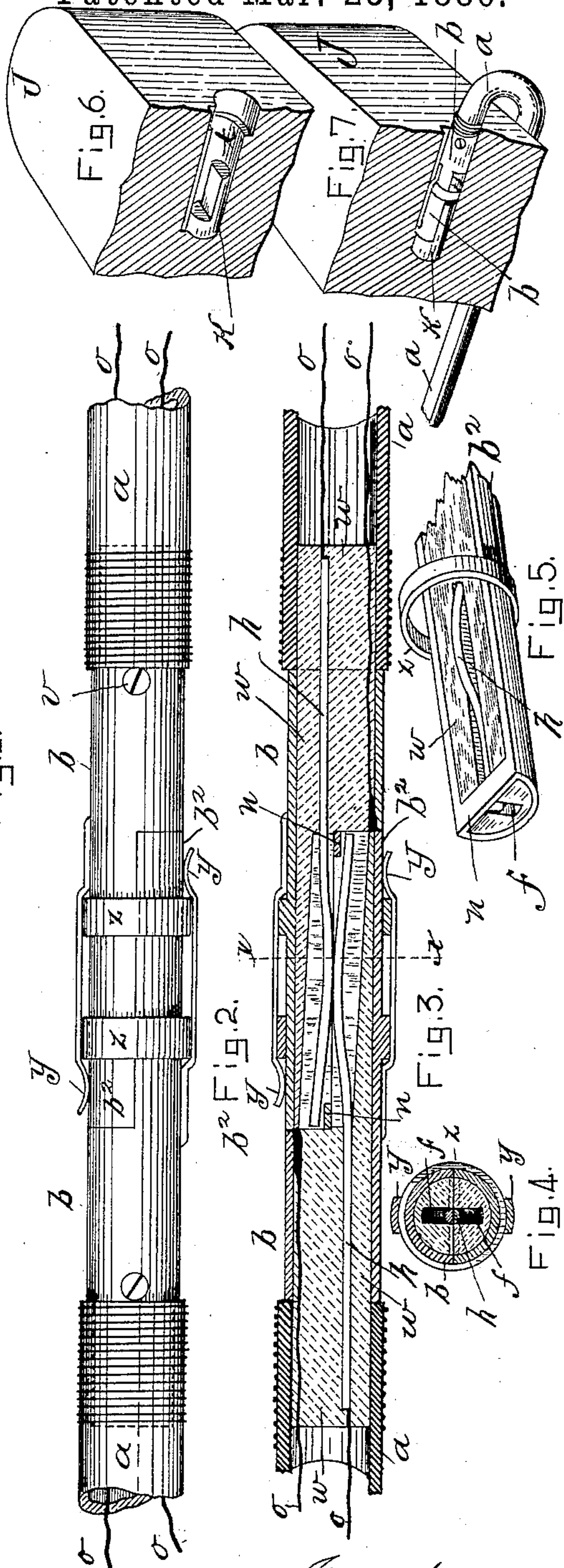
# ELECTRIC SIGNALING APPARATUS FOR RAILWAY TRAINS.

No. 338,439.

Patented Mar. 23, 1886.



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Witnesses.  
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# UNITED STATES PATENT OFFICE.

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ELECTRIC SIGNALING APPARATUS FOR RAILWAY-TRAINS.

SPECIFICATION forming part of Letters Patent No. 338,439, dated March 23, 1886.

Application filed December 19, 1885. Serial No. 186,153. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM F. RAY, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Electric Signaling Apparatus for Railway-Trains, of which the following is a specification.

This invention relates to improvements in electric signaling apparatus for railway-trains, the object being to provide improved coupling devices for the electric conductors of said apparatus, improved means for maintaining an open circuit in the conductor-lines, and for automatically closing the circuit when the couplings are drawn apart, and for holding the contact-points of the two conductors of a coupling apart when the latter is disconnected from a corresponding coupling.

In the drawings, forming part of this specification, Figure 1 is a side elevation of a portion of a railway-train having applied to it electric signaling apparatus embodying my invention, the car in said portion of a train being shown with its side partly broken away, to show a portion of the electric conductors therein, and the cab of the locomotive being shown partly in section. Fig. 2 is a side elevation, substantially of operative size, of the conductor-couplings and portions of the conductors and their inclosing-tube. Fig. 3 is a vertical longitudinal section of the parts shown in Fig. 2. Fig. 4 is a transverse section on line *x x*, Fig. 3. Fig. 5 is a perspective view of one end of the conductor-couplings, and showing the end of its spring circuit-closer. Figs. 6 and 7 are perspective views of the end of the platform-sill of a car in transverse section, Fig. 6 showing the coupling-socket therein and Fig. 7 showing said socket with the coupling therein and a piece of the conductor-tube connected to the latter.

In the drawings, A is the car, B the tender, and C the engine, and on the latter, or on the tender, in any convenient place, is located a suitable battery, indicated herein by D, with which the two electric conducting-wires *o o* are connected, one thereof having the alarm-bell *e* connected therewith, said bell being located on or near the engine within hearing of the engineer. Said conducting-wires *o o*, by

means of the couplings between each car and the engine and tender, as hereinafter described, form continuous conducting-lines running from said battery and bell under the tender B and the car or cars A of the train to the extreme end of the latter, be it longer or shorter, and at a convenient point or points in each car branches from said wires *o o* are run upward to an ordinary push-button, *c*, as shown in Fig. 1. In practice, I prefer to inclose said wires *o* (which are provided with a suitable insulating covering) within a rubber tube, *a*, the latter not being shown in said Fig. 1.

The conductor-couplings *b*, one on the ends of the conductors *o o*, at each end of the car or other place in the conductor-line where it may be necessary to break connections with cars, engine, or tender, are constructed and connected with the wires *o o* as follows: Each of the couplings *b* is made, substantially identical with the others, from brass or other suitable metal, one end thereof (its rear end) being of cylindrical tubular form. The opposite ends, *b*<sup>2</sup>, of said couplings are made of semi-cylindrical form, as shown, each having a flat ring, *z*, secured thereon, under which the ends *b*<sup>2</sup> find a place when two couplings are brought together in a connected position, as in Figs. 1 and 2, and whereby the ends *b*<sup>2</sup> are held one against the other and the couplings are kept in line. The said couplings are, to use a common expression, "halved together," and are connected by holding one in each hand and by bringing their ends *b*<sup>2</sup> together, as described. To prevent a too easy separation of said couplings and to improve their electric contact, a flat retaining-spring, *y*, is secured to each coupling on the outside of the ends *b*<sup>2</sup> thereof, and when the couplings are brought together, as in Fig. 1, the bent ends of said springs slip over the rings *z* and engage with the latter. A metallic bar, *n*, extends across the flat part of the end *b*<sup>2</sup> of the coupling.

Both the cylindrical and the semi-cylindrical parts of the coupling *b* have a plug, *w*, of wood or other insulating material, fixed therein, extending from or beyond the rear end of said coupling, through the latter to the opposite end thereof, under the bar *n*, said



plug being secured in the coupling by a screw, *v*, Fig. 2.

Within the plug *w* in each coupling *b* is secured the metallic spring circuit-finger *h*, to the rear end of which one of the conducting-wires *o* is connected, and from the latter it extends through said plug in a slot, *f*, in its half-round part to a point under the metallic cross-bar *n* at the end of the coupling, and just back of the end of finger *h* the latter curves outwardly above the face of the flat part of plug *w*, as shown in Fig. 5.

The second conducting-wire, *o*, is soldered or otherwise connected to the interior or to the rear end of the coupling *b*, as shown.

The rubber tube, when it is employed over the wires *o*, is connected to the end of the plug *w*, which projects beyond the rear end of the coupling *b*, as shown in Figs. 2 and 3.

It will be understood from the above description that when the wires *o o* are connected with the battery *D* and with one of the couplings *b* a closed electric circuit is formed through one wire and the spring-finger *h* to the coupling by the contact of said finger with the cross-bar *n* of the coupling, and thence through the other wire, which is connected to the coupling, to the battery.

When two couplings are connected together, as in Figs. 1 and 2, to unite the conductors between two cars or elsewhere on the train, the couplings themselves, to which one of the line-wires is connected, form the connection between the sections of the latter, and the spring-fingers *h*, to which the second line-wire is connected, form the connection between the sections of the latter. The union of said two couplings, as described, brings the aforesaid curved portions of the spring-fingers *h* into contact, as shown in Fig. 3, whereby the ends of the latter are sprung away from the cross-bars *n*, disconnecting them from the coupling *b*, and communication is thereby established between the sections of the wire *o*, which are connected with said fingers.

At the rear end of the rear car of a train, or at the rear of the tender *B* when disconnected from the train, will be found a single one of these couplings *b*, the spring-finger *h* of which when in its normal position lies in contact with the cross-bar *n* and closes the circuit in the two wires *o*, causing the alarm-bell *e* to ring needlessly and the battery to be exhausted; and to break the contact between said finger *h* and the coupling *b* under such circumstances the following means are provided: In the sill *J* of the platform of the car, or in other convenient part of the end of the latter, a hole, *t*, is made, into which a plug, *K*, of wood or other non-conducting material, is fixed, the end of the latter being of half-round form and adapted to fit the end of a coupling under the ring *z* thereof. The said hole *t* in the sill *J* is made large enough to admit the coupling, as shown in Fig. 7, and let it engage with said plug *K*, and thereby the curved part of finger *h* of the coupling is brought against the face

of the plug, and the end of the finger is sprung away from the cross-bar *n* of the coupling, and the circuit between the two wires is maintained open.

Fig. 7 illustrates the position of the conductors and the coupling thereon when the latter is held in the platform-sill, as above described; and Fig. 6 the coupling hole and plug in said sill.

The operation of the above-described improvements on a railway-train to signal the engineer to stop the latter, or to notify him that some part thereof has become accidentally detached, is as follows: The normal position of the coupling parts when the apparatus is in operative position on the train secures an open circuit on the conductor-line. By pressing the push-button *c* in any car the circuit is closed and the alarm-bell *e* is caused to ring, giving the engineer such notice as may be understood between him and the conductor of the train, and when the train accidentally breaks in two the couplings *b* are separated, letting the finger *h* of one of the latter come in contact with the cross-bar *n* of its coupling, thereby closing the circuit and causing the alarm-bell to ring and notify the engineer.

The above-described improvements provide a substitute for the ordinary bell-rope heretofore used, which is much more efficient and sure of operation than the latter for signaling the engineer of a train.

What I claim as my invention is—

1. The within-described electric signaling apparatus for railway-trains, consisting of the combination, with a suitable battery and an electrically actuated alarm-bell located on the engine, of two electric conductors connected with said battery and bell and extending in separated sections throughout the train, a coupling attached to the ends of each section of said conductors, consisting of a cylindrical and half-round metallic shell, to which one of said conductors is attached, having a ring surrounding said half-round portion, a spring-finger therein extending in a line with the latter, a metallic cross-bar extending between the sides of said half-round part of said shell, a plug of non-conducting material filling the said shell, and a circuit making and breaking finger having the second of said conductors attached thereto located in said plug and extending under said cross-bar of the shell, and having a curved portion projecting above the surface of said plug in the said half-round part of the coupling, substantially as set forth.

2. The within-described electric signaling apparatus for railway-trains, consisting of the combination, with a suitable battery and an electrically-actuated alarm-bell located on the engine, of two electric conductors connected with said battery and bell and extending in separated sections throughout the train, one or more push-buttons connected with said conductors for sending signals to the engine, a coupling attached to the ends of each section of said conductors, consisting of a cylindrical and half-



round metallic shell having the sides of the latter portion thereof united by a metallic cross-bar, to which shell one of said conductors is attached and has a ring surrounding its said half-round portion, a spring-finger thereon extending in a line with the latter, a plug of non-conducting material filling said shell, and a circuit making and breaking finger having the second of said conductors attached thereto, located in said plug and extending under said cross-bar of the shell, and having a curved portion projecting above the surface of said plug in the said half-round part of the coupling, substantially as set forth.

3. Electric signaling apparatus for railway-trains, consisting of a suitable battery and an electrically-actuated alarm bell located on the engine, of two electric conductors connected with said battery and bell and extending in separate sections throughout the train, combined with couplings attached to the ends of each section of said conductors, consisting of a cylindrical and half-round metallic shell, to which one of said conductors is attached, whose half-rounded ends overlap and are separably secured together by surrounding rings and spring-fingers thereon, substantially as described, each of said couplings having an internally-insulated circuit making and breaking finger, to which one of said conductors is attached, which fingers lie normally in contact with the said cross-bar of the shell and are brought into contact with and removed from the latter by the union of the two couplings, and are automatically returned to said normal position by the separation of the couplings, substantially as set forth.

4. The within-described coupling for the ends of the conducting-wires of electric-railway-signaling apparatus, consisting of a cylindrical and half-round metallic shell having the sides of the latter portion thereof united by a metallic cross-bar, to which shell one of said conducting-wires is attached and has a ring surrounding its said half-round portion, a spring-finger thereon extending in a line with the latter, and an internally-insulated circuit making and breaking finger, to which one of said conductors is attached, which lies normally in contact with said cross-bar of the shell, and has a curve therein to make a contact with the finger of another coupling when two of the latter are united, and whereby contact is broken between said finger and said cross-bar, substantially as described.

5. As means for maintaining an open circuit in the conducting-wires of an electric railway-signaling apparatus, the combination, with the cylindrical and half-round coupling *b*, having one of said conducting-wires attached thereto, and having an internally-insulated circuit making and breaking finger, to which one of said conductors is attached, one end of which lies normally in contact with said shell, of the non-conducting plug *K*, located in the coupling-receiving socket *t* of a fixed part of the end of the car, with which said coupling is engaged, and whereby the contact of its said finger with said shell is broken, substantially as described.

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Witnesses:

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