

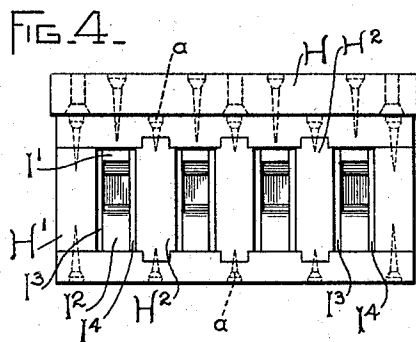
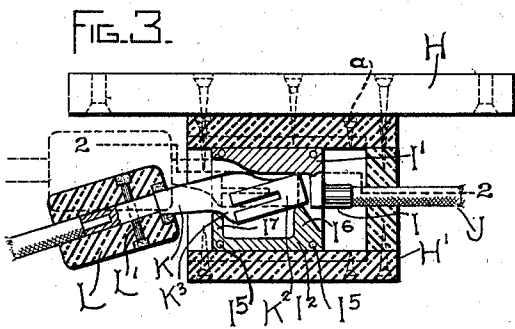
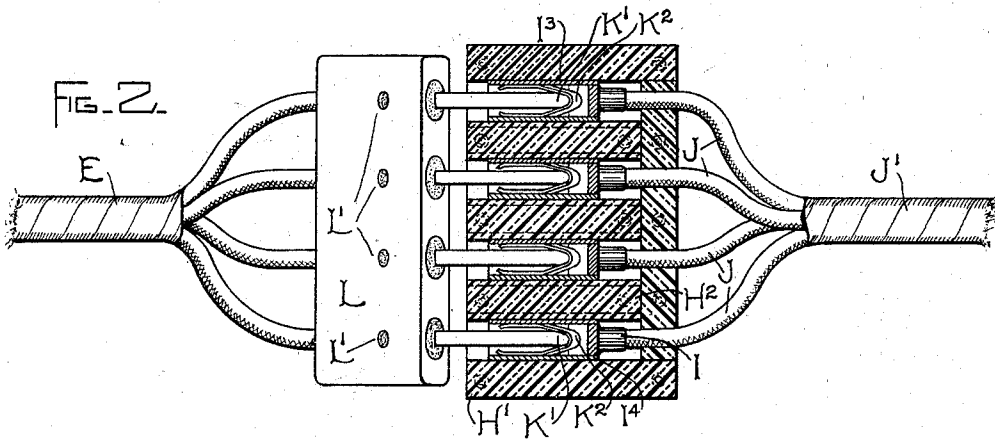
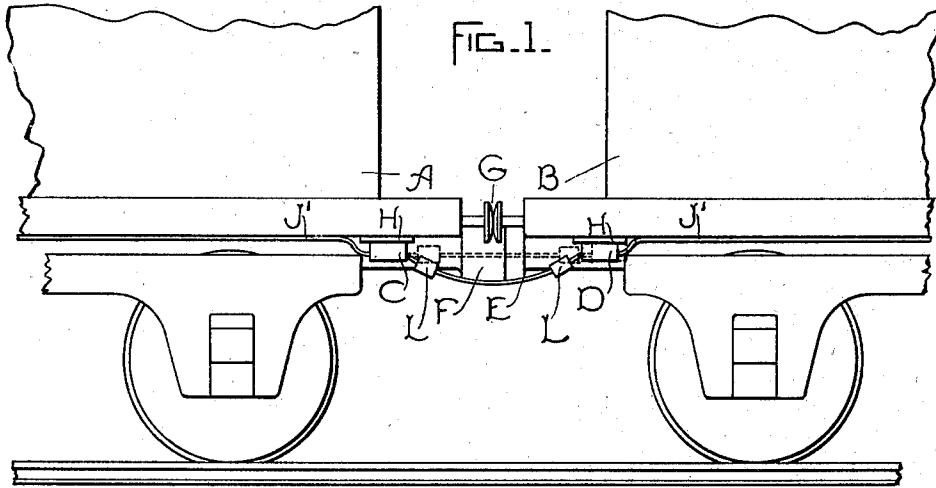
No. 625,828.

Patented May 30, 1899.

F. E. CASE.
CABLE COUPLING.

(Application filed Mar. 21, 1898.)

(No Model.)



WITNESSES.

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UNITED STATES PATENT OFFICE.

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

CABLE-COUPLING.

SPECIFICATION forming part of Letters Patent No. 625,828, dated May 30, 1899.

Application filed March 21, 1898. Serial No. 674,589. (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 Cable-Couplings, (Case No. 752,) of which the following is a specification.

My invention relates to couplings for electric wires, and particularly to those employed for connecting the wire or wires of one vehicle with those of another vehicle.

In motor-cars which are designed for heavy traffic the cable containing the circuit-wires is large and heavy, and when it becomes necessary to couple two or more such cars together the cable-terminals for uniting the sections of the various cars are necessarily large and cumbersome, and if they are permitted to trail behind the last car in the manner of the ordinary air-brake hose they are liable to be injured either by striking some object between the tracks or being filled with mud and dust. With the ordinary form of coupling, in which the male and female parts are first placed at an angle to each other and then moved into an approximately straight line, considerable slack is required in the cable in order to make the coupling. With cables intended for heavy current this is practically prohibitory on account of their size and stiffness.

My invention has for its objects to overcome the objections above pointed out and to provide a cable connection which is so arranged that it can be readily removed from the car when not in use and one which when the cars accidentally separate will automatically release.

In the accompanying drawings, which show an embodiment of my invention, Figure 1 is a side elevation of a coupling mounted in position on the cars. Fig. 2 is a horizontal section on line 2 2 of Fig. 3. Fig. 3 is a cross-section through one of the terminals, and Fig. 4 is an end elevation of a terminal-box.

My invention is shown in connection with a cable having four separate wires; but the same principle of construction is employed

whether one wire or a number of wires are to be united.

Situated under the front and rear platforms of the vehicles A and B are terminal-boxes C and D. These are united by means of a short section of cable E, having suitable terminals. The vehicles A and B are united mechanically by any desired form of coupler F, suitable buffers G being arranged to hold the vehicles in the position shown.

The terminal-boxes being similar in construction, a detail description of one of them will be sufficient. Mounted upon a base H, which is secured by bolts or screws to the under side of the car-platform or other accessible part of the car, is a box H', made of any suitable insulating material. The interior of the box is divided into a number of compartments by walls or partitions H², the number depending upon the number of wires in the cable, and each compartment is provided with a fixed terminal I. The fixed terminals are similar in construction and are provided with top and bottom metal pieces I' I² and side pieces I³ I⁴, which are secured together and to the pieces I' I² by rivets I⁵. Formed integral with the top piece I' is a terminal I, in which is mounted the end of the cable J. The bottom terminal of the box is provided with a projection I⁶, which when the cars A and B accidentally separate acts as a fulcrum for the male terminal K and permits it to be released. Formed integral with the bottom piece is a web I⁷, extending across the box and arranged to engage with the male terminal K and hold it in the position shown. By this arrangement the terminal K is locked against accidental separation. I have shown the terminals I made up of a number of pieces; but it is evident that a single casting may be substituted therefor.

Referring to Fig. 4, the means employed for securing the female terminals in place and also the partitions H² are shown. The partitions are tongued top and bottom, and the tongues enter corresponding grooves in the top and bottom of the box and are secured by screws, as shown in dotted lines. The female terminals, each constituting in effect a

box with an open or partially-open end, are situated between the partitions and depend somewhat upon them for their support, but in addition are held in place by screws *a*, as shown in dotted lines.

The wires or cables *J* are united to form a larger cable *J'*, which extends through the car, and are insulated in any desired manner.

In order to avoid the customary dangling cable end, I provide a short section of cable *E*, composed of a number of wires corresponding to those of the cable *J'*, which can be removed when not in use and placed in any desired receptacle on the car. This cable is arranged to have a small amount of slack, as shown in Fig. 1, to permit it to be mounted in position and also to compensate for changes in position of the cars *A* and *B*. The wires in the cable are each provided with a terminal, which consists of a metal tip *K'*, having a U-shaped spring-contact *K²*, arranged to engage with the sides of the terminal-box *I*. The under side of the terminal is provided with a projection *K³*, which constitutes in effect a hook and engages with the web *I⁷* to hold the cable-terminal in place. To maintain the terminals in place and to properly space them, they are mounted in an insulating-support *L* and are retained by pins *L'*.

In connecting the terminal-boxes *C* and *D* the terminal *K*, located at one end of the cable *E*, is first inserted in the box-like terminal *I* and lowered to a position where projection *K³* engages with web *I⁷*, after which the second terminal is mounted in a similar manner. On account of the construction very little slack in the cable is required, the amount being sufficient only to permit the second terminal to be mounted in place without straining the cable. The terminal can readily be removed by raising the projection *K³* to a point where it will pass web *I⁷*.

If the cable *E* is in operative position between two cars and the cars are accidentally separated, the cable will assume the position shown by the dotted lines in Figs. 1 and 3 and raise the front end of one or both of the terminals *K* to a point where the projection or hook *K³* will clear the web *I⁷*, the projection *I⁶* at the right-hand end of the terminal acting as a fulcrum. With this arrangement the cars will in the event of separation be automatically disconnected without destroying the coupling. At the same time it will be seen that the couplings are locked in position, and no amount of jarring will displace them or destroy the electrical connection between the cars.

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

1. The combination of a fixed terminal located on the end of a car, a cable-section adapted to be connected to the terminal, a contact on the cable-section engaging with the terminal, means for positively locking the terminal and contact in operative relation so

long as they occupy planes making an angle with each other, and means for releasing the terminal and contact as soon as they move into planes which coincide, or substantially coincide.

2. The combination of terminals permanently mounted on suitable supports, and a cable for establishing electrical connection between them, the said cable being provided with terminal-plugs which fit into corresponding receptacles in the terminals, the arrangement being such that under normal conditions, the terminal-plugs are locked in position by reason of the slack in the cable, but as soon as the terminal-boxes separate a certain distance, the slack is taken up and the cable is automatically disconnected from one or both boxes.

3. The combination of terminals mounted on separate supports, a short cable-section for electrically connecting the terminals, other terminals on the cable engaging the first-named terminals, means for positively locking and maintaining the connection so long as there is slack in the cable between the terminals or the pull in other than a straight line, and means for releasing the cable as soon as the slack is taken up, due to the separation of the supports.

4. The combination of terminal-boxes mounted on separate vehicles, each box being provided with a plurality of terminals, which are in electrical connection with a cable on the vehicle, a short cable-section for electrically connecting the boxes, terminals on the cable engaging corresponding terminals in the boxes, means for locking the cable-section terminals in place so long as there is slack in the cable, and means for releasing the cable as soon as the slack is taken up by the separation of the vehicles.

5. The combination of an insulated support, a fixed terminal mounted therein and connected to a fixed cable, a removable terminal arranged to make connection with the fixed terminal, an offset piece for securing the removable terminal in place so long as it remains in its normal position, and a piece acting as a fulcrum for releasing the terminal as soon as it moves to an abnormal position.

6. In a cable-connector, the combination of an insulating-box, partitions or walls dividing the box into compartments, fixed box-like terminals mounted in the compartments, removable terminals arranged to engage with the fixed terminals, and a hook or projection engaging with the box for locking the removable terminal in place so long as it remains in its normal position.

7. In a cable-connector, the combination of an insulating-box, a fixed terminal mounted in the box, a removable terminal attached to a cable, spring-contacts between the removable and fixed terminals, a hook or projection on the removable terminal arranged to engage with a corresponding projection on the sta-

tionary terminal, and a projection acting as a fulcrum for releasing the removable terminal when it is moved to an abnormal position.

8. In a cable-connector, the combination of an insulating-box, a fixed terminal mounted in the box, a removable terminal attached to a cable, a hook or projection on the removable terminal arranged to engage with a projection on the fixed terminal, the weight of the cable-section serving to hold the parts in their proper relation, and means for raising one end of the terminal for the purpose of disengaging the cable.

9. In a cable-connector, the combination of a fixed insulating-support, a plurality of terminals mounted thereon, means for connecting each terminal to a conductor, a short cable-section provided at its ends with terminals having offsets therein and spring-fingers, the terminals corresponding to, and arranged to engage with, the fixed terminals, a piece or pieces with which the offset portions engage to hold the cable in place, and a body of insulating material forming a support for the cable-section terminals.

10. In a cable-connector, the combination of an insulating-support, partitions for dividing the box into sections, fixed terminals mounted between the partitions, each termi-

nal comprising a box with an open end for the reception of the male terminal, a web in the front of the box for holding the terminal, and a projection in the back end of the box, arranged to form a fulcrum for releasing the male terminal.

11. As an article of manufacture, a cable-section provided with a terminal at one end for engaging a corresponding fixed terminal, a projection on the terminal for holding it in position when mounted in a contact device, and an extension which acts as a lever to release the terminal.

12. As an article of manufacture, a cable-section composed of a plurality of separate wires or smaller cables, a terminal for each wire, an insulating-support for holding and spacing the terminals, each terminal being provided with a projection or hook for holding the cable-section in place, and a projection which acts as a lever to assist in releasing the terminal.

In witness whereof I have hereunto set my hand this 16th day of March, 1898.

FRANK E. CASE.

Witnesses:

B. B. HULL,
M. H. EMERSON.