

F. E. CASE.
COUPLING FOR ELECTRIC MOTORS.

(Application filed Feb. 15, 1901.)

(No Model.)

2 Sheets—Sheet 1.

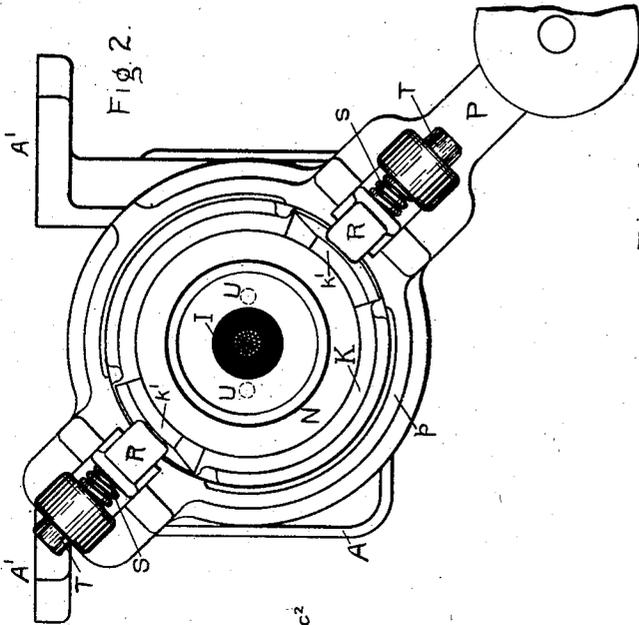


Fig. 1.

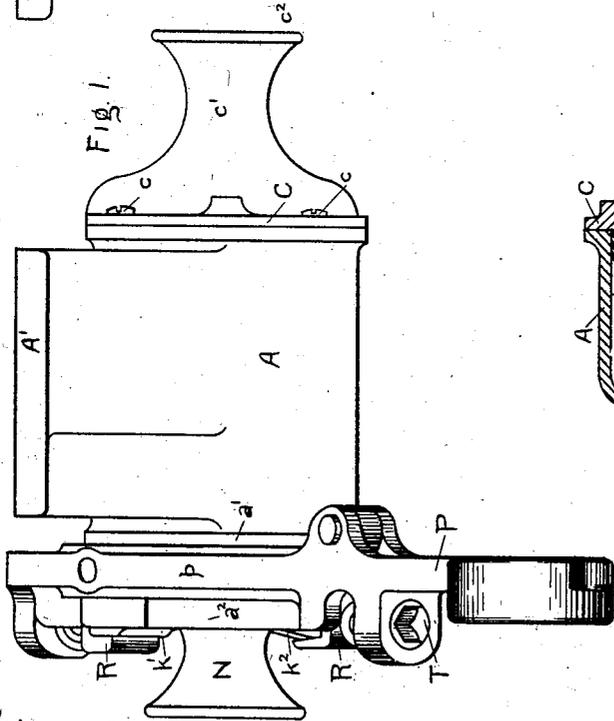


Fig. 4.

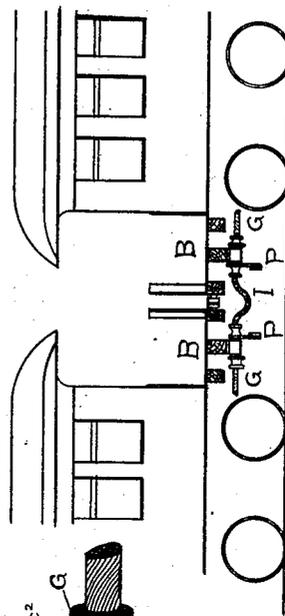
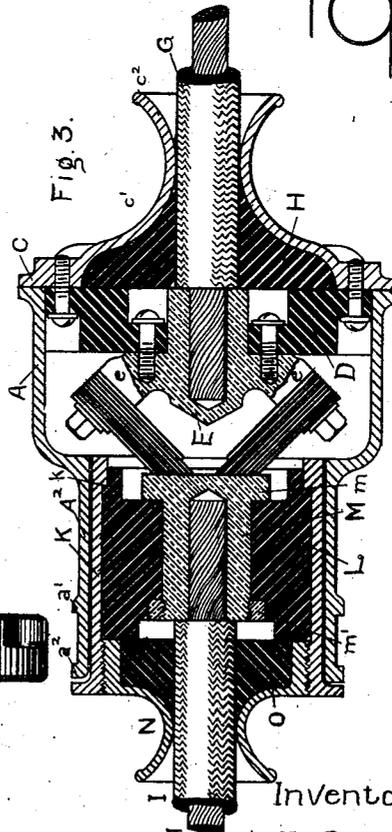


Fig. 3.



Witnesses:

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2 Sheets—Sheet 2.

Fig 5.

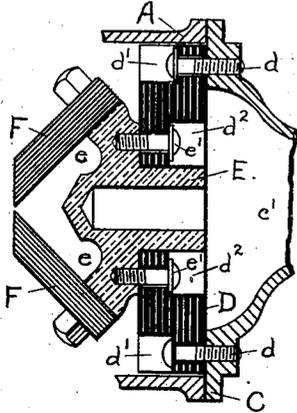


Fig 6.

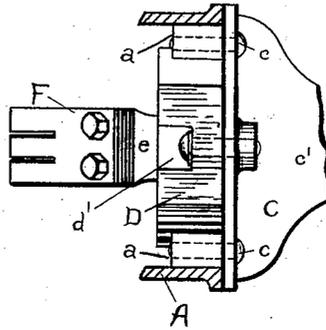


Fig 7.

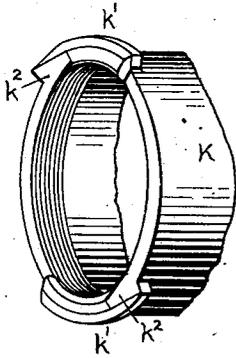


Fig 8.

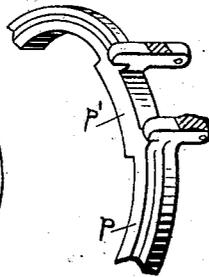


Fig 9.

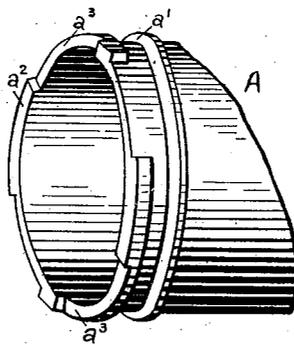
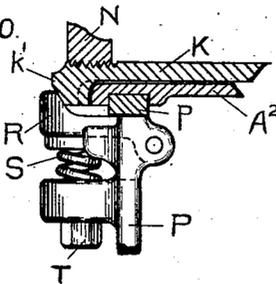


Fig 10.



Witnesses:

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UNITED STATES PATENT OFFICE.

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

COUPLING FOR ELECTRIC MOTORS.

SPECIFICATION forming part of Letters Patent No. 708,024, dated September 2, 1902.

Application filed February 15, 1901. Serial No. 47,414. (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, county of Schenectady, State of New York, have invented certain new and useful Improvements in Couplers for Electric Conductors, (Case No. 1,963,) of which the following is a specification.

This invention relates to couplings for connecting electric conductors, especially those employed in transmitting electric currents through the several cars of a railway-train. Such conductors must be provided with detachable couplings at the ends of each car, and if the conductor is to carry a heavy current, such as that used in operating electric-railway motors, the contacts must be exceptionally good and yet be capable of quick connection and ready separation. They must also uncouple automatically when the cars accidentally pull apart. My invention aims to accomplish all these ends by a strong and comparatively inexpensive construction, as hereinafter set forth, and particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my improved coupler. Fig. 2 is an end elevation of the same. Fig. 3 is a longitudinal horizontal section of the body portions of the coupler. Fig. 4 is a view of the adjacent ends of two cars, showing the location of the couplers. Fig. 5 is a cross-section of the stationary contact. Fig. 6 is a side view thereof. Figs. 7, 8, and 9 are perspective views of the ends of the plug and receptacle and a portion of the locking-lever. Fig. 10 is a cross-section of these parts, showing the yielding catch on the locking-lever.

The coupling which I have devised comprises a fixed member adapted to be mounted beneath the car-platform at the end of the car and a removable member constituting one of the terminals of a "jumper," by means of which connection is made from one car to another. The two members of the coupling are provided with engaging contacts suitably insulated from their inclosing casings, and a locking device constructed to yield under an abnormal pull, such as would occur when the train breaks apart, is provided for normally

holding the two members together, with their contacts in engagement.

It has been heretofore customary in train-couplers to provide one of the members with plug-contacts engaging with corresponding receptacles in the other member; but such a construction is not well adapted for large conductors carrying heavy currents, since if the contacts are made to engage sufficiently closely to form a good electrical contact they can be separated only with considerable labor. In a coupler constructed according to my present invention the engaging contacts are arranged to abut against one another in a plane transverse to the line of movement of the removable member. They can therefore be forced into close electrical contact with no danger of their sticking together when an attempt is made to separate them. In the construction which I have shown the contacts of the two members of the coupling are forced into close engagement by means of a locking device provided with cam-surfaces. In order to make the contact as perfect as possible, I prefer to construct the contact in one of the members in the shape of one or more brushes, constructed of sheet-copper or other suitable material. By mounting such brushes at an angle to the line of movement of the movable member of the coupling I am enabled to make use of the resilience of the metal in maintaining the contact. The contacts of the fixed member are mounted in a casing A, substantially rectangular in cross-section and provided with two upwardly-extending integral brackets A', by means of which the casing may be fastened to the under side of the frame of the car-platform B. The rear end of the casing is closed by a plate C, preferably fastened by screws entering lugs *a* in the corners of the casing. The plate has a rearwardly-extending circular funnel *c*, having a flaring mouth *c*² in line with a hole in a block D of insulation fastened to the plate inside of the casing by screws *d*, whose heads are preferably seated in recesses *d*' in each end of said block. The corners of the block are preferably beveled off to clear the lugs *a*. In the hole in said block is received a socket-piece E, made, pref-

erably, of copper and having branching arms e on the inner side of the block. To each arm is attached a contact F, preferably a laminated copper brush slotted lengthwise at its free end, both brushes being cut off on a plane at right angles with the axis of the casing. The socket is attached to the block D by screws e' , whose heads are preferably sunk in recesses d^2 in said block. An insulated cable G runs through the car for connecting up the desired apparatus. Its end fits snugly in the funnel c' , whose flaring mouth permits it to bend to and fro without danger of injuring the insulation. At the extremity of the cable the insulation g is removed and the bared conductor is inserted into the socket E, which thus constitutes, with the brushes, the stationary car-contact. Molded insulation H is filled into the funnel around the cable.

In order to connect the stationary contacts on the adjacent ends of two cars, I provide a short length of flexible conducting-cable I, furnished at each end with a terminal adapted to make good electrical contact with the brushes F. Locking devices are provided which hold the cable-terminals in contact with the brushes, but permit them to pull out in case the cars break apart.

The construction I prefer is as follows:

At the front end of the casing A is a tubular receptacle A^2 , integral with the casing and adapted to receive a tubular plug K, in which is an annular block L of insulation holding centrally a cable-terminal M, having at its outer end a solid flanged head m to bear against the brushes F and screw-threaded at its inner end to receive a fastening-nut m' . The block L preferably seats against an internal shoulder k near the outer end of the plug and is held in place by a funnel N, screwed into the rear end of the plug. The end of the connecting-cable I passes in through the funnel N and is connected with the terminal M, into which it enters. Insulation O is filled into the funnel around the cable.

The locking device to hold the plug K in the receptacle A^2 consists of a lever P, having a circular collar p , mounted rotatably on a cylindrical surface on the receptacle A^2 between the shoulders or flanges a' a^2 . The shoulder or flange a^2 is cut away at two opposite points to permit lugs p' on the inside of the collar p to slide on over the receptacle A^2 , the inner edge of the lugs being turned off on a circle slightly larger than the cylindrical surface on said receptacle, so that the collar is rotatably supported on said lugs. On the end of the plug K adjacent to the funnel N are two oppositely-arranged segmental flanges k' , with similar ends beveled off at k^2 . Notches a^3 are formed in the end of the receptacle, preferably extending only part way through the flange a^2 , to receive the flanges k' when the plug is thrust into the receptacle A^2 , and thus prevent the plug from rotating in the receptacle. The lever carries

two oppositely-arranged catches or hooks R, constructed to slide over the flanges k' and firmly clamp the plug in place when the lever is given a partial rotation. In order to release the plug when the cars accidentally break apart, the catches are pivoted to the lever so as to swing in radial planes with reference to the plug, being held in normal positions by springs S bearing against the backs of the catches and seated on screw-plugs T, by which their tension can be adjusted. The meeting faces of the catches and flanges k' are chamfered off, as shown, so as to readily disengage under a strong pull on the plug.

The operation of my invention is apparent from the preceding description; but for convenience it may be recapitulated as follows: Each car having fixed at each end a stationary casing A, receptacle A^2 , and contact FF, the cable I is used to connect the adjacent ends of two cars by having its plugs K thrust into the two receptacles, with the flanges k' entering the notches a^3 and the head m in contact with the brushes. A partial rotation of each lever P causes its hooks to slide up the beveled ends of the flanges k' , forcing the plug inward until the flanges rest solidly in the notches a^3 , the brushes F yielding slightly to permit this final inward movement of the plug, which causes an excellent close contact of the terminals M and F. The hooks clamp the plug so that it cannot be withdrawn except by a pull strong enough to enable the chamfered edge of the flanges k' to force back the catches.

If desired, the parts may be made large enough to carry additional contacts for other conductors, as indicated by the dotted circles U in Fig. 2.

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

1. In a coupler for electric conductors, the combination with a casing, of a block of insulation, a metallic socket-piece mounted therein, and contact-brushes secured to said socket-piece.

2. In a coupler for electric conductors, the combination with a casing, on a block of insulation, a metallic socket-piece mounted therein, and contact-brushes secured to said socket-piece, having their ends terminating in a plane transverse to the axis of the casing.

3. The combination with a receptacle provided with a cylindrical surface, of a plug fitting into the receptacle, a collar rotatable on the cylindrical surface, and spring-actuated hooks on the collar to engage with the plug.

4. The combination with a receptacle provided with a cylindrical surface, of a plug fitting into the receptacle, and provided with chamfered flanges, and a collar rotatable on the cylindrical surface and carrying yielding hooks having chamfered ends to engage with said flanges.

5. In a coupler for electric conductors, the

combination with a casing, of a block of insulation, and a metallic socket-piece mounted therein, and having arms to carry contact-brushes.

5 6. In a coupler for electric conductors, the combination with a casing, of a block of insulation removably secured therein, a socket-piece mounted in said block and having arms, and a brush secured to each arm.

10 7. In a coupler for electric conductors, the combination with a casing, of a block of insulation removably secured therein, a socket-

piece mounted in said block, arms projecting from said socket-piece, and a brush on each arm, said brushes being inclined toward each other and having their ends cut off on a plane transverse to the axis of the casing. 15

In witness whereof I have hereunto set my hand this 12th day of February, 1901.

FRANK E. CASE.

Witnesses:

BENJAMIN B. HULL,
MARGARET E. WOOLLEY.