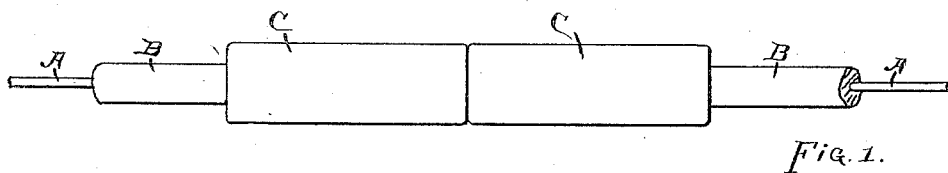
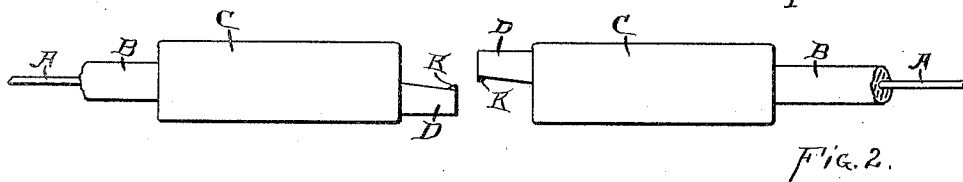
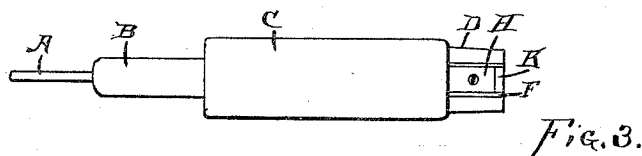
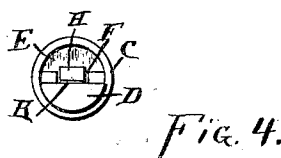
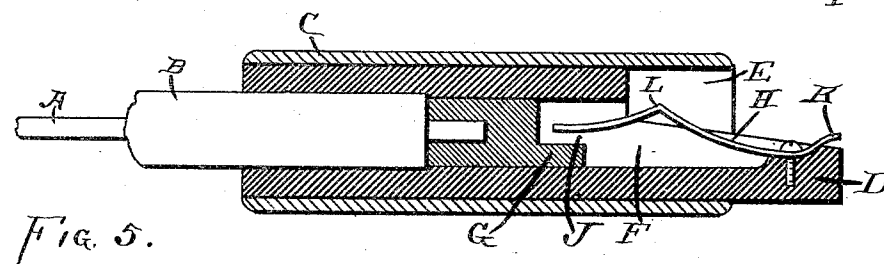
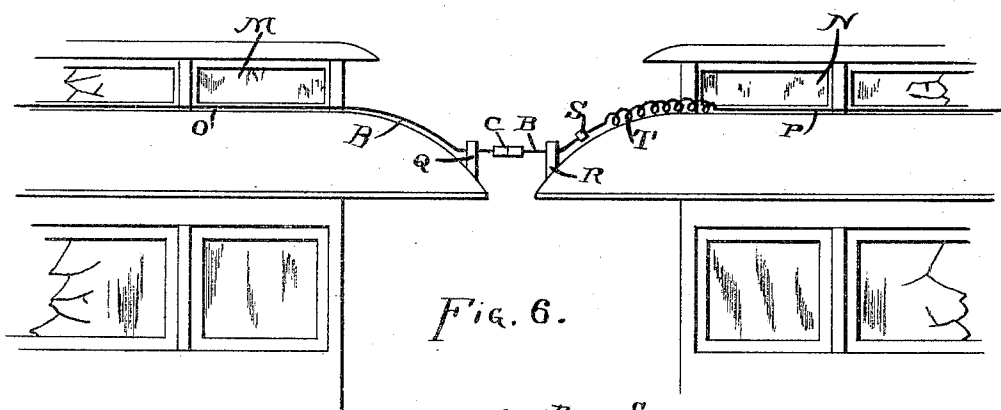
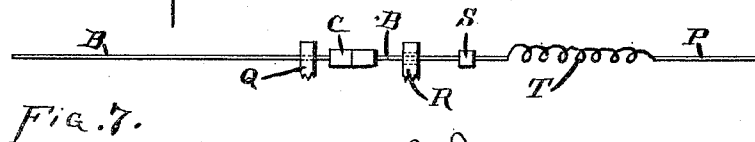


(No Model.)

F. R. JONES.
COUPLING FOR ELECTRIC WIRES.

No. 436,857.

Patented Sept. 23, 1890.



Witnesses:
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COUPLING FOR ELECTRIC WIRES.

SPECIFICATION forming part of Letters Patent No. 436,857, dated September 23, 1890.

Application filed May 22, 1890. Serial No. 352,798. (No model.)

To all whom it may concern:

Be it known that I, FORREST R. JONES, of Kearney, Buffalo county, Nebraska, have invented certain new and useful Improvements in Couplings for Electrical Conductors, of which the following is a specification.

This invention pertains to couplings for electrical conductors, and has been designed with special reference to electrical conductors employed in connection with railway-cars, though the invention is of course applicable to other situations.

As an exemplification of the use of my invention, I will make its description with special reference to street-cars provided with electric lights, my system of coupling being employed to connect the conductors of the several cars.

My improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of the direct coupling parts of my improved coupling shown as connected together—that is, coupled; Fig. 2, a similar view showing the same parts separated; Fig. 3, a plan of one of the coupling parts; Fig. 4, an end view of one of the coupling parts; Fig. 5, a longitudinal diametrical section of one of the coupling parts; Fig. 6, a side elevation of the end portions of two cars provided with my improved coupling arranged in connection with an electrical conductor assumed as the conductor for the lighting-current, special provision being made to prevent accident to the coupling by the movement of the cars; and Fig. 7, a detached view of the coupling devices illustrated in Fig. 6, the devices being shown upon a somewhat enlarged scale.

In the drawings, (omitting for the present any reference to Figs. 6 and 7,) A indicates the electrical conductors which are to be detachably coupled, these conductors being assumed as flexible, such being the usual construction in connection with car-service, the flexibility being attained generally by forming the conductor of strands; B, the usual insulating-jacket on the conductors; C, the two coupling parts, one secured to the end of each of the conductors, these two coupling

parts being of identical form so as to inter-member indiscriminately the general form of the coupling parts, being that of simple cylinders formed of non-conducting material, as hard rubber; D, semi-cylindrical projections extending one from the outer end of each coupling part; E, a semi-cylindrical recess in the outer end of each coupling part, this recess having a form corresponding with that of the projection D, as clearly illustrated, the form being such that when two coupling parts are pushed together endwise the projection will enter and fill the recesses and the entire coupling, thereby presenting a smooth cylindrical surface; F, a longitudinal groove in the flat face of each projection D, this groove extending from the outer end of the projection inwardly the full depth of the recess E and continuing onwardly as a cylindrical hole extending entirely through the coupling part; G, a metallic contact-piece permanently secured to the end of the conductor A and firmly secured within the cylindrical hole in the coupling part, this contact-piece thus presenting within the non-conducting coupling part the terminal of the conductor A; H, a spring secured in the groove F and free for flexation throughout the general inner portion of its length; J, the inner free end of the spring disposed over the contact-piece G and adapted to make contact therewith when the spring is depressed; K, the extreme outer end of the spring H, being disposed at the end of the projection D and presenting an inner declivity or incline, and L a hip or incline formed upon the spring H at that portion of its length which would be engaged by the declivity K of the fellow spring when the two coupling parts are united, the forms of the declivity K and hip L being such that when the two coupling parts are united the springs will be depressed into contact with the contact-pieces G and the declivity K of one spring will engage in behind the hip L of the other spring, so as to offer a certain amount of resistance to their tractive separation.

When the two coupling parts are separated, then each conductor may be said to have a blind end—that is to say, neither coupling part presents any exposed metal terminals

which are connected with the conductor. While the coupling is uncoupled the spring H is not in connection with the conductor. The uncoupled parts thus present no elements
 5 of danger by being handled, as the real terminal of the conductor is protected far within the body of the non-conducting coupling-piece. When the coupling parts are united, then the springs become depressed and con-
 10 nected with the conductors. The coupling parts are united by simple endwise presentation and the exercise of sufficient pushing force to cause the declivities K to depress the springs and engage behind the hips L. This
 15 engagement furnishes sufficient lock to hold the coupling parts properly together under all ordinary practical circumstances.

I have referred to the projections D and the recesses E as being semi-cylindrical; but I
 20 prefer that the flat boundary of the recess and projection should be arranged on a taper, as clearly shown in Fig. 5. This gives the couplings a sort of a wedging union and permits the two parts to be united very firmly
 25 and with little force, thus lessening the requirements of the springs to serve as a lock. The two coupling parts, when united, form practically water-tight joints.

In making the coupling the preferred construction is to form the general interior piece
 30 from a cylinder of hard rubber properly bored and grooved and rabbeted to form the projection and recess. A hard-rubber sleeve is then forced over the inner piece, thus com-
 35 pleting the recess. This contact-piece G may be a rabbeted cylindrical plug of metal soldered or otherwise secured to the end of the conductor and forced into or otherwise secured in the central bore of the coupling part.
 40 The insulating-jacket of the conductor is best allowed to project well into the central bore of the coupling part, so as to make a neat and well-protected union between the jacket and the coupling part.

My couplings are of special usefulness in
 45 connection with the conductors employed in lighting street-cars or other cars by electricity. In such use of conductors and couplings it is desirable that provision be made for the
 50 ordinary approach and separation of the cars as the cars yield at their main couplings and as they swing around curves, &c. It is desirable that the length of the conductor accommodate itself to the conditions without
 55 imposing bending strains on the flexible conductor, which strains would tend in time to break the conductor. It is also highly desirable that provision should be made for an automatic disengagement of the couplings
 60 when the cars separate without imposing damaging tractive strains on the main conductors.

In Figs. 6 and 7 I illustrate my coupling system as I generally apply it to the roofs of
 65 electrically-lighted street-cars. The direct coupling parts are as I have previously described. Referring now more particularly to

these two figures of the drawings, M indicates the end portion of one car; N, another car assumed as coupled thereto by the
 70 usual car-coupling devices; O, the car-wire of one of the cars, the same being arranged in its roof structure and extending from end to end of the car and terminating eventually at each end in such a coupling part as has
 75 been before described; P, a similar car-wire of the other car, these car-wires being arranged within the car, as to lighting, &c., as the design may require; Q, an eye at the extreme of one car-roof, this eye supporting
 80 fixedly the conductor of that car within a short distance of the coupling part—that is to say, the conductor is fastened in this eye and then projects flexibly a short distance beyond to the coupling part; R, a similar eye
 85 on the other car, in this case, however, the conductor being loose in the eye, so as to be capable of free endwise motion therein; S, an enlargement or stop formed upon or secured to the conductor inwardly beyond the eye R
 90 to serve in limiting the outward movement of the conductor through that eye, and T a spiral spring forming part of the car-wire of car N, this spring being disposed inwardly just beyond the stop S.
 95

I have illustrated the loose eye R and the stop S and the spring T as a provision upon one car only, but the arrangement may be identical upon both cars—that is to say, upon
 100 both ends of both cars.

By inspecting Fig. 6 it will be readily understood that the ordinary approach and separation of the two cars will cause the conductor of the right-hand car to move to and
 105 fro through the loose eye R, the spring T yielding to permit this movement and contracting again to take up surplus length, so that the conductor is not subjected to bends or kinking. When the cars are separated, then the coupling C will be pulled apart, and
 110 the stop S, coming in contact with the eye R, will prevent undue extension of the spring T.

I claim as my invention—

1. In an electrical coupling, the combination, substantially as set forth, of two inter-
 115 membering coupling parts formed of non-conducting material, a metallic contact-piece disposed within each of said coupling parts, an electrical conductor united to each of said contact-pieces, and a metallic spring secured
 120 to each of said coupling parts and adapted, when the two coupling parts are separated, to be out of contact with said contact-pieces and when the coupling parts are united to form contact with each other and each with
 125 its appropriate one of said contact-pieces.

2. In an electrical coupling, the combination, substantially as set forth, of coupling
 130 part C, having projection D and recess E, contact-piece G, disposed within the coupling-piece, conductor A, united to said contact-piece, and spring H, having declivity K and hip L.

3. The combination, substantially as set

forth, of an electrical conductor terminating in a coupling part adapted for union and separation with and from a fellow coupling part by endwise motion, an enlargement or
5 stop upon said conductor, an eye loosely engaging the said conductor between its coupling and said enlargement, and a spring forming part of said conductor and disposed at the side of said enlargement or stop farthest from said loosely-engaging eye.

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