

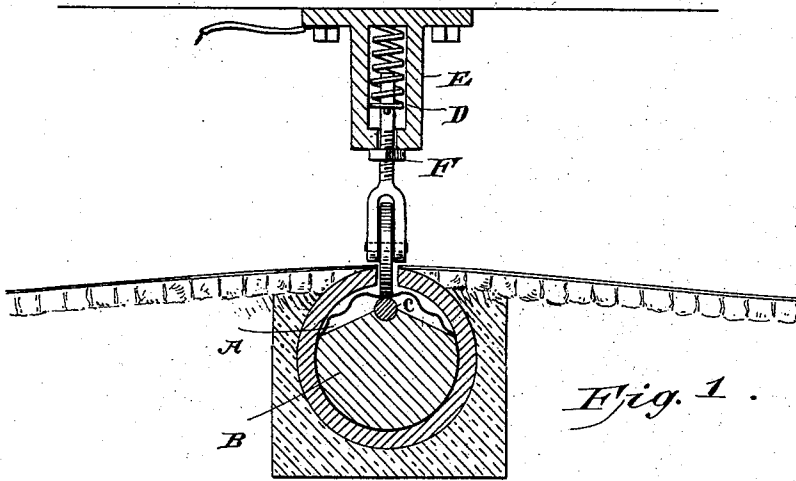
(No Model.)

F. C. PERKINS.

INCLOSED CONDUCTOR FOR ELECTRIC RAILWAYS.

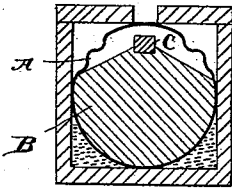
No. 491,132.

Patented Feb. 7, 1893.

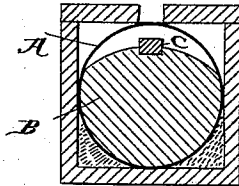


*Fig. 1.*

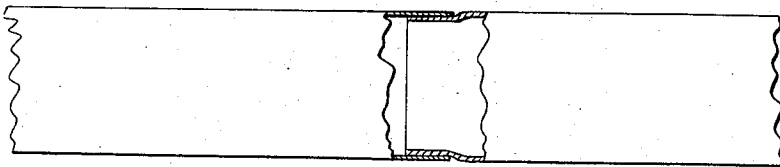
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

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## INCLOSED CONDUCTOR FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 491,132, dated February 7, 1893.

Application filed May 27, 1892. Serial No. 434,544. (No model.)

### *To all whom it may concern:*

Be it known that I, FRANK CLINTON PERKINS, a citizen of the United States, residing at Dunkirk, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Electric Conduits; 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.

This invention relates to supply conductors for electric railways or other systems wherein a traveling contact must be maintained with a system of electrical supply, the primary object being to produce a conductor for this purpose which may be placed upon the road bed of the railway or in a conduit extending along the same which will maintain perfect insulation and be proof against leakage in rainy weather or in damp places.

The invention is carried out by mounting the supply conductor of the system in a waterproof conduit, consisting of a metallic tube the upper portion of which is elastic and adapted when pressed into contact with the supply conductor by a trolley mounted on the car to lead current through the motor on such car.

More specifically the invention comprises a bare conductor mounted upon an insulating support in a conduit, the top of which is rendered elastic by being formed of sheet metal adapted to be pressed into contact with the supply conductor by a motor car.

The several features of novelty will be more particularly hereinafter described and definitely indicated in the claims appended to the specification.

In the accompanying drawings which illustrate the invention Figure 1 is a sectional view of a conduit containing a supply conductor mounted in accordance with my invention, showing also a trolley wheel in co-operative relation thereto. Figs. 2, and 3, are sectional views illustrating modified forms of the invention, and Fig. 4 shows the mode of making the joints of the several sections which constitute the metallic tube inclosing the supply conductor in one form of my invention.

Referring first to Fig. 1, A represents a metallic tube formed of copper, brass, steel, phosphor bronze or any suitable material having the requisite elasticity for the purpose and being proof against the effects of the weather and at the same time a good conductor of electricity. This tube is formed in lengths which may be jointed as indicated in Fig. 4 and contains an insulating support B within it, which may be of wood impregnated with oil or otherwise treated to render it a good insulator, upon which is mounted a bare supply conductor C. This conductor C is referred to herein as a supply conductor which is meant either the outgoing or return conductor or both of a system of electric supply. If alternating currents be used in the system the conductor will serve as both outgoing and return according to the direction of the impulse.

The tubular shell may be circular in cross section as indicated in Fig. 3 but is preferably provided with a number of corrugations as indicated in Figs. 1 and 2 so as to give it increased flexibility. The tube may be supported on a suitable foundation or may be inclosed in an exterior slotted conduit as indicated in the several views of the drawings. Such conduit may be formed of wood, terra cotta or any suitable material. Where high potentials are used for the supply current the space between the metallic envelope and the supports for the conductor may be filled with oil. In its normal position the tube is maintained by its own elasticity out of contact with the conductor C and may be held at any suitable distance therefrom which will of course vary with the size of the conduit, increased flexibility being possible as the size of the tube increases.

Upon the car is mounted a presser-foot which is preferably shod with a wheel at the point where it enters the conduit or comes in contact with the metallic tube, which may be arranged so that the degree of pressure may be controlled by the motorman. As shown in the drawings a simple screw adjustment is shown by which the pressure of this foot may be varied, an elastic spring D surrounding a stem which enters a box E, the tension of which may be varied by adjusting the nut F.

The pressure of the spring should be sufficient to force the top of the metallic tube A into contact with the conductor C. Under these circumstances as the car proceeds along the line of way a shifting contact is maintained by the wheel between the tube and the conductor and the current is therefore led from the conductor to the motor on the car by suitable connections, the tube rising away from the conductor as the car passes any given point and opening the connection at that point. The joints between the successive sections of the metallic inclosing tube will be sufficiently tight to exclude moisture and so shaped that a smooth exterior will be presented to the traveling wheel. In most cases a simple slip joint will be found sufficiently tight but if necessary a soldered or cemented joint may be made. The tube need not in all cases be formed of a single piece. The essential feature is that the conductor shall be inclosed in a watertight metallic envelope, the top or face which engages the traveling contacts being sufficiently flexible and elastic to be forced into electric engagement with the conductor and to spring back when the contact passes, and being so constructed as to present a continuous metallic contact surface.

The supply conductor may be supported within the tube in any suitable manner, the mode described being simply by way of illustration. The metallic inclosing shell may be supported between the rails or in a trough placed beneath the surface of the ground.

While the invention is particularly adapted to a surface or underground conductor it might also be used as an aerial conductor, the metallic tube being supported at any suitable distance from the ground. It will thus be seen that the supply conductor may be thoroughly insulated throughout its length and yet a continuous supply of current may be drawn by a motor provided with a suitable contact.

Having thus described my invention what

I claim as new and desire to secure by Letters Patent is:—

1. An insulated electric supply conductor for a traveling contact inclosed in an elastic metallic tube adapted to be depressed by the traveling contact and establish electric connection with the conductor.

2. An insulated electric supply conductor for a traveling contact inclosed in a watertight metallic tube having an elastic metallic face extending along the line of travel of the contact adapted to be depressed by said contact into electric connection with the conductor.

3. An electric conductor for leading current through a traveling contact, said conductor being supported upon an insulator in an elastic metallic tube inclosing the conductor in a watertight envelope the wall of the tube adapted to be depressed to establish electric connection with the contact.

4. An electric conduit comprising a slotted trough, an elastic metallic tube supported therein and a bare conductor mounted upon insulators in said tube, the wall of the tube adapted to be depressed into electrical connection with the conductor by a traveling contact.

5. An electric conductor for leading current through a traveling contact comprising a bare conductor supported upon insulators in a thin metallic tube corrugated to give increased elasticity.

6. An electric conductor for leading current through a traveling contact comprising a bare conductor supported upon insulators in a continuous elastic metallic tube composed of sections connected by watertight joints.

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

FRANK CLINTON PERKINS.

Witnesses:

NELLIE P. DROEGE,  
M. EINSTEIN.