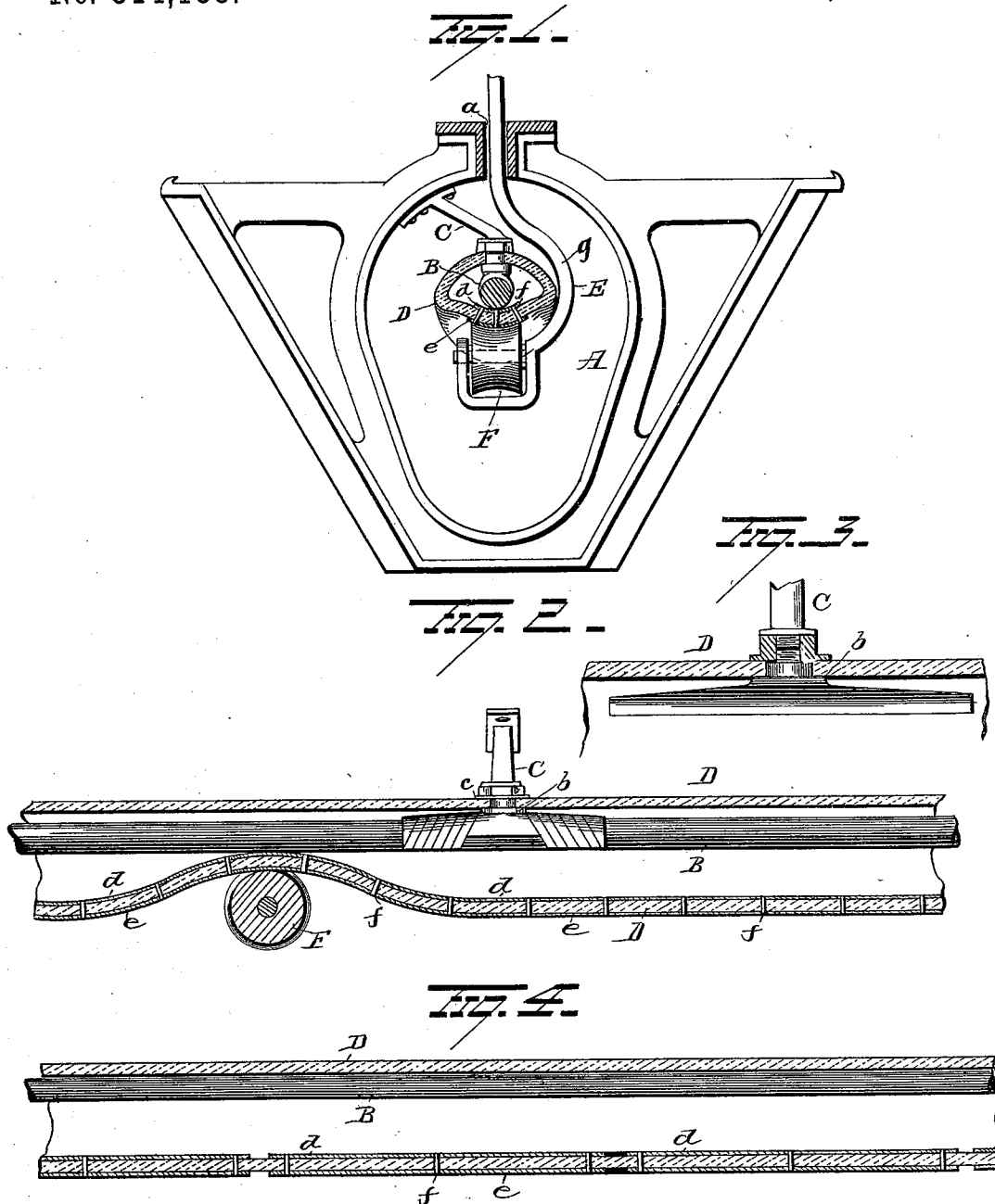


(No Model.)

H. A. SEYMOUR.
UNDERGROUND ELECTRIC CONDUCTOR.

No. 514,133.

Patented Feb. 6, 1894.



Witnesses
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HENRY A. SEYMOUR, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR
TO THE SHORT ELECTRIC RAILWAY COMPANY, OF CLEVELAND, OHIO.

UNDERGROUND ELECTRIC CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 514,133, dated February 6, 1894.

Application filed August 30, 1890. Serial No. 363,530. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. SEYMOUR, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Underground Electric Conductors; 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.

My invention relates to an improvement in underground electric conductors for electric railroads and has for its object to so arrange the main conductor within the conduit, that it shall be thoroughly insulated at all points.

A further object is to provide the main conductor of an underground electric railway system with an insulating envelope, so arranged that said conductor shall, at all times and at all points throughout its length, be completely surrounded by insulating material, whereby all moisture, dirt, &c., shall be effectually excluded from the conductor and the escape therefrom of any portion of the current, prevented.

A further object is to so construct and arrange an underground electric conductor that it shall be completely and effectually insulated, and whereby the trolley shoe or wheel may be brought into electrical communication from beneath the conductor, whereby the parts will be protected from injurious conflict with objects passing over the mouth of the conduit.

With these objects in view the invention consists in inclosing the main conductor in a yielding envelope of insulating material and providing the lower portion of said envelope with conducting devices, adapted to be forced into contact with the main conductor by the pressure of a trolley shoe or wheel against it.

The invention also consists in certain novel features of construction and combinations and arrangements of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawings: Figure 1 represents a cross section of a conduit having my improvements arranged therein. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a detached view illustrating the means of supporting the main conductor in

its insulating envelope. Fig. 4 is a longitudinal sectional view showing the strips *d, e* made in sections.

A represents a conduit in which is located, at a suitable distance below the mouth *a* thereof, a conducting wire B, supported and maintained in proper position by means of a series of arms C, which are preferably provided with grooved extensions adapted to receive a conductor B, to which they are secured by means of copper ribbon or in any other approved manner. The arms C may, if desired, be made in two sections and one section adapted to be removably connected with the other for a purpose presently explained, and the upper end of the upper section secured in the top portion of the conduit.

Supported upon the main conductor B and adapted to completely surround it, is an envelope or tube D of rubber, or a composition of cloth and rubber or of any other suitable flexible material. The envelope or tube D is provided with perforations, through which the lower portions of the arms C are adapted to pass and fit tightly,—washers *b, c* being placed on the arms at opposite sides of the wall of the envelope of tube D, whereby said arms may be firmly connected therewith, and the admission of air, water, dirt, &c., effectually prevented.

While the manner which I have shown and described for supporting the conductor and its envelope in the conduit, is a simple and convenient manner, it is evident that these devices may be otherwise supported without affecting the scope of my invention.

Placed within the lower portion of the envelope or tube D, is a thin metallic (preferably copper) plate *d*, which plate extends the full length of the main conductor B. Located on the exterior of the envelope or tube D and parallel with the plates *d* is a thin metallic plate *e*, which is electrically, as well as mechanically, connected with the interior plate *d*, by means of metallic pins or rivets *f*, so that when pressure is brought to bear against the exterior plate *e*, the interior plate *d* will be made to make electrical contact with the main conductor B. An arm E projects downwardly from the car and is curved, as at *g*, to pass partially around the envelope or tube D

and at the lower end of this arm, a trolley shoe or wheel F is located and adapted to make contact with the exterior plate *e* and force the interior plate *d* into contact with the main conductor B, whereby the current will be conveyed through the plates *d*, *e*, and their rivets *f*, to the trolley shoe or wheel F, and thence through the arm E and motor on the car.

- 10 By arranging the main conductor in a flexible envelope which is continuously closed at all points, moisture, &c., will be effectually excluded from the conductor, and by locating the devices for conveying the current, 15 beneath the conductor, said devices will be protected from internal injury.

Instead of electrically connecting the adjacent ends of the conducting strips *d* and also the adjacent ends of the strips *e*, I may 20 insulate the adjacent ends of the body of these strips so as to subdivide them into insulated sections as represented in Fig. 4, and by so doing insure a further safeguard against the escape of current.

- 25 By locating the contact strips below the main conductor as set forth, the contacts are retained normally out of engagement with the conductor by gravity and hence the envelope may be made wholly of thin flexible 30 insulating material or the upper portion may be made of rigid material and the lower portion only of flexible or yielding material.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a tube flexible on its under side, of an electrical conductor located within the tube and supported therein out of contact with the inner walls of the tube, and electrical contacts secured to the under side of the tube and adapted to be lifted into contact with the electrical conductor by an under running trolley, substantially as set forth.

2. The combination with a tube flexible on its under side, an electrical conductor located within the tube and a bracket extending through the tube and having the electrical conductor secured thereto, said bracket being also firmly secured to the tube, whereby it affords independent supports for the tube and conductor, of electrical contacts secured to the under side of the tube and adapted to be lifted into contact with the electrical conductor by an under running trolley, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

HENRY A. SEYMOUR.

Witnesses:

ELKANAH N. WATERS,
R. S. FERGUSON.