

(No Model.)

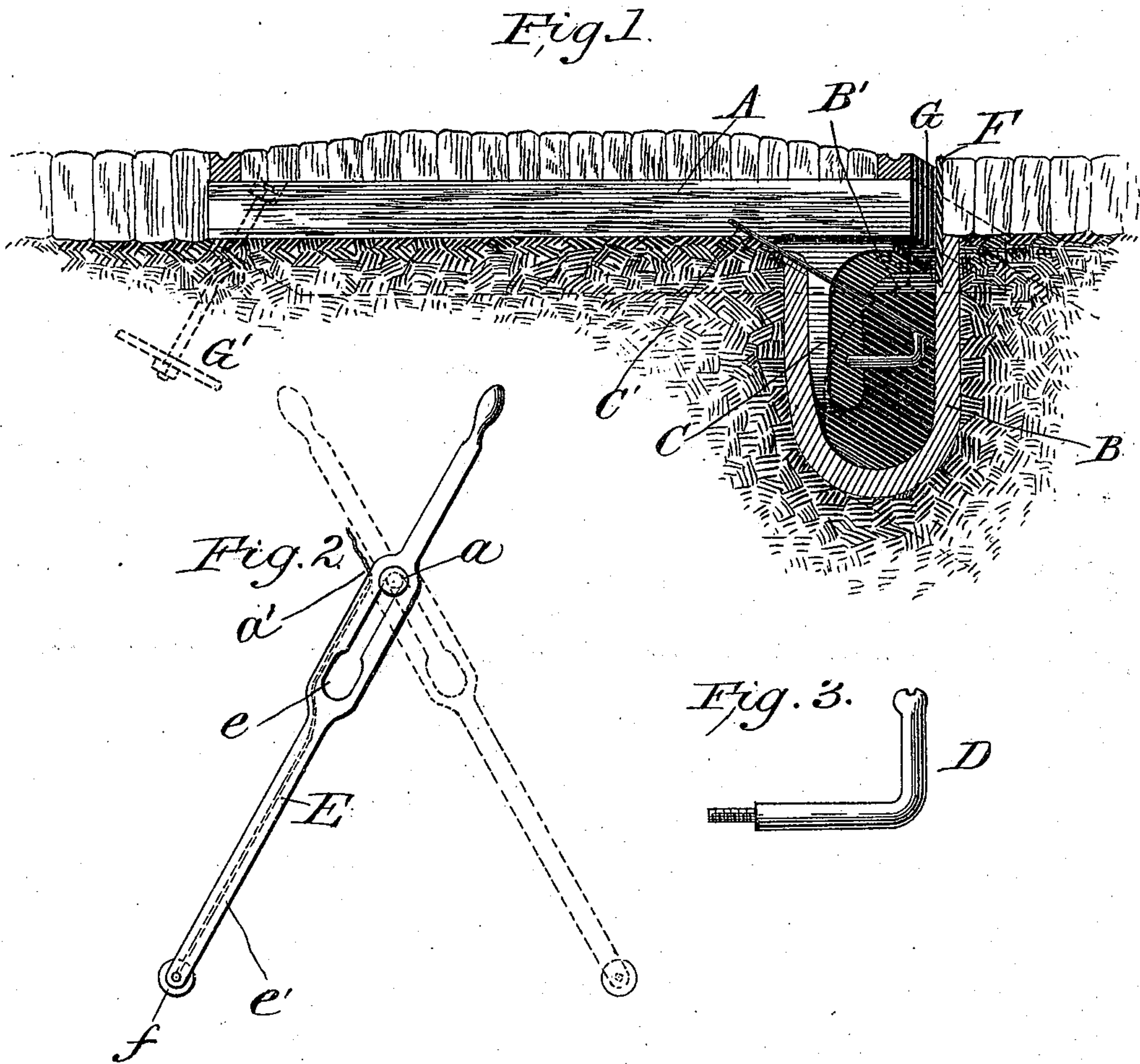
2 Sheets—Sheet 1.

I. LA R. JOHNSON.

SUBWAY FOR ELECTRIC RAILWAY CONDUCTORS.

No. 502,821.

Patented Aug. 8, 1893.



Witnesses  
E. J. Pitchard  
A. G. Heyman.

Inventor.  
I. La R. Johnson



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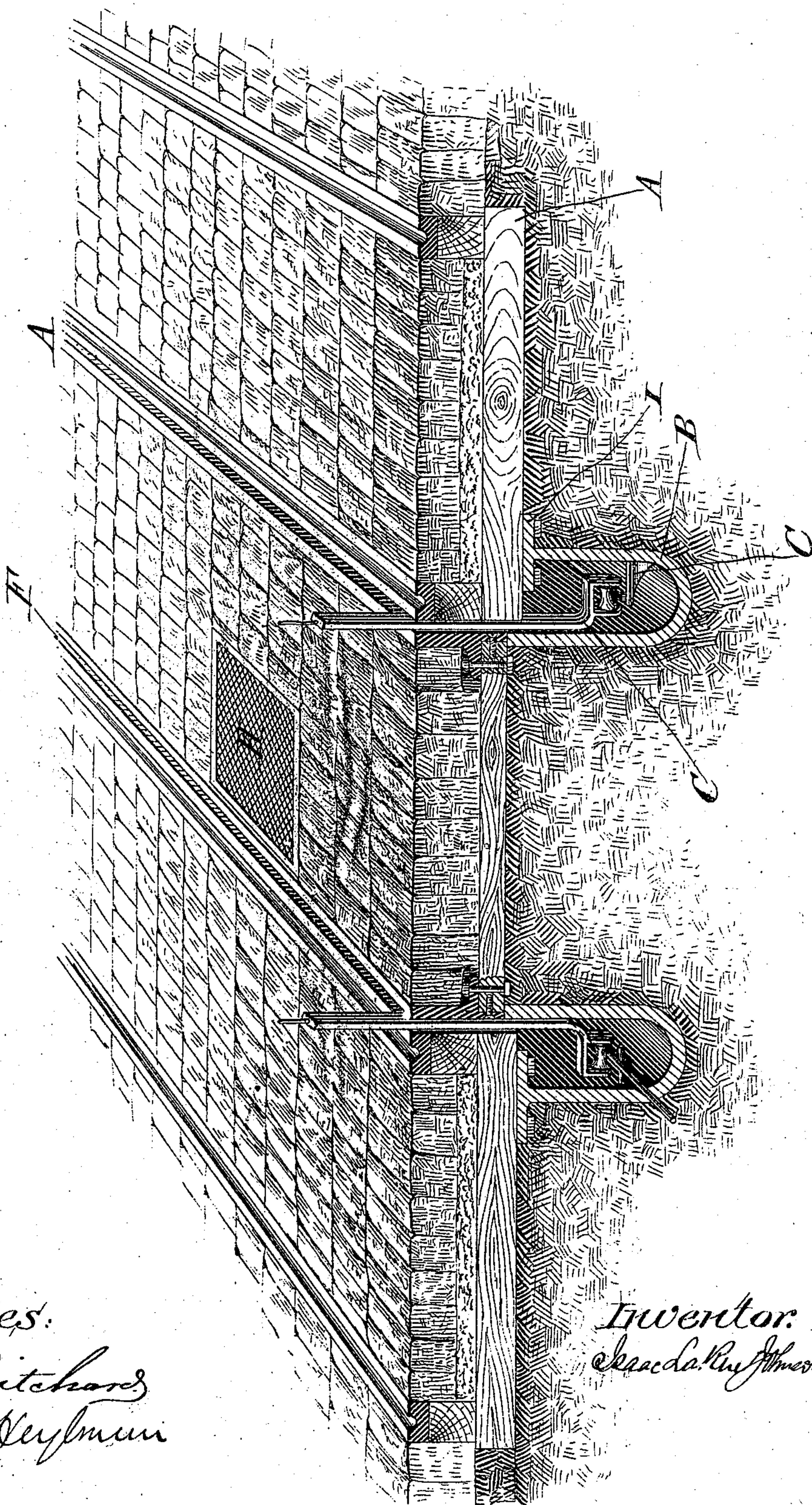
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Fig. A.



Witnesses:

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# UNITED STATES PATENT OFFICE.

ISAAC LA RUE JOHNSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

## SUBWAY FOR ELECTRIC-RAILWAY CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 502,821, dated August 8, 1893.

Application filed October 10, 1890. Renewed December 16, 1892. Serial No. 455,359. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC LA RUE JOHNSON, of Washington, in the District of Columbia, have invented a new and useful Improvement in Subways and Conduits for the Transmission of Power, for the Propulsion of Street-Cars More Particularly, of which the following is a specification.

The object of this invention is to provide a subway or conduit which will obviate the necessity of tearing up the road bed and track, and thus interrupt the travel of an established line of street railway, when it becomes necessary to convert the same into an electric road.

A further object is to simplify such subways and lessen the cost of constructing the same, and at the same time increase the efficiency; render the same compact, easy of access for clearing or repairs, and of the fewest parts possible consistent with strength, utility and reliability; all of which will be hereinafter more fully set forth.

Referring to the drawings which form a part of this application Figure 1 represents a sectional elevation of my improved subway or conduit, with an electrical conductor therein, supported by a bracket, which will be more fully herein described. Fig. 2 represents the trolley which is to be used in connection with my improved subway. Fig. 3 shows a bracket arm which supports the conductor, and Fig. 4 shows a sectional elevation of a modification of my improved subway.

In the drawings A, Fig. 1 represents a cross tie of the road way with which my improved subway is connected, B, the subway or conduit, C, the pendant for the support of the bracket D; F represents the guard plate which forms one of the walls of the trolley slot G, the opposite wall thereof being formed by the road rail adjacent thereto. The subway proper is semi-cylindrical in cross section, and has its walls extended in parallel planes to any desired height consistent with the requirements of the case, though it may be made very shallow. The ties have their ends on that side of the road, overhanging the subway, and at suitable intervals the pendants are attached to the sides thereof. In Fig. 1 they are shown as bolted to the tie and

at the same time partly embedded in the material of which the subway is composed. This is done for the purpose of securing greater solidity in the entire structure. This pendant may be of any suitable material, such as iron, wood, glass, rubber, or indurated fiber; the last being preferred as it possesses the requisites of non-conductivity, strength, lightness and durability. The bracket D may also be of any desirable form and material which will afford the best results in regard to non-conducting qualities, and other requisites, and upon this the conductor is to be secured in any approved manner.

The trolley E, which is shown in Fig. 2, consists, in this instance, of a lever having a longitudinal slot therein, by which it is pivoted to the car, as at *a*. This slot has an enlargement, which is shown at *e* by which the movement of the trolley may be the more easily controlled. At the lower contacting end of the trolley is located a pulley or roller *f*, which rests upon the conductor when the circuit is closed, and this communicates with a conductor *e'* located within the lower arm of the trolley, and is indicated in the drawings by dotted lines. This trolley must be of suitable insulating material, or have the conductor therein so insulated as to insure the transmission of the current uninterruptedly to the motor at or about the point indicated by the letter *a'*.

The guard plate F is designed to form, with the rail and stringer, the trolley slot. The cross ties and rails forming one side of the trolley slot will secure the subway or conduit from injury by heavily loaded wagons passing over or across it, and where electricity is the motive power the liability to short circuit the current is reduced to a minimum, the rail farthest from the subway or conduit being used for the return current.

The conduit may be made of any suitable material. In Fig. 1 it is shown as made of some plastic composition which may be molded and set or hardened within the trench.

In the modification shown in Fig. 4 some more durable material will be required for the conduit, such, for instance, as iron, as it will be provided with lugs I which are bolted to the under side of the cross tie or sleeper,



and these, in turn to the stringer. A sleeper is embedded between the two tracks, and to this the guard plate F is bolted so as to maintain it in the vertical position. Man-holes H are  
 5 provided at suitable intervals along the line in order that any dirt or other obstructions that may find entrance into the subway may be removed therefrom. The guard plate may be so secured in position as to be easily re-  
 10 moved therefrom, and thus enlarge the trolley slot and so admit of repairs being made to the interior of the conduit.

This conduit, it will be perceived, is designed to be located outside the tracks, and  
 15 not between them as has heretofore been the case. My reasons for adopting this arrangement are, that a smaller conduit than usual will be required, as a depth of from twelve to twenty-two inches will be ample, it is thought,  
 20 for operative purposes. In practice, should the conduit become disabled, the road can readily use horse cars while repairs are being made, and, in any event, repairs can be carried on without interrupting travel, and in  
 25 the conversion of horse roads, horses may be used up to the very last moment in which the changes are being made, all of which is a matter of great importance now, in view of the requirements of the service.

30 In order to prevent any vibration of the ties, they may have anchors connecting certain of them with the road bed, as shown in dotted lines at G'.

The inner wall of the subway B is reinforced in the manner indicated in dotted lines  
 35 at B' Fig. 1. This wall is carried up and over, and made heavier, so that that part which is beneath and between the ties will form a roof for the subway and a support for the  
 40 overhanging portion of the roadway.

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

1. In an electric railway, the rails, the subway, the ties having their ends overhanging  
 45 said subway, and the guard plate forming, with one of said rails, the trolley slot, substantially as described.

2. A subway for railways, located beneath one of the rails and supporting the same, and  
 50 having the ends of the ties overhanging said subway, and forming, with the rails thereon,

one side of the trolley slot, and a vertical guard plate which forms the opposite side thereof.

3. A subway for railways located beneath  
 55 one of the rails, and having the ties thereof overhanging said subway, the rail on that side, and a parallel guard plate forming the trolley slot, and having bracket pendants secured to the under side of the ties at de-  
 60 sired intervals for supporting the conductor brackets.

4. A subway for railways located beneath one of the rails thereof, cross ties having their ends overhanging said subway, a rail form-  
 65 ing one side of the trolley slot, and an adjustable guard plate the opposite side thereof, pendants secured to the under side of the ties within the subway, and brackets on said pendants for supporting a conductor.

5. A subway for railways located beneath one of the rails and contiguous thereto, ties overhanging the same, and forming with the rail thereon, one side of the slot, and having  
 75 a bracket supporting pendant bolted to the under side of the ties and secured to the conduit to give steadiness to the ties, and rails thereon.

6. A subway for railways, having one side edge thereof provided with longitudinal  
 80 flanges for attachment to the ties, the opposite side thereof prolonged and supporting a guard plate.

7. A trolley having a longitudinal pivot slot therein, and a longitudinal bore through  
 85 its lower arm to receive a conductor which communicates with a contacting pulley on its lower end and with the car motor, through an opening near the pivot slot.

8. A subway or conduit for railways, lo-  
 90 cated partly under one of the rails and outside of the tracks, and having the cross ties thereof overhanging said subway, said cross ties, together with the rail of said track and its support forming a covering for said sub-  
 95 way or conduit, and protecting the same from injury by heavily loaded wagons passing over or across it.

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Witnesses:

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