

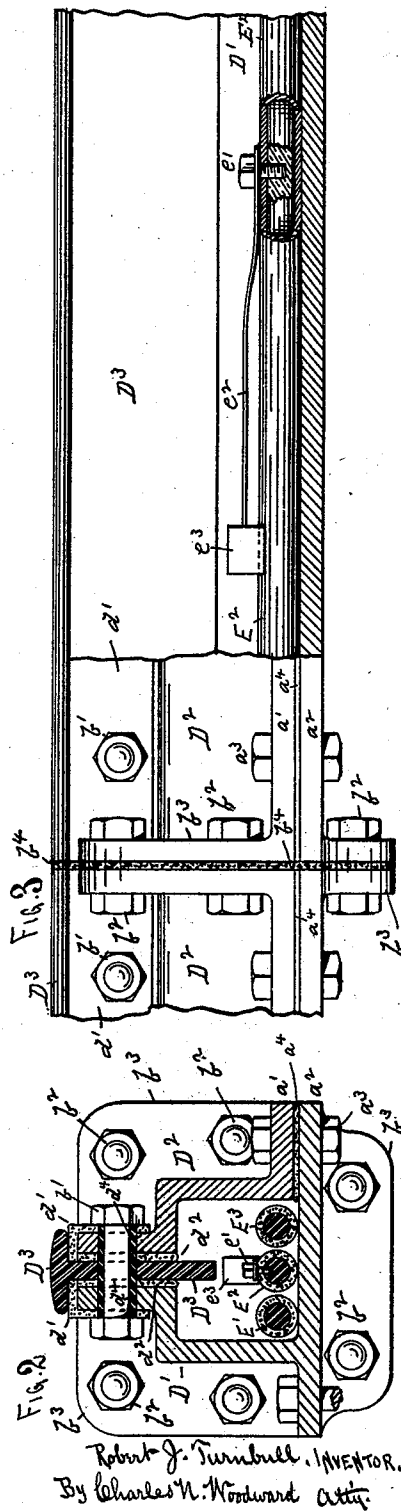
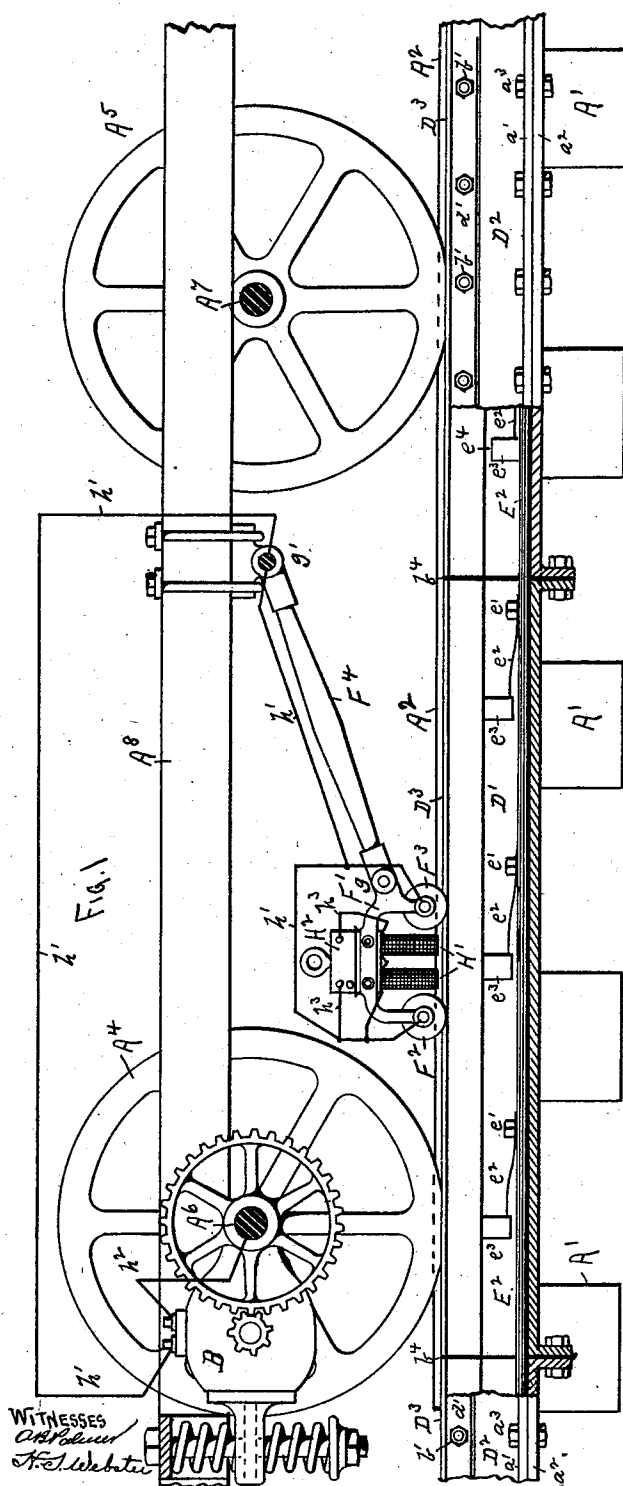
(No Model.)

2 Sheets—Sheet 1.

R. J. TURNBULL.
CLOSED CONDUIT FOR ELECTRIC RAILWAYS.

No. 531,664.

Patented Jan. 1, 1895.



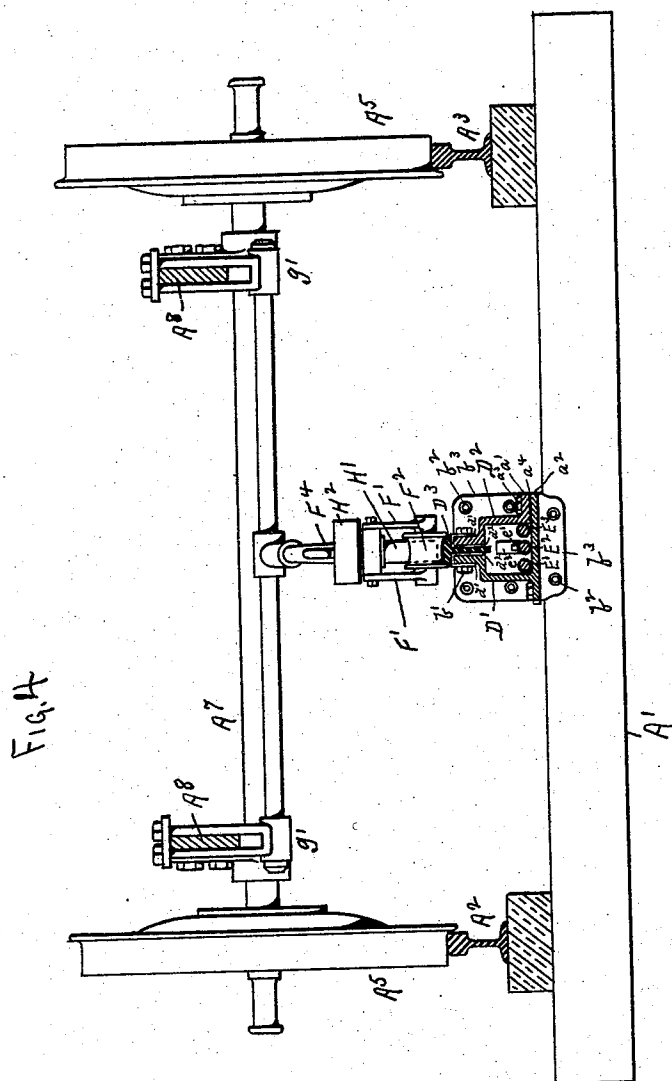
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WITNESSES.
A. B. Palmer
H. J. Webster.

Robert J. Turnbull, INVENTOR.
By Charles N. Woodward atty.

UNITED STATES PATENT OFFICE.

ROBERT J. TURNBULL, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF
TO AUGUSTUS F. PRIEST, OF SAME PLACE.

CLOSED CONDUIT FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 531,664, dated January 1, 1895.

Application filed January 19, 1894. Serial No. 497,399. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. TURNBULL, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Conduits for Electric Conductors, of which the following is a specification.

This invention relates to the transmission of electric currents, and conduits therefor, and consists in the construction and arrangement of parts as hereinafter shown and described, and specifically pointed out in the claims.

In the drawings,—Figure 1 is a sectional side elevation of a portion of a street car truck and its electrical connection and my improved conduit and transmission mechanism arranged in connection therewith. Fig. 2 is an enlarged cross section, and Fig. 3 is an enlarged sectional side elevation of the conduit and its connections. Fig. 4 is a cross sectional view of the parts shown in Fig. 1.

A' represents the ties on which the rails A² rest, (the upper edge only of one of the rails being shown in Fig. 1,) and A⁴ A⁵ are two of the flanged wheels running upon the rails and mounted upon the axles A⁶ A⁷. A⁸ represents a portion of the truck frame, and B represents the outline of an electric motor arranged to actuate one of the axles A⁶, all these parts being of the usual construction and arranged in the usual manner.

Resting across the ties, preferably between the rails, is a conduit formed of two main portions D' D² supporting a "T" rail D³ between them, as shown more clearly in Fig. 2, the two parts D' D² being formed with flanges a' a² along the lower edge on one side and united by bolts a³ at suitable intervals, and with a packing of rubber a⁴ or other suitable material to render the joint moisture proof. The "T" rail is held by bolts b', between the upper portions of the two parts D' D², as shown, the rail being insulated from the conduit by strips d' d² of vulcanite or other suitable material. The insulating strips d' are formed "L" shaped, the upper "leg" resting between the "head" of the "T" rail and the upper edges of the conduit, and the lower "leg" covering the outer surface of the conduit and

held in place by the bolts b', as shown, by which means the outer surface of the upper portion of the conduit is entirely covered and protected from any direct contact with the "T" rail, while at the same time no danger exists of a short circuit or "bridge" being formed between the "T" rail and conduit during rain or sleet storms. Non-conducting sleeves d⁴ encircle the bolts b' to more thoroughly insulate them from the conduit.

The "T" rails D³ and also the conduits, will be formed in sections preferably about six feet long, and united by bolts b² and flanges b³, with non-conducting and moisture proof packing b⁴ between the adjacent ends, as shown more clearly in Fig. 3.

The adjacent ends of the "T" rails will be placed a sufficient distance apart and with a sufficient thickness of insulating material between them to prevent the electric current passing from one section to the other. The "T" rail by this means is broken into sections so that a continuous electric current will not flow therethrough, and therefore become conductor rail sections.

The feed wires and other conductors E' E² E³ will be laid along the interior of the conduit, as shown, covered with the usual insulating wrapping or covering.

At suitable intervals the conductor from which the current is to be transmitted to actuate the motor B on the car, (which will preferably be the central one E³, as shown in Fig. 2,) is tapped by cap screws e', each cap screw being connected by a flexible connection e² to a contact block e³ resting upon or partially encircling the conductor wire, as shown.

The cap screw e', flexible connection e² and the block e³ are made of conducting material, so that the electric current from the conductor into which the cap screw is tapped will readily flow therethrough. These contact blocks are designed to be raised into contact with the under sides of the "T" rails D³, when the latter are electrically energized, and as many of the blocks may be arranged beneath each of the sections of the "T" rails as may be necessary to transmit the required current.

In the drawings three of the blocks are shown beneath each section of the "T" rails,

but a greater or lesser number may be employed as required.

The flexible connection e^2 is shown in the form of a wire or spring, but may be a section of small wire cable or other suitable substance which will not offer too great a resistance to the movement of the contact blocks.

Suspended in any suitable manner from beneath the truck frame of the car is a trolley frame F' carrying trolley wheels F^2 F^3 running upon the "T" rail D^3 , as shown. The trolley frame is shown connected by pivot joint g' to the truck frame by a trolley pole F^4 , but may be attached in any other suitable manner whereby the trolley wheels will be held in positive contact at all times with the conductor rail sections, and at the same time have sufficient flexibility to avoid being affected by the movement of the car. The trolley wheels will be connected electrically to the motor by wire h' in the usual manner as shown, while the latter will be connected by return wire h^2 to the axles of the car, in the usual manner.

Suspended from the trolley frame F' between the trolley wheels F^2 F^3 is an electro magnet H' having its poles in close relation to the conductor rail sections, so that when the trolley frame runs along over the conductor rail sections, the magnetic force of the electro magnet will transform each section D^3 of the conductor rail into an armature for the time being, and thus energize it electrically and cause it to attract the contact blocks e^3 and thus close a circuit between the conductor E^2 with which the contact blocks are connected and the conductor rail section, which is thence transmitted through the trolley wheels and wire to the motor.

The conductor rail sections D^3 will preferably be of brass. As soon as the electro magnet passes from over one of the conductor rail sections, the circuit will be broken and the contact blocks e^3 will drop back again to their normal condition, as shown at e^4 in Fig. 1, and thus likewise break the circuit between the conductor E^2 and the conductor rail section above. Thus that portion of the conductor rail only is electrically energized which is beneath the car and while the car is passing over it, and does not therefore become dangerous or a menace to persons or animals before or after the car passes. The short section which is beneath the car is protected by

the car, and will therefore never come in contact with any person, animal or substance which could be injured thereby.

While I have shown the electro magnet arranged between the trolley wheels and suspended from the same frame which supports the trolley wheels, it may be arranged if preferred, on a separate frame.

The electro magnet is shown connected into circuit with the conductor wires h' by "shunt" wires h^3 passing through a resistance coil H^2 , which is an operative arrangement, but may be wired and connected in any other suitable manner to accomplish the desired results.

With the form of winding shown only a small portion of the current would pass through, but sufficient for the purpose required.

The conduit must be moisture proof, and will therefore be amply protected by water proof paint or other suitable covering, or rendered moisture proof in any other suitable manner.

Having thus described my invention, what I claim as new is—

1. A conduit formed in two parts adapted to be united longitudinally, a conductor rail formed in sections and held between the parts of said conduit and projecting downward into the interior thereof, and extending above its upper surface, substantially as and for the purpose set forth.

2. A conduit formed in two parts adapted to be united longitudinally, a conductor rail formed in sections and held between the parts of said conduit and projecting downward into the interior thereof and extending above its upper surface, and moisture proof insulator strips interposed between said conductor rail sections and conduit and overlapping the upper portion of said conduit, whereby means are provided for conducting moisture away from said conductor rail sections and insulating the conductor rail sections from the conduit, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ROBERT J. TURNBULL.

Witnesses:

C. N. WOODWARD,
H. S. WEBSTER.