

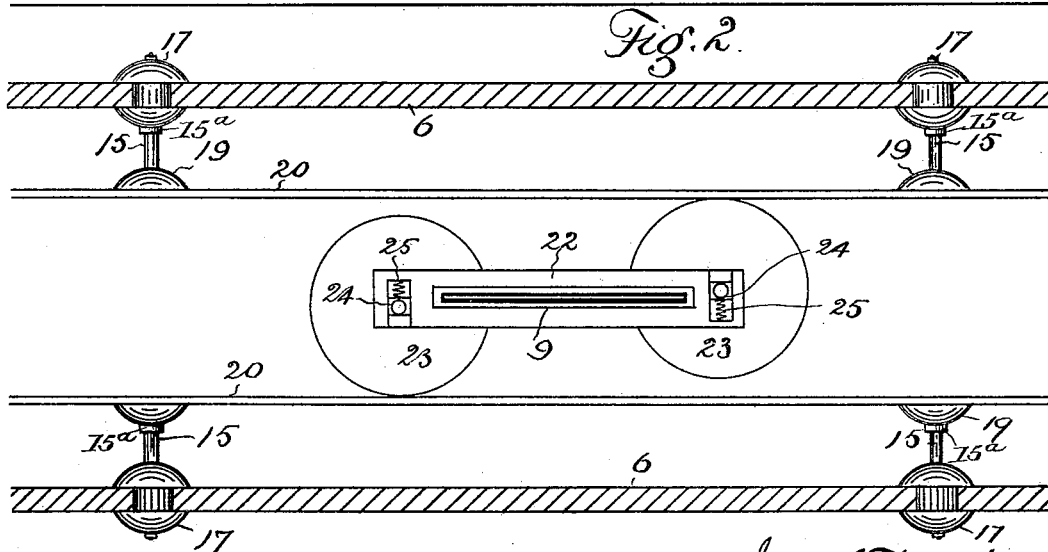
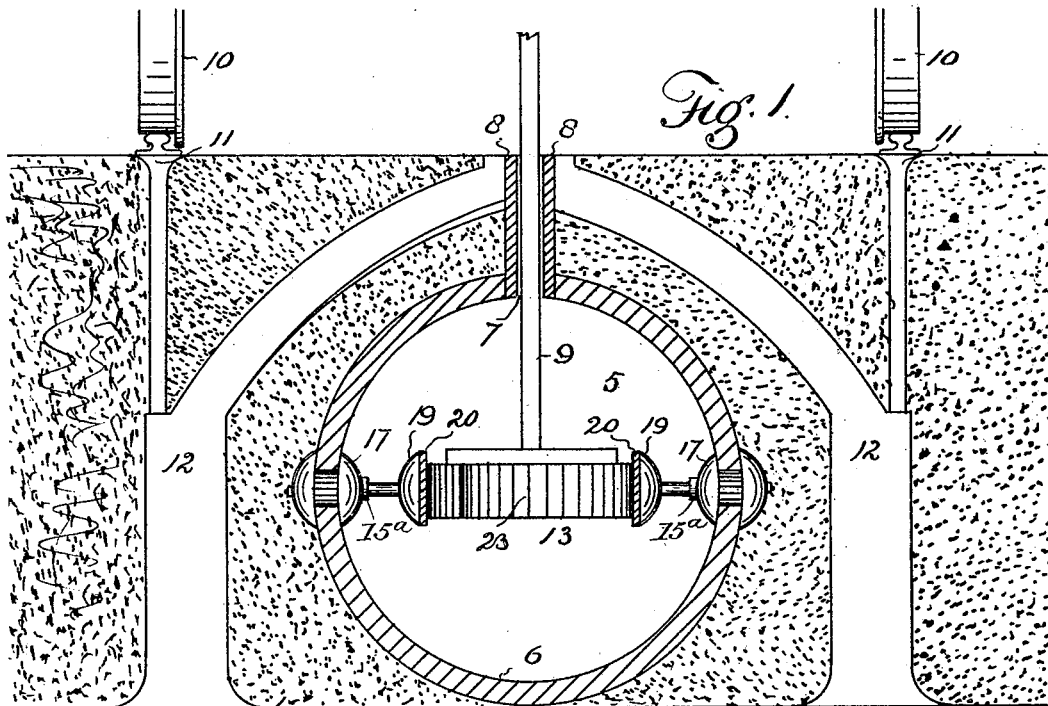
(No Model.)

2 Sheets—Sheet 1.

J. DAVIS & R. M. HUNTINGTON.  
ELECTRIC RAILWAY CONDUIT AND CONTACT.

No. 493,618.

Patented Mar. 14, 1893.



Witnesses  
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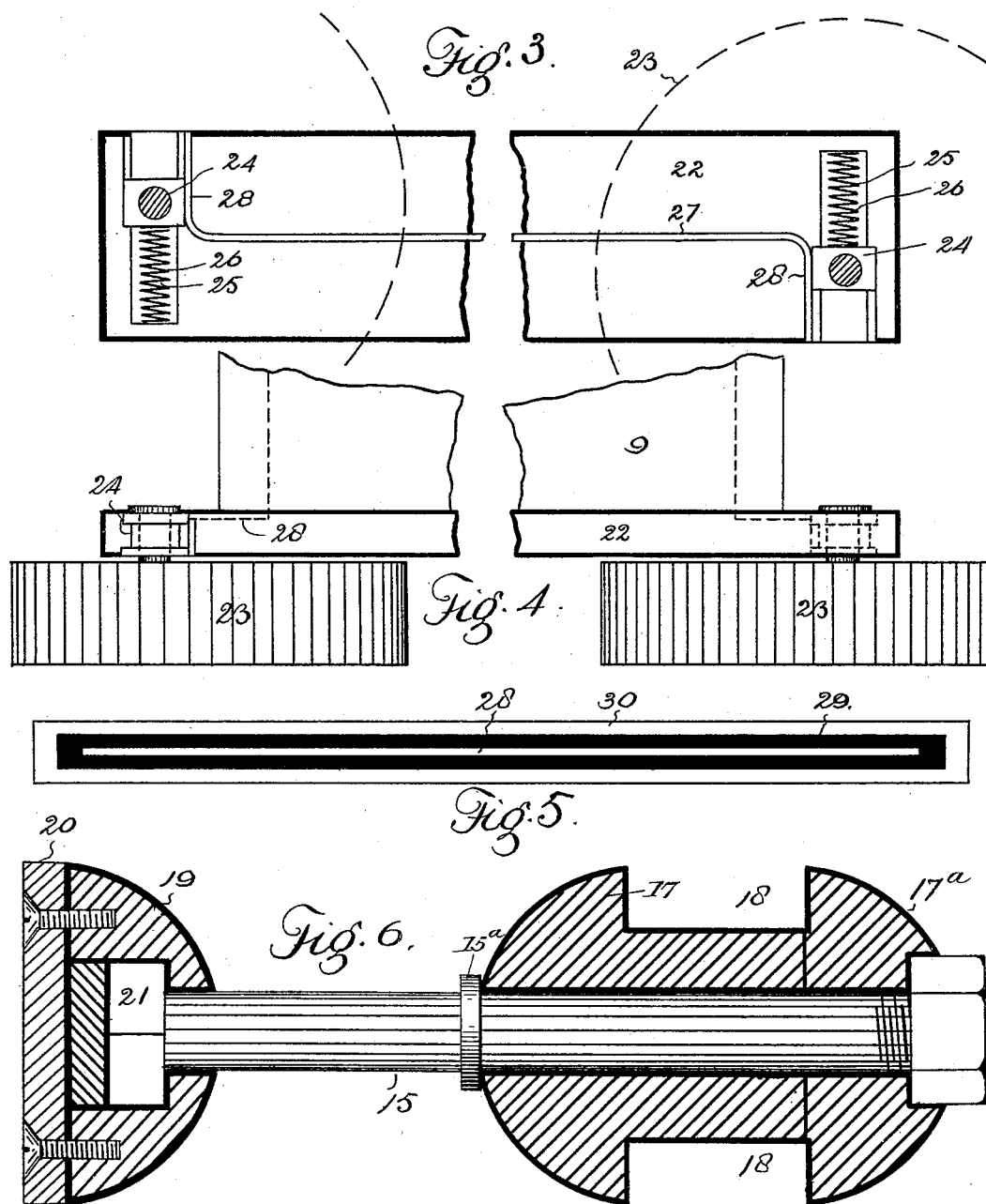
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# UNITED STATES PATENT OFFICE.

JOEL DAVIS AND REUBEN M. HUNTINGTON, OF DENVER, COLORADO.

## ELECTRIC-RAILWAY CONDUIT AND CONTACT.

SPECIFICATION forming part of Letters Patent No. 493,618, dated March 14, 1893.

Application filed October 2, 1891. Serial No. 407,492. (No model.)

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

Be it known that we, JOEL DAVIS and REUBEN M. HUNTINGTON, citizens of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Electrical Railroad Systems; and we do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in electrical railroad systems of the class having an underground conduit in which is supported a gatherer carried by the car the motors being connected in multiple arc with the supply conductor.

The same conduit now employed in cable railroad systems may be utilized for the purpose of our improved electrical systems and where the cable as a motive power, is being abandoned and electricity substituted our improved system can be constructed at small cost. Hence our system has been designed with special reference to the utilization of abandoned cable road conduits, the object of the invention being to provide a road wherein all overhead wires and exposed or live contacts shall be avoided and in which the main conducting wires or plates shall be thoroughly insulated from all surrounding objects except the gatherer carried by the car, and so supported within the conduit as to be entirely removed from any water that may find its way thereinto.

A further object of the invention is to furnish a system of simple and economical construction, reliable, durable, and thoroughly practicable in use.

The invention will be thoroughly understood by reference to the accompanying drawings in connection with the description hereinafter given.

In the drawings, Figure 1 is a vertical section taken through the conduit showing the gatherer carried by the car, in place. Fig. 2 is a horizontal longitudinal section taken

through the center of the conduit. Fig. 3 is an enlarged underneath view of the gatherer with the wheels or disks removed, their location being indicated by dotted lines. Fig. 4 is a side view of the same showing the disks in place. Fig. 5 is a top view on an enlarged scale of the bar supporting the gatherer and carrying the current therefrom to the motor on the car. The object of this view is to illustrate the manner of insulating this vertical conductor. Fig. 6 is an enlarged horizontal section showing the manner of supporting the conducting plates within the conduit, also the manner of insulating the same therefrom.

In the views, similar reference characters indicating corresponding parts or elements of the mechanism, let the numeral 10 designate the wheels of a car, the body portion of which is not shown. The rails engaged by the wheels are supported upon the plates 11, which in turn rest upon suitable shoulders formed upon the yokes 12, located at intervals as in cable track construction. Within these yokes is located the conduit 5 having concrete or other suitable walls 6, and provided with a longitudinal slot 7 extending upward to the surface and inclosed by metal plates 8, between which the supporting arm 9 of the gatherer 13 moves as the car is passing.

To the walls 6 of the conduit and located about half way between the top and bottom are secured the horizontal projecting bars 15. These bars are in the form of bolts passing through the sides of the walls 6 from which they are separated by divided insulating blocks having side recesses 18 into which dip the walls of the conduit. These insulating blocks consist of a body portion 17 and an outer cap 17<sup>a</sup>, adapted to slip over the outer extremity of the bolt which is provided with a shoulder 15<sup>a</sup> engaging the inner extremity of said body part.

To the inner extremities of bars 15 are secured insulating blocks 19 to which are bolted or otherwise suitably secured the copper plates 20. The object of insulating both extremities of bars 15 is to form a double safeguard against any leakage of the current there-through from the conducting plates. The inner extremity of bar 15 is provided with a head 21 which is secured within a suitable re-

cess formed in block 19. Another insulating plate is then placed in contact with head 21 filling the recess. The conducting plates are then secured to blocks 19 as before stated.

5 Plates 20 form in effect a single conductor divided into two parts, one on either side of the conduit, the current being carried from a suitable source of electricity and after passing through the conducting plates, the circuit is

10 completed *via* the ground in the ordinary manner.

The current gatherer 13 consists of an insulating plate 22 to which are movably journaled the rotating contact disks 23 by the use

15 of the horizontally sliding spring-actuated boxes 24. The springs 25 engaging these boxes are located within recesses 26 formed in plates 22 and hold the peripheries of the disks 23, which are two in number in contact at

20 all times with the plates on opposite sides of the conduit each disk engaging a plate, making the two plates in effect a single conductor. It will thus be seen that the two springs 26, while exactly alike are oppositely disposed

25 and have a tendency to move their respective blocks 24 together with the wheels 23 in opposite directions. The disks 23 and boxes 24 form good conductors of the current which passes from plates 20 through them to a con-

30 ductor 27 provided with bent extremities 28 which are continuously in contact with boxes 24 respectively. Conductor 27 leads to the central conducting plate 28 of the vertical bar 9, the current passing therethrough to the

35 motor on the car. Plate 28 is surrounded by a sheath 29 of insulating material, said sheath being in turn protected by a suitable metallic covering 30 in order to give the bar proper strength and durability. Bar 9 being prop-

40 erly secured to the car and connected with the motor thereon, the current passes from plates 20 through disks 23 and their journals, boxes 24, conductors 27 and 28 to the motor, making the return in the usual manner as before

45 stated.

Having thus described our invention, what we claim is—

1. In an electrical railroad system the combination of the underground conduit having two-part insulating blocks provided with re- 50 cesses into which the walls of the conduit dip on opposite sides, bolts passing through said blocks and carrying other insulating blocks at their inner extremities, the longitudinally divided conductor having its parts attached 55 to the insulating blocks carried by the bolts, the gatherer carried by the car and provided at its lower extremity with a slotted plate, movable spring actuated boxes located in said slots and carrying rotatable disks engaging 60 the side conductors, from which the current passes to the motor on the car through the medium of the disks, journal boxes and conducting plate of the gatherer, substantially as described. 65

2. In an electrical railroad system the combination of the underground conduit having the two part insulating blocks recessed to receive the walls of the conduit, a block being located on each side, bolts passing through 70 said blocks, the longitudinally divided conductor having its parts attached to the extremities of the bolts but insulated therefrom, the gatherer carried by the car, and provided at its lower extremity with a slotted plate, 75 movable spring actuated boxes located in said slots and carrying rotatable disks engaging the side conductors, from which the current passes to the motor on the car through the medium of the disks, journal boxes and conduct- 80 ing plate of the gatherer, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOEL DAVIS.

REUBEN M. HUNTINGTON.

Witnesses:

WM. McCONNELL,

C. J. ROLLANDET.