

No. 611,821.

Patented Oct. 4, 1898.

J. H. ROBERTSON.  
ELECTRIC RAILWAY CONDUIT AND TROLLEY.

(Application filed Oct. 20, 1896.)

(No Model.)

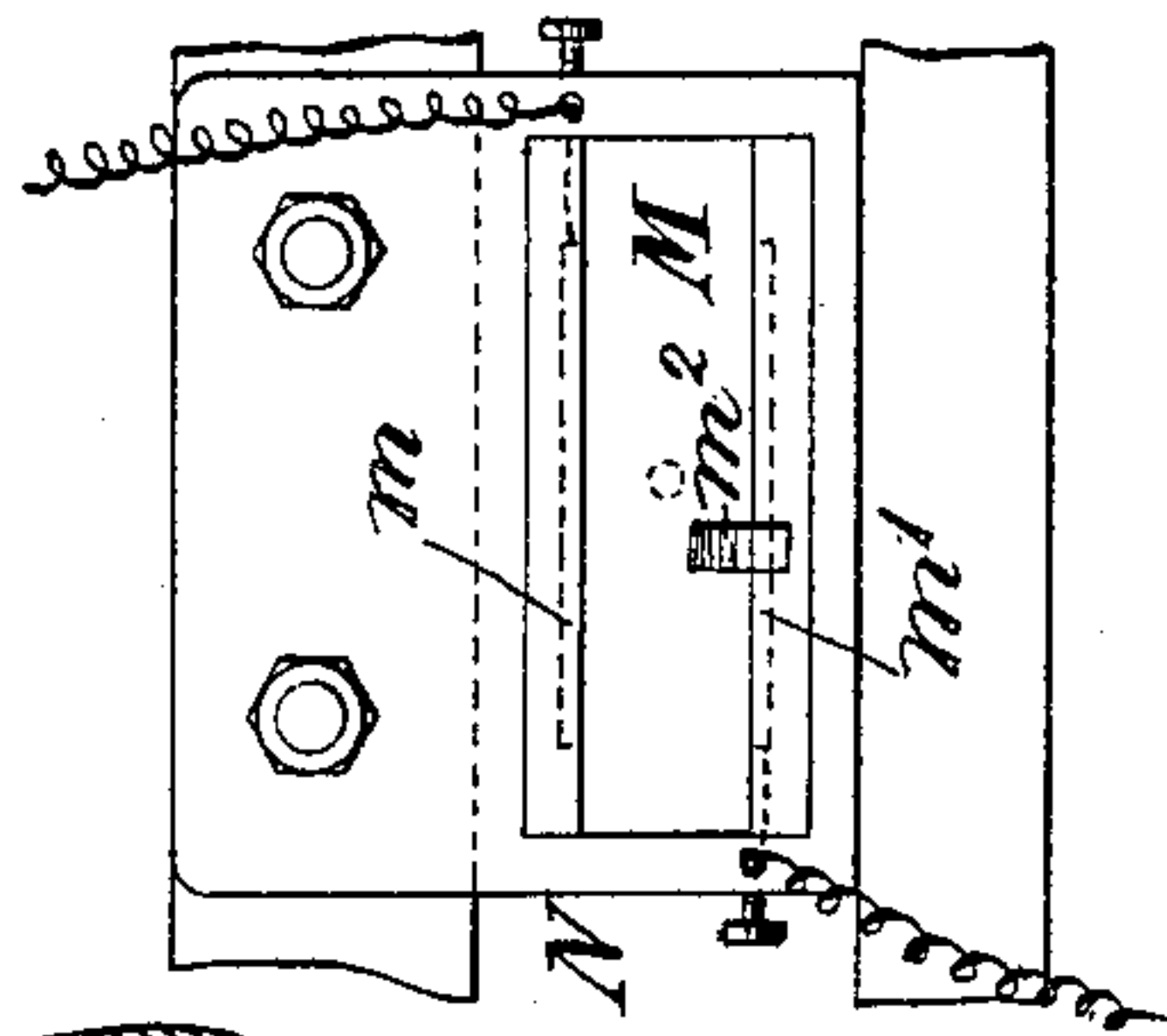


Fig. 2.

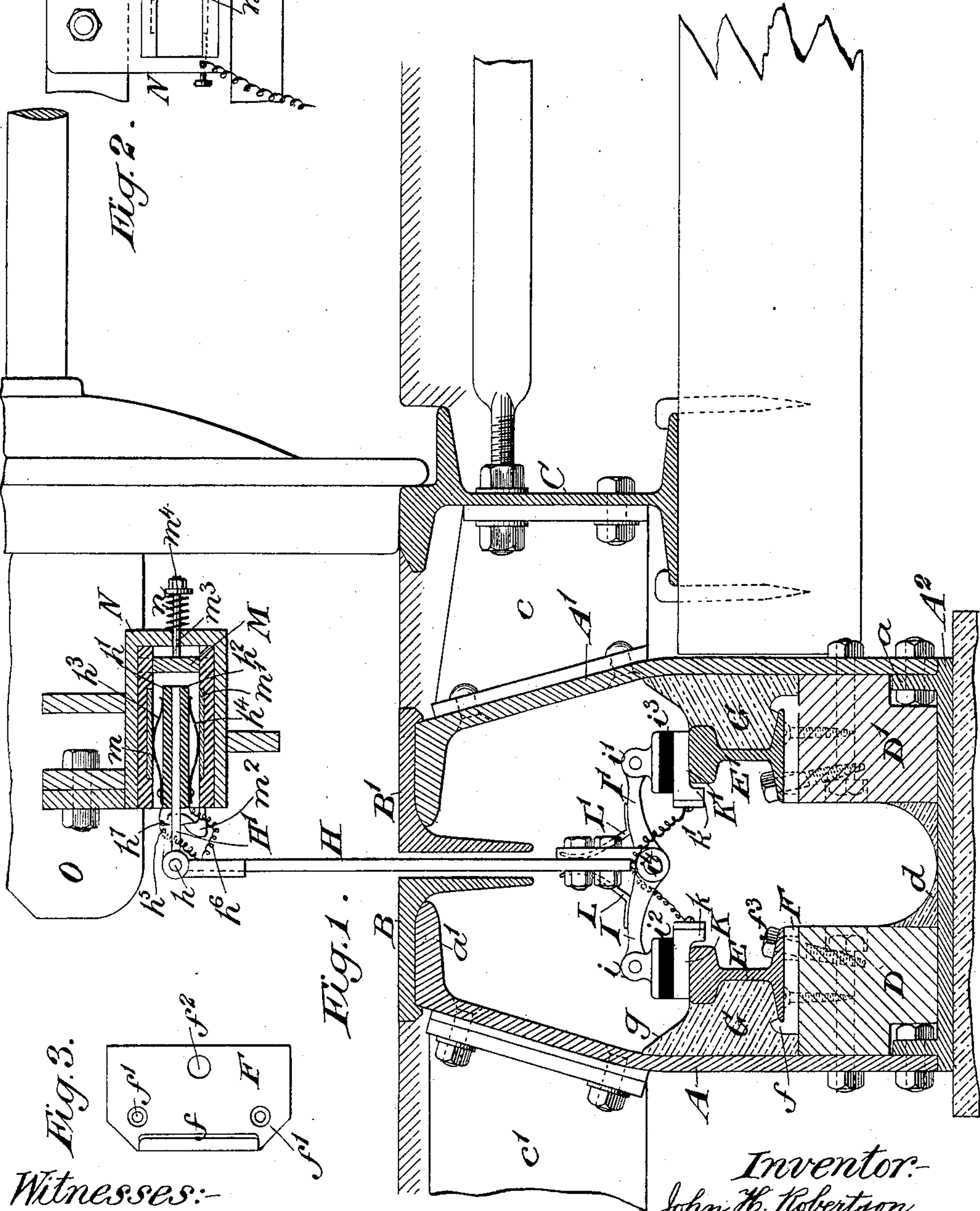
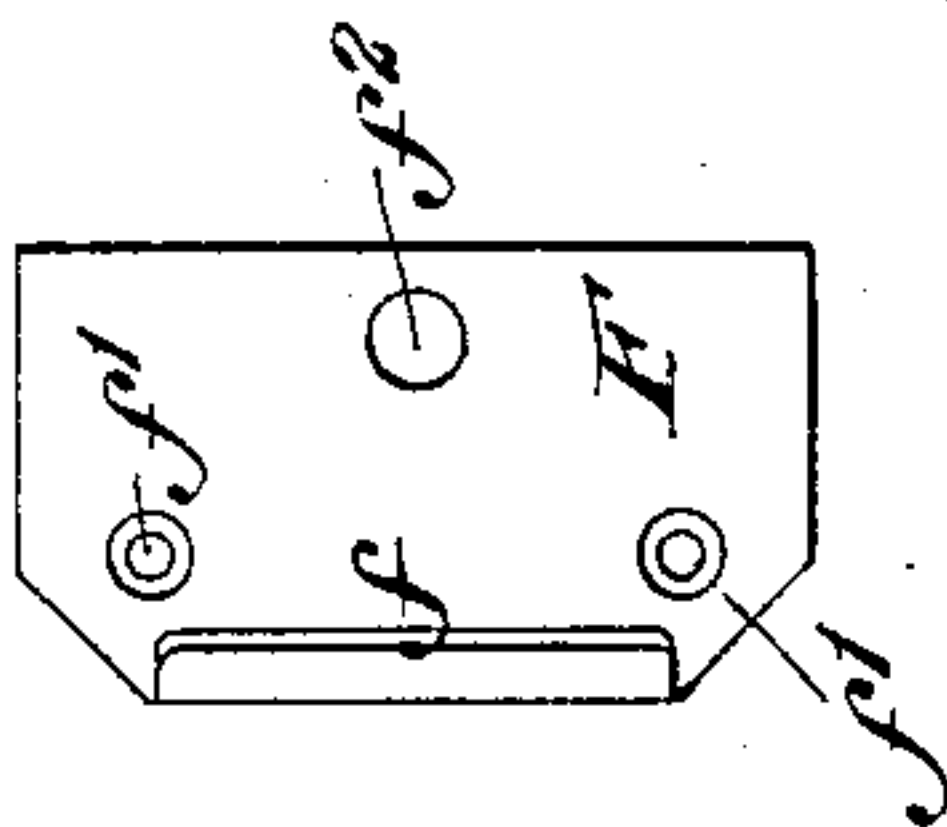


Fig. 1.

Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## ELECTRIC-RAILWAY CONDUIT AND TROLLEY.

SPECIFICATION forming part of Letters Patent No. 611,821, dated October 4, 1898.

Application filed October 20, 1896. Serial No. 609,415. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. ROBERTSON, of the city and county of New York, in the State of New York, have invented a new and useful  
5 Improvement in Electric-Railway Conduits and Trolleys, of which the following is a specification.

My invention relates to an improvement in electric-railway conduits and trolleys in  
10 which the conduit is provided with a pair of tracks along which the trolley-shoes are arranged to slide for forming the connection through the car-motor with the positive and negative poles of the source of power.

15 The conduit is shown in the present instance at the side of the track, it being understood that in case of a double track there will be two such conduits located side by side intermediate of the two tracks to accommodate  
20 cars moving in opposite directions.

In the accompanying drawings, Figure 1 is a transverse section through the conduit and a portion of the track adjacent thereto, showing the location of the electrical conductors  
25 within the conduit and the position which the trolley occupies relative thereto and also showing a portion of a car and the connection of the trolley therewith. Fig. 2 represents a view in elevation, looking toward the side of  
30 the car, of the box which serves to receive the upper joint of the trolley-arm; and Fig. 3 is a plan view, in detail, of one of the plates by means of which the electrical conductors within the conduit are secured to their non-  
35 conducting supports.

The side walls of the conduit are denoted by  $A A'$ , and they are connected at their lower edges by a base-plate  $A^2$ , provided with upwardly-extending lugs or flanges  $a$ , through  
40 which the sides  $A A'$  are bolted to the base-plate. The upper edges of the sides  $A A'$  are turned inwardly, as shown at  $a'$ , forming seats for the slot-irons  $B B'$ , and the sides  $A A'$  are connected, one of them—in the present  
45 instance  $A'$ —with the adjacent rail  $C$  of the track by a deep tie-plate  $c$ , and the other—in the present instance  $A$ —is connected by a similar deep tie-plate  $c'$  with an adjacent side of a companion conduit. (Not shown.)

50 Within the conduit, at its base, are firmly fixed suitable non-conducting supports (in the

present instance wooden supports  $D D'$ ) for supporting the electric conductors  $E E'$ . The conductors  $E E'$  are formed in the shape of  
55  $T$ -rails, commonly used in connection with railway-tracks, and are fixed to the supports  $D D'$  by means of interposed plates  $F$ , located at suitable intervals along the upper sides of the supports  $D D'$  and provided at one edge (in the present instance the outer edge) with  
60 an undercut lip  $f$  for receiving one edge of the base of the conductor  $E$  or  $E'$  and further provided with smaller perforations  $f'$  for fastening the plate itself to the supports  $D D'$  and with a larger perforation  $f^2$  for the recep-  
65 tion of a heavy spike or screw  $f^3$ , the head of which is intended to overlap the opposite edge of the base of the conductor  $E$  or  $E'$  and extend through the plate  $F$  into the supports  $D D'$ . The supports  $D D'$  are spaced apart, so  
70 as to bring the conductors  $E E'$ , supported thereon, to the right and left of the opening between the slot-irons  $B B'$ , and said space between the supports  $D D'$  has its base preferably made of rounded conformation, as  
75 shown at  $d$ , to prevent the accumulation of dust or snow in the corners. The space between the conductors  $E E'$  and the sides  $A A'$  of the conduit is filled in solidly with cement  
80  $G$ , the upper surface of the cement being so formed as to have a downward pitch from the interior of the sides  $A A'$  to the outer edge of the top of the conductors  $E E'$ , as shown  
85 at  $g$ . Such filling in of the space between the rails and the walls of the conduit and the pitch of the upper surface of the cement, as well as the groove at the bottom of the space  
90 between the supports  $D D'$ , admit of sweeping the conduit entirely free from foreign material which would tend to obstruct or interfere with the electrical contact between the  
95 trolley-shoes and the conductors  $E E'$ . The trolley-arm is jointed at  $h$ , the depending joint or section  $H$  being adapted to extend down through the opening between the slot-irons  $B B'$ , and carries at its lower end a pair  
100 of vertically-swinging arms  $I I'$ , pivoted at  $i^4$  and having suspended from their free ends the contact-shoes  $K K'$ . The shoes  $K K'$  are spaced from the hangers  $i i'$  by interposed insulating material  $i^2 i^3$  and have their adjacent edges provided with downwardly-extended



flanges  $k$   $k'$  for preventing them from slipping outwardly beyond the faces of the conductors E E'.

The hangers  $i$   $i'$  are pivoted to the free ends of their supporting-arms I I' to enable the shoes to accommodate themselves readily to any slight variations which may occur in the distances between the conductors E E', and the arms I I' are held yieldingly depressed by means of bar or plate springs L L', fixed to the arms I I' at one end and having their free ends engaged with the joint or section H of the trolley-arm.

The upper joint or section H' of the trolley-arm occupies a normally horizontal position and carries upon its outer and lower sides insulating-plates  $h'$   $h^2$ , to the opposite faces of which are secured yielding contact-pieces  $h^3$   $h^4$  in electrical contact with the wires  $h^5$   $h^6$ , leading to the shoes K K', one to each.

The section H', with its insulating-plates and yielding contact-pieces, is arranged to be received within an inner reciprocating box-frame M of suitable insulating material, provided with electric conducting-plates  $m$   $m'$ , located in its opposite faces in position to engage the contact-pieces  $h^3$   $h^4$ , carried by the trolley-section H'. The trolley-section H' is removably locked in the frame M by means of a latch  $h^7$ , carried by the trolley-arm in position to engage a catch  $m^2$ , fixed to the edge of the frame M. The frame M is held within an open front box N, fixed to a suitable support O at the side of the car. The frame M is connected with the box N to slide to a limited extent by means of a pin or rod  $m^3$ , fixed to the back of the frame M and extending through the back of the box N, where it is provided with a retracting-spring  $n$ , inserted between the back of the box N and a collar  $m^4$  on the pin.

The location of the shoes K K' and the manner in which they are attached to the trolley-arm and prevented from slipping outwardly on the conductors E E' also tend to center the depending section H of the trolley-arm in the slot and prevent it from becoming cut out by frictional contact with the sides of the slot, and also prevent it from becoming cramped within the slot.

What I claim is—

1. A conduit provided with electric conductors in the form of track-rails having their upper surfaces exposed for the reception of conducting-shoes, insulating-supports located

beneath the conductors, plates for securing the conductors to their insulating-supports at intervals, and cement fillings interposed between the conducting-rails and the sides of the cement fillings being inclined downwardly and inwardly from the sides of the conduit to the upper surfaces of the conductors, substantially as set forth.

2. The combination with a conduit provided with conductors spaced apart therein and a trolley-arm arranged to travel along the slot leading to the interior of the conduit, of a pair of arms pivoted to and extending in opposite directions from the trolley-arm, hangers pivotally secured to the ends of said pivoted arms, contact-shoes insulated from said hangers and adapted to travel along the conductors within the conduit and means for connecting the trolley-arm to a car, substantially as set forth.

3. The combination with a jointed trolley-arm, one section of which is adapted to travel along a slot leading to the interior of the conduit, of yielding contact-pieces carried by another section of the arm, contact-plates carried by the car for engaging said contact-pieces and means for removably connecting said arm-section with the car with its contact-pieces in engagement with the plates carried by the car, substantially as set forth.

4. The combination with the trolley-arm provided with a latch and a box-frame carried by the car and provided with a catch for engaging and disengaging the latch to lock the trolley-arm to and release it from the car, of contact-pieces carried by the trolley-arm, contact-plates carried by the car and means for yieldingly connecting the said contact-plates with the car to permit a shifting movement to accommodate the trolley-arm to the lateral movements of the car, substantially as set forth.

5. The combination with a box fixed to a car and a box-frame having a laterally-yielding connection with said box and provided with contact-plates, of a trolley-arm provided with yielding contact-pieces and means for removably connecting the trolley-arm with said yielding box-frame, substantially as set forth.

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Witnesses:

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