

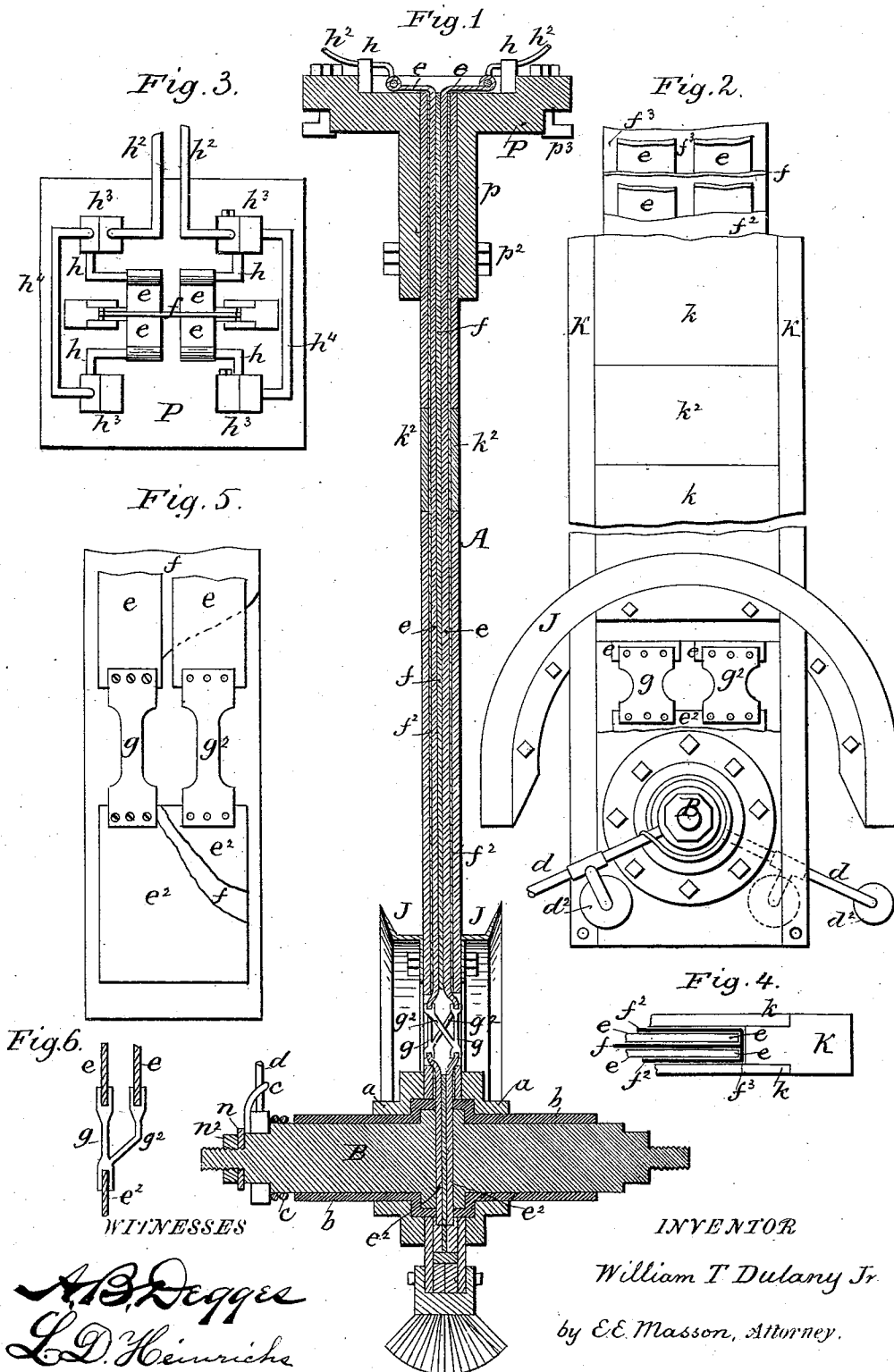
(No Model.)

2 Sheets—Sheet 1.

W. T. DULANY, Jr.
CONDUIT ELECTRIC RAILWAY.

No. 532,449.

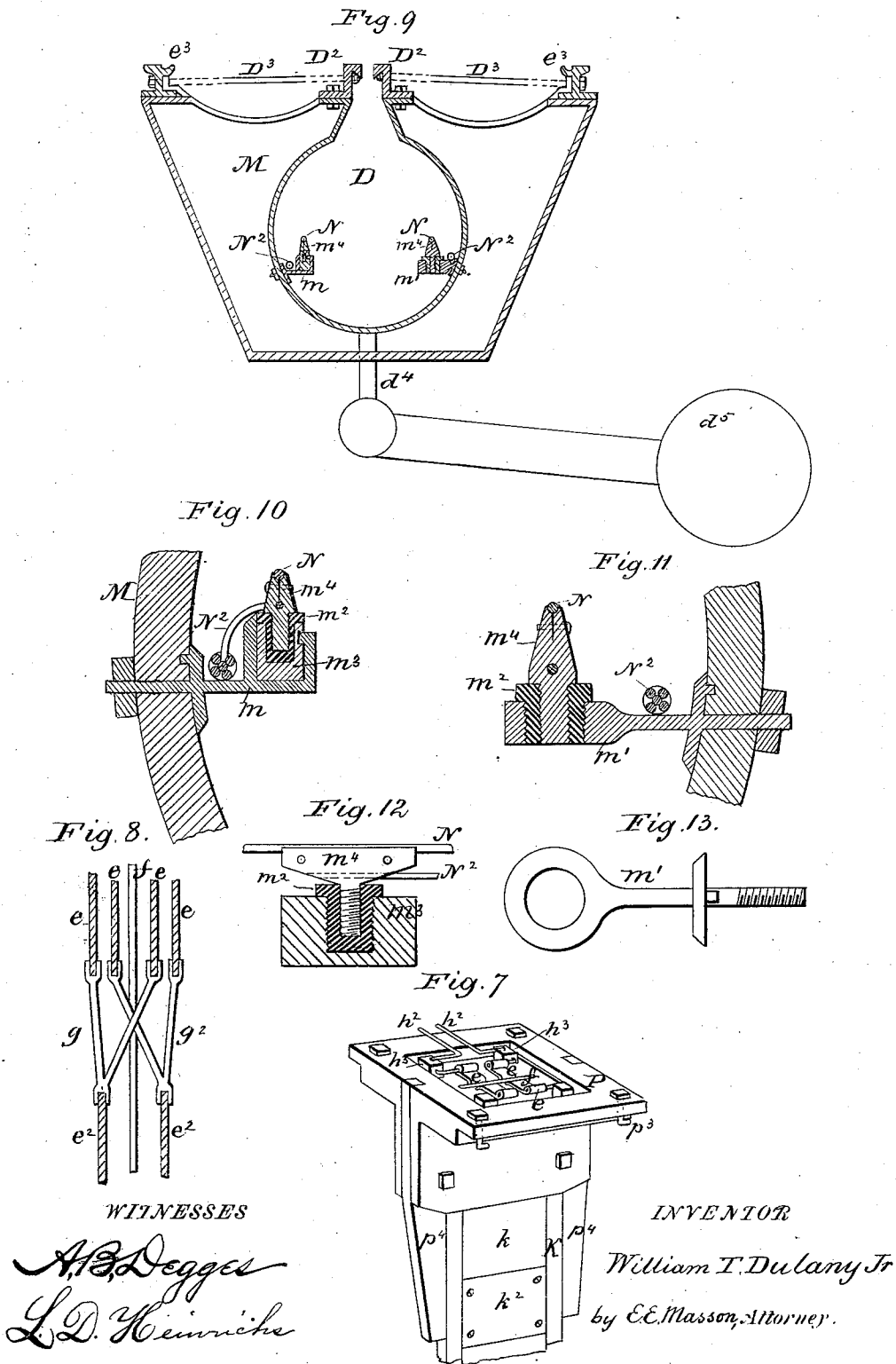
Patented Jan. 15, 1895.



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UNITED STATES PATENT OFFICE.

WILLIAM T. DULANY, JR., OF NEW YORK, ASSIGNOR OF ONE-HALF TO OSCAR F. SHAW, OF BROOKLYN, NEW YORK.

CONDUIT ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 532,449, dated January 15, 1895.

Application filed August 16, 1894. Serial No. 620,503. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. DULANY, Jr., a citizen of the United States, residing at New York city, in the county of New York, State of New York, have invented certain new and useful Improvements in Electric-Railway-System Conduits, of which the following is a specification, reference being had therein to the accompanying drawings.

The objects of my improvements are to provide in connection with two conductors or trolley wires placed within a conduit and insulated therefrom, a trolley standard containing within the wearing plates, flat metal plate conductors made in series with fuse blocks or cut outs above and also under the points of contact of the standard with the slot of the conduit, so that if the wearing plate on one side of the standard becomes cut or worn through while a car carrying the standard makes one of its trips, the plate conductors on the opposite side will continue to transmit power to the motor of said car.

Another object is to provide a cross fuse connection between the conductors of the standard to connect them so that if the wearing plate on either side of the standard becomes worn through or "short circuited" that the said cross fuse connection becomes operative and supplies the necessary current to operate the car motors by crossing the current from right to left in the conductor plates and vice versa.

Another object in making the cross-fuse connection between the conductor plates is to supply four paths for the current to travel, in case of accidents to the standard before reaching switches for the car, namely, up both sides of standard if no fuses are "burned out," up standard from right to left through cross fuse g^2 if the section fuse g on left side below the wearing plate and the corresponding upper fuse h on the right side of the head block P of the standard are "burned" and vice versa.

Another object is to divide the conduit system into sections; said sections being connected to their respective feeder conductors, and said feeders are connected at their switch board terminals in such manner as to form a metallic circuit.

I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is transverse vertical section of a trolley standard constructed in accordance with my invention, said standard having only one of the trolley arms mounted thereon. Fig. 2 is a side view of the lower portion of the trolley standard broken away at the top to show the position of the four conductor plates and their insulators. Fig. 3 is a top view of the standard showing the means for connecting the conductor plates e with their respective fuses h , and fuse terminals h^3 and from the latter through the wires h^2 to the motor, and also the wires h^4 through which the fuse terminals are connected together. Fig. 4 is a top view of the front (or rear) bar of the standard with portions of the side plates and insulated conductors. Fig. 5 is a front view of the lower portion of the series of plates constituting the conductors with the fuse blocks connecting the upper conductors e with the bottom conductors e^2 . Fig. 6 is a transverse vertical section of the plate conductors e and e^2 with their connecting fuse blocks for crossing the electric current from the lower to the upper plate conductors if one of the fuses in the standard is burned out. Fig. 7 is a perspective view of the head block of the standard showing tongues p^4 pendent therefrom on the front and rear of the standard, to protect it on the level of the slot of the track conduit. Fig. 8 is a transverse vertical section of the plate conductors nearly similar to that shown in Fig. 6 but showing all the plate conductors and their fuse blocks. Fig. 9 is a transverse vertical section of the track and conduit showing the two trolley wire conductors within said conduit and the feeder cables of the conductors. Figs. 10 and 11 are transverse vertical sections on a larger scale of portions of the conduit with the conductor supporting bracket attached thereto. Fig. 12 is a side view of the conductor clamp and insulator shown in Fig. 10 with feeder conductor N^2 attached thereto. Fig. 13 is a top view of the bracket shown in Fig. 11.

In said drawings A represents the trolley standard, and B the trolley journal bearings that are projecting from the sides of the stand-

ard adjacent to the bottom thereof and are secured thereto by means of flanged cap-plates a . The standard consists of side plates k that are bolted to the front and rear bars K , each of said bars being provided with a tongue as shown in Fig. 4, that extends some distance between the plates k and to which the latter are bolted, the space between the tongues of the bars K and the side plates k constituting a rectangular conduit for the reception of the flat metal conductors e and e^2 and their mica insulators f and f^2 . The central insulator f separates the conductors e and e^2 , the insulators f^2 protect them from contact with the side plates k , and the insulators f^3 protect them from contact with the tongues of the bars K and the inner edges of the conductors e from each other.

The inner end of each trolley journal B is provided with a flanged head to permit it to be secured to the plate conductors e^2 , by means of the cap plates a ; but upon each journal B , and around the flange of its head is placed a sleeve b of insulating material that protects it from contact with the side plates k and with the cap plates a .

Each conductor consists of three pieces, viz: the bottom plate conductor e^2 and the two upper plate conductors e that are united to the conductor e^2 by means of fuses g and g^2 of any suitable construction, but preferably as shown in Figs. 6 and 8 of short plates having their ends grooved to receive the ends of the conductors.

The location of the fuses g and g^2 is shown to be at a short distance from the trolley journals B . They may be at a higher point, but said point must be below the location of the wearing plates k^2 , and beneath the shield J . Said plates k^2 of the standard are located thereon, when in use, on the level of the edges of the slot of the underground conduit.

The upper end of the standard is received in a metal head block P said block having pendent therefrom a rectangular sleeve p through which bolts p^2 are made to pass horizontally to engage with the bars K of the standard and fasten the trolley standard to head block P . The head of the block P has bolts p^3 passing vertically therethrough to secure it to the frame of the car trucks. The head block of the standard is also provided with fuses (cut outs) h , the electric current passing thence through conductors h^2 to the motor, &c., of the car. The head block is also provided with tongues p^4 secured in vertical grooves therein and pendent therefrom on the front and rear to protect the front and rear bars K , on the level of the slot of the track-conduit.

To prevent mud and water that may be descending upon the standard, from reaching the fuses g and g^2 or the trolley journals and their arms, and producing "short circuit," shield J is bolted to the side plates k of said standard, a short distance above said trolley journals and fuses g and g^2 . Said shield

consists of arches formed of angle bars bent suitably with their outer flange turned up nearly parallel with the standard, and the lower portions of said arches extend a suitable distance in front and rear of the standard.

The trolley arms d are pivotally mounted upon the outer end of each journal B and are retained thereon by means of a washer n and nut n^2 . Each trolley arm d is provided with two grooved rollers d^2 connected in tandem to better facilitate their passage over the ends of each independent section conductor in the underground conduit without interrupting the electric current. To keep the rollers d^2 normally pressed upon the conductor wire a spring C is coiled upon the end of each journal B , and has one end secured to said journal, while the opposite end of said spring bears upon the inner end of each arm d .

The trolley conduit D has angle iron plates D^2 on top thereof at a suitable distance apart to provide between them the slot for the passage of the standard A . Each angle plate D^2 has brace bolts D^3 laterally extended therefrom that connects it with the rails e^3 of the track. To the yoke plates M of the conduit are attached brackets m and m' , the inner ends of which project within the conduit and support insulators m^2 and m^3 , and the latter carry clamps m^4 for the trolley conductors N . Upon said brackets are also placed the distributing feeder conductors N^2 that carry the electric current from the power station to each section of the trolley conductors of the underground system. The conduit D is provided at suitable distances apart with drainage pipes d^4 that are connected with sewers d^5 .

Having now fully described my invention, I claim—

1. An underground trolley standard having two sets of plate conductors, each set being separated from the other by insulating material and inclosed in insulating material, front and rear bars, side plates and wearing plates secured to said bars and inclosing the insulated sets of plate conductors, each set consisting of three plates viz; two upper plates united to the end of a lower plate by a fuse cut off substantially as described.

2. In an underground trolley standard the combination of two conductors, insulating material separating and inclosing said conductors, front and rear bars, side plates and wearing plates secured to said bars, each conductor consisting of two upper and lower plates apart from each other, and a fuse cut off uniting said plates on a lower level than the wearing plates substantially as described.

3. In an underground trolley standard the combination of two conductors, insulating material separating and inclosing said conductors, front and rear bars, side plates and wearing plates secured to said bars, and a head block secured to the upper end of the standard, each conductor consisting of three plates one plate being at the end of the other two

but apart from each other, and a fuse cut off uniting said plates on a lower level than the wearing plates, and a fuse cut off connected with the upper end of each top conductor plate substantially as described.

4. In an underground trolley standard the combination of two conductors insulating materials separating and inclosing said conductors, front and rear bars, side plates and wearing plates secured to said bars and a metal head block secured to the upper end of the standard and having vertical grooves therein and from said grooves pendent tongues p^4 to protect the front and rear bars of said standard substantially as described.

5. In an underground trolley standard the combination of two conductors, insulating material separating and inclosing said conductors, front and rear bars, side plates and wearing plates secured to said bars, each conductor consisting of three plates, one plate being at the end of the other two, but apart from each other, and a cross fuse cut off uniting said

plates, a trolley journal B having a flanged head, an insulating sleeve b surrounding said journal and head, and a cap plate a secured to the side plates of the standard substantially as described.

6. In an underground trolley standard the combination of two conductors, insulating material separating and inclosing said conductors, front and rear bars, side plates and wearing plates secured to said bars, each conductor consisting of three plates, one plate being at the end of the other two but apart from each other, and a cross-fuse cut-off uniting said plates on a lower level than the wearing plates, and a mud deflecting shield secured to the standard over said cross-fuse cut-offs substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM T. DULANY, JR.

Witnesses:

JOSEPH SOLOMON,
STEWART WINSLOW.