(No Model.) 2 Sheets—Sheet 1.

W. T. DULANY, Jr.

CONDUIT RAILWAY TROLLEY.

No. 532,448. Patented Jan. 15, 1895.

Fig. 2

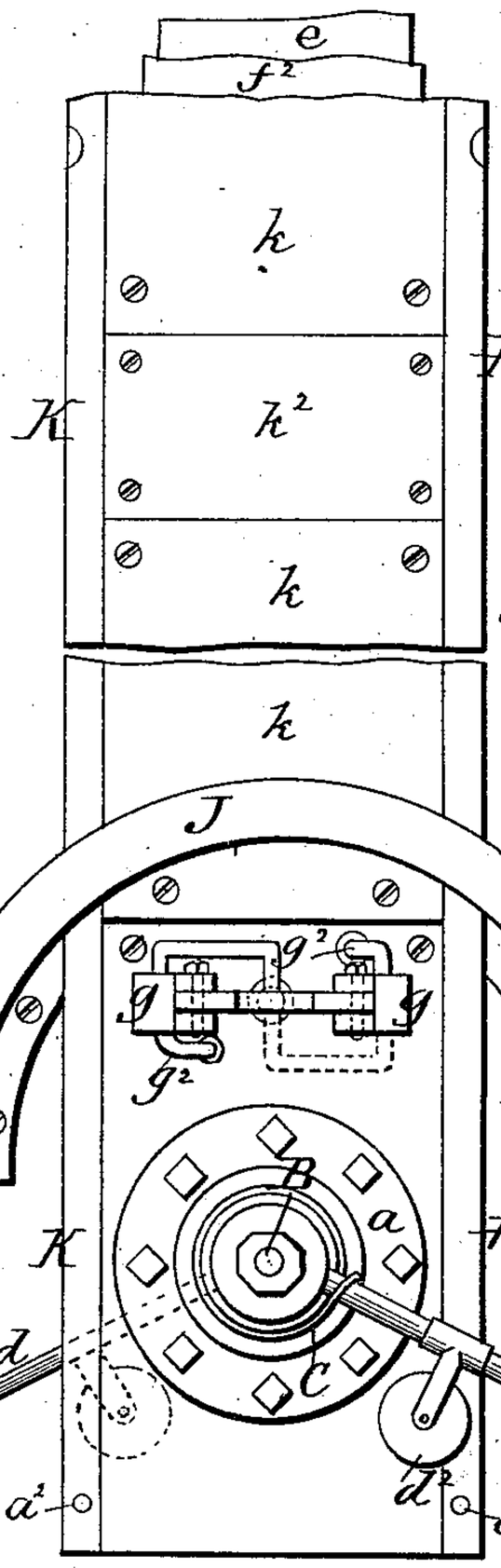


Fig. 1

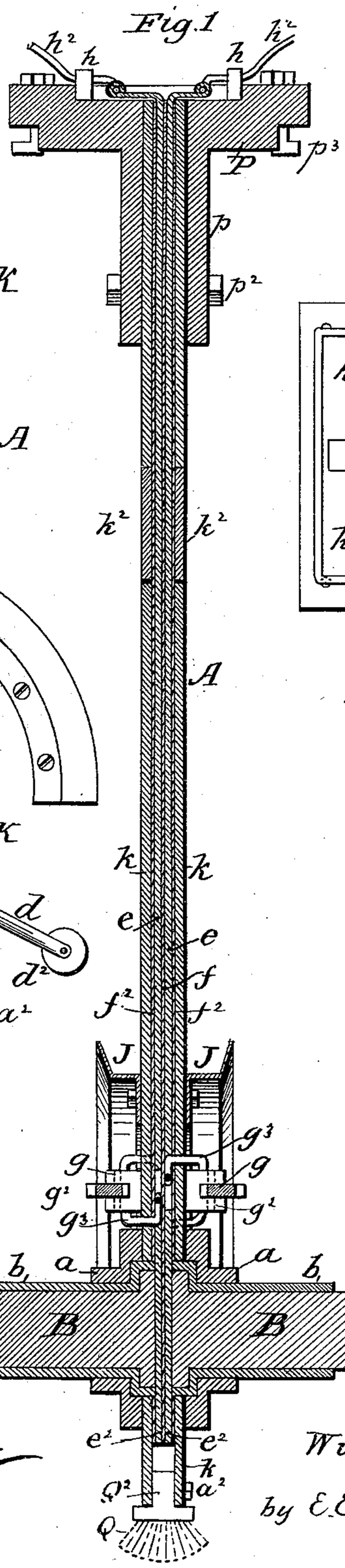


Fig. 3.

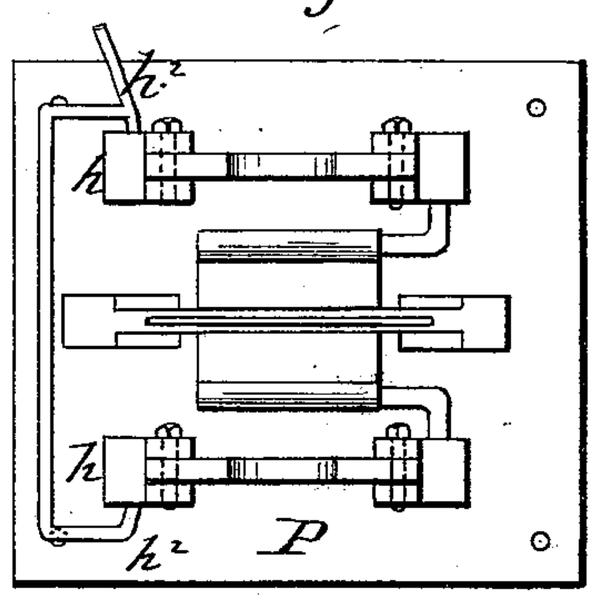


Fig. 5

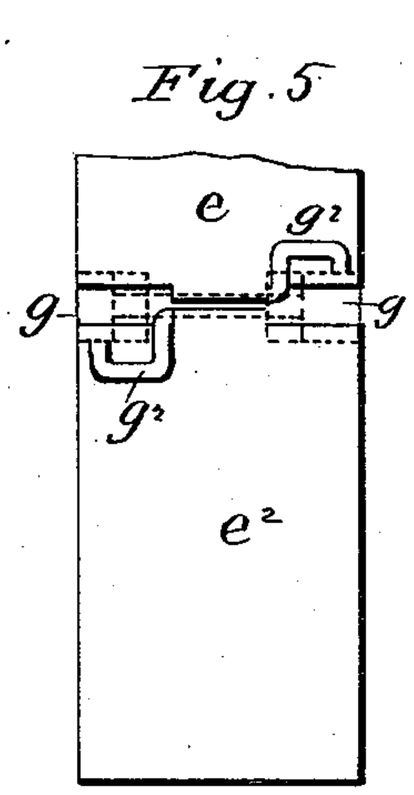
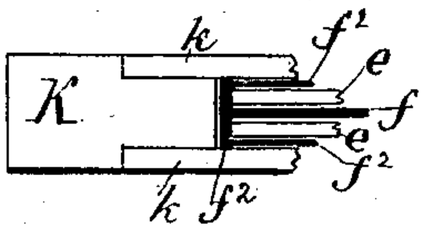


Fig. 4



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

W. T. DULANY, Jr.

CONDUIT RAILWAY TROLLEY.

No. 532,448. Patented Jan. 15, 1895.

Fig. 7.

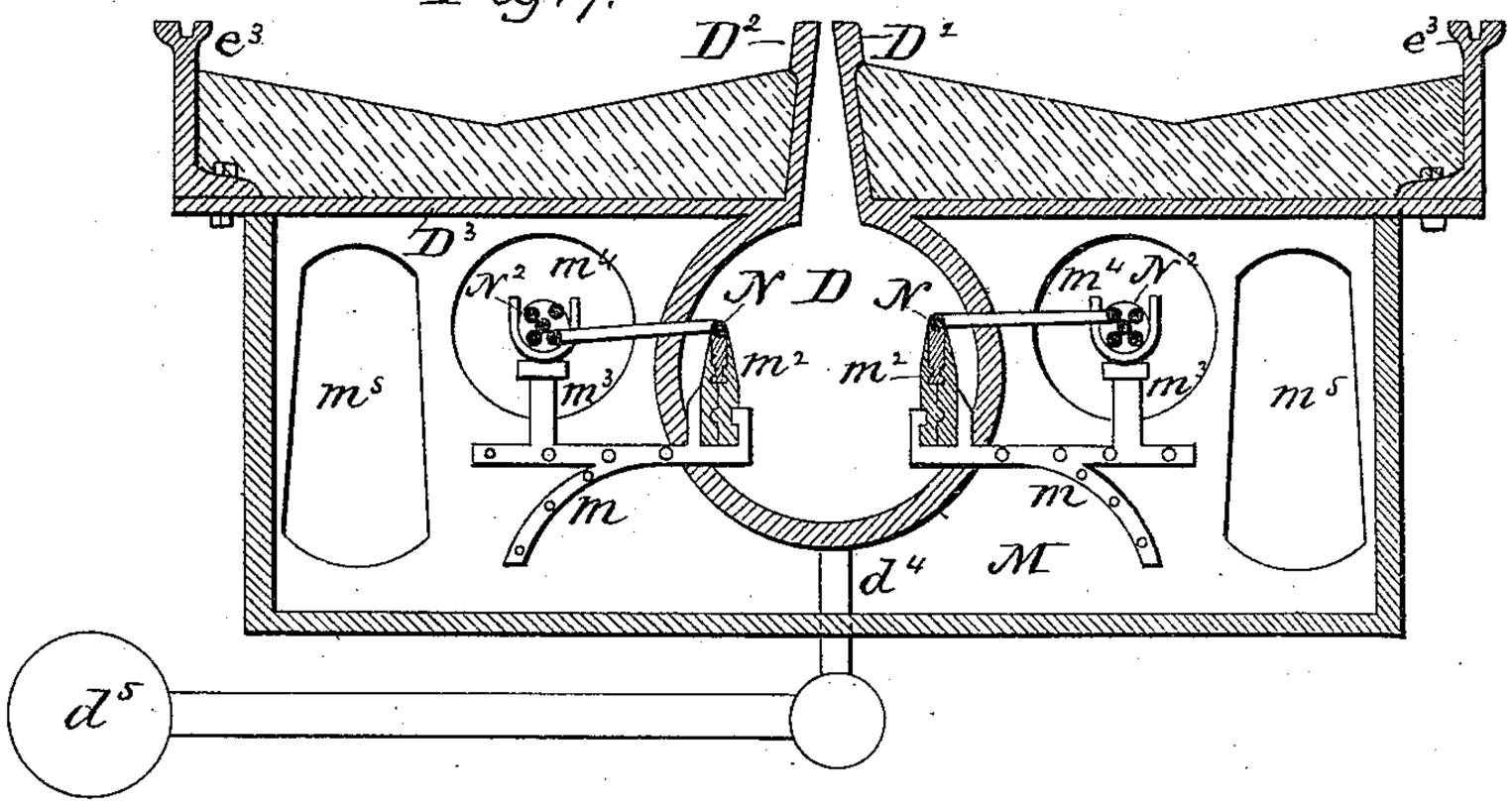


Fig. 6

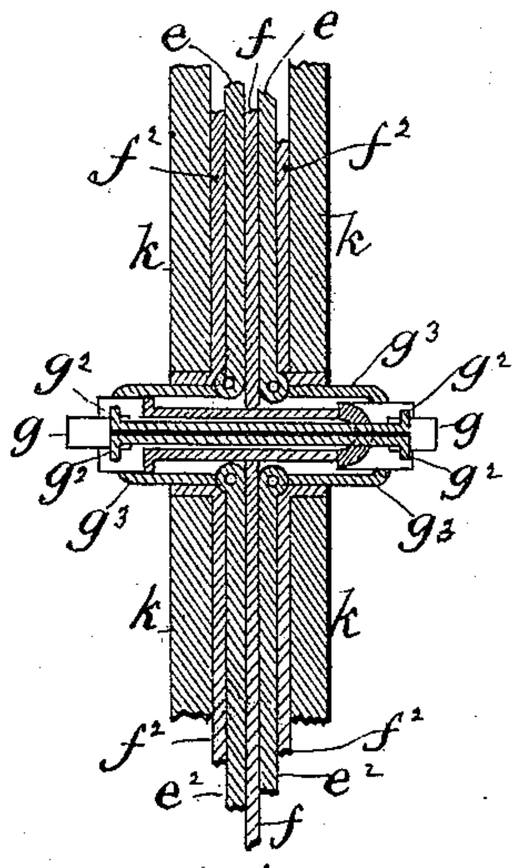


Fig. 9

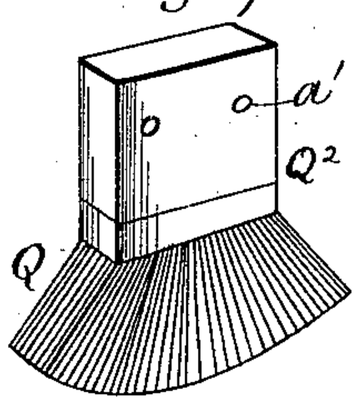
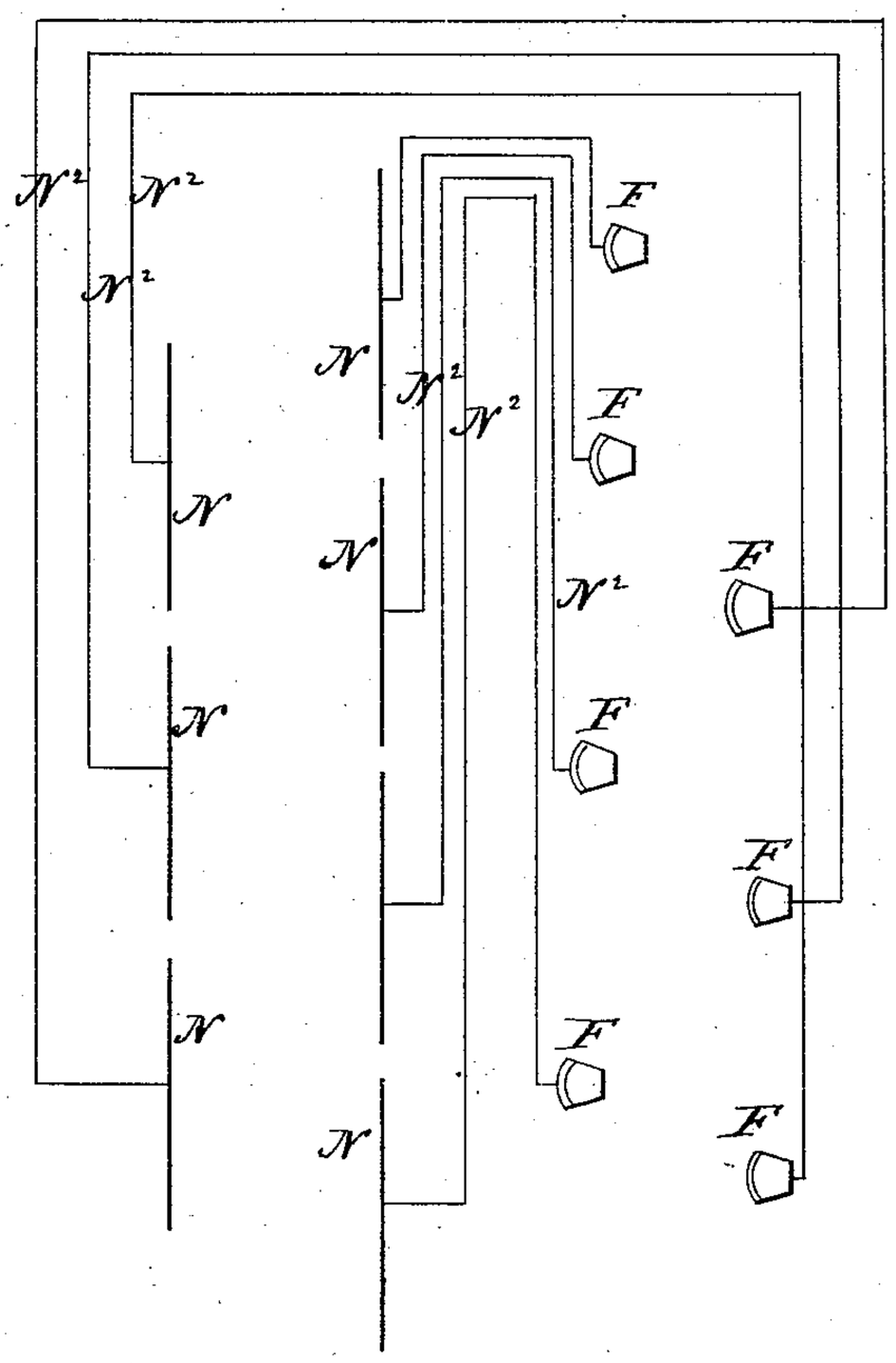


Fig. 8.



WITNESSES

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UNITED STATES PATENT OFFICE.

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CONDUIT RAILWAY-TROLLEY.

SPECIFICATION forming part of Letters Patent No. 532,448, dated January 15, 1895.

Application filed March 30, 1894. Serial No. 505,745. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM TASKER 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 while a car carrying the standard makes one of its trips, the plate conductor on the opposite side will continue to transmit power to the motor of said car.

Another object is to provide the portion of the standard within the conduit with water and mud deflecting shields to protect the fuses of the plate conductors and the journals of the trolley and prevent "short circuiting."

Another object is to provide a cross fuse connection between conductor fuses *g g* to connect them so that if a section conductor in the conduit becomes "grounded" or "dead" on one side, and the wearing plate on the opposite side of the standard becomes worn through and "ground" 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 cross connection between fuses *g g* is to supply four paths for the current to travel in case of accidents to the standard and conduit system before reaching switches for the car: namely, up either one side or both sides of standard if no fuses are "burned out" and up standard from right to left through cross fuse if the section fuse of conduit on left side and the lower fuse *g* and the upper fuse *h* on the right side of standard are "burned" and vice versa.

Another object is to divide the conduit system into sections; said sections being connected through suitable fuses to their respective feeder conductors and said feeders are connected at their switch board terminals with, and made to pass through ampère meters to easily localize from said terminal any defect or "ground" on a section or part of the system.

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

Figure 1 is a 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. Fig. 3 is a top view of the standard. Fig. 4 is a top view of the front (or rear) bar of the standard with portions of the wearing plates and insulated conductors. Fig. 5 is a front view of the lower portion of the series of plates constituting the conductors on one side of the standard, with the fuse blocks uniting two plates of said series. Fig. 6 is a transverse vertical section of the lower portion of the standard showing a cross fuse connection between the fuses *g g* to illustrate the method of crossing the current from the lower conducting plates e^2, to the upper conducting plates *e* in the standard, this modified construction being preferred for the purpose of crossing the current in said standard if one or the other of the section fuses is burned out. Fig. 7 is a transverse vertical section of the track showing the two trolley wire conductors within the conduit and the feeder cables of the conductors. Fig. 8 is a plan view of a series of sections of trolley conductors, each section being shown connected with a switch board terminal or ampère meter. Fig. 9 is a perspective view of the conduit cleaning brush to be attached to the lower end of the standard.

In said drawings A represents the trolley standard, and B the trolley journal bearings that are projecting from the sides of the standard 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 pair of flat conductors e e^2 and their mica insulators f and f^2. The central insulator f separates the conductors e and e^2 and the insulators f^2 protect them from contact with the side plates k and from contact with the tongues of the bars K. 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 two lengths e and e^2 that are united together by means of fuses (cut outs) g and g^2 of any suitable construction. They are shown in this instance as consisting of short lengths of wire g^3 having one end secured to the central portion of the conductor e by wrapping said portion around said end, while the opposite end is embedded in the easily fusible plug g secured to the end of the opposite section e^2 of the conductor. The location of the fuses g is shown to be at a short distance above the trolley journals B, and the location of the cross fuse g^2 is shown in Fig. 6 connecting fuses g to each other. 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. The head block of the standard is also provided with fuses (cut outs) h nearly similar to the fuses g, the electric current passing thence through wires h^2 to the switches and motor of the car.

To prevent mud and water that may be descending upon the standard from reaching fuses g g or the trolley journals and their arms and producing a "short circuit," shields J are bolted to the side plates k of said standard a short distance above said trolley journals and fuses g g. Said shields consist 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 wire spring C is coiled upon the end of each journal B and has one end secured to said journal while the opposite end bears upon the inner end of each arm d.

Fig. 9 shows a fan shaped brush Q having a metal back Q^2 to be bolted to the bottom or lower end of the standard between its two plates k projecting from the bottom of said standard beyond its conductors for the purpose of sweeping (cleaning) the dirt or mud out of the conduit and depositing the same in "catch basins," not shown, situated at suitable distances apart and having conduits connecting both tracks, one with the other. Said conduits are to have a man hole plate between said tracks for the purpose of better facilitating the removal of the same and to prevent clogging up of the conduits by the dirt, &c. The back of the brush has openings a' to receive bolts a^2 made to pass through them in fastening the same to the plates K of the standard A.

The trolley conduit D has plates D^2 on top thereof at a suitable distance apart to provide between them the slot for the passage of the standard A; and said conduit has laterally extended bars D^3 that connect it with the rails e^3 of the track. Said bars rest upon yoke-plates M to which are attached brackets m, the inner ends of which enter the conduit and support insulators m^2 for the trolley conductors N. Said brackets also carry on suitable standards and insulators m^3, the distributing feeder conductors N^2 that carry the electric current from the power station to each section of the trolley wire of the underground system. For this purpose the yoke-plates M have large perforations m^4 on each side of the conduit. They have also openings m^5 that may be used for the passage of properly insulated telegraph and electric light wires or cables. The conduit D is provided at suitable distances apart with drainage pipes d^4 that are connected with sewers d^5.

To facilitate the detection of any defect in any of the sections of the trolley conductors N each conductor N is connected by means of its feeder conductor N^2 and through suitable fuses at their switch board terminal, with, and through ampère meters F preferably located in the power-house or office of the railway line, and thus prevent any car from being stalled for any great length of time upon any part of the line as the defect can be immediately perceived and located and repairs be promptly made by the employés.

Having now fully described my invention, I claim—

1. An underground trolley standard having two plate-conductors separated 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 plate-conductors, each conductor consisting of two plates united end to end by a fuse cut off substantially as described.

2. In an underground trolley standard the combination of two plate-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 plates placed end to end but 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 plate 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 two plates placed end to end but apart from each other, 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 plate-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 plates placed end to end but apart from each other and a fuse cut off uniting said plates, and said cut off, 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 plate of the standard substantially as described.

5. In an underground trolley standard the combination of two plate 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 plates placed end to end but apart from each other, and a fuse cut off uniting said plates and said cut off on a lower level than the wearing plates, and a shield secured to the standard over said fuse cut offs substantially as described.

6. The combination of an underground trolley standard having plate conductors, insulators, and plates *k* inclosing them, and extended downward beyond said conductors with a conduit cleaning brush having its back secured to the lower end of said plates *k* between them substantially as described.

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

WILLIAM TASKER DULANY, JR.

Witnesses:
OSCAR F. SHAW,
FRANCIS E. V. DUNN.