

(No Model.)

J. P. MICHIELI.
CONDUIT ELECTRIC RAILWAY.

No. 510,647.

Patented Dec. 12, 1893.

Fig. 1.

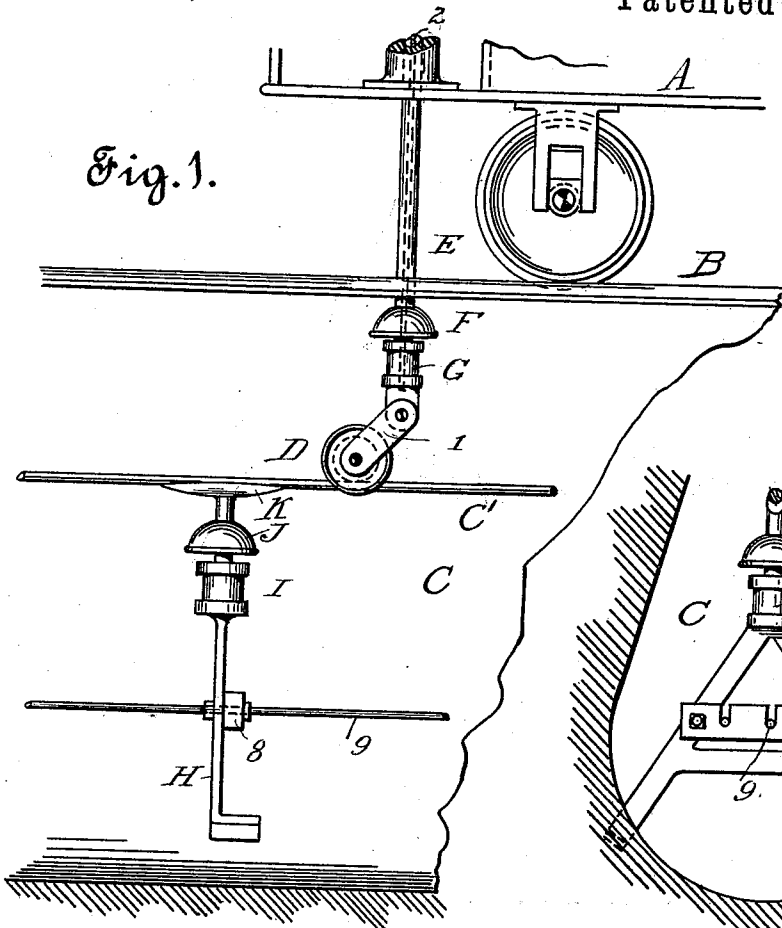


Fig. 2.

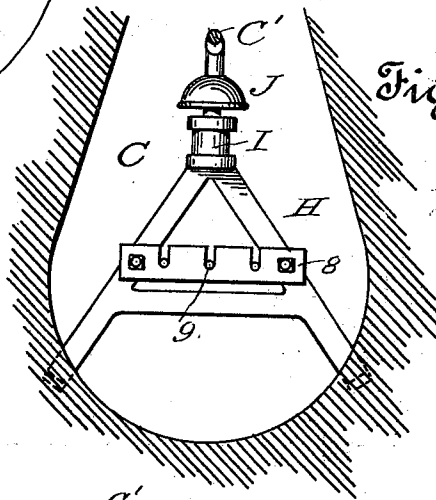


Fig. 5.

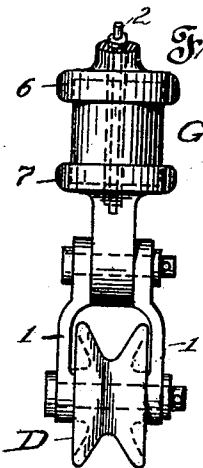


Fig. 4.

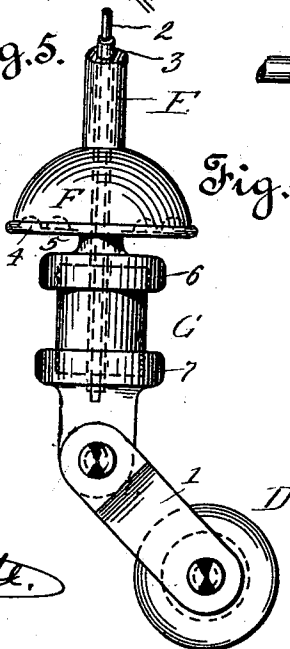
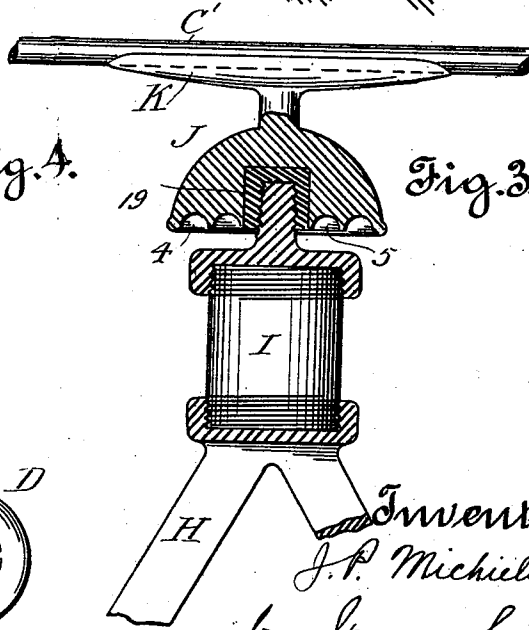


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN P. MICHIELI, OF SAN FRANCISCO, CALIFORNIA.

CONDUIT ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 510,647, dated December 12, 1893.

Application filed July 14, 1893. Serial No. 480,507. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. MICHIELI, a subject of the Emperor of Austria-Hungary, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Electric Railways; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to electric railways of the class using the underground or conduit system and more especially to special means and appliances for preventing rain and dampness which may enter the conduit from injuriously affecting the contacts and grounding the current.

The invention consists in certain special features of construction which will be fully hereinafter described and which are shown in the accompanying drawings in which—

Figure 1, is a side elevation showing a part of a car and the interior of a conduit. Fig. 2, is a cross section of the lower part of the conduit with one of the fixed interior supports in end view. Fig. 3, is a side view and part section of the same, enlarged. Fig. 4, is a side elevation of the contact wheel and its support. Fig. 5, is an end view of the same.

In the drawings A, represents the frame of a car running upon rails B, and C, is the underground tunnel or conduit. I show no motor or other electrical parts upon the car, as they form no part of my invention and may be of any desired construction.

C', represents the main conductor, extending through the conduit in contact with which runs the contact wheel D, on the car. This wheel is pivoted in yielding arms 1, 1, suspended from the bottom of a hollow standard E, which projects down from the bottom of the car. The wire 2, from the motor is shown with insulation 3, the latter inclosed within the hollow standard E. (See Fig. 4.) At the bottom of the standard E, and secured to or forming part of it is a hemispherical deflector F, in the lower flat face of which are concentric grooves 4, and 5. The conducting wire from the car extends through the deflector and also through the cylinder G, below it. The latter is a glass tube G, having screwed to its ends the heads 6, and 7. The general relation of the parts is best shown in Fig. 1.

The main conductor is supported at proper intervals in the conduit by angular standards H, secured in the conduit, (Fig. 2,) and having attached to them the transverse grooved holders 8, which carry the feed wires 9. Secured to each of these standards is a glass insulator I, like that just described, to the upper end of which is connected a deflector J, having bottom grooves and insulated from the upper head of the glass tube as shown at 19. Upon the top of this deflector and preferably formed with it is an elongated support K, for the main conductor, shaped so as to partially inclose it and still permit the trolley to run freely upon the conductor.

In damp or wet weather, when water enters the conduit, the contacts are completely guarded and protected by the two constructions above described. Water can trickle down the deflectors and may possibly enter the outer groove in its lower surface, but experiments show that it cannot possibly enter the inner one. Were the deflectors not used the water might possibly close the circuit between the heads of the insulating cylinders and thus ground the current.

The connections between the feed wires and the main conductor are not shown as they may be of the usual character, placed at the ends of the line, or upon long lines, at proper intervals between the ends.

What I claim is—

1. In an underground electric railway, the combination with a car and a conductor, of a vertical trolley standard having a screw threaded cap formed upon its lower end and a hemispherical deflector slightly above said cap, a cylinder of glass having its upper end screw threaded to engage said cap, a second cap screw threaded upon the lower end of said cylinder and carrying a trolley wheel, and wires passing through the cylinder to the lower cap, substantially as described.

2. In an underground electric railway, the combination with the conduit, of A shaped standards fixed in said conduit and carrying the main conductor, and cross bars bolted to the legs of the standard, said cross bars having a series of transverse slots for the reception of the feed wires, substantially as described.

3. In combination with the standards H,

having screw threaded recesses at their upper ends, a cylinder of non-conducting material screw threaded at both ends and engaging said recess, a cap screw threaded upon the upper
5 end of the cylinder and having an upwardly projecting shank, and a hemispherical deflector having its flat side recessed to receive said shank and its rounded side adapted to support the conductor, substantially as de-
10 scribed.

4. An insulating support for electric conductors comprising a cylinder of glass having screw threaded ends, and supporting and con-

necting caps screw threaded to engage said ends, substantially as described.

5. In combination with a trolley support for underground electric railway systems, a deflector having a grooved lower surface, substantially as and for the purposes set forth.

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

JOHN P. MICHIELI.

Witnesses:

L. W. SEELY,
JOHN COFFEE.