

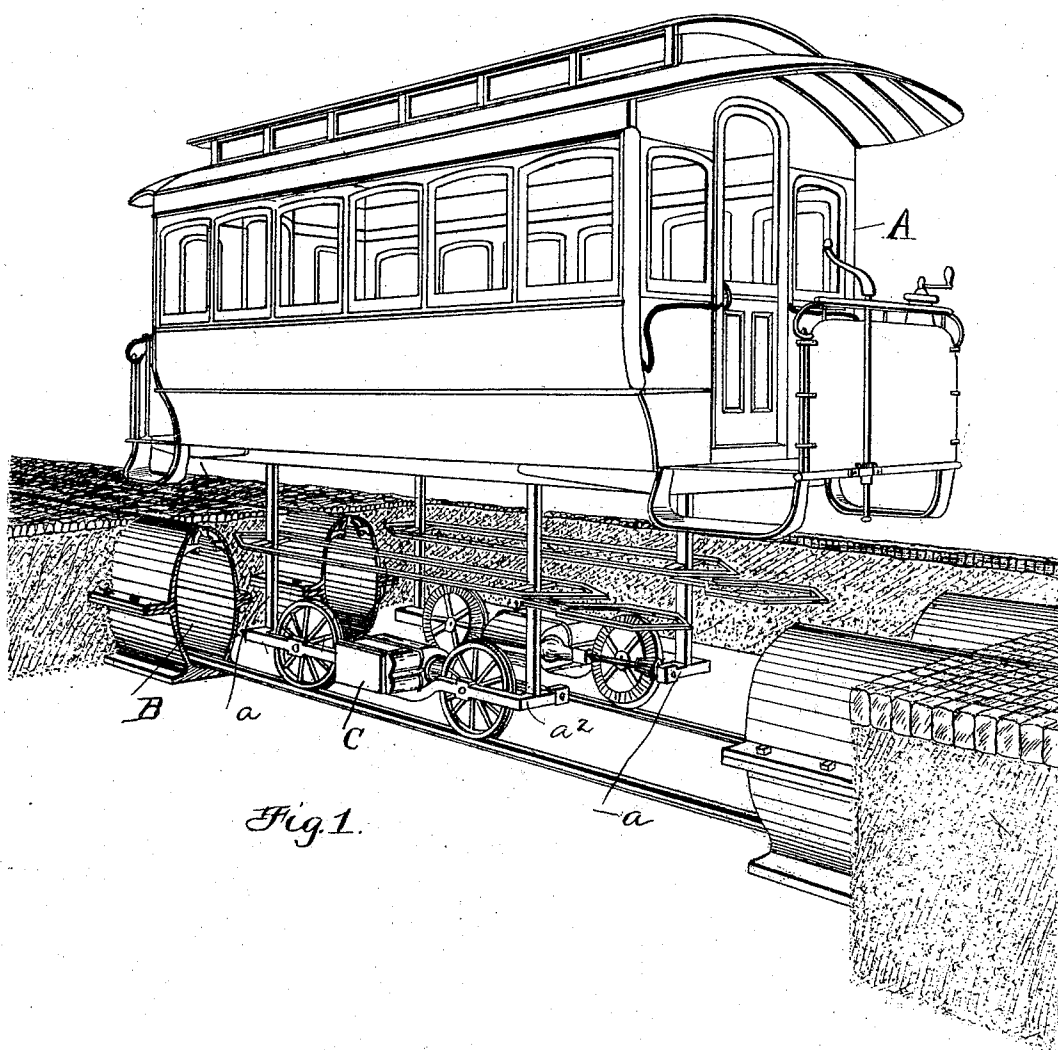
(No Model.)

3 Sheets—Sheet 1.

F. S. PERRIN.
ELECTRIC RAILWAY SYSTEM.

No. 500,943.

Patented July 4, 1893.



WITNESSES
James C. Allen
A. D. Harrison

INVENTOR.
F. S. Perrin.

(No Model.)

3 Sheets—Sheet 2.

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Fig. 2.

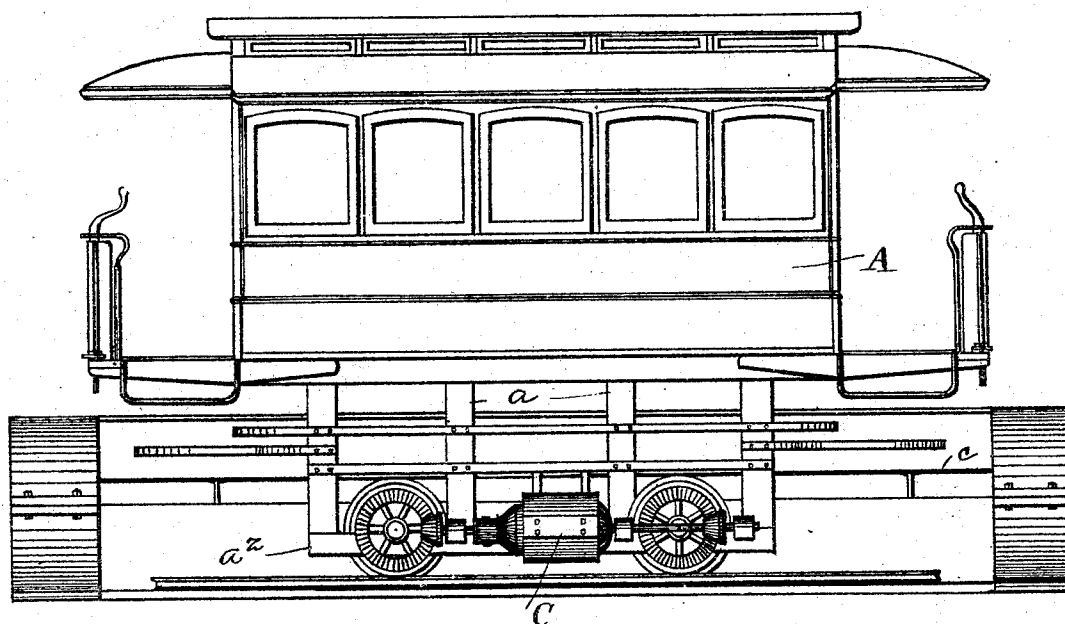
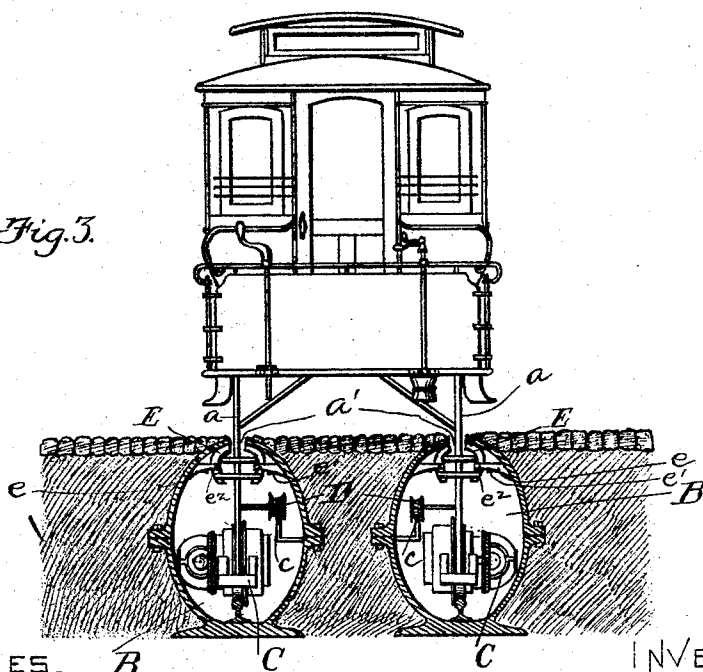


Fig. 3.



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(No Model.)

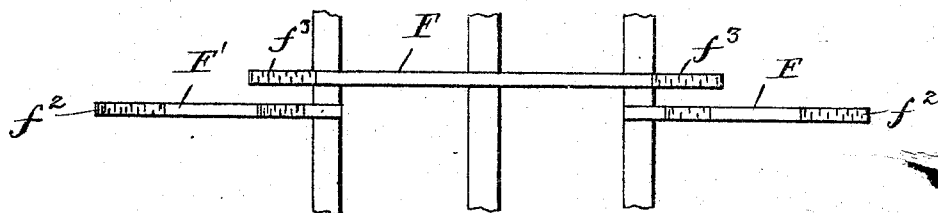
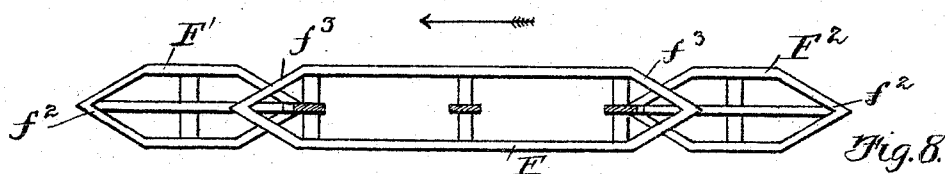
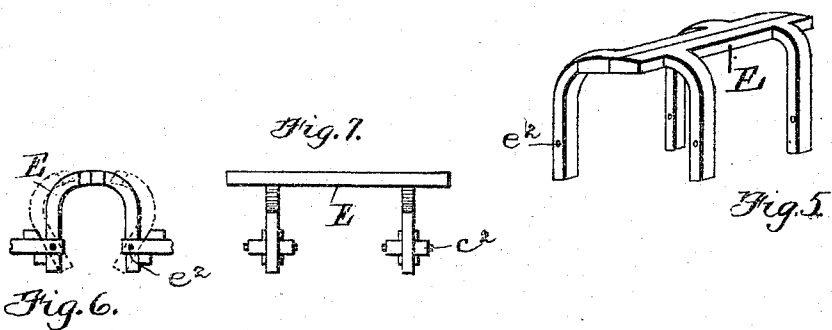
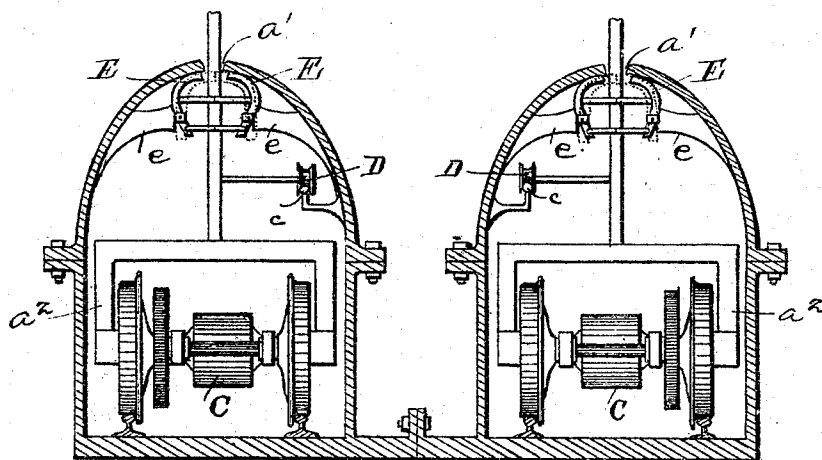
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Fig. 4.



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Fig. 9.

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UNITED STATES PATENT OFFICE.

FREDERICK S. PERRIN, OF LYNN, MASSACHUSETTS.

ELECTRIC-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 500,943, dated July 4, 1893.

Application filed April 2, 1892. Serial No. 427,570. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK S. PERRIN, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Electric-Railway Systems, of which the following is a specification.

My invention relates to electric railway systems, and more particularly to that class in which the current derived from a central station or storage battery is sent to the motors on the vehicle from a conductor placed underground.

The object of this invention is to dispose the running gear, motors, and all other, so to speak, vital parts under ground in a suitable conduit or conduits, to provide suitable supports adapted to pass through narrow slots in said conduits and sustain the weight of the car, and to provide durable and effective means for closing said slots before and after the passage of the car.

To these ends the invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings forming a part of this specification, Figure 1 is a view in perspective of a car with a portion of the conduits broken away to show the arrangement of the running gear and its attendant parts. Fig. 2 is a side elevation, the conduits also broken away, showing the conductor and the frames for opening and closing the shutter. Fig. 3 is an end view, partly in vertical section, showing shutters, frames, and running contact. Fig. 4 shows an arrangement in vertical section of two subways having two trucks of four wheels each. Fig. 5 is a perspective detail of two shutters. Fig. 6 is an end view of the same showing, in dotted lines, the shutter open. Fig. 7 is an inside view of one shutter, showing pivot and stop therefor. Fig. 8 is a top view of the shutter opening frames. Fig. 9 is a side view of the same.

The same letters of reference indicate the same parts in all of the figures.

The car A is provided with any suitable number of uprights or supports a extending downwardly through the slot a' and into the conduit B, where they are secured firmly to truck frames a^2 upon which the motor C is mounted in any suitable manner, said up-

rights and their connections collectively forming a narrow elongated frame rigidly attached to and projecting downwardly from the car and adapted both to run in a narrow slot extending lengthwise of the track, and to support the entire weight of the car, there being two of said frames attached to each car.

I may connect the motor with the wheels by any desirable method, preferably by extending the armature shaft in both directions and securing thereon spindles adapted to mesh with bevel gears on the inner surface of the wheels. I may, however, utilize any approved form of motor and gearing. A conductor c (Fig. 3) is suitably supported in the conduit and has a trolley D to convey the current to the motor.

Near the top of the conduit (Fig. 3) are braces or hangers e having stops or lugs e' thereon. Pivoted at e^2 in these braces or hangers are two shutters or jaws E, the pivoted points thereof being near the lower extremities of the shutters or jaws, so that when they are closed (Fig. 5) the greater weight above pin e^2 will have a tendency to close the shutters.

On the uprights a are suitably secured frames F F' F² (Figs. 8 and 9), one above the other, and so arranged that the upper frame will engage the interior of shutters E above the pins e^2 , and the lower frame will engage the shutters below pins e^2 . These frames have beveled or wedge-shaped ends, as shown, and it will be observed that said frames are slightly wider than the space between the pins e^2 . The operation of these shutters and frames will now be readily understood. As the car moves, for instance, in the direction of arrow (Fig. 8), frame F' will pass between the arms of shutters E below the pins e^2 ; but, as said shutters are already closed, this frame will not act upon the same. However, when frame F advances, point f^3 will enter above pins e^2 and force said shutters apart against stops e' where they will rest until frame F² advances, and, acting against the portion beneath pins e^2 , serve to close said shutters.

From the foregoing it will be seen that manifold advantages accrue from the construction shown. The entire running gear being underground, all danger of encountering obstacles on the track will be obviated,

making it impossible to run over persons, or to throw the car or cars off the track by any obstruction. There is no open slot into which wheels of vehicles can fall. No snow or rain can penetrate to impair the efficiency of the running contact; and the motors are shielded entirely from the elements, having the additional advantage of deadening the noise caused by the motors. The disadvantage of protruding tracks in busy streets is overcome.

I claim—

1. In an electric railway system, the combination with a car, of two narrow elongated frames rigidly attached to the car and projecting downwardly therefrom, two conduits below the surface of the ground, a rail in each conduit, a wheeled truck in each conduit and supporting the car through the said frames, and an electric motor carried by each of said trucks, substantially as and for the purpose set forth.

2. The combination with an underground conduit, having a narrow longitudinal slot, of two shutters pivoted below said slot, one on each side thereof, each of said shutters having an arm projecting below the pivotal point, as set forth.

3. In an electric railway system, the combination with a car and an underground conduit having a narrow longitudinal slot, of running gear located within the conduit and connected with the car, shutters pivoted within said conduit and having extensions below their pivotal points and means connected with the car for operating upon the shutters above or below their pivotal points to open and close them, as set forth.

4. In an electric railway system, a car supported upon uprights extending through slots in the road bed and fixed to suitable running gear below the slots, pointed frames secured to said uprights and shutters or jaws below the slot adapted to be opened and closed by said pointed frames, substantially as described.

5. In an electric railway system, a conduit, a slot therein, shutters or jaws pivoted within said conduit and adapted to open and close said slot, a car, upright supports therefor, running gear upon which said uprights are secured, a motor on said running gear, horizontally disposed wedge-shaped frames, one above the other, adapted to open and close said pointed shutters or jaws in the passage of said car, said running gear, motor, frames, and shutters or jaws being inclosed by said conduit, substantially as described.

6. In an electric railway system, the combination of an underground conduit and shutters or jaws formed on curved arms which are pivoted to fixed supports at points below the shutters, portions of said arms projecting above and portions below the pivots, an operating device located above the pivots and another operating device below the pivots, whereby the shutters may be opened and closed as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 26th day of March, A. D. 1892.

FREDERICK S. PERRIN.

Witnesses:

JAS. C. DE LONG,

SAML. B. THOMPSON.