

(No Model.)

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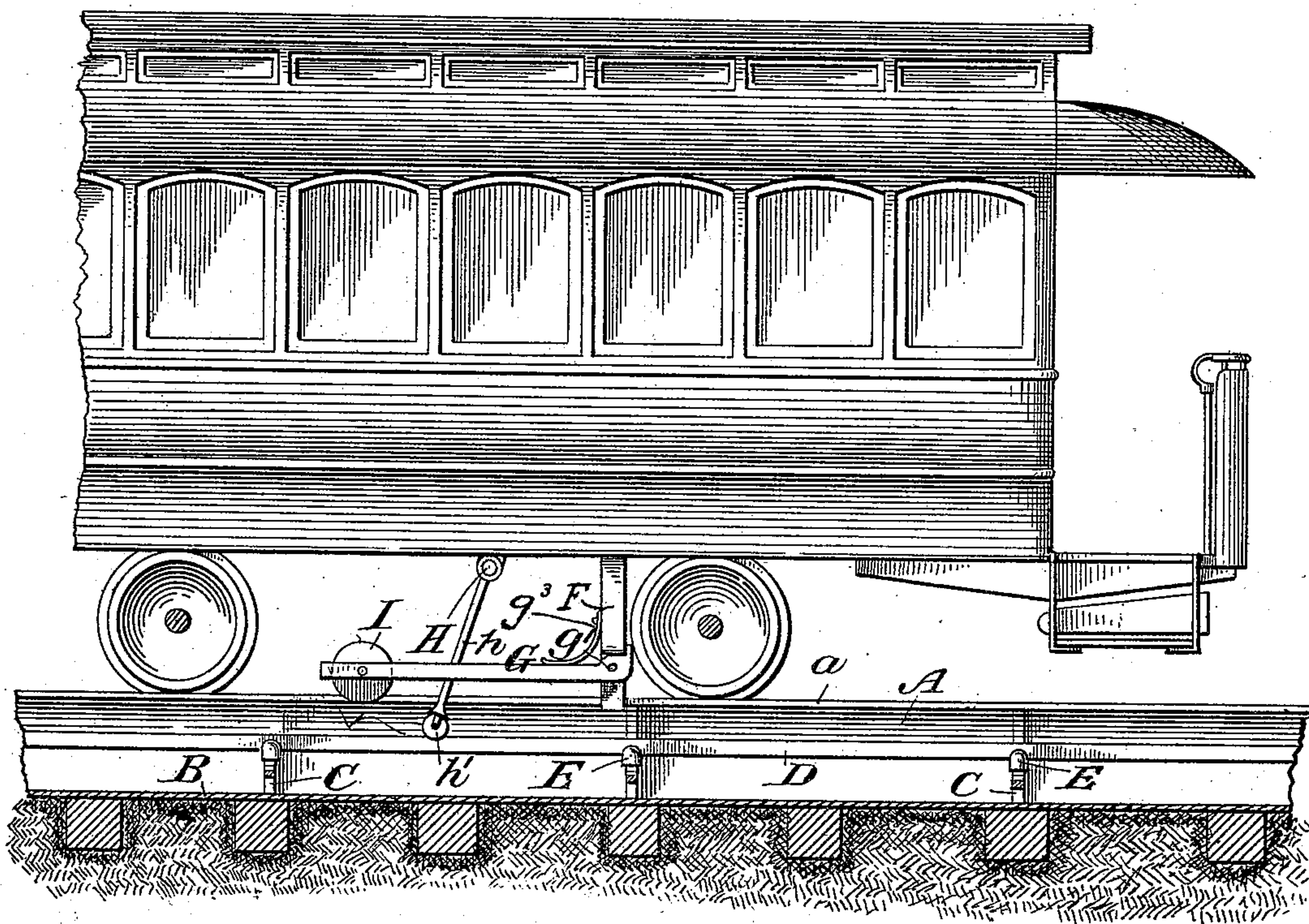
J. E. PARKER.

# UNDERGROUND ELECTRIC PROPULSION.

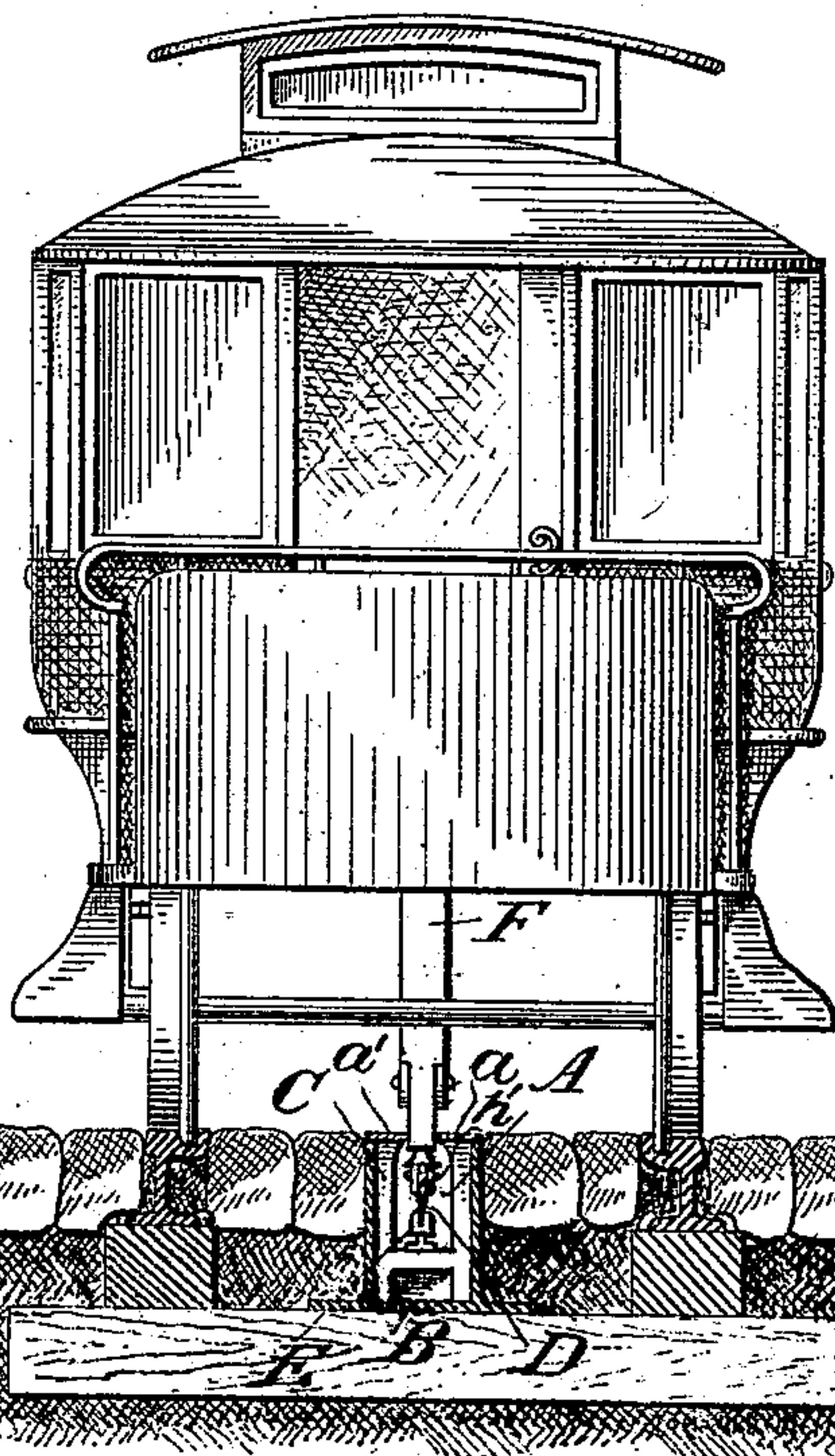
No. 549,652.

Patented Nov. 12, 1895.

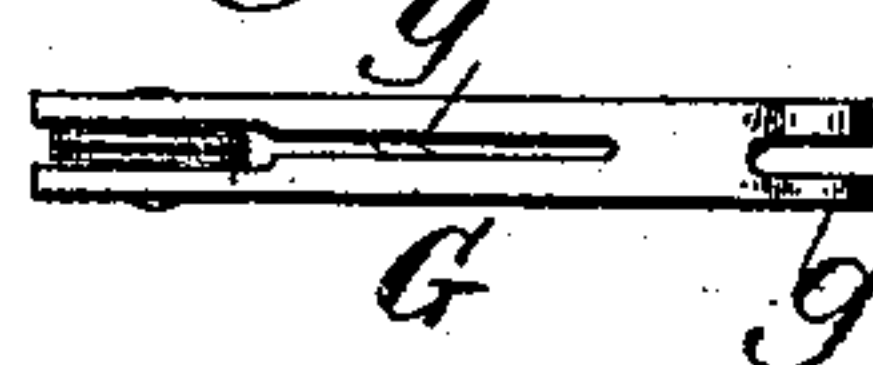
*Fig.1,*



*Fig. 2,*



*Fig. 3.*



Inventor:-  
John Row Parker.

*Witnesses:-*

*B. F. Kaywood*

J. J. Rüst.



(No Model.)

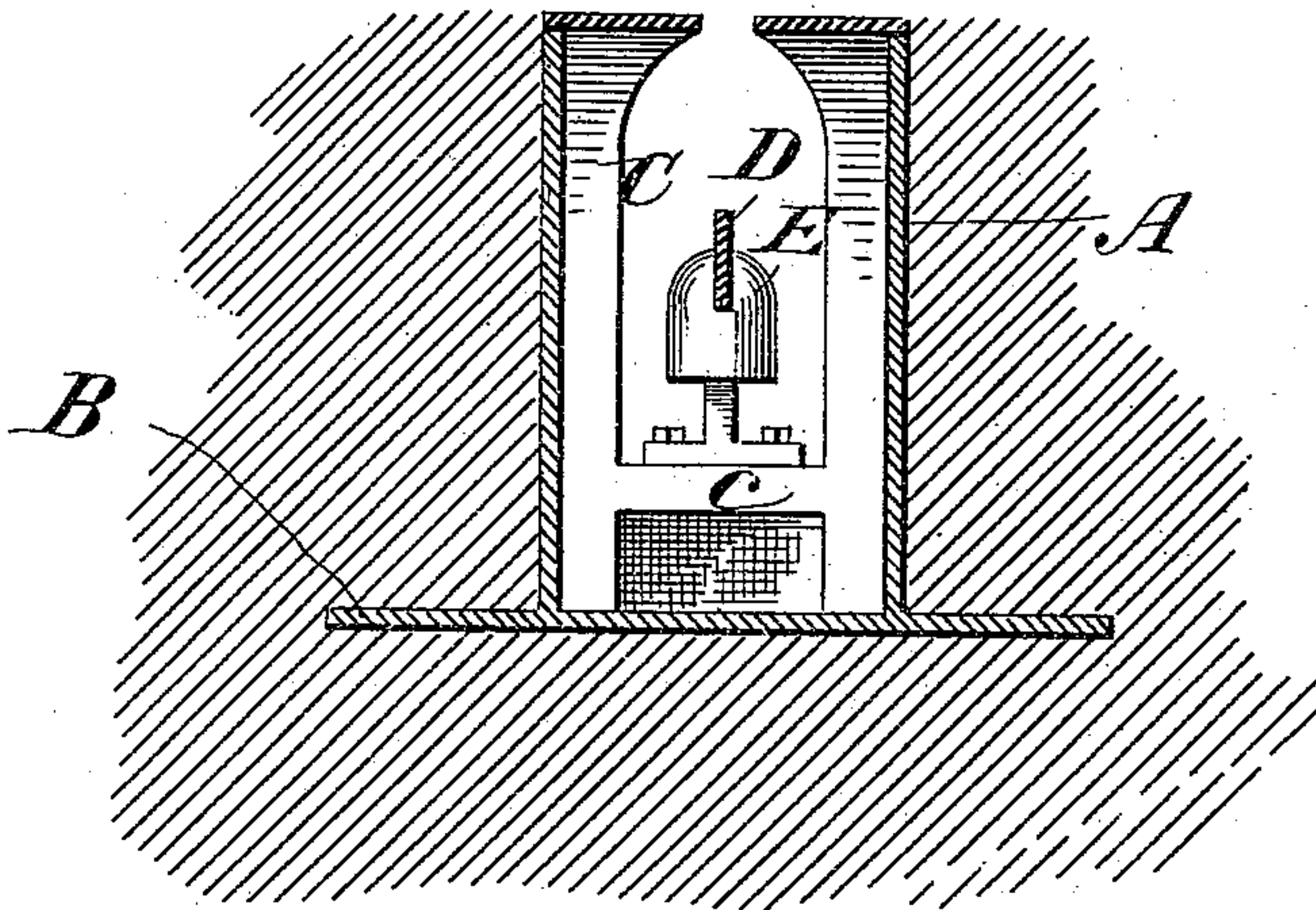
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UNDERGROUND ELECTRIC PROPULSION.

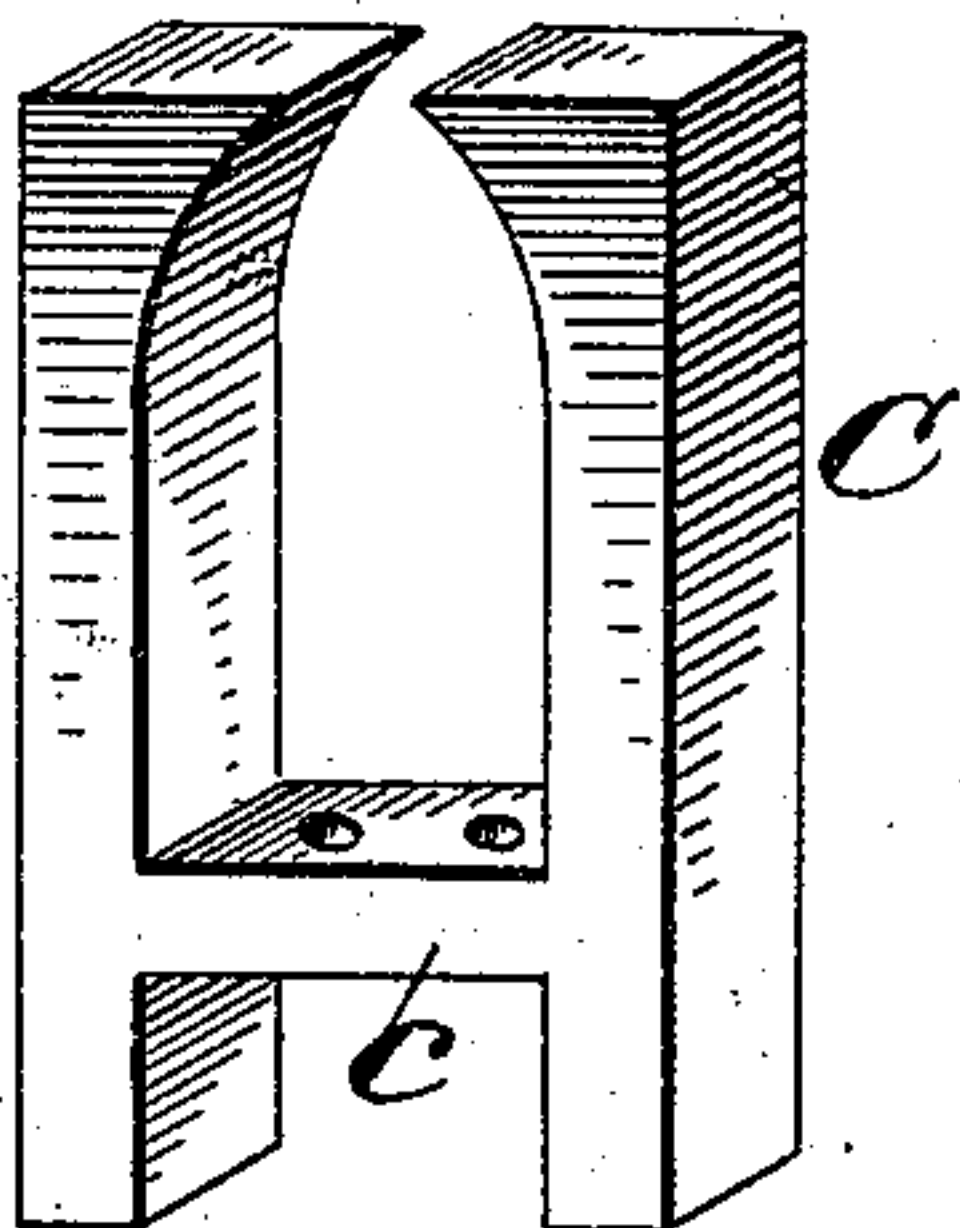
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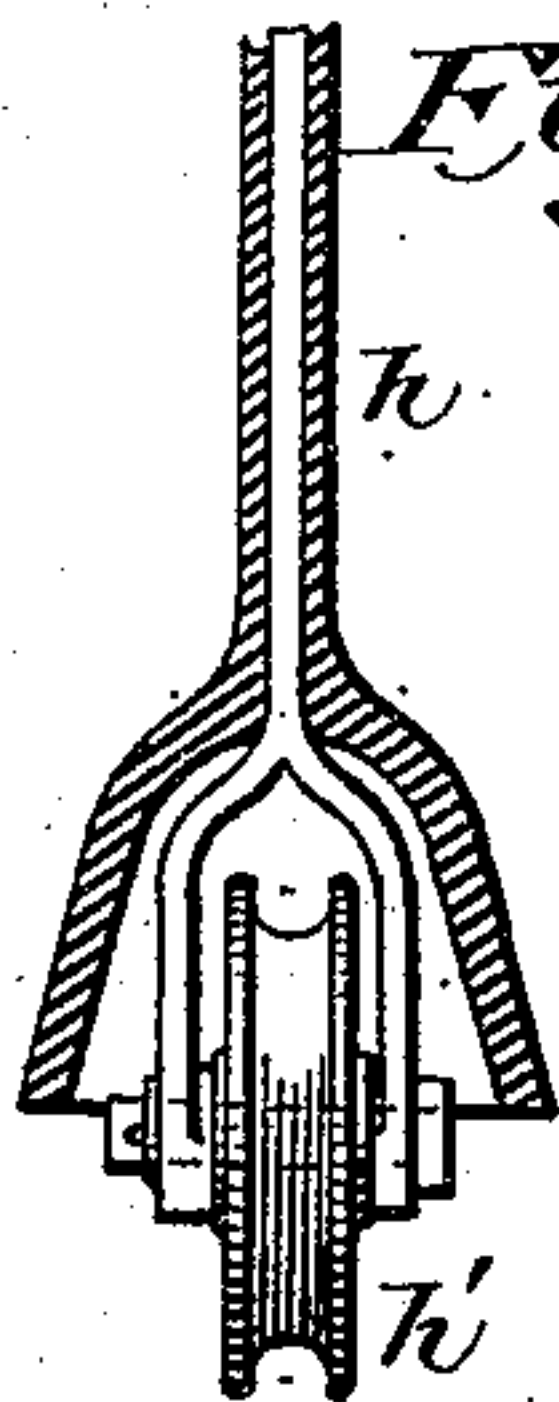
*Fig. 4,*



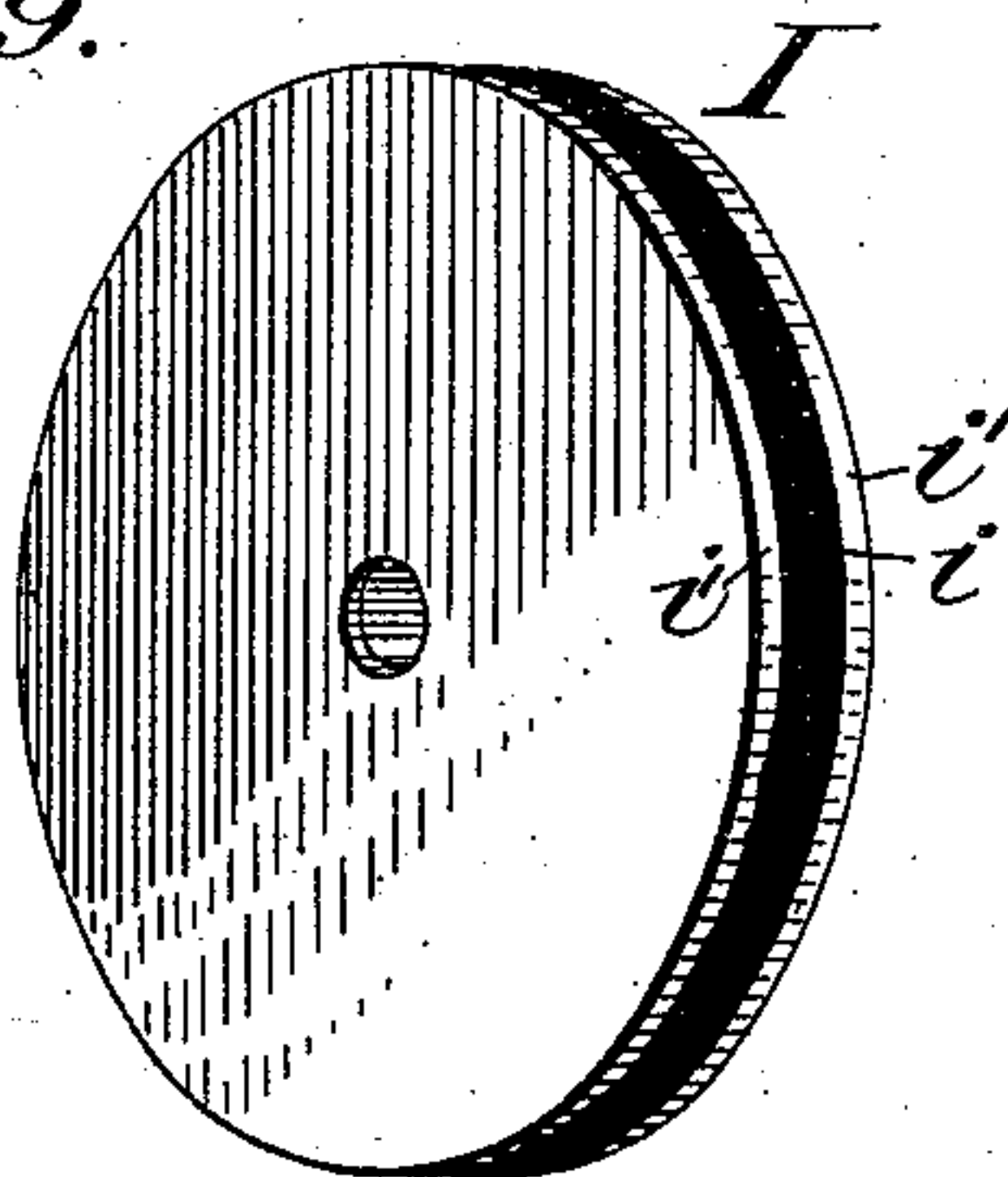
*Fig. 5,*



*Fig. 9.*



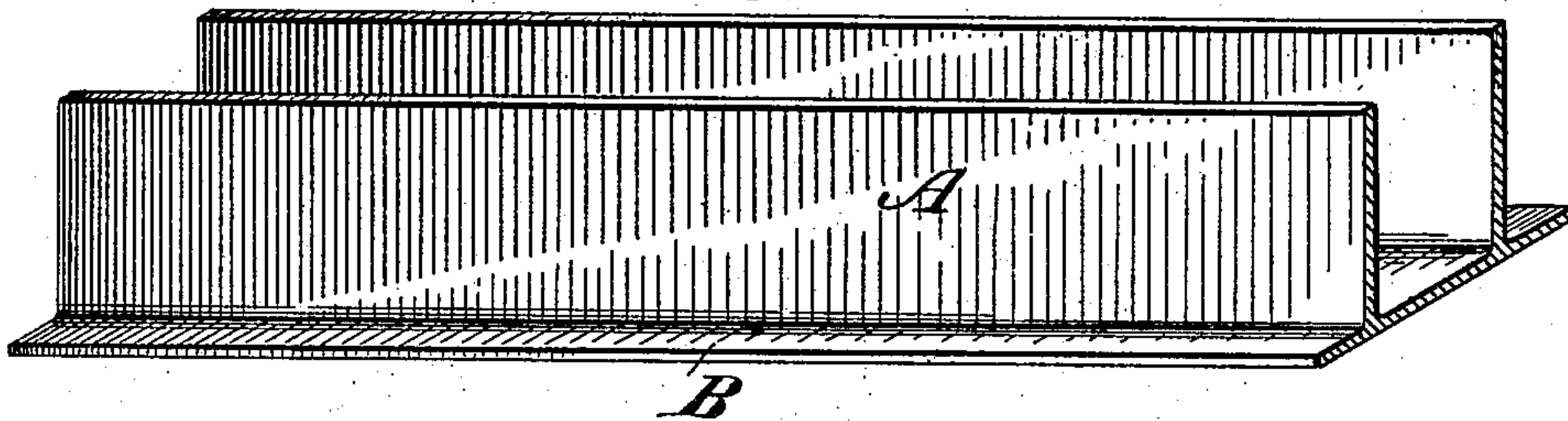
*Fig. 6,*



*Fig. 7,*



*Fig. 8,*



Witnesses:-

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# UNITED STATES PATENT OFFICE.

JOHN E. PARKER, OF NEW YORK, N. Y.

## UNDERGROUND ELECTRIC PROPULSION.

SPECIFICATION forming part of Letters Patent No. 549,652, dated November 12, 1895.

Application filed June 23, 1894. Serial No. 515,542. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN EDWARD PARKER, of the city of New York, in the State of New York, have invented certain new and useful  
5 Improvements in Underground Electrical Propulsion, of which the following is a description, reference being made to the accompanying drawings, forming part of this specification.

10 My invention relates to electric railways, (conduit system;) and my object is to design a simple, safe, and comparatively inexpensive system of operating electric railways by means of an electric conductor placed in a conduit.

15 In the accompanying drawings, in which like letters of reference refer to like parts wherever used throughout this specification, Figure 1 is an elevation, partly in section, of the system in operation; Fig. 2, a transverse  
20 sectional view of the same; Fig. 3, a view of the trolley-guard. Fig. 4 is a cross-section of the conduit, showing the iron cross-frame therein with the insulator and conductor attached. Fig. 5 is a view of the iron cross-  
25 frame, and Fig. 6 is a view of the wheel which conducts the return current. Fig. 7 represents one side of the conduit-cover. Fig. 8 is a representation of the iron conduit and flange thereof, and Fig. 9 is a cross-sectional  
30 view of the trolley-support with the trolley connected therewith.

Referring to the drawings, I have shown in Fig. 8 the iron conduit, which is rectangular in shape and about fifteen inches deep by nine  
35 inches in width, more or less, and having on its under side a flange three inches wide or thereabout at each side thereof, said flanges being designated by the letters A and B, respectively. This conduit is set on a firm  
40 level bottom in the center of the track, the top being flush with the roadway, and the flange on the under side is for the purpose of rendering the conduit immovable, and it may be spiked to the cross-ties of the railway in  
45 order to further effect this object or additionally secured in any desired manner. The conduit consists of sections about ten feet long (or more or less, if convenient) and are joined together with an iron shoe or by fish-plates,  
50 or by both, making a continuous iron trench, and at proper intervals provision is made for drainage purposes in the usual manner.

The iron frame C, which is shown in Fig. 5,

is placed crosswise in the conduit at regular intervals and bolted to the side thereof, and  
55 about three inches from the bottom of the frame is an iron bar, to which is bolted the wooden shank of the insulator E. The top of the frame is turned inward, so as to provide a support for the cover of the conduit,  
60 the half of which, being the covering for one side of the conduit, is shown in Fig. 7 and designated by the letter *a*. The other side of the conduit has a similar covering and the  
65 usual slot is formed between the two, and the covers are bolted or keyed to the cross-frame C.

The insulator E, Fig. 5, is formed of glass or other suitable material similar in shape to those used on telegraph-lines, with a hollow  
70 bell-shaped formation underneath, and having a slot across the top into which fits a flat metal conductor I, projecting above the top of the insulator, and this conductor may be and preferably is beveled on the upper side,  
75 so that dirt cannot accumulate on its upper edge.

A bar of metal F is suitably connected within the car and extends through the bottom thereof into the slot of the roadway or con-  
80 duit, and is for clearing the slot of obstructions, and also serves as a part of the trolley-guard.

G represents a fork or bar of steel called the "trolley-guard" (shown in detail in Fig. 3)  
85 and provided with a slot *g*, the inner part of which is of less width than the slot in the conduit. It is pivotally attached to the bar F by a spindle *g'* and is movable upward and kept pressed downward by a spring *g''*. The con-  
90 tact-wheel I shown in Fig. 6 is placed in the wider part of the trolley-guard slot, and its lower part rides in the roadway or conduit-slot. It is made of two disks of tempered steel with a washer of india-rubber between  
95 and a spindle in the center, which is screwed up until the wheel fits in the roadway-slot. This gives it a slight expansion at the extreme edge of the wheel, and as it passes along it not only makes the necessary contact for  
100 the return current, but also keeps the sides of the road-slot in good condition for making an electrical contact by cutting away the rust and dirt from the sides of the slot.

The trolley-support *h* is made of ebonite or  
105 vulcanite or other suitable non-conducting



substance and passes between the slot of the trolley-guard G. It is hollow or bell-shaped at the lower end, so as to provide the necessary insulation for the trolley-wheel, and is provided with a central bore through which passes the conductor, which contacts with the trolley.

The trolley-wheel is of metal and rides on the upper side of the conduit-conductor D, and thus the current comes from the generator along the conductor to the motor by means of the wire-conductor within the trolley, and after passing the motor through parts F G I goes to earth through the conduit in the usual manner.

The trolley-support h is pivotally connected with the car, and the trolley held down or in contact with the underground-conductor D by a spring or in any desired manner.

It will be readily seen that the trolley-support cannot possibly touch the side of the roadway or conduit slot. The slot g in the trolley-guard being of less width than the roadway or conduit slot and placed exactly in the center of the bar F, keeps it under all circumstances clear of the roadway-slot. It will likewise be observed that this system is absolutely safe, because the conduit is in direct contact with earth throughout its whole length, and any derangement of the conductor can only cause a contact with the metal work of the conduit, which makes perfect earth connection, and therefore no damage could result to life or property, the current being rendered harmless by its contact with the earth.

I am aware that glass insulators have been devised for the purpose herein set forth, and do not regard such devices broadly as of my invention, the construction of which is materially different from the devices heretofore known.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an underground system of electric railways, a rectangular metal slotted conduit, having a continuous flange or flanges on the base thereof, and a removable cover in which the slot is formed, in combination with the removable iron cross frame adapted to support the underground conductor and the removable cover, substantially as shown and described.

2. In an underground system of electric railways, a rectangular metal slotted conduit, having a continuous flange or flanges, formed on the base thereof, and a removable cover, in combination with the removable iron cross frame, and a conductor supported thereby, and properly insulated, said cross frame being also adapted to support the removable cover, substantially as shown and described.

3. In an underground system of electric railways, a metal conduit in combination with

a removable metal cross frame, a slotted insulator supported therein, and a flat conductor supported in the slot of the insulator, said cross frame being also adapted to support the cover of the conduit, substantially as shown and described.

4. In an underground trolley system of electrical railways, the combination, with a car, of a trolley guard connected with the car and adapted to travel along the slot of the underground conduit, said guard being provided with a slot through which passes the trolley support, substantially as shown and described.

5. In an underground trolley system, of electrical railways, the combination, with a car, of a trolley guard pivotally connected with the car, and supported by a bar projecting into the conduit slot, said guard being provided with a slot through which the trolley support passes, substantially as shown and described.

6. In an underground trolley system of electric railways, the combination, with a car, of a trolley guard pivotally connected with the car and supported by a bar projecting into the conduit slot, said guard being provided with a slot of less width than the conduit slot through which passes the trolley support, said guard being also provided with a wheel pivoted in the end thereof and adapted to travel in the conduit slot, substantially as shown and described.

7. In an underground trolley system of electric railways, the combination, with a car, of a trolley support through which passes the trolley conductor, said support being formed of non-conducting material and provided at its lower end with a hollow bell-shaped portion or formation, in which is located the trolley, substantially as shown and described.

8. In an underground trolley system of electric railways, the combination, with the car, of a cleaner adapted to travel in a slot of the conduit, a trolley guard connected therewith, a wheel connected with said guard and also adapted to travel in said slot, and a trolley support passing through said guard, composed of insulating material and provided on its lower end with a bell-shaped portion in which is located the trolley, substantially as shown and described.

9. In an underground trolley system of electric railways, a rectangular metal conduit, in combination with a removable iron cross frame, located therein, and adapted to support a removable conduit cover, which is secured thereto, and an insulated conductor supported by said frame, substantially as shown and described.

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Witnesses:

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