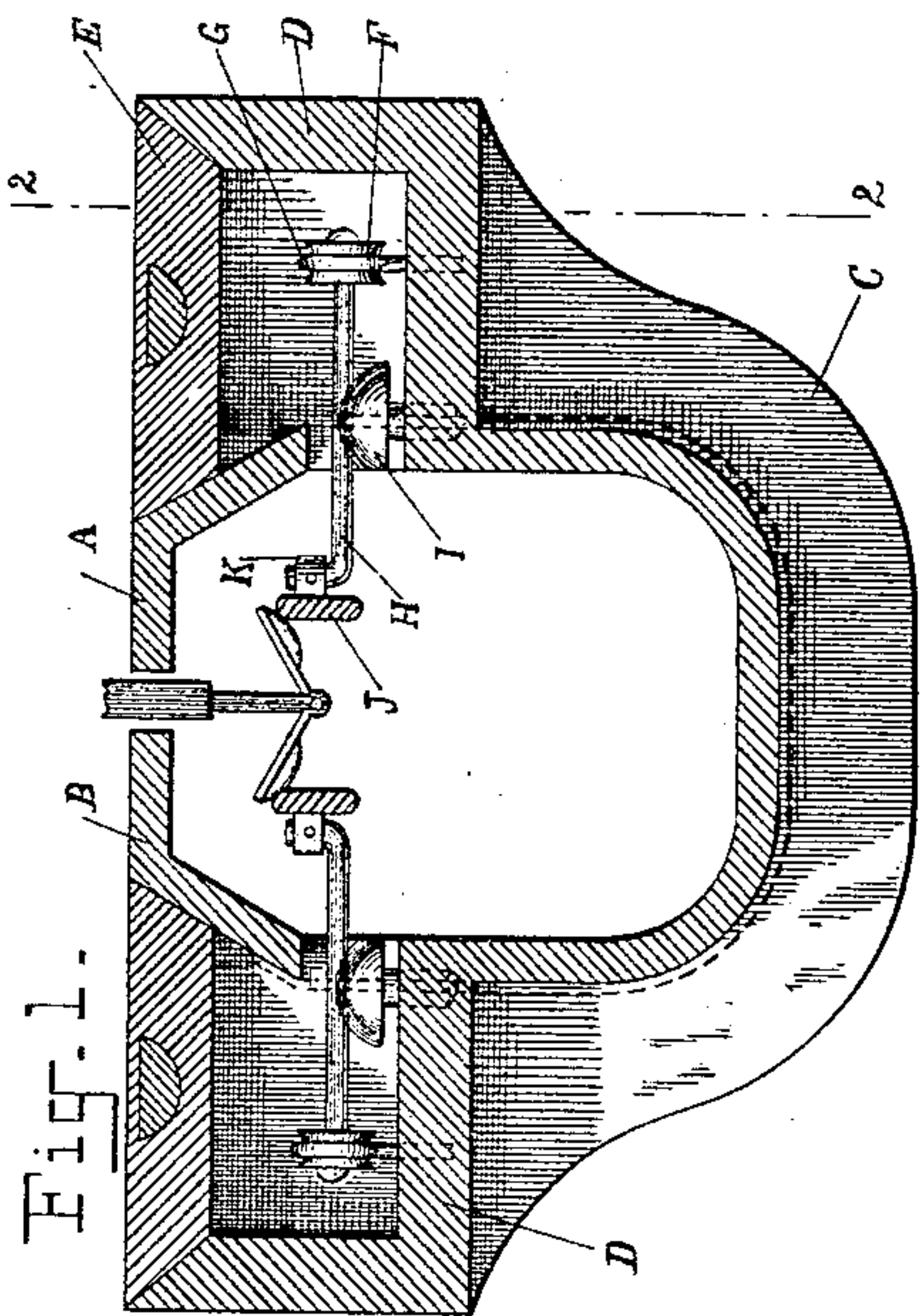
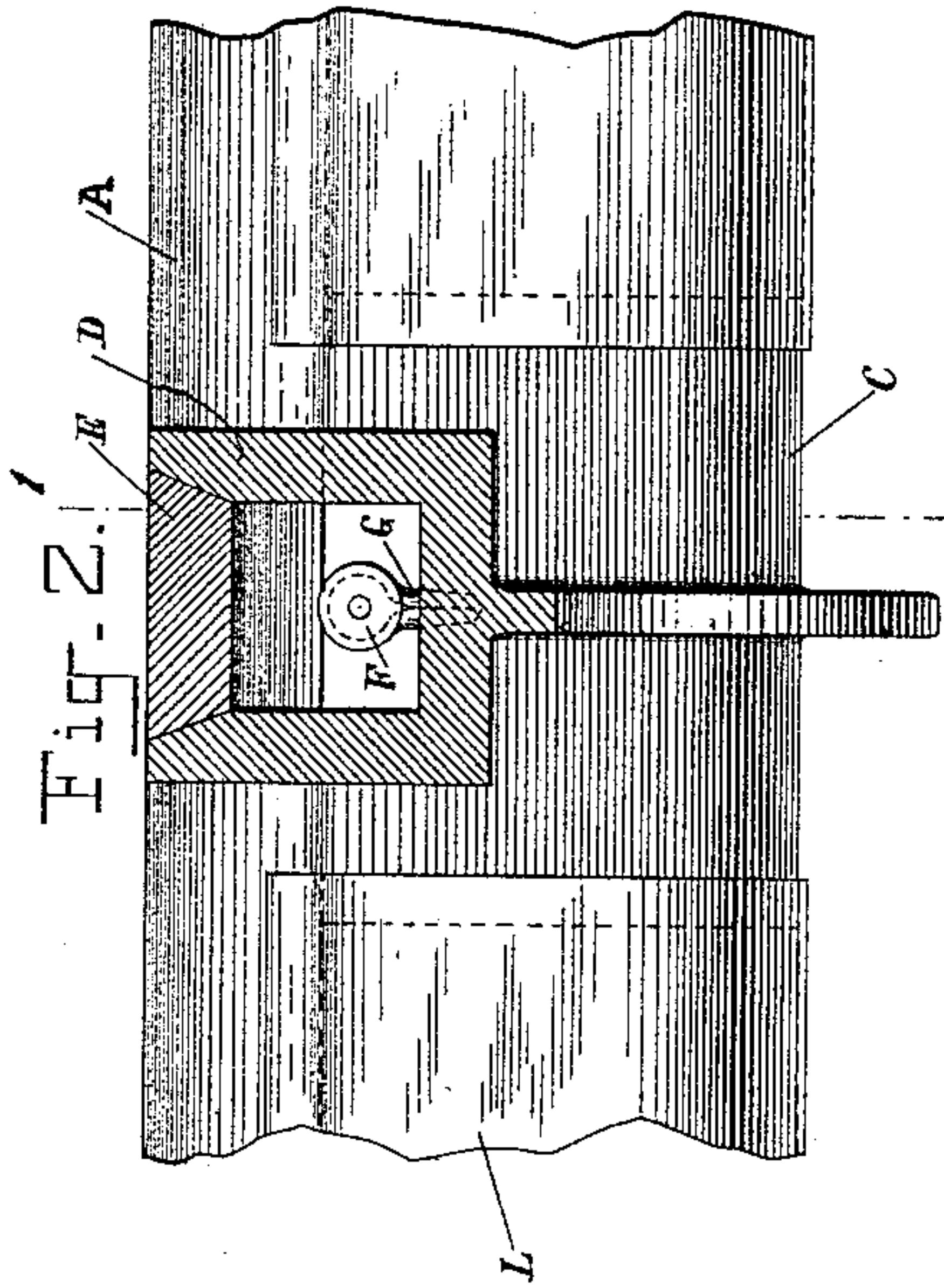


(No Model.)

E. M. BENTLEY.  
ELECTRIC RAILWAY.

No. 389,279.

Patented Sept. 11, 1888.



Witnesses.  
*John F. Nelson.*  
*Edward S. McKinney*

Fig. 1.

Fig. 2.

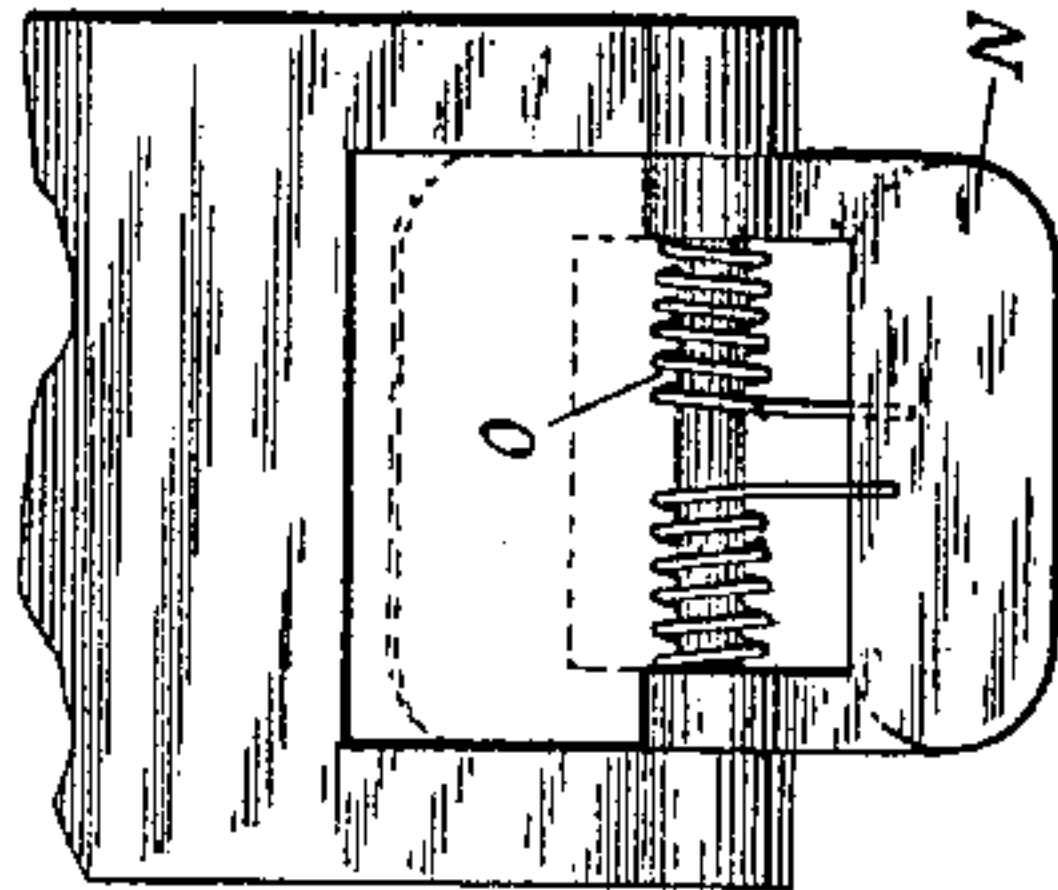


Fig. 3.

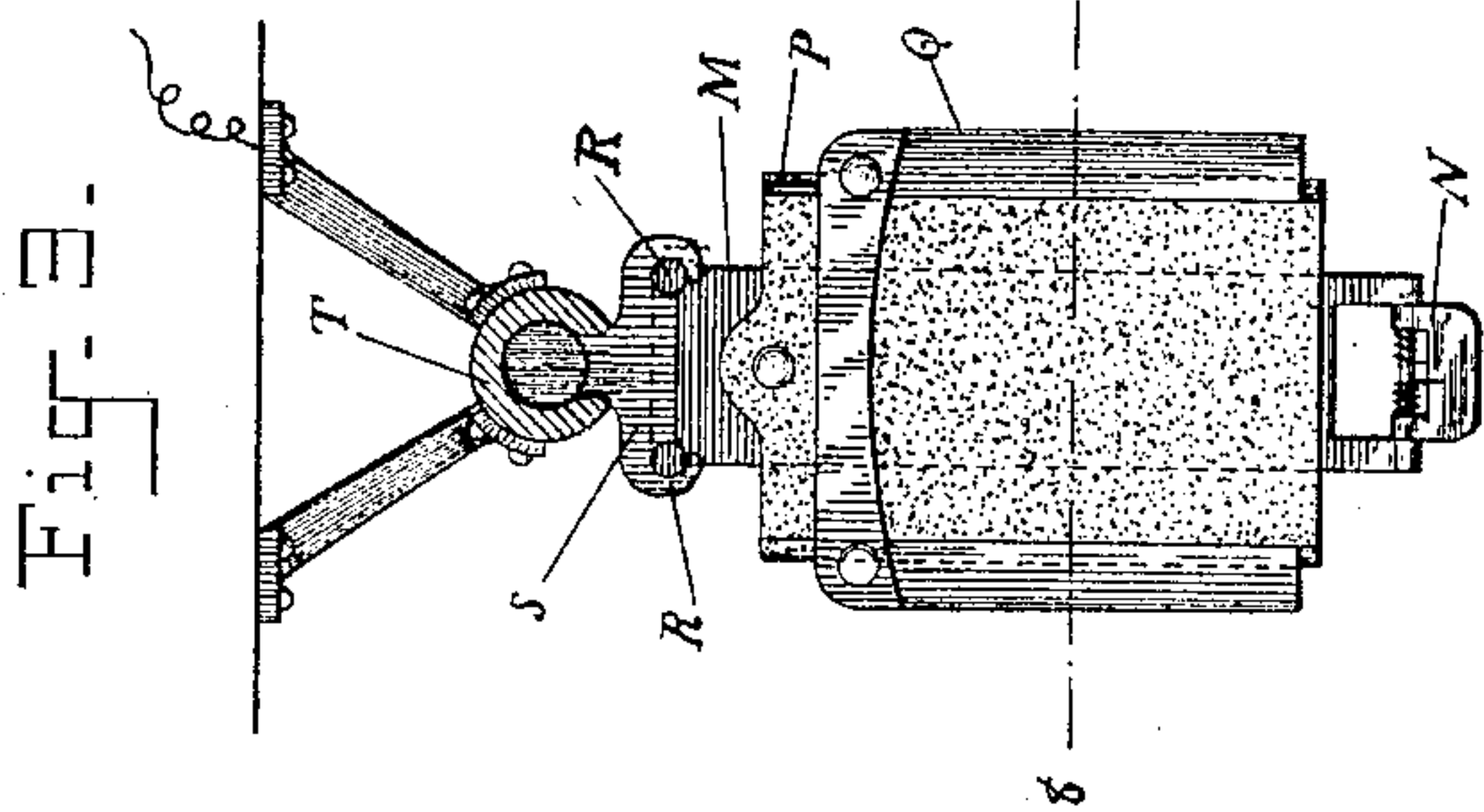
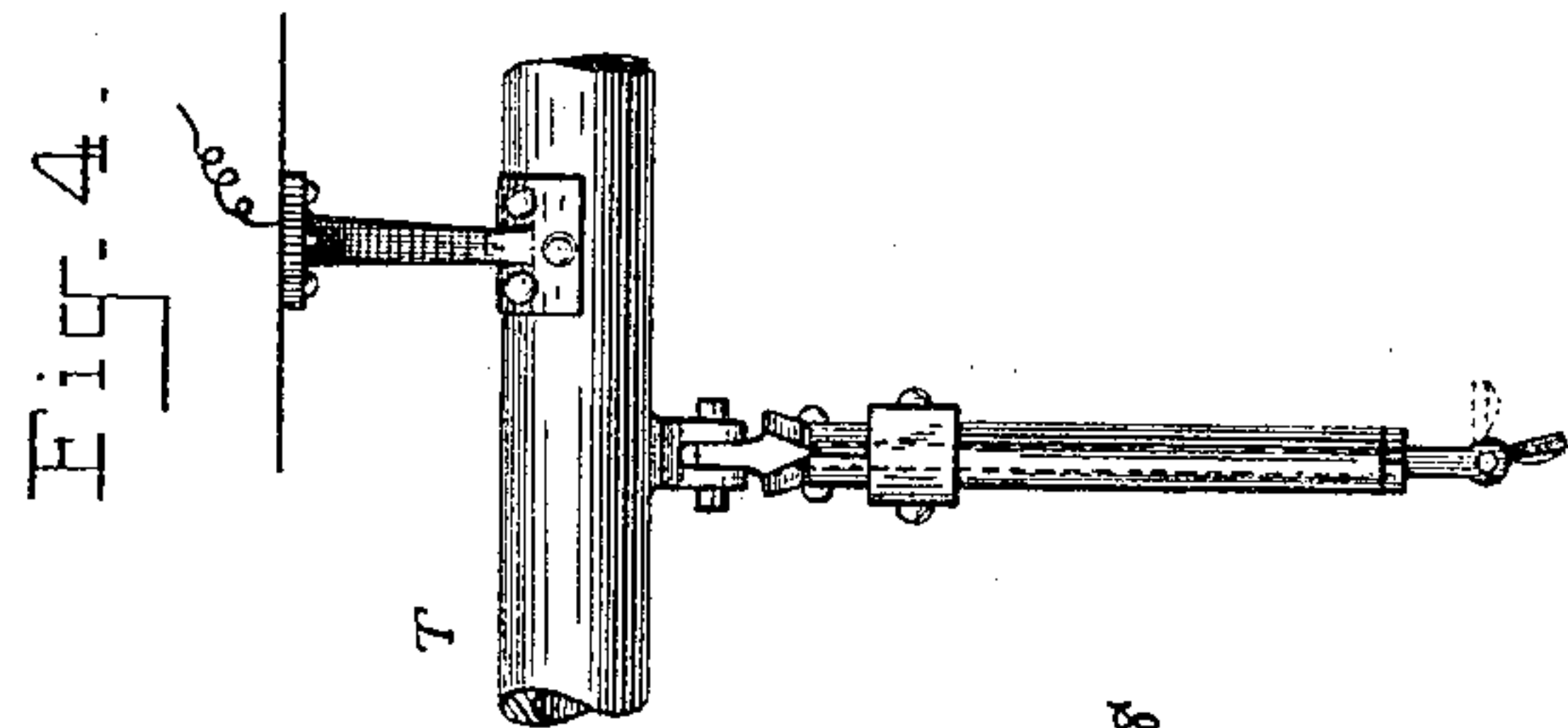


Fig. 5.

Fig. 6.

Fig. 7.

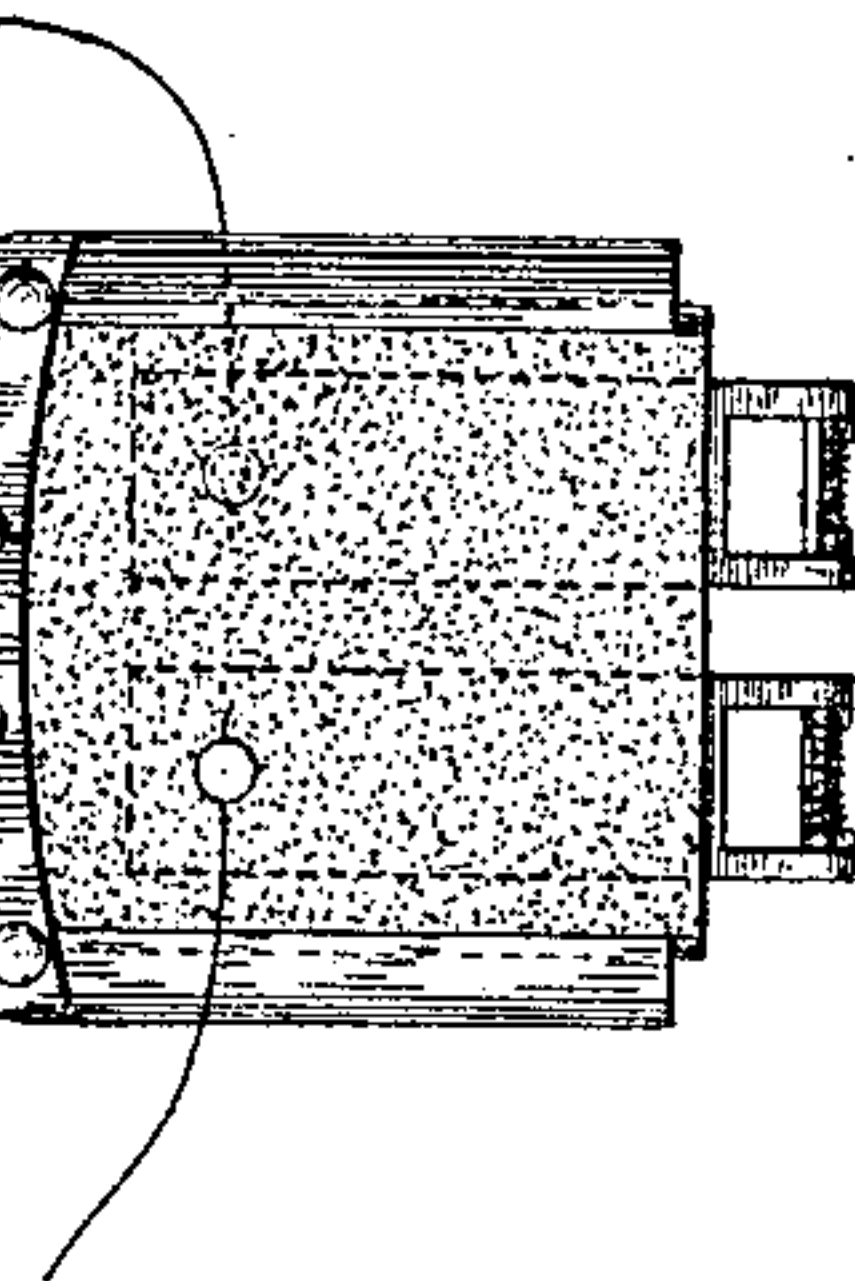


Fig. 8.

Inventor.

*Edward M. Bentley.*  
*by Bentley & Knight.*  
*Atty's.*



# UNITED STATES PATENT OFFICE.

EDWARD M. BENTLEY, OF NEW YORK, N. Y.

## ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 389,279, dated September 11, 1888.

Application filed August 3, 1888. Serial No. 281,884. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD M. BENTLEY, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Electric Railways, of which the following is a specification.

My invention relates to electric railways; and it consists in certain new and useful features of construction in the slotted conduit containing one or more supply-conductors for a railway, and also in a new and useful form of contact device to extend into the slot of a conduit and connect with the supply conductor or conductors inclosed therein.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a transverse section of a conduit on the line 1 1, Fig. 2. Fig. 2 is a longitudinal section on the line 2 2 of Fig. 1. Fig. 3 is a side elevation of my contact device with a transverse guide therefor in section. Fig. 4 is an end elevation of the said contact device. Fig. 5 is a side elevation of a contact device in which two insulated conductors are employed. Figs. 6 and 7 are enlarged details of the contact-piece. Fig. 8 is a transverse section on the line 8 8 of Fig. 3. Fig. 9 is a detail view of the insulator.

The main feature of my new conduit consists in a yoke adapted to support the slot rails and form with them the main skeleton of the conduit, the yoke having on one or both of its upper ends an enlargement reaching to the surface of the road-bed and hollowed out to form an inclosure for the insulator. This box has a removable cover accessible from the surface of the roadway, and within it is supported one or more insulators, from which a rod extends beneath the slot rail into the conduit and carries at its extremity the main conductor.

The contact device or plow which I have devised is an improvement upon the plow of the general type shown in Patent No. 338,175, issued to Walter H. Knight, March 16, 1886.

The two main features of the contact device are, first, that the conductor, extending into the conduit, forms in itself a main supporting-shank, the insulation and the guard being attached to it independently of the main

support from which the whole device is hung; second, that the contact-shoes pivoted to the lower end of the conducting-shank have a spring-hinge normally holding the shoes out at substantially a right angle to the shank, so that when inserted in the conduit the shoe will bear down upon the upper edge of the main conductor instead of on the lower edge of the conductor with an upward spring-pressure, as is the case in the said patent. While the contact-shoe is normally held out by the spring in a horizontal position, it can be turned in either direction against the force of the spring, so as to be folded up into the shank or bent down vertically into line with the shank. By this arrangement the plow can be readily inserted or withdrawn through the slot of the conduit at any point, the shoe folding up into the shank when the plow is inserted and bending down into line with the shank when the plow is withdrawn.

Referring, now, to the drawings, A and B represent two slot-irons of a conduit in the form of an obtuse angle-iron.

C is the yoke, adapted to be placed at intervals and support the slot-rails A and B. The two ends of yoke C are enlarged into box D, which extends to the surface of the roadway, where they have removable covers E. In box D is a ring-insulator, F, supported in an eye, G. Through the center of F extends a rod, H, which has a second bearing in a notch on the top of insulator I.

J is the main conductor, having a loop, K, behind, which fits over the bent end of rod H. The rod H, having a slight lateral movement in the notch of insulator I, permits of compensation for any expansion or contraction which may take place in conductor K by reason of variations in temperature.

L represents a sheet-iron bottom which fills out the conduit between successive yokes C.

It will be readily apprehended that by the construction described each insulator along the line will be easy of access from the street by the removal of cover E. Since the rod H, carrying conductor J, extends from within box B beneath the slot-iron A, the latter can also be readily removed without any interference with the conductor or the insulator.

Referring, now, to the contact device, M rep-



resents a conducting-shank, of steel or other metal, forked at its lower end and having the contact-shoe N pivoted in the fork and provided with a spring, O, normally holding it in a horizontal position, as shown by the dotted lines in Fig. 4.

P is an insulating-sheath surrounding shank M and bolted thereto.

Q is a guard adapted to embrace insulation P and be bolted or riveted thereto. At its upper end shank M is provided with transverse pins R R, which engage with openings on a sliding head, S, adapted to move in hollow transverse guide T, bolted to the vehicle.

In Fig. 5, where two conductors are employed in the contact device, they are insulated from each other and from the frame, while the whole device is suspended by a piece corresponding to the shank M of Fig. 3, this piece having a sliding head engaging with the guide and performing the same functions as does the traveler in the device previously described.

It will be readily seen that the device described may be readily inserted or withdrawn through the slot of the conduit, and when in place the contact-shoe will bear down upon the upper edge of the conductor J, as is shown in Fig. 1. When the plow is to be inserted, the shank is simply pushed through the slot, the contact-shoe automatically folding up, as shown in dotted lines in Fig. 7, into the fork of the shank. After passing through the slot, the shoe springs out until it strikes the conductor, as seen in Fig. 1. To withdraw the plow, it is simply pulled upward, when the shoes strike the under edge of the slot and are bent down, as shown in the full lines of Fig. 7, until they are in line with the shank and pass through the slot without difficulty. It will also be seen that as the main conducting-shank M passes directly up to engage with the transverse guide T the current is to be taken off from the guide, and the usual flexible connection now employed to connect with the plow as it moves from side to side may be dispensed with, which is a feature of much practical value.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an electric-railway conduit, a transverse yoke supporting a slot-rail and having a box or pocket at its upper end, in which is the insulator for the supply-conductor.

2. In an electric railway, the combination, with a slot-rail, of a transverse yoke having a box or pocket near its upper end, and an insulator therein provided with an extension into the conduit, from which the supply-conductor is supported.

3. The combination, in a conduit for an electric railway, of a transverse yoke having a box or pocket near its upper end, a slot-rail on said yoke, an insulator in said box, and a projection therefrom extending beneath the slot-rail into the conduit and supporting the supply-conductor.

4. In a conduit for an electric railway, the combination of a slot-rail, a box outside of the slot-rail, an insulator in said box, and a projection therefrom extending beneath the slot-rail into the conduit and carrying the supply-conductor.

5. In an electric railway conduit, the combination, with a slot-rail, of an outside box extending to the surface of the roadway having a removable cover, an insulator therein, and a projection from the said insulator extending into the conduit beneath the slot-rail and carrying the supply-conductor.

6. A yoke for an electric-railway conduit having a box at its upper end flush with the surface of the roadway and provided with a removable cover.

7. In a conduit for an electric railway, the combination, with a slot-rail, of an outside box, an insulator therein, and an extension from said insulator projecting into the conduit to carry the supply-conductor and held loosely within the box to permit expansion and contraction of the conductor attached to its inner end.

8. In a conduit for an electric railway, the combination, with a transverse yoke, of an angular slot-rail supported thereon, a box in said yoke, an insulator within said box, and a projection therefrom extending into the conduit and carrying the supply-conductor.

9. In a conduit for an electric railway, the combination, with an angular slot-rail, of a transverse yoke having a box, an insulator in said box, a projection therefrom extending into the conduit and carrying the supply-conductor, and a contact device bearing upon the upper part of said conductor.

10. The combination, in an electric railway, of a slot-rail, a yoke or substructure supporting the same, a horizontal insulating device extending from said substructure and carrying the supply-conductor, and a contact device extending into the conduit and bearing on the upper part of the supply-conductor.

11. In an electric railway, the combination, with a slot-rail, of a transverse yoke, a box in said yoke, an insulator therein, and a metallic projection extending from said insulator into the conduit and attached to the back of the supply-conductor.

12. In a contact device for an electric railway, the combination of a protected insulated conductor extending through the slot of a conduit, having a contact device at its lower end and at its upper end a sliding head engaging with a transverse guide, from which the current is led to the propelling-motor.

13. In a contact device for an electric railway, the combination, with an insulated conductor extending through the slotted conduit, of a protecting-guard attached thereto and supported thereby and a support for the said contact device attached to the conductor at a point above the said guard.

14. In a contact device for an electric railway, the combination, with a protected con-



ductor extending through the slot of a conduit, of a contact device at its lower end bearing on the upper side of the supply-conductor and made thinner than the width of the slot, 5 so as to be withdrawn therethrough.

15. In a contact device for an electric railway, the combination, with a forked shank extending into the conduit, of a contact de-

vice pivoted in said fork, thinner than the width of the slot, and provided with a spring 10 holding it normally at an angle to the said shank.

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