

(No Model.)

J. JACKSON.
METHOD OF ELECTRICAL PROPULSION FOR STREET OR OTHER CARS.
No. 553,529.

Patented Jan. 28, 1896.

Fig. 1.

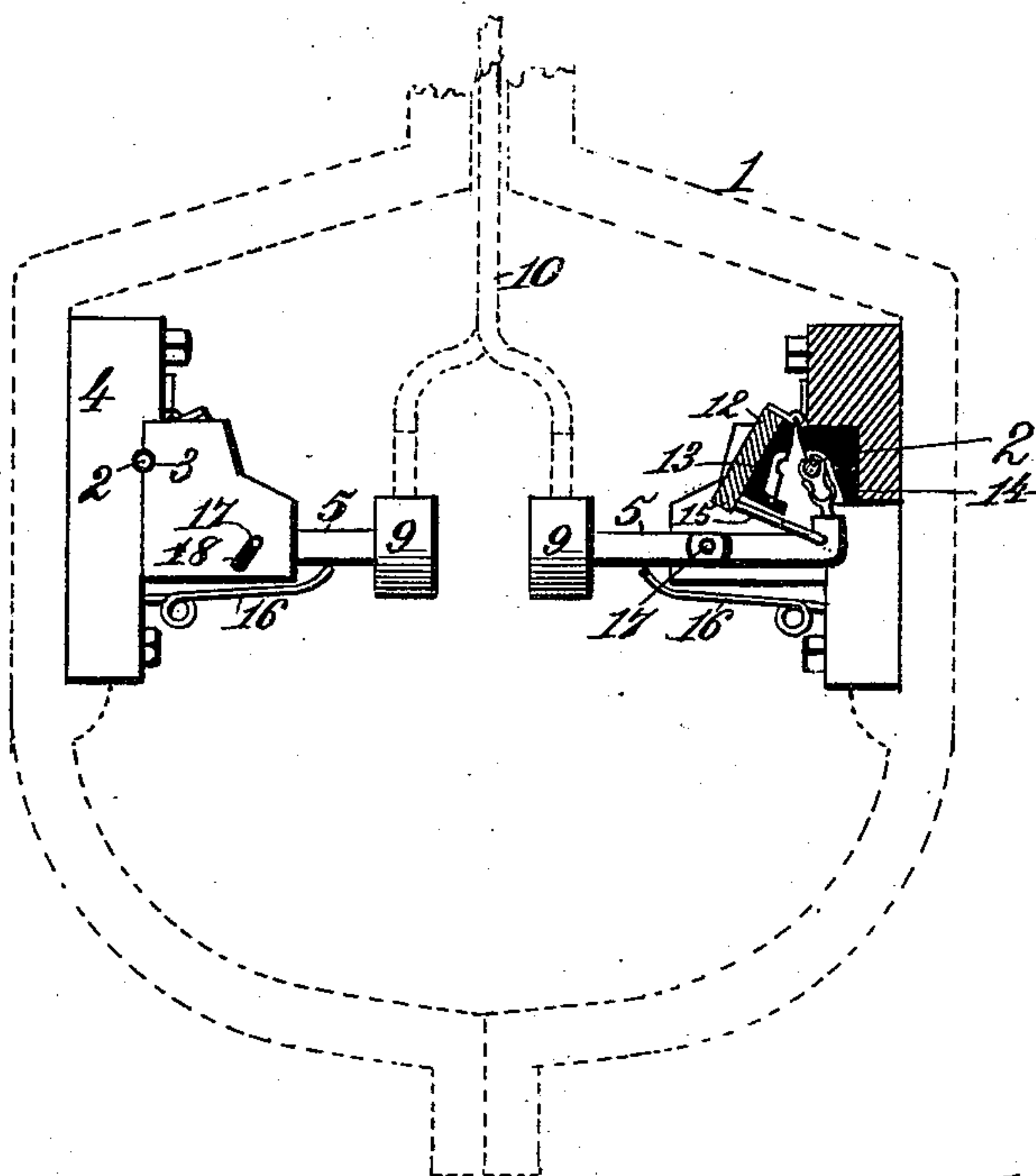


Fig. 2.

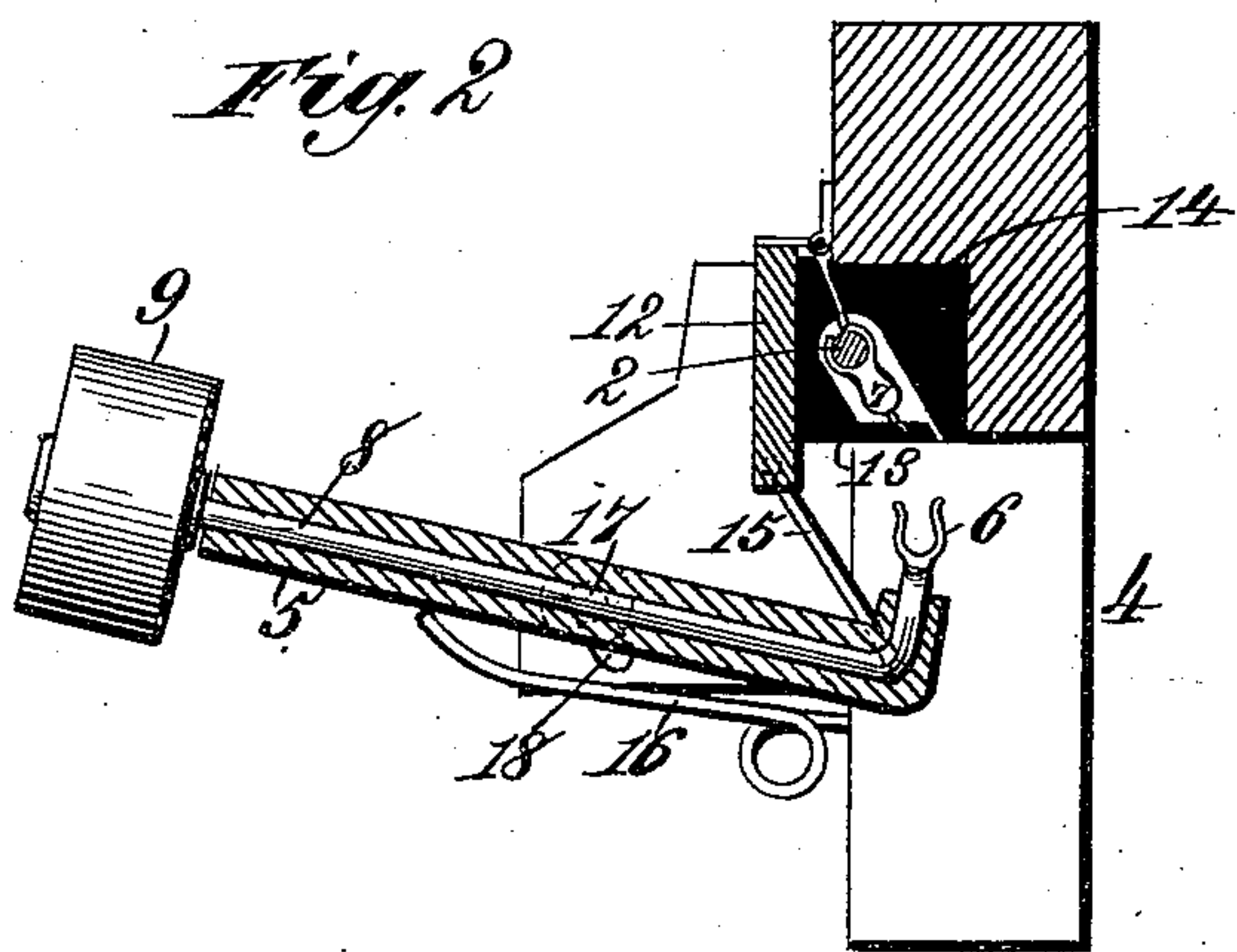


Fig. 3.

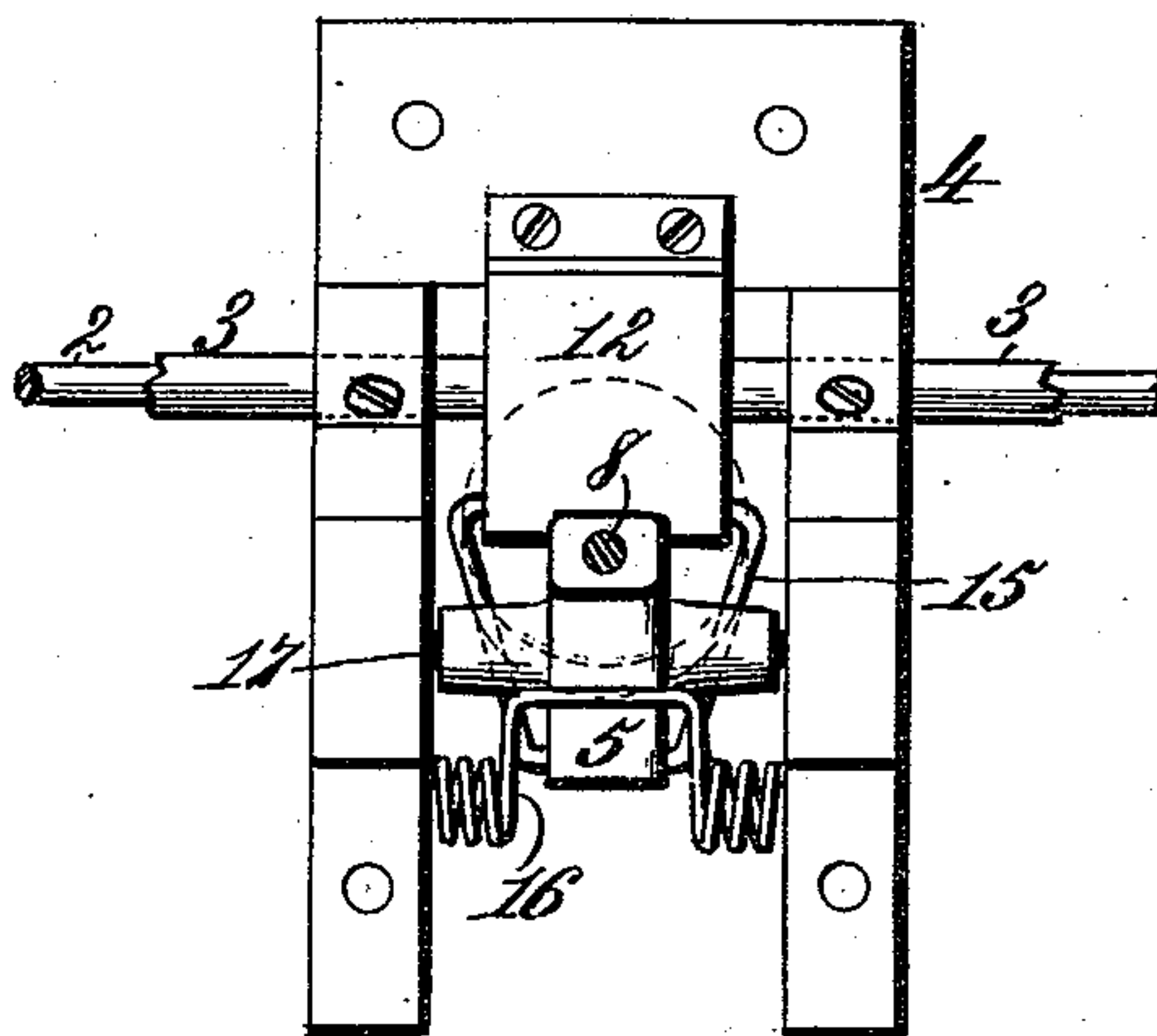


Fig. 4.

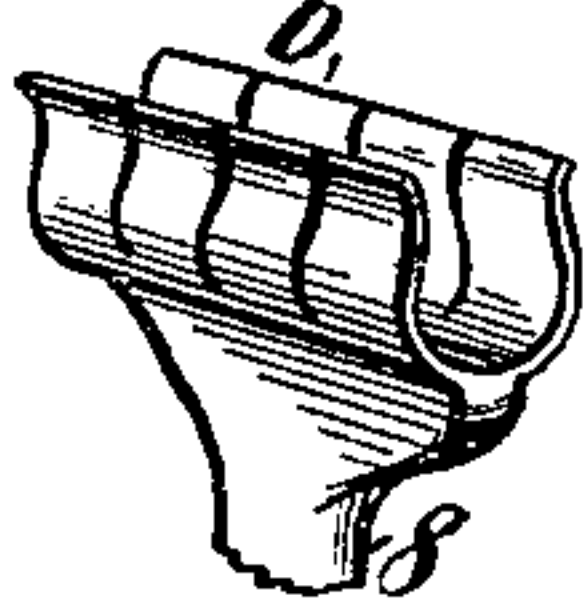


Fig. 5.

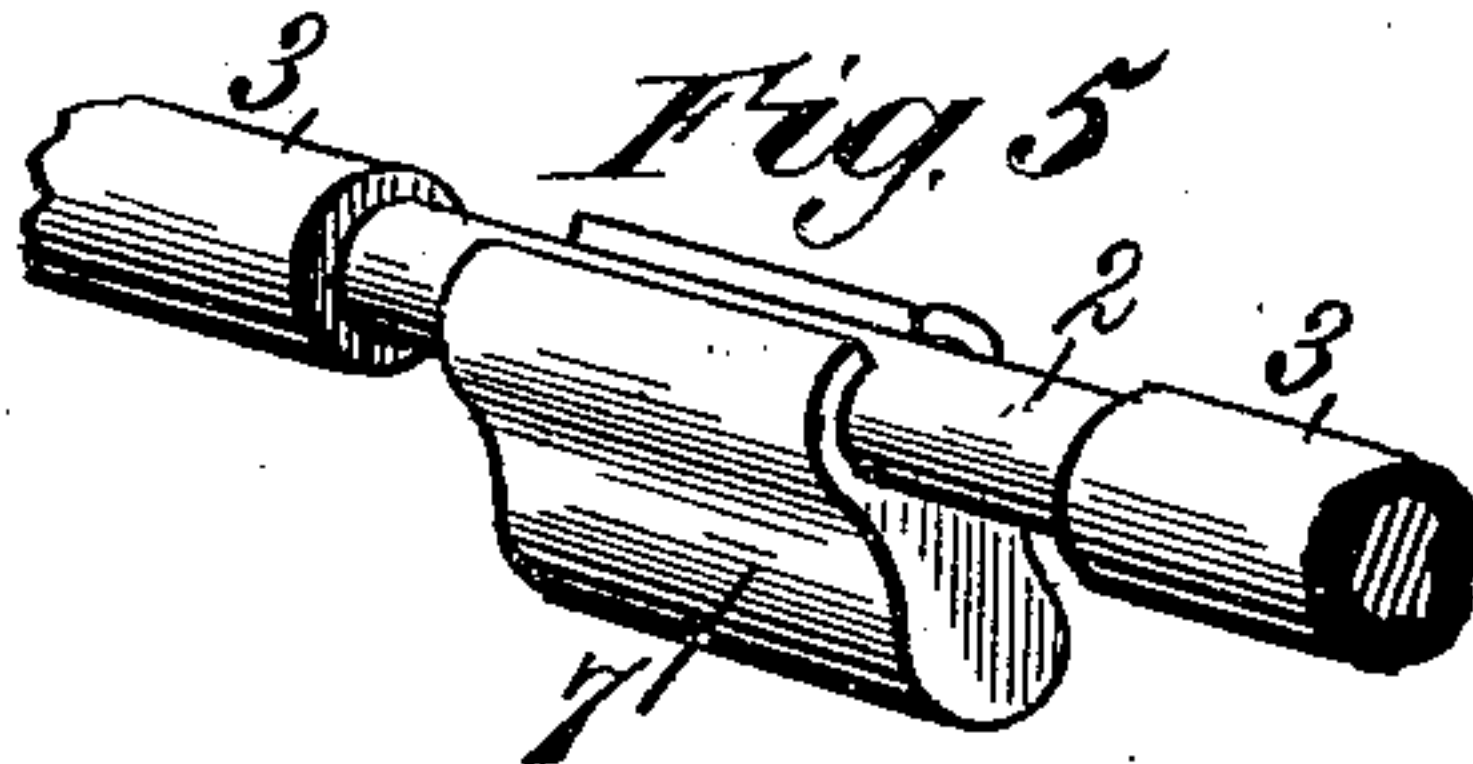
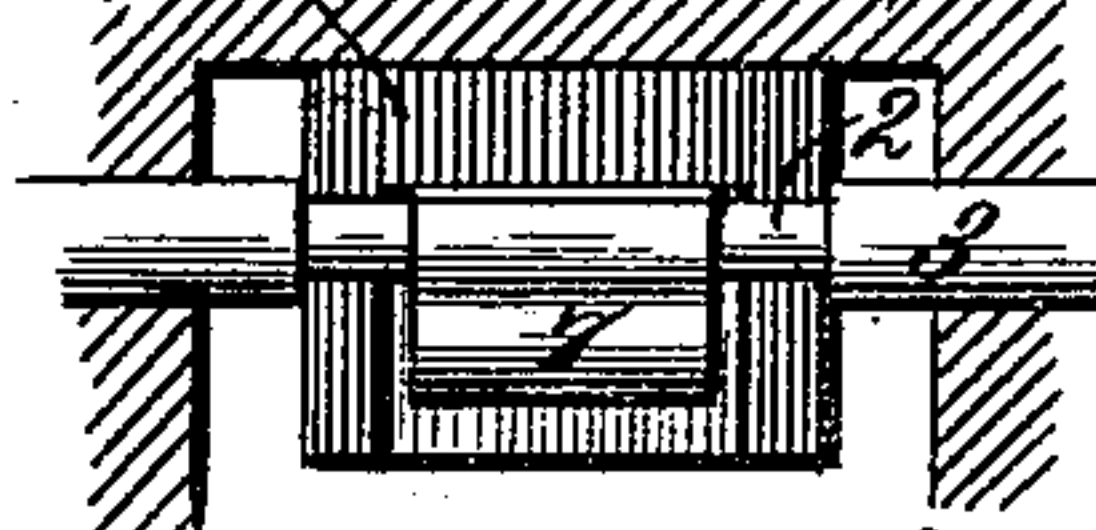


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN JACKSON, OF CLINTON, IOWA.

METHOD OF ELECTRICAL PROPULSION FOR STREET OR OTHER CARS.

SPECIFICATION forming part of Letters Patent No. 553,529, dated January 28, 1896.

Application filed November 10, 1893. Serial No. 490,511. (No model.)

To all whom it may concern:

Be it known that I, JOHN JACKSON, a citizen of the United States, residing at Clinton, in the county of Clinton and State of Iowa, have invented certain new and useful Improvements in Methods of Electrical Propulsion for Street or other Railway Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain improvements in methods of electrical propulsion for street-railway cars and other purposes; and the object thereof is to provide a simple and economical construction and combination of parts whereby the leakage or waste of current due to long lengths of unprotected or uninsulated conductors shall be practically avoided, and whereby current may be taken from a main conductor at a series of distributing-stations or supply-points through contacts which are normally open.

It is a further purpose of my invention to largely reduce the cost of installation, to prevent the burning, blistering, or corrosion of the contacts which are periodically brought into contact with the main conductors, and to provide means whereby injury of this kind may be remedied without replacing the line-wire or main conductors.

It is my purpose, in other words, to provide a system of electrical supply for the motors of street-railway cars in which the expense of providing a continuous conduit adapted for the passage of the moving contact device on the car, with its proper adjuncts, shall be in great measure avoided, and whereby the main conductor or line-wire may be wholly insulated throughout its entire length, the insulation being opened at suitable intervals in order to supply the current required to the motors of cars passing over the line of road. It is my purpose, in this connection, to provide the main conductor with removable or detachable contacts, which may, from time to time, be renewed if necessary, and by which any corrosion produced by the formation of the voltaic arc at the point of contact may be easily and readily repaired without involving the main conductor or requiring any repair of the same.

My invention consists, to the end specified, in the several novel features of construction and new combinations of parts hereinafter fully described, and then more particularly pointed out in the claims forming part of this specification.

To enable others skilled in the art to which my invention pertains to fully understand and to make, construct, and use the same, I will now proceed to describe said invention in detail, reference being had for this purpose to the accompanying drawings, in which—

Figure 1 is a view, in vertical transverse section, showing the application of my invention to a line of electric railroad of any known or preferred construction. Fig. 2 is a view in vertical section transverse to the line of the main wire, and taken centrally through the main feeder, constructed in accordance with my invention. Fig. 3 is a detail front elevation of the parts shown in Figs. 1 and 2. Fig. 4 is a detail construction, showing the brush or movable contact forming part of the apparatus shown in the preceding figures. Fig. 5 is a detail construction showing the removable and replaceable contact-piece clamped upon or otherwise attached to the main conductor. Fig. 6 is a detail section taken in a transverse plane in Fig. 2, showing the rearward portion of the opening and closing insulation of the main conductor.

In the said drawings, the reference-numeral 1 indicates the conduit in which the main line wire or conductor is laid, this conduit or subway being shown in Fig. 1 in dotted lines. The conduit may be of any suitable form or construction, and one advantage of my invention is that the expense of the installation may in this respect be largely reduced.

The numeral 2 indicates the main conductor or line-wire, which is provided, as shown in Figs. 3, 5 and 6, with a heavy insulation, (indicated by the numeral 3,) this insulation being practically coextensive with the length of the wire.

At suitable points along the line of the road I locate feeders for the motor upon the cars, the interval or distance between these feeders being preferably somewhat less than the length of the car, or less than the length of the plow or contact-bar which is brought in contact therewith.

The feeder, which constitutes one essential feature of my invention, consists of the following parts: Upon a bracket 4, which is bolted or otherwise attached to either side of the subway or conduit, is pivotally mounted a lever 5, which carries upon one end a split contact 6 formed of conducting material and having such construction that it is adapted to straddle either the wire or main conductor 2, or, preferably, a removable or detachable block or contact-piece 7 formed of any suitable conducting metal and either clamped upon the main-line wire or secured thereto in electrical contact therewith in any suitable manner, the shape of this contact 7 being such that it will readily enter between the forked or divided end of the split contact 6 and take current from both sides of the latter through a lateral conductor 8, which extends through the body of the lever 5 and has electrical connection with a friction-pulley or friction-wheel 9 placed in such position in the subway 1 that it may be engaged by the plow or the contact-bar 10, which depends through a suitable surface opening, as shown in Fig. 1. I usually construct the plow 10 of a length equal to that of the car, though it may vary from these proportions to any desirable extent; but in all cases I arrange the lateral feeders described at successive points in the subway at such intervals of separation that the contact-plow will engage with one in advance before it has entirely passed off from the feeder in the rear.

As the main conductor 2 is necessarily exposed at the several points where contact is made through the lateral conductors 8, I provide means whereby the line-wire shall at these points be protected against loss by leakage or from any other cause by the following means:

Upon the front of the bracket 4 is hinged or otherwise attached a covering-piece 12 having upon its inner face an insulating shield or covering 13. This insulating-piece partly incloses the main-line wire 2 and extends beneath the lower ends of the removable contact-piece 7, its edges abutting against an insulating-block 14 within the body of the bracket, and thereby fully inclosing the exposed portions of the main-line wire and the contact-piece mounted thereon. To the covering-piece 12 is pivotally connected an arm 15, having connection also with the end of the lever 5, the arrangement being such that as the plow 10 engages with the friction-wheel 9, thereby depressing the end of the lever 5, the covering-piece 12 will be thrown in such direction upon its hinged attachment as to open an entrance for the split contact-piece 6, which is thereby enabled to engage with the contact-piece 7. As the covering-piece 12 is controlled in its movement by the action of the lever 5, it will be both opened and closed by the fall and rise of that end of said lever which carries the friction-roll 9, thereby opening the main-line wire for communication of

current to the lateral feeder 8 and closing the said lever the moment that current ceases to flow to the motor upon the car.

The lever 5 is normally sustained in the position shown in Fig. 2, out of circuit with the main line 2 by means of a spring 16 of any suitable kind, and in case irregularities in the road, or other causes, should lead to the unequal depression of the friction-roll 9 upon the end of the lever 5, whereby the exposed end of such lever may require to be depressed beyond the point at which complete contact is made between the split contact 6 and contact-piece 7, provision is made for permitting further depression of the outer end of the lever 5 by any suitable means—such, for example, as mounting the ends of the fulcrum-pin 17 in slots 18 formed in the bracket 4 and permitting a limited vertical movement of the fulcrum of each lever against the tension of the spring 16.

I prefer to slit the contact 6 in the manner shown in Fig. 4, after the manner shown in construction of the brushes for taking up the electric currents in generators. I have shown the contact-piece 7 as being merely clamped or pinched upon the main conductor 2, since I regard this the simplest and most economical form of construction. I may however attach said contact-piece by any other preferred means, or in any manner known in the art, the sole purpose being to render the same easily and readily detachable in case of the formation of a voltaic arc at the point of contact should in time injure or destroy the contact-piece, the main purpose of the latter being to remove from the main-line wire all injury resulting from such cause and transferring the same to a part which may be easily and readily replaced without material expense.

By my invention it will readily be seen that the initial cost of installation may be largely decreased, inasmuch as I am able to dispense in great measure with the continuous subway or conduit for containing the denuded wires and require only a sufficient underground space to permit the passage of the plow or contact-bar with feeders of the kind described interposed at intervals along the line. By my invention also I afford complete insulation to the main conductor throughout its entire length and at the points where the current is supplied, these points being opened momentarily at the instant of the passage of the car, and being closed by an effective insulation at all other times, thereby fully preventing the waste or leakage of current which has heretofore proved an essential objection in the operation of electric railways.

What I claim is—

1. In an electric railway, the combination with a main line conductor, and a plurality of contact devices disposed at intervals along the conductor, said conductor being provided with denuded sections opposite each contact device, and housings of insulating material

which completely cover the denuded portions of the conductor and which embrace movable parts or sections adapted to be moved out of the path of the movable parts of the contact devices to permit the approach of the same to the denuded portions of the conductor, substantially as described.

2. In an electric railway, the combination with a main line conductor consisting of a continuous strand or wire, and a plurality of contact devices disposed at intervals along the conductor, said conductor being provided with denuded sections opposite each contact device, and housings of insulating material completely covering the denuded portions of the conductor and embracing movable parts or sections adapted to be moved out of the path of the movable parts of the contact devices to permit the approach of the same to the denuded portions of the conductor, and detachable contact pieces secured to the denuded portions of said continuous strand or wire within the said housings, substantially as described.

3. In an electric railway, the combination with a main line conductor having at intervals denuded portions surrounded by insulated housings, parts of which are movable, and contact devices embracing movable parts adapted to be engaged by a shoe on the car, and to be thereby brought into electrical connection with the denuded portions of the main conductor, and connections between said moving parts of the contact device and the movable sections of the inclosing housings, whereby such movable sections of the housings will be opened to permit the approach of the movable parts of the contact devices to the main conductor, substantially as described.

4. In an electric railway, the combination with an insulated main line conductor provided with denuded portions at intervals, of

movable contact devices embracing levers having movable fulcrums, and each of which is provided at one end with a contact device adapted to engage the main conductor, and at its opposite end with means for engaging a shoe or contact pieces connected with the car, substantially as described.

5. In an electric railway, the combination with an insulated main line conductor provided with denuded portions at intervals and with insulating housings inclosing the denuded portions of the conductor, and having movable parts or sections and contact devices adapted for actuation by a car, and provided with levers having movable fulcrums, said levers being connected with the movable sections of the insulated housings for opening and closing the same, substantially as described.

6. In an electric railway, the combination with a main line conductor, an insulating housing having a movable section, and a movable contact piece consisting of a lever provided at one end with a contact piece adapted to engage the main conductor and connected by means of a link with the movable section of the insulating housing, substantially as described.

7. In an electrical railway, the combination with a main line conductor of a series of removable electrical contacts, clamped or otherwise detachably secured upon the main conductor, an insulating housing or inclosure, a lateral feed-lever having a split contact at one end and a friction roll at the other end adapted to be engaged by the passing car, substantially as specified.

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

JOHN JACKSON.

Witnesses:

EWELL A. DICK,

CHAS. B. TILDEN.