

No. 614,575.

Patented Nov. 22, 1898.

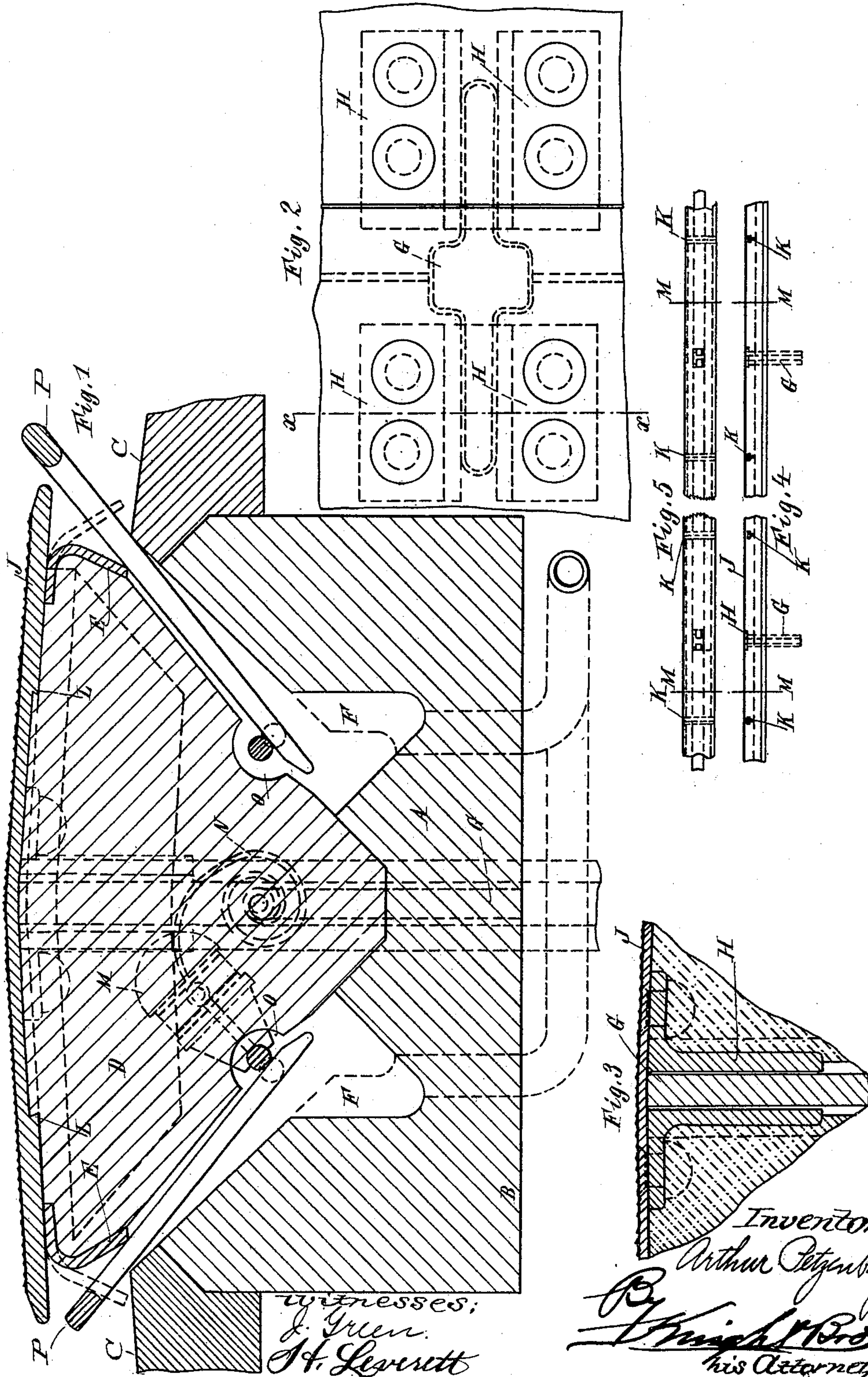
A. PETZENBÜRGER.

CONDUIT AND ELECTRIC CURRENT CONDUCTOR FOR SURFACE RAILWAYS.

(Application filed Mar. 30, 1896.)

(No Model.)

2 Sheets—Sheet I.



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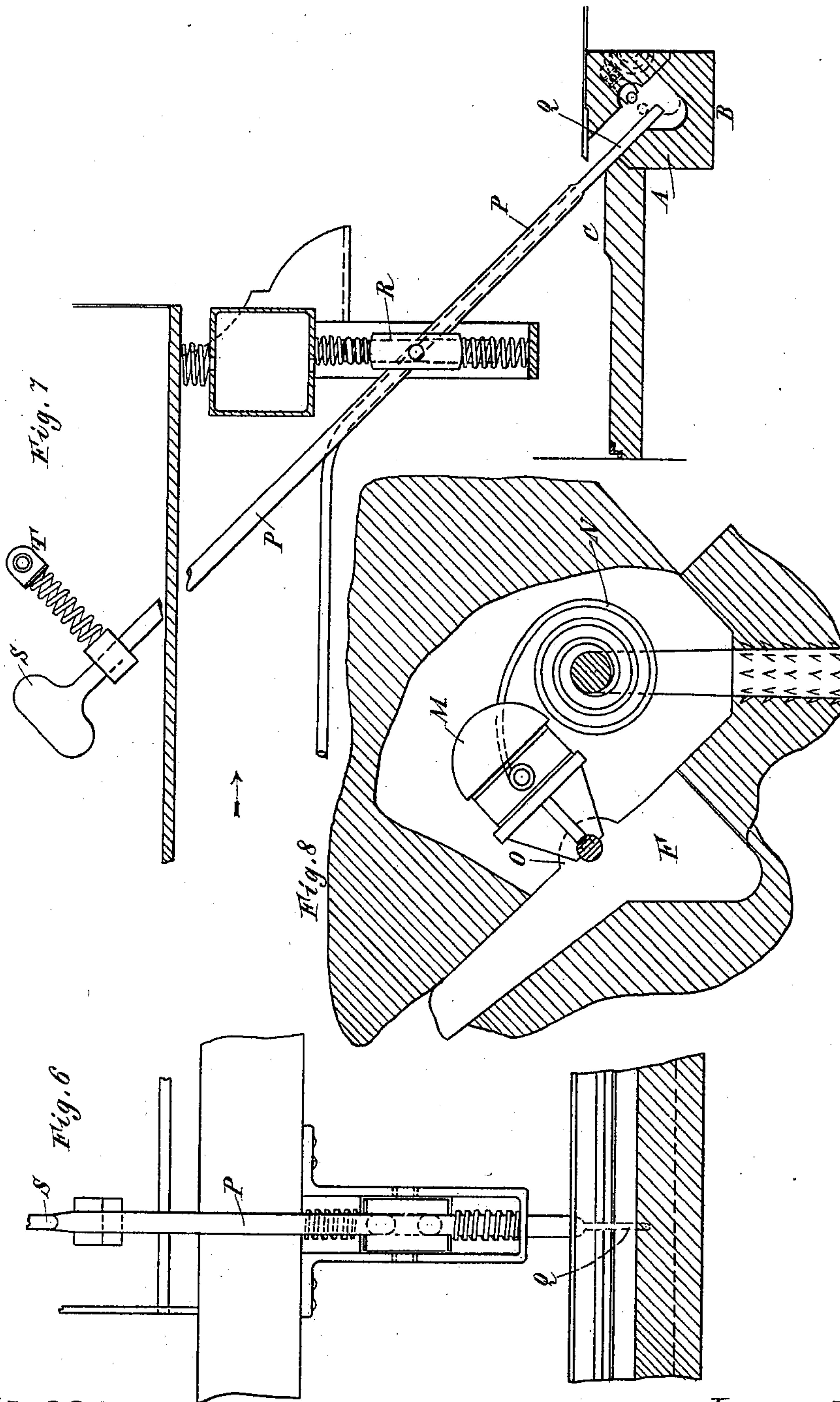
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(No Model.)

2 Sheets—Sheet 2.



Witnesses:

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By
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UNITED STATES PATENT OFFICE.

ARTHUR PETZENBÜRGER, OF GROSS LICHTERFELDE, GERMANY.

CONDUIT AND ELECTRIC-CURRENT CONDUCTOR FOR SURFACE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 614,575, dated November 22, 1898.

Application filed March 30, 1896. Serial No. 585,482. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR PETZENBÜRGER, a subject of the King of Prussia, Emperor of Germany, and a resident of Gross Lichterfelde, in the Kingdom of Prussia and German Empire, have invented certain new and useful Improvements in Conduits and Electric-Current Conductors for Surface Railways, of which the following is a specification.

The object of this invention is to provide a new and improved conduit for conducting the electrical current for electric railways.

In the accompanying drawings, forming a part of this specification and in which like letters indicate like parts in all the views, Figure 1 is a cross-sectional view of the conduit constructed according to my invention. Fig. 2 is a detail plan view showing the manner of attaching the top to its supports. Fig. 3 is a detail transverse sectional view of the conduit, taken on line *xx* of Fig. 2. Fig. 4 is a longitudinal sectional view of the same, taken on a reduced scale. Fig. 5 is a plan view of the same. Fig. 6 is a detail side elevation of the contact device, showing the conduit in longitudinal section. Fig. 7 is a detail cross-section at right angles to the longitudinal axis of the tracks and car, showing the contact mechanism. Fig. 8 is a detail transverse sectional view showing the spring-supported insulator in a cavity of the covering-board.

The underground electrical conduits used heretofore for conducting the current to cars are so constructed that they are only accessible under great difficulties, or, if accessible, are very expensive.

The object of the present invention therefore is to provide a new and improved conduit which is comparatively cheap, easily accessible, and adapted to be used for single or double track roads. In the street a channel A is excavated about seventeen cubic meters deep, Figs. 1 and 7, which is lined with a mixture of Portland cement and sharp sand B in layers about three cubic meters thick and to such an extent that the bottom of the channel is about ten cubic meters below the road-bed C, Fig. 7. For single-track railways the channel is located at one side of the track and for double-track railways between the two tracks. The central inner face of the cement

lining is shaped into a longitudinal angular recess, so that at the middle a bearing is formed for the lower bearing edge of the top beam D, which in turn is so shaped that its outwardly inclined or flared sides are about two cubic meters from the walls of the flaring channel, whereby two slots are formed (one on each side) for the passage of the contacts carried by the cars. For the purpose of preventing the street-mud from passing into these slots the covering-plate D is provided with a leather strip E for each slot, which strip also prevents sparking and covers the top openings of the slots, as the covering-plate is about three and one-half cubic meters above the pavement. This arrangement will not interfere much with the traffic, as in streets in which steam or street railway tracks are laid there are offsets of from five to six cubic meters. At each side of the bearing of the top beam a gutter F is provided for catching water, and at suitable intervals, about fifty meters apart, ducts are formed for carrying off the water, toward which ducts the gutters are inclined for lengths of twenty-five meters toward both sides. For the purpose of keeping the mud away from said gutters as much as possible the pavement is to have ten per cent. grade in fifty cubic meters from the slot and offsets of one cubic meter at distances of fifteen cubic meters from the slot-openings. (See Fig. 7.) The top beam D fits snugly on its bearing-surface, so that it will have a solid support throughout its entire length and can support the heaviest wagon-loads with the least strain. Furthermore, for the purpose of taking up the jolts of any vehicle running upon the same it is held every five meters and at crossings every three meters by supports G, Fig. 4, which are securely embedded in the cement lining and connected with the top beam by means of angle-pieces H.

The top plate or beam D is provided on its upper surface with a wrought-iron riffled or roughened plate J, which at distances of about 1.50 meters is supported by light T-irons embedded in the top beam D. The plate J and top beam are connected by beveled flanges L, Fig. 1, and heavy wood-screws to form one solid body, so that the top beam D can resist pressure from the top as well as from the

sides, but at any time can easily be lifted off to permit of examining or repairing the conductors.

The conductors are attached to insulators M, Fig. 4, in the usual manner at distances of from ten to fifteen meters. The insulators are each supported by two spiral springs N, Fig. 1, which are attached by means of screws to the cement lining and serve for constantly pressing the conductors and contacts together, independent of the jolts and jars of the latter. The cover-beam B is recessed for a width of about ten cubic meters at the points where the insulators M are located. Throughout their entire length the cover-beams have a groove O, semicircular in cross-section, along the conductor, so as to give the latter room to swing.

The contact-guide is composed of a tube P, which carries at its lower end the insulated contact-pin Q and which is connected by a conducting-wire with the electric motor. The tube P is shiftable in the direction of its length and can be turned in the box R, Fig. 7, so that the motorman can move the contact up or down or turn it in the box R by means of the handle S when he wishes to guide said pin in or out of the slot and bring it in or out of contact with the conductor. The tube P extends to the longitudinal central axis of the car, and so as not to be affected by the working or jolting of the car said tube is hung in springs at its supports R and T.

The conduit-way (seen in section, Fig. 1) has in the middle of the bottom thereof a longitudinal ridge forming a bearing for the cover, whereby two gutters F are produced for leading away rain, &c.

Both bearing and gutters extend the entire length of the conduit-way, since the covering-board closes almost the whole length thereof. The standard G, being designed to strengthen the covering-board against shocks caused by carriages, &c., is embedded in the concrete whereon the conduit-way is formed and at the top is secured to the covering-board by

angle-irons H, (shown in Figs. 1, 2, 3, and 4,) the covering-board, with the angle-pieces H, fitting closely around the standard. To protect the pitch-pine covering-board against injury, the same is covered by a wrought-iron plate with a roughened surface to give a footing to those who pass over it. This roughened plate is supported by iron angle-pieces K, sunk into the covering-board at about 1.5 meters distance one from the other. It is immovably fastened to the covering-board by means of dovetailed rabbet L and by strong screws, plate, and board, forming thus one piece, strengthened against thrust, &c., by G and K.

The object of fastening tube P to box R is to protect tube P from vibration, so as to produce by it the contact of wire and contact-pin. This box R is best placed in the plane passing through the longitudinal axis of the carriage, because here the vibrations are the least, or it may be fixed to a support fastened to the frame of the carriage.

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

The combination, in an electric conduit for railways, of a cover-beam D having longitudinal slots O and cut-out portions to receive the electric wires and insulator-supports respectively, the longitudinal bearing in the conduit supporting the cover-beam away from the sides of the conduit to form slots, the resiliently-supported insulators supported in the conduit in the cut-out portions of the cover-beam, and the electric-current wires mounted on said insulators and supported thereby in the slots O of the cover-beam, substantially as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ARTHUR PETZENBÜRGER.

Witnesses:

PEREGRINE VARNALS,
KARL HARTMANN.