

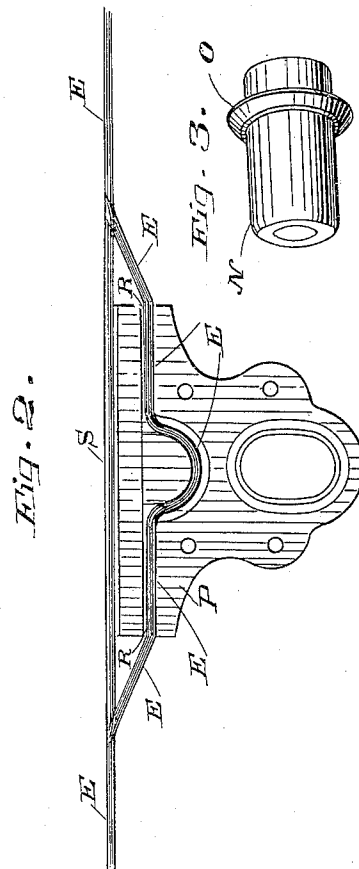
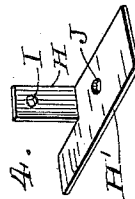
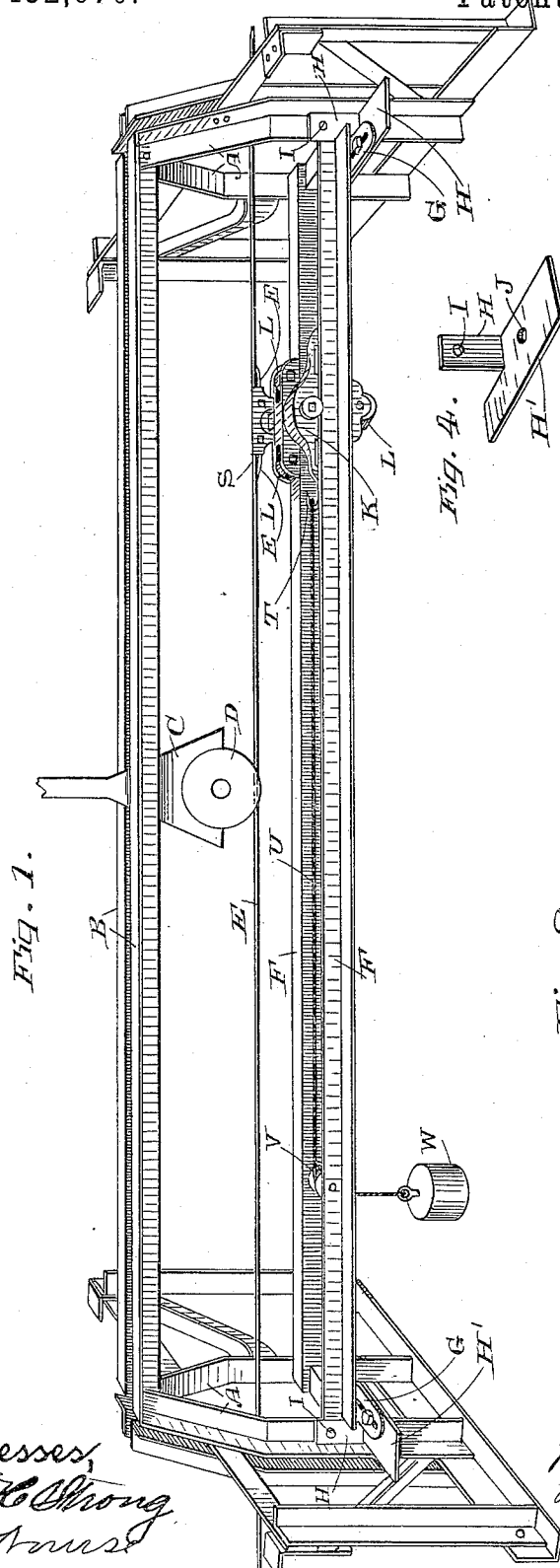
(No Model.)

2 Sheets—Sheet 1.

B. JENNINGS.
CONDUIT ELECTRIC RAILWAY.

No. 432,670.

Patented July 22, 1890.



Witnesses,
Geo H Strong
J H Strong

Inventor,
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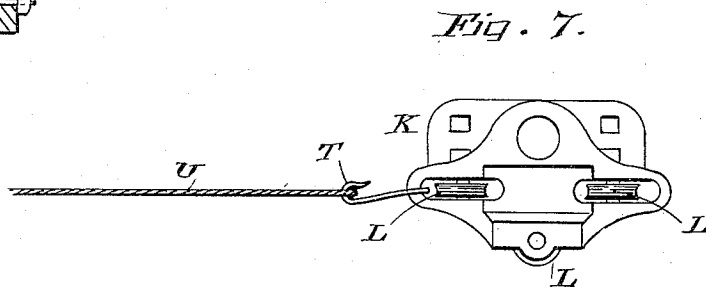
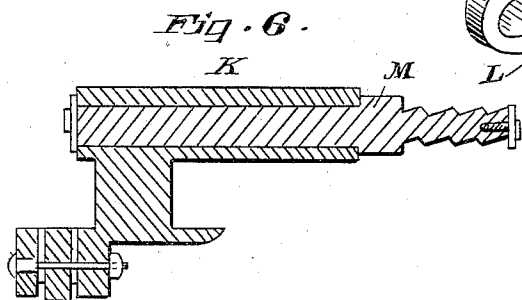
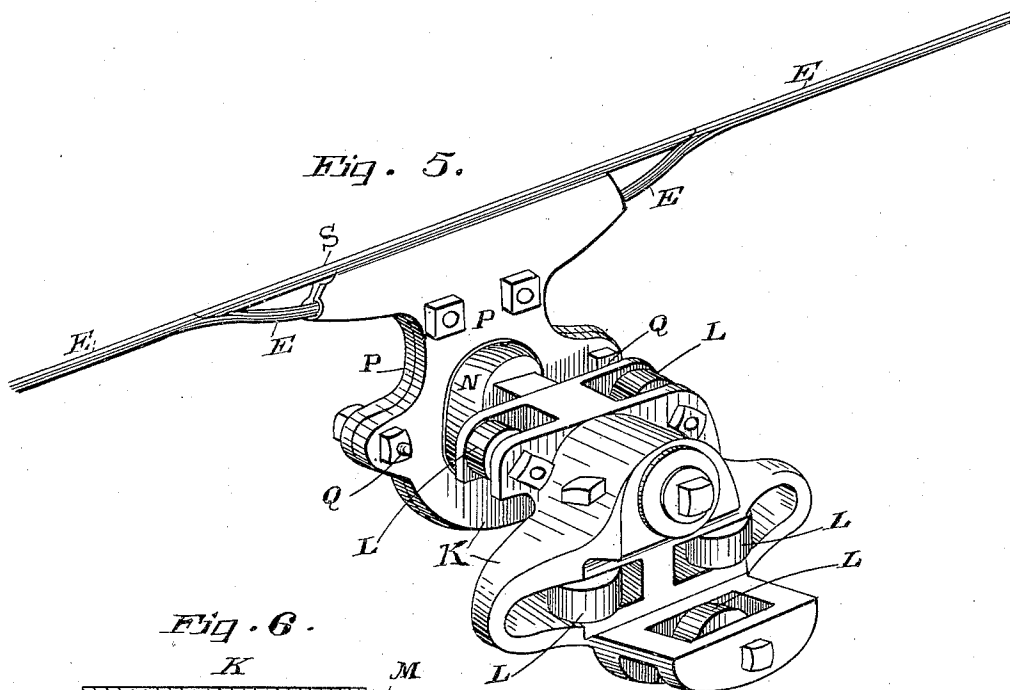
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2 Sheets—Sheet 2.

B. JENNINGS.
CONDUIT ELECTRIC RAILWAY.

No. 432,670.

Patented July 22, 1890.



Witnesses,
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UNITED STATES PATENT OFFICE.

BYRON JENNINGS, OF SAN JOSÉ, CALIFORNIA.

CONDUIT ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 432,670, dated July 22, 1890.

Application filed January 18, 1890. Serial No. 337,363. (No model.)

To all whom it may concern:

Be it known that I, BYRON JENNINGS, a citizen of the United States, residing at San José, Santa Clara county, State of California, have invented an Improvement in Conduit Electric Railways; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to certain improvements in conduit electric railways; and it consists in supports to which the conducting-wires are fixed, and in a means for automatically maintaining the tension upon said wires and in a compensating device for the expansion and contraction of the wires.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a view of a section of the conduit, showing the application of my device. Fig. 2 is an enlarged view of one of the clamps and supports for the wire. Fig. 3 is a view of the insulator. Fig. 4 is a view of the bearing-plate. Fig. 5 is a view of the truck. Fig. 6 is a section through the same. Fig. 7 is an end view of the truck.

My device is especially applicable to what is known as the "conduit system," in which the electrical wires are stretched within a tube or conduit beneath the surface of the ground in such a manner that a trolley-wheel connected with a motor upon a car is allowed to travel in contact with the conducting-wire, so as to furnish a power to operate the motor.

A A are the yokes which support the framework of the conduit.

B are the slot irons or rails between which the shank C passes from the car, and D is the trolley-wheel journaled to the shank C so as to travel upon the conducting-wire E.

F F are angle-iron or other suitable rails extending between a pair of the yokes A A, these rails being suitably united together at opposite ends and having a slotted horizontal extension G at one side.

H is a plate of iron split in from one end and having one portion upturned, so as to be bolted to the side of the yoke through a bolt-hole I. The other portion H' of this end of the iron plate remains horizontal, and the slotted guide G rests upon it. J is a bolt-hole made through this horizontal portion of the plate, and a bolt passes through this hole and

through the slot in the guide G, so as to retain the end of the rail-frame and allow it to be moved from one side to the other. Each end of the rails F is provided with a similar device, and by loosening the bolts which pass through the holes J and the slots in the guides G it will be possible to move the rails bodily to one side, for a purpose to be hereinafter described.

K is a truck, which may be made of cast-iron or other suitable material, and it is provided with anti-friction rollers L, which are adapted to travel upon the top, bottom, and sides of the rails F, so that the truck will move with as little friction as possible. Through that portion of the truck which lies above the rails F a hole is made, and into this hole is fixed a block of wood M. This block projects out to one side of the truck K, and upon the end of the block is fixed an insulator N. This insulator may be made of any suitable form or shape. In the present case I have shown it of an oval cylindrical form, having an enlargement or flange around it, as shown at O.

P P are iron plates having openings through them corresponding in shape with the insulator N, and having the inner faces chambered, so that when these plates are placed over the insulator they clasp the fillet or flange O between them. Through the plates P holes are made, and bolts Q pass through these holes, having nuts which are screwed upon the bolts, so as to clamp the plates together, and they are retained upon the insulator by means of the fillet, while the shape of the insulator is such that the plates cannot turn around upon it, but will be held in proper position. The insulator is held in place upon the carriage or truck K by means of lag-bolts, which screw into the ends of the wooden block upon which the insulator is supported, the heads resting against washers, one of which holds the insulator upon the block, while the other, at the opposite end, retains the block in the truck or carriage. In the upper side of the plates P is formed a curved or irregular groove or channel R, which is plainly shown in the enlarged Fig. 2. The main conducting-wire E is pressed into this groove or channel by a suitable former or die after the wire has been properly stretched within the tube or tunnel and allowed to rest

upon these carriers at the points where they are placed. After it has been pressed into this groove or channel R, the plates are screwed together, and thus clamp the wire 5 firmly in place, the irregular curve in which the groove or channel is made serving to hold the wire in place and prevent its slipping within the clamp or holder. In order to form a continuous line of wire upon which the trolley-wheel D may travel, I then fit a supplemental strip or piece of wire S, which extends in a straight line over the curved or depressed portion of the main wire, which has been fitted into the clamps P, as before described, 10 and I solder this supplemental piece S at each end, it being grooved or channeled, so as to form a straight and continuous line. This section S rests in a semi-cylindrical groove or channel formed in the top of the clamps P 15 and above the curved channel R, as shown in Fig. 2.

The carriage K has a hook or attachment T at one end, to which is attached a wire or wire rope U. This rope passes along between 25 the rails F and over a pulley (shown at V) having a weight W suspended from its end. The object of this device is to keep a continual tension upon the carriage K and through it upon the conducting-wire E. It will be manifest that as the wire E contracts from cold or by other reasons the carriage, moving 30 freely upon the guides F, will move backward and draw the weight W up; but when the wire expands and lengthens the weight will draw the carriage forward and will thus maintain the proper tension upon the wire, so as to keep it in a comparatively straight line for the trolley-wheel to travel upon. These rails F, with the tension devices, are fixed between 40 two adjacent yokes A, (which are usually three or four feet apart,) and the device may be placed from twenty-five to forty or more feet apart, according to the amount of weight which is employed upon the tension apparatus, it only being necessary to have them near 45 enough together so that the wire will not sag to an undue extent between its supports.

By reason of the irregularly-curved groove R in the clamps P it will be manifest that 50 the main wire will be held strongly and prevented from slipping in the clamps, so that whatever weight is applied to the carriage will exert its full force and pull upon the wire to keep the latter straight, and the friction-wheels upon the carriage will prevent the latter from being twisted or cramped by reason of the pulling of the wire at one side of the carriage, and they will enable the carriage to run freely at all times.

By this device I am enabled to maintain 60 the conducting-wire in a sufficiently straight line for continuous contact with the trolley-wheel, and at the same time I reduce the number of supports for the wire and the consequent leakage of electricity, which must take place at every such support, no matter how perfect the insulation may be made.

Although I have in these drawings shown the clamps in such a position as to support the wire along the top of the clamps, it will 70 be manifest that they may be reversed upon the insulators, so that the wire will be suspended from below, if it is desirable to have the trolley-wheel make its contact with the wire from below instead of from above. 75

As the tubes or conduits are apt to become clogged with dirt or sand that either falls in from street traffic above or washes in from storms, it is necessary to move the wire to one side of the slot for the purpose of allowing the conduit to be cleaned. This is done 80 by loosening the bolt which passes through the slotted guides G, to which the ends of the rails F are fixed, and as this guide rests upon the horizontal plate H' it will be manifest 85 that the rails, the carriage, and the wire may all be drawn to one side after the bolts are loosened, so as to allow free access to the conduit, and after it has been cleaned they may be moved back again, so as to bring the wire 90 into proper relation with the slot in the road-bed, so that the trolley-wheel will make the proper contact with it.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is— 95

1. A support for the conducting-wire of an electric railway, consisting of the clamps P, fixed upon an insulator and having a curved or irregular groove or channel R, into which 100 the main portion of the wire is compressed, a channel upon the top of the clamp, and a supplemental wire extending over the depressed portion of the main wire and fixed to it at opposite ends, so as to form a continuous line 105 over the clamp, substantially as herein described.

2. A support for the conducting-wire of an electric railway, consisting of the clamp in which the wire is held, an insulator upon 110 which said clamp is fixed, and a truck or carriage to which the insulator is attached, in combination with guide-rails upon which the carriage is supported, a rope attached to the carriage, a pulley over which said rope passes, 115 and a weight suspended from the end of the rope, whereby the tension upon the conducting-wire is maintained, substantially as herein described.

3. The conducting-wire of an electric railway and insulated clamps by which said wire 120 is held and supported at intervals of its length, carriages to which said insulators are attached, and weights or springs connected with said carriages so as to exert a constant tension 125 upon the wire in one direction, in combination with guide-rails or supports upon which the carriages travel, slotted yokes to which the ends of the rails are fixed, and supporting-plates with bolts by which the 130 guide-rails are fixed to the plates, so that the rails, carriages, and conducting-wire may be moved transversely of the line of the wire, substantially as herein described.

4. The guide-rails supported upon the transversely-slotted yokes, the carriage having the anti-friction rollers adapted to travel upon the guide-rails and having a hole made transversely through it, a block fitted into said
5 hole and secured therein, and an insulator fitted upon the projecting end of the wooden block, in combination with the two-part clamps fitted and secured upon the insulator, and having an irregular groove or channel within 10 which the conducting-wire is clamped, substantially as herein described.

In witness whereof I have hereunto set my hand.

BYRON JENNINGS.

Witnesses:

S. H. NOURSE,
H. C. LEE.