

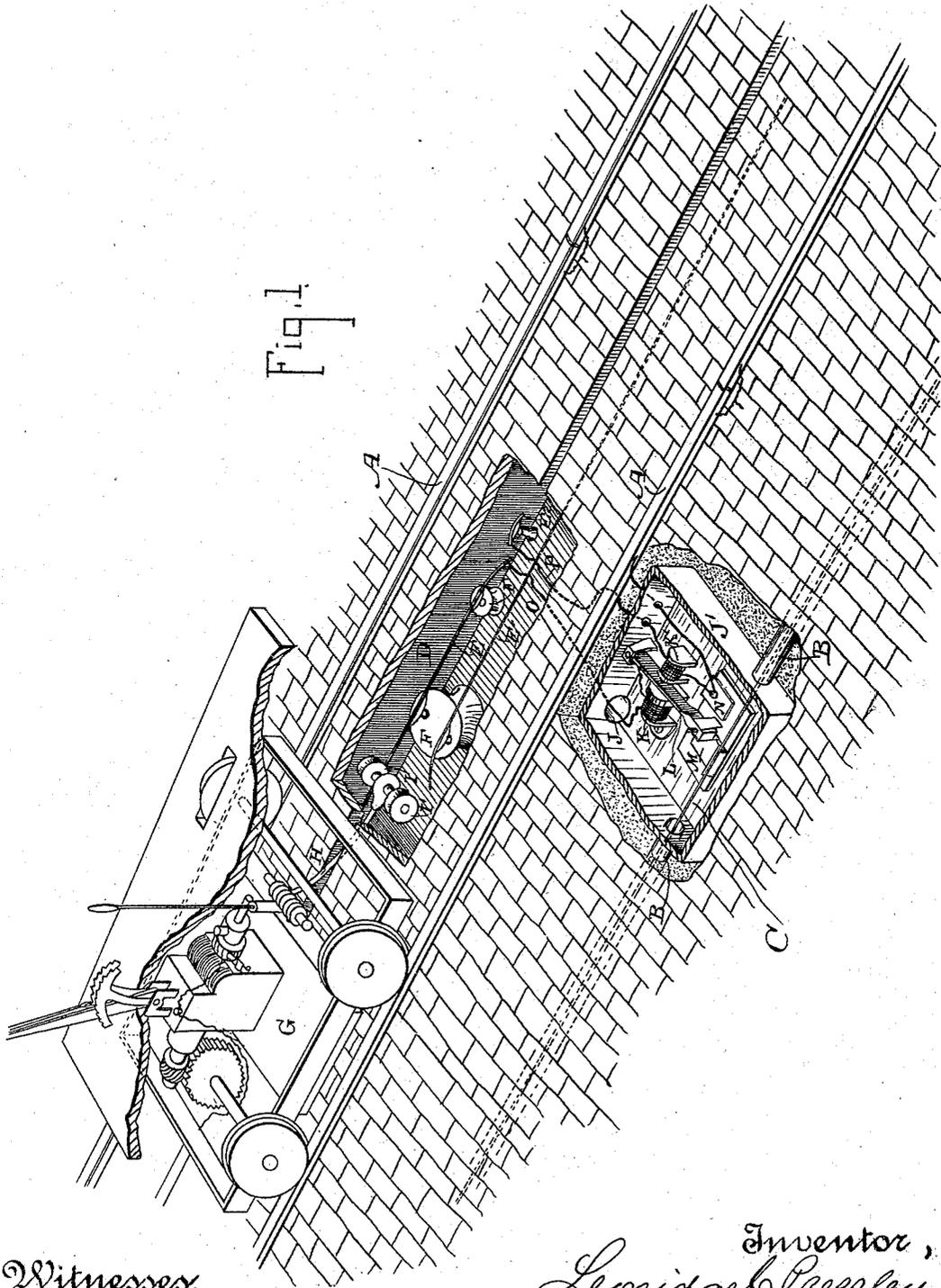
(No Model.)

2 Sheets—Sheet 1.

L. C. PRESSLEY.  
CONDUIT ELECTRIC RAILWAY.

No. 542,105.

Patented July 2, 1895.



Witnesses,  
*J. H. Morse*  
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Inventor,  
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*By Davenport Co., atty*

(No Model.)

2 Sheets—Sheet 2.

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Fig 2

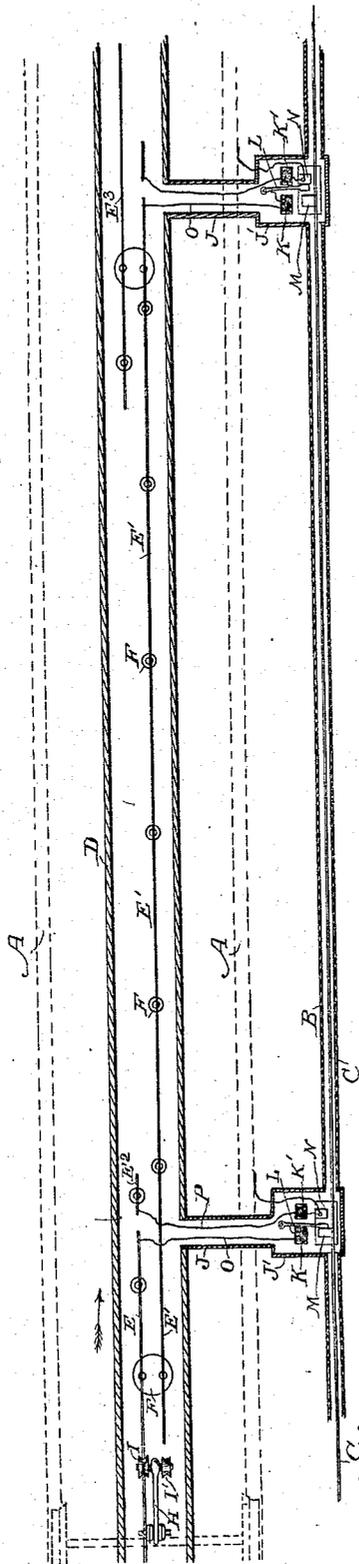
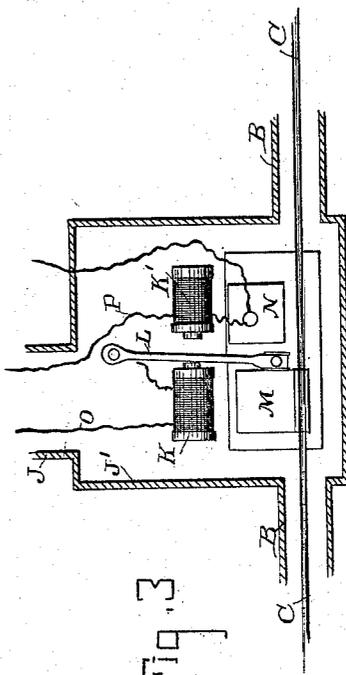


Fig 3



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# UNITED STATES PATENT OFFICE.

LEONIDAS C. PRESSLEY, OF SAN FRANCISCO, CALIFORNIA.

## CONDUIT ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 542,105, dated July 2, 1895.

Application filed February 13, 1895. Serial No. 538,270. (No model.)

*To all whom it may concern:*

Be it known that I, LEONIDAS C. PRESSLEY, a citizen of the United States, residing in the city and county of San Francisco, 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 improvements in electric railways of that class in which a current is carried beneath the surface of the ground and is transmitted at intervals to the rail or conductor, through which it in turn passes to the car and the motor thereon.

My invention consists in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of my device with parts broken away. Fig. 2 is a plan view showing a section of the tunnel and lateral passages, with the conducting rails or wires and intermediate parts. Fig. 3 is an enlarged section of the casing containing the electromagnets and automatic switch.

The objects of my invention are to convey an electrical current through insulated and protected conductors, to transmit the current successively to short sections of the trolley-rail during the passage of a car, and to cut it off from said rail as soon as the car has passed by means of automatically-operating devices.

A A are the tracks of a railroad.

B is a sealed main or tube parallel with the tracks, within which extends the wire C, which conveys the current of electricity.

D is a conduit having metal rails or conductors E E' supported within it. These rails are made in lengths and are arranged alternately upon each side of a central line. They overlap each other a short distance at the termination of one and the commencement of the other rail, as plainly shown in the drawings. These rails or conductors are supported upon conical or umbrella-shaped insulators F, made of any suitable insulating material and having holes or sections for the standards which support the conductors.

The outer edges of the upper part of the insulators overhang the base, where they are permanently attached, to such an extent that any moisture or water falling upon them will

drip off without wetting the smaller part of the standard, and thus the loss of electricity by reason of the wetting of the insulators is avoided.

The car G has the usual or any suitable motor and mechanism for transmitting the electrical energy to drive the car-wheels.

The tube or tunnel within which the rails E are disposed has a slotted opening through the top, through which the shank H extends from the car, and within the tube or tunnel it carries the trolley-wheels I I', each of which is adapted to travel upon one of the rails E. These are grooved and are mounted on a shaft of sufficient length so that one of the wheels travels in line with one of the wires E and the other in line with the other wire.

The opposite end of the shank H is suitably connected with the driving mechanism upon the car, so that whenever either of the trolley-wheels is in contact with its conductor E a current of electricity will pass through it and the shank to the motor mechanism upon the car, and the current may be grounded through the wheels, or, if desired, returned through a return-wire, or otherwise arranged in any suitable or well-known manner.

It will be noted that for a large portion of the time only one trolley will be in contact with its conductor; but as the two approach each other they overlap or pass one another to such a distance that both trolleys will, for a short time, be in contact with the parallel portions of the conductors E E'. At a point approximately opposite the overlapping adjacent ends of each of the conductors E E' a channel J extends outwardly to a point near the conductor C and has a sufficiently-large box or chamber J' to contain electromagnets K and K'. L is an armature fulcrumed so that it extends between these two magnets and is capable of swinging to one or the other whenever either is energized. The end opposite the fulcrum-point, being free to move, when moved to one side forms contact with a conducting-plate M, and through it with the main conductor C, and when moved to the other side forms contact with another plate N, which forms a ground for it.

A wire O connects one of the rails E with the electromagnet K, and through this with the oscillating armature L and the plate M.

This plate M is connected with the main conducting-wire C, so that when the armature L has been attracted to the magnet K it will also form contact with the plate N and will then transmit a current of electricity from the main conductor C through the plate M, the armature L, the electromagnet K, and the wire O to the rail E, which terminates at this point, and this rail is thus charged for the whole of its length.

The operation of the device will be as follows: This rail being charged, when the trolley forms contact with it at its rear end the current of electricity will be transmitted through the car and motor, so that the car will be propelled along the track. In the present case the car is supposed to be moving from left to right. The trolleys are shown at the left end in Fig. 2 at the instant before they reach the point where the rails E and E' overlap, and the current which is transmitted through them is received from the electromagnet K shown nearest the left side of the drawings. At the instant when the trolley has moved so that the other trolley-wheel I' has formed contact with the conductor E' a part of the current from the conductor E will be transmitted into the conductor E' and will charge it throughout its length, in the present case extending to the electromagnets shown at the right end of the drawings. The current of electricity thus received by the conductor E' then passes through the conducting-wire O, through the magnet K of that station, and the magnet, being thus energized, attracts the armature-lever L from its previous contact with the electromagnet K'. This removes it from the ground-plate N and forms contact with the plate M, and thus makes direct connection between the rail E' and the main conductor C, so that this rail is then charged from the station at the right and the current is temporarily received through both rails E and E'. The car continuing its motion, the trolleys will move on until the trolley I has left the conductor E, and it then passes over a short section E<sup>2</sup>, which is independently supported in line with the conductor E. From this section E<sup>2</sup> a wire P leads to the electromagnet K', and as the current of electricity is now being received from the section E' the current will pass through the two trolleys I and I' from E' into E<sup>2</sup>, thence through the wire P and the electromagnet K', which, thus being energized, will attract the swinging armature L, withdrawing it from the magnet K and breaking contact with the plate M and making contact with the ground-plate N, thus cutting out the rail or conductor E from connection with the conducting-wire C and leaving the rail E' to receive the current as long as the trolley I' is in contact with this rail or conductor. When the car has reached the point where the trolley I makes contact with the rail or conductor E<sup>3</sup>, (shown at the right end of Fig. 2,) the same operation takes place that has pre-

viously been described, the rail E<sup>3</sup> being temporarily charged from the rail E', while the trolleys upon both rails and the swinging armature at the farther end of this rail will be actuated to make connection with the main conductor, and thus directly energize this rail, while the rail E' will be cut out in the same manner as previously described for the rail E. The operation thus continues indefinitely as long as the car is moving and the current is successively transmitted from one section of rail to the other, and is correspondingly cut out from the previous section after the car has passed over it.

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

1. In an electric railway, trolley rails extending within a conduit in alternate sections upon each side of an intermediate line, the adjacent ends of each two rails overlapping each other a short distance, a main insulated conductor extending parallel with the conduit within a sealed channel, contact conducting plates connected with said conductor adjacent to the ends of each of the rails, an electro magnet connected with the rail over which the trolley is to approach and energized by a temporary current therefrom, a movable armature attracted by said magnet when energized, and forming contact with the conducting plate whereby a direct current is transmitted from the conductor into the rail over which the trolley is approaching.

2. In an electric railway, trolley rails fixed in alternate lengths upon each side of an intermediate central line and slightly overlapping each other at their adjacent ends a trolley connection with the car having two trolley wheels in the lines of the two alternate rails, so that they form contact alternately with one rail and the other as the car progresses, electro magnets situated near the adjacent ends of the alternate rails, a wire connecting the magnet with the rail over which the trolley is to approach, whereby the magnet is temporarily energized as soon as contact is made by both trolley wheels with the overlapping ends of adjacent rails, a movable armature which is attracted by the magnet when energized, a conducting plate connected with a main electrical conductor, and with which the armature forms contact when attracted by the magnet, whereby the current is transmitted into the trolley rail directly from the main conductor before the trolley has left the preceding rail.

3. In an electric railway, insulated trolley rails fixed within a conduit in alternate lines, a double trolley adapted to form contact alternately with one rail and the other, an electro magnet connected with the terminal end of each rail, and a swinging armature upon which the magnet acts adapted to form contact with the main conductor and energize the electro magnet, as the trolley wheels pass from one rail to the other and temporarily

charge the succeeding rail by the current from the preceding one.

4. In an electric railway, insulated conducting rails supported in line alternately upon one side and the other of a central line, trolley wheels connected with the cars and adapted to travel alternately upon one rail and the succeeding one, electro magnets with movable armatures adapted to make connection between a main conductor and the terminal end of each rail when energized, means for energizing each succeeding electro magnet from the preceding rail, consisting in overlapping said rail so that both trolleys are temporarily traveling upon the two rails, a means for cutting out the preceding rail as soon as the succeeding one has been energized consisting of a

second electro magnet by which the swinging armature is attracted when the second magnet is energized, a short independent rail section and a wire connecting it with said magnet, said rail section being so disposed that when the trolley leaves the preceding rail it passes over this independent section and through it energizes the electro magnet where- by the armature is attracted and contact with the conducting plate and connection with the previous rail is broken.

In witness whereof I have hereunto set my hand.

LEONIDAS C. PRESSLEY.

Witnesses:

S. H. NOURSE,  
H. F. ASCHECK.