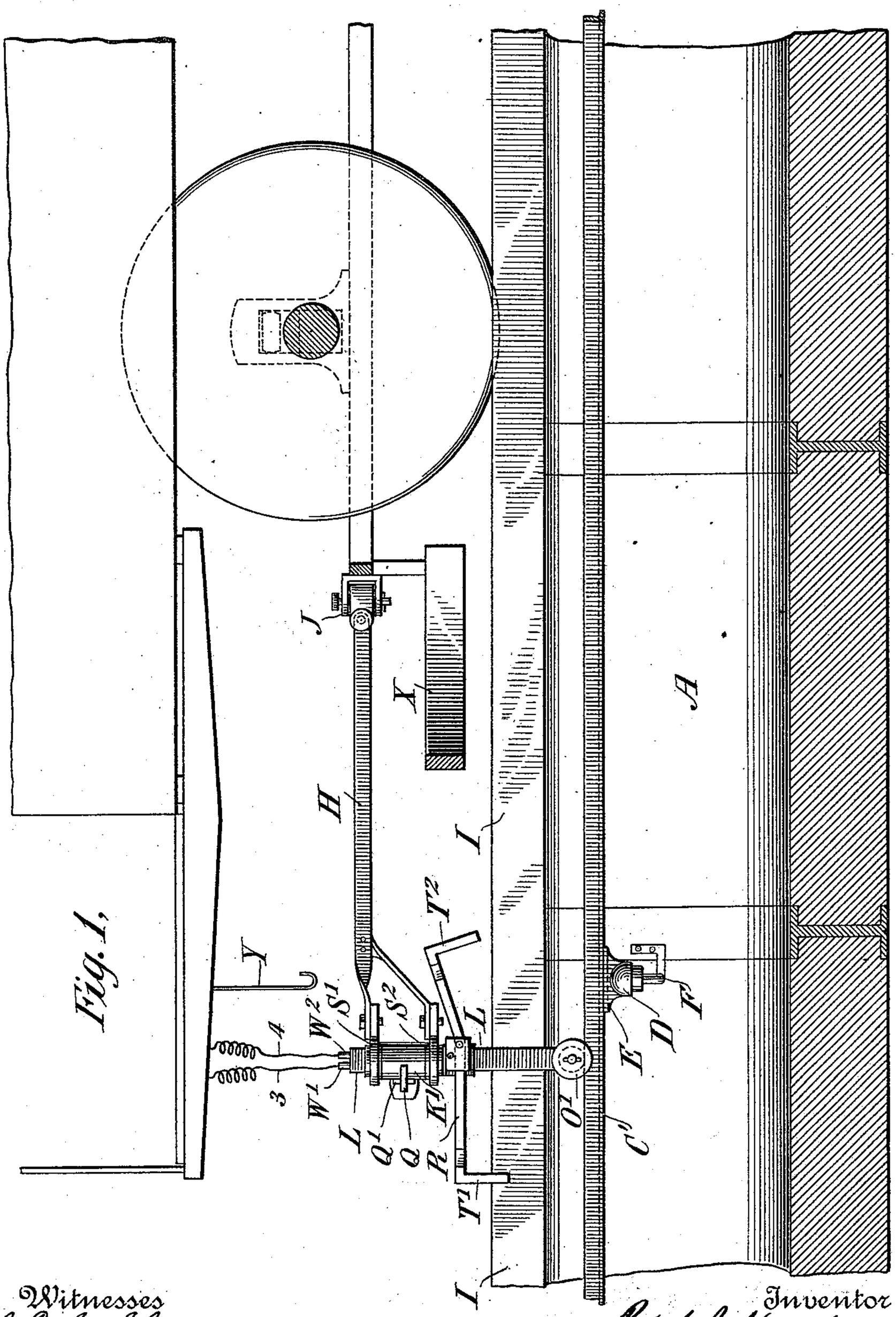
(No Model.) 2 Sheets—Sheet 1.

R. J. HEWETT.

CONDUIT RAILWAY TROLLEY.

No. 526,835. Patented Oct. 2, 1894.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

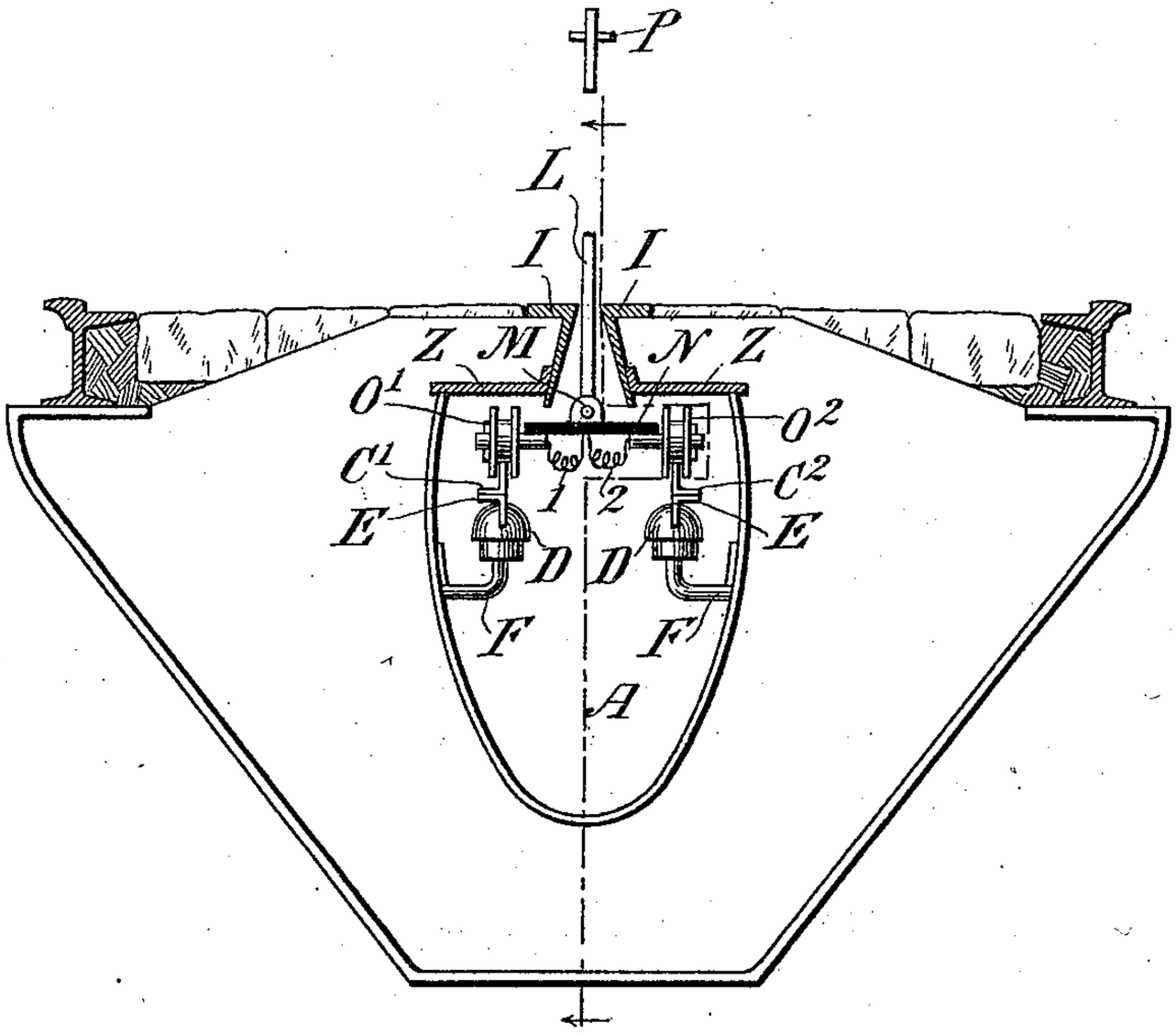
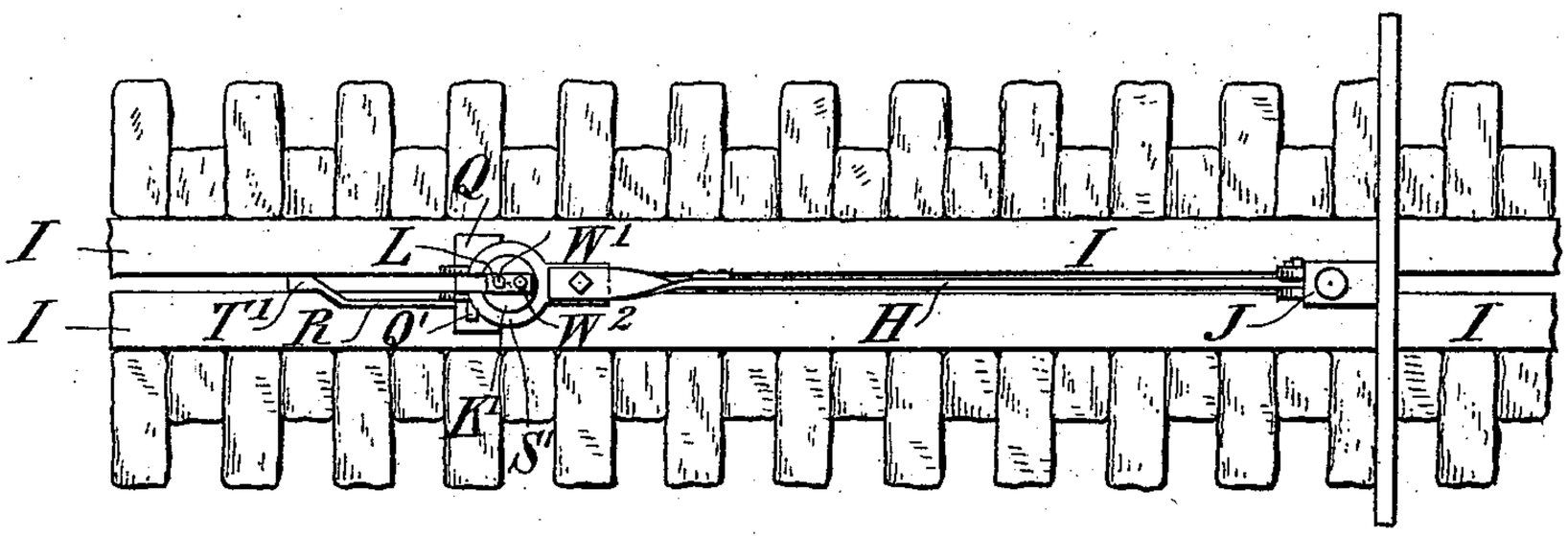


Fig. 3.



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UNITED STATES PATENT OFFICE.

ROBERT JOSEPHUS HEWETT, OF ST. LOUIS, MISSOURI.

CONDUIT RAILWAY-TROLLEY.

SPECIFICATION forming part of Letters Patent No. 526,835, dated October 2, 1894.

Application filed February 9, 1894. Serial No. 499,621. (No model.)

To all whom it may concern:

Be it known that I, ROBERT JOSEPHUS HEWETT, a citizen of the United States, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Conduit Electric Railways, of which the following is a specification.

This invention relates to conduit electric railways.

The object is to provide a conduit system applicable to the various practical requirements of street railways.

In carrying out the invention I mount upon insulated supports in a slotted conduit supply conductors of special construction and provide each car with a trolley device so constructed as to be at all times in the best cooperative relation to said conductors and to automatically adjust itself to the best working relation in passing over curves. The trolley device is also so constructed as to permit detachment from the car to permit other cars to pass over, and to admit of removal from the conduit. The trolley is preferably of the overrunning type, which enables a more simple line construction to provide for transit over switches and crossings. The trolley is so mounted that it will accurately follow vertical or horizontal deviations of the supply conductors from a right line but will always maintain the supporting bar or plow in true vertical alignment with the slot.

The several features of novelty will be more particularly described hereinafter, and will be definitely indicated in the claims appended to this specification.

In the accompanying drawings which illustrate my invention, Figure 1 is a sectional view on the plane of the line 2—2 Fig. 2, looking in the direction indicated by the arrows, showing in side elevation a trolley embodying my improvements. Fig. 2 is a transverse section of a conduit embodying my improvements, showing also part of an overrunning trolley. Fig. 3 is a top plan of the conduit and the trolley support.

In Fig. 1 A is a conduit of suitable depth and width constructed of concrete as a part integral of the permanent way as in cable railway construction. The upper part, however is provided with a flat roof formed of roof plates Z of cast iron or wrought iron resting on the overhanging ends of the yokes. On each roof plate is placed a sand bed and paving material such as wood or stone blocks, cobble-stones or concrete and asphaltum as the nature of the street traffic may require. The slot rails I, I, are of the same pattern as used in cable railways. The conduit roof is made flat instead of arched so as to provide shelter for the conducting bars and insulators, thus placing them as far as possible out of reach of the slot. Hand holes with suitable hatch covers may be provided at intervals along the line of way to facilitate cleaning and repairs, and to permit removing the trolley from the conduit when necessary. As these may be of ordinary construction, I have deemed it unnecessary to illustrate them. Ample sewer connections are also provided at intervals to permit drainage. The insulators D, D are of any suitable form such as are used for heavy line work, and are fixed to the conduit yokes by means of bracket pins F, F as shown. Oil insulators may be used when the working potentials are such as to require them. The conducting bars are of angle iron as shown at C', C^2, fixed as shown on top of strong bell-shaped insulators, D, D, by means of fixtures E. The fixtures E consists of a metal cap fastened in any suitable way to the top of the insulator and having a web extending upward and terminating with a flange. To the flange is attached the angle iron conducting bars C', C^2 by means of bolts passing through slotted holes in the flange to compensate for or permit expansion and contraction. Expansion joints may also be provided. The angle iron pattern of conducting bar gives great stability. The vertical portion should have the greater width, say one and one-half inches thus providing for the downward strain, while the horizontal portion may have a lesser dimension, say one inch thus giving a stability in a lateral direction, so as to maintain the two bars in parallelism.

In conduit systems using underrunning contact devices the conductors must necessarily have gaps at crossings and switches of sufficient width to permit the passage of the carrying bar. This necessitates complicated crossings and switches. For this reason I prefer an overrunning trolley since in such

construction the contacts and carrying devices travel above the conducting bars. Crossings and switches can therefore be of the most simple design. Moreover, the conductors are made to support the trolley device and the continuity of the conduit is more easily maintained.

The trolley device is composed of a connecting bar H one end of which is attached to the truck frame by means of a universal joint J, and extends back over the guard-board X, terminating in a bifurcated extension surrounding a vertical axle K′ reduced at the extremities so as to form shoulders, as indicated in Fig. 1, against which the ring-shaped termini S′, S² of the bar H bear. The axle K′ is slotted on one side, as indicated in Fig. 3, and the bearing rings S′, S² are correspondingly slotted to admit the insertion or withdrawal of the plow L, which may be locked in place by a key Q passing through the axle, as will be fully understood from an examination of Figs. 1 and 3. A check key Q′ passing through the narrow end of the key Q serves to keep the latter firmly in place. It will thus be seen that the axle K′ forms a support for the plow and permits a rotary movement in a horizontal plane, so that the trolley wheels O′, O² may be adjusted to the best working relation of the conductors in transit over a curve. To the lower end of the plow L is attached by means of a joint M, see Fig. 2, an insulated cross-bar N to the ends of which are attached two trolley wheels O′, O². The trolley wheels run on the vertical part of the two angle iron conducting bars C′, C². The axis of M is horizontal and permits the two trolley wheels to adapt themselves to differences of level of the two conducting bars. The connecting bar H and the slotted axle K′ maintain the plow in a vertical position, but permit entire freedom of movement in lateral directions, so as to conform to the curvature of the slot. A bent bar R, which I call a "tiller bar" because it steers or adjusts the plow and trolley wheels to the curvature of the conduit slot, is pivotally mounted on the axle K so as to be capable of being rocked in a vertical plane. It is provided at its extremities with vertical guide bars T′, T², either of which may be thrown in the slot so as to control the position of the plow. As shown in the drawings, Fig. 1, the bar T′ is in active relation to the slot and said bar forms one end of a short chord of the circle or arc on which the tiller bar R is moving, the plow forming the other end of the chord. The conduit plow and its insulated cross-bar N, which is the axis of the trolley wheels, is thereby adjusted for the curve, that is to say, the axis of the wheels is shifted to a line slightly in advance of the radius line of the curve, and this adjustment takes place before the wheels reach the curve. The ends of the tiller bar may be made adjustable in a line with the slot so as to vary the lead of this advanced adjustment according to the average curvature of the line, though in most cases this adjustment can be experimentally determined for the line and the bars may be non-adjustable. When the car is moving toward the left the guide bar T′ is turned up out of the slot and the guide bar T² is turned down into the slot. The result of these provisions is that the conduit slot steers the trolley so as to constantly maintain the best working relation between the wheels and working conductors, and no reliance need be placed upon the flanges of the wheels to accomplish this result.

Modifications of the construction described will readily occur to those skilled in the art.

To the trolley wheels O′, O² are connected insulated wires 1, 2, which lead up through a suitable channel in the plow and terminate in insulated tubular connections W′, W², which are located entirely within the upper end of the plow and are thoroughly insulated from it. Flexible wires 3, 4, terminating in plug connectors may be placed in or withdrawn from electrical communication with the tubular sockets. The wires 3, 4, lead to the motors and controlling devices on the car. At the end of lines where through car service is required with overhead trolley lines, the trolley plow is disconnected by removing the terminals 3, 4 from the sockets, and then removing key Q. The plow can then be dropped out of the axle K′ and turned down into the conduit until the crosspin P rests on the edges of the conduit slot, where it is entirely out of the way of guard boards and truck frames of cars. The cars can then be moved over without obstruction. The plow may then be shifted along the track through switches to the in-bound track, and attached to an in-bound car. When out of use the connecting bar H, is hung up on hook Y.

The plow and trolley can be removed from the conduit along the route by taking out the pin P and dropping the plow into the conduit, when it can be removed sidewise through one of the hand holes placed at intervals.

At a crossing with another similar system the supply conductors of the road having the right of way may be made continuous, and those of the intersecting road interrupted and connected by suitable conductors dipping under the continuous conductors, insulated guide bars to support the trolley at the dead sections being used.

I do not confine my invention to the use of trolley wheels. Sliding contacts might also be used. Neither do I limit the invention to two conducting bars. The trolley device is readily applicable to one conducting bar by merely omitting one trolley wheel and half of the insulated cross-bar N and joint M. The single trolley wheel would then be carried by a rigid insulated arm instead of the cross-bar N. It will be evident that my invention is readily applicable to the existing forms of cable railway conduits.

Having thus described my invention, what

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

1. A conduit collector provided with an adjustable steering device engaging the slot walls at a point in advance of the plow to automatically adjust the collector to curves.

2. A conduit collector provided with an adjustable steering device engaging the slot walls at a point in advance of the plow to automatically adjust the collector to curves, and means for reversing the position of the steering device when the car reverses direction of travel to adjust the collector contact in advance of the curve.

3. A conduit collector provided with a plow free to shift in vertical and horizontal planes, provided within the conduit with grooved collector contacts journaled on a horizontal axis parallel to the slot at a point between the supply conductors.

4. A conduit collector provided with a plow free to move in vertical and horizontal planes but fixed against rocking out of a vertical plane, and provided with double collector contacts capable of rocking on a horizontal axis within the conduit.

5. A conduit collector provided with a pivoted support mounted on the vehicle, to admit movement in vertical and horizontal planes a detachable plow capable of dropping within the conduit connected thereto, detachable connections for the motor leads and means for sustaining the pivoted support when the plow is disconnected.

6. A conduit collector comprising a pivoted bar mounted on the vehicle so as to permit of lateral and vertical movement, a detachable plow mounted on said bar capable of rotary movement in a horizontal plane, and a current collector engaging the conductors within the conduit mounted on said plow.

In testimony whereof I have hereunto subscribed my name this 5th day of February, A. D. 1894.

ROBERT JOSEPHUS HEWETT.

Witnesses:

J. J. HAMMOND,

F. J. LAUGHLIN.