

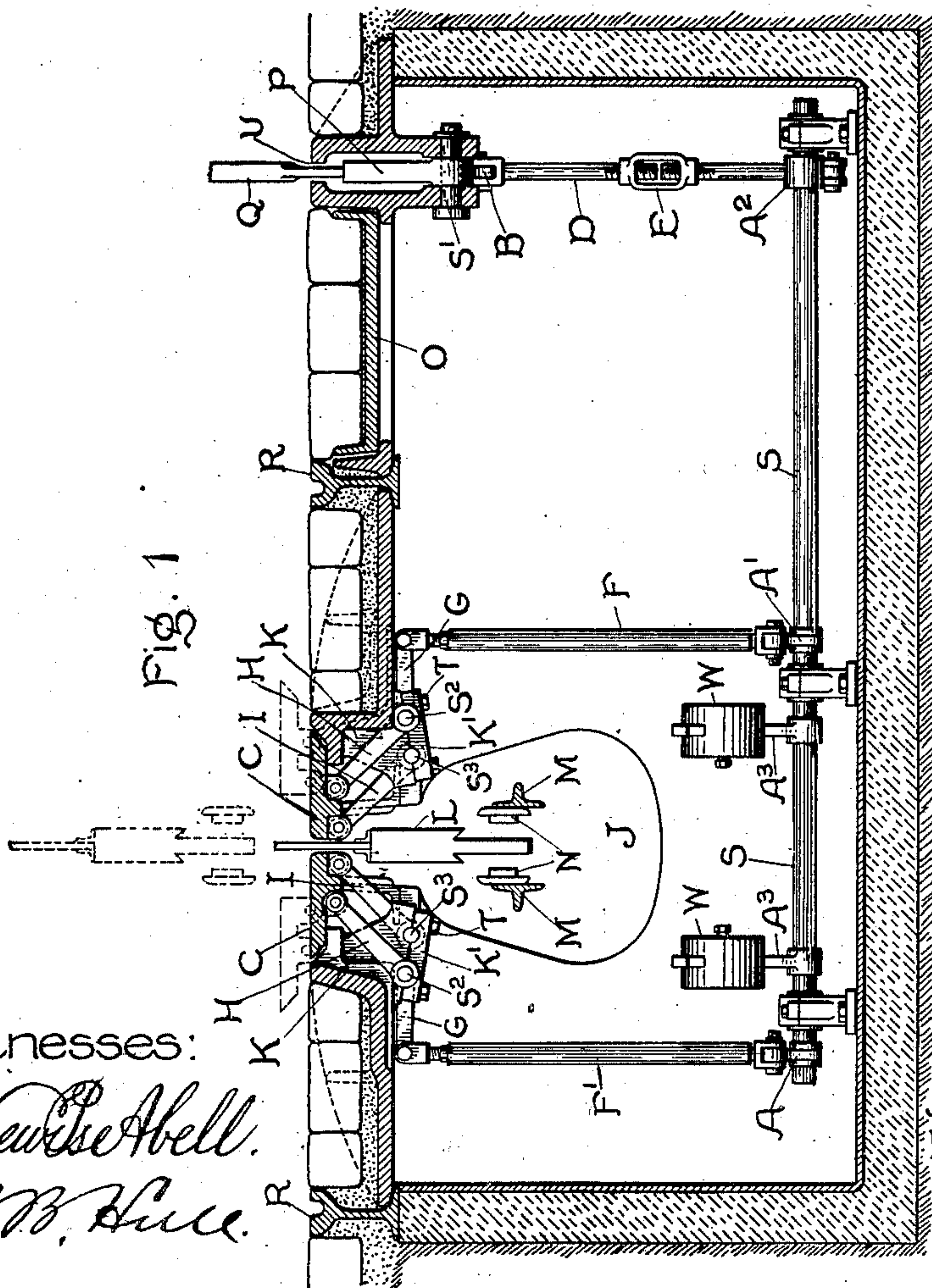
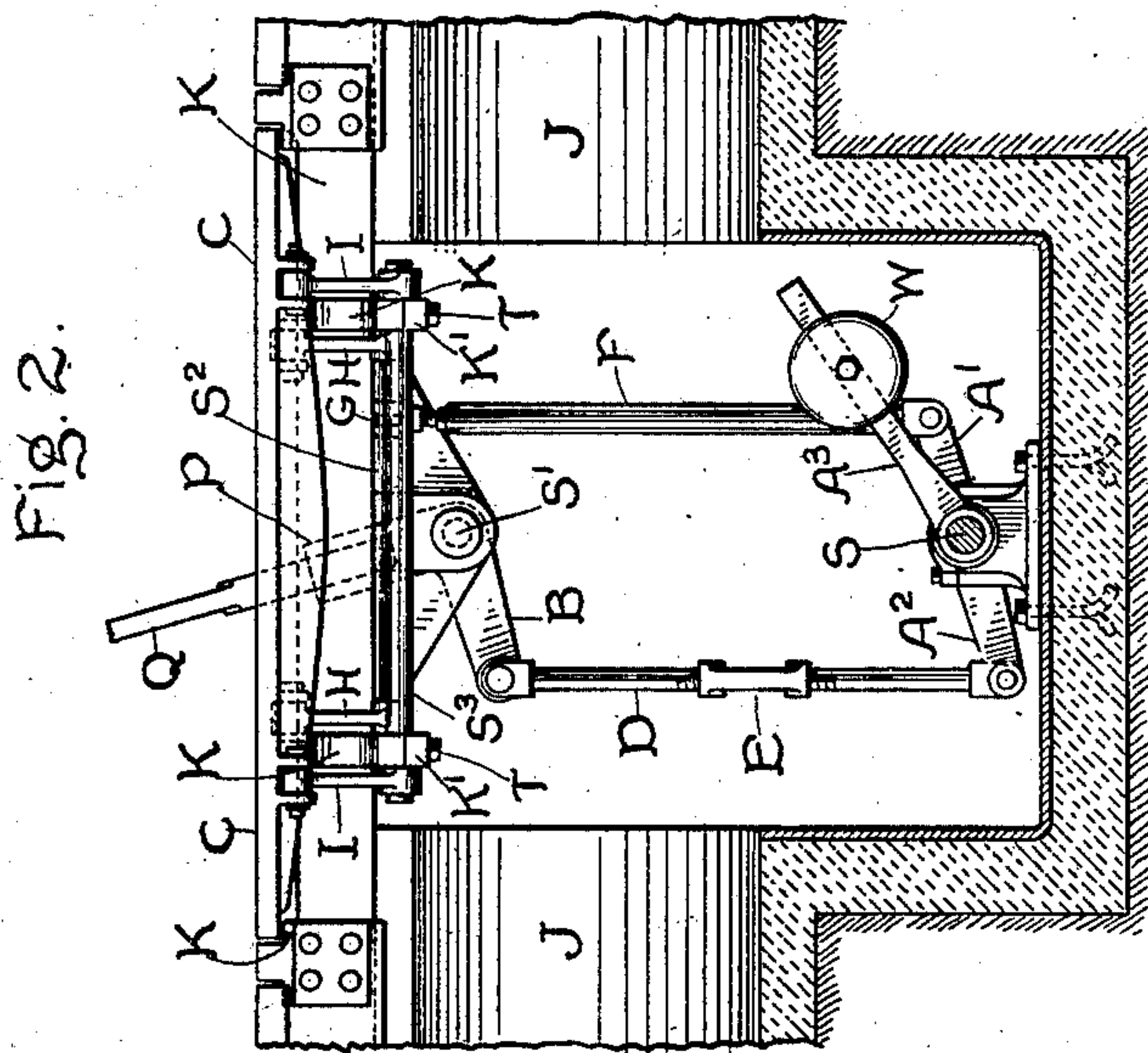
No. 729,136.

PATENTED MAY 26, 1903.

A. N. CONNETT.
ELECTRIC RAILWAY.

APPLICATION FILED FEB. 21, 1901.

NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALBERT N. CONNETT, OF LONDON, ENGLAND, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 729,136, dated May 26, 1903.

Application filed February 21, 1901. Serial No. 48,203. (No model.)

To all whom it may concern:

Be it known that I, ALBERT N. CONNETT, a citizen of the United States, residing at London, England, have invented certain new and useful Improvements in Electric Railways, of which the following is a specification.

This invention relates to electric railways of the conduit type, wherein the conduit is any suitable inclosure for protecting the electric conductors which supply the vehicle-motors and wherein a collector or plow which is suspended from the vehicle extends through a slot in the upper portion of the conduit and makes electrical contact with the conductors in the conduit.

The invention consists in means for moving a portion of the inclosure in order that when necessary the plow may be removed therefrom.

Of the drawings, Figure 1 is a lateral cross-section of a track and roadway to which my invention is applied, and Fig. 2 is a longitudinal section of the same.

The slot through which the collector extends into the conduit is necessarily very narrow in order to prevent vehicle-wheels and other objects from entering it, and hence the shank of the plow must be very narrow in order to have free movement within the slot. Furthermore, it is necessary that contact-shoes or current-collecting mechanism on the lower portion of the plow within the conduit should be of considerable size in order that they may be successfully operative. Hence it will be evident that the plow cannot be raised or lowered through the slot and that some means must be provided for temporarily removing a portion of the upper wall of the inclosure or, as is shown herein, of widening the slot.

Usually a plow is attached to the car in the car-barn, where the car is located over a large hole or open portion of the conduit; but there are several reasons why it is desirable or necessary to provide means out on the road for removing the plow from the conduit. The chief of these occurs in the combined urban and suburban roads where the conduit system is used within the city limits and the overhead line is resorted to in the suburbs, the cars being adapted to receive current

from either system. In this case it becomes necessary to remove the plow from the conduit when the end of the conduit system is reached and to lower the plow into the conduit on the return trip when the end of the overhead system is reached. In other cases it may be desirable to remove a damaged plow from a car without first pushing the car to the barn. These difficulties have previously been recognized and have usually been overcome in practice by stationing a workman at the end of the conduit, who when the car came to a stop would make the necessary changes, which in some cases consisted in removing the plow from the car. In a railway equipped with my improvements, however, it is not necessary for any one to descend into the conduit nor to work beneath the car. The apparatus is such that the motorman or conductor can from the car-platform in a manner similar to which a road-switch is operated or from a position in the roadway alongside the car actuate the mechanism which controls the conduit cover or covers to move the latter, so that the conduit-plow may subsequently be removed from or lowered into the conduit in any suitable manner—such, for instance, as that described in my application for patent, Serial No. 48,204, filed February 21, 1901.

In the drawings, C C represent the conduit-covers, which are moved to the position shown in dotted lines by the removable hand-lever Q in the hands of the car operator. The car runs on the rails R and carries the collector or plow L, which after the covers C have been moved to the position shown in dotted lines may be raised, as also shown in dotted lines. The collector L in normal operation extends through the slot into the conduit J, and the contact-shoes N, carried by the collector, engage with the positive and negative mains M. At the particular portion of the road at which the cross-section is taken the conduit J is enlarged to make room for the cover-lifting apparatus.

The supports K have depressed portions upon which the covers C closely rest in their closed positions, so that their upper portions are on a level with the road-bed.

Operating in bearings formed by the sup-

port K and the piece K', attached thereto by bolts T, are shafts S² and S³, to which shafts are rigidly mounted the arms H and I, which are pivoted to the lower side of the cover C at that portion of the cover which does not rest upon the depressed portion of the support K. The arms or levers H and I are arranged parallel to each other, so that when the shaft S² is given a movement of partial rotation the cover C will be raised away from the position in which it closes the conduit to another position which is parallel thereto.

Both covers C will be raised similarly and simultaneously, so that the slot, which normally is just sufficient to permit the passage of the shank of the plow, is widened to such extent that the plow can be freely raised or lowered without contact of any portion thereof with the covers. Furthermore, in case a heavy weight, such as a wagon or truck, should bear on the portion of a cover nearer to the slot than to that portion of the cover upon the stationary support K the cover would not be depressed at such point, since it can move only parallel to its normal position, and the support K prevents movement of the other part of the cover. Also the strain on the part of the cover nearer the slot would be divided between the cover-support K and the arms or levers H and I. In no case if the parts are properly designed to have sufficient strength will the cover be depressed below its normal closing position.

The means by which the motorman's lever Q imparts a movement of rotation to the shaft S² will now be described. A main shaft S is suitably journaled in bearings in the bottom of the conduit. As shown to the right in Fig. 1, an arm A² is rigidly mounted upon the shaft, and pivoted to this arm is a two-part link D, connected by an adjusting turnbuckle. A second arm B is pivoted to the upper end of the link D and rigidly secured at its farther end to a short shaft S', which is suitably journaled in the conduit. Secured to the shaft S' is a socket-lever P, which extends toward an auxiliary slot U in the roadway and is adapted to be engaged and reciprocated by the motorman's implement Q. From this description it will be clear that the reciprocation of the implement Q will cause opposite movements of rotation to be imparted to the shaft S.

Rigidly secured to the shaft S are arms A and A', and links F' F are pivoted at their lower ends to these arms and are connected to the mechanism which operates the covers C C. A description of the mechanism for one of these covers will be sufficient to show the operation of both. The link F', for example, is pivoted at its upper end to the lever G, which is rigidly mounted on the shaft or pivot-piece S². Thus as the arm or lever H is also rigidly secured to the shaft S² a bell-crank lever is formed, whereby when the implement Q partially rotates the shaft S the

link F' will pull down the arm G of the bell-crank lever and the arm H will carry the cover C to its upper position, which is parallel to its normal position, owing to the operation of the parallel lever I.

As shown in Fig. 2, the cover C is of considerable length, so that upon the shafts S² and S³ are rigidly mounted a plurality of the above-described arms H and I, respectively. Also rigidly mounted upon the shaft S are arms A³, upon which are adjustably mounted weights W. These are for the purpose of giving inertia to the apparatus and maintaining it in stable equilibrium in any position. Thus in Fig. 2, for example, when the implement Q is moved to the right and the cover C is elevated the weight W tends to maintain it in its open position.

As shown in Fig. 1, a manhole with a cover O is provided, so that for purposes of repair access may be had to the interior of the conduit.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a conduit structure, a conduit-cover, a stationary member forming part of the conduit structure adapted to support said cover when in its closed position, in combination with means in said conduit for moving said cover.
2. In a conduit structure, a conduit-cover, a stationary member forming part of the conduit structure adapted to support said cover when in its closed position, means in the conduit connected to the cover for moving the latter, and means accessible from the roadway for actuating said means.
3. In a conduit structure, a conduit-cover, a fixed frame for supporting said cover in its closed position, means in the conduit connected to the cover for moving the latter, and a lever accessible from the roadway for actuating said means.
4. In a conduit structure, a pair of conduit-covers including the slot for the plow between them, a fixed frame for supporting said covers in their closed positions on a level with the road-bed, and means in the conduit accessible from the roadway whereby the covers can be moved away from each other to widen the slots sufficient to permit the passage of the conduit-plow.
5. In a conduit structure, a pair of conduit-covers including the slot for the plow between them, a fixed frame for supporting said covers in their closed positions, in combination with means in the conduit adapted to be controlled from the roadway for raising the covers bodily away from each other.
6. In a conduit structure, a conduit-cover, a fixed support forming part of the conduit structure upon which said cover rests in its closed position with its top on a level with the roadway, and means in the conduit connected with the under side of the cover adapted to be controlled from the roadway for moving the cover.

7. In a conduit structure, a pair of conduit-covers including a slot between them, a fixed frame forming part of the conduit structure upon which said covers rest in their closed position with their tops on a level with the roadway, and means in the conduit connected with the under side of said covers adapted to be controlled from the roadway for moving the covers away from each other to permit the passage of the conduit-plow.

8. A conduit-cover, movable supporting means for supporting said cover when in its open position, and means in the conduit controlled from the roadway for moving said cover and movable supporting means to permit the passage of the conduit-plow.

9. A conduit-cover, a stationary support upon which said cover normally rests, a movable support connected to the under side of the cover, and means in the conduit controlled from the roadway for moving said movable support to move the cover from the stationary support to permit the passage of the conduit-plow.

10. A conduit-cover, a stationary support for said cover, in combination with means in the conduit controlled from the roadway for raising said cover bodily to a position which permits the passage of a conduit-plow.

11. A conduit-cover, a stationary support upon which said cover rests in its closed position on a level with the roadway, a lever pivoted to the under side of the cover, and means controlled from the roadway for operating the lever to move the cover from the stationary support.

12. A conduit-cover, a stationary support for said cover when in its normal closed position, a lever pivoted to the under side of the cover, said lever acting as a support for said cover when in its open position, and means controlled from the roadway for actuating the lever to move the cover from its closed position to permit the passage of the conduit-plow.

13. A conduit-cover, a stationary support on which said cover normally rests, a pair of parallel levers pivoted to the lower side of said cover, and means controlled from the roadway for actuating the levers to move the cover parallel to the roadway from its closed position.

14. A conduit-cover, a stationary support for said cover when in its normal position, a bell-crank lever, one end of which is pivoted to the lower side of the cover, and means controlled from the roadway for moving the other end of said lever.

15. A conduit-cover, a stationary support therefor, a bell-crank lever pivoted in said support, and pivoted at one end to said cover, and means controlled from the roadway for moving the other end of said lever.

16. A conduit-cover, a stationary support therefor, a bell-crank lever pivoted in said support and pivoted at one end to said cover, a link parallel with one arm of said bell-crank

lever, and pivoted at one end to the cover and at the other end to the support and means controlled from the roadway for moving the other end of said bell-crank lever.

17. A conduit-cover, a stationary support on which one side of the said cover rests in its closed position, a pair of parallel levers in the conduit having their upper ends pivoted to the portion of the cover which does not rest upon the support, the lower ends of said levers being pivoted to said support, whereby the cover will, in all elevations, be parallel to the roadway, and the support, cover and levers will cooperate to prevent a load from depressing the portion of the cover to which the levers are pivoted when the cover is in its closed position.

18. In a conduit structure, a conduit-cover, a stationary frame forming part of the conduit structure for supporting said cover when in its normally closed position, opening and closing means for said cover within the conduit adapted to hold the cover in the position into which it is moved by said opening and closing means.

19. In a conduit structure, a conduit-cover, opening and closing means therefor within the conduit adapted to be controlled from the roadway, and an adjustable weight carried on an arm attached to said opening and closing means to counterbalance the weight of said cover, said adjustable weight being so arranged that the cover will be held in any position into which it is moved by said opening and closing means.

20. A conduit-cover, a stationary support for said cover, a shaft journaled within the conduit, means connecting said cover and shaft, and means controlled from the roadway for moving said shaft to raise said cover from its stationary support.

21. A conduit-cover, a stationary support for said cover, a shaft journaled within the conduit, arms rigidly mounted on the shaft, means pivoted to an arm and to the conduit-cover, and means pivoted to another arm and controlled from the roadway whereby said cover is moved away from and toward said stationary support.

22. A conduit-cover, a shaft journaled within the conduit, means connecting said cover and shaft, an arm rigidly mounted on the shaft, a second shaft journaled within the conduit, an arm rigidly mounted on said second shaft, a lever pivoted at one end to the arm mounted on the first shaft, and at the other end to the arm mounted on the second shaft, and a lever connected with the second shaft adapted to be controlled from the roadway.

23. A conduit-cover, a shaft journaled within the conduit and adapted to be controlled from the roadway, an arm rigidly mounted on said shaft, a second shaft journaled within the conduit, an arm rigidly mounted thereon, a lever pivoted at one end to the arm mounted on the first shaft and at the other end with the arm mounted on the second shaft and a

plurality of arms rigidly mounted on the second shaft and pivoted at their free ends to the cover.

24. In a conduit structure, a conduit-cover
5 adjacent to the slot of said conduit, in combination with a fixed support for said cover forming part of the conduit structure, means in the conduit for moving said cover, said conduit having an independent opening from the
10 roadway, and an implement adapted to be

manipulated above the surface of the roadway and inserted in said independent opening to actuate said cover-moving means.

In witness whereof I have hereunto set my hand this 9th day of February, 1901.

ALBERT N. CONNETT.

Witnesses:

ALFRED NUTTING,
FREDK. L. RAND.