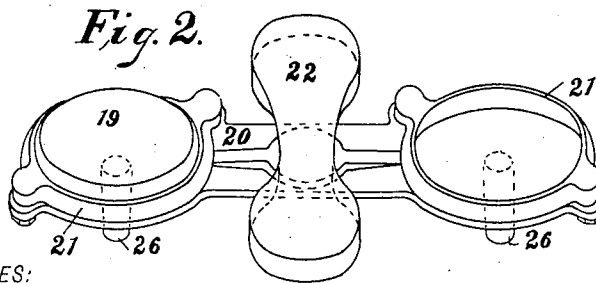
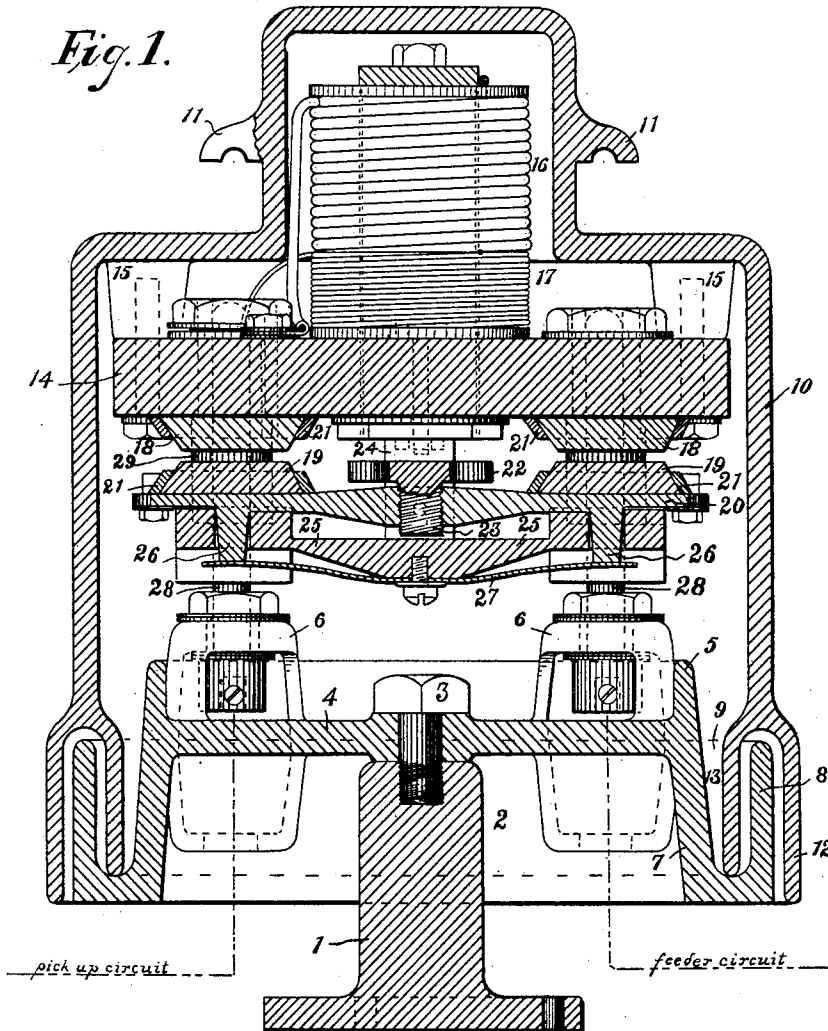


(No Model.)

W. CHAPMAN.
ELECTRIC RAILWAY SWITCH AND BOX THEREFOR.
No. 560,471. Patented May 19, 1896.



WITNESSES:
Ethan Dodder
Hubert C. Tener

INVENTOR
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BY
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ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM CHAPMAN, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR
TO THE ELECTRO-MAGNETIC TRACTION COMPANY, OF SAME PLACE.

ELECTRIC-RAILWAY SWITCH AND BOX THEREFOR.

SPECIFICATION forming part of Letters Patent No. 560,471, dated May 19, 1896.

Application filed July 29, 1895. Serial No. 557,449. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CHAPMAN, a citizen of the United States, residing in Washington, in the District of Columbia, have invented a new and useful Improvement in Electric-Railway Switches and Boxes Therefor, (Case No. 655,) of which the following is a specification.

My invention relates to switches and switch-boxes especially adapted for outdoor service, and it has particular reference to devices of this character which are used in connection with surface-contact electric-railway systems in which the exposed contacts are energized only when the current-collecting devices carried by the car are in contact therewith.

The objects of my invention are, first, to provide an inclosing box or casing having a protecting cover or bell which is readily removable, which is adapted to be placed below the surface of the street or track, and which will preclude the entrance of any moisture, whatever may be the condition of the atmosphere or the material surrounding the box; second, to provide movable contacts for closing the feeder-circuit which are electrically and mechanically connected and loosely supported and guided so that they will have a free upward right-line movement when attracted by an electromagnet and a like downward movement under the action of gravity; third, to provide a movable armature which is adjustable on its support with reference to the poles of the magnet, and, fourth, to provide carbon contact plates or faces and a simple and efficient means for fastening them in position upon their respective supports.

My invention relates to the electric-railway system set forth in the patents to Malone & Wheelless, No. 524,773 of August 11, 1894, and No. 534,238 of February 12, 1895, and embodies certain improvements upon the structure covered by said patents.

Referring to the drawings, Figure 1 is a vertical section through the switch and its inclosing box or casing; and Fig. 2 is a perspective view of the armature and its supporting-bar and the clamping-rings for the carbon contact plates or faces, one of these

plates being removed and the other shown in position clamped to the support.

Reference being now had to the drawings in detail, 1 is a supporting block or base, which may be bolted to any suitable foundation, and 2 is the bottom portion of the switch box or casing, suitably fastened to the base-piece 1, preferably by means of a bolt 3, as shown. The plate 4, which is directly fastened to the supporting-base 1, is surrounded by an upwardly-projecting flange 5, these two portions forming a pan or receptacle which is designed to be filled with some insulating moisture-repelling substance, preferably of a solid or semisolid character, like paraffin-wax, for example. This plate 4 also has projecting from both above and below the same three hollow bosses, only two of which are shown in the drawings. Each of these bosses has openings at the top and bottom, and each has a lateral opening above the plate 4, in order that free access may be had to the interior of the same in order to readily connect and disconnect the electric conductors from the pins projecting into the same, and also to admit the insulating and moisture-repelling material, and thus prevent any access of moisture to the switch through these parts of the apparatus. A peripheral flange 7 projects downwardly from the plate 4, and is preferably wider than the flange 5. An upwardly-projecting flange 8 surrounds the flange 7, the two being joined together at the bottom, so as to form a trough or channel 9, the plate, hollow bosses, and flanges above described preferably constituting parts of a single casting, although they obviously might be separately formed and afterward joined together, if desired. This channel 9 is in practice filled with oil or some other suitable insulating and moisture-excluding liquid.

10 is the protecting cover or bell, provided near its top with suitable handles 11 and at its bottom edge with two peripheral lips or flanges 12 and 13, the former extending outside the switch-box bottom 2, and the latter extending into the trough or channel 9 and resting upon the bottom of the same. It will be readily seen that this construction permits

of the ready removal of the bell 10 by merely lifting upon the handles 11, and that the shape of the bell is such that it tends to prevent the entrance of moisture, and, furthermore, that all moisture is absolutely excluded by reason of the structure and relative location of the flanges 8, 12, and 13 when employed in connection with the moisture-repelling liquid in the channel 9 and the material filling the pan or receptacle 4 5 and the hollow bosses 6.

I will now proceed to describe the switch proper, which is rigidly attached to and carried by the bell or cover 10. 14 is a slab or plate of insulating material, which is bolted to lugs 15, depending from the top of the bell 10. Supported upon and fastened to the top of this slab 14 are the two spools of an electromagnet, only one being shown in the drawings. Each of these spools has a winding or coil 16 for the main current and a similar coil or winding 17 for the current employed to complete the main-circuit connection.

18 and 19 are carbon contact-plates, the former being supported by the slab 14 and the latter by the supporting and conducting bar 20. Each of these carbon contact-plates is shown as circular in contour, but they may have any other form desired. Each has a beveled periphery and is surrounded by a ring 21 of good conducting material, the interior of which conforms to the shape of the periphery of the contact-plate and is provided with two lugs having screw-threaded bolts or pins, by means of which it is securely fastened to its support, and thus clamps the carbon plate securely in position. This means of attachment for the carbon plates not only insures a good electrical connection, but permits of a ready separation of the parts when desired.

22 is an armature provided with a screw-threaded projection 23, which engages with a correspondingly-screw-threaded opening in the middle of the supporting-bar 20. This means of connection between the armature and its support is employed in order that the armature may be raised or lowered by turning it upon its axis in order to vary the distance between it and the poles of the magnet to suit different circuits or other varying conditions. Any other suitable means for raising and lowering the armature with reference to its support obviously might be adopted, and hence I do not desire to limit myself to the specific means shown. 24 is a yoke attached to and depending from the slab 14 and provided with lateral arms 25. These arms 25 are provided with cylindrical perforations which receive and guide tapered lugs 26, depending from the bar 20. These tapered lugs rest upon a spring 27, bolted at its middle to the under side of the yoke 24. As the last-named features form no part of my invention, further description of their structure and function is unnecessary.

Pins 28 are rigidly fastened to and project

upwardly from the hollow bosses 6 and engage at their outer ends with conducting-sockets supported by the slab 14. These pins and sockets serve to make the electrical connections for the pick-up circuit and in connection with the carbon plates to complete the feeder-circuit; but they form no part of my invention and therefore need not be more fully described.

It will be understood from the illustration and the foregoing description that when the auxiliary or pick-up circuit is completed by the contact of the collecting-bars carried by the car with the contact-pins in the roadway the armature will be attracted and the supporting-bar 20 raised, thus bringing the carbon plates 18 and 19 into contact and completing the feeder-circuit through the contact-plates, the supporting-bar 20, and the coil 16, and that this circuit will be maintained as long as the collecting-bars are in contact with the contact-pins.

While I have described a specific form and arrangement of parts, I desire it to be understood that my invention is not limited to the specific structure shown and described, but may be varied as regards the details of structure and arrangement without departing from the spirit and scope of the invention.

I claim as my invention—

1. In a switch-box, the combination with a bottom comprising a pan and a trough or channel surrounding the same, of a cover or bell having two peripheral flanges at its lower edge, one of which rests in said trough or channel and the other of which extends outside the same.

2. In a switch-box, a bottom comprising a horizontal base-plate, a peripheral flange projecting above said base-plate and two concentric flanges below said base-plate joined at their lower edges to form a trough or channel.

3. In a switch-box, the combination with a bottom having a peripheral channel for non-conducting liquid and a pan containing non-conducting, moisture-repelling material and provided with hollow terminal supporting bosses, of a protecting cover or bell the lower edge of which rests in said channel.

4. In a switch-box, a bottom having a peripheral trough or channel and an elevated base-plate provided with a peripheral flange and with hollow bosses projecting from both sides thereof, said bosses having end openings and the upper portions thereof having side openings.

5. In a circuit-closing switch for electric railways, the combination with an electromagnet and stationary terminal contact-plates, of an armature and a loosely-mounted supporting-bar therefor provided with corresponding contact-plates, and means for adjusting the armature upon its supporting-bar with reference to the poles of the magnet.

6. In a circuit-closing switch for electric rail-

ways, the combination with an electromagnet and stationary terminal contact-plates, of a loosely-mounted armature-supporting bar provided with corresponding contact-plates, and an armature having a screw-threaded engagement with said supporting-bar, whereby it may be raised and lowered with reference thereto.

7. In a circuit-closing switch, the combination with a stationary insulating-base, a pair of contact-plates and clamps for fastening the same to said base, of a cooperating pair of contact-plates, a supporting-bar therefor and clamps for fastening said plates to said bar, substantially as described.

8. In a circuit-closing switch, a stationary slab or plate of insulating material provided with an electromagnet and carbon contact-plates, of a movable bar provided with an armature and carbon contact-plates, said arma-

ture and contact-plates being respectively in vertical alinement with the magnet-poles and contact-plates carried by the stationary insulating slab or plate.

9. A carbon contact-plate for switches having a beveled periphery, in combination with a clamping-ring therefor, conforming interiorly to the periphery of said contact-plate.

10. The combination with a contact-plate and a supporting-base therefor, of a clamping-ring surrounding said plate, and means for clamping said ring to said base.

In testimony whereof I have hereunto subscribed my name this 26th day of July, A. D. 1895.

WILLIAM CHAPMAN.

Witnesses:

WESLEY G. CARR,
H. C. TENER.