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PATENTED JUNE 28, 1904.

E. A. GRAY & S. H. BRAND.
ELECTRIC RAILWAY SWITCH.

APPLICATION FILED FEB. 11, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

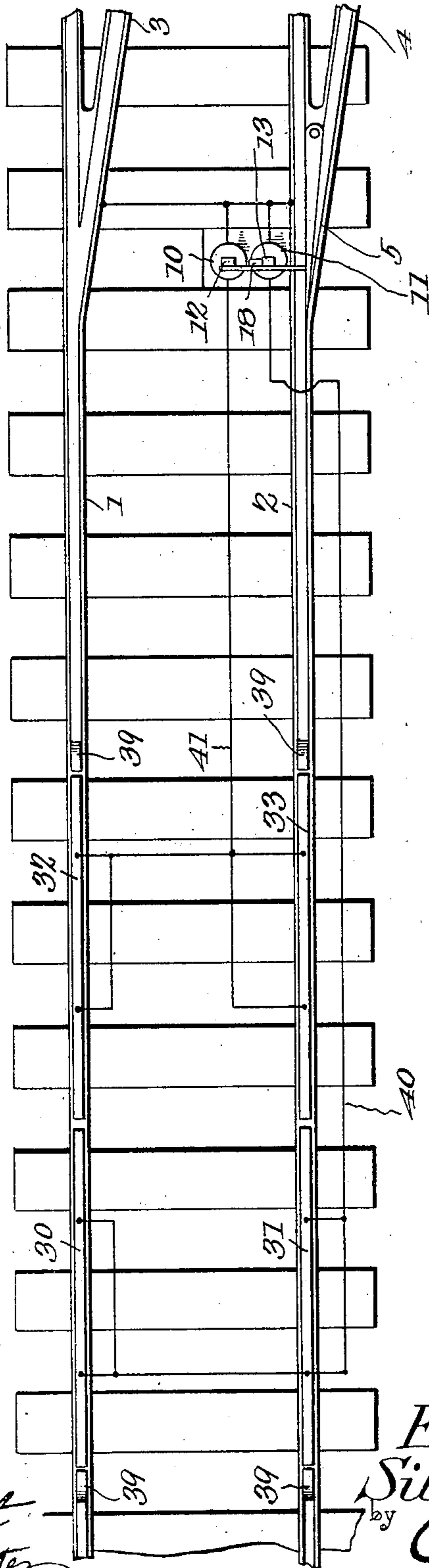
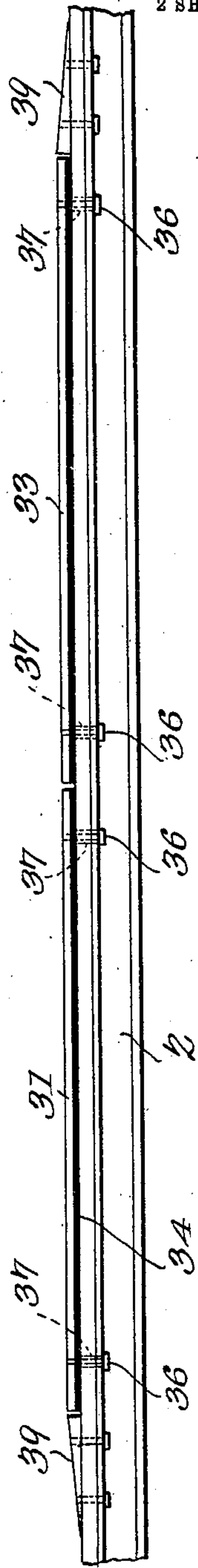


Fig. 3.



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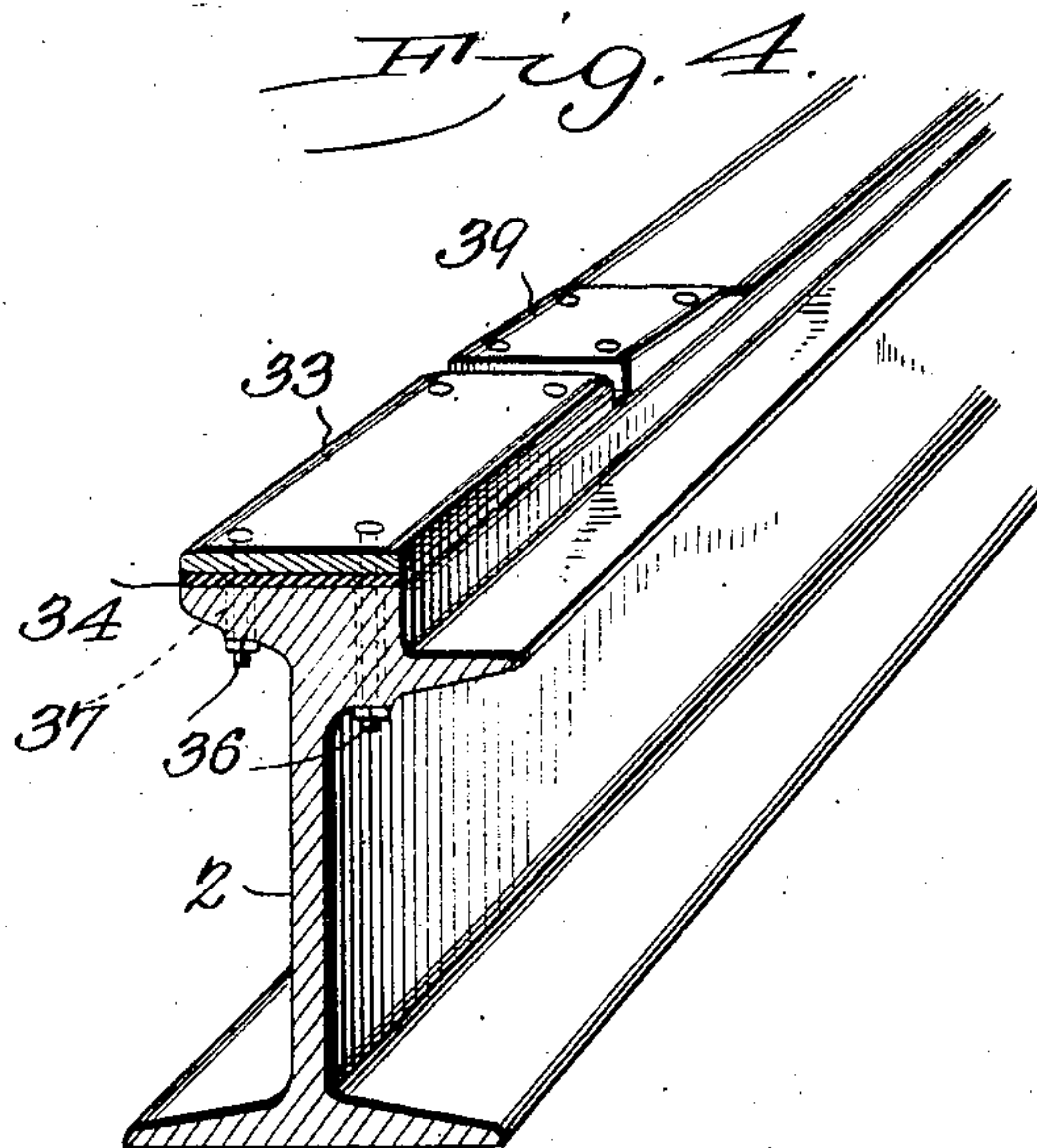
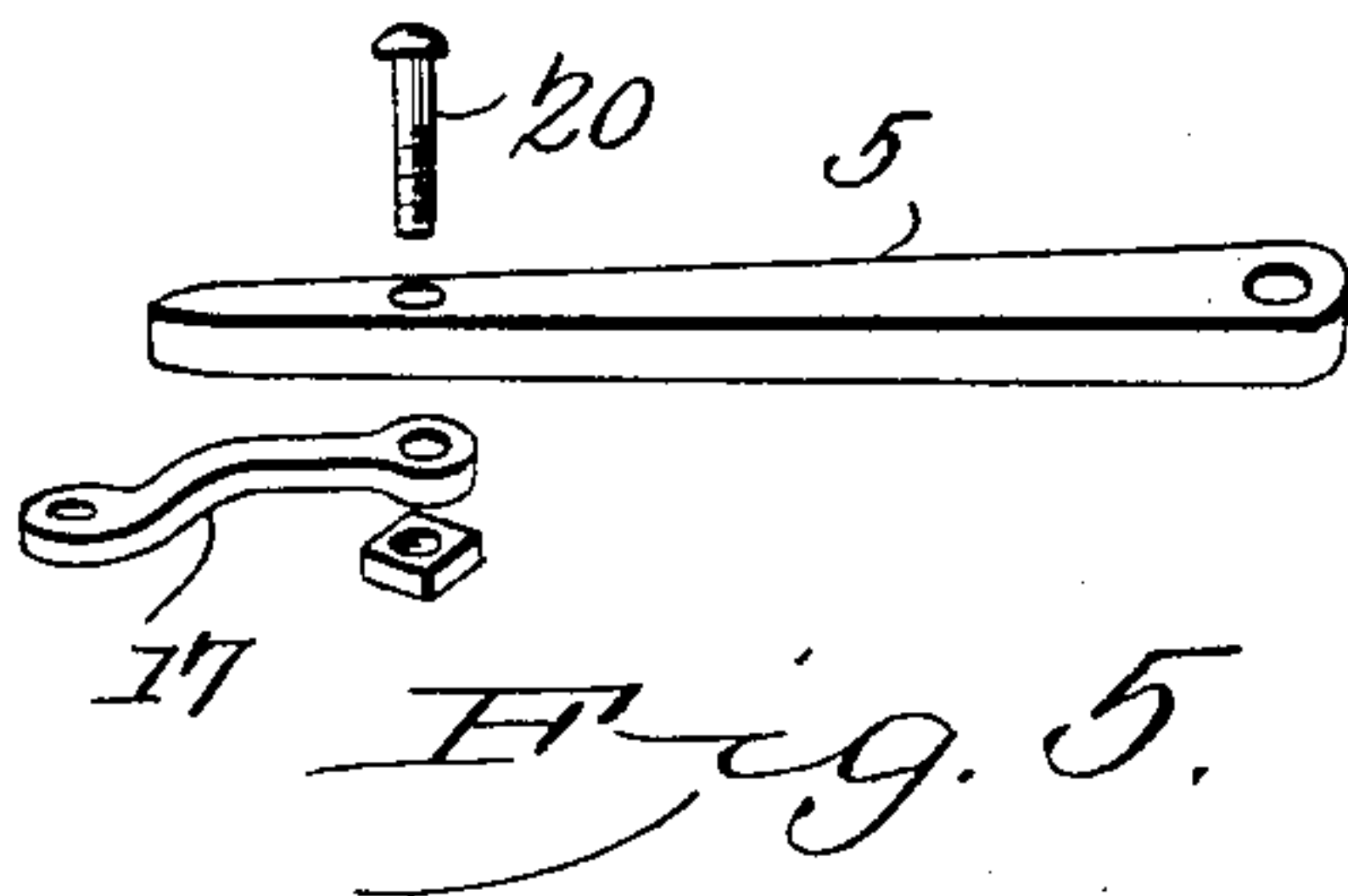
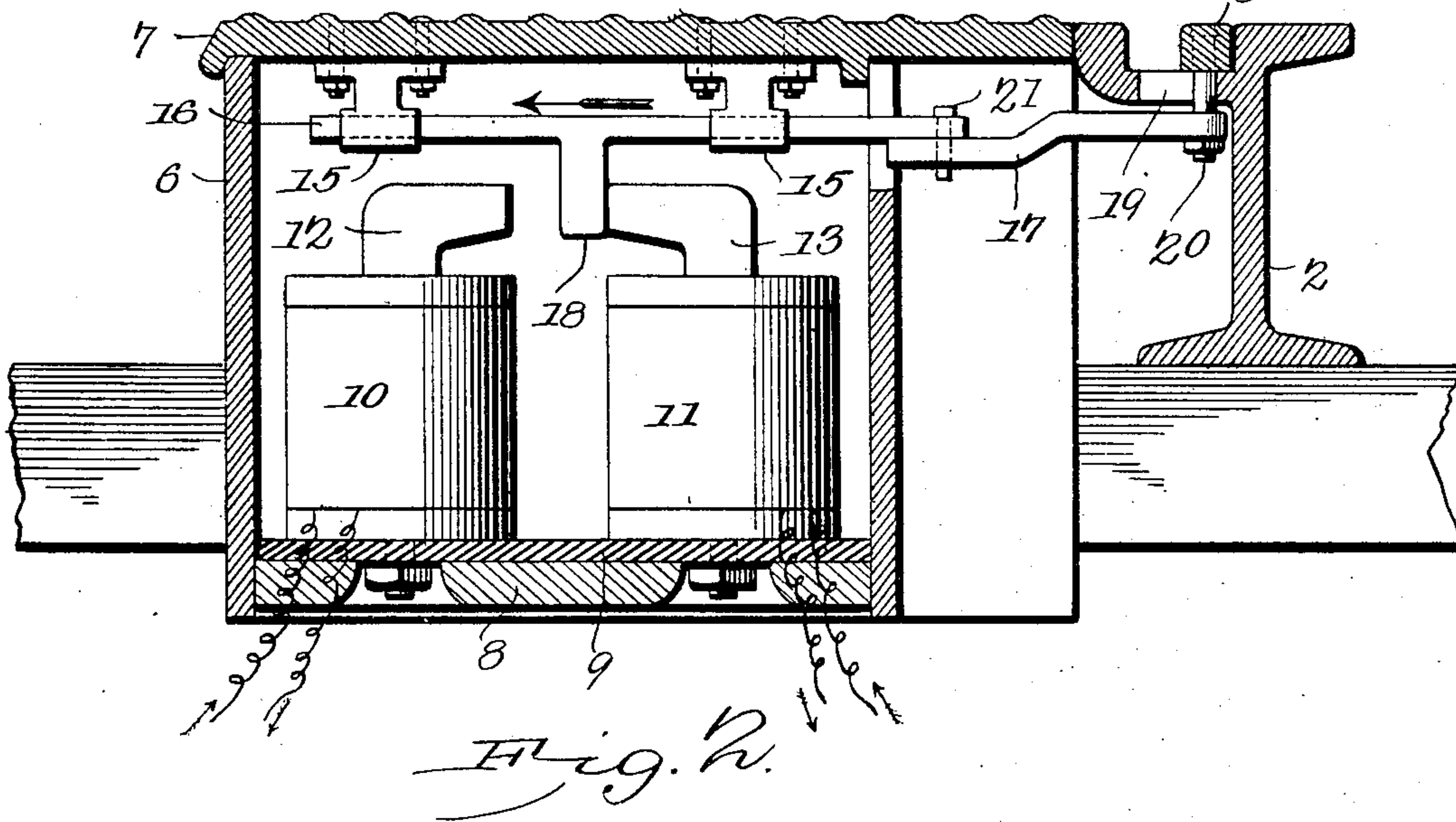
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2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD A. GRAY AND SILAS H. BRAND, OF CHICAGO, ILLINOIS.

ELECTRIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 763,390, dated June 28, 1904.

Application filed February 11, 1904. Serial No. 193,189. (No model.)

To all whom it may concern:

Be it known that we, EDWARD A. GRAY and SILAS H. BRAND, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Electric Railway-Switch, of which the following is a specification.

This invention relates to railway-switches, and has for its principal object to provide an electrically - actuated switch mechanism whereby a train or an approaching car may be caused, through suitable electromagnets, to move the switch in either direction.

A further object of the invention is to provide a switching device adapted principally for use in connection with electrical railway systems of that general class in which the motor power is supplied by an overhead or underground conductor and returned by one of the traffic-rails or by other suitable conductors, provision being made for utilizing the current in effecting movement of the switch.

A still further object of the invention is to provide a novel form of switch-operating mechanism which may be readily applied to existing switches and readily disconnected therefrom without loss of time should the mechanism become disarranged, and thus render it necessary to operate the switch manually.

A still further object of the invention is to provide novel means for insulating the car-wheels from the main traffic-rails as they approach the switch; so that the current instead of passing directly to the rail or rails may be directed through the electromagnets to the switch.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a plan view, partly in the nature of a diagram, of a portion of an electric railway provided

with a switch-operating mechanism arranged in accordance with the invention. Fig. 2 is a transverse sectional elevation through a switch-box, the view being on an enlarged scale. Fig. 3 is a side elevation of a portion of one of the traffic-rails. Fig. 4 is a sectional perspective view of one of the traffic-rails, illustrating the arrangement of one of the conducting-strips. Fig. 5 is a detail perspective view of the switch-tongue and its connections.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

Referring first to Fig. 1, 1 and 2 designate portions of the traffic-rails of an electric-railway system, and to these rails are connected siding or switch rails 3 and 4, the switch-tongue 5 being interposed at a suitable point, so that the cars may be directed along either the main line or to the siding, as desired, and these parts may be constructed in the manner commonly practiced. At a point adjacent to the tongue-switch is placed a box 6, preferably formed of metal and having vertically-disposed walls serving for the reception of a removable cover 7, that will preferably extend at one side to a point adjacent to the rail 2. The box is provided with a wooden or similar base 8, on which is placed a sheet of insulating material 9, which may be in the form of glass, rubber, vulcanized fiber, or other suitable material. To this insulated base is secured a pair of electromagnets 10 and 11, that are connected in separate and distinct circuits, and said electromagnets are provided with pole-pieces 12 and 13, respectively, the pole-pieces being directed toward each other in the manner more clearly shown in Fig. 2. To the under side of the cover is bolted a pair of hangers or brackets 15, serving as guides for a longitudinally-slidable bar 16, that is connected by a link 17 to the switch-tongue 5. The slide 16 has a depending flange or tongue 18, forming an armature that is disposed within the field of force of both the electromagnets and when attracted by either will shift the position of the switch-tongue. A portion of the base of the switch-casing is recessed to form a transverse slot 19 for the passage of the securing-pin 20, by which the

switch-tongue is held to the links; but the connection between the slide 16 and link 17 is in the form of a simple headed pin 21, which may be readily removed by merely raising the cover 17 should any of the parts become disarranged and manual adjustment of the switch rendered necessary.

On top of the traffic-rails 1 and 2 at a point adjacent to the switch are arranged insulated plates or strips of any desired number and onto which the car passes when approaching or leaving said switch. In the present instance four plates 30, 31, 32, and 33 have been shown, and each of these plates is formed of a comparatively thin strip of steel that rests on a strip 34, formed of suitable insulating material, both the insulating and the steel strip being disposed immediately above the tread of the traffic-rails. The metallic strips are held in place by suitable bolts 36, that are surrounded by sleeves or collars 37, formed of insulating material, at the points where they pass through the traffic-rails. The sets of plates 30 32 and 31 33 are spaced from each other and not in electric communication. The metallic plates are at some distance above the tread of the wheels, and in order that the car-wheels may be properly guided to position a number of guide-plates 39 are used, these being in the form of inclined planes that are bolted to the treads of the traffic-rails, so that the car-wheels may be raised and lowered without jar. The plates 30 and 31 are both connected to a line-wire 40, leading to the traffic-rails at a point adjacent to the switch, and in said line-wire the coil or coils of the electromagnet 11 are connected, so that a current sent along this line will energize the magnet and the latter by moving the armature 18 will shift the switch-tongue in such manner as to open the main line. The strips 32 and 33 are connected to a line-wire 41, that leads to the traffic-rails, and in said line-wire 41 the coil or coils of the electromagnet 10 are connected, so that a current sent along this line will energize the electromagnet 10, and the latter by moving the armature 18 will shift the switch-tongue in such manner as to open the line to the siding. When a car is approaching the switch, it will first mount the strips 30 and 31, and should the siding-line be open and the motor-man desire to continue on the main line he will close his motor-circuit so that a current from the main conductor will pass through the motor and the supporting-wheels of the car to the strips 30 and 31, and from thence along the line-wire 40 to the electromagnet 11, and from thence to the return-rails, energizing the electromagnet and moving the switch to open the main line. Before passing onto the plates or strips 32 and 33 the motor-circuit will be cut off and the previously-acquired momentum allowed to carry the car from the strips 32 and 33, the car then descending to

the traffic-rails and continuing on the main line. If the main line is opened and the car is to follow the switch or siding, the car travels over the switch 30 and 31 under its former momentum with its circuit broken, and the circuit is closed when the car reaches the strips 32 and 33, so that a current will be sent along the line-wire 41 to energize the electromagnet 10 and move the switch in such manner as to open the siding. Should a car traveling in the opposite direction desire to move the switch after passing beyond it, the circuit will be closed at the proper time and the switch thus moved in the desired direction. All of the strips 30, 31, 32, and 33 may be made any desired length in order to accommodate cars or trucks of different length, and the current-conducting wires may be led through protecting-tubes in the usual manner in order to prevent grounding of the circuit.

Having thus described the invention, what is claimed is—

1. In an electric railway-switch, a movable switch member, electromagnets for operating the same, insulated strips arranged above the traffic-rails and forming supports for the wheels of the vehicle, and current-conductors connecting said strips to the electromagnets.

2. In electric railways, a movable switch member, electromagnets for operating the same, metallic strips arranged above and insulated from the treads of the traffic-rails on which the vehicle-wheels may run, and current-conductors to which the strips, the electromagnets, and the traffic-rails are connected.

3. In electric railways, a movable switch member, electromagnets for operating the same, metallic strips arranged above and insulated from the treads of the traffic-rails, inclined guide-plates for elevating the vehicle-wheels from the traffic-rails to the strips, and current-conductors connecting the strips, the electromagnets, and the traffic-rails.

4. In electric-railway systems, a movable switch member, a pair of electromagnets adapted, respectively, to move said member in opposite directions, a plurality of independent strips insulated from the rail-treads, and current-conductors connecting the independent strips to the separate electromagnets.

5. In electric-railway systems, a movable switch member, electromagnets for operating the same, insulating-strips mounted on the treads of the traffic-rails, metallic strips mounted on the insulating-strips, means for securing the several strips to the traffic-rails, and current-conductors connecting said strips to the electromagnets.

6. The combination with a movable switch member, of a box or casing having a removable cover disposed to one side of such switch member and accessible independently of the latter, electromagnets disposed within the casing, an armature, and an armature-carrying slide connected to the switch member, said

armature-carrying slide being supported by and removable with the cover.

5 7. The combination with a movable switch member, of a box or casing having a removable lid or cover that is accessible independently of the switch member, a pair of electromagnets arranged within the box or casing, hangers pendent from the cover, an armature-supporting slide guided in the brackets, an
10 armature carried thereby, and a link connection between the slide and the switch, said connection being detachable when the cover, armature-slide and armature are raised.

15 8. The combination with a movable switch member, of a box or casing having a removable lid or cover accessible independently of the switch member, hangers pendent from the cover, an armature-carrying slide guided in

said hangers, a link connected at one end to the switch member, and its opposite end being disposed below one end of the armature-supporting slide, a headed pin forming a connection between the link and the slide and removable with the latter when the cover is raised, an armature carried by the slide, and
20 a pair of electromagnets disposed within the box, substantially as specified. 25

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

EDWARD A. GRAY
SILAS H. BRAND.

Witnesses:

JNO. M. DURYEE,
W. B. CARLIN.