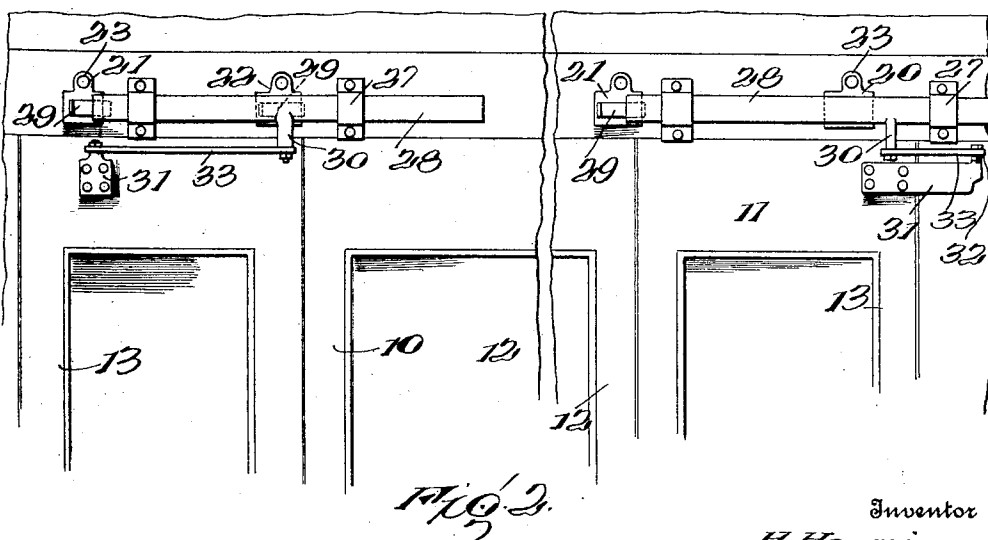
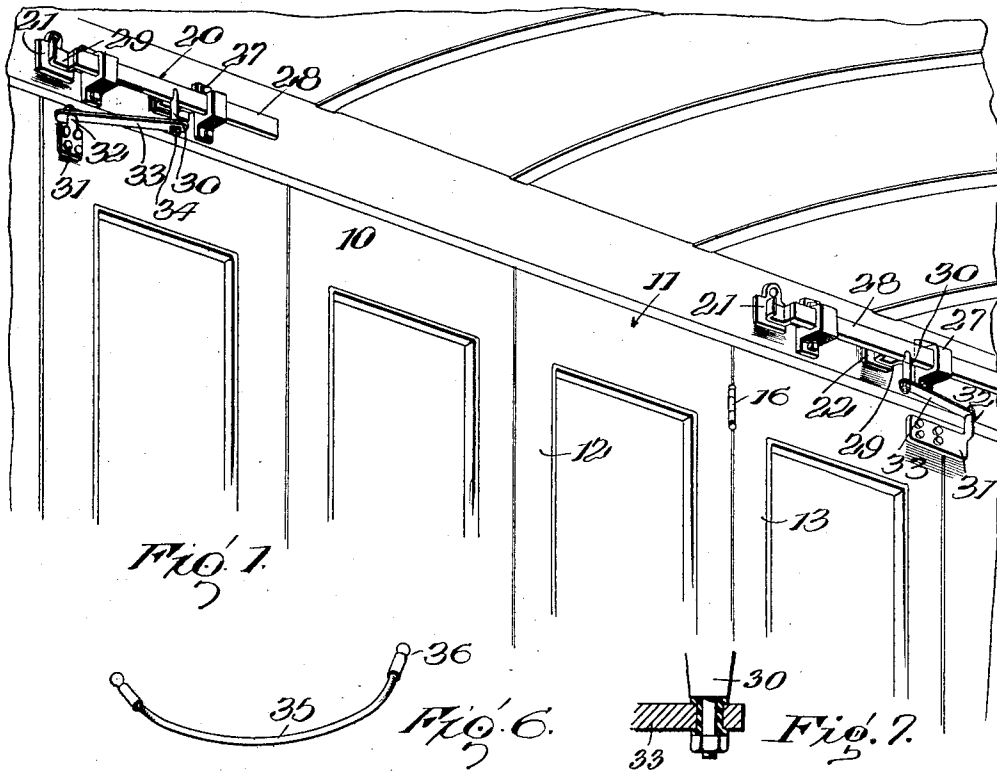


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DOOR CONTROLLED CIRCUIT BREAKER.
APPLICATION FILED DEC. 17, 1914.

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Patented Mar. 7, 1916.

2 SHEETS—SHEET 1.



Witnesses

W. H. Woodman.

By

H. Harris

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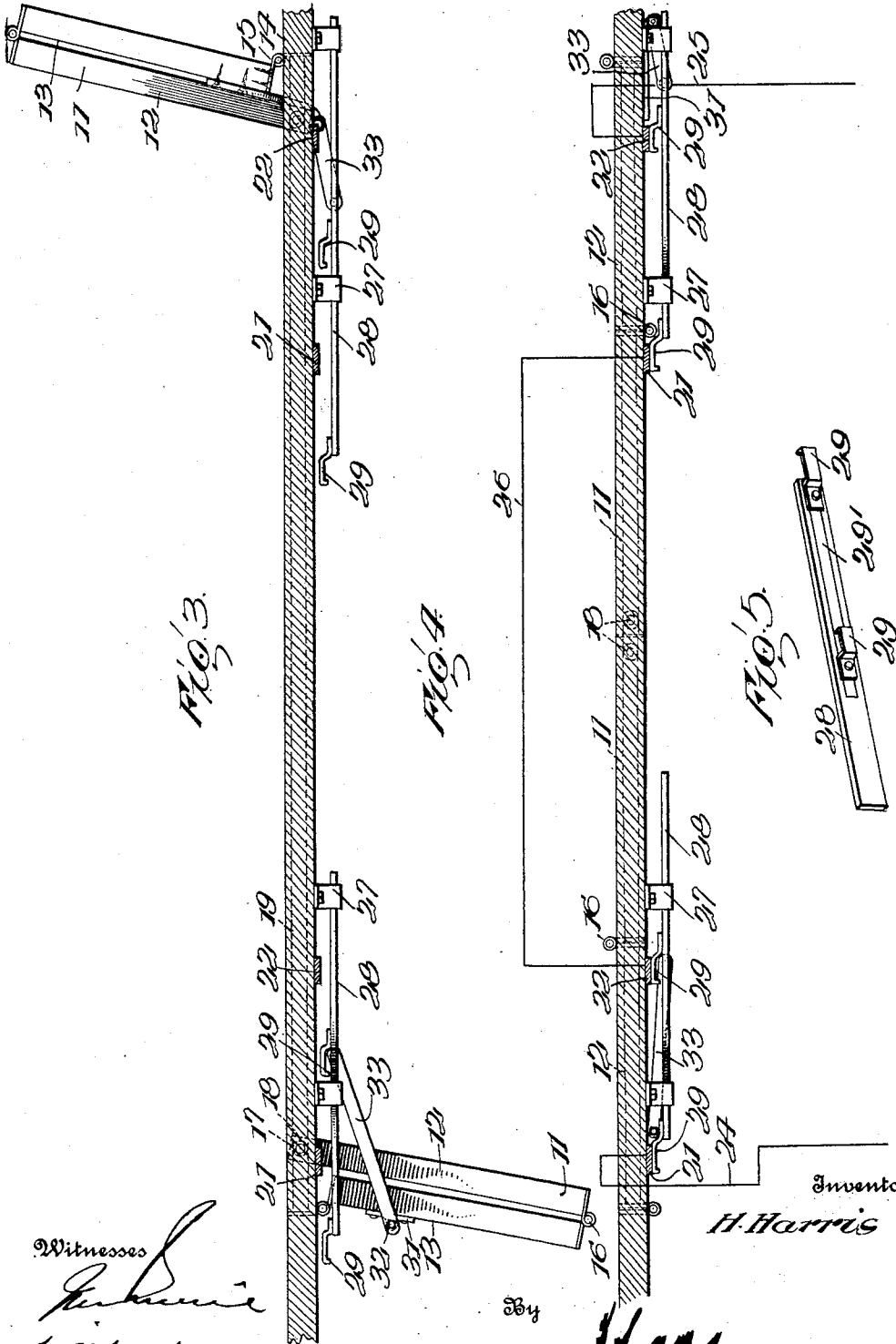
Attorneys.

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UNITED STATES PATENT OFFICE.

HENRY HARRIS, OF BUFFALO, NEW YORK.

DOOR-CONTROLLED CIRCUIT-BREAKER.

1,174,142.

Specification of Letters Patent.

Patented Mar. 7, 1916.

Application filed December 17, 1914. Serial No. 877,772.

To all whom it may concern:

Be it known that I, HENRY HARRIS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Door-Controlled Circuit-Breakers, of which the following is a specification.

My invention relates to new and useful improvements in safety appliances for railway cars, the primary object of my invention being the provision, in connection with an electrically driven railway car having doors which are closed when the car is running and opened only to permit passengers to board the car or leave it, of a device or devices in the power circuit of the car between the controllers and motors operable by the doors to open the circuit when the doors are opened and to keep such circuit opened until the doors are all closed.

A still further object of my present invention consists in the provision of a simple and efficient form of door operated, mechanical device of such a type as to avoid arcing between the contacts upon making or breaking of the circuit.

A still further object of my invention consists in the provision of a device of the above described character which may be operated by practically any type of swinging or sliding door now in use, or any style or type of door or doors which may be in use hereafter. And a still further object of my invention consists in constructing the device in such a manner as to include spaced, fixed contacts mounted upon the door casing or at any other suitable point, and a movable bridging contact member operated by the door and movable into simultaneous engagement with the fixed contacts upon closing of the door and out of engagement with such contacts upon opening of the door.

As it sometimes happens that the door mechanism of a car will become jammed, broken or otherwise out of order, a still further object of my invention consists in the provision of a bridging member entirely separate from the door which may be applied in place of the door operated bridging member should the door become inoperative, in order that the car may be driven by its own power to a suitable point for repairs.

With these and other objects in view, my invention will be more fully described,

illustrated in the accompanying drawings, and then specifically pointed out in the claims which are attached to and form a part of this application.

In the drawings: Figure 1 is a fragmentary perspective view of the interior of a car, showing a pair of conventional co-acting doors and a pair of my improved devices co-operating therewith; Fig. 2 is a fragmentary elevational view of the structure shown in Fig. 1; Fig. 3 is a horizontal sectional view taken through the devices, the doors being shown in open position; Fig. 4 is a view similar to that illustrated in Fig. 3, but showing the doors in closed position; Fig. 5 is a perspective view of the bridging member of one of my devices; Fig. 6 is a perspective view of the supplemental bridging member which is employed in case of emergency; Fig. 7 is a detail sectional view of an insulated connection employed.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

As will be later more apparent, my improved device is capable of being operated by doors of practically any type, whether sliding or swinging, and I do not, therefore, wish to in any way limit myself to its use with doors of the type shown. In order, however, to insure a clear and accurate understanding of my invention and its operation, I have illustrated it in connection with a door construction including double doors 10 and 11, each including hingedly connected sections 12 and 13. As shown, the sections 13 are connected to the sides of the door casing 14 by hinges 15, while the sections 12 are connected to the sections 13 by hinges 16, the free vertical edges of the door sections 12 abutting against each other when the doors are closed. The door sections 12, at their upper ends and adjacent their free edges, are provided with upwardly directed pins 17 carrying rollers 18 capable of movement in a longitudinal slot 19 formed in the lower face of the upper sill of the door casing.

As best illustrated in Fig. 3 of the drawings, the door 10 is of the type in which the sections swing inwardly upon opening of the door, while the door 11 is of the type in which the sections swing outwardly, the sections, in both cases, folding against

each other in open position of the doors. It will of course be understood that both doors may swing either outwardly or inwardly, the showing in the present instance being merely to illustrate the operation of my device with swinging doors. It will also operate equally as well with sliding doors, but such illustration is not deemed necessary.

Mounted at any suitable points, preferably immediately above the sections 13 of the doors 10 and 11, are the devices, each indicated as a whole by the numeral 20. Each of these devices includes a pair of spaced, fixed contacts 21 and 22, preferably in the form of metal plates, these contacts being secured to the door casing or other suitable support. Each of these contacts is preferably provided with a plug receiving socket 23, for a reason which will be hereinafter explained. As best illustrated in Fig. 4 of the drawings, the current supplying wire 24, leading from the controller or controllers, is connected to one of the plates 21, while the current carrying wire 25 is connected to the other plate 21 and leads to the motor or motors of the car. A conductor wire 26 connects the contact plate 22 of the two devices. Each device further includes a pair of spaced brackets 27 which are preferably mounted one adjacent each of the contact plates of its device and in alinement with each other and with such plates. These brackets are provided with alined eyes or guide openings through which is slidably mounted a contact bar or bridge 28. This contact bar or bridge is provided with spaced contacts 29 adapted to engage one with the contact plate 21 and the other with the contact plate 22 in one position of the bar 28. As best shown in Figs. 3 and 4, these contacts 29 are secured to the bar by one end and have their body portions offset from the bar to insure proper engagement with the fixed contact plates, the contacts 29 being preferably formed of resilient metal in order to further insure suitable engagement. As a rule, one of the contacts 29 is fixed to one extreme end of the bridging bar 28, while the other is fixed to the intermediate portion of such bar. The bar 28 is provided, preferably, at a point intermediate its length with a downwardly depending arm 30. Inserted in one face of the bar 28 and connecting the contacts 29, is a metal conductor 29'.

Secured to the upper inner corner of each door section 13, is a bracket 31 having an upstanding pivot pin 32 adapted to pivotally receive one end of a link 33. The opposite end of this link is pivotally connected to the lower end of the bracket arm 30, the link being secured against disengagement from the pin 32 and arm 30 by nuts 34 or other equivalent fastening devices. Bush-

ings 34' of insulating material are preferably disposed about the pivot pins 32 and arms 30 in order to insulate the brackets from the connected parts. One of these bushings is shown in connection with the pivot pin of one of the brackets in Fig. 7. These brackets 31 may be of any suitable form and the pin carrying portions of such brackets may be offset beyond the hinged edge of the door section to which it is attached, as shown at the right of Fig. 1, if such an arrangement is necessary to insure sufficient movement of the contact bar 28. The particular point for mounting the brackets 31 must, of course, be determined by the type of door with which the device is employed and upon the amount of movement of such door.

As shown in Figs. 1, 2 and 4 of the drawings, when the doors 10 and 11 are closed, the circuit is uninterrupted from the controller to the motors, entering the contact plate 21 of one of the devices, passing through the current carrier embedded in that bar 28 of such device and contact plate 22 of the same device, through the wire 26, through the contact plate 22 of the other device, current carrier of the bar 28 of such device and through the contact plate 21 thereof. As soon, however, as the door is even partially opened, the contacts 29, carried by the bridging member or contact bar 28, are moved out of engagement with the contact plates 21 and 22 and the circuit opened at two different points. This circuit will, of course, remain open until the doors are again closed. It will therefore be seen that it will be impossible for any one to leave the car while the latter is moving under power for the reason that the power will be automatically cut off as soon as the doors are opened. Furthermore, it will be impossible for the operator of the car to start it until the doors are closed and no one will be able to board the car while it is in motion.

In case the door becomes jammed, broken or otherwise inoperative, it is necessary to provide means for closing the circuit between the contact plates 21 and 22 of any or all of the devices in addition to the door controlled bridging bars 28. For this reason I provide conductor cables 35 of suitable length to act as bridges between the contact plates 21 and 22 of a device, each cable being provided at its ends with jacks or plugs 36 which may be inserted in the sockets 23 of the contact plates. It will of course be understood that as many of these cables are provided as there are devices, although they will never be used except in case of emergency.

In order to prevent any danger of accident to passengers on the car, through possibility of accidental contact with the electrically

charged portions of the devices, each device, with the exception of the lower portion of its arm 30, is preferably inclosed in a housing and insulated from the housing unless
 5 the latter be of non-conductive material. Each housing should, of course, be of sufficient length to permit proper sliding of the contact bar 28 and should be slotted for the passage of the arm 30. As these housings
 10 form no part of my invention, I have not deemed it necessary to illustrate them.

It will of course be understood that while I have illustrated two of my devices employed in connection with a double door, if
 15 the train is equipped with single doors, the devices may be employed with equally good results, one device being attached to each door. It will further be understood that, irrespective of the number of doors in the
 20 car, each door will be supplied with one or more of my devices, the number depending upon whether the door is of double or single type.

From the foregoing description, it will be
 25 apparent that I have provided a mechanical device or apparatus for automatically opening and closing each and every or any or all electric circuit wires between the controllers and motors of electric railway cars
 30 or the negative wires of the motors. It will also be clear that the device may be installed as shown in the drawings above the doors, or, if preferred, below the platform of the cars or any other suitable place, being al-
 35 ways provided with a housing of proper character, preferably of some insulative material.

Having thus described the invention, what is claimed as new is:

40 1. A device of the character described including contact plates adapted for attachment to a door frame, a bracket adapted for attachment to a door, guide members adapted for attachment near the contact
 45 plates, a contact member slidable in the

guides and having resilient portions engageable with the plates, and a link pivotally connecting the bracket and the contact member.

2. A device of the character described in- 50
 cluding contact plates adapted for attachment to a door frame, a bracket adapted for attachment to a door, guide members adapted for attachment near the contact
 55 plates, a contact member slidable in the guides and having resilient portions engageable with the plates, and a link pivotally connecting the bracket and the contact member, said link being insulated from the contact member. 60

3. A device of the character described including contact plates adapted for attachment to a door frame, a bracket adapted for attachment to a door, guide members adapted for attachment near the contact
 65 plates, a contact member slidable in the guides and having resilient portions engageable with the plates, a link pivotally connecting the bracket and the contact member, said contact plates being provided with
 70 jack receiving sockets, and a cable having terminal jacks for engagement in the sockets.

4. A device of the character described including spaced contacts adapted for attachment to a door frame, guide brackets also
 75 adapted for attachment to a door frame, a bridging contact member reciprocally mounted in the guide brackets, and means connected to the contact member and adapted for operative connection with a door, said
 80 contact member having resilient portions for simultaneous engagement with the contacts.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY HARRIS. [L. S.]

Witnesses:

CLARENCE F. ROWLEY,
 JOHN W. READY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."