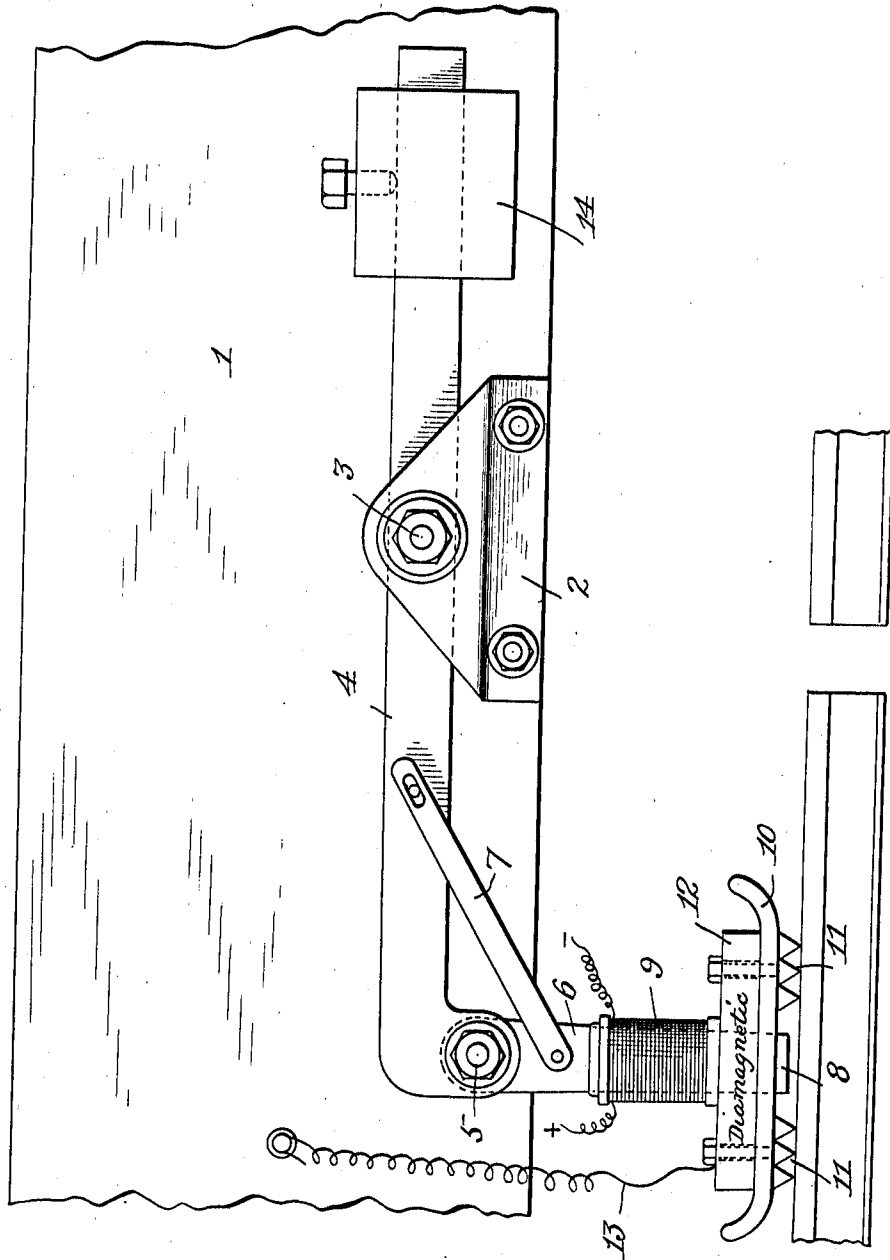


F. LACROIX.
CONTACT SHOE FOR THIRD RAILS.
APPLICATION FILED MAR. 13, 1908.

945,400.

Patented Jan. 4, 1910.



Witnesses

Edwin L. Yewell
Chas. J. O'Neill

Fred Lacroix

By

Grav. Burroughs

Inventor

Attorney

UNITED STATES PATENT OFFICE.

FRED LACROIX, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-FOURTH TO DAVID S. GREENEBAUM AND ONE-FOURTH TO JACOB A. CANTOR, BOTH OF NEW YORK, N. Y.

CONTACT-SHOE FOR THIRD RAILS.

945,400.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed March 13, 1908. Serial No. 420,844.

To all whom it may concern:

Be it known that I, FRED LACROIX, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Contact-Shoes for Third Rails, of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which the invention appertains to make and use the same, reference being had to the accompanying drawing, forming part of this specification.

The invention relates to improvements in contact-shoes such as are employed to collect the current from the third-rail conductor to operate the motor on the car of an electric railway.

In the third-rail of a long line there are many breaks necessitated by switches and other operative parts. In the ordinary construction the shoe is normally thrust toward the line of the third-rail by a yielding mechanism. Consequently in such a construction the shoe in passing over a break in the third-rail strikes the end of the succeeding rail-section with considerable force. The successive shocks of passing shoes tend to batter the end of the rail-section and the repair and replacement of the latter is often required. Also the shoe itself, by the continued hammering that it receives in passing over the breaks in the third-rail, becomes injured so as to impair its efficiency and its connections become so weakened that it is often torn from the car. Furthermore, with the shoes in ordinary use much trouble is experienced in obtaining a proper electric contact with the third-rail when the latter is coated with ice, which frequently happens in cold weather.

The invention in the present instance has for its object the elimination or reduction to a considerable extent of the shock caused by the impact of the shoe on a succeeding rail-section after it has passed a break in the third-rail. To accomplish this the shoe is normally held away from the line of the third-rail by a mechanism that gives to pressure, and means are provided for moving the shoe into contact with the third-rail after it has passed a break in the latter.

The invention also has for its object the provision of means for insuring a proper electric contact between the shoe and third-

rail when the latter is coated with ice. This is done by placing on the face of the shoe means for clearing ice from the rail.

The invention consists in the novel construction, combination and arrangement of parts, such as will be hereinafter fully described, pointed out in the appended claims and illustrated in the accompanying drawing.

The figure of the drawing shows the side elevation of a device embodying the invention.

The support 1, of insulating material such as wood and adapted to be attached to the car-frame, has secured to the side of the same the bracket 2. To the latter is pivoted as at 3, the horizontal lever 4. On one end of the lever, as at 5, is hinged the upper end of the vertical hanger 6. The swinging movement of the hanger is limited by the link 7 pivoted to the hanger and having a short sliding connection with the lever.

The lower end of the hanger 6 is of soft iron to form the core 8 and surrounding the latter is the helix 9 forming an electromagnetic. The helix is electrically connected with a suitable source of electricity, which may be a battery carried by the car. On the lower end of the hanger is mounted the contact-shoe 10 through which projects the core 8 slightly beyond the face of the shoe. On the face of the shoe are the serrations 11 that extend a short distance beyond the end of the core. Interposed between the shoe and the lower end of the helix and surrounding the lower end of the core is the block 12 of diamagnetic material, such as brass. This block tends to localize the magnetic influence at the pole of the core and prevents it from extending to the shoe. A flexible conductor 13 leads from the block 12 to the support 1 so that an electrical connection can be made with the motor on the car.

On the end of the lever 4, opposite to the end carrying the shoe, is the counter-weight 14. The latter is adjustable on the lever and by moving the same to overbalance the shoe the latter is normally held away from the third-rail. By adjusting the counter-weight on the lever the force with which the shoe is held away from the third-rail can be regulated.

The operation of the device is as follows: When the car is in position so that the third-rail comes within the influence of the electro-

magnet, by the attraction of the latter the shoe is depressed against the action of its supporting mechanism from its normal position to contact with the third-rail, thereby completing the circuit through the rail and shoe. When a break in the third-rail is reached the magnet ceases to act and the shoe, through the action of the counter-weight and the intervening mechanism, resumes its normal elevated position. After the break is passed and the succeeding third-rail section comes within the influence of the magnet the shoe is again depressed to complete the circuit. The hinged connection that the shoe has with the lever permits the shoe to make a square contact with the rail. The strength of the magnet is sufficient to overcome but slightly the action of the counter-weight. Also through the inertia of the shoe and its connections, which first has to be overcome by the magnet, the break in the third-rail is well passed before the shoe again contacts with the rail. Consequently the shoe does not strike the end of the rail-section and does not batter the same, nor is the impact sufficient to injure the shoe as the magnet acts easily and smoothly. The localizing of the magnetic influence by the diamagnetic block at the end of the core prevents the shoe from becoming magnetized and there is no tendency of the latter to become attracted until the end of the core is directly over the rail. Should there be any ice on the rail it will be broken and removed when the shoe engages the rail by the serrations on the face of the same.

It is obvious that certain mechanical equivalents can be substituted for some of the parts hereinbefore described in detail. As instances, a spring may be used instead of the counter-weight and a permanent magnet for the electromagnet.

Having thus described my invention, what I claim and desire to secure by Letters Patent is,

1. In a collector for third-rail conductors, a contact-shoe, movable mechanism normally holding said contact-shoe in an elevated position, and a magnet on said movable mechanism to actuate the latter to depress the contact-shoe.

2. In a collector for third-rail conductors, a contact-shoe, movable mechanism normally holding said contact-shoe in an elevated position, a magnet on said movable mechanism to actuate the latter to depress the con-

tact-shoe, and adjustable means for regulating the action of said movable mechanism.

3. In a collector for third-rail conductors, a contact-shoe, a pivoted lever normally holding said contact-shoe in an elevated position, and a magnet on said lever to actuate the latter to depress the shoe.

4. In a collector for third-rail conductors, a contact-shoe, a pivoted lever normally holding said contact-shoe in an elevated position, a magnet on said lever to actuate the latter to depress the contact-shoe, and a weight adjustable on said lever to regulate the action of the lever.

5. In a collector for third-rail conductors, a contact-shoe, movable mechanism normally holding said contact-shoe in an elevated position, a magnetic core on said movable mechanism to actuate the latter to depress the contact-shoe, and diamagnetic material surrounding said core to localize the magnetic influence at the end of the core.

6. In a collector for third-rail conductors, a contact-shoe, movable mechanism normally holding said contact-shoe in an elevated position, adjustable means for regulating the action of said movable mechanism, a magnetic core on said movable mechanism to actuate the latter to depress said contact-shoe, and diamagnetic material surrounding said core to localize the magnetic influence at the end of the core.

7. In a collector for third-rail conductors, a contact-shoe, a pivoted lever normally holding said contact-shoe in an elevated position, a magnetic core on said lever to actuate the latter to depress the contact-shoe, and diamagnetic material surrounding said core to localize the magnetic influence at the end of the core.

8. In a collector for third-rail conductors, a contact-shoe, a pivoted lever normally holding said contact-shoe in an elevated position, a weight adjustable on said lever to regulate the action of the lever, a magnetic core on said lever to actuate the latter to depress the contact-shoe, and diamagnetic material surrounding said core to localize the magnetic influence at the end of the core.

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

FRED LACROIX.

Witnesses:

GEO. L. GREEN,
JEANNETTE F. GREEN.