(No Model.)

T. B. & H. WILCOX.

ELECTROMAGNETIC CONTACT MAKING DEVICE FOR ELECTRIC RAILWAY SYSTEMS.

No. 524,367. Patented Aug. 14, 1894.

Fig. 2.

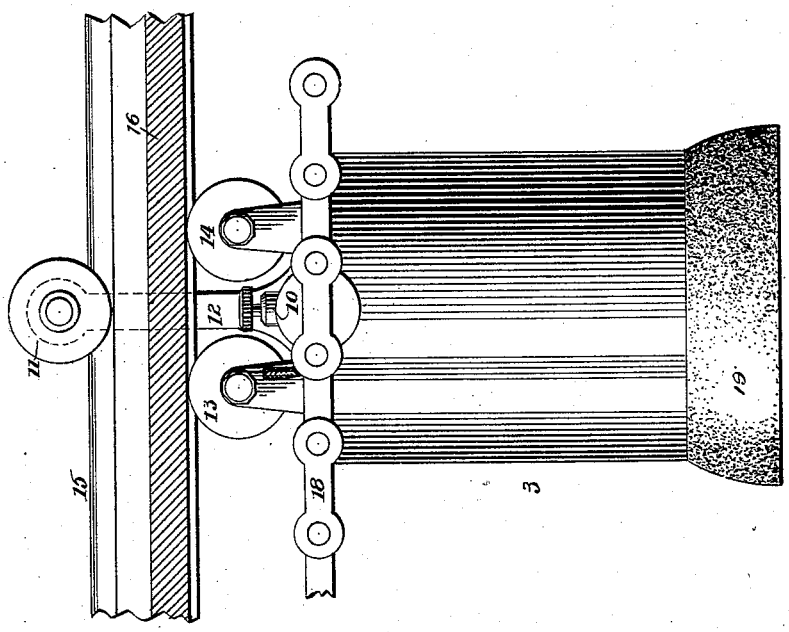
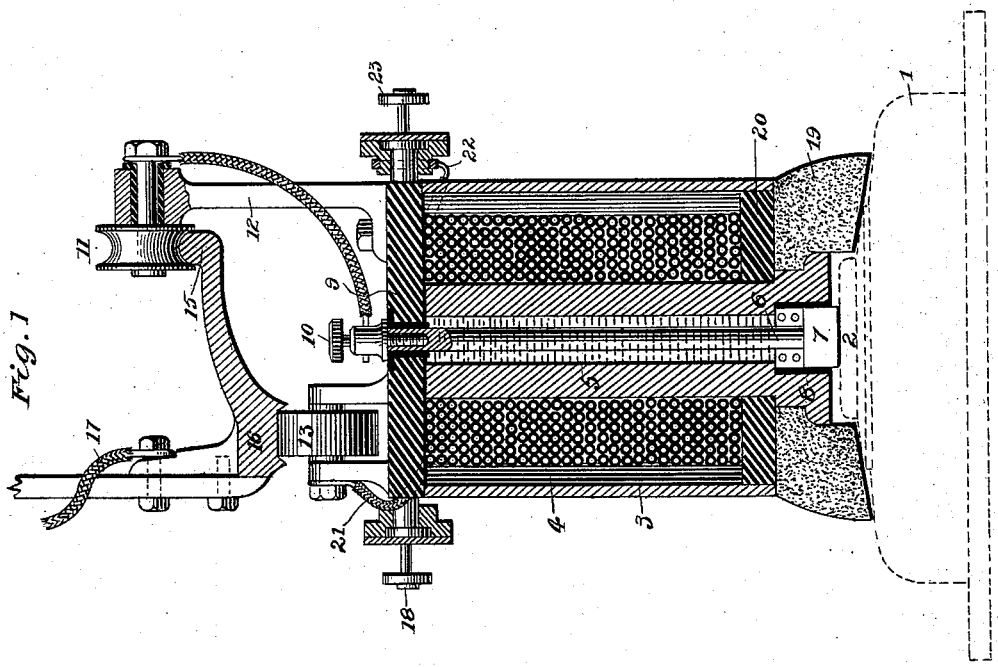


Fig. 1



WITNESSES:

Frank S. Ober

A. J. Brown

INVENTORS

Theodore B. Wilcox

Henry Wilcox

BY G. H. Stockbridge

their ATTORNEY.

UNITED STATES PATENT OFFICE.

THEODORE B. WILCOX AND HENRY WILCOX, OF NEWARK, NEW JERSEY.

ELECTROMAGNETIC CONTACT-MAKING DEVICE FOR ELECTRIC-RAILWAY SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 524,367, dated August 14, 1894.

Application filed August 1, 1893. Serial No. 482,075. (No model.)

To all whom it may concern:

Be it known that we, THEODORE B. WILCOX and HENRY WILCOX, citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electric-Railway Systems; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In an application filed on the 16th day of August, 1892, and renewed on the 1st day of August, 1893, the serial number of which application is 482,098, we have described a system of railroading through the medium of electricity, in which we provide a series of electromagnetic devices, carried by the motor car, and so supported as to be capable of being brought successively into contact with a series of plates along the road-bed. In the application referred to, we say that we prefer to use on every car three magnets, inclosed in suitable boxes, the whole magnet-box structure being easily replaceable, so that if one gets out of order another can be quickly substituted. The magnets and magnet-boxes are carried upon an endless sprocket chain, one part of which is stretched along under the car near the surface plate. The chain rotates freely, being mounted loosely on pivoted sprocket wheels, one at each end of the car. The magnet-boxes are so spaced as to be just as far apart along the length of the sprocket chain as the surface plates are distant from each other. Consequently, if one magnet with its box is brought into contact with one of the surface plates, then the next magnet will, in its turn, make contact with the next plate, and so on. It is, of course, understood that the magnet, on reaching a new plate, is charged and attracted to the said plate, at the same time that the magnet which has preceded it is de-energized and released. The action of the charged magnet upon the surface of the plate is to attract a movable magnetic piece within the said plate, and thus create an electric contact, and form a new path for the electric current, in a way which will be fully understood, without specific description.

The present application is concerned with the details of the magnet and magnet-box, and these details are clearly shown in the drawings, in which—

Figure 1, is a vertical section of the magnet and its box, the top of a co-operating suface plate being shown in dotted lines; and Fig. 2, is an external view of the same apparatus, being an elevation taken at right angles to the section, Fig. 1.

Designating the different parts by suitable characters, 1, is a surface plate, adapted to be located in the road bed of an electric railway. The part 2, of the said plate is of iron, and adapted to enter, or be surrounded by, the lower end of the magnet-box, when the conditions are favorable. The casing of the box is shown at 3, and it is of metal, and within it is a magnet, 4, surrounding an iron core, 5. Through the iron core, with an air space between, projects a rod, 6, of aluminium bronze, or other good conducting material. At its lower end this rod is provided with a head, 7, which is insulated from the core, 5, by insulating material shown at 8. The rod, 6, projects through the top, 9, of the casing, 3, from which it is insulated, and a binding-post, 10, is connected with it above the top, which binding-post is in electrical connection with a trolley, 11, supported on a standard, 12, projecting from the top of the casing. Two other trolleys, 13, and 14, are similarly supported on standards projecting from the case top.

The trolley, 11, is adapted to make contact with a rail or contact strip, 15, which is formed in one piece with a rail or contact strip, 16, adapted to bear on the trolleys, 13, and 14, and make electrical contact therewith. From contact strip, 16, a wire, 17, leads off a branch circuit through an electric motor, or other translating device.

At 18, we have shown the sprocket chain on which the magnet-box is supported. At the lower end of the box, we have attached a rim, 19, of soft rubber, the object of which is to aid in securing the perfect insulation of the plates at the surface of the road, even though the said plates should be covered with water. Dependence is placed, for securing this result, upon what may be called the suctional tendency of soft rubber with respect

to objects with which it is brought into contact. Between the magnet core and the inner walls of the casing, at the bottom, is a ring of insulating material, 20.

It will not be necessary to detail the construction and operation of the apparatus further than to say that the magnet, 4, is charged through the medium of a circuit which enters by way of the rail, 15, and passes through rail 16, to the trolley, 13. Thence by a wire, 21, the circuit goes through the magnet, 4, and passes out by way of a wire, 22, to the sprocket, 23, corresponding, on the opposite side of the magnet-box, to the sprocket, 18, already mentioned. From there, the circuit may go to ground, or wherever else desired.

In the operation of the system of railroading referred to in our statement of invention, the circuit above described becomes charged when the proper contacts are made, and, consequently, the iron core, 5, becomes magnetic. This being the case, and it being assumed that the surface plate, 1, 2, is in the neighborhood of the magnet, 4, the two magnetic substances will seek each other and the parts will be drawn into the position shown in Fig. 1, with the head, 7, of the rod, 6, resting upon, and making contact with, the plate, 2.

It should be added that the action above described renders the plate, 2, itself magnetic, and acts upon a movable piece of iron, within the underground box with which the surface-plate is provided to close a new electric circuit, including said piece of iron, the plate, 2, head, 7, rod, 6, binding post, 10, and trolley, 11, rails, 15, and 16, trolley, 13, wire, 21, magnet, 4, wire, 22, and sprocket, 23, to ground or elsewhere.

In both descriptions of the circuit through the magnet, it should be understood that the branch, 17, will lead off its proportionate share of the current through the motor, or other translating device, in the said branch.

Having now described our invention, what we claim is—

1. An electro-magnetic contact making device, detachably mounted upon an endless chain, the said electro-magnet being inclosed in a suitable casing on which are supported suitable circuit terminals for the said magnet, as and for the purpose set forth.

2. An electro-magnetic contact making device, consisting of an electro-magnet, inclosed in a suitable box or casing, a hollow iron core for the said magnet, the said core being traversed by, and insulated from, a conductor which forms the contact terminal, and the said box being provided with suitable means for attachment to a support, and also carrying circuit terminals for the magnet, as and for the purpose set forth.

3. An electro-magnetic contact maker, provided with an electro-magnet having a hollow core through which projects good conducting material for making electrical contact, as and for the purpose set forth.

4. An electro-magnetic contact making device, having an electro-magnet with a hollow core, said core being traversed by, and insulated from, a suitable conducting rod which projects at one end, for making good electrical contact, and to which is attached, at the other end, a binding-post, as and for the purpose set forth.

5. In an electro-magnetic contact-making device, the combination with an electro-magnet having a hollow core, of a contact-piece within said hollow core, the said contact-piece being operatively connected with one terminal of an electric circuit, and the magnet being adapted to bring said contact into contact with another terminal, as and for the purpose set forth.

6. In combination with an electro-magnet having a hollow core and a contact-piece within said hollow core operatively connected with one terminal of an electric circuit, of an independent circuit terminal, also magnetic in its nature, the said electro-magnet being adapted to become charged and cause the mutual attraction of its own core and the said independent circuit terminal, as and for the purpose set forth.

7. An electro-magnetic contact-making device having an electro-magnet inclosed in a suitable box or casing and resting upon an annular rim of soft rubber, as and for the purpose set forth.

8. An electro-magnetic contact making device, having its contact surfaces surrounded at the time of contact only by soft rubber, whereby any water which may have accumulated upon the co-operating contact will be rendered harmless against causing injurious leakage, as and for the purpose set forth.

9. The combination with a normally exposed surface plate forming one terminal of an electric circuit, of a co-operating terminal surrounded by soft rubber, as and for the purpose set forth.

10. In an electrical distribution system, a pair of terminals, one of which is normally exposed and the other surrounded by soft rubber, as and for the purpose set forth.

11. An electro-magnetic contact making device, having an electro-magnet inclosed in a cylindrical box, and provided with a central contact terminal, in combination with a ring of soft rubber, surrounding the said contact terminal, and forming the support for the box, as and for the purpose set forth.

In testimony whereof we have signed our names, in the presence of two witnesses, this 16th day of November, A. D. 1892.

THEODORE B. WILCOX.
HENRY WILCOX.

Witnesses:
DAVID KAY, Jr.,
WM. KOLB.