(No Model.)

T. B. & H. WILCOX.

ELECTRIC RAILWAY SYSTEM.

No. 524,366. Patented Aug. 14, 1894.

Fig. 1.

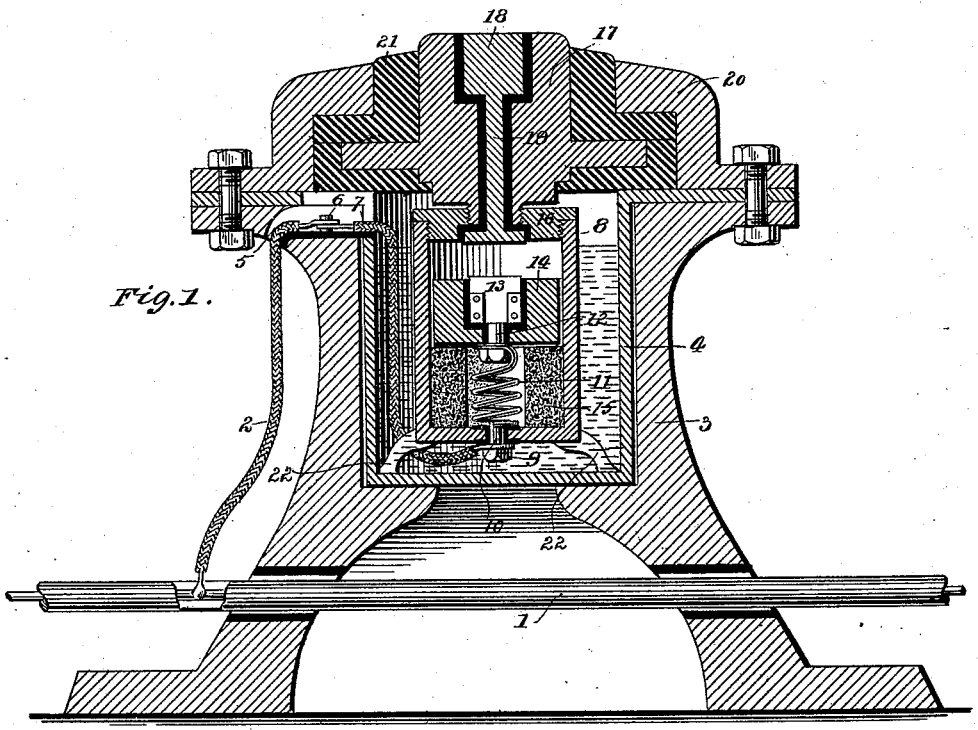


Fig. 4.

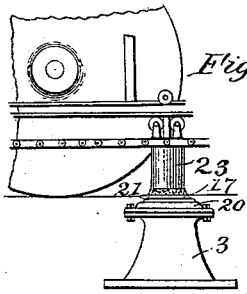
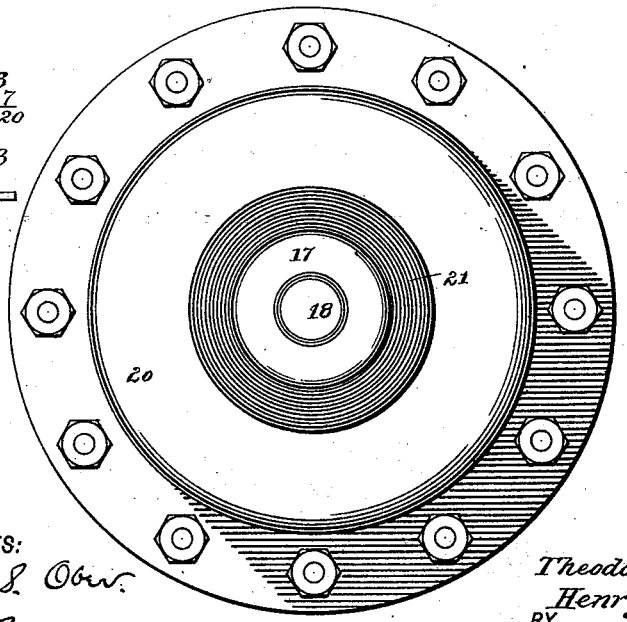


Fig. 2.



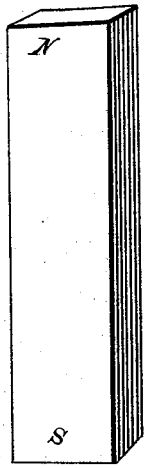


Fig. 3.

WITNESSES:

Frank L. Ober.

INVENTORS,
Theodore B. Wilcox.
Henry Wilcox
BY G. A. Stockbridge
Their ATTORNEY.

UNITED STATES PATENT OFFICE.

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

ELECTRIC-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 524,366, dated August 14, 1894.

Application filed August 1, 1893. Serial No. 482,074. (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 electro-magnetic 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 surface plate, as an article of manufacture by itself, and it is illustrated in the accompanying drawings, in which—

Figure 1, is a vertical section of the surface plate. Fig. 2, is a plan of the same. Fig. 3 is a detail view of a permanent magnet or loadstone, which may be employed for bringing the magnetic circuit-controller into operation, and Fig. 4 is a view of one of the surface-plates in contact with a magnet on a car.

Designating the different parts of the apparatus by indicating characters, 1, is an insulated wire, constituting the main circuit of the railway system above referred to, and 2, is an insulated branch wire, running to the surface plate in a manner which will presently be explained. The main body of the structure which we call the surface plate is a frame or standard, 3, consisting of a metallic casting with a cylindrical opening in it. Within this opening is placed an insulating box, 4, of vulcabeston, or other good insulating material, shaped to fit the opening, and also to cover the top of the rim around the edge of the casting, 3.

The branch wire, 2, is led, as shown in the drawings, into a groove or gutter, 5, in the casting, 3, and is there attached by a loop connection, to an insulated pin, 6, to which is also joined an insulated wire, 7, extending from the box, 4. The wire, 7, runs to the bottom of a second insulating box, 8, within the box, 4, and is joined to a nut, 9, which is attached to the lower end of a bolt, 10. The said bolt passes through the bottom of the box, 8, and is there joined to a wire, 11, the other end of which is connected with a nut-bolt, 12. The latter, as well as the bolt 10, is preferably formed of aluminium bronze, so as to form a good electrical conductor. The bolt, 12, enters, or is formed in one piece with, a head, 13, the entire structure being secured within, but insulated from, a movable iron contact, 14. It should be stated that the wire, 11, is formed into a take-up coil, to admit of sufficient play for the contact, 14, and that it passes through a hollow cylinder, 15, of soft rubber, which takes up the shock when the contact, 14, is dropped.

In the top of the box, 8, is an iron piece, 16, closely adjoining a piece of iron, 17, which projects upward and at the top forms the sur-

face plate proper, which is exposed above the pavement between the rails of the railway track. Within the face of the plate, above the surface of the street, appears the enlarged end, 18, of a rod, 19, of aluminium bronze, which passes through both the iron piece, 17, and the iron piece, 16, with interposed insulating material, causing an electrical separation. Outside the iron piece, 17, is a casting of iron, 20, which forms a cap for the whole surface structure, and is joined to the casting, 3, through the rim of the box, 4, by a flanged joint. At 21, we show insulating material for isolating the part, 17, from the cap.

It will be observed that the box, 8, is supported within the box, 4, by suitable legs or standards, 22, 22. The chamber between the said boxes is an oil reservoir, the object of having the oil being to insulate the contact parts as thoroughly as possible, and prevent injurious leakage.

It will be observed that when the iron block or plate, 14, is lifted under the influence of magnetic action exerted directly through the parts, 17, and 16, contact is made between two surfaces of aluminium bronze, so as to make as good electrical connection as possible. The whole structure may be regarded as a magnetic contact maker, or, more broadly still, a magnetic circuit controller.

For the sake of combining all the elements needed in a circuit closer of this sort, we have shown in Fig. 3, a loadstone or permanent magnet, 23, which may be used for bringing the magnetic circuit controller into operation. In practice, the original magnetism is much more likely to be furnished by an electro-magnet 23 on the car, after the manner set forth in another application of ours, filed on the 16th day of August, 1892, renewed on the 1st day of August, 1893, and having the Serial No. 482,098.

What we claim is—

1. A surface plate for electric railways, provided with a box in which a magnetic contact maker is adapted to reciprocate, in combination with a magnet, operating outside the plate, for causing the reciprocation of the said contact-maker, the exposed portion of said plate consisting of parts made respectively of magnetic and of non-magnetic material insulated from each other, as and for the purpose described.

2. In an electric railway system, a surface plate adapted to be charged by an independent magnet, a main wire leading to the said plate, and connected by a branch to a movable magnetic contact maker within the said plate, one or more magnets, carried by a motor car, for actuating the said contact maker, and charging the said surface plate, the exposed portion of said plate consisting of parts made respectively of magnetic and of non-magnetic material insulated from each other, as and for the purpose set forth.

3. In an electrical railway system, a series of surface plates arranged along the track, a main conductor, having branches running to movable magnetic contact makers within successive plates, in combination with a motor car carrying one or more magnets for actuating the said contact makers, the exposed portion of each of said surface plates consisting of parts made respectively of magnetic and of non-magnetic material insulated from each other, as and for the purpose set forth.

4. A surface plate for electric railways, consisting of a casting having a cylindrical opening, and an insulating box fitting into the said opening, and secured by a cap to the said casting, in combination with an inner insulating box containing a reciprocating magnetic contact maker, and a cooperating contact terminal secured within the cap, but insulated therefrom, as and for the purpose set forth.

5. A surface plate for electric railways, in which is a box containing two terminals of a magnetic contact maker, the said box being supported within a larger box, and the intervening space being filled with oil, in combination with a take-up coil of iron, joined to the movable part of the magnetic contact maker, the said take-up coil being joined to a binding nut outside the inner box by an oil and watertight connection, as and for the purpose set forth.

6. In a surface plate for electric railways, a suitable box or casting, forming the standard or support for the plate, a cap for the said casting, connected thereto by a flanged joint, in combination with a main conductor, and a branch leading to circuit connections within the said casting, whereby new connections can be made without disturbing the casting forming the standard, 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.