C. B. & J. F. McLEER.

SIGNAL SYSTEM.

APPLICATION FILED JAN. 26, 1912.

1,042,944. Patented Oct. 29, 1912.

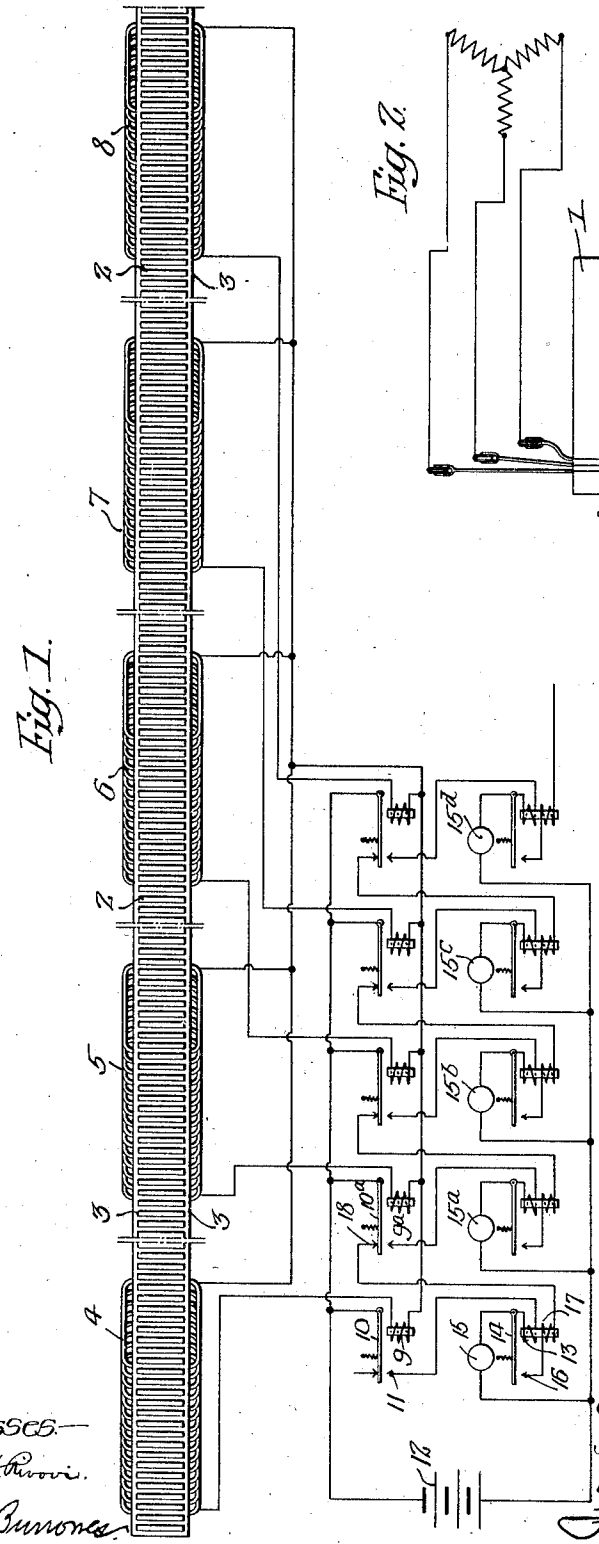

Fig. 1.

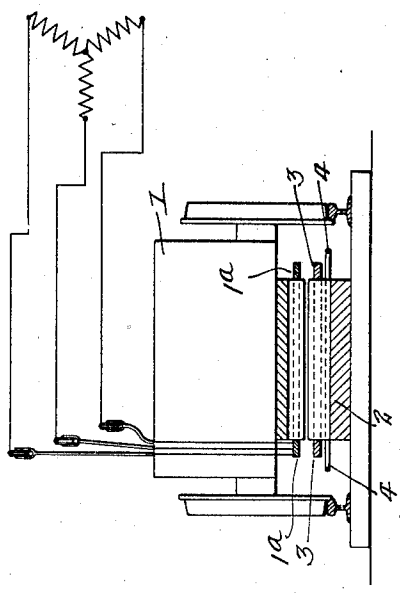

Fig. 2.

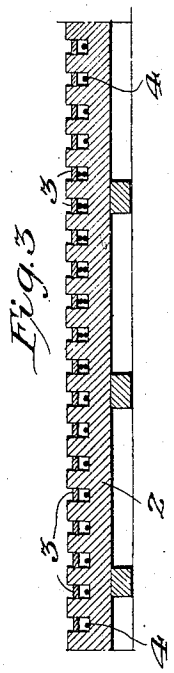

Fig. 3.

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UNITED STATES PATENT OFFICE.

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SIGNAL SYSTEM.

1,042,944. Specification of Letters Patent. Patented Oct. 29, 1912.

Application filed January 26, 1912. Serial No. 673,540.

To all whom it may concern:

Be it known that we, CHARLES B. McLEER and JOSEPH F. McLEER, citizens of the United States, residing in Brooklyn, New York, have invented certain Improvements in Signal Systems, of which the following is a specification.

One object of our invention is to provide a system of apparatus for automatically giving, at any desired point such as the terminus of a road, indication of the position of all of the trains operating on said road, the arrangement of parts being such that they may operate as an automatic block system if desired.

Another object of our invention is to provide a signal system particularly adapted for use in connection with electrically operated railroad systems employing an alternating current of electricity, and more especially that form of electric transportation system described and claimed in an application for patent filed by us on the twenty-sixth day of May, 1911, Serial Number 629,603.

We further desire to provide a system having the above noted characteristics which shall be relatively simple as to the construction and arrangement of its parts, which shall be reliable under operating conditions, and not likely to get out of order.

These objects and other advantageous ends we secure as hereinafter set forth, reference being had to the accompanying drawings, in which,

Figure 1 is a diagrammatic view illustrating the preferred arrangement of apparatus constituting our invention, and Figs. 2 and 3 are respectively transverse and longitudinal sections, also diagrammatic, further illustrating certain features of our system.

In Fig. 2 we have illustrated in a purely diagrammatic manner, the movable member of an electric transportation system, with which our invention is designed to be used, and in the present instance the said movable member is provided with windings 1^a supplied with three-phase alternating current, for the purpose of imparting motion to this movable element 1. There is provided along the right of way a toothed structure 2 of laminated iron on which is mounted a ladder-like structure of copper or suitable conductor 3, forming a developed squirrel cage winding designed to coact with the winding on the movable member in the well-known manner to produce movement of the latter.

Our invention consists in mounting in or adjacent the laminated structure 2, along the right of way of the railroad or transportation system, a series of suitably designed windings 4, 5, 6, 7 and 8, preferably placed at suitable distances apart and mounted in the same slots as are used to receive the windings formed by the conductor 3. With such an arrangement it is obvious that the movable structures or elements 1 of the railway system will, in passing over or adjacent the windings 4—8, induce in them an alternating current, and we therefore connect to said windings indicating or current actuated apparatus mounted at any desired point or points for utilizing this induced current to operate indicators, block signal apparatus or the like. As exemplifying such an arrangement, we have shown the winding 4 as connected in a closed circuit, including an electromagnet 9, having an armature 10, capable of engaging a contact 11 when said magnet is energized. The armature itself is connected to one terminal of a battery 12 or other source of current, while the contact 11 in turn is connected to one terminal of one of two magnet windings 13, whose second terminal is connected to an armature 14, as well as to one terminal of a lamp or other indicating device. The second terminal of such device is connected to the second terminal of the current source 12, and there is provided a contact 16, designed to be engaged by the armature 14 when this electromagnet 17 is energized, which contact is connected to one terminal of the second winding 17, of said magnet.

The second terminal of the second winding is connected to a contact 18, placed to be engaged by the armature 10^a of an electromagnet 9^a connected in circuit with the second of the signal windings 5. The armatures 10, 14 and 10^a are all normally held in positions remote from their electromagnets, and it will be understood without further detailed explanation that each of the four other indicating units respectively connected to the windings 5, 6, 7 and 8, is constructed and arranged in a manner similar to that just described for use in connection with the winding 4. With such a system therefore the passage of one of the movable elements or cars of the railroad system over the wind-

ing 4 would by inducing a current therein, energize the electromagnet 9, thus attracting toward it the armature 10. As a consequence a local circuit is completed from the current source 12, through the armature 10, contact 11, winding 13 of the double wound magnet and lamp 15, back to the source 12. Said lamp or other indicating or operating device is therefore actuated, giving notice that one of the movable elements of the system has passed over that part of the road in which is mounted the winding 4.

The energization of the winding 13 draws the armature 14 into engagement with the contact 16, thus completing the circuit of the instrument 15 from the current source 12 through the armature 10^a of the second signal unit, contact 18, winding 17 of the double wound magnet, contact 16, armature 14, instrument 15 and back to the source. The lamp or instrument 15 is thus maintained in its indicating condition even after the cessation of current flow in the winding 4 has caused the circuit through the winding 13 of the double wound electromagnet to be broken by reason of the disengagement of the armature 10 and the contact 11.

The instrument 15 continues to be supplied with current until the winding 5 is energized by the passage over it of one of the movable members of the railroad system, whereupon the energization of the electromagnet 3^a draws the armature 10^a out of engagement with the contact 18, thus causing the deënergization of the winding 17 with the consequent breaking of the circuit through said instrument 15. At the same time the indicating instrument 15^a belonging to the second signal unit is energized and is maintained in this condition by the same apparatus and sequence of operations as that described in connection with the first signal unit, and so on from unit to unit, as the car or other movable member of the railroad system passes along the right of way. It is obvious that if the movable element of the system is moving in a direction opposite that above assumed the indicating instrument 15^d of the last signal unit would be first energized and thereafter the instruments 15^c, 15^b, etc.

With the above described arrangement of apparatus, there is thus provided a relatively simple system, whereby each moving member of the electric railway is caused to automatically give indication of its position at any point on the right of way as it travels along the same and it is particularly to be noted that the current for primarily actuating the apparatus is provided by the moving train member itself.

We claim:

1. The combination with an electric railway system having a fixed motor member along the right of way, of a signal system, including windings respectively mounted in inductive relation to said fixed motor members; and signal apparatus connected to be actuated by current induced in said windings upon the passage of a car adjacent the motor member.

2. The combination with an electric railway system having a fixed motor member including current conductors along the right of way, of a signal system including a series of windings placed at intervals along the right of way in inductive relation to said conductors of the motor member; with signaling apparatus in circuit with the windings of the signal system.

3. The combination with an electric railway system having along its right of way a motor member consisting of a core, and current conductors thereon; of a series of windings mounted at intervals along the right of way in inductive relation to the current conductors of the motor member; with current actuated apparatus in circuit with each of said windings including means for indicating flow of current in any of the windings.

4. The combination with an electric railway system, including along its right of way a laminated core having a substantially continuous, closed circuit current mounted therein of a series of windings mounted at intervals upon said core in inductive relation to the closed circuit conductor thereon; and signal mechanism operatively connected to said series of windings.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

CHAS. B. McLEER.
JOSEPH F. McLEER.

Witnesses:
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JAMES RENNEY,