No. 613,418. Patented Nov. 1, 1898.

C. L. KEMERY.

ELECTRIC RAILROAD.

(Application filed Jan. 12, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

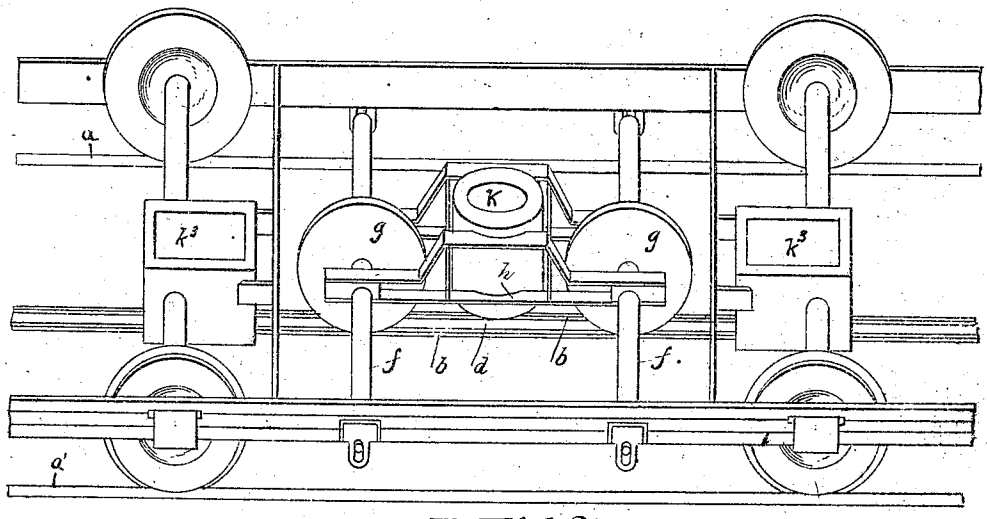
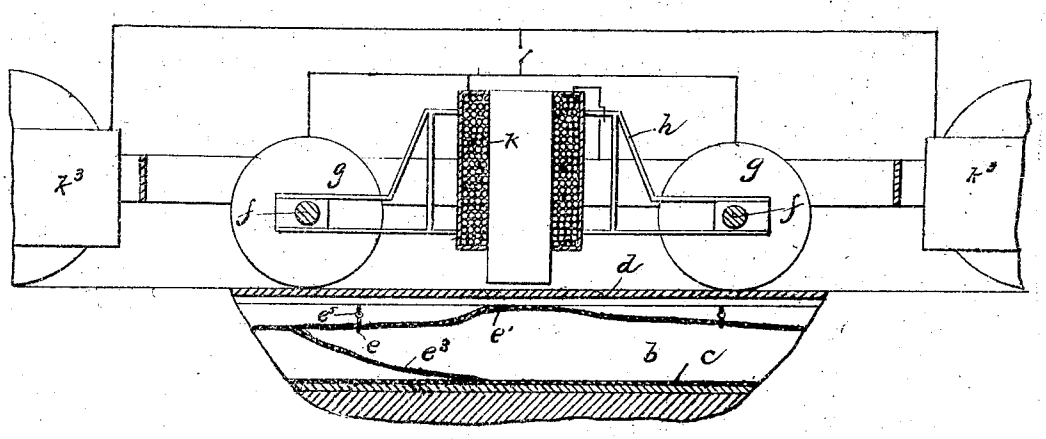


Fig. 2.



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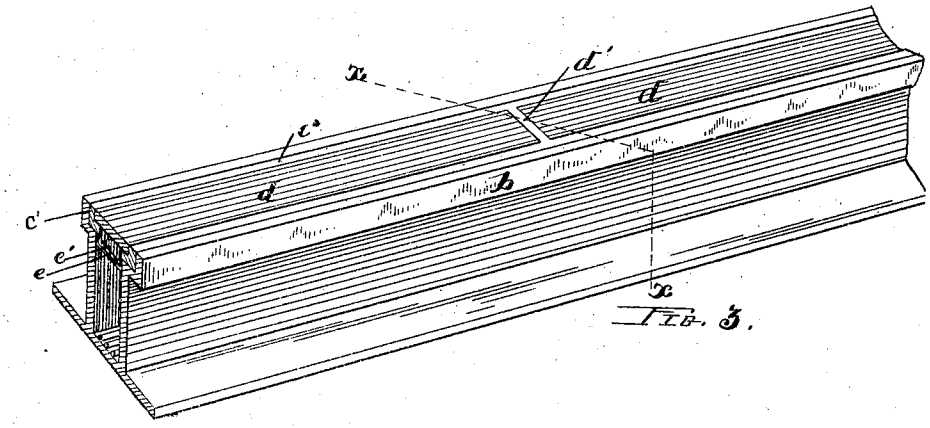

FIG. 3.

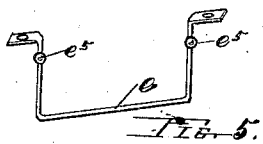

FIG. 5.

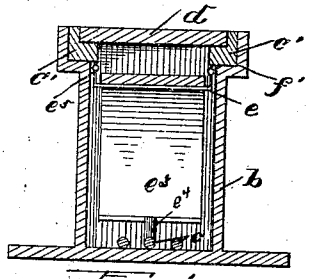

FIG. 4.

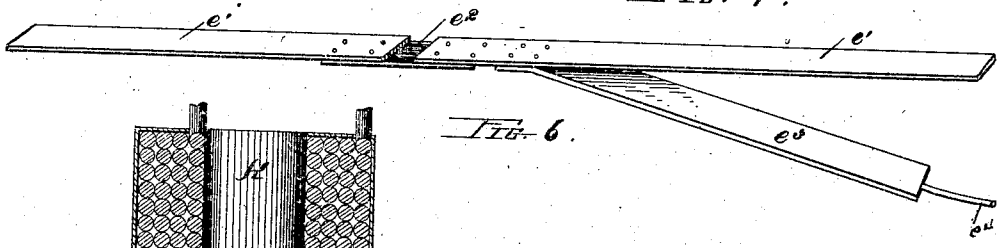

FIG. 6.

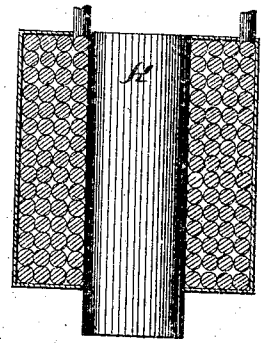

FIG. 7.

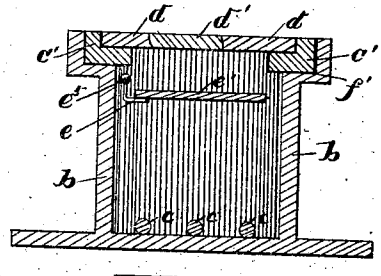

FIG. 8.

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ELECTRIC RAILROAD.

SPECIFICATION forming part of Letters Patent No. 613,418, dated November 1, 1898.

Application filed January 12, 1898. Serial No. 666,425. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. KEMERY, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Electric-Railroad Construction, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in electric railways, and has for its object to produce an economical and effective system for utilizing electricity as the motive power in railways.

The invention might be termed a "third-rail" system, and it consists of the construction of a track with an intermediate rail acting as a conduit for the current-wires, and being so insulated as to prevent the same from being charged throughout its length. Arranged in the top or face of this conduit or intermediate rail and extending throughout the length thereof are plates or bars of suitable conducting material, each of said plates or bars being insulated from the adjacent ones, while arranged within the conduit, underneath these plates or bars, are strips of soft iron or other suitable conducting material that are connected by strips of copper or other suitable material to the current-wires. The truck of the car has arranged thereon and supported in any suitable manner an electromagnet that is connected to the motors in multiple. As the electromagnet passes over one of the conducting-plates of the intermediate rail, the conducting-strips arranged within the conduit are, through the magnetic force of this magnet, drawn into contact with the conducting plate or bar of the intermediate rail and the electrical circuit thereby completed. This electrical circuit, however, only extends the length of the conducting plate or bar that is being acted upon by the electromagnet.

The various details of construction will be hereinafter more particularly pointed out in the specification and in the accompanying drawings, like letters of reference indicating similar parts throughout the several views, in which—

Figure 1 is a perspective view of a truck and a portion of the track constructed in accordance with my invention. Fig. 2 is a side elevation, partly in section, showing connection made by the electromagnet. Fig. 3 is a perspective view of a portion of the intermediate rail and conduit. Fig. 4 is a cross-sectional view of the same. Fig. 5 is a perspective view of one of the hangers for the conducting-strips arranged within the conduit. Fig. 6 is a perspective view of a portion of these strips. Fig. 7 is a vertical sectional view of the electromagnet. Fig. 8 is a sectional view taken on the line X X of Fig. 3.

To put my invention into practice, I arrange between the two rails a a' of the track an intermediate rail or conduit b, within which is suitably arranged the current-wires c.

The two walls inclosing the conduit are preferably flanged outwardly and upwardly at their top to form a sufficient space for the reception of the conducting plates or bars and a suitable insulation of the same. This flanging of the walls forms an angle f', within which is placed an angular-shaped strip of any suitable insulating material c', that extends throughout the length of the conduit and projects inwardly in the conduit a sufficient distance to prevent any danger of the conducting plates or bars coming in contact with the walls of the conduit. Resting upon these angle-shaped strips of insulation are the conducting plates or bars d, which are arranged throughout the length of the conduit and each bar insulated from the adjacent ones, as shown at d', by any suitable insulating material, thereby absolutely preventing the charge of more than one bar or plate at the same time. Arranged within the conduit underneath these conducting bars or plates and supported by hangers e, which are secured to the insulating material c', are strips e', composed of soft iron or other suitable conducting material that is susceptible to the magnetic force of the magnet. These pieces are in short strips connected by plates e^2, composed of copper or other material which is not susceptible to the electromagnetic force. These strips e' are also connected at desired intervals, in accordance with the amount of power required, by strips e^3, composed of copper or other suitable material, to which the current-wire e^4 is connected, the latter con-

necting the strips e^3 to the main current wires or cables *c*.

The truck-frame has secured thereto and suitably insulated therefrom cross-shafts *f*, upon which are mounted the contact-rollers *g*, said cross-shafts *f* having also mounted thereon suitable frames *h*, by means of which the electromagnet *k* is supported at a point directly above the conducting plates or bars *d*. This magnet is electrically connected with the contact-rollers *g* and the ground, so as to be in multiple with the motors k^3, and is of such high resistance as to use but a small portion of the current, that the feeding of the motors will not be materially affected. Thus it will be seen that the magnet *k* is in circuit at all times, whether the motors are in or not, and consequently the strip *e'*, directly beneath the magnet, is always in contact with a conducting-plate *d*, on which one or the other of the contact-rollers *g* is bearing at that time.

It is necessary that at the beginning of the line the first conducting-plate *d* be permanently connected with the strip *e'* or that some mechanical means be employed for raising the strip into contact with said conducting-plate, in order that the magnet may receive its initial current. However, as various well-known devices may be employed for this purpose and such do not form part of my invention it is not thought necessary to include same in this application.

The hangers *e* are preferably provided with an insulation e^5, arranged on the vertical arms of the same, which prevents danger of the current being conducted from the hangers to the walls of the conduit.

It will of course be understood that suitable connections are made through the operating mechanism to the current-controlling device, which is arranged at a suitable point on the car or locomotive for the motorman or engineer and which it has not been thought necessary to illustrate in this application.

Assuming now that a current is turned on by the motorman or engineer, the force of the electromagnet will cause the strip *e'*, underneath the plate or bar *d*, over which the magnet may be, to be drawn into contact with the said strip or bar, in which position it remains until the car has passed beyond the said conducting plate or bar *d*, and the contact is broken by the insulation *d'*, while simultaneously therewith the electromagnetic force will be in action upon the succeeding strip *e'*, which is drawn into contact with the succeeding conducting plate or bar *d*, and the circuit thereby continued until it is broken by the current-controlling device in charge of the motorman or engineer. Through the connection of these strips *e'*, by means of the copper plates or other material non-sensitive to the action of the electromagnet, only that strip *e'* that is directly underneath the electromagnet is drawn into contact with the conducting plate or bar *d*, and the charging of all the plates or bars is by this means prevented.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An electric-railway system comprising a conduit having current-wires arranged in the bottom thereof, a series of conducting plates or bars arranged in said conduit and insulated from each other by a strip *d'* and from the conduit by suitable insulating material, hangers secured to said insulating material, a series of conducting-strips connected together by non-magnetic conductors and suspended in the said hangers, connections between the said strip and the current-wires, contact-rollers, a magnet suspended from a frame and supported by the shaft directly above the conducting-plates, whereby the conducting-strips are drawn into contact with the conducting-plates, substantially as herein shown and described.

2. An electric-railway system comprising a conduit having feed-wires arranged in the bottom thereof, angular strips of insulating material in flange-spaces along the upper edges of the conduit, conducting-plates resting on the insulating-strips and insulated from each other, U-shaped brackets suspended from the insulating-strips and extending beneath the contact-plates, insulators located in the vertical arms of said brackets, conducting-strips susceptible to magnetism supported in the brackets, non-magnetic plates of conducting material connecting the conducting-strips, conductors connecting the feed-wires with the conducting-strips, a car, contact-rollers journaled therein to bear on the conducting-plates, and an electric magnet mounted on the car directly above the conduit and suitably connected with the contact-rollers to be energized by the current therefrom for the purpose of attracting the conducting-strips into contact with the conducting plates, as described.

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

CHARLES L. KEMERY.

Witnesses:

JOHN NOLAND,

WILLIAM E. MINOR.