W. B. PURVIS & A. DE W. GRITMAN.

ELECTRIC RAILWAY.

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1,044,819. Patented Nov. 19, 1912.

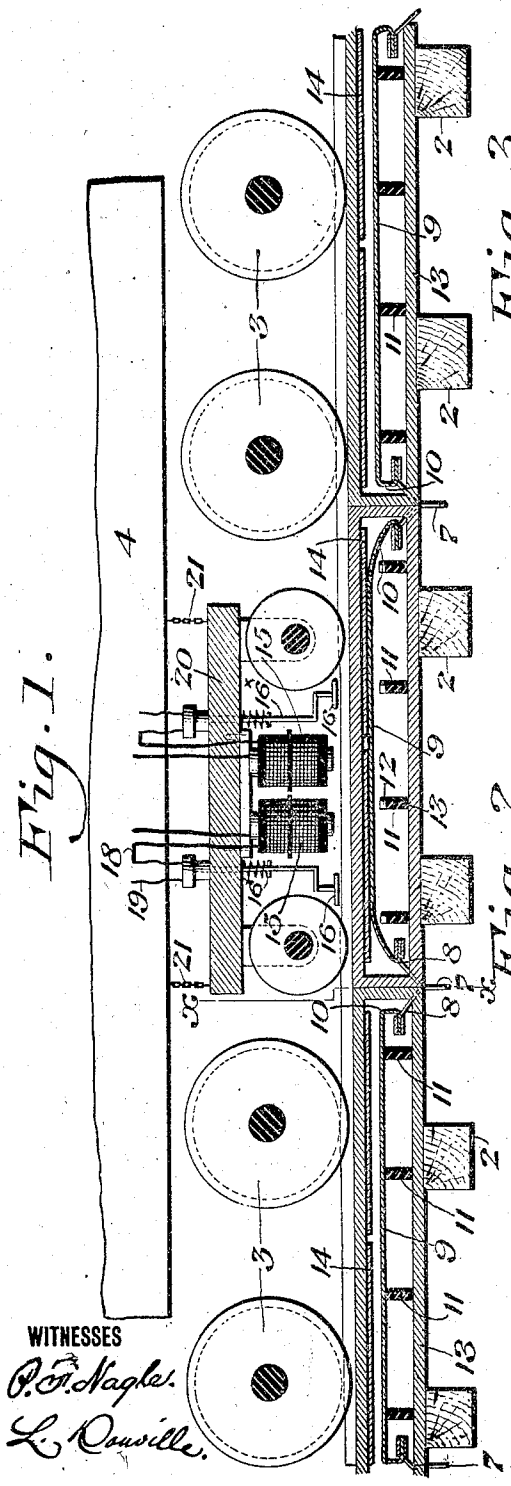

Fig. 1.

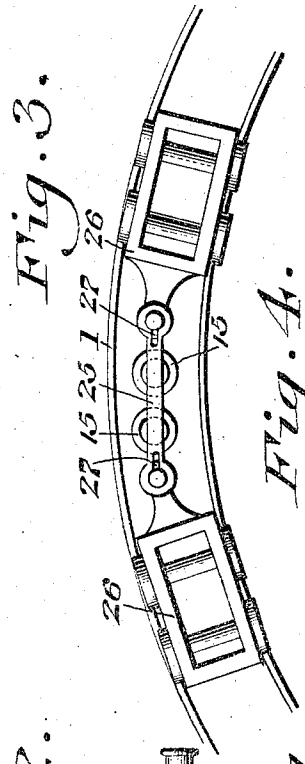

Fig. 3.

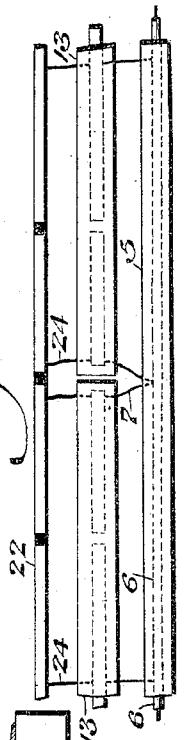

Fig. 4.

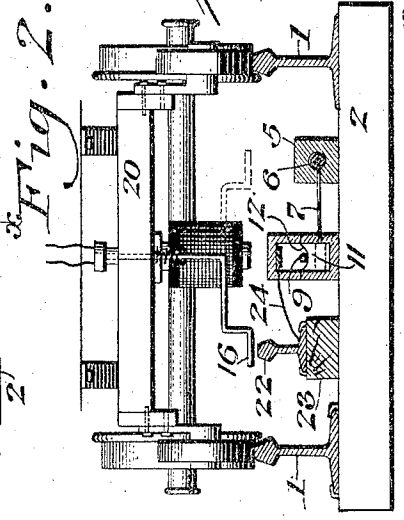

Fig. 2.

WITNESSES

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ELECTRIC RAILWAY.

1,044,819. Specification of Letters Patent. Patented Nov. 19, 1912.

Application filed December 1, 1909. Serial No. 530,710.

To all whom it may concern:

Be it known that we, WILLIAM B. PURVIS, residing in Sharon Hill, county of Delaware, State of Pennsylvania, and ABEL DE WITT GRITMAN, residing in the city and county of Philadelphia, State of Pennsylvania, both citizens of the United States, have invented a new and useful Electric Railway, of which the following is a specification.

This invention relates to an improvement in electric railways and more particularly to the third rail type involving a novel form of conduit and current feeding devices, whereby a constantly energized third rail is dispensed with.

It is well known in surface systems using a third rail that the live third rail is a constant source of danger, and therefore great precaution must be taken to prevent passengers and the public generally from contacting with the same.

In our present invention we have devised a system wherein the third rail is never energized throughout its length but only in certain sections adjacent a car at the time the latter is passing over the third rail, that is only a sufficient number of sections of third rail are energized to supply the car motor with energy to propel the car and therefore it is practically impossible for anyone to be injured by coming in contact with the third rail.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating our invention, we have shown in the accompanying drawing one form thereof which is at present preferred by us, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which our invention consists can be variously arranged and organized, and that our invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a sectional side elevation of a portion of a railway system embodying our invention. Fig. 2 represents a transverse section on line *x*—*x*, Fig. 1. Fig. 3 represents a plan of a modified form of construction. Fig. 4 represents a plan of a portion of the track construction.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—1 designates the track rails of a system embodying our invention, the same being mounted, as usual, upon ties 2 and forming a road bed of ordinary construction.

3 designates the wheels supporting the car body 4 and adapted to run on the rails 1, as will be readily understood, the same being driven by any suitable type of electric motor.

5 designates a suitable conduit, preferably formed of wood or like suitable material in order to contain and insulate a cable 6 which serves as a main feed wire for the current to be supplied to the car motors. Attached to this cable 6 at suitable intervals are a plurality of suitably insulated feed wires 7, each of which terminates in branches 8 forming a connection with the current controlling mechanism now to be described. This mechanism, as herein disclosed, consists of a plurality of cable sections 9, each of which has its ends formed by a return bend 10 in order to permit free expansion and contraction and of course it will be understood that the sections 9 are made of some suitable conducting material. Each section 9, in the present instance, is supported upon a plurality of brackets 11 formed of insulating material and preferably having a curved upper face 12 for the cable section 9 to rest in. It will be noted that the brackets 11 merely support the sections 9, which are thus free to move in the manner desired to accomplish our novel result.

13 designates a hollow block formed of wood or the like for the purpose of inclosing the cable sections 9 and their adjuncts, whereby a substantially sealed compartment is formed well adapted to prevent moisture and climatic conditions generally from affecting the conductors and the like.

14 designates, in the present instance, a pair of bars or strips of suitable conducting material, secured interiorly of each block 13 and preferably above each cable section 9, these strips 14 forming the terminal of the return for a circuit of which the section 9 is the other terminal. It will be apparent if the sections 9 are brought into contact with the strips 14 that the current from the main feed wire 6 will be supplied direct to the strips 14.

In order to cause the cable sections 9 to contact with the strips 14 in the desired manner, we preferably utilize a pair of magnets 15 carried by the car 4 and so positioned as to be in alinement with the block conduit 13, and in close proximity to the top of the same. It will thus be apparent, if the magnets 15 are energized, that the cable sections 9 will be attracted and drawn into contact engagement with the strips 14, the sections being acted upon successively as the car moves along the track.

It will be understood that the magnets 15 are formed with a double winding in order to provide for the initial energizing to raise one cable section 9, so as to supply the current from the main feed cable. The initial current is supplied from a suitable storage battery or the like on the car, which may be switched out of circuit as soon as the car is in motion, and the magnets energized by a part of the main current. This current is supplied to the magnets 15 by way of the shoe 16, arm 17 and conducting wire 18, as will be apparent. The wire 19 connects to a suitable motor and as the same forms no part of our invention and is of conventional type and wiring it is not thought necessary to encumber the drawing with further illustration. As here shown, the magnets 15 are mounted on an auxiliary truck 20 secured by suitable chain connections 21 to the car body, the wheels of the truck 20 being suitably insulated from the car frame. This feature of construction is important since thereby any car of ordinary design may be readily equipped with our magnet mechanism for coöperation with the novel track structures.

22 designates a third rail suitably mounted on a block base 23 in order to position it adjacent the shoe 16, and with which it is in contact when the car is in operation. It will be noted that there is a pair of shoes 16, one being preferably mounted on either side of the magnets 15 so that the third rail 22 is engaged by the two contacts simultaneously. Preferably these shoes 16 are mounted on a rod 16^x adapted to be swung around so as to position the shoes 16 on the opposite sides of the car, if necessary, as indicated in dotted lines, Fig. 2.

24 designates a connecting wire between the rail 22 and each strip 9, whereby the rail 22, which is normally out of circuit may be brought into the circuit and convey the current to the shoes 16. The third rail 22 is preferably formed in sections and arranged with two sections adjacent to each block 13, and one of the sections lies parallel to each strip 14, whereby two sections of third rail are energized as the car passes along and thus establishes a continuous supply of current. As each terminal is connected to a separate section of the third rail 22, energization of a length of third rail greater than the length of the car is prevented. As the magnets 15 pass over one block 13 the cable 9 is drawn into contact first with one strip 14 and then with the other, the latter being held in contact as the magnets pass onward over the next adjacent block in which the cable 9 is lifted into contact with a strip 14 before the contact is broken in the block 13, just passed over.

In Fig. 3 we disclose a modification wherein the magnets 15 are mounted on a bar 25 which is pivotally supported on either end to the trucks 26 of the car, thus dispensing with the auxiliary truck entirely if necessary. It will be noted that the bar 25 is provided with suitable slots 27 to permit free movement when rounding a curve, and whereby the magnets 15 are maintained directly in line with the conduit 13.

It will now be apparent that we have devised a complete unitary electric system, wherein the danger of a live third rail is eliminated and in which only certain sections of the third rail adjacent the car are energized as the car passes over them and at no time are more than two rail sections energized simultaneously. It will further be apparent that by means of the novel sealed boxes and conduits the danger from moisture, weather conditions and the like affecting the feed wires or connections, is entirely eliminated.

It will now be apparent that we have devised a novel and useful construction which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description and while we have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. In an electric railway system, the combination of a plurality of conductor sections, a casing inclosing each section and forming a water-tight compartment, a main feed cable adjacent said casings, an independent sealed duct for said cable, a plurality of terminals fixedly secured to the top of each casing and substantially parallel with the conductor section therein, connections between said cable and each conductor section, a sectional third rail disposed at one side of said casings and in parallel relation thereto, each section thereof being connected to a terminal, and a conductor carried by said car to engage said third rail.

2. In an electric railway system, the combination of a plurality of sealed hollow blocks, a cable section movably mounted in each block, supports for each cable section, a main feed cable adjacent said blocks and inclosed in a separate duct, connections between said main feed cable and each cable section, a pair of terminals in each block, a magnet carried by a car and adapted to attract said cable section to successively engage said terminals, a sectional third rail disposed in parallel relation to said hollow blocks, each section thereof being connected to a terminal, and contacts carried by said car to engage said third rail.

3. In an electric railway system, the combination of a plurality of sealed hollow blocks, a cable section movably mounted in each block, supports for each cable section, a main feed cable, a sealed conduit for said main feed cable, connections between said main feed cable and each cable section, a pair of terminals in each block, a magnet carried by a car and adapted to attract a cable section to successively engage said terminals, a sectional third rail disposed in parallel relation to said hollow blocks, each section thereof being connected to a terminal, and contacts carried by said car to engage said third rail.

4. In an electric railway system, the combination of a plurality of hollow blocks, a cable section movably mounted in each block and having reversed end portions, supports for said sections, a main feed cable, connections between said cable and the end portions of each section, terminals in each block adjacent said cable section, a magnet carried by a car and adapted to bring a cable section into contact with said terminals, a third rail connected to each terminal, and contacts carried by said car to engage said third rail.

5. In an electric railway system, an auxiliary truck detachably secured to a car body, wheels on said truck insulated therefrom and contacting with the track rails, magnets carried by said truck, a sectional third rail adjacent said magnets, shoes carried by said car adapted to engage said third rail, a sealed conduit adjacent said third rail, a cable in said conduit, terminals in said conduit connecting the sections of said third rail, and means to energize said magnets to close a circuit.

6. In an electric railway system, a third rail formed in sections insulated from each other, a sealed sectional conduit, a flexible cable section in each section of said conduit, a main feed wire cable connected to said flexible cable, a plurality of terminals in each conduit section insulated from each other and electrically connected with adjacent third rail sections, an auxiliary truck secured to a car body, shoes and magnets carried by said truck, and means to energize said magnets to attract said flexible cable sections to bring the same successively into contact with said terminals.

7. In an electric railway system, an auxiliary truck detachably secured to a car body, wheels on said truck insulated therefrom and contacting with the track rails, magnets carried by said truck, a plurality of conductor sections adapted to be moved by said magnets, a casing inclosing each section and forming a water tight compartment, a main feed cable adjacent said casing, an independent sealed duct for said cable, a pair of terminals in each casing above and parallel with a conductor section, connections between said cable and each conductor section, a sectional third rail, each section thereof being connected with a terminal, shoes carried by said car body adapted to engage said third rail, and means to energize said magnets to close a circuit.

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