(No Model.)

C. T. H. SCHWIEGER.

UNDERGROUND CONDUCTOR SYSTEM FOR ELECTRIC RAILWAYS.

No. 555,266. Patented Feb. 25, 1896.

Fig. 1.

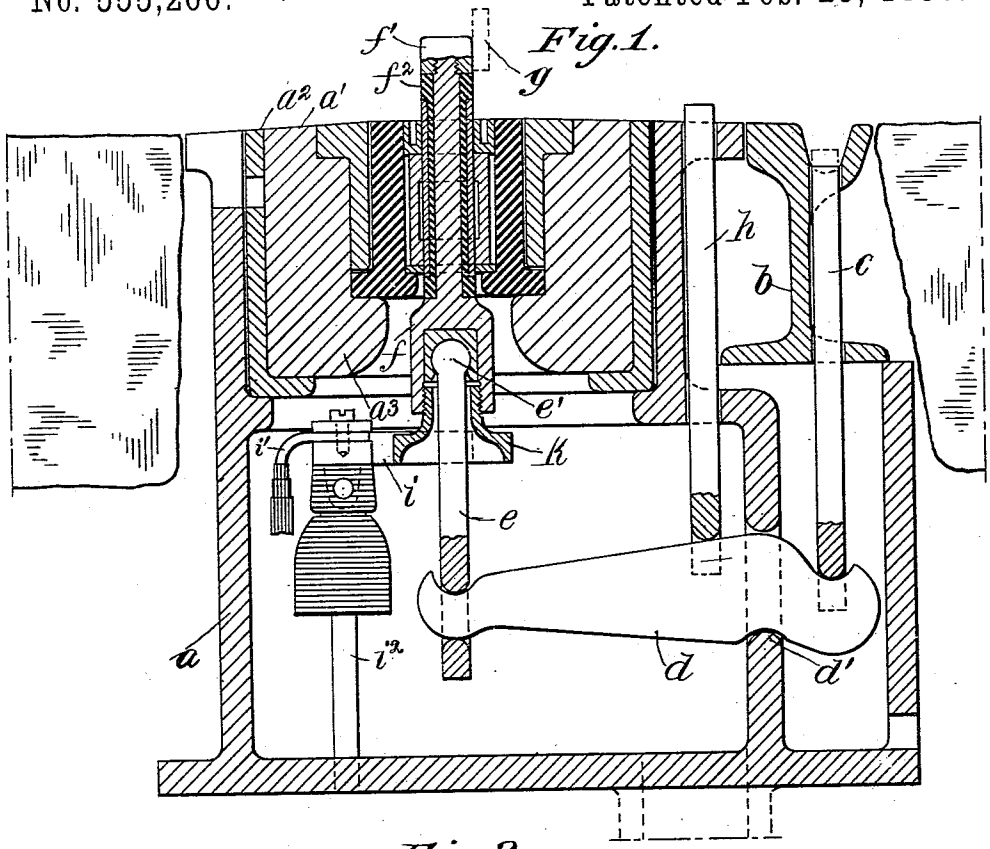


Fig. 2.

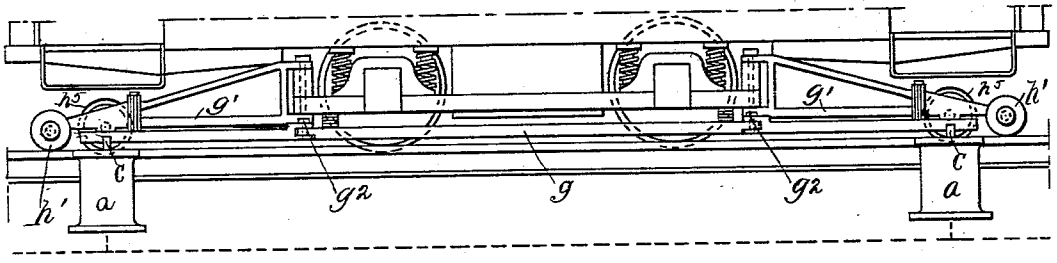


Fig. 3.

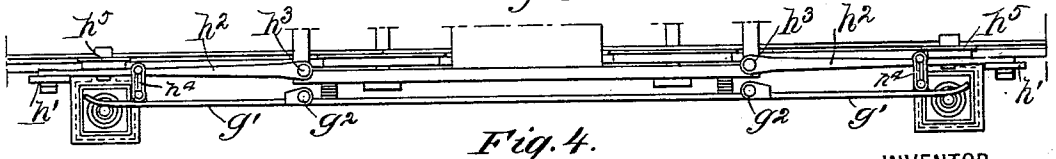
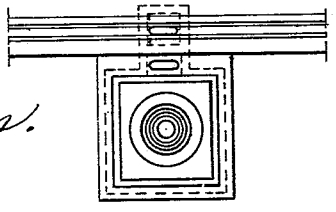


Fig. 4.



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UNDERGROUND CONDUCTOR SYSTEM FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 555,266, dated February 25, 1896.

Application filed November 15, 1895. Serial No. 569,049. (No model.) Patented in Italy September 28, 1895, No. 39,627.

To all whom it may concern:

Be it known that I, CARL THEODOR HEINRICH SCHWIEGER, a subject of the Emperor of Germany, residing at Berlin, Germany, have invented new and useful Improvements in Underground Conductor Systems for Electric Railways, (Case No. 625,) of which the following is a specification, and for which Letters Patent have been granted in Italy, No. 39,627, dated September 28, 1895.

My invention relates to an underground conductor system for electric railways, and more particularly to that class of underground conductor systems in which the working conductor is made in sections which are adapted to be successively connected into circuit as the car advances, the object of the present invention being to provide mechanical means for cutting the sections into and out of circuit whereby the employment of electromagnetic devices may be dispensed with and a certainty of operation obtained which has not been secured in constructions heretofore employed.

The underground electric-railway systems as usually constructed are quite expensive, as they require a spacious conduit with a slot opening into the roadway, and furthermore they are objectionable, as it is found difficult to properly insulate the working conductors. It has, therefore, been proposed to form the working conductors in sections and to provide mechanism, usually electromagnetic in character, for cutting the sections into circuit as the car advances, and for cutting the sections out again after the car has passed. The sectional-conductor system, when carried to the extreme, comprises a number of contact-terminals arranged along the roadway with which an elongated conductor carried longitudinally upon the car is adapted to engage, the terminals being cut into circuit as the car advances and cut out again after the passage of the car.

The present invention relates to sectional-conductor systems of the latter type, and the terminals are adapted to be cut into and out of circuit through the agency of a rod or bolt which extends into the groove of one of the rails upon which the car travels, the rod being engaged and depressed by the flange of the wheel as the vehicle passes, thus operating intermediate mechanism to elevate the contact-terminal whereby the same may be engaged by the contact device carried upon the vehicle. A roller upon the rear of the vehicle is adapted to engage a second rod or bolt to depress the contact-terminal as the car is leaving the section, the contact-terminal normally resting flush with the road-bed. An electric switch is operated by the movement of the contact-terminal to cut the same into circuit, the contact-terminal being cut into circuit when raised and cut out of circuit when depressed.

Referring to the accompanying drawings, Figure 1 is a sectional view of a switch-box embodying my invention. Fig. 2 is a view illustrating my invention in connection with a passing vehicle. Fig. 3 is a view illustrating the contact-terminals arranged along the roadway in connection with the collecting conductor carried upon the car. Fig. 4 is a plan view of the switch-box.

Like letters refer to like parts in the several figures.

The box *a* is situated with the surface flush with the road-bed, the box being preferably secured to the under side of the rail *b* by means of a flange bolted to the rail. A rod or bolt *c* passes through holes provided in the head and flange of the rail and is adapted to normally rest with its end extending into the groove of the rail, the opposite end being bifurcated and engaging the end of a lever *d*, fulcrumed at *d'* and engaging by its opposite end a rod *e*, carrying upon its end a ball *e'*, engaging a socket in the end of the vertically-moving contact-rod *f*, carrying upon its upper end the contact-terminal *f'*, adapted when the contact-rod is raised to be engaged by the collecting-conductor *g*, carried upon the vehicle. A rod *h* extends through openings provided in the casing *a* and is adapted to normally rest flush with the roadway, but is moved into a position with its end projecting above the surface when the lever *d* is rocked by the depression of the rod *c*. A roller *h'*, carried upon the rear of the vehicle, is adapted to engage and depress the rod *h*,

thus returning the parts to their normal positions with the contact-terminal f' flush with the roadway and the rod c projecting into the groove of the rail. The contact-rod f is mounted in a bearing provided in the cover a' of the box a, the cover comprising, preferably, a cast-iron frame a^2 filled with cement a^3 and supporting at the middle the bearing for the rod f. The surface of the rod f is covered with insulation f^2 to thoroughly insulate the same. A conducting portion k is carried upon the rod f and is adapted when the rod f is raised to make contact with the spring i, which is electrically connected with the main conductor by rubber-covered cable i', the spring i being mounted upon a standard i^2. The conductor g carried upon the vehicle is of such length that it makes contact with one of the terminals f' before breaking contact with the preceding terminal. In order to round curves, the conductor g is formed with pivoted end portions g' g', adapted to be swung upon pivots g^2 g^2. Likewise, the rollers h' h', which are adapted to engage and depress the rods h, are mounted upon arms h^2 h^2, pivoted at h^3 h^3. The arms g' and h^2 are joined together by a link h^4, which causes them to move together. Upon the arms h^2 are provided flanged wheels h^5 h^5, the flanges being adapted to move within the groove of the rail and thus maintain the swinging conductors g' g' in position to engage the contact-terminals and the rollers h' h' in position to engage the rods h.

As the vehicle advances, the forward wheel of the truck engages and depresses the rod c, thus rocking the lever d upon its fulcrum and moving the rod f upward to bring the contact-terminal f' in position to be engaged by the conductor g carried upon the car. Before the conductor g breaks contact with the contact-terminal thus moved into operative position contact is made with the next succeeding terminal, the conductor upon the car being thus continuously in engagement with the contact-terminals. As the car passes a section, the roller h' carried upon the rear of the car engages and depresses the rod h, thus moving the contact-terminal f' into its lowered position and moving the end of rod c into the groove of the rail, whereby it may be engaged by a subsequently passing car. The flanged wheels h^5 h^5 engaging the groove of the rail maintain the swinging portions g' g' of the conductor g and the traveling wheels h' h' in proper position to engage the contact-terminals and the rods h, respectively, whether the car be upon a straight track or be rounding a curve.

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

1. In an underground conductor system for electric railways, the combination with a series of contact-terminals adapted to normally rest in a depressed position, of an operating rod or part the end of which normally projects into the path of a wheel or other part of the vehicle, mechanism between the contact-terminals and the rods for raising the contact-terminals when the rods are depressed, a rod or part provided in connection with each contact-terminal adapted to occupy an elevated position when the contact-terminal is raised, and a wheel or other part carried on the vehicle adapted to engage and depress said rod to return the contact-terminal to its normal position; substantially as described.

2. In an underground conductor system for electric railways, the combination with a series of contact-terminals adapted to normally rest in a depressed position with their ends flush with or beneath the surface of the roadway, of a bolt or rod provided in connection with each of said contact-terminals and having its end projecting into the groove of one of the rails upon which the car travels, mechanism between the contact-terminals and the rods for raising the contact-terminals when the rods are depressed, a rod provided in connection with each contact-terminal adapted to project above the surface of the roadway when the contact-terminal is raised, and a wheel or roller carried upon the rear of the vehicle adapted to engage and depress said rod to return the contact-terminal to its normal position; substantially as described.

3. In an underground conductor system for electric railways, the combination with the rod c extending into the groove of the rail, of the fulcrumed lever d engaging said rod c at one end, rod e engaging said lever d at the opposite end and carrying a ball upon its end, the contact-terminal having a socket adapted to engage the ball provided upon the rod e, the rod h engaging the lever d upon the side of the fulcrum opposite the point of engagement of the rod c, the conducting portion k carried upon the contact-terminal, and the contact i adapted to be engaged thereby when the contact-terminal is raised; substantially as described.

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

CARL THEODOR HEINRICH SCHWIEGER.

Witnesses:

OSCAR NIELEFELD,

THEODOR STÜDEMANN.