

UNITED STATES PATENT OFFICE.

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SECTIONAL CONDUCTOR FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 555,470, dated February 25, 1896.

Application filed March 21, 1895. Serial No. 542,571. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BAKER, of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Sectional Conductors for Electric Railways, of which the following is a specification.

This invention relates to improvements in conductors for trolley systems of electric railways; and it consists in dividing the said conductor in sections each normally disconnected from and auxiliary to the main conductor or feed-wire and intermittently connected therewith by the automatic mechanical action of the trolley when entering upon a section, restrained in connection therewith electrically while the trolley remains in contact with the said section and disconnected therefrom mechanically when the electric current is broken by the trolley leaving the said section and entering on the next adjacent section, when the latter and the succeeding sections progressively are connected and disconnected in the same manner.

Of the accompanying drawings, forming a part of this specification, Figure 1 is a plan of a section and part of the two sections next adjacent. Fig. 2 is a side elevation of the connecting and disconnecting mechanism. Fig. 3 is a plan of Fig. 2. Fig. 4 is a section of a supporting-insulator and bracket and of the conductor.

Corresponding parts in the several views are denoted by like letters of reference.

A is a trolley moving in the direction indicated by the arrow *a*, upon the sectional conductor of which B B are sections strained upon insulating-brackets *b* by means of tension-springs *b'*. C C are automatic switches arranged to co-operate with the said trolley in closing, maintaining, and opening electric connection between the said section and a continuous conductor or feed-wire D. One of the said switches is placed at each end of each section and comprises a horizontal lever *c* hung by means of a fulcrum *c'* in a frame *c²* constituting a part of such section and having the upper edge thereof projecting above the upper surface of the said section, as at *c³*, in a position to be depressed by the said trolley as the latter rolls upon the said section from the next preceding section; an

electrode *b²* of the said section arranged to be depressed by the said lever, and an electrode *d* of the said continuous conductor arranged to receive in contact the electrode *b²* when the latter is depressed, and further arranged to serve as an electromagnet, of which the electrode *b²* constitutes the armature. The said lever *c* is normally maintained in an elevated position by means of the spring *c⁴* attached to the outer end of the arm *c⁵* thereof and restrained by the stop *c⁶* abutting against the lower side of the said section, and has attached to the said fulcrum *c'* thereof an arm *c⁷* provided with a spring-tongue *c⁸* resting upon the electrode *b²*. The said electrode *b²* is in the form of a horizontal lever *b³* hung in the said frame *c²* by means of the fulcrum *b⁴* and restrained normally in contact with the said spring-tongue *c⁸* by means of the spring *b⁵*. The said electrode *d* is supported by the frame *c²*, but insulated therefrom and serves as an electromagnet *d'*, as hereinbefore stated, by winding about a core *d²* having the pole *d³* thereof adjacent to the said lever *b³*, which serves as an armature thereto, as hereinbefore stated. The electrodes and electromagnets are inclosed in a box *c⁹* for protection from injury.

The relative positions of the sections are such that the trolley cannot leave one section until it has established the electrical connection of the next succeeding section with the continuous conductor. This is accomplished by extending the terminal of each section a short distance by the initial end of the next succeeding section. The initial end of each section is depressed to form an incline *b⁶* and provided with an insulating-shield *b⁷* to permit the trolley to roll easily upon the said section.

The operation will be evident. Upon the trolley depressing the lever *c* the electrodes *b²* *d* are brought in contact and an electric circuit established. The electromagnet *d²* is excited by the passage of the electric current, and by virtue of the attraction exercised upon the armature *b³* the said electrodes *b²* *d* are maintained in contact after the said trolley has left the said lever *c* and until the current is broken upon the trolley leaving the said section, when the cessation of magnetic attraction by the electromagnet *d²* permits

the spring b^5 to separate the said electrodes $b^2 d$ by raising the armature-lever b^3 to its normal position against the spring-tongue c^8 .

It may be well to state that suitable provision will be made, as in car-lighting systems, for maintaining a circuit while the motor is cut out, and hence the stopping of the car in the middle of a section would not produce demagnetization of the coil d' , for the circuit including the latter is not broken until the trolley leaves the conductor-section. Hence after the trolley has depressed a lever c and caused the magnet d' to become energized said magnet will not be de-energized until the trolley leaves the section of conductor with which the magnet connects.

I do not confine myself to the exact construction herein explicated.

I claim—

1. In a sectional electrical conductor for trolley systems, the combination with the stationarily-supported sections thereof, of mechanical means distinct from the conductor-sections whereby the moving trolley is caused to progressively connect the said sections with a continuous electrical conductor, electrical means whereby each section thereof is restrained in connection with the said continuous electrical conductor after the trolley has become disengaged from the mechanical circuit-closing means of that section and during such time as the said trolley remains in contact with the said section, and mechanical means whereby each section is disconnected from the said continuous electrical conductor when the electric current is broken as the said trolley advances from the said section to the next succeeding section, said mechanical disconnecting means being inferior to the electrical restraining means whereby the disengagement of the trolley from the mechanical circuit-closing means is prevented from effecting disconnection of the electrodes.

2. In a sectional electric railway, the combination of conductor-sections, mechanical means whereby the moving trolley is caused to progressively connect the said sections with a continuous electrical conductor or feeder, said means comprising a lever at the initial end of each section arranged to be depressed by the said trolley as the latter advances upon the said section, and a second lever arranged to be depressed by the first-named lever and constituting an electrode of

the conductor-section adapted to make contact with an electrode of the continuous conductor; and an electromagnet continuous with the electrode of the continuous conductor and arranged to co-operate with the second-named lever as an armature and thereby restrain the electrodes in contact after the trolley has become disengaged from the first-named lever and during its engagement with the conductor-section.

3. In a sectional electrical conductor for trolley systems, the combination with the sections thereof, of mechanical means whereby the moving trolley is caused to progressively connect the said sections with a continuous electrical conductor, said means comprising a lever at the initial end of each section arranged to be depressed by the said trolley as the latter advances upon the said section and an electrode of the said section arranged to be depressed by the said lever to contact with an electrode of the said continuous conductor, electrical means whereby each section thereof is restrained in connection with the said continuous electrical conductor during such time as the said trolley remains in contact with the said section, said means comprising an electromagnet forming a conducting part of the electrode of the said continuous electrical conductor and an armature forming a part of the electrode of the said section, the said magnet and armature being arranged to co-operate and restrain the said electrodes in contact during the passage of the electric current, and mechanical means whereby each section is disconnected from the said continuous electrical conductor when the electric current is broken as the said trolley advances from the said section to the next succeeding section, said means comprising a spring exerting itself in opposition to the magnet but inferior to the latter whereby only when the trolley leaves the conductor-section does the spring act to separate the electrodes.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 28th day of February, A. D. 1895.

WILLIAM H. BAKER.

Witnesses:

A. D. HARRISON,
ROLLIN ABELL.