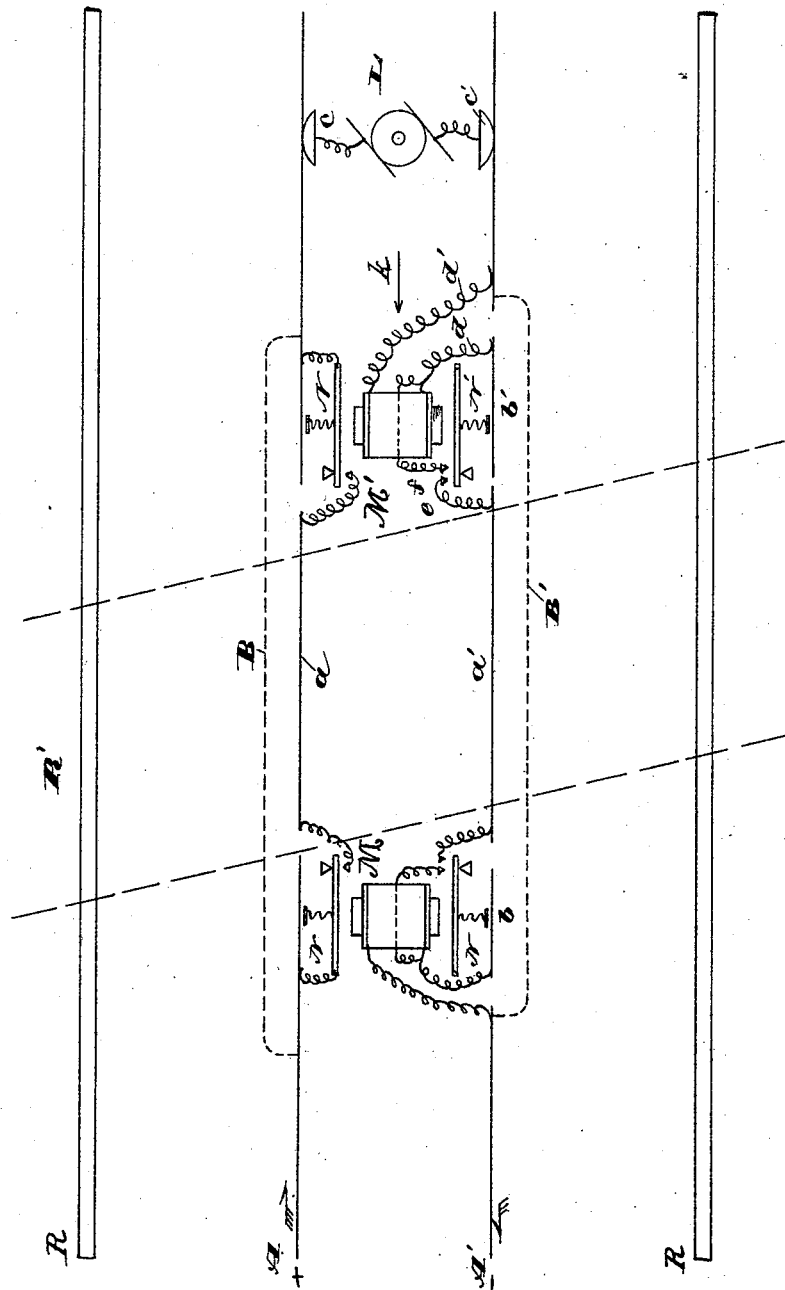


(No. Model.)

E. M. BENTLEY.  
ELECTRIC RAILWAY.

No. 343,101.

Patented June 1, 1886.



Witnesses  
Albert E. Lynch  
Wm M. Monroe.

Inventor.  
Edward M. Bentley.  
by Bentley & Knight  
attos

# UNITED STATES PATENT OFFICE.

EDWARD M. BENTLEY, OF BROOKLYN, NEW YORK.

## ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 343,101, dated June 1, 1886.

Application filed July 10, 1885. Serial No. 171,200. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD M. BENTLEY, a citizen of the United States and a resident of Brooklyn, New York, have invented certain new and useful Improvements in Electric Railways, of which the following is a specification.

My invention consists in insulating a section of the main conductor of an electric railway at a point where the railway crosses a road, and providing automatic circuit-closers by which the said section is thrown into electrical connection with the main conductor whenever an electric locomotive is passing over it.

In the accompanying drawings, R represents the rails of an ordinary railway. R' represents a road crossing the same.

A A' represent the two conductors which carry the main supply of current for the propulsion of vehicles upon the railway. These two conductors are normally in the circuit; but the sections *a a'* at the crossing are normally out of circuit, the current being carried around them by means of bridge-wires B B'.

MM' are two electro-magnets at the two sides of the road or highway crossing the railway-track, which act as circuit-closers to connect the sections *a a'* in circuit whenever a locomotive approaches.

L represents an electric locomotive, *c c'* being the two contacts by which the current passes from the conductor A through the motor upon the locomotive to the opposite conductor, A'.

As the locomotive, moving in the direction of arrow *k*, approaches the crossing the contact *c'* comes onto the short insulated section *b'* of the main negative conductor A'. The current will then pass from A, by contact *c*, through the motor, to contact *c'*, to section *b'*, wire *d*, magnet M', wire *d'*, to the negative conductor. The magnet M', being thus energized, attracts its two armatures, N and N', and these two armatures close the circuit between the sections *a a'* and the main conductors A A'. The section *a'* is connected with A' by means of the wires *e f d*, magnet M', and wire *d'*, so that when the contact *c'* passes from section *b'* onto section *a'* the magnet M' remains energized and keeps *a'* in circuit while the locomotive is passing over the crossing. When the locomotive

has reached the ends of sections *a a'*, the contacts *c c'* then pass off onto the main conductor A and the short section *b*, respectively. The circuit may then be traced from A, by contact *c*, through the motor, to contact *c'*, to section *b*, magnet M, to conductor A'. This will energize the magnet M, but only momentarily, for when the contact *c'* passes from *b* to A' the current passes directly from A through the motor to A', and both the magnets M and M' are short-circuited, drop their armatures, and leave the sections *a a'* insulated, as at first. When the locomotive is coming from the opposite direction, the same action will take place, the magnet M being energized first. By means of this arrangement wherever it is desirable that the main conductors of an electric railway should be rendered perfectly harmless to men or animals likely to pass over them or come in contact with them in any way, the said conductors are at that point entirely insulated from the main source of current, except at the instant when a locomotive or train is passing over that point, although elsewhere along the line the main conductors are normally in circuit.

It will be readily seen that the armatures N may be omitted and the cut-out be made to act upon one conductor only, the other conductor being continued through uninterruptedly.

Having thus described my invention, what I claim is—

1. The combination, in an electric railway, of a main conductor normally in circuit, a section thereof normally out of circuit, a bridging-conductor around said section, a circuit-closer between the section and the main conductor, and means for automatically operating the circuit-closer upon the approach of a locomotive.

2. The combination of the main conductor normally in circuit, the insulated section in line with said conductor, but normally out of circuit, the bridging-conductor around said section, and a circuit-closer between the said section and the main conductor controlled by a passing locomotive.

3. The combination of a main conductor, an insulated section in line with said main conductor, bridging-conductor, a circuit-closer between said main conductor and said insu-

lated section, and means for actuating said circuit-closer while a train is passing said section.

4. The combination of a main conductor, an insulated section, a bridging-conductor, and a circuit-closer at each end of said section, so as to be actuated by a locomotive from either direction.

5. The combination of a main conductor normally in circuit, an insulated section and electro-magnet in the circuit of said main conductor, and a circuit-closer between the main conductor and the insulated section controlled by said electro-magnet.

6. The combination of a main conductor normally in circuit, an insulated section, an electro-magnet in the circuit of said main con-

ductor, and a circuit-closer controlled by said electro-magnet and adapted to close the circuit between the main conductor and the insulated section through the said electro-magnet.

7. The combination of two main conductors, an insulated section in each, a circuit-closer between each main conductor and its insulated section, and a common actuating device for said circuit-closers.

In testimony whereof I sign this specification, in the presence of two witnesses, this 24th day of June, 1885.

EDWARD M. BENTLEY.

Witnesses:

ALBERT E. LYNCH,  
CHAS. H. DORER.