

(No Model.)

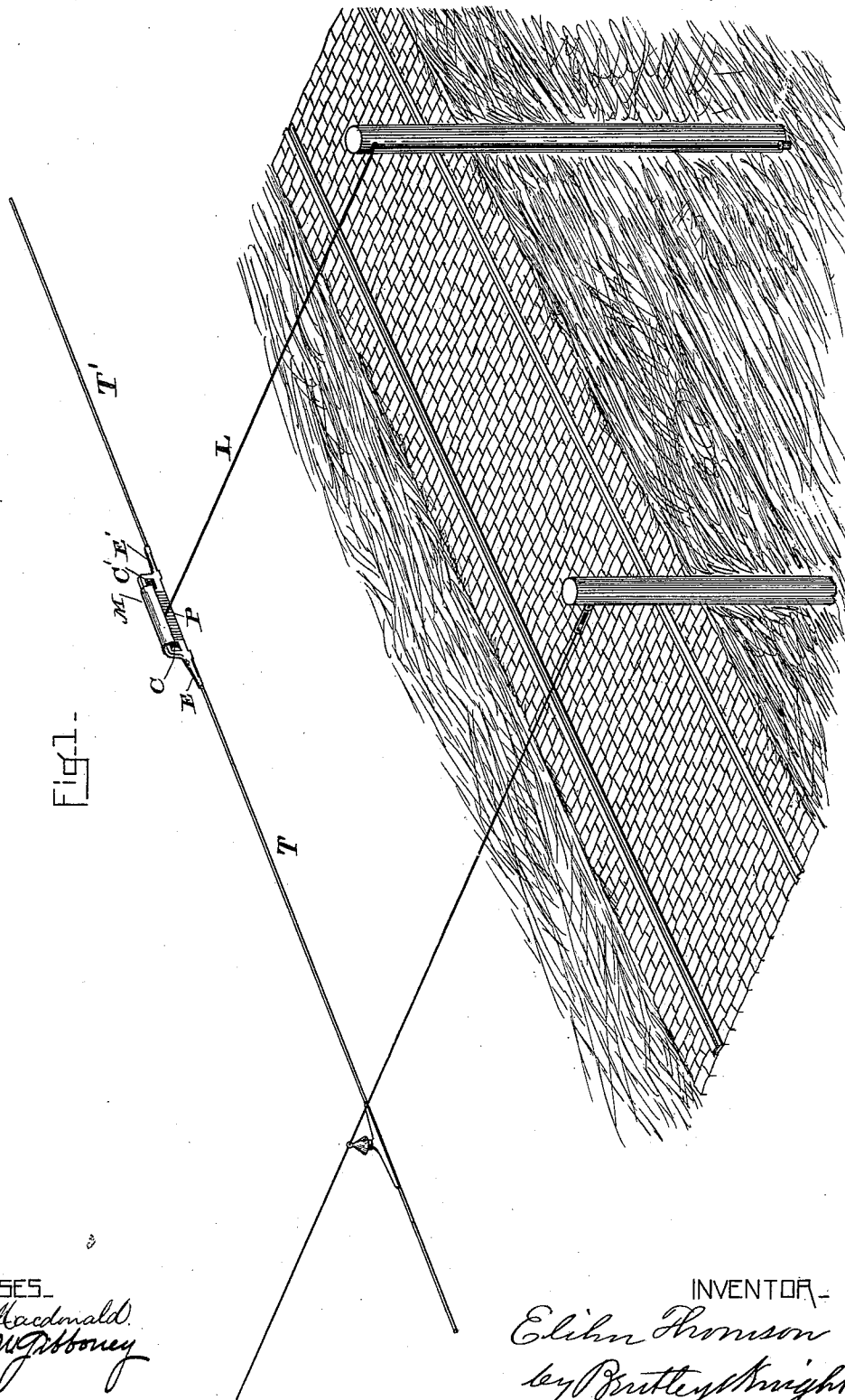
2 Sheets—Sheet 1.

E. THOMSON.

SECTION INSULATOR AND LIGHTNING ARRESTER FOR ELECTRIC RAILROADS.

No. 463,761.

Patented Nov. 24, 1891.



WITNESSES.

A. P. Macdonald.
John W. Gibbons.

INVENTOR.

Elihu Thomson
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Att'no

(No Model.)

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Fig. 2.

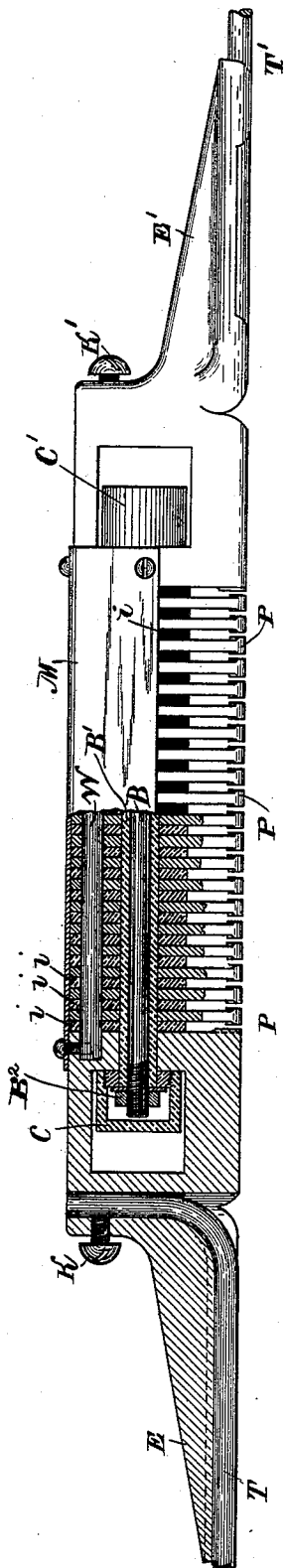


Fig. 5.

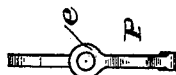


Fig. 4.

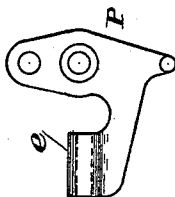
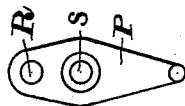


Fig. 3.



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UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF SWAMPSCOTT, MASSACHUSETTS.

SECTION-INSULATOR AND LIGHTNING-ARRESTER FOR ELECTRIC RAILROADS.

SPECIFICATION forming part of Letters Patent No. 463,761, dated November 24, 1891.

Application filed September 1, 1890. Serial No. 363,680. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, residing at Swampscott, county of Essex, and State of Massachusetts, have invented a new and useful Improvement in Section-Insulators and Lightning-Arresters for Electric Railways, of which the following is a specification.

The object of my present invention is to provide a practicable arrangement for interrupting electrically the trolley-wire of an electric railway into insulated sections, each supplied with current independently by suitable feeders, while preserving the path of travel for the contact-wheel unbroken, in order that leakages of current may affect only that particular section upon which the leak exists. The section-insulating device provided for this purpose may be connected to ground in a way hereinafter described, and serve also as a lightning-arrester. With this object in view I attach to but insulate from adjacent sections of the trolley-wire a series of conducting plates or surfaces separated from one another by intervening insulation. These plates form a continuation of the line of the trolley-wire, and hence do not obstruct or interfere in any way with the passage of the trolley-wheel. The number of plates and intervening insulation-spaces will be so proportioned to the potential of the current upon the line that an arc cannot be formed throughout the entire series, the principle on which this invention is based being the same as that set forth in my application for Letters Patent Serial No. 352,507, filed May 20, 1890.

In the accompanying drawings, Figure 1 is a perspective view showing the invention applied to a single trolley-wire. Fig. 2 is a part side and part sectional view of the sectional insulator. Figs. 3, 4, and 5 are details illustrating the construction of the conducting-plates.

The trolley-wire may be supported over the street by posts and guy-wires or in any other of the ways now known, and it is divided electrically into several sections at convenient points, two such sections being shown at T T', which will be supplied independently with current from a feed wire or wires in the manner customarily employed in electric-railway service. In order to insulate these

sections one from the other I attach to them a number of conducting plates or surfaces P, separated from one another by intervening insulation and arranged in line with the trolley-wire, as shown in Fig. 2. It will of course be understood that the arrangement of these conducting-plates and the means of attaching them to the trolley-wire may be varied in a great many ways; but I prefer to thread the different plates upon a bolt B, covered by an insulating tube or sheath B' throughout its entire length, the bolt passing through central openings S in the plates. (Seen in Fig. 3.) Insulating-washers *i i i*, preferably of mica or other non-inflammable material, space the plates the desired distance apart and prevent any direct electrical connection from one to another. The bolt B connects mechanically the two clamping ears or fins E E', each provided with an opening into which the bent ends of the trolley-wire are inserted and fastened by set-screws K K', and insulating-washers placed under nut B² and the head of bolt B guard effectively against electrical communication being established between the fins through the bolt. These washers may be screw-threaded, and insulating-caps C C' inclose the ends of the bolts to prevent the entrance of moisture thereto, the fins being cut away to receive the caps. The conducting-plates and insulating-washers are also perforated, as at R, Fig. 3, and through them is passed a pin or rod W, which will either be of insulating material or be insulated from the plates and ears and which holds the parts in place. Over the whole will be arranged a hood M, (partly shown in Fig. 2,) of insulating material, such as vulcanized fiber well oiled or painted, so as to shed moisture.

The conducting-plates are insulated at their upper ends by the washers and insulating sheath-covering bolt B; but at their contact-ends it is desirable to have them entirely separated, mechanically as well as electrically, with only an air-space between, so that moisture or metal-dust cannot collect between the conducting-pieces, destroying the efficiency of the device.

When it is desired to make use of these section-insulators as lightning-arresters, or when leakage from one section to the other is

to be absolutely cut off, one or more of the conducting-plates will be provided with a ground connection. (Seen at L in Fig. 1.) For this purpose an ear may be formed on the plate or segment, as at *e*, Fig. 4, to receive the ground-wire leading therefrom. The earth connection will ordinarily be made from the middle plate of the series, and then current from either section will be intercepted at this middle plate and carried to ground rather than pass across the entire series of plates, as it must do to get from one section to another. Lightning discharges also reach ground by jumping the insulating-spaces between the plates until the middle plate is reached, where they will pass to earth.

I make no broad claims herein for the invention of the divided arc, as this has been claimed in other applications of mine, particularly Serial No. 352,507, already referred to.

What I claim as new, and desire to secure by Letters Patent, is—

1. A section-insulator for insulating adjacent sections of an electric-railway line conductor, comprising separate conducting-plates secured in place, but spaced apart and insulated at points somewhat above their contact-surfaces and having such contact-surfaces separated entirely from one another by an air-insulation space, but rounded and arranged in line to form a continuation of the path of travel of the contact device.

2. The combination of the clamping-ears connected with the adjacent ends of a sec-

tionalline conductor forelectric railways, with a bolt connecting said ears mechanically and a series of conducting-plates separated by intermediate insulation supported upon but insulated from said bolt and with their contact ends arranged in the path of travel of the contact device.

3. The combination of the bolt B between adjacent sections of an electric-railway line conductor and insulated therefrom, with the conducting-plates arranged side by side upon the same in the path of travel of the contact device, but insulated from the bolt, and the washers of insulating material between the plates, as described.

4. The combination of the adjacent sections of an electric-railway line conductor and clamping-ears connected therewith, with the insulated bolt joining said ears, the conducting-plates thereon, the intermediate washers of non-inflammable material, and the holding-pin W, as described.

5. The combination of an insulating device connected with an electric-railway line conductor for insulating adjacent sections of the same from one another and comprising a series of conducting-surfaces separated from one another by intervening insulation, with a ground connection leading from one or more of the plates at or near the middle of the series, as described.

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Witnesses:

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