Apr. 10, 1923

1,451,559

N. A. WAHLBERG

SECTION INSULATOR

Filed June 3, 1921

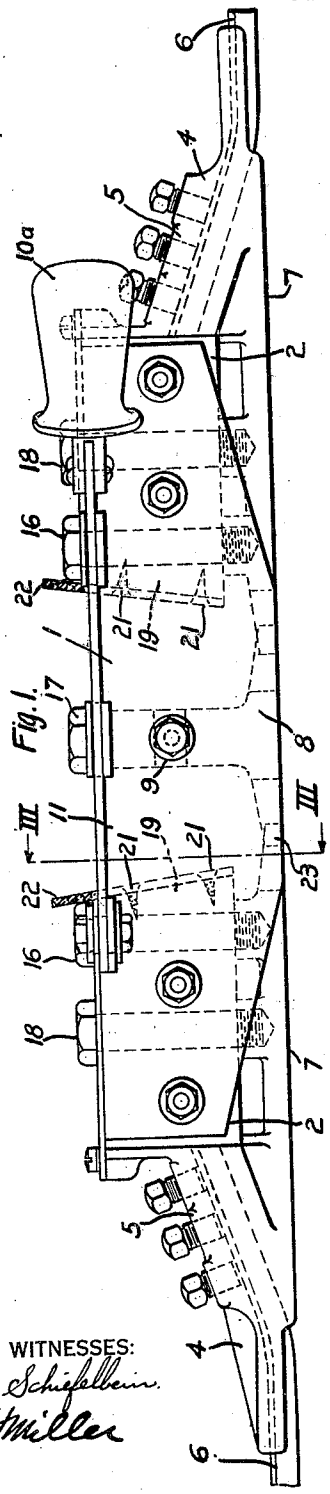


Fig. 1.

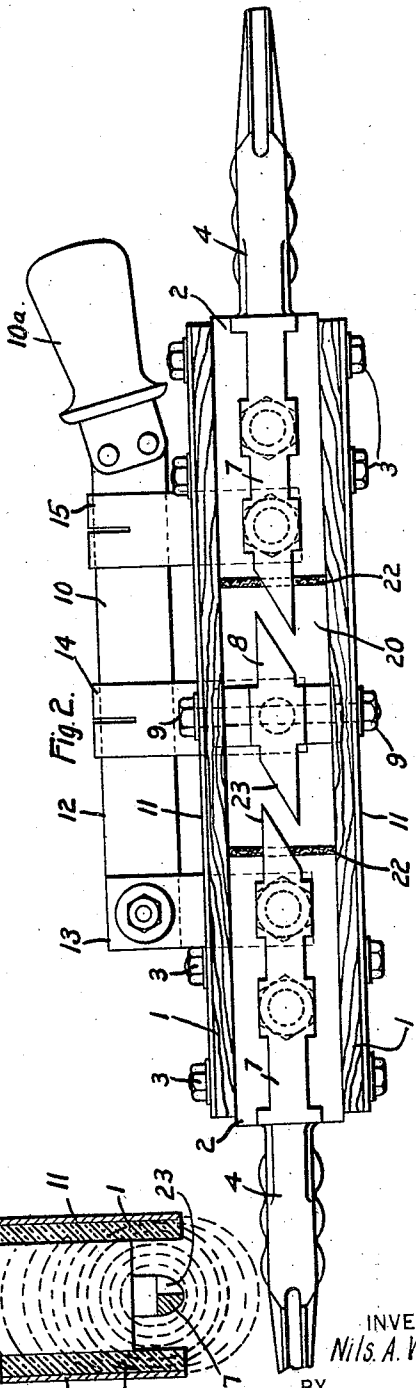


Fig. 2.

Fig. 3.

WITNESSES:

A. G. Schiefelbein.

H. Miller

INVENTOR

Nils. A. Wahlberg.

BY

Wesley G. Carr

ATTORNEY

Patented Apr. 10, 1923. 1,451,559

UNITED STATES PATENT OFFICE.

NILS A. WAHLBERG, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

SECTION INSULATOR.

Application filed June 3, 1921. Serial No. 474,717.

To all whom it may concern:

Be it known that I, NILS A. WAHLBERG, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Section Insulators, of which the following is a specification.

My invention relates to trolley-conductor section insulators or switches and particularly section insulators for use in mines where branch conductors extend from a main-passage conductor into side passages or headings.

One object of my invention is to provide a device of the above indicated character that shall be simple and durable in construction, economical to manufacture and effective in operation.

Another object of my invention is to provide means for effectively reducing or quenching arcs that may form between the adjacent ends of spaced trolley-conductor sections or members.

Trolley-conductor devices, of the above indicated character, have usually been provided with spaced trolley-conductor sections, or trolley-runner members to electrically insulate branch-conductors from a main conductor and a switch to shunt the gap between the sections.

Normally, any arcing caused by passing trolleys, on a device of this kind, causes damage to the apparatus. Further, when it is desired to electrically disconnect a section, by opening the switch on the section insulator, an arc may be established in the air gap between the sections to energize the dead section, by the inadvertent passing of a locomotive trolley over the gap. This unintentional and unexpected energization of the dead section may cause serious injury to operators or apparatus, or even loss of life. It is, therefore, obvious that the elimination or effective reduction of arcs of this character are much to be desired, if not imperative. Section insulators usually comprise insulating body or other members disposed above the arc gap which interfere with the natural tendency of the arcs to rise and, therefore, prevent the arcs being quickly dissipated upwardly.

Attempts have been made to reduce the arcing at section insulators by the use of blowout coils but such construction is complicated and expensive as compared with the ordinary section insulator.

In practicing my invention, I so provide an arc chute above the arc gap or gaps and, also, so provide simple magnetizable plates adjacent to the chute that the insulator substantially reduces or magnetically blows out its arcs, without the use of coils.

In combination with the above features, my insulator comprises two series-related air gaps which not only provide an intermediate dead section, as an additional safeguard, but serve to reduce the arcs by the well known principle of series-arc resistance.

As a further arc-reducing measure, the adjacent ends of the trolley-runner sections are formed diagonally and are so overlapped as to permit a passing trolley to engage both ends simultaneously.

Figure 1 of the accompanying drawing is a side elevational view of a section insulator embodying my invention.

Fig. 2 is a bottom plan view of the device shown in Fig. 1, and

Fig. 3 is a cross-sectional view of the device, taken along the line III—III of Fig. 1, indicating, by dotted lines, the magnetic blow-out flux field.

In general, my device comprises a pair of elongated insulating side plates 1, of wood or other suitable material, insulating end blocks 2, of similar material and secured to the side plates by bolts 3, end members 4 having portions 5 for the reception of the adjacent ends of trolley conductor sections 6 and trolley-runner portions 7 extending towards the center of the insulator, an intermediate trolley-runner member 8 secured to the side plates 1 by screws 9, switch 10 and relatively thin magnetizable side plates 11 conforming and secured to the outer surfaces of the side plates 1 by the bolts 3.

The switch 10 comprises a handle member 10^a, a pivoted knife-blade member 12, a stationary pivot terminal member 13, and two sets of stationary jaw members 14 and 15.

The members 13 and 15 are secured to the end blocks 2 by bolts 16 that extend through the blocks into the trolley-runner sections 7, and the stationary jaw member 14 is secured to the intermediate trolley-runner member 8 by a screw 17. Screws 18 also extend through the end blocks 2 into the trolley

runner section 7 to assist the bolts 16 in holding the terminal members 4 in position on the end blocks 2.

The inner opposing faces 19 of the end blocks 2 are upwardly and outwardly inclined to constitute the end boundaries of an arc chute 20 and are covered by plates 22 of asbestos or other suitable material which are fastened to the faces 19 by means of screws 21.

As shown in Fig. 3, when an arc tends to persist between the adjacent overlapping diagonal ends 23 of the trolley runner sections 7 and 8, a magnetic flux is set up. The flux field, by reason of the presence of the magnetizable plates 11 will be distorted, substantially as shown in the dotted lines, and, since the natural tendency of an arc is to rise, the latter will be projected into the magnetic-flux field above the arc gap and impelled upwardly, through the arc chute 20. This action will tend to quickly dissipate the arc and to, thereby, materially reduce the dangers arising therefrom.

The magnetizable side plates 11, not only serve the useful function of affecting the arc in the above described manner, but since they interlink with the bolts 3 which, in turn, interlink with the end blocks 2 and the screws 16 and 18, also serve as mechanical reinforcing means for the insulating side plates 1.

While I have shown and described a preferred form of my invention, changes may be effected therein without departing from the spirit and scope thereof, as set forth in the appended claims.

I claim as my invention:

1. A section insulator comprising spaced end-to-end related trolley-contact sections, an insulating member for mechanically connecting said sections, and a magnetizable reinforcing member secured to said member for controlling an arc between the sections.

2. A trolley-conductor device comprising a plurality of spaced trolley-contact sections, a plurality of insulated magnetizable members in side-by-side relation for upwardly directing arcs caused by trolleys passing between said sections.

3. A trolley-conductor device comprising means independent of the conductor circuit and responsive to current therein for affecting arcs caused by passing trolleys.

4. A trolley-conductor device comprising means magnetizably related to the conductor only for suppressing arcs caused by passing trolleys.

5. A trolley-conductor device comprising trolley-conductor members spaced apart to provide an arc gap and a magnetizable member disposed in spaced relation to said members and responsive only to the magnetic flux field thereof for suppressing arcs therebetween.

6. A trolley-conductor device comprising spaced trolley-contact members and an arc chute for substantially enclosing adjacent portions of said contact members for upwardly directing arcs therefrom.

7. A trolley-conductor device comprising spaced end-to-end related trolley-contact members, an arc chute for receiving arcs therefrom and a magnetizable member disposed adjacent to the chute for influencing the arcs.

8. A trolley-conductor device comprising a plurality of spaced trolley-contact members arranged to provide a plurality of arc gaps and a single arc chute for said gaps.

9. A section insulator comprising an elongated insulating structure having an intermediate opening constituting an arc chute, means for protecting walls of the chute against damage by arcs and metal structures adapted to receive conductors of adjacent trolley-conductor sections and related to provide an arc gap adjacent to the chute.

10. A section insulator comprising an elongated insulating structure having an intermediate opening constituting an arc chute, means for protecting walls of the chute against damage by arcs, metal structures adapted to receive conductors of adjacent trolley-conductor sections and related to provide an arc gap adjacent to the chute and a magnetizable member mounted on the insulating structure for controlling arcs formed at said gap.

11. A section insulator comprising a pair of elongated insulating side plates, spaced insulating blocks disposed therebetween adjacent to the ends thereof to provide an intermediate arc chute, terminal members secured to the blocks for attachment to the ends of adjacent trolley-conductor sections and having inwardly-projecting trolley-contact portions, an intermediate member secured to the side plates in the arc chute and having a trolley-contact portion disposed in spaced end-to-end relation with respect to said first trolley-contact portions to provide a pair of arc gaps and a pair of elongated magnetizable plates mounted on the outer side surfaces of said insulating plates.

12. A trolley-conductor device comprising an arc chute having an insulated magnetizable side member adjacent an arc gap.

In testimony whereof, I have hereunto subscribed my name this 29th day of April 1921.

NILS A. WAHLBERG.