Nov. 14, 1944. S. S. MATTHES 2,362,759

SECTION INSULATOR

Filed June 17, 1943

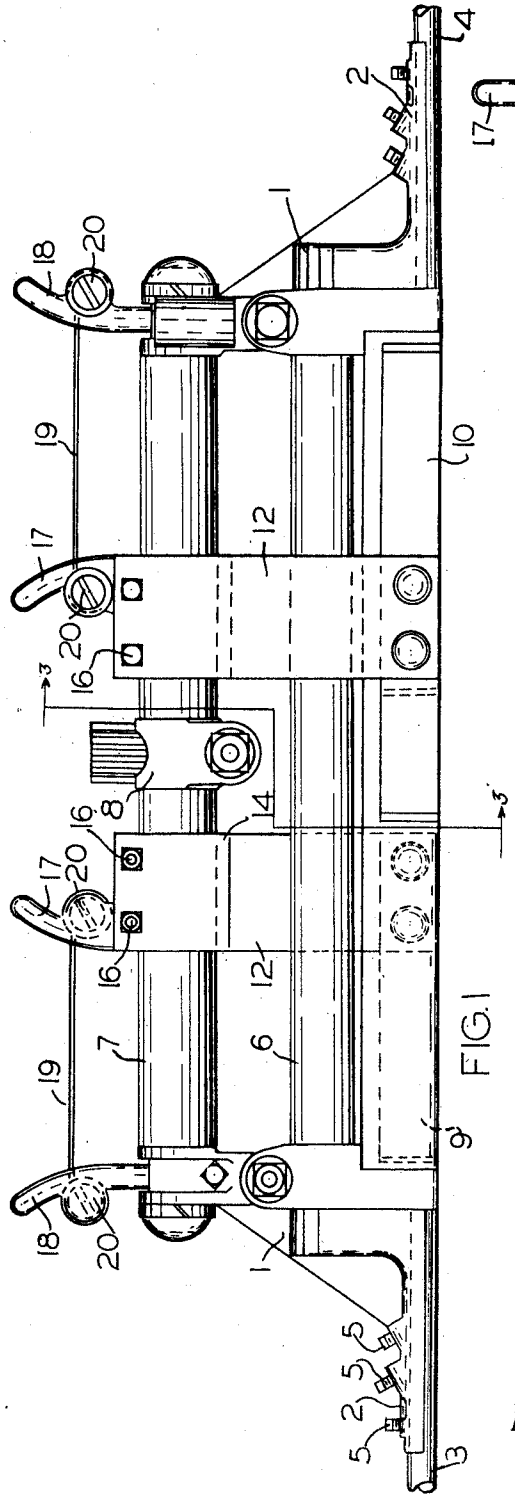


FIG. 1

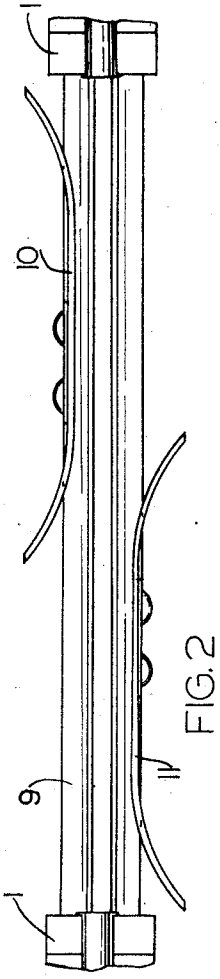


FIG. 2

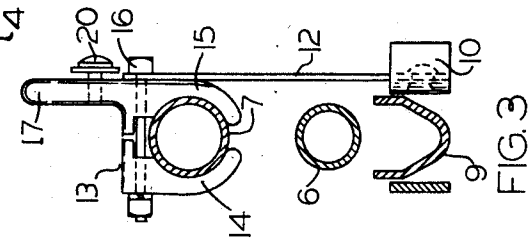


FIG. 3

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SECTION INSULATOR

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7 Claims. (Cl. 191—39)

My invention relates to section insulators and particularly those devices for insulating one section of trolley wire from an adjacent section.

In said devices in the past it has been customary to attach the adjacent ends of the trolley wire to end members held in spaced relation by insulated members and to provide a guide of insulating material along the lower side of the device to guide a current collector from one end of the device to the other end of the device.

In such a combination, the guides of insulating material may be of any length from a few inches up to possibly 18 inches or more.

A section insulator of such construction is liable to produce a very heavy arc when the collector leaves one end member to cross over to the other end member especially if the vehicle operator has his controller in the "on" position. When operating with 500 to 650 volts, the current is very apt to follow the collector as it moves towards the other end member, and in some cases may cause a complete short circuit of the device and entirely destroy the same.

If the operator has his controller in the "off" position when he crosses the section insulator, there may be sufficient arcing due to the current taken by heaters, compressors, lights etc. to severely burn the insulating guide in the course of time.

It is the purpose of my device to provide a continuous source of power to the current collector for the operation of the vehicle as the collector moves from one end member to the other end member.

Another advantage of my invention is to prevent arcing at the current collector which tends to burn, roughen and reduce the life thereof.

Another object of my invention is to prevent burning and destruction of the insulating guide and to increase its life.

Another object of my invention is to provide power to the vehicle to start the same if it should stop with the current collector on the section insulator.

Still another object of my invention is to prevent a "shorting" or "burning" of the device in the event a collector operates across the device and onto a grounded section.

My invention resides in the new useful and novel construction, combination and relation of the parts hereinafter described and shown in the accompanying drawing.

In the drawing:

Figure 1 is a side view in elevation of my invention.

Figure 2 is a bottom view of the guide, contacts and a short portion of each end member.

Figure 3 is a section on the line 3—3 of Figure 1.

In the preferred embodiment of my invention I employ end members 1 of metal provided with means 2 to receive the ends of the trolley wires 3 and 4, and screws 5 for holding the wires in place with their lower edges in alignment.

The end members 1 are held in spaced and insulated relation by a tension insulator 6 and a compression insulator 7. A device of this character is clearly shown and described in my U. S. Patent 2,127,085, issued August 16, 1938.

A support 8 may be secured to the member 7 to attach the device to an overhead support.

Extending between the end members 1 is a guide 9 of insulating material by means of which a current collector is guided from one end member to the other end member.

In order to render the current collector energized throughout its passage from one end member to the other end member I make use of contacts 10 and 11.

These contacts are placed on opposite sides of the guide 9 and in insulated relation and held in position by the spring supports 12 of metal to conduct current.

The supports 12 are each attached to a clamp 13 comprising the members 14 and 15 held in clamping position on the insulating member 7 by the bolts 16.

The support is secured to the member 15 by the bolts 16.

It will be noted that the contacts are of such length that the inner ends overlap while the outer ends approach close to their respective end member. By this means a current collector, in passing from an end member will engage the adjacent contact before it breaks contact with the end member.

Further, in passing from one contact to the other contact at the center of the device the collector will for a time engage both contacts.

Also, when passing from one of the contacts onto the end member the collector will be in engagement with both parts at the same time.

The members 15 are each provided with an arcing horn 17 and the end members are each provided with a horn 18 spaced from the horn 17.

In order to energize the contacts 10 and 11 I connect the adjacent pair of horns 17 and 18 by a member 19 which is secured to the horns by bolts 20.

It will be apparent that with the contacts 10

and 11 energized, the current collector in crossing the device will always be energized and that the flow of current to the collector is never broken at the contacts or end members, therefore there is no arcing and no burning of the current collector or the guide 9 or of the end members.

It will be evident that if a vehicle stops with its current collector on the section insulator, the vehicle will be able to start when necessary.

The members 19 are usually of copper wire but may be of other suitable current conducting material. The carrying capacity of the member 19 is such that one or both will fuse if the current carried thereby exceeds a predetermined value and its horns 17 and 18, upon which the arc will form with the rupture of the number 19, will assist the arc to rise and break without damage to the various parts of the device.

If one section of the system should become grounded, this would place full potential of the system between the contacts 10 and 11 and should a short circuit form between the parts 10 and 11 while one section is grounded, one or both members 19 will be fused and the circuit opened and the device saved from destruction. As the current collector passes along the guide 9, the flanges of the collector will engage the contacts and press them outwardly.

It is my belief that I am the first to provide a sectionalizing device for the purpose intended and which involves in a single device the various advantageous features described and others which will be apparent to those skilled in the art.

I claim:

1. A line section insulator comprising, in combination, a pair of end members, means associated with each end member whereby it may be secured in a trolley system, insulating means holding the end members in spaced and insulated relation, an insulating guide member extending between the end members to guide a grooved current collector mounted on a vehicle by its groove, a pair of contacts positioned one on each side of the guide member and engageable by the flanges of the current collector, the contacts being of such length as to have overlapping inner ends adjacent the longitudinal center of the guide whereby a passing current collector will engage both contacts at the same time in passing from one contact to the other contact and the outer end of each contact being spaced from the adjacent end member and so positioned relative to the adjacent end member that the contact and the adjacent end member will both be simultaneously contacted by the current connector in passing from the end member onto the contact and vice versa, yielding means supporting the contacts from the insulating means, spaced arcing horns mounted on the device and attached to each end member and to the adjacent end of the contact member and extending above the said insulating means whereby an arc formed between the horns will be dissipated and forced upward and away from the insulating means and fusible means connecting the horns of each pair at points above the insulating means whereby each contact member will be electrically connected to its end member while the fuse is intact, the said fusible means arranged to fuse when the current drawn by the current collector in passing from one end member to the other end member exceeds that necessary for the normal operation and starting of the vehicle.

2. A section insulator for an overhead trolley system normally maintaining the trolley sections insulated from each other, comprising in combination, elongated insulating means, end members normally insulated from each other and secured to each of the insulating means whereby the insulating means are secured in operating position in the system, an insulating guide extending between the end members to guide a grooved current collector on a vehicle by means of its groove, yieldingly mounted contacts having overlapping ends adjacent the longitudinal center of the guide insulated from each other and adapted to be engaged by the flanges of the current collector moving between the guide and the contacts in passing from one end member to the other end member, means mounted on the device and electrically connecting the contacts to the end members, one contact to an end member, the last said means including a fusible element positioned above the insulating means and arranged when the current drawn by the collector exceeds a predetermined value to fuse and open the circuit with the end member, the arc formed being dissipated upward away from the insulating means.

3. In a sectionalizing device for an overhead trolley system normally maintaining the sections in insulated relation, in combination, a pair of end members for securing the device in the system, insulating means to normally hold the end members in spaced and insulated relation, a guide of insulating material extending between the end members to guide the current collector on a vehicle from one end member to the other end member, a pair of laterally yieldable contact members interposed between the end members and insulated from each other and having overlapping ends intermediate the end members and adapted to be engaged by the current collector, the contact members being so constructed and arranged relative to each other that the current collector in passing from one end member to the other end member will be alternately in simultaneous engagement with the end members and the adjacent contact member and at an intermediate point between the end members will be in simultaneous engagement with the contact members at their overlapping ends and means positioned above the insulating means electrically connecting the end members to the contact members, one end member normally connected to one contact member, whereby the current collector will be constantly supplied with energy in passing across the device and the trolley sections electrically connected only when the current collector engages the overlapping ends of the contact members, the said electrical connecting means arranged to rupture and open said electrical connection between said end members and the contacts should one end member be grounded as the current collector engages the overlapping ends of both contact members simultaneously.

4. In a sectionalizing device for an overhead trolley system, in combination, a pair of end members for securing the device in the system, insulating means holding the end members in spaced and insulated relation, a guide of insulating material extending between the end members to guide the current collector on a vehicle from one end member to the other end member, a pair of laterally yieldable contact members having

overlapping adjacent ends interposed between the end members and insulated from each other and adapted to be engaged by the current collector, the contact members being so constructed and arranged relative to each other and to the end members that the current collector in passing from one end member to the other end member will be in simultaneous engagement with the end members and the adjacent contact member and at an intermediate point between the end members will be in simultaneous engagement with both contact members and means mounted on the device above the insulating means electrically connecting each end member to the adjacent contact member, whereby the current collector will be constantly supplied with energy in passing across the device and the sections of trolley being connected only when the collector engages both contacts simultaneously, the said electrical connecting means arranged to rupture and open said electrical connection between said end members and the contacts at points above the insulating means should one end member be grounded as the current collector engages both contact members simultaneously and means located above the insulating means to dissipate upwardly the arc formed when said connection is ruptured to avoid injury to the device.

5. In a section insulator comprising a pair of spaced end members adapted to connect the device in an overhead trolley system, insulating means holding the end members in spaced and insulated relation including a guide of insulating material extending between the end members to guide a current collector and contacts insulated from each other and spaced from the end members distributed along the guide engageable simultaneously by the current collector, the combination with the end members and the contacts of fusible means positioned above the insulating means and electrically connecting the contacts to the end members, one contact to an end member, means attached to the end members and to the adjacent contact and projecting above the insulating means to support the fusible means, the fusible means adopted to disconnect the contact from its end member in case the current flowing through said fusible means exceeds a predetermined value.

6. A section insulator comprising in combination, elongated insulating means comprising a tension member and a compression member above the tension member, end members attached to the ends of the insulating means, one member to an end of said means, current collector guiding means of insulating material disposed between the end members below the tension member, contacts disposed on opposite sides of the guides in insulated relation to each other and spaced relation to the end members and adopted to be engaged by the current collector in passing from one end member to the other end member, means securing the contacts to the insulating means and projecting above the compression member, and safety means positioned above the compression member and disposed between the said securing means and its adjacent end member whereby the contact is electrically connected to its adjacent end member, the said safety means arranged to electrically disconnect the contact from its end member in case of a current flow through said safety means in excess of a predetermined value.

7. In a sectionalizing device for an overhead trolley system, comprising, end members an insulating means holding the members in spaced and insulated relation and having means to connect the device into the overhead system between sections thereof, and means positioned between the end members and extending along the lower part of the device to guide a current collector thereacross, the said means being so constructed and arranged as to normally maintain the end members insulated from each other and to supply current to the current collector during its entire passage from one end member onto the other end member, the combination with the end members and the last said means of other means whereby a portion of the last said means is normally electrically connected to said sections and automatically disconnected when the current to the collector exceeds a predetermined value, the said other means being positioned on the device above the insulating means and between the end members.

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