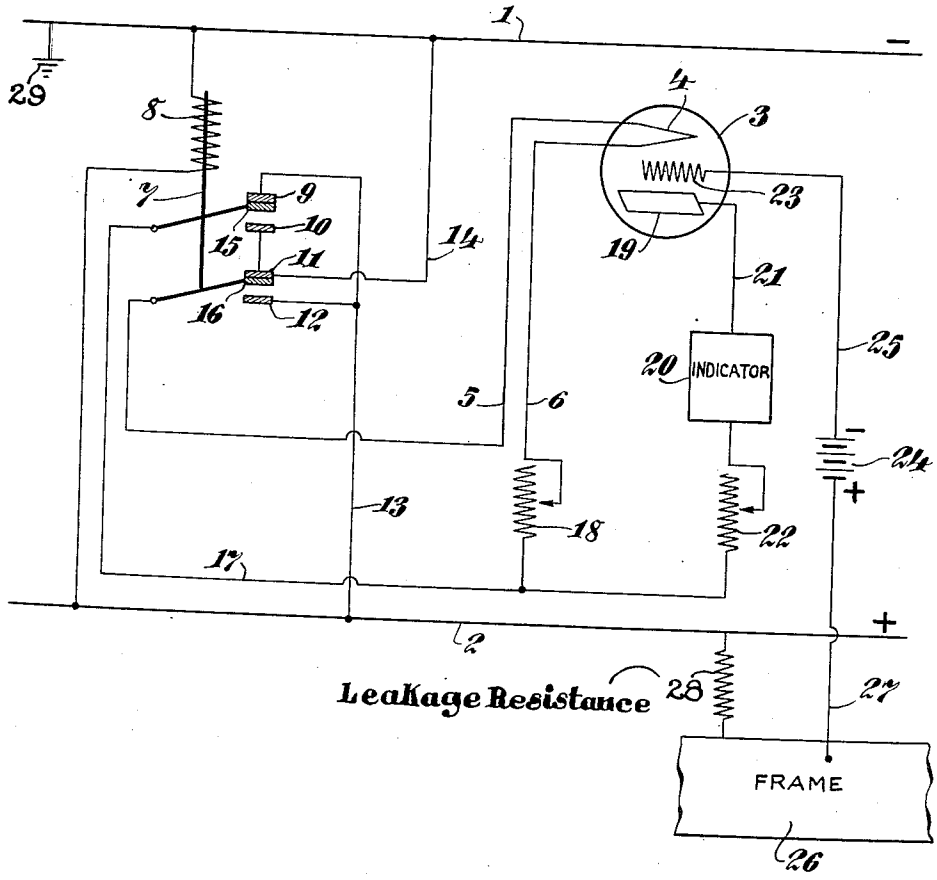
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BODY CHARGE INDICATOR FOR TRACKLESS TROLLEY COACHES

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BODY CHARGE INDICATOR FOR TRACKLESS TROLLEY COACHES

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The present invention relates to signal devices for trackless trolley coaches and the like, by means of which indication is given of the existence of a charged condition of the coach body.

Inasmuch as trackless trolley coaches and the like run on rubber tires which insulate the metallic parts thereof effectively from the ground, the body frequently is in a charged condition where a difference of potential exists between the body and the ground. This condition is particularly likely to arise due to leakage through faulty insulation and obviously is an extremely undesirable one inasmuch as it endangers incoming and outgoing passengers.

An object of the present invention, accordingly, is to provide a device by means of which the existence of a charge in the vehicle body may be indicated.

A further object of the invention is to provide a mechanism by means of which effective indication of a charged condition of the vehicle body may be provided regardless of the possibility or existence of a change in polarities of the trolley mechanism of the vehicle.

Further objects of the invention will appear as it is described in detail in connection with the accompanying drawing, wherein the single figure is a diagrammatic illustration of a signalling device constructed in accordance with the present invention, including the electrical circuits by means of which the device is operated.

Referring to the above drawing, the power circuit from which the vehicle operating mechanism is supplied with power is indicated at 1 and 2, 1 being the negative wire and 2 the positive. This circuit may receive power from a power line through trolley mechanism which need not be described herein. At 3 there is shown a Thyratron tube, the filament 4 of which is connected to wires 5 and 6, which are connected across the wires 1 and 2 through a polarized switch mechanism 7. The polarized switch 7 is controlled by a coil 8 which is connected across the wires 1 and 2 and is provided with stationary contacts 9, 10, 11 and 12. Contacts 9 and 12 are connected to wire 2 through a wire 13, while contacts 10 and 11 are connected to wire 1 through a wire 14. The polarized relay 7 is provided with movable contacts 15 and 16, contact 15 being movable between the stationary contacts 9 and 10, while contact 16 is movable between stationary contacts 11 and 12.

Movable contact 15 is connected to the wire 6 by means of a wire 17, while movable contact 16 is connected to wire 5. A current limiting resistor 18 is connected in the circuit including wire 6 in order to properly adjust the potential across the filament 4.

The plate 19 of the tube 3 is connected to an indicator 20 by means of a wire 21, the indicator being connected to wire 17 through a resistor 22.

The grid 23 of the tube 3 is connected to a battery 24 by means of a wire 25, the other terminal of the battery being connected to the frame 26 of the vehicle by means of a wire 27. It should be noted that the battery 24 is so connected that the negative terminal thereof is connected to the grid 23 while the positive terminal is connected to the frame 26.

In the drawing the resistance 28 represents the leakage resistance between the positive circuit and the vehicle frame, such leakage resistance being due to the insulation resistance of fixtures and various other parts. The negative trolley wire 1 is grounded at 29. It will thus be seen that passengers will contact both the frame and the ground at the same time. If the leakage resistance 28 is sufficiently high, there will be very little voltage between the ground 29 and the frame 26. If, on the other hand, this leakage resistance is very low, the passenger may get a very serious shock. Inasmuch as the voltage across the leakage resistance 28 is impressed on the grid 23 of the tube 3 which is connected to the frame 26 through battery 24, this voltage serves to overcome the bias voltage of the battery 24 and allows the tube to break down, causing a current flow through the indicator circuit 21, if the leakage resistance falls below a predetermined amount. In this fashion, the characteristics of battery 24 determine the point at which the tube breaks down and a signal is given.

The battery 24 is of such character that if the potential between the frame and the negative trolley (filament) exceeds a predetermined value, as for example, 20 volts, the grid loses control of the tube and current flows from the plate to the filament through the signal circuit, thereby actuating the indicator and giving a signal.

It will be seen that the polarized relay 7 preserves the proper polarities on the plate and filament of the tube 3 in the event that the overhead polarities are reversed inasmuch as the movable contacts 15 and 16 connect the filament to the wires 1 and 2. By using a Thyratron tube, enough current can be supplied to directly operate the signalling device or indicator 20, thus eliminating a relay.

Inasmuch as a relay or meter would furnish a

direct connection between the coach frame and the main power circuit, the very condition which is sought to be avoided would be produced, whereas, by means of the tube and circuits described above, no direct connection exists between the power circuit and the frame.

While the invention has been described with specific reference to the circuit and mechanism shown in the accompanying drawing, it is not to be limited, save as defined in the appended claims.

We claim:

1. A device for indicating a charged condition of the frame of a vehicle having a power circuit comprising an indicator, an electronic tube having a filament, a plate and a grid, a polarized relay connected across the power circuit and having a plurality of contacts, circuits to connect the contacts to the filament of the tube and the power circuits, a circuit to connect the indicator to the plate of the tube and one of the contacts, a circuit to connect the grid of the tube to the frame of the vehicle, and a battery in the last named circuit.

2. A device for indicating a charged condition of the frame of a vehicle having a power circuit comprising an indicator, an electronic tube having a filament, a plate and a grid, a polarized relay connected across the power circuit and having a plurality of contacts, circuits to connect the contacts to the filament of the tube and the power circuits, a circuit to connect the indicator to the plate of the tube and one of the contacts to connect the plate to the positive side of the power circuit, a circuit to connect the grid of the tube to the frame of the vehicle, and a battery in the last named circuit with the positive terminal thereof connected to the frame of the vehicle.

3. A device for indicating a charged condition of the frame of a vehicle having a power circuit comprising an indicator, an electronic tube having a filament, a plate and a grid, circuits to connect the electronic tube to the indicator and vehicle power circuit, means to bias the grid of the tube to render the indicator inoperative, and means to connect the tube to the frame to cause a difference of potential existing between the frame and the grounded side of the power circuit to oppose the grid bias and actuate the indicator.

4. A device for indicating a charged condition of the frame of a vehicle having a power circuit comprising an indicator, an electronic tube having a filament, a plate and a grid, circuits to connect the electronic tube to the indicator and vehicle power circuit, a polarized relay connected in the circuit including the electronic tube and vehicle power circuit, a circuit to connect the grid of the tube to the frame, and means in the last named circuit to bias the grid whereby a difference of potential existing between the frame and the grounded side of the power circuit tends to overcome the bias and to actuate the indicator.

5. A device for indicating a charged condition of the frame of a vehicle having a power circuit comprising an indicator, an electronic tube having a filament, a plate and a grid, circuits to connect the filament and plate of the tube to the vehicle power circuit, means to bias the grid of the tube to render the indicator inoperative, the indicator being in the circuit of the plate of the tube, and means to connect the grid of the tube to the frame through a battery to cause a difference of potential existing between the frame and the grounded side of the power circuit to oppose the grid bias and actuate the indicator.

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