

No. 814,671.

PATENTED MAR. 13, 1906.

J. D. BURNS.

SYSTEM OF PREVENTING THE COLLECTION OF ICE ON RAILS.

APPLICATION FILED FEB. 7, 1905.

2 SHEETS—SHEET 1.

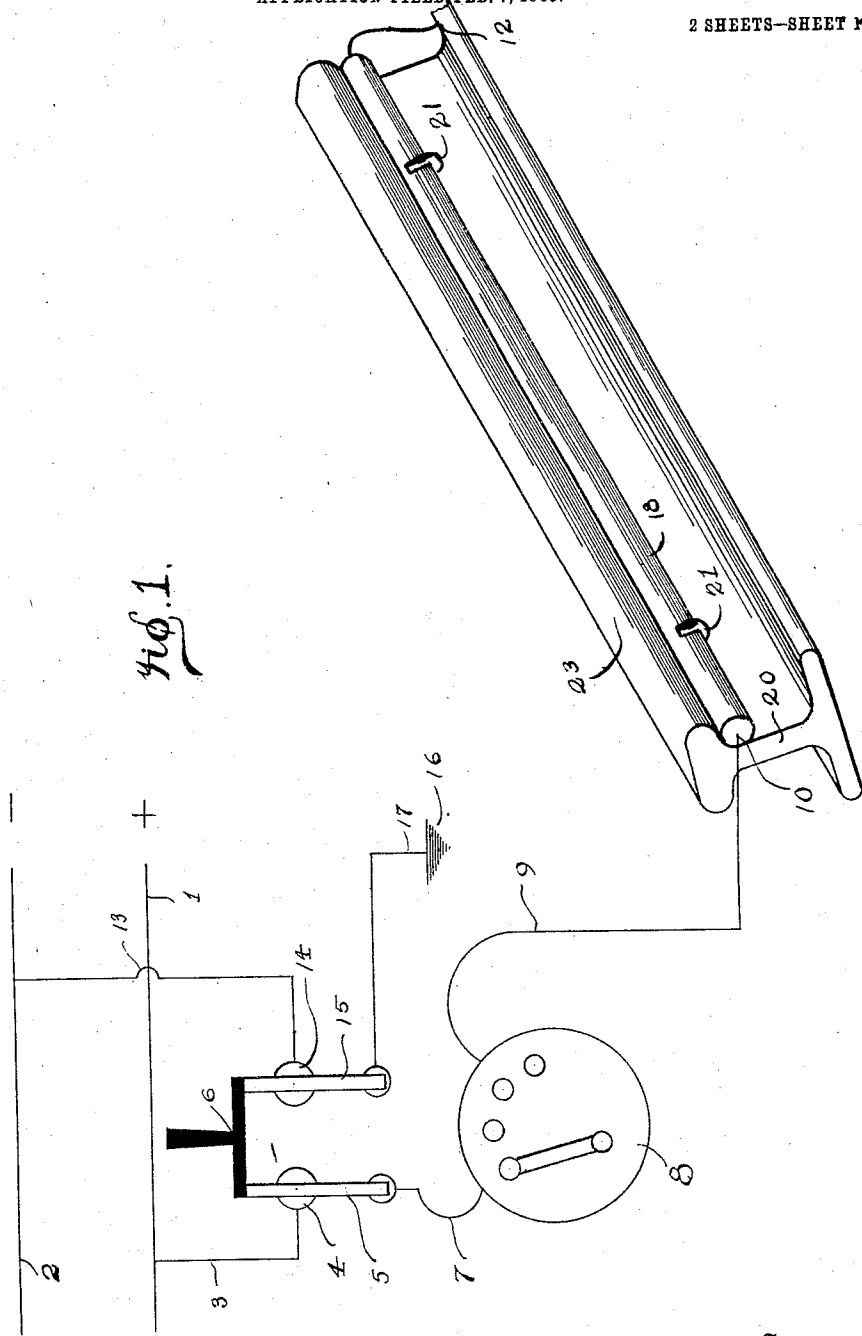


Fig. 1.

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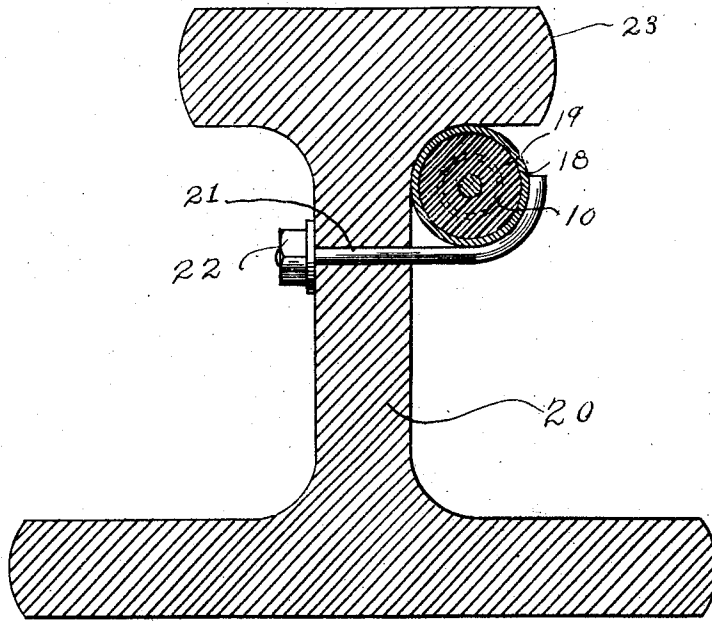


Fig. 2.

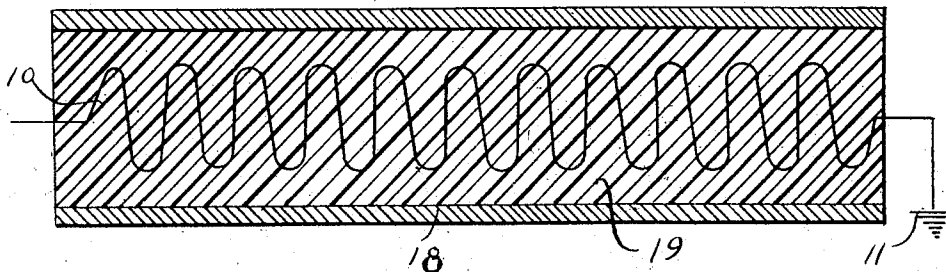


Fig. 3.

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UNITED STATES PATENT OFFICE.

JEREMIAH D. BURNS, OF WASHINGTON, DISTRICT OF COLUMBIA.
ASSIGNOR OF TWENTY-FOUR ONE-HUNDREDTHS TO LINCOLN
GUYNN, OF WABASH, INDIANA, AND WILLIAM J. SHEETZ, OF
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SYSTEM OF PREVENTING THE COLLECTION OF ICE ON RAILS.

No. 814,871.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed February 7, 1905. Serial No. 244,549.

To all whom it may concern:

Be it known that I, JEREMIAH D. BURNS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Systems of Preventing the Collection of Ice on Rails, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to improvements in a system of preventing the collection of snow or ice on or about rails on which cars are to be propelled, the main object being the provision of means whereby electricity is so used
15 as to increase the temperature of such rails or the atmosphere surrounding the same, so as to be above the freezing-point, and thereby prevent snow or ice from collecting thereon or adjacent thereto.

20 In order to carry this invention into effect, a resistance-wire of low conductivity is embedded in a non-conductor of electricity, but a conductor of heat, and held in contact with
25 or adjacent to the rails and electricity caused to pass through the resistance-wire in such manner as to heat the substance surrounding the same, and thereby transmit to the rails
30 or to the atmosphere surrounding the same such heat as will cause the temperature of the rails or atmosphere to raise and be held at such a degree of temperature as to prevent
snow or ice from collecting on rails or adjacent thereto.

To attain these objects and carry this invention into effect, my invention consists of a system of this character embodying novel features of construction and combination of parts substantially as disclosed herein.

In the accompanying drawings, Figure 1 is a diagrammatical view showing a complete system embodying my invention. Fig. 2 is a vertical sectional view through a rail and my heat-conducting means, showing the method of attaching the same to the rail. Fig. 3 is an enlarged detail longitudinal sectional view taken through the heat-conductor.

Referring to the drawings, the numeral 1 designates the + bus-bar, while the numeral 2 designates the - bus-bar of a trolley system, or, in fact, any electrical system. Connected to the bus-bar 1 is a wire 3, which is connected to a post 4, adapted to be contacted by

one member 5 of the double switch 6, a wire 7 connecting the member 5 of the switch to the rheostat 8. Connected to the outgoing post
55 of the rheostat is a wire 9, which is connected to one end of the resistance-wire 10, whose other end is connected either to the ground at 11 or to the rail 12, as may be desired. To the bus-bar 2 I connect a wire 13, which is
60 connected to a post 14, adapted to be contacted by the member 15 of the switch 6, the said member 15 being connected to the ground at 16 by means of a wire 17. Thus the circuit for feeding the resistance-wire 10
65 is completed. This resistance-wire is incased within a tube or iron pipe 18 by means of a concrete filling 19, made of a non-conductor of electricity, but of a conductor of heat, such as clay, cement, or any silica composition,
70 either pure or composition, such as glass or porcelain. The pipe 18 is suspended to the web 20 of the rail 12 by means of a series of hooks 21, which pass through the web and are held in place by the fastening means 22,
75 the hooks being so constructed as to clamp the pipe 18 closely against the under side of the flange 23 of the rail. By this means, the resistance-wire being of the lowest possible conductivity, heat is generated within the
80 tube or pipe 18, conducted through the filling 19 to the pipe, and consequently to the under side of the flange 23 of the rail in such a manner as to increase the temperature of the rail, so as to be above freezing-point, and
85 by means of the rheostat the degree of temperature may be increased by increasing the voltage of electricity passing through the resistance-wire.

I would have it understood that although I
90 have shown the resistance-wire as grounded and fed only at the two points in a system the said resistance-wire will be fed the same as in power systems at intervals and grounded in like manner, thus insuring the best possible
95 results and the more even distribution of electricity through the resistance-wire.

From the foregoing description, taken in connection with the drawings, it is evident that I provide a system whereby the temper-
100 ature of the flange of a rail or rails may be kept at such a degree as to prevent the collection of ice thereon, and thus prevent accidents by slipping of cars upon the ice and

also loss of power by giving a better contact for the passage of electricity to the motors of the cars where the rails are used as a return.

In underground systems the resistance-wires are tapped onto the feed-wires and employ the same positive and negative connections as do the conducting-wires of said systems, the form heretofore described being readily applicable to this underground system.

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

1. In a system of this character the combination with electric feed-wires and the rails of a railway system, of a metallic support carried by the web of the rails, and means for increasing the temperature of the rails to melt or prevent snow or ice from collecting on the rails carried by said supports above the same and directly below the tread of the rail, the said means being connected directly to the feed-wires, for the purpose set forth.

2. In a system of this character, the combination with electric feed-wires and the rails of a railway system, of metallic supports carried by the webs of the rails, a metallic tube or pipe removably supported in said supports, a resistance-wire incased within said tube or pipe, a plastic non-conductor of electricity and conductor of heat forming a homogeneous mass within the tube or pipe and surrounding the resistance-wire, and means for connecting the wire to said resistance-wire.

3. In a system of this character, the combination with electric feed-wires and the rails of a trolley system, of metallic supports carried by the web of the rails and a metallic tube or pipe removably supported in said supports, a resistance-wire incased within said tube or pipe, a plastic non-conductor of electricity and conductor of heat forming a homogeneous mass within the tube or pipe and surrounding the resistance-wire, and means for connecting the feed-wire to said resistance-wire.

4. In a system of this character, the combination with electric feed-wires and the rails of a trolley system, of metallic supports carried by the web of the rails, a metallic tube or pipe removably supported in said supports, a coiled resistance-wire incased within said tube or pipe, a plastic non-conductor of electricity and conductor of heat forming a homogeneous mass within the tube or pipe and surrounding the coiled resistance-wire, and means for connecting the feed-wires to said resistance-wire.

5. In a system of this character, the combination with feed-wires and rails of a trolley system, of metallic supports carried by the web of the rails, a metallic envelop detachably carried by the supports, and a resistance-wire so mounted within the envelop as to be free from the action of oxygen thereon so that the wire cannot be burned out and

means for connecting the feed-wires to said resistance-wire.

6. In a system of this character, the combination with feed-wires and rails of a trolley system, of metallic supports carried by the web of the rails, a metallic envelop detachably carried by the supports, a coiled resistance-wire so mounted within the envelop as to be free from the action of oxygen thereon so that the wire cannot be fused, and means for connecting the feed-wires to said resistance-wire.

7. The combination with bus-bars and rails of a trolley system, of metallic supports carried by the web of the rails, a metallic tube or pipe removably supported by the supports, a resistance-wire incased within said tube or pipe, a plastic non-conductor of electricity and conductor of heat forming a homogeneous mass within the tube or pipe and surrounding the resistance-wire and conductors for electricity connected to the bus-bars and the resistance-wire.

8. In a system of this character, the combination with bus-bars and rails of a trolley system, of metallic supports carried by the web of the rails, a metallic tube or pipe removably supported by the said supports, a coiled resistance-wire incased within said tube or pipe, a plastic non-conductor of electricity and conductor of heat forming a homogeneous mass within the tube or pipe and surrounding the coiled resistance-wire, and conductors for electricity connected to the bus-bars and resistance-wire.

9. In a system of this character, the combination with electric feed-wires and the rails of a trolley system, of metallic supports carried by the web of the rails, a metallic tube or pipe removably attached to the supports, a resistance-wire of low conductivity incased within said tube or pipe, a plastic non-conductor of electricity and conductor of heat forming a homogeneous mass within the tube or pipe and surrounding the resistance-wire and means for connecting the feed-wire to said resistance-wire.

10. In a system of this character the combination with feed-wires and rails of a trolley system, of metallic supports carried by the web of the rails, a metallic envelop detachably supported by the supports, a resistance-wire of low conductivity so mounted within the envelop as to be free from the action of oxygen thereon so that the wire cannot be fused and means for connecting the feed-wires to said resistance-wire.

11. The combination with bus-bars and rails of a trolley system, of metallic supports carried by the web of the rails, a metallic pipe or tube removably attached to the rails, a resistance-wire of low conductivity incased within said tube or pipe, a plastic non-conductor of electricity and conductor of heat forming a homogeneous mass within the tube

or pipe and surrounding the resistance-wire, and conductors of electricity connected to the bus-bars and the resistance-wire.

5 12. In a system of this character, the combination with bus-bars and rails of a trolley system, of metallic supports carried by the web of the rails, a metallic tube removably attached to the supports, a coiled resistance-wire of low conductivity incased within said
10 tube or pipe, a plastic non-conductor of electricity and conductor of heat forming a ho-

mogeneous mass within the tube or pipe and surrounding the coiled resistance-wire, and conductors for electricity connected to the bus-bars and the resistance-wire.

In testimony whereof I affix my signature
15 in presence of two witnesses.

JEREMIAH D. BURNS.

Witnesses:

W. J. SHEETZ,
DAVID P. MOORE.