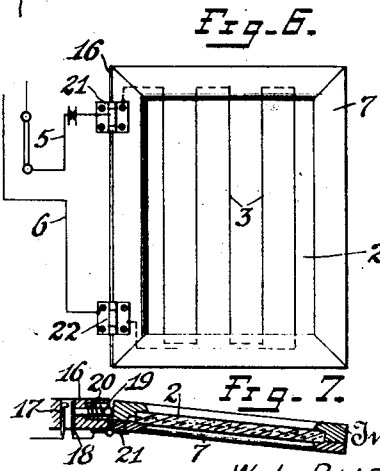
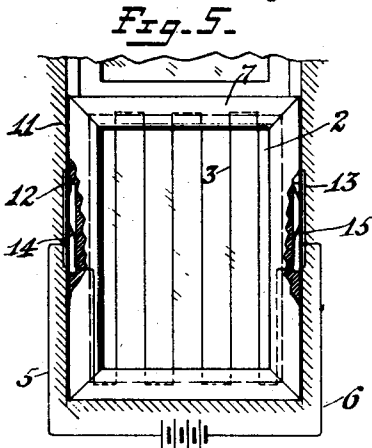
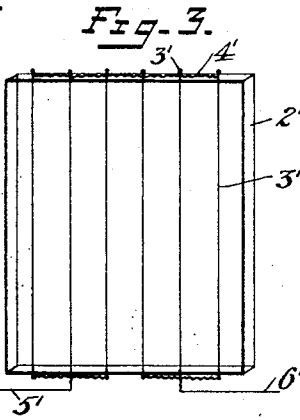
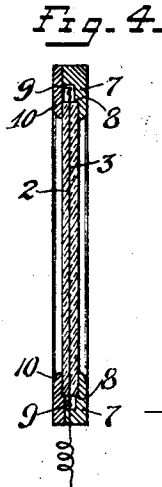
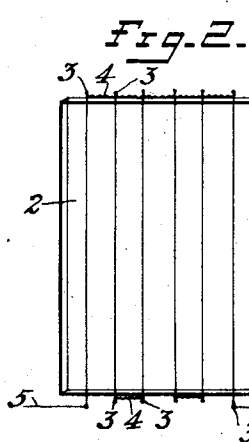
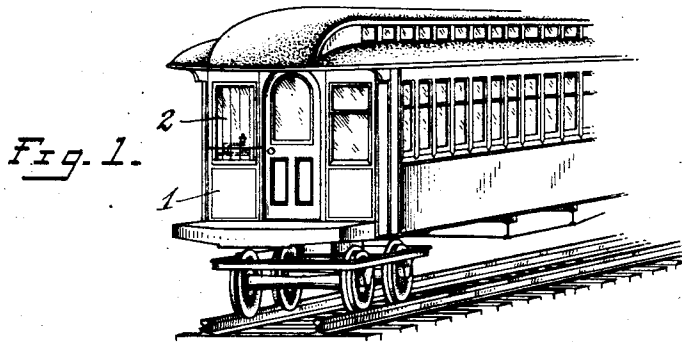


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WINDOW.
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957,728.

Patented May 10, 1910.



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WINDOW.

957,728.

Specification of Letters Patent.

Patented May 10, 1910.

Application filed September 14, 1905. Serial No. 278,358.

To all whom it may concern:

Be it known that I, WILLIAM LORD BLISS, a citizen of the United States, residing at Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Windows for Cars, Cabs, &c., of which the following is a full, clear, and exact description.

My invention relates to windows, particularly for cabs and the vestibules of cars.

The object of the invention is to provide a window upon which rain, mist, sleet and snow will not collect, and which will nevertheless be strong and not liable to fracture.

The invention consists in improvements, the principles of which are illustrated in the accompanying single sheet of drawings. Briefly, it may be said to comprise the employment of a sheet or pane of glass having embedded therein a number of wires forming a part of an electric circuit, by which the glass is heated. The glass is mounted in a frame having grooves at its ends for receiving the ends of the wires, and the ends of the wires are preferably connected by separate short branches. For windows which are adapted to be opened, an automatic switch is provided for opening the circuit when the window is opened, so that current can flow only when the window is closed.

Figure 1 is a perspective view of a fragment of a railway car having my invention applied to the window in front of the motor-man's box. Fig. 2 is a perspective view of a pane of glass having wires or electrical conductors embedded therein and connected in series. Fig. 3 is a similar view showing groups of wires in parallel. Fig. 4 is a vertical section of the window glass and sash embodying the improvements of my invention. Fig. 5 is a view largely diagrammatic, showing a vertical sliding window in a frame, with contacts for automatically opening the electric circuits. Fig. 6 shows a hinged or swinging window. Fig. 7 is a horizontal sectional plan showing a switch which is closed upon closing the window and opened upon opening the window.

1 indicates a vehicle, such as a railway car.

2 is a pane of glass sufficiently transparent for the purpose of vision therethrough.

3-3 indicates wires forming electrical conductors. These should be of comparatively small diameter and designed to afford

the proper resistance in order to obtain the desired degree of temperature when the available current is flowing. Since these wires are securely embedded in the glass in the process of manufacture, there is always danger of the ends being broken off by any slight blow. There is also danger of the glass being fractured by any uneven heating. I therefore prefer to connect the adjacent ends of the wires by short lengths of wire 4 slightly separated from the end of the sheet of glass, so that the temperature of the connecting strip will not directly communicate to the end of the glass.

5 and 6 are terminals of the wiring through the glass.

2' is a pane of glass having embedded therein wires 3' which are connected by the strips 4', arranged so that some of them are in parallel to better attain the temperature desired. 5'-6' are the terminals of this series—parallel arrangement of wires. The temperature to which the glass is raised by the current flowing through the wires is not extremely high, it simply being necessary to maintain the glass at such a temperature as will cause the moisture or sleet, etc., striking against the outer surface, to be vaporized reasonably fast.

7 represents the sash of the window, having shoulders 8-8 top and bottom, for holding the glass securely in its vertical position. 9-9 are grooves in the top and bottom of these sashes which permit of the introduction of the glass with the protruding ends of the wire 3-3, without causing them to strike against the sash or be injured in any manner.

10-10 are rabbet plates for removably securing the glass in the sash. These plates preferably form one side of the grooves 9-9 in the sash.

11 indicates a frame in which the sash 7 is adapted to be vertically moved. In the structure of Fig. 1 the window is adapted to be lowered, while that shown in Fig. 5 is adapted to be raised, for opening.

12 and 13 are contact plates in the frame connected to the mains of the energizing circuit, and provided if desired with a suitable manually controllable switch.

14 and 15 are spring contacts carried by the window frame and connected to the terminals of the window circuit, so that when the window is closed, as shown in Fig. 5, the circuit is complete and the apparatus will be

in operation. When the window is open the contacts 14 and 15 slip off the terminals 12 and 13, and the window circuit is thus opened and deenergized.

5 In the form shown in Fig. 6, the sash 7 is hinged to the frame 16.

17-18 are contact members in the frame normally separated when the window is open.

10 19 is a plunger and 20 a spring for holding it in its extended position, as shown in Fig. 7.

The circuit through the window wires passes through the hinges 21 and 22. The automatic switch having contacts 17 and 18, is located in one branch of the circuit and automatically turns on and off the current as the window is closed or opened.

What I claim is:

20 1. In a window for cabs, vestibules, and the like, a pane of glass, conducting wires embedded therein, and means for automatically throwing the wires in circuit upon closing the window and opening the circuit on
25 opening the window.

2. In a window for cabs, vehicles, etc., a sash having supporting shoulders and grooves beyond the shoulders, a pane of glass mounted in said sash positioned by said
30 shoulders, conducting wires embedded in said glass, and having their ends extending into said grooves, and means for energizing the circuit through said wires, for the purpose specified.

35 3. In a window construction, a stationary frame having contacts, a source of electrical energy connected to said contacts, a sash movable in said frame and having terminals adapted to electrically engage said frame
40 contacts, a glass plate supported in said sash and a conductive wire embedded in said glass plate, the ends of the wire being housed and protected in said sash and connected to said sash terminals.

45 4. A window construction comprising, a frame, a sheet of transparent glass carried thereby, a plurality of conducting wires embedded therein and arranged so as to furnish a heating means throughout the glass
50 but not to obstruct the vision through the window, means for supplying current sufficient to heat the wires so as to prevent the formation or collection of ice on the exterior of the glass and means for automatically
55 throwing the wires into circuit upon closing the window.

5. A window construction comprising, a frame, a sheet of transparent glass carried thereby, a plurality of conducting wires em-

bedded therein and arranged so as to furnish a heating means throughout the glass but not to obstruct the vision through the window, means for supplying current sufficient to heat the wires so as to prevent the formation or collection of ice on the exterior
65 of the glass and means for automatically opening the circuit through the wires on opening the window.

6. A window construction comprising, a frame, a sheet of transparent glass carried
70 thereby, a plurality of conducting wires embedded therein and arranged so as to furnish a heating means throughout the glass but not to obstruct the vision through the window, means for supplying current sufficient to heat the wires so as to prevent the
75 formation or collection of ice on the exterior of the glass and means in the frame for altering the circuit conditions.

7. A window construction comprising, a
80 frame, a sheet of transparent glass carried thereby, a plurality of conducting wires embedded therein and arranged so as to furnish a heating means throughout the glass but not to obstruct the vision through the
85 window, means for supplying current sufficient to heat the wires so as to prevent the formation or collection of ice on the exterior of the glass and sliding circuit contacts in said frame.

8. A window construction comprising, a
90 frame, a sheet of transparent glass carried thereby, a plurality of conducting wires embedded therein and arranged so as to furnish a heating means throughout the glass
95 but not to obstruct the vision through the window, means for supplying current sufficient to heat the wires so as to prevent the formation or collection of ice on the exterior of the glass and circuit contacts concealed in
100 said frame.

9. A window construction comprising, a frame, a sheet of transparent glass carried
105 thereby, a plurality of conducting wires embedded therein and arranged so as to furnish a heating means throughout the glass but not to obstruct the vision through the window, means for supplying current sufficient to heat the wires so as to prevent the
110 formation or collection of ice on the exterior of the glass, said frame having one or more grooves into which the ends of said conducting wires project and are housed.

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