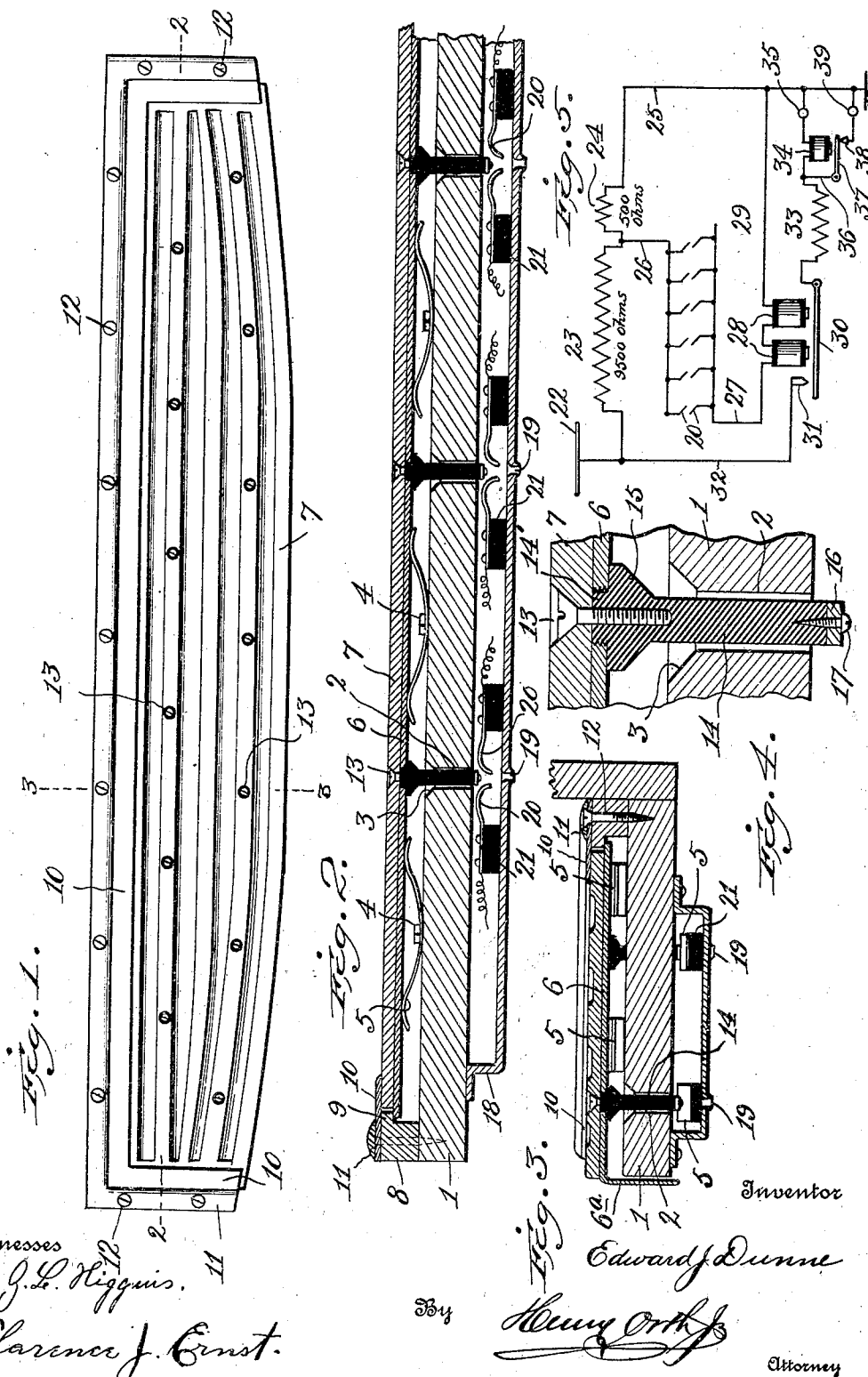


E. J. DUNNE.
SAFETY SIGNAL DEVICE.
APPLICATION FILED JULY 20, 1912

1,054,186.

Patented Feb. 25, 1913.



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To all whom it may concern:

Be it known that I, EDWARD J. DUNNE, a citizen of the United States of America, residing at Jersey City, in the county of Hudson and State of New Jersey, United States of America, have invented certain new and useful Improvements in Safety Signal Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to car safety signal devices, and has for its object to provide a loose, bodily depressible railway car-step, by means of which a signal is given to the driver of the car that a person is on the step, and my invention consists in the combination and arrangement of parts, as will hereinafter be particularly described and pointed out in the claims.

Referring to the drawings, in which like parts are similarly designated—Figure 1 is a plan view of an electric street-railway car step, embodying my invention. Fig. 2 is a section on line 2—2 of Fig. 1, drawn to an enlarged scale. Fig. 3 is a transverse section on line 3—3 of Fig. 1, also to an enlarged scale. Fig. 4 is an enlarged, detail, sectional view showing one of the plug contacts, and Fig. 5 is a wire diagram showing the operating circuits as derived from the trolley, or other supply conductor.

My invention is such as can be readily applied to existing cars without any great expense for reconstruction of a step, step-board or running-board.

In the drawings, 1 indicates the ordinary step-board or running-board of a car, and through this board I bore a number of holes 2, in a plurality of rows, and preferably staggered. I have shown the step-board (Fig. 3,) as provided with two such longitudinal rows of holes. The holes 2 are preferably, but not necessarily, reamed conical at their upper ends, as shown at 3. Secured to the upper face of the step-board 1 by means of suitable bolts, 4, are curved leaf springs 5. I have shown two longitudinal rows of such springs, but the number of springs may be increased or diminished according to the length and width of the step-

board. The bolts 4 securing the springs 5 to the step-board 1, pass substantially through the middle of these springs, so that their upwardly directed ends normally hold a sheet iron plate 6 a slight distance above the step-board. This sheet iron plate 6 may or may not be provided with a suitable tread surface.

In the drawings I have shown the sheet iron plate 6 as provided with a corrugated lead tread surface 7. Any other anti-slipping tread surface may be used, or the sheet iron plate 6 may itself be corrugated, roughened, or otherwise rendered safe, as is customarily done in existing treads for step-boards, and the special tread surface, such as 7, may be omitted.

On three sides of the step-board I provide limit members 8 of wood or other material, having a flange 9 against the under edge of which the sheet metal tread 6 is held by the springs 5. On top of these limit members 8 and extending also around the three sides of the board and plate 6 I place an apron 10, of rubber or other flexible elastic material, and on top of this I place a metal frame 11, held in place by screws or bolts 12, serving simultaneously to hold the frame 11, apron 10, and limit members 8 to the step-board.

The sheet metal tread 6 is extended downward over the front of the step-board, as shown at 6^a, (Fig. 3) to form a protecting apron.

Secured to the movable tread by means of bolts or screws 13 are plugs 14 of insulating material. These plugs preferably have a screw-threaded boss 14' at their upper end, by means of which they may also be screwed into corresponding holes in the tread-plate 6, and also have an enlarged conical head 15 corresponding with the countersunk portions 3 of the holes 2 in the step-board. On the lower ends of these insulating plugs are conducting contact plates or washers 16, secured thereto by means of screws 17, or other suitable devices.

Beneath the step-board is provided a sheet metal pan 18 having perforations 19 for the drainage and discharge of rain water or the like. On this pan I secure pairs of contact springs 20 mounted on suitable insulating blocks 21. There is a pair of springs beneath each hole 2, as clearly shown in Fig. 2, and contact is made between the springs of a pair by the washer 16 when the

tread 6 is depressed against the springs 5, thereby closing electrical contact between one or more pairs of springs 20.

The amount of vertical movement of the tread 6 is but a fraction of an inch, and the tread is movable bodily downward. By making the tread bodily movable or depressible, I decrease the extent of movement of the tread to a great extent.

The insulating plugs 14 hold the tread in proper relative position to the step-board and also prevent it from slipping therefrom forward.

The springs 20 are connected in parallel in the electrical circuit, and are preferably wired in the manner shown in Fig. 5, wherein 22 is a trolley wire, 23 a high resistance, say in the neighborhood of 9500 ohms, either connected to the trolley of the car or to leads thereto, and 24 is a smaller resistance, in the neighborhood of 500 ohms, in series therewith, and connected by wire 25 to the ground through the car wheels, or to the return rail, as the case may be, the lower resistance 24 being at the grounded end of the circuit.

Between the two resistances I connect a wire, 26, leading to a contact 20 of each pair of contacts, the other contacts of said pairs being connected to a wire 27 which in turn is connected to a magnet or magnets 28 that are connected by wire 29 to wire 25. This circuit is in parallel with the low resistance 24. The magnets 28 operate an armature 30 against a stationary contact 31 connected by wire 32 to the trolley or supply wire. The armature 30 is connected through a resistance 33 to a relay 34 and lamp 35 to wire 25. Between the resistance 33 and the magnet 34 I connect a lead 36 to the armature 37 of the magnet 34, said armature resting on a stationary contact 38 that is connected to a lamp 39 and there-through to wire 25. This arrangement of circuits makes it possible to make use of power from the propulsion circuits of the car, thereby avoiding the use of batteries, which are always troublesome, and still have a low voltage under the step, too low to be of any injury, by reason of short circuit or otherwise, to the person on the step.

By reason of the step being bodily movable, and especially in the case when long step-boards are provided with my improvements, such as the long step-boards on open cars, it may often happen that only a small number of pairs of springs 20 will be bridged by their conductors 16 on the end of the plugs 14. As the plugs pass down in the holes 2 the countersinks 3 receive the conical heads 15 of the plugs, and properly center the plugs with relation to the holes and the contact springs 20. When one or more pairs of the contacts 20 under the step-board are connected by the depression of the

plugs 14, the low voltage circuit 26, 20, 27, 28, 29 and 25 is energized, and the magnets 28 bring up their armature 30 to close circuit from the trolley through the resistance 33 and one or the other of lamps 35, 39. These lamps 35 and 39 are placed in some suitable position so as to give warning to the motorman, or other person concerned, that someone is standing on the step.

I have shown a pair of lamps, 35, 39, so that in the event that one lamp burns out, the automatic relay 34, 37, will automatically close circuit through the lamp 39.

It is, of course, obvious that other signals, either visible or audible, may be used in addition to or in place of lamps 35, 39.

I claim—

1. The combination with a step-board having perforations therein, a bodily depressible tread, springs between said tread and board, flanged limit members for the tread, a flexible apron covering the space between the tread and limit members, electrical contacts below the step-board and plug contacts on the tread passing through the perforations in the board.

2. The combination with a step-board having perforations therein; of a bodily-depressible, yieldingly-supported tread, circuit closing plugs passing through the perforations in the step-board, and contacts beneath the step-board closed by the plugs, said step-board and plugs having an extent of movement less than the length of said plugs, whereby said plugs will hold the tread in relation to the step-board under all conditions of operation.

3. The combination with a step-board having perforations therein; of a pan below said step-board, pairs of spaced contacts secured to said pan, a bodily-depressible, yieldingly-supported tread on said step-board, and plug contacts secured to the tread and movable in the perforations thereof each arranged to bridge a pair of said spaced contacts when moved between them upon depression of the tread.

4. The combination with a step-board having perforations therein provided with conically formed upper ends; of a pair of contacts beneath each perforation, a yieldingly-supported, bodily-movable tread, plug contacts secured to the tread, passing through the perforations and having conical heads conforming to the upper ends of said perforations, whereby each plug is arranged to bridge a pair of said contacts.

5. The combination with a step-board having perforations therein; a bodily movable, yieldingly supported tread member on said board, limiting means to limit the upward movement of said member, a perforated pan secured to the bottom of said board, a pair of contacts mounted on the pan beneath each perforation in the board.

plug contacts secured to said member, passing through said perforations and arranged to bridge said pairs of contacts.

6. The combination with a step-board
5 having conically ended perforations therein; of a bodily-depressible, yieldingly supported tread having an apron extending over the front of said board, limit members overhanging three sides of the tread, an
10 apron extending from the limit members over the tread member, a perforated pan secured to the bottom of said board, pairs of insulated spaced contacts mounted on the pan beneath the perforations in the board

and conically-headed plugs of insulating 15 material secured to the tread whose heads conform to the conical ends of the perforations in the board, and conductive pieces secured to the ends of the plugs arranged to bridge the pairs of contacts. 20

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EDWARD J. DUNNE.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."