

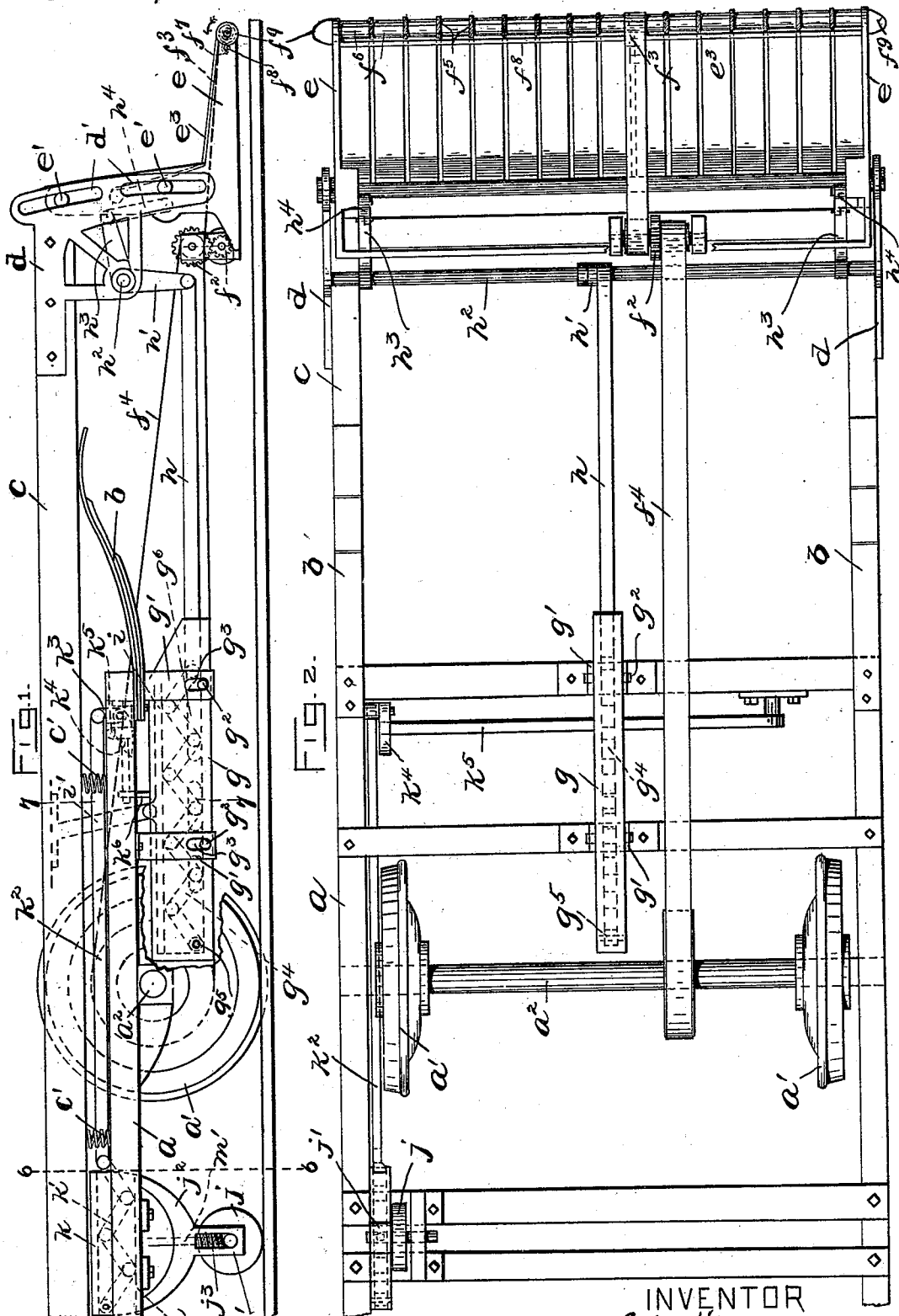
(No Model.)

2 Sheets—Sheet 1.

C. W. HOWE.
LIFE GUARD FOR STREET CARS.

No. 511,428.

Patented Dec. 26, 1893.



WITNESSES
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UNITED STATES PATENT OFFICE.

CHARLES WESLEY HOWE, OF WALTHAM, MASSACHUSETTS.

LIFE-GUARD FOR STREET-CARS.

SPECIFICATION forming part of Letters Patent No. 511,428, dated December 26, 1893.

Application filed February 20, 1893. Serial No. 463,065. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WESLEY HOWE, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Life-Guards for Street-Cars, of which the following is a specification.

This invention relates to an improvement in life-guard apparatus, for application to cars which are propelled by electricity or other motive power where horses are not employed.

The object of the present invention is to provide a fender whose position with relation to the surface over which the car moves will not be varied by the vibrations of the car-body on the springs which support it, or by irregularities in the track, the said fender remaining at all times substantially parallel with such surface and at a uniform distance therefrom.

The accompanying drawings illustrate constructions by which my invention may be carried out.

Figure 1 shows a side elevation of the lower portion of a car-body and the front portion of a truck, with my improvements applied thereto. Fig. 2 shows a bottom plan view of the same. Fig. 3 shows an enlarged sectional detail of an extension apparatus for compensating for the up and down motion of the car-body. Fig. 4 shows an enlarged sectional view of a portion of an improved form of roller which is carried at the front of the fender. Fig. 5 shows a cross-section of this roller. Fig. 6 shows a vertical section on line 6—6 of Fig. 1. Fig. 7 shows a cross-section on line 7—7 of Fig. 2. Fig. 8 shows a side elevation of a modified apparatus.

The same letters of reference indicate the same parts in all the figures.

In the drawings, the letter *a* designates a truck-frame of a car, in which the wheels *a'* are mounted so that the truck will have no vertical movement. A flat spring *b*, formed of a plurality of leaves, is fastened to the under side of the truck-frame at each corner thereof, and the car-body *c* rests upon these springs, which are carried upwardly on an ogree curve, so that the body will be elevated above the truck. Supplemental spiral springs *c'* are mounted on the upper side of the truck, and the car-body also rests upon these springs. A pair of brackets or frames *d* are secured to

each side of the car-body at the front of the same, and are provided with slots *d'*.

The fender comprises side-pieces *e*, with vertical portions having projecting studs *e'*, which engage the slots *d'*, and horizontal portions supporting a roller of improved construction at their outer ends. The bottom and back of the fender are composed of slats *e²*, connected by cross-ties. These slats are somewhat yielding, so as to cushion the blow of a body which may fall upon or be thrown into the fender. The roller at the front of the fender comprises a shaft *f*, which is geared to an axle of the car, so as to rotate in an opposite direction to the wheels of the car, as indicated by the arrow in Fig. 1. Said shaft may be connected with the axle *a²* of the car in any suitable manner to effect its rotation in this direction. I have here shown a pair of gears *f²*, supported in bearings on the rear portion of the fender, and belts *f³* *f⁴* connecting said gears respectively with the shaft *f* and the axle *a²*. The shaft *f* is formed with a plurality of equidistant projecting surfaces *f⁵*, preferably in the form of collars, and milled or roughened so that they will more readily catch up a body in the path of the car and carry it over upon the fender. These projecting surfaces may be formed in numerous ways and have various contours.

I provide against the entanglement of the clothing or hair of a person who may be struck by the fender and carried over upon the same by the revolving roller or shaft, by arranging a shield over the shaft between the projecting surfaces *f⁵*, in the form of a series of loose sleeves or collars *f⁶*, in which the shaft may turn freely without imparting motion to them. These loose members may have any suitable construction. I have shown them provided with rearwardly-projecting fingers *f⁷*, whose outer ends rest on a rod *f⁸* extending across the fender. It will be seen that these projecting fingers, besides preventing any rotation of the loose sleeves or collars when pressure is brought to bear upon them by the weight of a body falling upon the fender, also form a bridge from the revolving shaft to the bottom of the fender, over which objects or bodies may pass without becoming entangled in the front portion of the fender. The special construction of the roller, as here shown and described, is not essential to the

performance of its functions, and may be varied in many particulars, and therefore I do not confine myself to this construction, but consider myself entitled to all such variations.

5 Cones f^9 are formed on the ends of the shaft f , outside of the side-pieces e , and these cones are designed to move a body or object to one side out of the path of the car, in case such body or object is projecting slightly into
10 the path of the car when struck by the fender.

The connection from the fender to the truck and car-body, by which to compensate for the vibrations of the car and maintain the
15 fender at a certain distance from the surface over which the car travels, will now be described. An elongated casing g is supported in a horizontal position by hangers g' secured to the under side of the truck, the said casing
20 having projecting studs g^2 which engage slots g^3 in the said hangers. The normal position of the casing is that shown in Fig. 1, where its studs g^2 rest on the lower sides of the slots g^3 . The purpose of these slots is to permit a
25 limited vertical movement of the casing, for a purpose hereinafter explained. Within the casing g and extending longitudinally thereof is a series of knuckles, composed of links g^4 , jointed together in zigzag order, and
30 fastened at the rear end to the casing by a pin or bolt g^5 . The casing forms a slide-way for these knuckles, which may be expanded and contracted therein, the pins forming the lower joints being guided in slots or grooves
35 g^6 formed in the sides of the casing. A rod h is connected with the outer or front end of the knuckles, and extends horizontally to a point below the front end of the car, where it is jointed to the outer end of a crank-arm
40 h' , fixed upon a rock-shaft h^2 , which is journaled in bearings formed on rearward extensions of the supporting-frame or brackets d . A pair of arms h^3 are fixed on the rock-shaft h^2 , near the ends thereof, and these arms connect at their outer ends by links h^4 with the
45 fender. It will be observed that the arms h' and h^3 form, in effect, a bell-crank. A flat plate or head i bears upon the top of the knuckles g^4 within the casing g , and is rigidly suspended from the car-body by a link
50 or hanger i' .

The operation of the parts just described is as follows: Upon a downward movement of the car-body toward the truck, the plate or
55 head i will press downward upon the knuckles g^4 , and will bring about a longitudinal extension of the same and a consequent forward movement of the shaft h in the direction indicated by the arrow in Fig. 1. This movement of the rod h actuates the bell-crank,
60 tending to elevate the arms h^3 , whose ends are connected with the fender and support the same. Thus the downward movement of the hangers d with the car-body is compensated
65 for in the bell-crank by the action of the rod h on the same, and the point of connection of the fender with the arms h^3 remains fixed,

whereby the fender is maintained at one position and at a constant distance from the surface over which the car moves. Upon the
70 car-body rising again, the weight of the fender restores the parts to their normal positions. Thus vibrations of the car-body do not affect the position of the fender with relation to the surface over which the car moves,
75 and the fender may therefore be carried in close proximity to such surface, whereby its efficiency in taking up objects or bodies in the path of the car is greatly increased.

I also make provision for maintaining the
80 fender at its proper distance from the ground, in case of the front wheels of the truck dropping into a depression in the track. A roller j is mounted in bearings j' , formed on the lower ends of hangers j^2 secured to the truck-
85 frame a , the said roller being allowed a vertical movement in its bearings, but held in the lower ends of the same by springs j^3 . This roller is designed to travel above a rail of the track behind one of the wheels a' . A
90 casing k is secured to the truck and forms a slide-way for a set of knuckles k' , similarly constructed and arranged to those in the casing g heretofore described, and fastened at one
95 end, while the opposite end is connected with a horizontal rod k^2 extending forward and joined to a bell-crank k^3 , one arm k^4 of which extends under a lever k^5 , which is connected by a hanger k^6 with the casing g . A plate
100 or head m engages the knuckles k' , and is mounted on the upper end of a rod m' connecting with the journals of the roller j . The operation of these parts is as follows: Should the front wheels a' of the truck drop
105 into a depression in the track, the bearings j' will move downward, whereby the knuckles k' are caused to bear down on the head or plate m and to expand longitudinally, thereby moving the rod k^2 forward, which causes
110 the bell-crank k^3 k^4 to raise the lever k^5 and casing g , thereby pressing the knuckles g^4 upward against the head or plate i , and causing an extension of the same, and a compensation for the movement of the car-body toward
115 the ground, in the same manner as before described, whereby the fender is maintained at its proper position. After the depression or rut has been passed, the parts assume their
120 normal positions, the bearings j' moving up, so that the journals of the roller j are at the lower ends of said bearings.

Fig. 8 illustrates a modified construction for carrying out my invention. The fender is jointed at n and n' , so that it may be folded
125 up, and the hangers o have straight grooves o' , receiving the studs o^2 on the fender. The gearing by which the front roll of the fender is connected with an axle of the car is the same as that before described. The construction
130 by which to compensate for the vibrations of the car is somewhat different from that before described. A bell-crank p is pivoted in bearings p' , fastened to the under side of the truck-frame, and one arm of this

bell-crank is connected by a link or hanger p^2 with the car-body, while the other arm of the bell-crank is connected by a horizontal rod q with the vertical arm q' of a bell-crank pivoted in bearings on the rear side of the hanger o , the other arm q^2 of said latter bell-crank having a curved slot q^3 which engages a rod q^4 extending crosswise of the fender. As the car-body vibrates up and down, this motion is compensated for through the bell-crank p , rod q and bell-crank q' q^2 , so that the fender is maintained at a constant distance from the surface over which the car travels.

It will be evident that various constructions might be employed to carry out my invention, and to accomplish the objects of the same. It is to be understood, therefore, that I do not limit myself to the means here shown as embodying my ideas, but consider myself entitled to all variations thereof which lie within the scope of the invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A life-guard for street-cars, comprising in its construction a fender supported in engagement with slide-ways on the car-body, and a lever-and-rod connection between the fender, the car-truck and the car-body, whereby the vibrations of the car-body do not affect the position of the fender relative to the surface over which the car moves, and the fender is maintained in substantial parallelism with such surface.

2. A life-guard for street-cars, comprising in its construction a fender suitably supported from the car-body, a knuckle or series of knuckles engaging a slide-way on the truck and having one end fastened thereto and the other end suitably connected with the fender, and a head attached to the car-body and bearing on said knuckle, substantially as described.

3. A life-guard for street-cars, comprising in its construction a fender suitably supported from the car-body, a casing supported by the car-truck, a knuckle or series of knuckles in said casing and having one end connected therewith while the opposite end is suitably connected with the fender, and a bearing-head connected with the car and engaging the knuckle or knuckles, substantially as described.

4. A life-guard for street-cars, comprising in its construction a fender suitably supported by the car-body, a roller in downwardly-movable bearings on the car-truck, said roller being adapted to bear on the surface over which the car moves, and suitable connections between the roller and the fender, substantially as described.

5. A life-guard for street-cars, comprising in its construction a fender suitably supported by the car-body, a knuckle or series of knuckles engaging a slide-way and fastened at one

end thereto and its opposite end suitably connected with the fender, a roller in downwardly-movable bearings on the car-body and adapted to bear on the surface over which the car moves, and a bearing-head engaging the knuckle or knuckles and connected with the roller.

6. A life-guard for street-cars, comprising in its construction a fender suitably supported from the car-body, a vertically-movable casing supported by the car-truck, a knuckle or series of knuckles in said casing and having one end connected therewith while the opposite end is suitably connected with the fender, a bearing-head connected with the car-body and engaging the knuckle or knuckles, a roller in downwardly-movable bearings, and suitable connections between said roller and the vertically-movable casing whereby a downward movement of the roller-bearings operates to raise the casing and extend the knuckle or knuckles therein.

7. A life-guard for street-cars, comprising in its construction a frame or support attached to the car-body, and a shaft or roller in bearings on said support and geared to an axle of the car whereby a rotary motion is imparted to the shaft in the reverse direction to the rotation of the said axle, said shaft having a series of projections and loose parts between the said projections.

8. A life-guard for street-cars, comprising in its construction a frame or support attached to the car-body, and a shaft or roller in bearings on said support and geared to an axle of the car whereby a rotary motion is imparted to the shaft in the reverse direction to the rotation of the said axle, said shaft having a series of projections and loose collars between said projections and provided with extensions engaging a part of the frame or support whereby said collars are held from movement.

9. A life-guard for street-cars, comprising in its construction a frame or support connected with the car-body, and a shaft or roller in bearings on said support and having conical ends outside the support, said shaft geared to an axle of the car, substantially as described.

10. A car, having an independently-movable life-guard, a downwardly-extending projection below the car at a point behind said guard, said projection bearing yieldingly on the track, and mechanism intermediate of said projection and guard whereby the guard is maintained at a uniform distance from the track regardless of irregularities therein, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of February, A. D. 1893.

CHARLES WESLEY HOWE.

Witnesses:

C. F. BROWN,

F. PARKER DAVIS.