

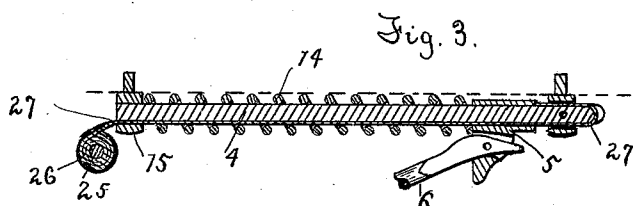
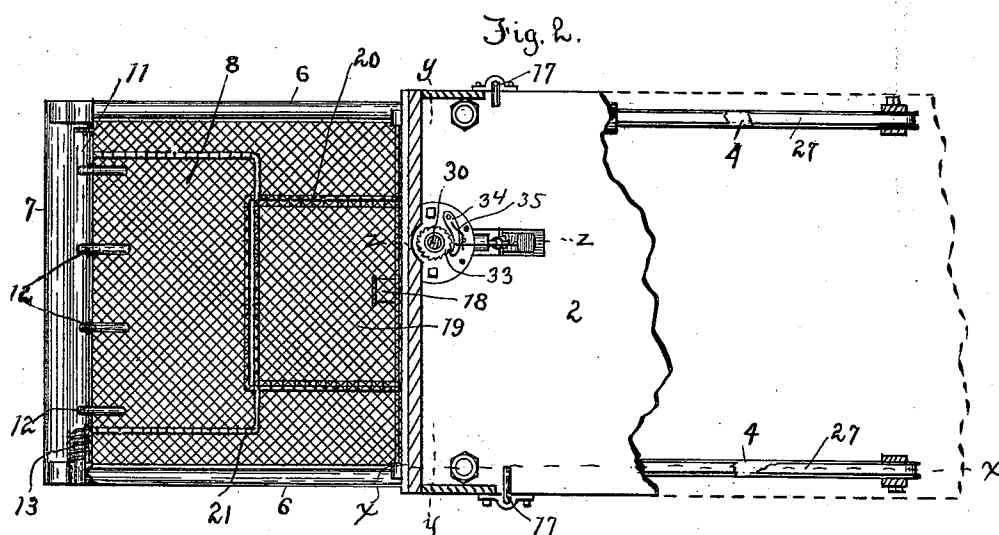
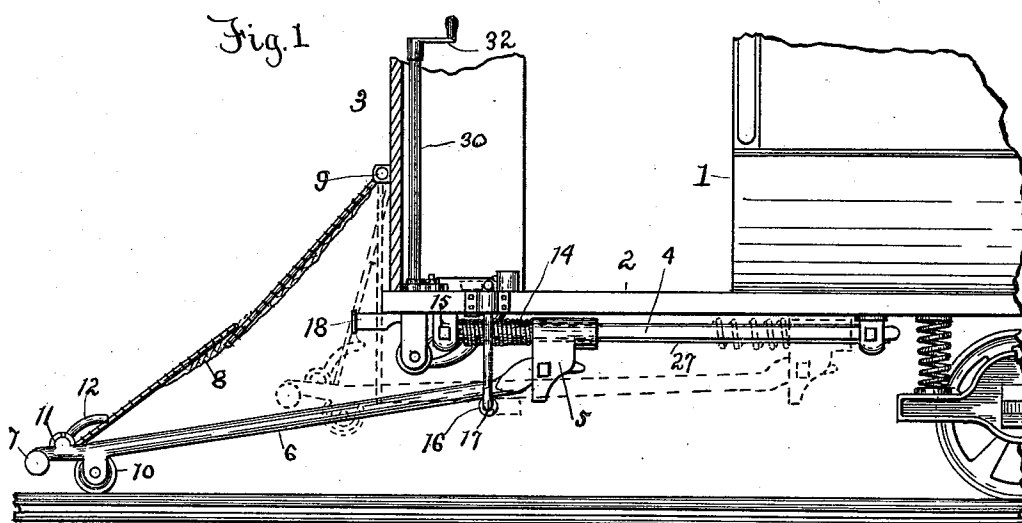
(No Model.)

2 Sheets—Sheet 1.

L. DULLIGAN.
LIFE SAVING NET FOR CARS.

No. 542,877.

Patented July 16, 1895.



Witnesses
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

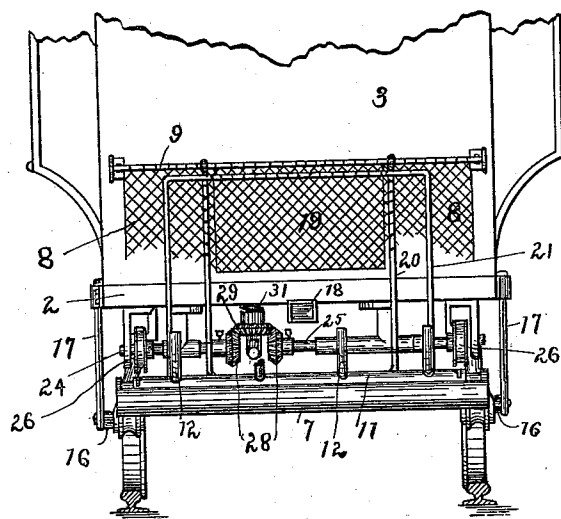


Fig. 7.

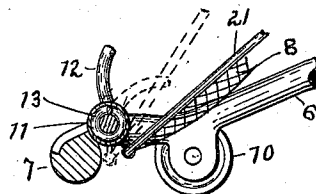


Fig. 5.

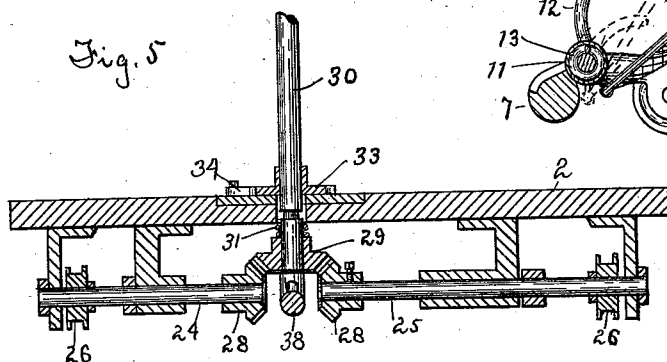
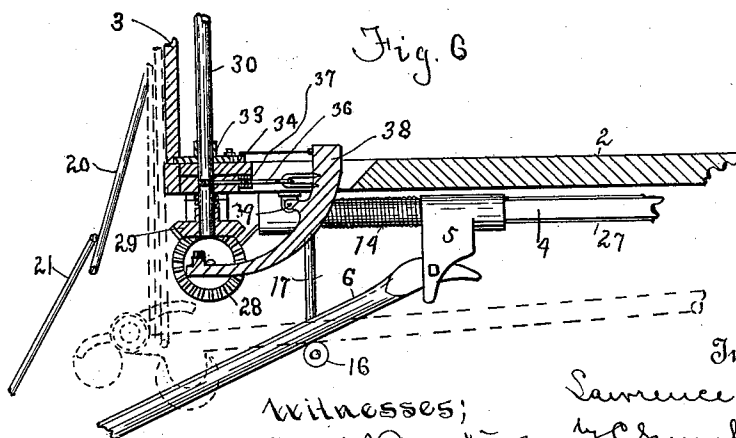


Fig. 6.



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UNITED STATES PATENT OFFICE.

LAWRENCE DULLIGAN, OF ROCHESTER, NEW YORK.

LIFE-SAVING NET FOR CARS.

SPECIFICATION forming part of Letters Patent No. 542,877, dated July 13, 1895.

Application filed September 16, 1893. Serial No. 485,712. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE DULLIGAN, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Life-Saving Nets for Cars; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My invention has for its objects to provide an improved attachment for street and other cars adapted to prevent loss of life by and injury to persons who may be struck by the car while in motion, which attachment is simple in construction and is preferably normally beneath the car and out of the way, permitting the coupling of cars, &c., but may be projected in proper position to engage and support a person or obstruction on the track when desirable; and to these and other ends it consists in certain improvements in construction and combinations of parts, all as will be hereinafter fully described, and the novel features pointed out in the claims at the end of this specification.

In the drawings, Figure 1 is a side elevation of a portion of a street-car, showing the application of my invention thereto. Fig. 2 is a plan view of the same with portions broken away; Fig. 3, a longitudinal sectional view on the line *xx* of Fig. 2 with the slides retracted. Fig. 4 is a front elevation of the car with the attachment retracted; Fig. 5, a sectional view on the line *yy* of Fig. 2; Fig. 6, a sectional view on the line *zz* of Fig. 2; Fig. 7 a sectional view of the front portion of the net-frame.

Similar reference-numerals indicate similar parts in the several figures.

The body of the car, indicated by 1 in the drawings, is of the usual or any preferred construction, having the front platform 2 and the dash or front 3. Beneath the platform 2 and arranged on opposite sides are two supporting bars or ways 4, upon which are arranged movable slides 5, each having downward extensions, between which are pivoted bars 6, extending forward and connected at their forward ends by a cross-bar 7, the two pivoted bars and the cross-bar constituting a frame

for supporting a net 8, attached to the front of the frame at one end and at the other to a rod 9 on the dash or front of the car, as shown. The forward ends of the bars 6 are provided with wheels 10, adapted, when desired, to rest upon the rails or the ground and extending, preferably, parallel with the cross-bar 7, and just back of it is a rock-shaft 11, having short curved arms 12, and preferably within this rock-shaft are one or more springs 13, connected to the side bars 6, (or to studs arranged within the ends of the rock-shaft,) which tend to rotate the said shaft and hold it normally with the arms 12 in the position shown in full lines in Figs. 1 and 2 and in dotted lines, Fig. 7. The net 8, which may be composed of any suitable flexible material, as netting or canvas, is connected to the under side of the rock-shaft 11, forward of the center, as in Fig. 7, and is normally held taut by the springs; but when a weight, as the body of a person, is in the net the shaft will be rocked and the arms 12 turned up, as in full lines in Fig. 7, thereby preventing its dropping out again.

As before stated, the slides 5 are movable longitudinally on the ways 4 and are, when the device is in use, held at the forward ends thereof by means of springs 14, attached to the slides and to brackets 15 beneath the car. By this means not only may the net-frame be projected, when desired, (its normal position being retracted, as in dotted lines, Fig. 1,) but when in use and projected the springs will serve to reduce the shock when a person drops into the net. When the net is retracted against the tension of the springs, the wheels 10 may either rest upon the track or the frame may be supported in the position in dotted lines, Fig. 1, by small rollers 16 on the arms of vertical rock-shafts 17, said rollers projecting at an angle to the shafts and adapted when turned inward to pass beneath the side bars of the net-frame, or they may be turned outward or parallel with the bars, so as not to engage them, as will be understood.

In order that the draw-head 18 of the car may be readily accessible for coupling or the attachment of horses, I provide a supplemental net or apron 19, the sides of which are attached by rings to the side rods of a supplemental frame 20, pivoted to the car front, the attachment being such that the rings can slide

on said rods, and the lower end of this apron is connected to a wire or other frame 21, connected to the lower end of the main net-frame, but preferably to the rock-shaft 11, from which it will be seen that when the net-frame is retracted the apron 19 will be lifted and the draw-head exposed, as in Figs. 1 and 4.

As a means for retracting the net-frame and releasing it when desired, I arrange at the front of the car two shafts 24 and 25, each supported in suitable bearings, and provided near the outer end, in line with the brackets 5, with a pulley 26, to which is connected one end of a strap or cord 27, the other end connected to a bracket 5 and passing around the rear end of the rod or way 4, as in Fig. 3. The inner proximate ends of the shafts 24 or 25 are provided with bevel-gears 28, adapted to mesh with a bevel-gear 29 secured to a vertical shaft 30, said shaft being arranged in vertical bearings on the car and capable of a limited vertical motion, the engagement of the gears being caused by a spring 31, arranged between gear 29 and the car-platform or a suitable projection. The shaft is further provided at the upper end with an operating-handle 32 and also with a ratchet-wheel 33, with which engages a pawl 34 on the floor, operated by a spring 35. In order to keep the gear 29 in engagement a movable locking-bolt 36 is employed, projected into a groove in the shaft by a spring 37, and said bolt and the pawl 34 are both connected to the upper end of a foot-lever 38, pivoted at 39, the lower end passing beneath the shaft and serving, when the upper end is moved downward, to raise said shaft and disengage the gears, the movement also serving to first withdraw the bolt 36 and the pawl 34, as in Fig. 6.

The operation of the device will now be apparent.

The net-frame may be kept projected, as in full lines, Fig. 1, when it will serve to receive and retain a person or object on the track, or it is preferably in the position shown in dotted lines in Fig. 1, and in order to put it in this position, the gears being engaged and retained in engagement, the operator turns the shaft 30, winding the cords 27 on the pulleys and drawing the frame backward against the tension of the springs, this operation uncovering the draw-head, as described, and the pawl 34 holds the parts. During this operation the bars 5 may be supported or not, as desired. When the motorman sees a person or an obstruction on the track he simply presses on the foot-lever 38, releasing the pawl and lifting the shaft, or, if desired, the gear alone, and allows the springs to project the net-frame, into which the person will be received and retained without injury.

It will be understood that the construction of the parts could be variously modified without departing from the spirit of my invention—as for instance, springs for projecting the net-

frame could be made to push instead of pulling on the brackets or slides.

It will be understood that while I have shown and described a net for receiving the person or object on the track an apron of canvas or any more or less flexible material would answer the same purpose.

I claim as my invention—

1. The combination with the vehicle, of the ways thereon, the slides movable on the ways, the net-frame pivoted to said slides, springs for moving the slides forward, and retaining devices for holding the net-frame retracted against the tension of the springs, substantially as described.

2. The combination with a vehicle, of the net-frame movable on ways, the net having the aperture, and the supplemental apron or net connected to the forward part of the frame and the vehicle, and adapted to cover the aperture in the main net when the frame is moved outward and uncover it when moved inward: substantially as described.

3. The combination with a vehicle, of the net-frame movable on ways, the net having the aperture, the supplemental apron or net connected to the vehicle, and adapted to cover the aperture in the main net, and the rods connected to the end of the apron and to the front of the main frame, whereby the aperture will be covered when the frame is projected and uncovered when retracted: substantially as described.

4. The combination with a vehicle the frame movable on ways, the net connected thereto, and to the vehicle having the aperture and the frame around it, of the supplemental apron or net, the frame connected to it and to the forward part of the main net frame, whereby when the net is projected the apron will cover the aperture, but when retracted it will be uncovered: substantially as described.

5. The combination with the vehicle, the net frame, having the rock shaft at the front provided with the rearwardly-extending retaining arms, of the net attached at one end to the rock shaft: whereby the weight of a body in the net will rotate the rock shaft and elevate the arms: substantially as described.

6. The combination with the vehicle, the net frame having the rock shaft at the front provided with the retaining arms, and the spring for rotating it and holding the arms down, of the net attached at one end to the rock shaft, whereby the weight of a body in the net will rotate the rock shaft and elevate the arms: substantially as described.

7. The combination with a vehicle, a frame movable thereon, a net connected to said frame and springs for projecting the frame, of a shaft adapted to be rotated by the operator, and a retaining device therefor, and separable connections between said shaft and the net frame, whereby the net-frame may be retracted by the operation of the shaft and then

released allowing the springs to project it, substantially as described.

8. The combination with a vehicle, guides thereon, a frame sliding on said guides, and springs for projecting said frame, of the rotatable shafts, cords connecting them with the frame, and retaining devices for holding the frame retracted against the tension of the springs, substantially as described.

9. The combination with a vehicle, a frame movable thereon, springs for projecting it and a net connected to said frame, of the shafts having the gears and the pulleys thereon, the cords connecting the pulleys and net frame, the rotatable shaft having the gear, retaining devices therefor, and means for disconnecting the gear on said shaft from those on the pulley shafts: substantially as described.

10. The combination with a vehicle, a frame movable thereon, springs for projecting it and a net connected to the frame, of a shaft having a pulley and a gear thereon, a cord connecting the pulley and net frame, a shaft having a gear meshing with the first mentioned one and a lever for disconnecting the gears under the control of the operator: substantially as described.

11. The combination with a vehicle, a frame movable thereon, springs for projecting it and a net connected to the frame, of a shaft having a pulley and a gear thereon, a cord connecting the pulley and net frame, a shaft having a gear meshing with the first mentioned one, a bolt holding the gears in engagement, and a lever operating to withdraw the bolt and disconnect the gears: substantially as described.

12. The combination with a vehicle, a frame movable thereon, springs for projecting it and a net connected to the frame, of a rotary shaft and connections between it and the frame for retracting the latter, a second shaft and retaining devices therefor, and a detachable clutch between said two shafts: substantially as described.

13. The combination with a vehicle, of the frame movable thereon, having the inclined pivoted side bars and the net connected to said frame, of the projections engaging the side bars of the frame, and adapted to lift their forward ends as the frame is retracted: substantially as described.

14. The combination with a vehicle, of the frame movable thereon, having the inclined pivoted side bars, the rollers at the front and the net connected to the frame, of the rock shafts having the projecting arms adapted to be turned in line with or away from the side bars of the frame, whereby the bars may be lifted as the frame is retracted, when desired: substantially as described.

15. The combination with a vehicle, of the pivoted frame movable on ways, springs for projecting said frame, and retaining devices for holding the frame retracted against the tension of the springs, substantially as described.

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Witnesses:

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