

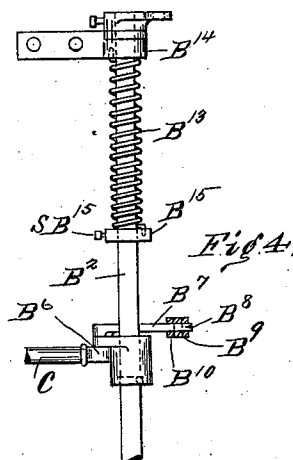
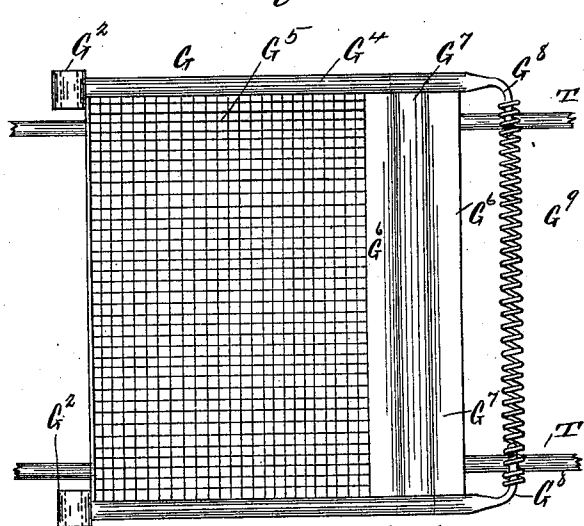
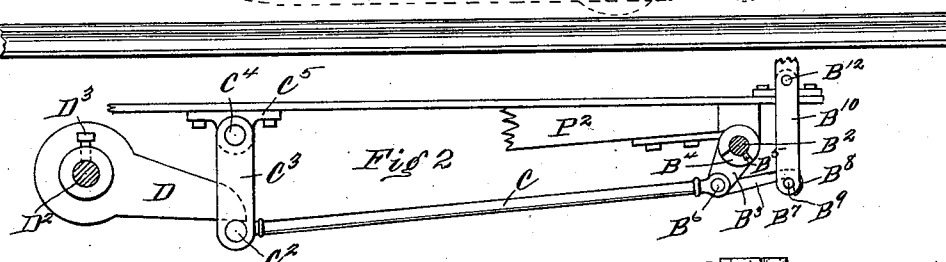
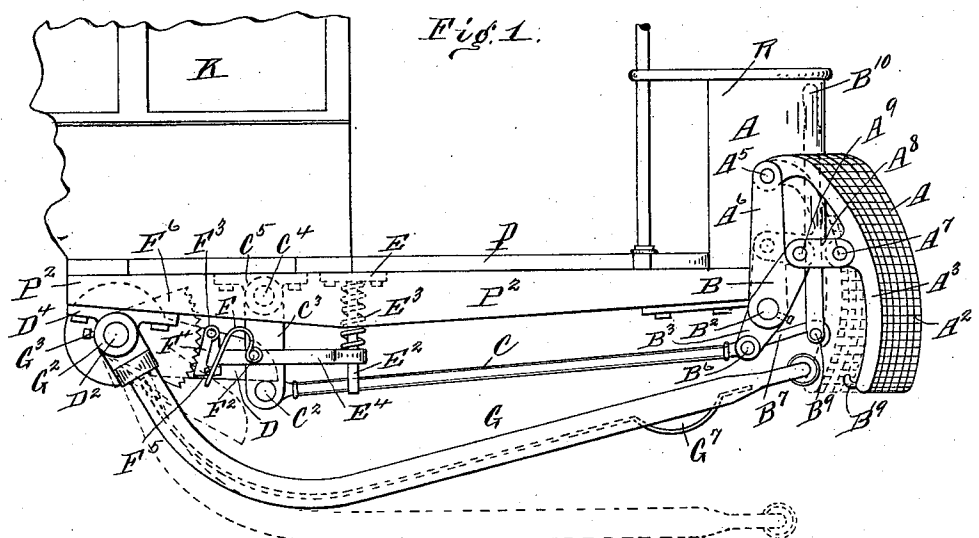
(No Model.)

3 Sheets—Sheet 1.

L. J. HUNTER.
FENDER FOR STREET CARS.

No. 574,541.

Patented Jan. 5, 1897.



Witnesses

J. W. Diarmid
H. Smith

Inventor

Lytle J. Hunter
per *Wm. Hubbell Fisher*
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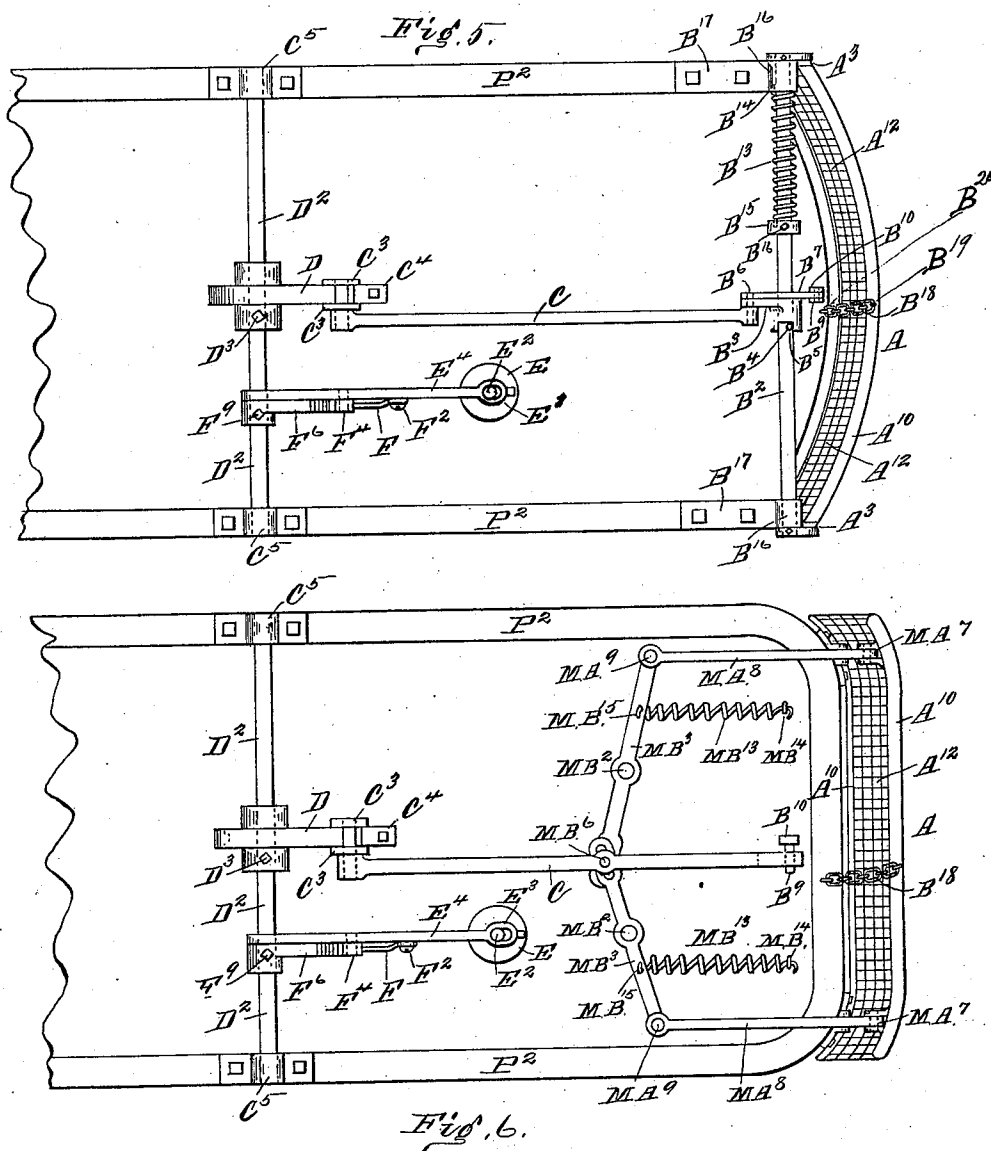
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3 Sheets—Sheet 2.

L. J. HUNTER.
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Witnesses
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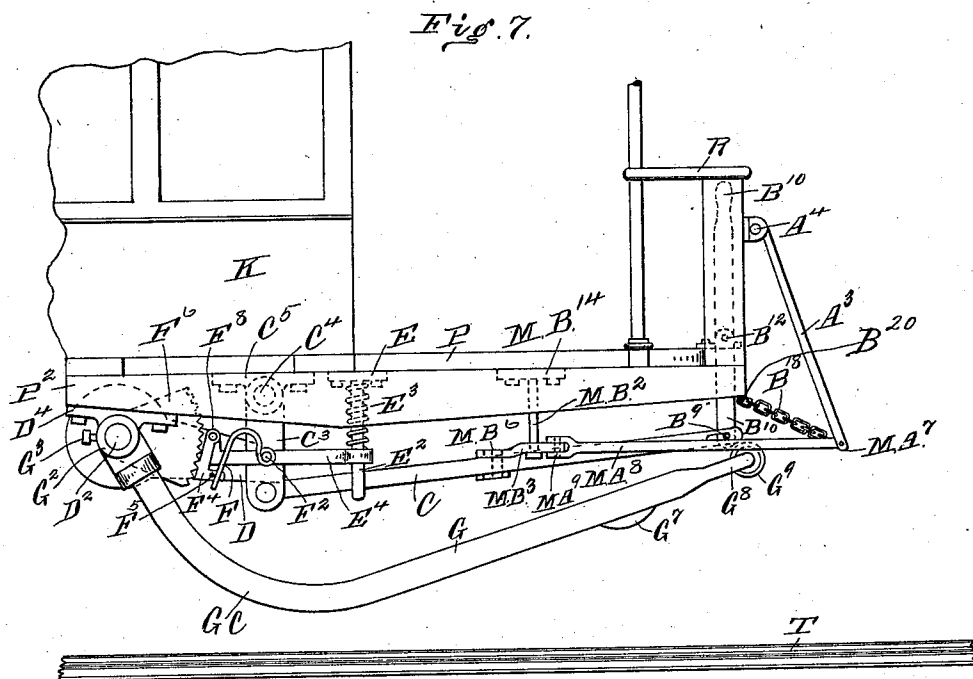
(No Model.)

3 Sheets—Sheet 3.

L. J. HUNTER.
FENDER FOR STREET CARS.

No. 574,541.

Patented Jan. 5, 1897.



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UNITED STATES PATENT OFFICE.

LYTLE J. HUNTER, OF COVINGTON, KENTUCKY, ASSIGNOR OF ONE-FORTIETH
TO O. C. PHILLIPS, OF COLUMBUS, OHIO.

FENDER FOR STREET-CARS.

SPECIFICATION forming part of Letters Patent No. 574,541, dated January 5, 1897.

Application filed March 18, 1895. Serial No. 542,231. (No model.)

To all whom it may concern:

Be it known that I, LYTLE J. HUNTER, a citizen of the United States, and a resident of the city of Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Fenders for Street-Cars, of which the following is a specification.

The several features of my invention and the various advantages resulting from their use, conjointly or otherwise, will be apparent from the following description and claims.

In the accompanying drawings, making a part of this application, Figure 1 is a side elevation of the end portion of a car, showing the dash, platform, a portion of the cab, and mechanism embodying my invention applied thereto. This view also shows in dotted lines a certain change in the position of the fender and indicates the track below. Fig. 2 is a side elevation of the principal portion of the mechanism for enabling the bumper to actuate the fender. Fig. 3 is a plan view of the fender. Fig. 4 is a plan view of the mechanism for retracting or moving out the bumper and of certain other devices hereinafter fully specified. Fig. 5 is a view of the under side of the mechanism, illustrating my invention, with the exception of the fender, which is removed. Fig. 6 is a view of the underside of the mechanism shown in Fig. 5, with the exception that a modification of a portion of the means for enabling the bumper to actuate the fender is here shown. Fig. 7 is a side elevation of the end portion of a car and of the mechanism illustrating my invention as modified in Fig. 6 and of the rail below.

For a further description of my invention I submit the following:

At the end of the car and preferably in front thereof I provide a bumper A. This bumper or trigger A is arranged, in combination with mechanism, so that when the bumper is operated by striking an obstacle it, the bumper, will withdraw the devices whereby the fender is upheld and allow the fender to fall, substantially as hereinafter described. In the preferred form of such mechanism (of my invention) the bumper is connected at A¹ to a pivot

A⁵, fixed to a stud A⁶, connected to a suitable portion of the car, as the supporting-beams P² of the platform P thereof. Again, below this point the bumper is pivotally connected at A⁷ to one end of a link A⁸. The other end of this link is pivotally connected at A⁹ to the free end of the lever B, whose other end is pivoted on shaft B². The shaft B² is supported at each end in a bearing B¹⁶ B¹⁷, connected to the car, as beams P P. A part of the boss of this lever is cut away, forming a recess B¹, and in this recess plays a stud B⁵. Hence oscillation of the lever B beyond a certain point operates to turn the shaft B². This latter shaft carries a lever B³, fixed thereto, and the free end of this lever is pivotally connected at B⁶ to one end of a connecting or draw rod C, whose other end is pivotally attached by pivot C² to the lower or free end of an oscillating hanger C³. The upper end of this hanger is pivotally connected by pivot C⁴ to the bearing C⁵, attached to the car, preferably to the beams P P.

Upon the supporting-rod or bottom C² of the hanger rests (when the fender C is elevated) the forward end of the arm or hook D, the rear end of the latter being fixed to and on the shaft D² by suitable means, as the set-bolt D³. This shaft D² is supported in bearings C⁵, pivotally set in bearings, as C⁵, connected to the car—viz., to the beams P P. To this shaft D² is fixed the fender G, preferably by means of the set-screw G³, passing through those bosses G² of the fender which surround said shaft. Thus the fender G and the arm D can be mutually set, so as to regulate the dip (elevation) of the fender above the track and the location of the movement of the fender in relation to the track and to the car. The fender G curves down at GC and extends forward in the vicinity of the front of the car. The details of its construction (also of my invention) are as follows:

The side edges G⁴ of the fender consist of strong rods or bars. Between these for the greater part of the length of these arms is the scoop G⁵ of the fender, preferably made, as shown, of wire-netting.

In front of the netting is a broad sheet G⁶,

of metal or wood, which is curved downward at G⁷ below the level of the bars G⁴. The fender is preferably wider than the track, and the rails come under the sheet, and when the fender falls the curved portion G⁷ rests upon the track and supports the forward end of the fender and aids the latter in sliding easily along and prevents its forward end from catching on the track or on some small stone or bolt projecting up from the track-bed.

In order to make the impact of the fender against the body which it meets and is to shovel (so to speak) onto itself lighter, the front end of the fender at a short distance in front of the edge of plate G⁶ is provided with an elastic piece, preferably consisting of a spring G⁸, as shown, strained across from the front end of one bar G⁴ to the front end of the other bar G⁴. For the better accomplishing of this purpose the ends of the bars G⁴ are bent horizontally toward the center of the road-bed, and these ends G⁸, reduced, enter the adjacent end of the hollow spiral spring G⁹ and are connected thereto.

The operation of the devices thus described is simple and practicable, to wit: the fender is elevated and the mechanism in the position shown in Fig. 1. The car proceeds and on its way runs into a man, the bumper or trigger striking him. This impact drives back the bumper, and through the agency of the lever B rotates shaft B², drawing rod C forward and withdrawing the hanger C³ from under the arm D. Unsupported, the latter drops and allows the fender to drop till it reaches the rails. In this position it receives the prostrate form of the man or other human being, the latter rolling onto the upper side of the scoop G⁵. Thus the person who has been knocked down by the car or who has slipped and fallen in front of the car is saved from the violent death which ordinarily results when the wheels or the low portions of the center of the car run onto him.

The fender picks up any object that is small enough to come under the car-platform and its accessories, and thereby prevents the wheels from rolling onto the said object. In this way the car will be prevented from being derailed. Consequently injury to the car and especially to its inmates will be avoided.

It is very desirable that the fender when allowed to descend shall descend very rapidly to enable it to be on the track in time to catch the person who has come into contact with the bumper A. To accomplish this, I employ suitable mechanism. One description of the same (of my invention) is as follows: A lever E⁴ is made fast at one end to the shaft D² and at its front end encircles a guide-rod E², the latter at its upper end is fixed by a foot E to the car, as beams P P. A spiral spring E³, compressed between the arm E⁴ and the foot E, embraces the guide-rod E². This spring E³ thus continually and forcefully tends to depress the arm E⁴ and the fender G, and when

the arm D is unsupported will very quickly force the fender down onto the track, the force of the spring being added to the force of gravity.

In order that the fender may not rebound from the track into the air, and thus be out of its proper place to receive the person in front of the car on the track as the rapidly-moving car comes over that person, I provide a suitable detent mechanism, of which the following (of my invention) is a preferred description:

To the shaft D² is fixed a ratchet-wheel F⁶, usually by means of a set-screw F⁹. On the arm E⁴, I pivot at F³ a pawl F⁴ for engaging said ratchet-wheel, and I provide a spring F⁵, pivoted at F² to said arm E⁴. The free end of this spring elastically presses against the free end of said pawl, or, more accurately, against a pin F⁵ of the pawl, and pushes the pawl continually against the ratchet-wheel. Owing to the direction in which the pawl engages the ratchet-wheel as the fender falls the pawl slipping over the teeth of the ratchet-wheel offers no resistance to the descent of the fender, but the pawl engages the adjacent tooth of the wheel, so as to prevent the fender rising after it has reached the track. The pawl and ratchet will hold the fender there until it being desired to raise the fender the pawl is moved and held back by human agency, *e. g.*, the driver or conductor of the car, until the fender has been lifted and the arm D brought onto the hanger C³. This latter operation is readily accomplished automatically, because the upper portion of the free end of the arm D is beveled, as shown, like the latch of a door-lock. Elevation of the fender raises this arm D, and the latter pushes forward the lower end of the hanger C³ and rises above the pivot or bottom C² thereof. The hanger then having an opportunity to return to its vertical position will do so and pass under the arm and support it and the fender in this first-named elevated position.

Preferred means for automatically advancing the bumper or trigger A and drawing forward the hanger C³ after having been pushed back by collision of the bumper A with the human being, &c., aforementioned are as follows: On the shaft B² is a spiral spring B¹³, at one end connected to the boss or journal B¹⁴, fixed to the car, and at the other end to the shaft, preferably through the medium of the ring B¹⁵ on shaft B² and fixed to the latter by a set-screw SB¹⁵. This setting device allows of the spring being elastically strained more or less as desired. The shaft B² is journaled at each end in suitable journals, such as the boss B¹⁴. The tendency of the spring is to rotate the shaft B² from the left over to the right, (see Fig. 4.) and thus to move the bumper A forward and the hanger C³ backward. The movement of the bumper forward is limited by suitable means,

as a chain B¹⁸, of proper length, hooked to the bumper at a suitable point at B¹⁹ and connected to the car, as at B²⁰.

It is desirable that means for enabling the driver of the car to lower the fender be provided. The reason for this is quite obvious. When the car is running fast and the conductor sees an object on the track, he can drop the fender and thus be sure that the car-wheels shall not pass over it, even though he may not be able to bring his car to a full stop before reaching the object. To this end I employ the following means: To the pivotal connection B⁶ one end of an arm B⁷ is attached. The other end of this arm has a hook B⁸, which hooks over the lower end of the pin B⁹ of the lever B¹⁰, pivotally fulcrumed at B¹² to the car or a support thereof. The upper end of the lever is within easy reach of the driver. (See Fig. 1.) When the driver desires to drop the fender, he pulls back on the upper end of the lever B¹⁰, and thus forces forward the lower end thereof, thereby drawing the hooked arm or link B⁷ forward and with it the lower end of lever B³. The advancement of the lower end of this lever drops the fender in the manner already described.

The preferred description of the bumper A is as follows: Outer rigid side bars A³ and top and bottom bars A¹⁰, firmly united to their said respective side bars, constitute the frame. Within this frame and connected thereto I locate a wire-netting A¹² of considerable firmness, yet somewhat elastic, so that when the bumper strikes an object it will not bruise or otherwise materially injure it.

In the drawings, K indicates the cab of the car, and R indicates the dash or front railing at the end of the car in front of the driver, and T indicates the track.

I will now describe a modification of certain features of my invention for enabling the bumper A to withdraw the hanger C³ from the arm D. This modification is illustrated in Figs. 6 and 7 and consists in substituting for the vertical lever B³ the lever or levers MB³, each fulcrumed on pivot MB², fixed to the frame at MB¹⁴. One end of each of these levers at MA⁹ is pivotally connected to one end of the connecting rod or link MA⁸. The other end of the latter rod is pivotally connected at MA⁷ to the lower stiff margin A¹⁰ of the bumper A. The upper end of the bumper is pivoted, substantially as heretofore described, to the car by a pivotal connection A⁴. To stiffen this bumper, the side bars A³ are moved inwardly a very little and still constitute braces of the bumper and extend from the pivot A⁴ down to the pivotal connection MA⁷. The inner end of each lever MB³ is pivotally connected with the draw-rod C (heretofore described) by a pivot, as MB⁶, and at such connection the ends of these levers are slotted to allow them to work, as they there do, in the arc of a circle. The operation of this modification does not differ substantially from that of the mechanism of

which this is a modification, to wit: When the bumper A is pushed back by collision, as aforementioned, the rods MA⁸ are moved back, operating the levers and drawing forward rod C, with similar result as aforementioned—viz., causing the fender to drop.

Means for automatically retracting the fender and levers MB³ and rod C to first position consist of the spring MB¹³, stretched between fixed projection MB¹⁴ of the car and point MB¹⁵ on one of the levers MB³.

Means for enabling the driver to drop the fender consist of the lever B¹⁰, fulcrumed at B¹², as aforementioned, the lower end of the lever connecting directly with the forward end of the rod C by a projection B⁹, working in a slot of rod C.

The shape of the bumper may be varied. Thus two conformations of the bumper are illustrated in the drawings, one in Figs. 1 and 5 and another in Figs. 6 and 7.

My movable bumper, yielding as it does upon the impingement of a body which it meets, is obviously valuable for use by itself. It is my purpose, therefore, to employ it at times alone, *i. e.*, without using a dropable fender with it. On other occasions I purpose to use it conjointly with the dropable fender.

My invention is simple in operation and effective. That it is useful needs no comment, as any device that contributes to the saving of human life and to the prevention of injury to human beings and other animals and to the car is eminently useful.

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

1. In combination with a car, the movable bumper or trigger guard, and the dropable fender, and mechanism between the bumper and the fender for enabling the moving of the bumper in a given direction to drop the fender, and the support to wit hook D, fixed to shaft D² of the fender, and mechanism for automatically retracting the bumper and for returning the swinging support C² under the hook D, as soon as pressure upon the bumper A is removed, substantially as and for the purposes specified.

2. The combination of the car, a dropable fender, and the oscillatory pivoted support C², swung from a pivot C⁴ of the platform, and the arm D fixed to the fender-shaft D², and the movable bumper and mechanism for moving the bar C connected ultimately with the bumper, substantially as and for the purposes specified.

3. The combination of the car, and the slidable bar C and a pivoted oscillating support for the arm D, and shaft D² and fender G fixed thereto, and mechanism substantially as set forth for moving the bar C and dropping the fender, and the bumper A, and mechanism substantially as described for enabling the latter when moved to actuate the bar C, substantially as and for the purposes specified.

4. The combination of the car, and a drop-

able fender, having axial shaft D², and lever-arm D thereon, and a pivoted oscillating support C¹, C³, C², and a reciprocatory bar C and connected to the latter, and mechanism substantially as set forth for moving the said bar C and dropping the fender, and for enabling the bumper when moved to actuate the bar C, and the driver's lever, and mechanism substantially as set forth for enabling this lever to actuate the bar C, substantially as and for the purposes specified.

5. In a car-fender mechanism, the combination of means for withdrawing the support for the fender, the fender G, shaft D² thereof, arm E⁴ of said shaft, spring E³ to depress said arm, ratchet-wheel F⁶ on said shaft, spring F¹, and pawl F⁴, substantially as and for the purposes specified.

6. In a car-fender mechanism, the combination of means for withdrawing the support for the fender, the fender G, shaft D² thereof, arm E⁴ of said shaft, spring E³ to depress said arm, ratchet-wheel F⁶ on said shaft, spring F¹ fixed to arm E⁴, and pawl F⁴ also fixed thereto and engaging the ratchet-wheel, substantially as and for the purposes specified.

7. The fender having in its front portion a broad curved depressed sheet extending over the rails and across the road-bed between the rails, substantially as and for the purposes specified.

8. The fender having at front an elastic coiled wire, and behind the latter a curved depressed sheet extending across the track and over the rails, substantially as and for the purposes specified.

9. The fender, having at and across its front an elastic coiled wire, and behind the latter a curved depressed portion extending across the track and over the rails, and a netting fabric, at rear of the latter, substantially as and for the purposes specified.

10. In a fender, the combination of the rigid side arms or bars G⁴, and the yielding portion G⁵, connected to the bars, and the downwardly-curved part G⁷ held between and by the bars, and the coiled spring G⁹, at each end embracing the end of the adjacent side bars, this forward end of each side bar being at right angles to the rest of the bar, substantially as and for the purposes specified.

11. The bumper A pivoted at A⁴, and pivotally connected by links A⁸ to the lever B, shaft B², lever B and lever B³ fixed thereto, and rod C, carrying mechanism for directly supporting the fender, substantially as and for the purposes specified.

12. The bumper A pivoted at A⁴, and pivotally connected by link A⁸ to the lever B, shaft B², lever B and lever B³ fixed thereto, and rod C, hanger C³ connected to said rod, shaft D² and arm D supported thereon, and fender fixed to said shaft, substantially as and for the purposes specified.

13. The bumper A pivoted at A⁴, and pivotally connected by link A⁸ to the lever B, shaft B², lever B and lever B³ fixed thereto,

and rod C, hanger C³ connected to said rod, shaft D² and arm D supported thereon, and fender fixed to said shaft, and ratchet F⁶, and pawl for engaging the latter, substantially as and for the purposes specified.

14. The bumper A pivoted at A⁴, and pivotally connected by link A⁸ to the lever B, shaft B², lever B and lever B³ fixed thereto, and rod C, hanger C³ connected to said rod, shaft D² and arm D supported thereon and fender fixed to said shaft, and arm E⁴ of shaft D², and spring E³ for depressing said arm, substantially as and for the purposes specified.

15. The bumper A, pivoted at A⁴, and pivotally connected by link A⁸ to the lever B, shaft B², lever B and lever B³ fixed thereto, and rod C, hanger C³ connected to said rod, shaft D² and arm D supported thereon and fender fixed to said shaft, and arm E⁴ of shaft D², and spring E³ for depressing said arm, and ratchet F⁶ on shaft D², and pawl F⁴ and spring F¹, both supported by arm E⁴, substantially as and for the purposes specified.

16. In combination with the fender and means for supporting the same, shaft B², and means for enabling the transverse reciprocatory rotatable shaft to withdraw the support of the fender including arm B³ and pull-rod C connected to the free end of said arm, the spring B¹³ embracing the shaft and at one end connected to a stationary portion of the mechanism and at the other to the shaft B², substantially as and for the purposes specified.

17. In combination with the fender and means for supporting the same, shaft B², and means for enabling the transverse reciprocatory rotatable shaft to withdraw the support of the fender including arm B³ and pull-rod C connected to the free end of said arm, the spring B¹³ embracing the shaft and at one end connected to a stationary portion of the mechanism and at the other to the shaft B², and the bumper A and interconnecting mechanism, substantially as and for the purposes specified.

18. In combination with the fender and means for supporting the same, shaft B², and means for enabling the transverse reciprocatory rotatable shaft to withdraw the support of the fender, the spring B¹³ embracing the shaft and at one end connected to a stationary portion of the mechanism and at the other to the shaft B², and the bumper A, pivotally fulcrumed, and lever B mounted on said shaft B², and a connection between the bumper and said lever, substantially as and for the purposes specified.

19. In combination with the fender and means for supporting the same, shaft B², and means for enabling the shaft to withdraw the support of the fender, the spring B¹³ embracing the shaft and at one end connected to a stationary portion of the mechanism and at the other to the shaft B², and vertical lever B¹⁰, pivotally fulcrumed, and hook-piece engaging same and connected to said means for enabling the shaft B² to withdraw the sup-

port of the fender, substantially as and for the purposes specified.

20. In mechanism for dropping the car-fender, the combination of the lever B^{10} , pivotally fulcrumed, shaft B^2 , levers B and B^3 thereof, hook-piece B^7 , B^8 , connected to the latter lever, substantially as and for the purposes specified.

21. In mechanism for dropping the car-fender, the combination of the lever B^{10} , pivotally fulcrumed, shaft B^2 , levers B and B^3 thereof, hook-piece B^7 , B^8 , connected to the latter lever, and bumper A connected to lever B, all substantially as and for the purposes specified.

22. In mechanism for dropping the car-fender, the combination of the lever B^{10} , pivotally fulcrumed, shaft B^2 , levers B and B^3 thereof, hook-piece B^7 , B^8 , connected to the latter lever, and bumper A connected to lever B, and spring for retracting the bumper and hook-piece, and the mechanism for supporting the fender, substantially as and for the purposes specified.

23. The combination of bumper A, and lever B^{10} , lever B for bumper, shaft B^2 , lever B^3 fixed thereto, hanger C^3 , rod C connected to lever B^3 and hanger C^3 , shaft D^2 , arm D, and fender thereon, arm D for connection with hanger, ratchet, and pawl, arm E^4 of shaft D^2 and spring for depressing same, all substantially as and for the purposes specified.

24. The combination of a bumper pivotally hung and a shaft B^2 and a lever connected with the said shaft and operated by the bumper, and the dropable fender, and mechanism for enabling the operation of said lever to drop the said fender, and a spiral spring as B^{13} for retracting the bumper and adding to the resiliency of its movement, and fixed at one end to the car, and a ring and a set-screw, whereby the tension of this spring can be adjusted, substantially as and for the purposes specified.

LYTLE J. HUNTER.

Attest:

C. J. McDIARMID,
K. SMITH.