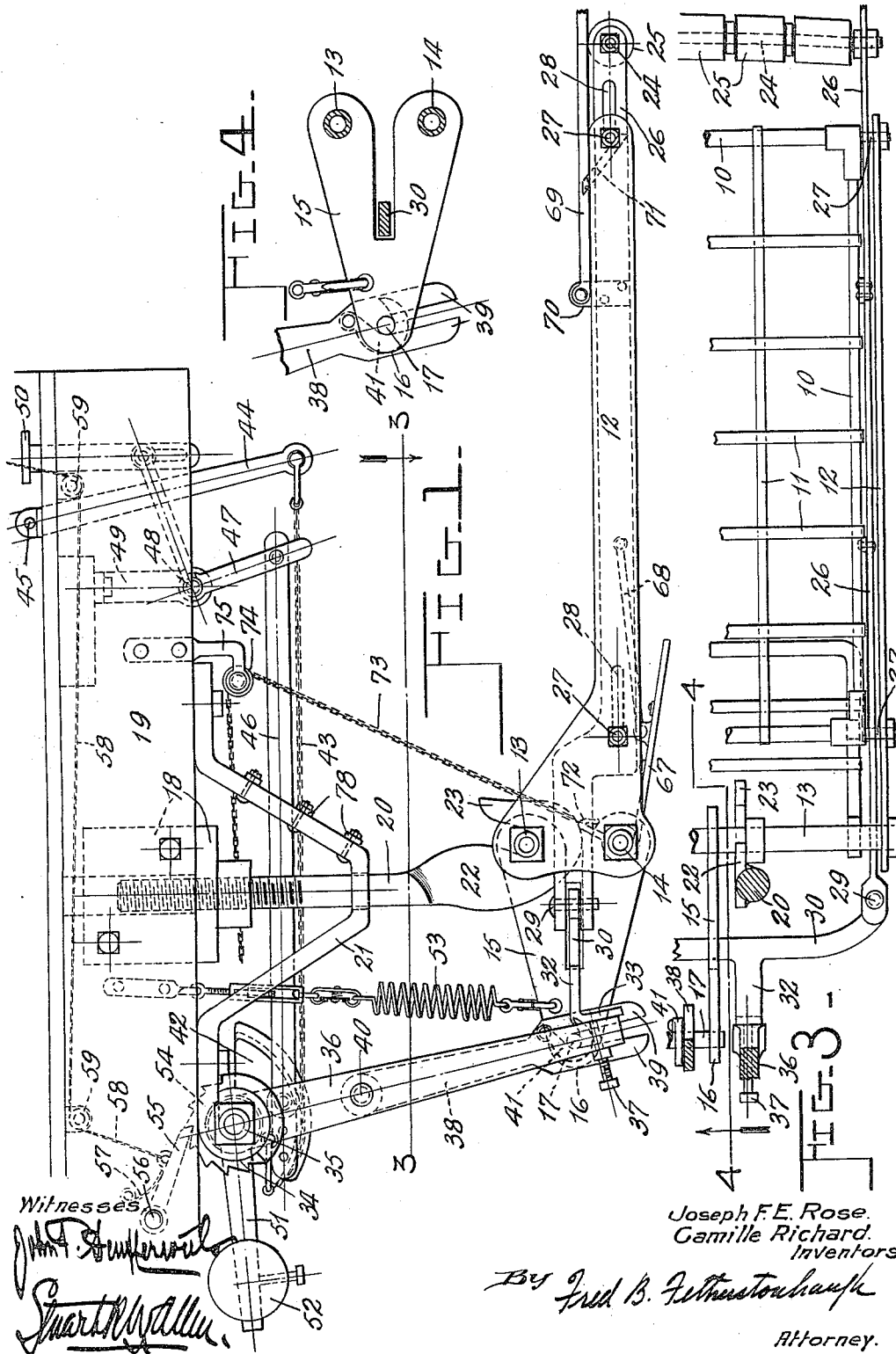


CAR FENDER.

Patented Oct. 22, 1912.

1,042,277.

4 SHEETS—SHEET 1.



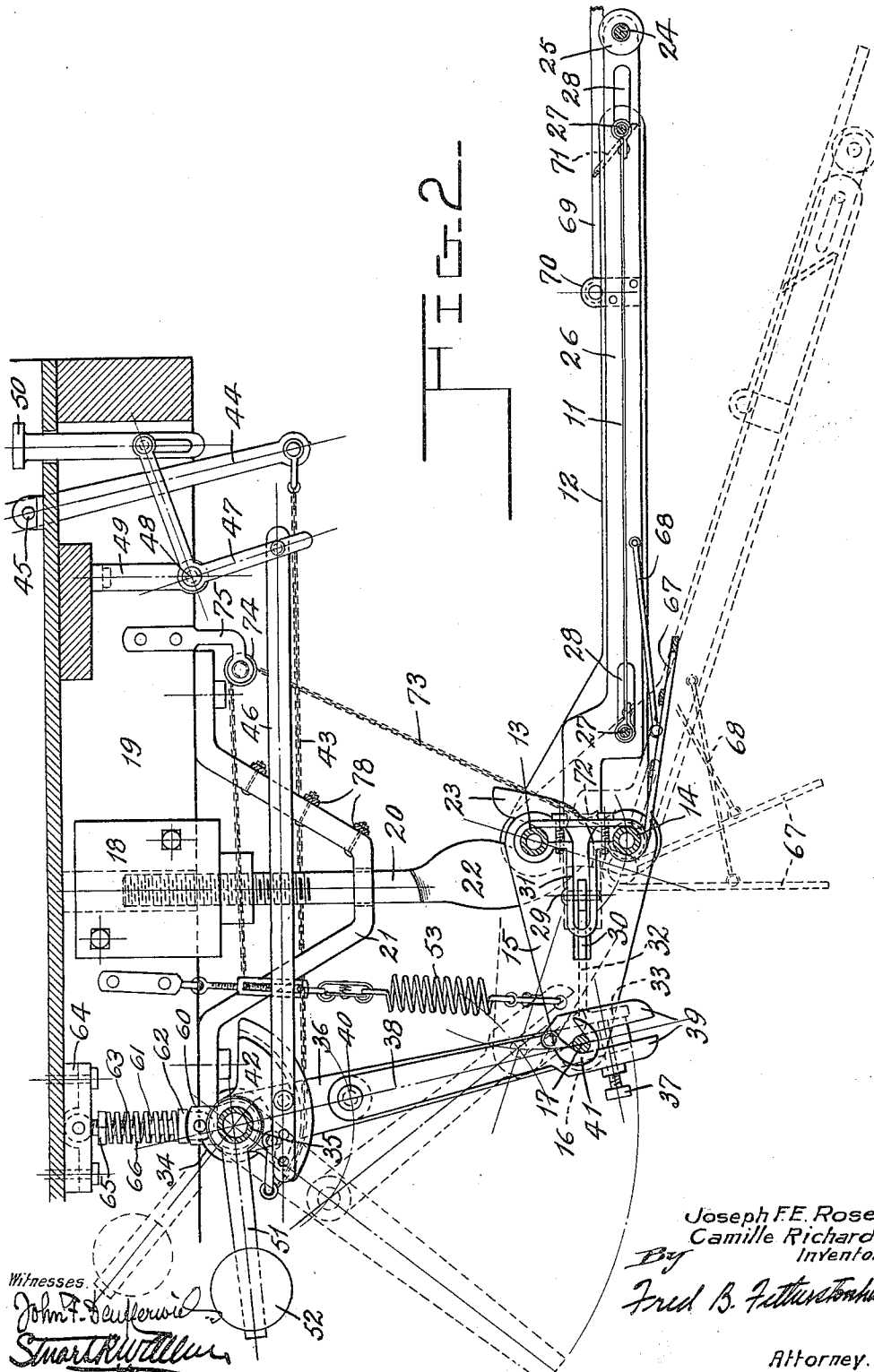
J. F. E. ROSE & C. RICHARD.
CAR FENDER.

APPLICATION FILED NOV. 28, 1908.

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4 SHEETS—SHEET 2.

1,042,277.



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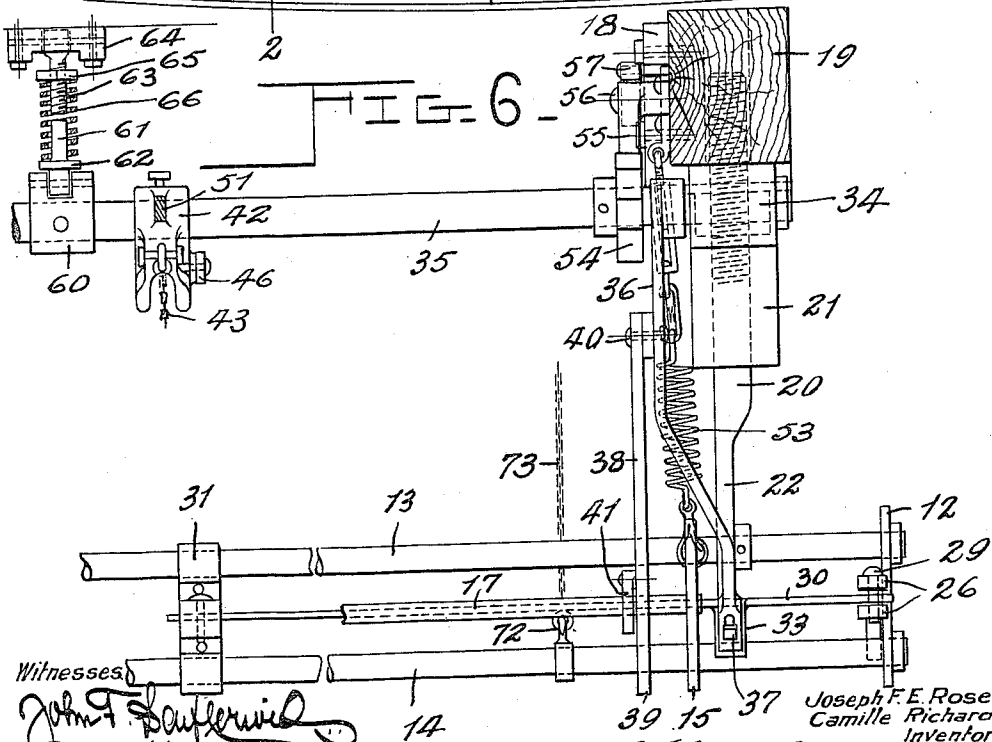
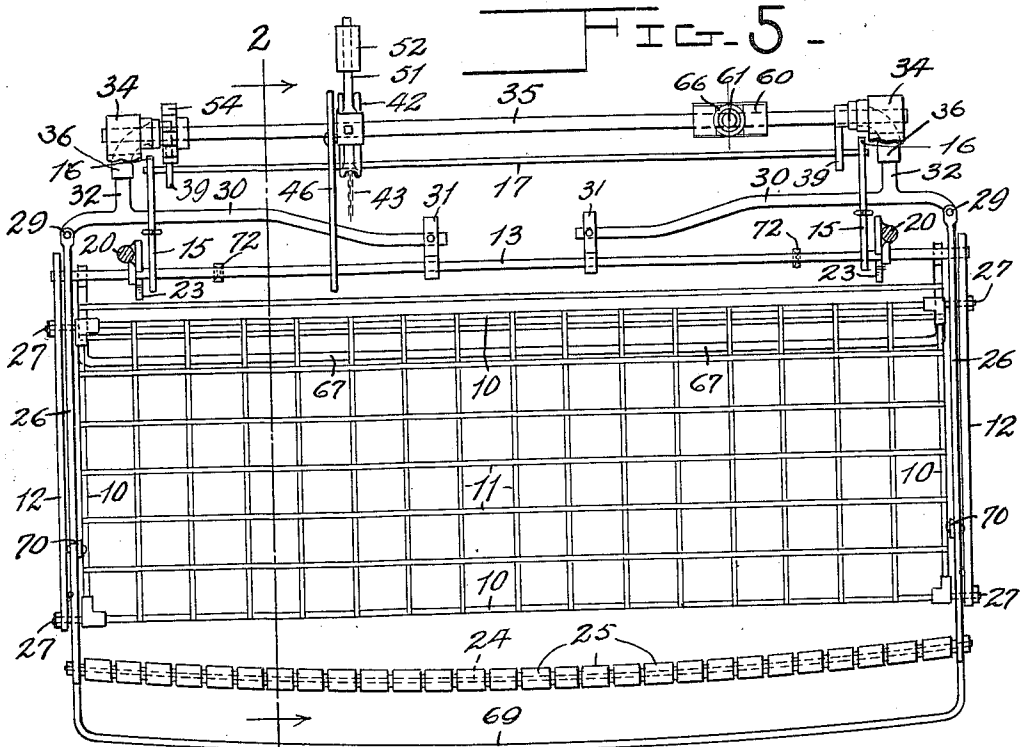
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4 SHEETS-SHEET 3.

1,042,277.



Witnesses

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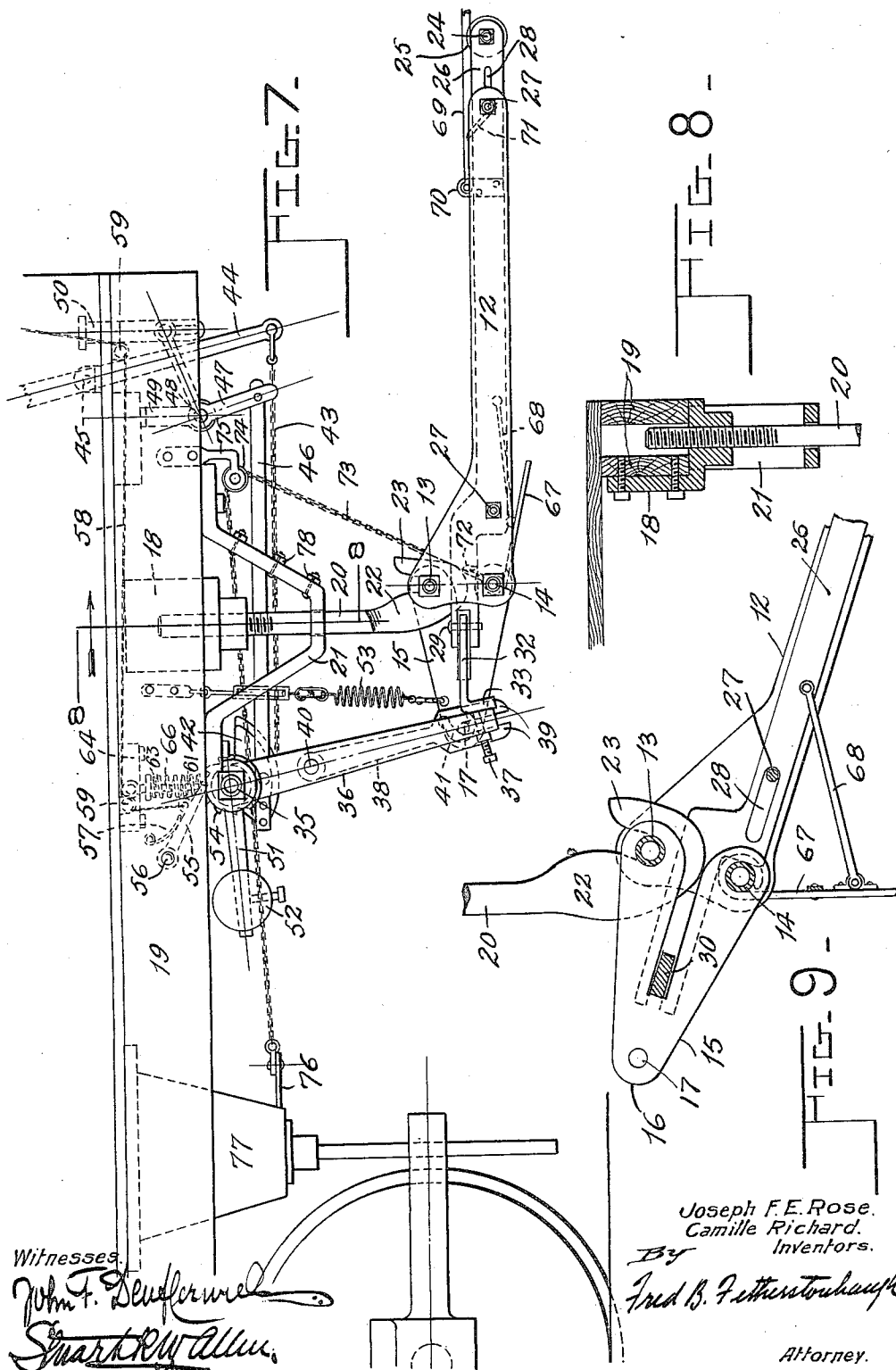
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4 SHEETS-SHEET 4.

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UNITED STATES PATENT OFFICE.

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CAR-FENDER.

1,042,277.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed November 28, 1908. Serial No. 464,910.

To all whom it may concern:

Be it known that we, JOSEPH F. E. ROSE and CAMILLE RICHARD, both of the city of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Car-Fenders, of which the following is a full, clear, and exact description.

Our invention relates to improvements in fenders for street cars, and the main object is to provide a fender which will drop instantly on striking any obstruction on the track, and which cannot be raised except by means of the mechanism provided therefor.

A further object is to provide a fender which is located partially under the car and is thereby protected from injury by collision with vehicles.

Another object is to provide means for catching any object which might through mischance pass under the fender.

A still further object is to provide a strong, simple, inexpensive fender which may be instantly detached from a car.

Many of the fenders at present in use have one or more great disadvantages. Some are expensive, others are uncertain in operation, while almost all complicate instead of simplifying the motorman's duties. It is our purpose to disclose herein a fender which will have none of these disadvantages and which will embody a number of advantages believed to be as yet unknown in fender construction.

The device consists briefly of an apron having a pair of lateral superposed bars at the rear thereof, the uppermost of which bars engages a pair of hangers depending from the car sills and forms the pivotal center of the fender. The lateral bars are connected by rearwardly extending plates through which a locking bar extends. The main shaft of the device is mounted on the car sills above the locking bar and carries a pair of locking arms to which are pivoted bifurcated connecting rods engaging the locking bar. When the fender is raised, the centers of the locking bar, main shaft and connecting rod pivots, are in line and the connecting rods and locking arms sustain the weight of the fender. When a trigger bar, extending across the front of the fender, collides with any object, it moves the locking arms rearwardly and throws the centers out of line, where-

upon the fender drops by gravity. Means are provided whereby the motorman may raise or lower the fender at will. A pivoted screen is provided under the fender and actuated by the fender for the purpose of catching any object which might pass under the fender. A positive locking device is provided to prevent the fender, when once dropped, from riding over an object on the track and rolling same under the car wheels.

In the drawings which illustrate our invention and in which similar reference numerals designate corresponding parts throughout all the figures:—Figure 1 is a side elevation of the device. Fig. 2 is a vertical cross sectional view on the line 2—2 of Fig. 5. Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 1. Fig. 4 is a detail sectional view on the line 4—4 of Fig. 3. Fig. 5 is a plan view of the device. Fig. 6 is a partial rear elevation. Fig. 7 is a general side elevation. Fig. 8 is a vertical cross sectional view of the car sill on the line 8—8 of Fig. 7. Fig. 9 is a detail view showing the back screen lowered.

In the above defined figures, 10 designates a rectangular frame, preferably of pipe, within which a lattice 11 of woven metallic straps is stretched. This frame 10 is fixed at the four corners between two side members 12 shaped substantially as shown in Figs. 1, 2, 3, and 7. The rear portions of the side members are connected by a pair of superposed horizontal bars 13 and 14, the upper of which, 13, will be hereinafter called the pivotal bar, and the lower, 14, the resistance bar. The pivotal and resistance bars, 13 and 14, respectively, are connected by substantially V-shaped locking plates 15, having their apexes 16 extending rearwardly and connected by a locking bar 17 which lies parallel with the bars 13 and 14. L-shaped anchor plates 18 are bolted to the sills 19 of the car, as seen in Figs. 1, 2, 6, 7 and 8, and are threaded to receive adjustable posts 20, which depend therefrom and pass through suitable brackets 21 bolted to the car sills. The lower portion of the posts 20 are flattened at 22 and turned upwardly and forwardly to form hooks 23 adapted to support the pivotal bar 13.

A trigger bar 24 extends across the front of the apron and is provided throughout its entire length with a plurality of loose sleeves

25 of wood, rubber, or other suitable material, which serve to reduce the impact of collision and support the fender when in its lowered position, as seen in dotted lines in Fig. 2. The extremities of the trigger bar are fixed to rearwardly extending push bars 26 which are supported by bolts 27 passing through slots 28 in the said bars. The bolts 27 also support the frame 10 between the side members 12. The push bars 26 are located between the apron frame 10 and the side members 12, and are protected and prevented from bending thereby. The rear extremities of the push bars are pivoted at 29 to trip levers 30 which are pivoted to brackets 31 fixed adjacent the center of the pivotal bar 13 and the resistance bar 14. The trip levers 30 pass between the arms of the locking plates 15 and are supported thereby. The trip levers are provided with integral rearwardly extending tripping fingers 32 having downwardly turned extremities 33, as seen in Figs. 1 and 7. The rear ends of the brackets 21 are bent around in circular form so as to provide bearings 34 for the main shaft 35. A pair of locking levers 36 are fixed to the shaft 35 and extend downwardly until the adjusting screws 37 in their lower extremities abut the extremities 33 of the trip fingers 32. Connecting rods 38 having bifurcated lower extremities 39 adapted to straddle the locking bar 17, are pivoted to the locking levers 36 at 40, a short distance below the shaft 35. Hooks 41 are pivoted near the lower ends of the connecting rods 38 and engage the locking bar 17, maintaining the same between the bifurcations 39 of the connecting rods. A chain quadrant 42 is fixed to the shaft 35 at a suitable point and from this quadrant a chain 43 extends forward to the lower extremity of a lever 44 pivoted to the car floor at 45 and located conveniently to the motorman for raising the fender.

When the motorman pulls the lever toward him, the chain 43 rotates the shaft 35 through the medium of the quadrant 42. On the drop of the fender, the locking levers 36 and connecting rods 38 assume the positions shown in dotted lines in Fig. 2. The rotation of the shaft 35 throws the levers 36 forwardly so that they and the connecting rods 38 form a toggle exerting great downward pressure on the locking bar 17 carried at the rear of the plates 15 so that the fender is raised.

A bar 46 is pivoted at one extremity to the quadrant 42 and at the other to one arm of a bell crank lever 47 pivoted at 48 to a suitable bracket 49 depending from the car floor. The other arm of the bell crank lever 47 is pivoted to a depressible pedal 50 extending upwardly through the car floor. A lever 51 extends rearwardly from the quadrant 42 and carries a slidably-adjust-

able counterbalance-weight 52 adapted to aid the motorman in raising the fender. This weight also serve the purpose of maintaining the adjusting screws 37 in engagement with the trip finger extremities 33 against the jarring caused by the motion of the car. In order to insure the dropping of the fender when the trigger bar is pressed, helical tension springs 53 are stretched between the locking plates 15 and the car sills 19. The springs 53 also help to maintain the fender in elevated position until the trigger bar is pressed by holding the locking bar 17 in close engagement with the bifurcated extremities 39 of the connecting rods 38.

To prevent the fender rising and passing over an object on the track after it has dropped, a ratchet wheel 54 is placed on the main shaft 35 and a pawl 55 is pivoted to one of the car sills at 56 and adapted to engage the teeth of the ratchet wheel. A spring 57 is provided to maintain the pawl 55 constantly in engagement with the ratchet wheel. A chain 58 is attached to the pawl and passes over pulleys 59, terminating at some point convenient to the motorman. The chain 58 may, if desired, be connected so as to be operated by the lever 44. To insure the rapid rotation of the main shaft 35 when the trigger bar is pressed, a collar 60 is fixed thereto carrying a short pivoted post 61. The post is shouldered at 62 near its pivotal point. A short threaded post 63 is pivoted to a block 64 on the car sill, and an adjusting nut 65 placed on the post. A strong compression spring 66 surrounds the posts, its ends abutting the shoulder 62 and the nut 65.

When the fender is in elevated position, the spring 66 bears directly down on the axis of the shaft 35, as best seen in Fig. 2, and exerts no turning effect thereon, but when the shaft commences to turn it carries the post 61 with it so that the axis of the spring is thrown out of line with the axis of the shaft and the spring expands and operates through the short leverage of the collar 60, to turn the shaft. In this connection, it is to be noted that the spring 66 is in compression and assists the rotation of the shaft.

A small screen 67 is pivoted to the resistance bar 14, and connected at each side to the push bars by links 68. A bar 69, lying normally in front of the trigger bar, is pivoted to brackets 70 carried by the push-bars 26. Catches 71 are provided on the bars 69 which engage the bolts 27 when the fender is elevated and maintain the bar 69 rigid with the fender.

Many kinds of fenders owing to complex construction and operation multiply the motorman's duties. We will now proceed to describe that portion of the device adapted

to decrease the motorman's duties in stopping his car to avert collision with an object on the track. A pair of hooks 72 are fixed to the resistance bar 14, from which
 5 hooks chains 73 extend over pulleys 74 carried in brackets 75, under the car, to suitable valves 76 controlling the emission of sand from the sand boxes 77, as seen in Fig. 7. A plurality of transverse bars 78
 10 may be bolted between the brackets 21 to prevent an object picked up on the fender from passing over the back of same and eventually coming under the wheels of the car.

15 The operation of the device is very simple and we will now describe the same. The principle on which the fender operates is that the weight of the same is unevenly distributed on either side of the pivotal center,
 20 namely the pivotal bar 13, the heavier or forward portion of the fender being on the front side and tending by the force of gravity, to drop. This front portion comprises the fender apron and the trigger mechanism
 25 for releasing the same. The locking plates 15 which project rearwardly will consequently rise with the drop of the fender and it is obvious that, if the locking plates be maintained depressed, the fender will remain elevated as seen in Figs. 1, 2 and 7.
 30 The mechanism for maintaining these locking plates depressed comprises the locking levers 36 and the connecting rods 38 pivoted thereto and pivotally engaging the locking
 35 bar 17 which connects the locking plates 15. When the fender is elevated, the centers of the main shaft 35, connecting rod pivot 40, and locking bar 17 are all in line, the upward push of the locking bar is transmitted
 40 directly to the shaft 35 which it is powerless to rotate having no leverage over same. When the trigger bar 24 is pressed, however, it forces the lower extremities of the locking
 45 levers 36 rearwardly, through the medium of the push bars 26, trip levers 30, and trip fingers 32.

It will be understood that the locking levers lie beyond the ends of the bar 17 as clearly shown in Figs. 3, 5, and 6, and are
 50 therefore free to move past the same. The rearward movement of the locking levers 36 thus throws the connecting rod pivot 40 out of line with the shaft 35 and locking bar 17. As soon as this occurs, the upward pressure
 55 of the locking bar 17, acting through the connecting rods 38, exerts a leverage over the locking levers 36 and throws their lower ends 39 farther rearwardly, thus allowing the fender to drop, as seen in dotted lines in
 60 Fig. 2. The adjusting screws 37 may be so regulated that the lower extremities of the locking levers will lie a little forward of the center line through the shaft 35, pivot 40 and bar 17 above described. In this case,
 65 the tendency of the levers to move forward

is checked by the extremities 33 of the tripping fingers 32, the whole force due to the weight of the fender being opposed to the rearward movement of the push bars 26 and trigger bar 24 when the latter strikes
 70 an obstruction. An adjustment such as this will give greater security when the car has to traverse a very rough track by preventing the jarring from throwing the locking bar 36 rearwardly out of line. The disadvantage of this arrangement is that any effective
 75 pressure exerted on the trigger bar must needs be sufficient to overcome the opposed pressure due to the weight of the fender. It is, however, unnecessary, under ordinary
 80 circumstances, to effect such an adjustment, as the counterbalance weight 52 acting through its lever 51, the chain quadrant 42 and main shaft 35, tend to hold the lower
 85 extremity of the locking levers in close engagement with the extremities 33 of the tripping fingers 32. The springs 53 also aid in maintaining the device in position by absorbing the vibrations of the fender
 90 caused by the jarring of the moving car and hold the locking bar 17 in close engagement with the bifurcated extremities 39 of the connecting rods 38. As soon as the
 95 lower ends of the locking levers 36 commence to move rearwardly, the spring 66 which was held in compression, as will be readily understood from the drawings, is released and by its expansion greatly accelerates the rotation of the shaft 35 and
 100 consequently the movement of the locking levers and connecting rods.

If an obstruction is met with on the track, the bar 69 comes in contact therewith and is pressed rearwardly thereby, thus throwing
 105 the lower extremities of the locking levers rearwardly through the medium of the push bars 26, trip levers 30 and tripping fingers 32. The fender then drops by gravity as above described. When the bar 69 is pressed
 110 rearwardly by collision, the catches 71 are withdrawn from the bolts 27 and the bar 69 left free to rise over any object on the fender, thus preventing the same from falling
 115 off. The rearward movement of the push bars 26 acts through the links 68 to lower the screen 67, as seen in Figs. 2 and 9, in order that an object which might get under the fender at the sides, will be prevented
 120 from being crushed by the car wheels. When the fender drops, the ratchet wheel 54 rotates under the pawl 55, which locks the same against return movement and prevents
 125 the fender being raised, since the locking bar 17 is retained between the bifurcations of the connecting rods by the hooks 41.

When the motorman wishes to raise the fender, he first pulls the chain 58 to release the pawl 55 and then pulls the lever 44
 130 which, acting through the chain 43 and quadrant 42 with the aid of the weight 52

attached thereto, rotates the main shaft to move the lower extremities of the locking levers forwardly and force the connecting rods to assume their original positions axially parallel with the locking levers whereby the fender is raised. As the locking levers advance, they force the tripping fingers forward, thus replacing the trigger bar and bar 69 in advance of the fender through the medium of the connecting mechanism. When the motorman wishes to lower the fender, he presses the pedal 50 which acts through the bell crank lever 47 and pedal bar 46 on the quadrant to rotate the shaft 36 and move the locking levers rearwardly to release the fender.

When the motorman sees an obstruction on the track with which he thinks he is in danger of colliding, such as a person, his first duty is to lower the fender. He then successively opens the sand box, shuts off the power, applies his brake (air or hand), and reverses his controller in case it should be necessary to reverse the motors as an emergency brake. It is obvious that any diminution of the amount or number of these five successive acts would tend to greatly accelerate and simplify the stopping of the car. In our invention, the fender is lowered by pressing the pedal 50. This may be done simultaneously with the shutting off of the power, as both the motorman's hands are free. As the fender drops, the chains 73, which are attached to the resistance bar 14, are pulled and the valves of the sand boxes are opened. Thus whether the motorman lowers the fender, or whether it is automatically lowered by impact with some obstruction, the motorman is always sure that the sand box is open. Moreover the number of acts required to stop the car are reduced from five to four, and the time required to perform said acts reduced to two-fifths of the original time, as the three acts of lowering the fender, shutting off the power, and applying the brake, are performed by separate members and may take place simultaneously. The only remaining act is to reverse the controller and, in cases of great emergency, the motors.

It will be readily seen in Fig. 2 that, as the fender drops, it also moves rearwardly, thus preventing it from being injured by coming in contact with vehicle wheels, etc. Its location is such that it is at all times protected by the buffer of the car from such injury. It will also be obvious that this fender will not interfere with the coupling of cars, as there are no parts which would interfere with the free play of the draw bars, also no parts lying in front of the buffer. If it is desired to remove the fender, the hooks 41 are disengaged from the locking bar and the front raised sufficiently to free the locking bar from the bifurcated extremities of the

connecting rods. The fender is then raised so that the pivotal bar 13 is lifted out of the hooks 23, thus entirely freeing the fender, without the necessity of removing any bolts or nuts. This statement does not apply to the springs 53, the use of which is optional. When the fender is dropped, it will be seen in Fig. 2 that it runs along the ground on the sleeves or rollers 25 which prevent it from catching in any unevenness therein and becoming damaged.

The term trigger bar has been applied to the bar 24, because the bar 69, which acts as the trigger when in place, may be dispensed with without in any way affecting the efficiency of the fender, as it is merely an additional safeguard.

The advantages of this device are numerous, the principal one being: first, simplicity and inexpensiveness due to a minimum number of parts, which may be stamped or cut from standard stock; second, absolutely automatic action caused by rearward pressure of any part of the trigger bar; third, automatic opening of the sand boxes; fourth, location under the car thus protecting the working parts from injury; fifth, convenience of removal or in coupling cars; and sixth, positive locking means for preventing the fender from rising over an object on the track after the fender has once been lowered.

Having thus described our invention, what we claim is:—

1. A car fender comprising a pivoted apron, rearwardly extending plates rigidly attached to said apron, a locking bar connecting said plates, locking levers, means connecting said locking bar and levers whereby the fender is maintained in elevated position, and means for actuating said locking levers whereby the fender is lowered.

2. A car fender comprising a pivoted apron, rearwardly extending plates rigidly connected thereto, a locking bar connecting said plates, a shaft journaled under the car, locking levers carried by said shaft, connecting rods pivoted to said levers and engaging said locking bar, and means for actuating the locking levers whereby the fender is allowed to drop.

3. A car fender comprising a pivoted apron, rearwardly extending plates rigidly connected thereto, a locking bar connecting said plates, a shaft journaled under the car, locking levers carried by said shaft, connecting rods pivoted to said levers and engaging said locking bar, means for actuating the locking levers whereby the fender is allowed to drop, a ratchet wheel on said shaft, and a pawl engaging said ratchet wheel to lock the fender in its lowered position.

4. A car fender comprising an apron, side members supporting said apron, pivotal

and resistance bars connecting said side members, plates connecting said bars, a locking bar connecting said plates, a shaft journaled under the car, locking levers carried by said shaft, connecting rods pivoted to said levers and engaging said locking bar, a trigger bar, and means operated by the trigger bar for actuating said locking levers whereby the fender is allowed to drop.

5. A car fender comprising an apron, side members supporting said apron, pivotal and resistance bars connecting said side members, plates connecting said bars, a locking bar connecting said plates, a shaft journaled under the car, locking levers carried by said shaft, connecting rods pivoted to said levers and engaging said locking bar, a trigger bar, means operated by the trigger bar for actuating said locking levers to release the fender, springs for depressing the fender, a ratchet wheel on the shaft, and a pawl engaging said ratchet wheel to lock the fender in its depressed position.

6. A car fender comprising an apron, pivotally mounted side members supporting said apron, rearwardly extending locking plates rigidly connected to the side members, a locking bar connecting said locking plates, a shaft journaled under the bar, locking levers carried thereby, connecting rods pivoted to said locking levers, and engaging said locking bar, a trigger bar, push bars carrying said trigger bar, pivoted trip levers connected to said push bars, and trip fingers on said trip levers adapted to actuate said locking levers whereby the fender is allowed to drop.

7. A car fender comprising a pivotally mounted apron, a shaft journaled under the car, locking levers carried by said shaft, connecting rods pivoted to said locking levers and axially in line therewith, a trigger bar carried by the apron, and means actuated by the trigger bar for moving said locking levers out of line with the connecting rods.

8. A car fender comprising a pivotally mounted apron, a shaft journaled under the car, locking levers carried by said shaft, connecting rods pivoted to said shaft and axially in line therewith, a trigger bar in front of the apron, push bars supporting said trigger bar, trip levers pivotally connected to said push bars, tripping fingers carried by said trip bars, and adapted to move the locking levers out of line with the connecting rods.

9. A car fender comprising a pivotally mounted apron, a shaft journaled under the car, locking levers carried by said shaft, connecting rods pivoted to said locking levers, and axially in line therewith, a trigger bar in front of the apron, means actuated by the trigger bar for moving the locking levers out of line with the connecting rods, a pedal, pedal actuated means for moving the lock-

ing levers out of line with the connecting rods, and means for returning the locking levers into line with the connecting rods.

10. A car fender comprising a pivotally mounted apron, rearwardly extending plates rigidly connected thereto, a locking bar connecting said plates, a shaft journaled under the car, locking levers carried by the shaft, connecting rods axially in line with said levers pivotally mounted thereon and engaging said locking bar, a trigger bar, means actuated by the trigger bar for moving said locking levers out of line with the connecting rods, a pedal, means actuated by said pedal for moving the locking levers out of line with the connecting rods, and manually operated means for returning the locking levers into line with the connecting rods.

11. A car fender comprising a pivotally mounted apron, rearwardly extending plates rigidly connected thereto, a locking bar connecting said plates, a shaft journaled under the car, locking levers carried by said shaft, connecting rods axially in line with said levers pivotally mounted thereon and engaging said locking bar, hooks pivoted to the connecting rods and engaging the locking bar, a trigger bar, means actuated by the trigger bar for moving said locking levers out of line with the connecting rods, a pedal, means actuated by said pedal for moving the locking levers out of line with the connecting rods, a spring for rotating said shaft, a ratchet wheel on said shaft, springs for depressing the fender apron, a spring pressed pawl engaging the ratchet wheel to lock the apron in its depressed position, releasing means for said pawl, and manually operated means for returning the locking levers into line with the connecting rods.

12. In a car fender, the combination with sand boxes and valves therefor, of a pivotally mounted apron, means for maintaining said apron normally elevated, means for automatically releasing said apron, pedal actuated means for releasing said apron, means for depressing said apron, means operated by the apron for opening said sand valves, means for locking the apron in its depressed position, means for releasing said locking means, and manually operated means for raising said apron.

13. In a car fender, the combination with sand boxes and valves therefor, of a pivotally mounted apron, locking means for maintaining said apron elevated, automatically actuated means for releasing said locking means, pedal actuated means for releasing said locking means, means actuated by the apron for opening the sand valves, and manually operated means for raising the apron and resetting said locking means.

14. In a car fender, the combination with sand boxes and valves therefor, of a pivotally mounted apron, a locking bar in the

rear of said apron, locking means engaging said locking bar and maintaining the apron elevated, a trigger bar carried by the apron, means actuated by the trigger bar for releasing the locking means whereby the apron drops, pedal actuated means for releasing the locking means whereby the apron drops, means actuated by the apron for opening the sand valves, and manually operated means for raising the apron and resetting the locking means.

15. In a car fender, the combination with sand boxes and valves therefor, of a pivotally mounted apron, a locking bar in the rear thereof, a shaft journaled under the car, locking levers carried thereby, connecting rods pivoted to said locking levers and engaging the locking bars, said connecting rods axially in line with the locking levers, a trigger bar, means actuated thereby for moving said locking levers out of line with the connecting rods, and manually operated means for returning the locking levers into line with the connecting rods.

16. In a car fender the combination with sand boxes and valves therefor, of a pivotally mounted apron, rearwardly extending plates rigidly connected thereto, a locking bar connecting said plates, a shaft journaled under the car, locking levers carried by said shaft, connecting rods axially in line with

said levers pivotally mounted thereon and engaging said locking bar, hooks pivoted to the connecting rods and engaging the locking bar, a spring adapted to rotate the shaft and move the locking levers and connecting rods out of line, a trigger bar, means actuated by the trigger bar for moving said locking levers out of line with the connecting rods, a pedal, means actuated by said pedal for moving the locking levers out of line with the connecting rods, spring for depressing the apron, means actuated by the apron for opening the sand valves, a pivoted screen below the apron, means for lowering said screen, a pivoted bar in front of the trigger bar, means for locking said bar to the apron in its elevated position, a ratchet wheel on the shaft, a spring pressed pawl in engagement with said ratchet wheel for locking the apron in its depressed position, means for withdrawing said pawl, and manually operated means for returning the locking levers into line with the connecting rods and raising the apron.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

JOSEPH F. E. ROSE.
CAMILLE RICHARD.

Witnesses:

C. W. TAYLOR,
E. B. MCKENZIE.