No. 677,532. Patented July 2, 1901.

S. W. ALEXANDER.

YIELDING AUTOMATIC ADJUSTABLE CAR FENDER.

(Application filed Sept. 6, 1899.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.

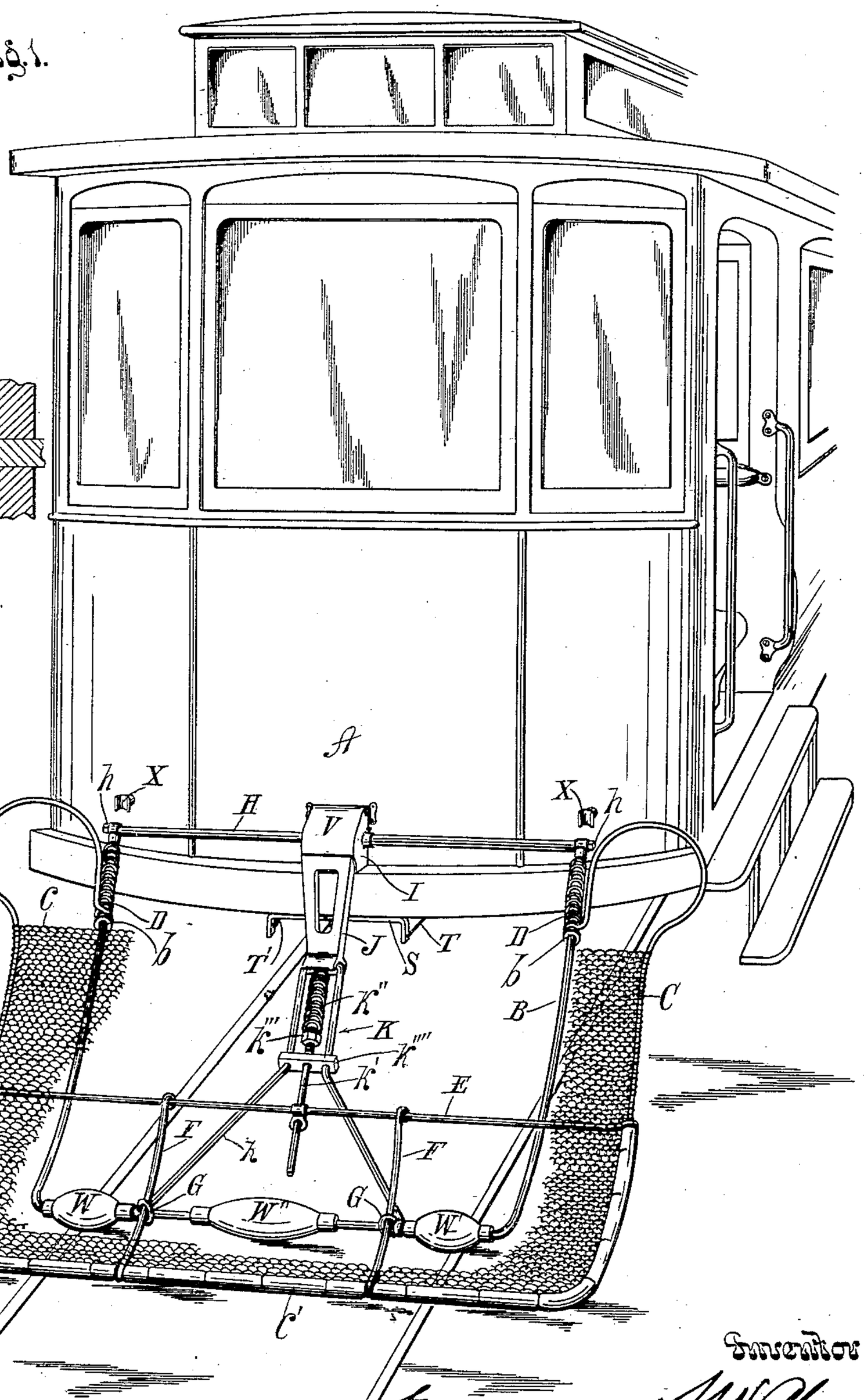
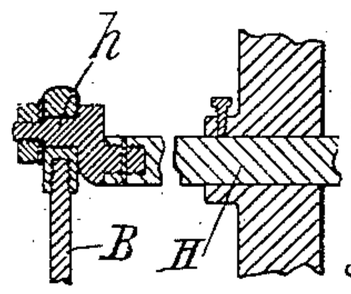


Fig. 2.



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his attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 4.

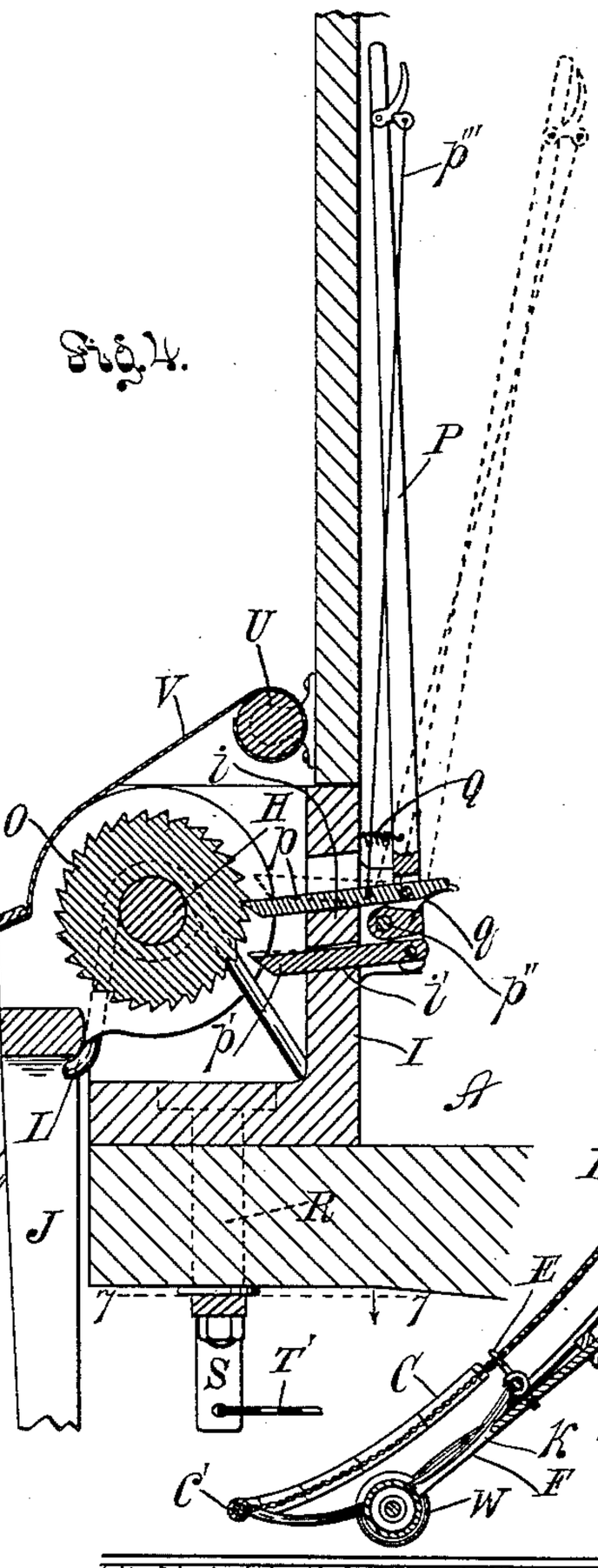


Fig. 5.

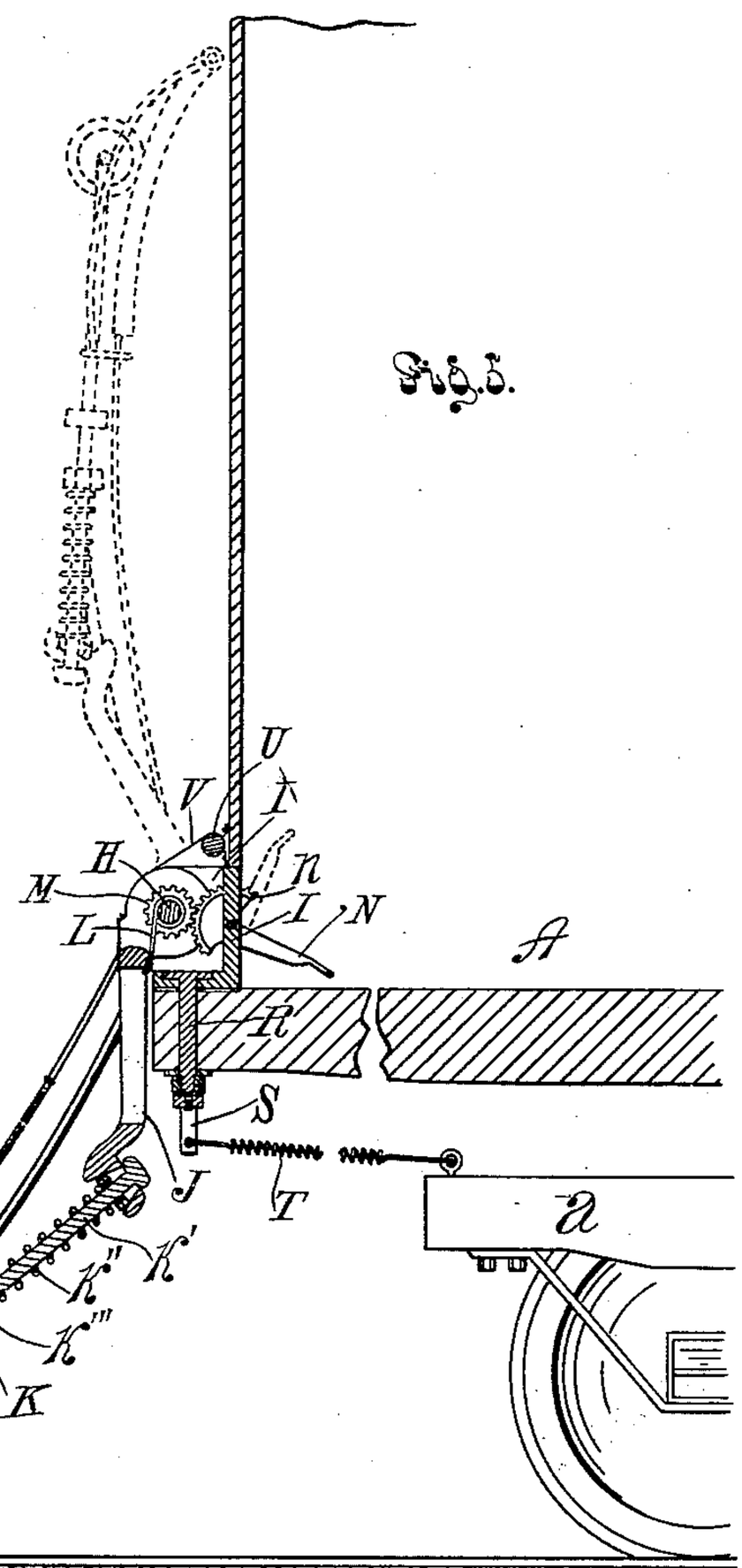
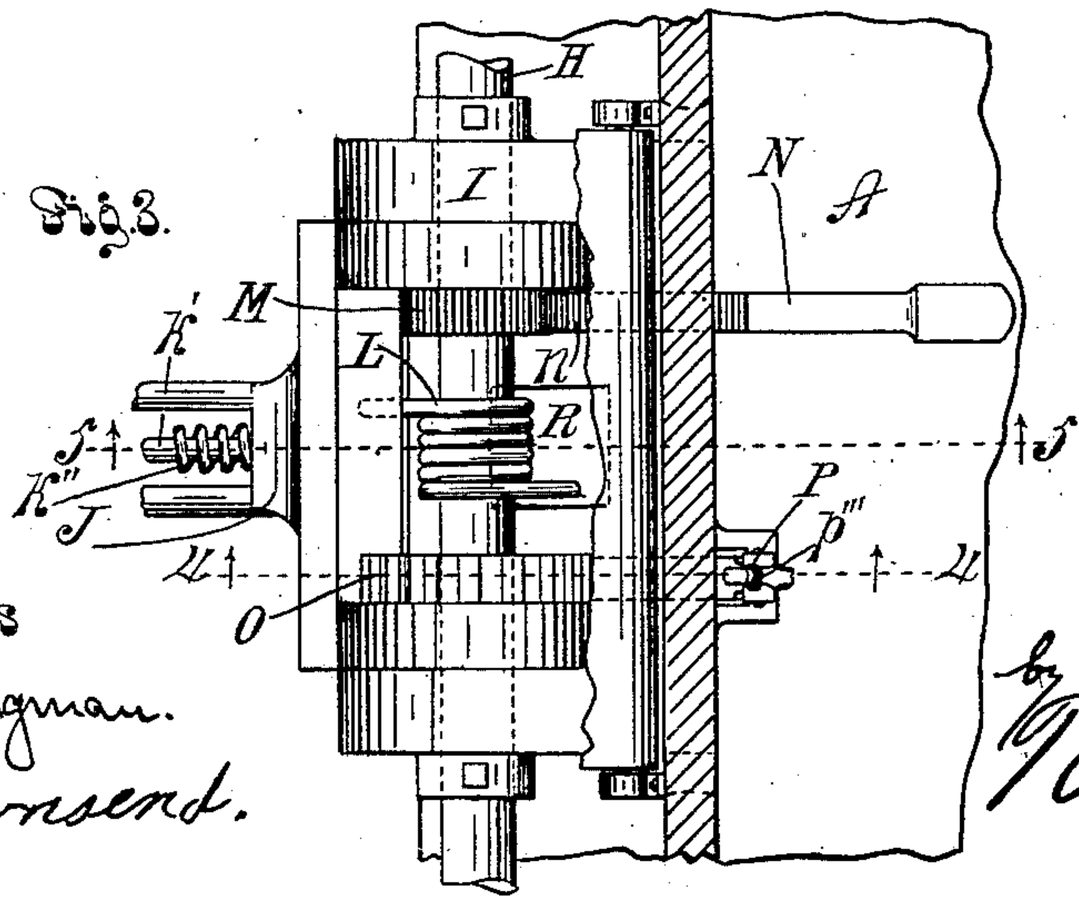


Fig. 3.



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(No Model.) 4 Sheets—Sheet 3.

Fig. 7.

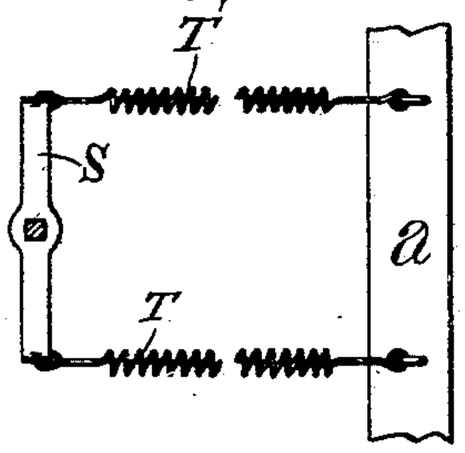
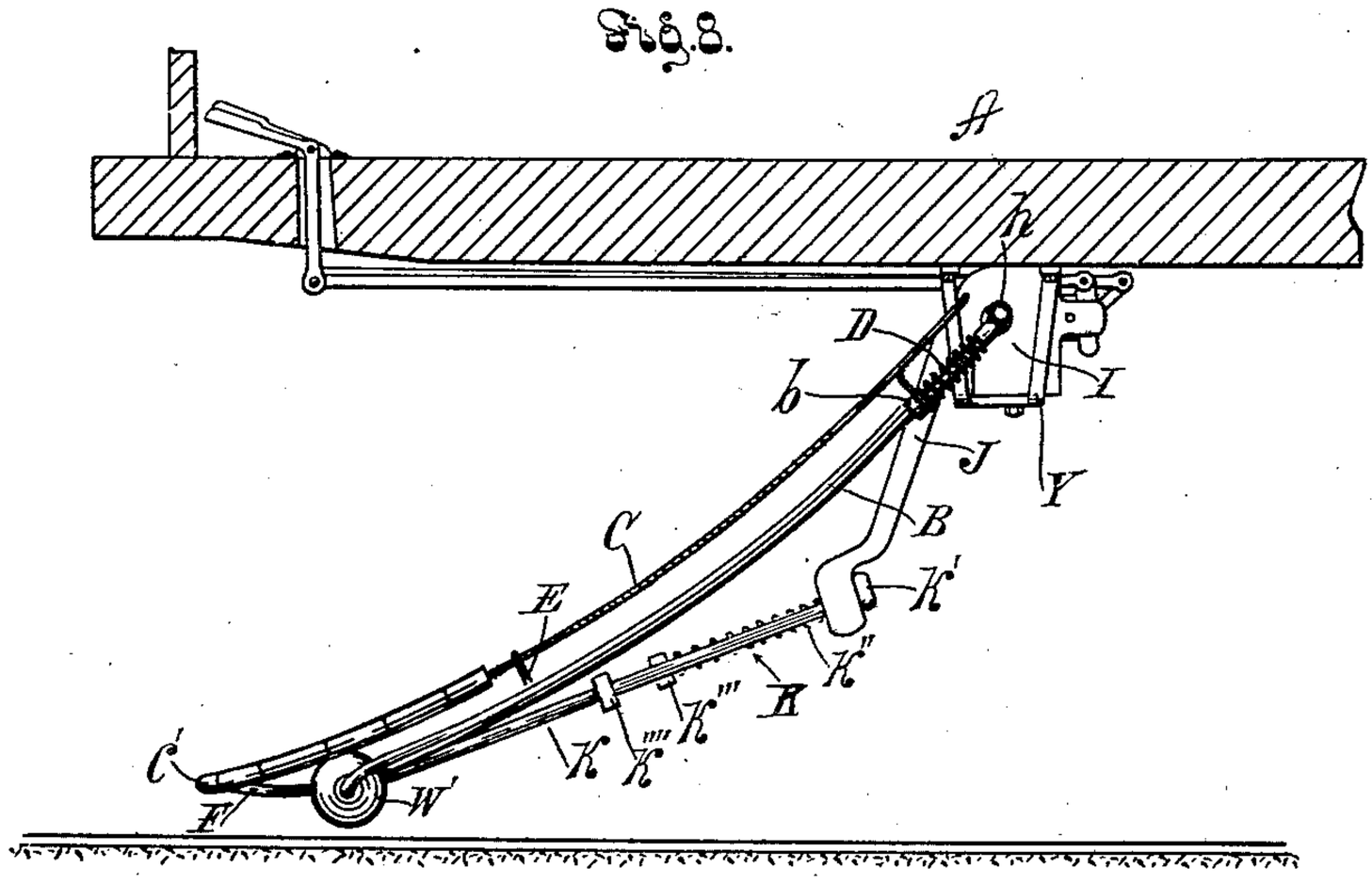


Fig. 6.

Fig. 8.



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(No Model.) 4 Sheets—Sheet 4.

Fig. 9.

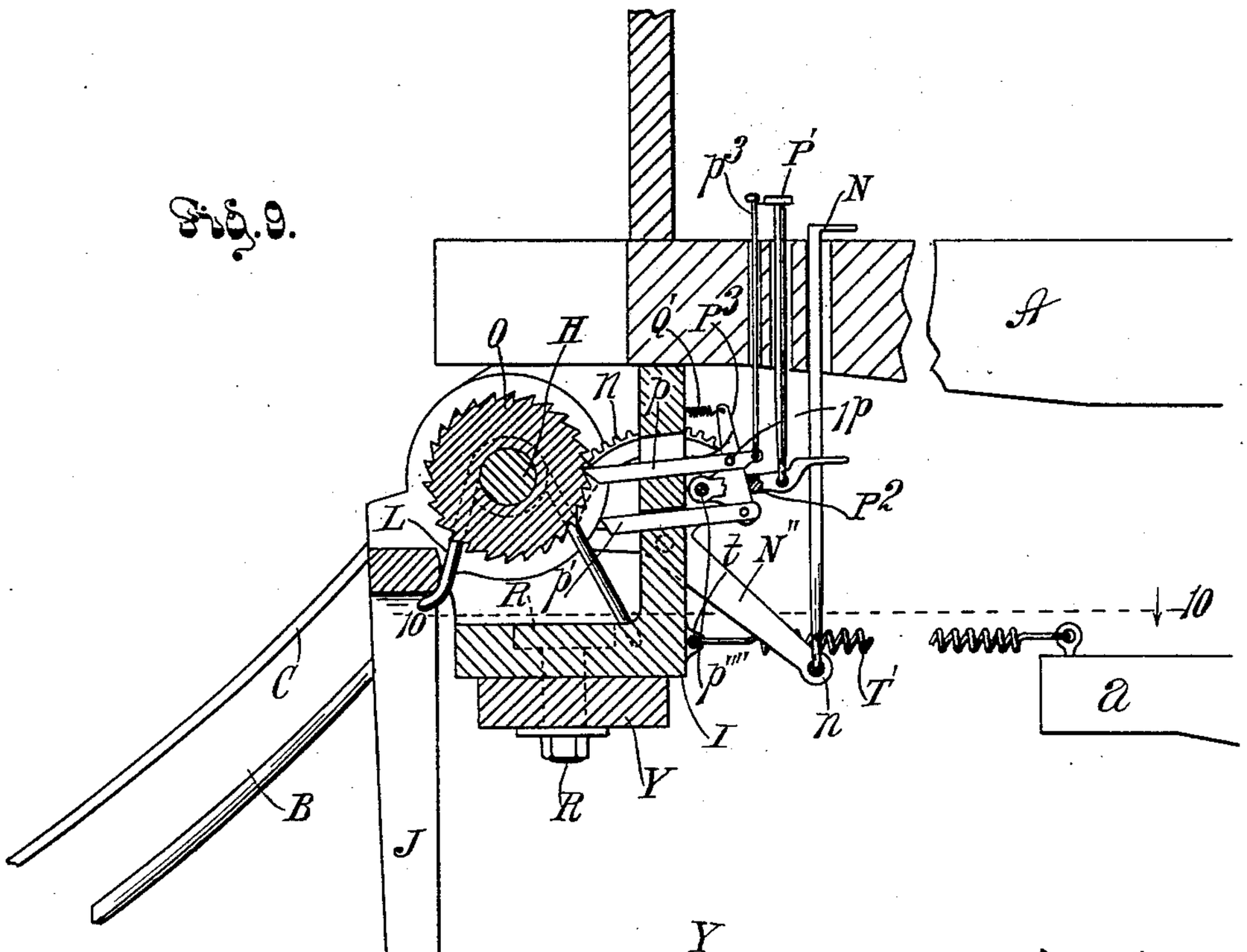
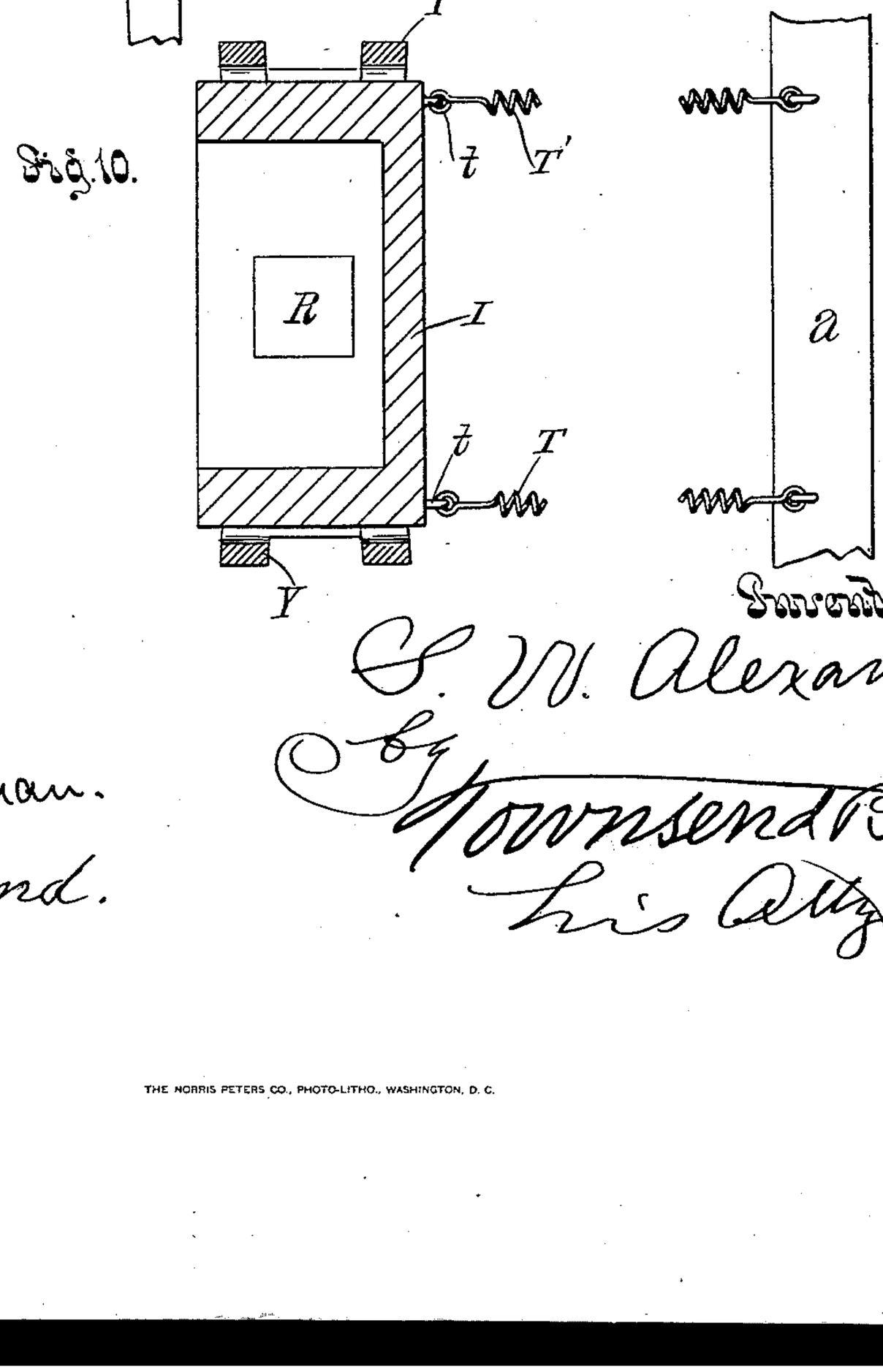


Fig. 10.



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UNITED STATES PATENT OFFICE.

SCOTT W. ALEXANDER, OF LOS ANGELES, CALIFORNIA.

YIELDING AUTOMATIC ADJUSTABLE CAR-FENDER.

SPECIFICATION forming part of Letters Patent No. 677,532, dated July 2, 1901.

Application filed September 6, 1899. Serial No. 729,651. (No model.)

To all whom it may concern:

Be it known that I, SCOTT W. ALEXANDER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Yielding Automatic Adjustable Car-Fender, of which the following is a specification.

An object of my invention is to provide a car-fender which will be sufficiently strong for perfect safety and will be sufficiently yielding to lessen the danger of injury to the person struck.

Another object of my invention is to allow the fender to go close to the track and to be under the control of the gripman, so that he can depress it or raise it, as required.

Another object of my invention is to make provision whereby the fender will ride over ordinary obstacles without breaking and also to provide for allowing the fender to rise in case it should contact with the track in cases of sudden depression or rise in the track.

Another object of my invention is to allow the fender to automatically fold up against the end of the car when it is released for this purpose.

Another object of my invention is to cause the fender to automatically follow the track in going around a curve.

I provide an adjustable curtain for covering the mechanism which raises and lowers the fender.

My invention in its preferred form is applied in front of a car, so that any person caught by the fender will be held from passing under the body of the car; but my invention can be applied beneath the car-body at any point desired.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective view showing my newly-invented fender in operative position at the front of a street-car. Portions of the wire-netting of the receiver of the fender are broken away for clearness of illustration. Fig. 2 is a fragmental longitudinal sectional detail of the shaft or bar which carries the fender-frames. This view shows the eccentric arrangement of the bearing for the frames relative to the bearing for the hanger which lifts the frame. Fig. 3 is a fragmental plan detail showing the mechanism for raising and lowering the fender. Fig. 4 is a sectional view of the same on line 4 4 looking in the direction of the arrows. Fig. 5 is a fragmental mid-sectional elevation of my invention applied to the front end of a car. Solid lines show the fender in operative position and dotted lines indicate the position of the same when it is lifted up. Line 5 5, Fig. 3, indicates the line of section. Fig. 6 is a fragmental side elevation with parts in the position into which they are thrown when the guard-rollers contact with the track on an incline. The hanger is shown partially in mid-section. Fig. 7 is a fragmental plan detail on a reduced scale to show the king-bolt bar S and its connection through rods T T′ with the truck *a*. Line 7 7, Fig. 4, indicates the plane of view. Fig. 8 is a side elevation of my invention applied underneath the car rearward of the front. The car is shown in partial mid-section. Fig. 9 is a sectional detail of the invention as applied underneath the car at the front end thereof. Fig. 10 is a sectional plan on line 10 10, Fig. 9.

A indicates the car.

My newly-invented fender comprises a supporting-frame B, supported by the car, and a yielding receiving-frame C above the main supporting-frame B and supported thereby and movable with relation thereto. The receiving-frame C is slidingly mounted on the supporting-frame B, and springs, as at D, are provided to normally hold the receiving-frame extended forward. The receiving-frame C is preferably formed of a rod bent to form the front and sides of the frame and having its upper ends slidingly connected with the supporting-frame. This rod may or may not be composed of a single piece. In the drawings I have shown it formed integral. E indicates a cross-bar on said frame. One or more running-bars F extend between and are connected with the cross-bar E and the front member of the supporting-frame. There are preferably two of these bars, and in the drawings I have shown two such bars.

G indicates links connecting the running-bars with the front of the supporting-frame B, thus to support the front end of the receiv-

ing-frame and to allow the receiving-frame to slide toward and from the car while supported by the supporting-frame B.

The supporting-frame B is preferably pivoted to the car by means of a shaft or supporting-bar H, which is carried by a box I, mounted upon the car. Means are provided within the box for holding the supporting-frame practically rigid relative to the car. Such means are adapted to be released, and the spring is provided for drawing the supporting-frame upward when said means are released. This will be more fully understood upon reference to Figs. 3, 4, and 5.

J indicates a hanger pivoted to the car by the rod H, which extends through the box I.

K indicates a yielding connecting device pivotally connecting the hanger J with the supporting-frame B. The hanger is preferably pivoted to the car below the axis of the pivot of the frame B, as indicated in Fig. 2, where the pivot *h* of the supporting-frame B is shown above the pivot H of the hanger.

L indicates a spring, being resilient means for drawing the hanger J upward to lift the fender. The connection between the hanger J and the connecting device K has a limited movement, so that when the spring L draws the hanger J up it will operate through the connection K and lift the frames to bring the fender into its lifted position. (Shown in dotted lines in Fig. 5.) The extensible connecting device K is preferably composed of a yoke *k*, pivoted to the front of the supporting-frame B, a rod *k'*, pivoted to the hanger J and sliding through the yoke *k*, and the spring *k''* to move the rod inside the yoke.

k''' indicates an adjustable nut on the rod *k'* to adjust the tension of the spring *k''*.

k'''' indicates a head-bar through which the rod *k'* plays.

M indicates a pinion fastened to the hanger to raise and lower the same.

N indicates a lever pivoted to the car through the medium of the box I and provided with a cogged segment *n*, meshing with the pinion M. It is to be understood that the pinion may have cogs for less than half of its perimeter, because the movement of the hanger is through such an arc; but in the drawings I have shown the pinion provided with teeth entirely around it. The lever N, with its cogged segment *n*, is preferably set to be depressed by the foot of the motorneer to throw the fender down against the action of the lifting-spring L.

O indicates a ratchet-wheel fastened to the hanger.

P indicates a pawl-lever provided with pawls *p p'* to operate the ratchet-wheel a notch at a time. The pawls *p p'* are pivoted to the ratchet-lever above the pivot *p''* of such lever and are supported by supports *i i'*, the same being portions of box I, in which the hanger is pivoted.

p''' indicates means for withdrawing the pawl *p* from its operative position, so that the motorneer can release the ratchet-wheel, as will be hereinafter more particularly set forth.

Q indicates a spring for normally holding the lever P forward to throw the pawl *p* into engagement with the wheel, and the pawl *p* is provided with a spring *q* to hold the pawl normally in engagement with the spring when the ratchet-wheel rotates. Upon the lowering of the hanger J the pawl *p* will yield to allow the ratchet-wheel to turn; but when the lever P is thrown back and forth the two pawls *p p'* will operate as an escapement to allow the ratchet-wheel to return one notch at a time.

I will now describe the device by means of which the fender is caused to follow the track when the car is going around a curve.

R indicates a king-bolt fastened to the box I and extending down through the frame of the car to turn therein.

S indicates a cross-bar at the lower end of the king-bolt.

T indicates a tension-rod connecting one end of the bar S with the car-truck *a* at a point on one side of the mid-line thereof. T' indicates a like tension-rod connecting the other end of the bar with the car-trucks on the opposite side of the mid-line.

U indicates a spring-actuated curtain-roller of the ordinary kind, fastened to the car above the mechanism contained within the box I. V indicates a curtain on said roller and extending over the frame-operated mechanism and attached to the moving part of the fender, as at *j*, at the top of the hanger J.

The fender is preferably provided with spheroidal rollers W W' W'' to engage the pavement or track whenever the fender is thrown down far enough for that purpose. The object of the spheroidal shape of these rollers is to allow the rollers to slide sidewise readily over any obstacle which may be in the way.

In practical operation the spring L will normally hold the fender up against the car whenever the mechanism is released for this purpose. This will usually be the position of the fender at the rear end of the car. When it is desired to bring the fender into its operative position, the motorneer will depress the lever N, thus operating the pinion H to draw the hanger J down into the position shown in Fig. 5, thus throwing the fender down with its front end close to the track, but slightly thereabove.

In case a person should be in the way of the fender the yielding frame C will catch the person, and such frame is preferably made of a light and springy webbing, such as is ordinarily used for spring-wire mattresses, although any suitable material may be provided for this purpose. Tubular rubber cushions *c'* are also applied around the front portion of the receiving-frame C to prevent any danger of injury by abrasion. When a person is caught by the frame C, the frame will slide

upward against the pressure of the spring D, thus yielding to the inertia of the person struck and reducing the liability of injury to the person struck.

The fender will not ordinarily be thrown quite so far down as it is capable of going, the fender being constantly supported by the spring L; but the motorneer can force the fender down farther by pressing down upon the foot-lever N. This he will preferably do whenever an accident is imminent. In such case the rollers W W′ W″ may contact with the track or with the pavement. In case the motorneer does not thus lower the fender, the weight of the body will compress the spring L, thus bringing the rollers W W′ W″ into contact with the rails and pavement underneath them to support the weight of the body. These rollers will also contact with the rails or pavement or road-bed when the fender would otherwise strike in going over a sudden rise of track or in case where the track is suddenly depressed or in case where the car is thrown from the track. These rollers are held in their position by the spring k'', and such spring is made very strong to prevent the fender from being thrown up by such contact of the rollers except when considerable strength is exerted.

The rods T T′ normally hold the bar S crosswise of the car; but in going around a curve the change of relative position of car-body and car-trucks causes the rods T T′ to turn the cross-bar S and the box and the fender, so as to follow the track.

In the form shown in Fig. 9 the apparatus is designed to be operated wholly by the foot of the motorneer. N indicates a tread-bar extending down through the floor of the car A and pivoted at its lower end to the lever N″, which corresponds to the lever N. (Shown in Figs. 3 and 5.) P′ indicates a tread-bar extending down through the floor of the car and pivoted at its lower end to the arm P^2, which is fastened to and operates the pivoted lever P^3, which carries the pawls p and p'. p'''' indicates the pivot of the lever p^3, and Q′ indicates the spring which holds the lever P^3 to throw the pawl p into engagement with the ratchet O. p''' indicates a tread-bar extending down through the floor of the car and pivoted at its lower end to the pawl p rearward of its pivot p''.

In practical operation the motorneer will throw the fender down by pressing down with his foot upon the tread-bar N, and the pawl p will hold the ratchet-wheel O to hold the fender down. To release the fender, the motorneer may work the tread-bar P′ up and down by alternately pressing upon it with his foot and then relieving the pressure. This operates the lever P^3 to release the ratchet-wheel a notch at a time. In order to allow the fender to move up fully at once, he will press upon the tread-bar P′ and while holding it down he will press upon the tread-bar p^3, thus withdrawing the pawl p, so that when he releases the tread-bar P′, still holding the tread-bar p^3 down, the pawl p' will withdraw from the ratchet-wheel, while the pawl p is held out of the way of the ratchet-wheel, thus allowing the fender to fold up into its elevated position. (Shown in dotted lines in Fig. 5.)

b indicates stationary stops on the member B, which prevent the yielding receiving-frame C from moving forwardly beyond the normal position in which said yielding frame stands for receiving the person on the track.

X indicates sockets to receive the member B when the fender is folded up against the front end of the car.

Y indicates a hanger fastened to the under side of the frame of the car to support box I when the fender is supported from beneath the car.

In Figs. 9 and 10 the spring connections T T′ are fastened to eyes t, fixed to the box I. The tread-bar N is linked into the end of the lever N″ in Fig. 9, so as to allow for lateral as well as vertical movement of the parts at the joint n when the box I is rotated upon the axis R.

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

1. In a car-fender the combination of a supporting-frame supported by the car; a receiving-frame comprising a rod bent to form the front and sides of the frame and having its upper ends slidingly connected with the supporting-frame; a cross-bar, one or more running-bars connected with and extending between the cross-bar and the front member of the supporting-frame; and links connecting the running-bars with the front of the supporting-frame.

2. The combination with a car, of a supporting-frame pivoted to the car and extending forward from the car; means for holding the supporting-frame practically rigid relative to the car and adapted to be released; a spring for throwing the supporting-frame upward; a yielding frame slidingly mounted upon the supporting-frame and springs for normally holding the yielding frame in a forwardly-extended position.

3. In a car-fender the combination with a car of a frame pivoted to the car; a hanger pivoted to the car; a connecting device pivotally connecting the hanger with the frame; and means for operating the hanger to raise or lower the frame.

4. In a car-fender the combination with a car, of a frame pivoted to the car; a hanger pivoted to the car below the axis of the pivot of the frame; a connecting device pivotally connecting the hanger with the frame; and means for operating the hanger to raise and lower the frame.

5. In a car-fender the combination with a car, of a frame pivoted to the car; a hanger pivoted to the car; an extensible connecting device pivotally connecting the hanger with the frame; means for normally contracting

the connecting device; and means for operating the hanger to raise and lower the frame.

6. In a car-fender the combination with a car, of a frame pivoted to the car; a hanger pivoted to the car; a yoke pivoted to the front of the frame; a rod pivoted to the hanger and sliding through the yoke and a spring to move the rod into the yoke.

7. In a car-fender the combination with a car, of a frame pivoted to the car; a hanger pivoted to the car and connected to the frame to raise and lower the same; a pinion fastened to the hanger; and a lever pivoted to the car and provided with a cogged segment meshing with the pinion.

8. In a car-fender the combination with a car, of a frame pivoted to the car; a hanger pivoted to the car and connected with the frame to raise and lower the same; a pinion fastened to the hanger; a lever pivoted to the car, and provided with a cogged segment meshing with the pinion; and means for normally holding the frame up.

9. In a car-fender the combination with a car, of a frame pivoted to the car; a hanger pivoted to the car and connected with the frame to raise and lower the same; a pinion fastened to the hanger; a lever pivoted to the car and provided with a cogged segment meshing with the pinion; means for yieldingly holding the frame up; a ratchet-wheel fastened to the hanger; and a pawl for holding the ratchet-wheel.

10. In a car-fender, the combination of a frame pivoted to the car and arranged to be brought into position with its free portion elevated against the car and thus out of the way; resilient means for yieldingly holding the frame up with its free portion against the car; and a ratchet device for holding the frame against the action of said resilient means, and arranged to allow the frame to be readily forced down against the force of said resilient means.

11. In a car-fender the combination with a car, of a frame; a hanger connected with the frame; means for yieldingly holding the hanger up; means for throwing the hanger down; a ratchet-wheel fastened to the hanger; a lever provided with pawl-escapement for the ratchet-wheel; and means for withdrawing one of the pawls from its operative position.

12. In a car-fender the combination with a car, of a box mounted upon the car; a king-bolt fastened to the box and extending through the frame of the car to turn therein; a cross-bar fastened to the lower end of the king-bolt; a tension-rod connecting one end of the bar with the car-truck at a point on one side of the mid-line thereof; a tension-rod connecting the other end of the bar with the car-truck on the opposite side of the mid-line; and the fender carried by the box.

13. The combination with a car, of a car-fender frame; mechanism for raising and lowering the car-fender frame; a spring-actuated curtain-roller fastened to the car and a curtain on said roller and extending over the frame-operating mechanism and attached to a moving part of the fender, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 31st day of August, 1899.

S. W. ALEXANDER.

Witnesses:
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F. M. TOWNSEND.