(No Model.) 2 Sheets—Sheet 1.

L. A. HUFSCHMIDT & R. STYLES.

CAR FENDER.

No. 570,402. Patented Oct. 27, 1896.

FIG. 1.

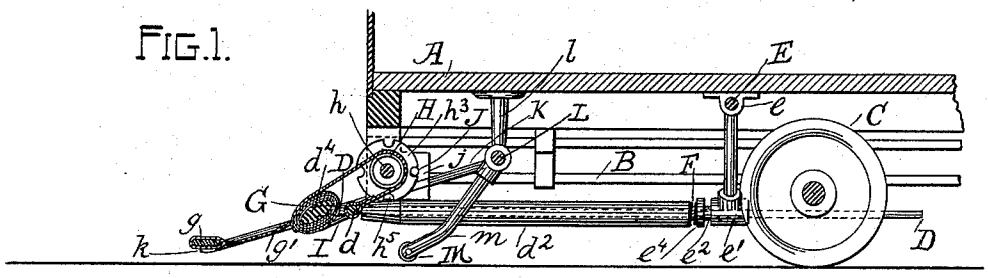


FIG. 2.

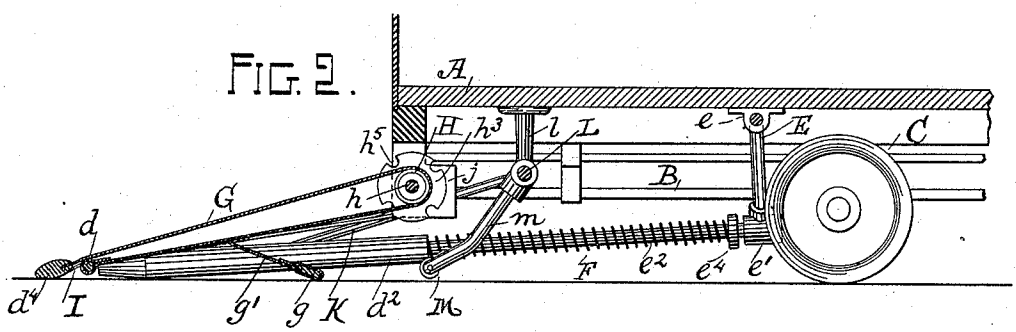
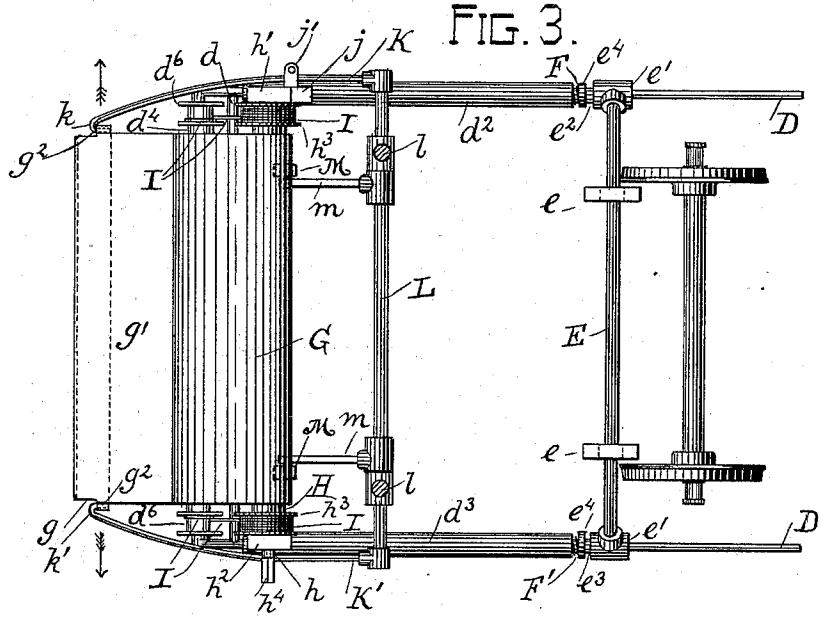


FIG. 3.



WITNESSES

George O'Byrne

Fabius F. Finch

INVENTORS

Louis A. Hufschmidt

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

(No Model.) 2 Sheets—Sheet 2.

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FIG. 4.

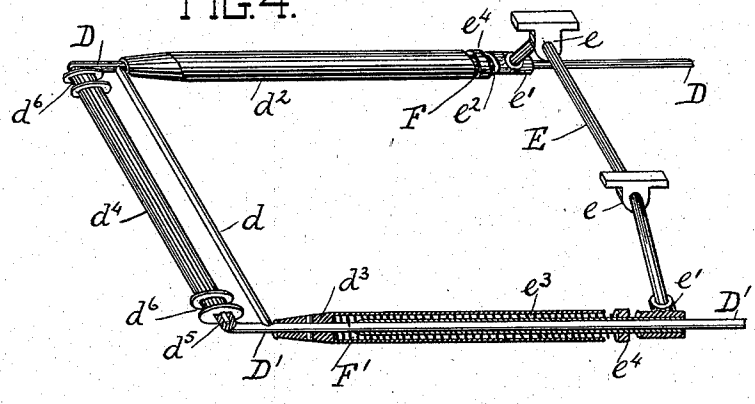


FIG. 5.

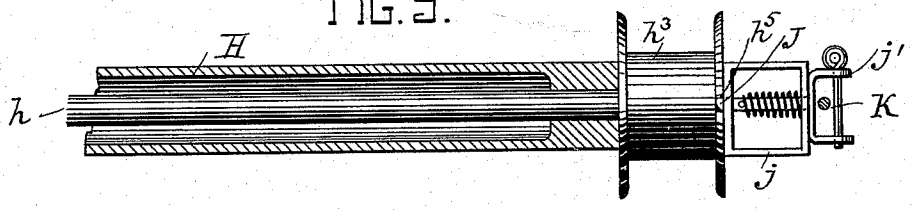
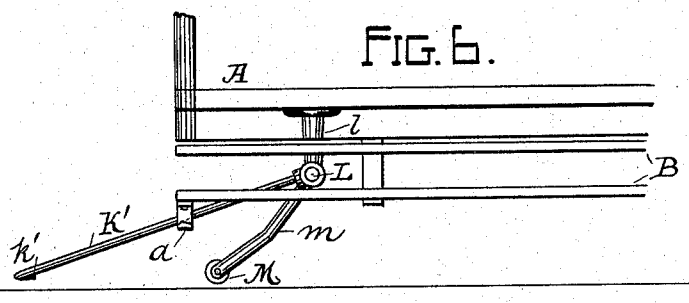


FIG. 6.



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UNITED STATES PATENT OFFICE.

LOUIS A. HUFSCHMIDT AND ROBERT STYLES, OF SAN FRANCISCO, CALIFORNIA, ASSIGNORS TO THEMSELVES AND HENRY HUFSCHMIDT, OF SAME PLACE.

CAR-FENDER.

SPECIFICATION forming part of Letters Patent No. 570,402, dated October 27, 1896.

Application filed March 27, 1896. Serial No. 585,129. (No model.)

To all whom it may concern:

Be it known that we, LOUIS A. HUFSCHMIDT and ROBERT STYLES, citizens of the United States, and residents of the city and county of San Francisco, State of California, have invented a new and useful Car-Fender, of which the following is a specification.

This invention has reference to devices affixed or appended to the front of street-cars for the protection of people that may chance to be in the way while the cars are in motion.

The object of our said invention is to provide a car-fender that will drop to the track upon being met by a body lying or falling across the same, whether animate or inanimate, and shoot forward to pick it up without mangling it or injuring it in any way.

A further object is to so arrange the construction as to deaden the force of the blow when the body thus encountered is struck by the fender.

The particular improvements devised and claimed by us will now be described with reference to the drawings hereunto annexed, in two sheets, which illustrate one good form of fender made according to the principle of our invention, and in which—

Figure 1 is a sectional elevation representing the said fender attached to the front end of a car with the working parts wound up ready for operation; Fig. 2, a similar view showing the fender outstretched; Fig. 3, a top plan of the entire fender detached from the car; Fig. 4, a perspective, partly in section, of the fender-actuating frame; Fig. 5, a detailed view, on an enlarged scale, of part of the winding mechanism and the locking and unlocking devices connected therewith; and Fig. 6, a side view illustrating separately the guard-wheels used for keeping up the fore part of the fender above the track while traveling over uneven ground.

Like letters of reference indicate like parts throughout these six views.

The letter A represents the lower front portion of a street-car, B the steps, usually placed on each side thereof, and C the forward car-wheels. It is under this portion of the car that our fender is placed, most of it being concealed from view when not in operation.

The frame employed for working our fender consists of two parallel rods D D′, joined by a cross-rod *d* near one end and suspended by the other end from the under side of the car through the agency of an oscillating hanger composed of a rod E, fitted in boxes *e* and having downwardly-bent ends provided with T-couplings *e′* or other suitable bearings through which the rods D D′ are adapted to slide. By preference small tubes e^2 e^3 are interposed between the T-couplings or bearings *e′* and the rods D D′ for the latter to slide in. These tubes are rigidly secured to the couplings and are arranged to telescope into larger-sized tubes d^2 d^3, carried by the rods D D′, thus covering said rods for the greater part of their length. Spiral springs F F′, coiled about the tubes e^2 e^3 and each confined between a collar e^4 thereon and the inner front end of the tubes d^2 d^3, tend to keep the two sets of tubes apart and throw the frame forward of the couplings. The forward end of the frame has across it an elliptical roller d^4, consisting of a bar more or less oval in cross-section and provided with end pins, as d^5, fitted in suitable sockets or holes in the ends of the rods D D′, which are curved inward to receive them. This roller is parallel with and located at a short distance from the transverse rod *d*.

The frame above described is made to spread out an apron G, passed over a roller H under the front end of the car and having its two ends secured, respectively, the lower one to the cross-rod and the upper one to the elliptical roller of the frame. This apron is made, preferably, of stout canvas or cloth, though it may be made also of leather or any convenient fabric having the requisite pliancy. The roller H is loosely mounted and freely revolves on a shaft *h*, laid transversely of the car and journaled in boxes *h′* h^2 thereunder. This roller holds up the apron while it is folded and unfolded and, through it, also the forward end of the actuating-frame. When the apron is spread out, the axes of rotation of the elliptical roller d^4, roller-shaft *h*, and hanger-rod E are substantially in line, as represented at Fig. 2.

The apron is furled up against the tension of the springs of the frame by turning the

oval roller under it. This is effected by means of ropes, cords, chains, or belts I, fastened at one end to drums d^6 on the roller d^4 and at the other end to drums h^3 on the roller-shaft h, the said ropes winding from one set of drums to the other in a direction opposite to that in which the apron itself is furled or unfurled. As they are wound upon the drums h^3 and unwound from the drums d^6 by turning the roller-shaft h, for instance, with a removable crank applied to the end h^4 thereof, the ropes revolve the elliptical roller upon its axis and consequently roll up the apron from the upper end, which causes the lower end attached to the rod d to recede in a corresponding ratio and pull back the frame. The apron and retracted frame can thus be brought in the position illustrated at Fig. 1, where the canvas is formed into a big pad or cushion right in front of the car, a little above the ground-line, and the springs F F′ are compressed so as to be completely covered, together with the inner tubes e e^3, by the outer tubes d^2 d^3, which for this reason are called "dust" or "atmosphere" protectors. The rods in the meanwhile slide rearward through the oscillating hanger until both ends of the frame are raised from the ground and substantially on a same level, as shown. Owing to the small angle of pull, due to the peculiar position and arrangement of the elliptical roller d^4, rod d, shaft h, and hanger-bearings e, which angle is still further diminished by the backward pressure of the spiral springs upon the hanger itself, the fore part of the frame keeps low down quite close to the ground, while it is drawn back and is lifted from the road-bed only when very near the car or when the weight to be raised up is much less than the resistance offered by the springs.

Reversely, when the springs are released and recoil the fore part of the frame immediately drops down and virtually sweeps the roadway in shooting forward and unrolling the apron. The apron is, however, prevented from unfurling and the spring-pressed frame normally kept back by a spring catch or latch J engaging suitable notches h^5 in the outer flange of one of the drums h^3. This catch passes through a small frame j in rear of one of the boxes provided for the roller-shaft h, and is rounded at its inner end in such a way as to allow the notches in the drum-flange to slip past it when the roller-shaft is turned to wind up the apron, but not in the opposite direction. The catch thus acts like a pawl on a ratchet-wheel and affords the same safety, so that the fender will usually stay wound up, and a man winding it can stop winding at any place or moment and yet will not leave the revolving apron slip or shoot out unnecessarily.

The catch J is pulled out of the notched drum and the spring-actuated frame released by means of spring-arms K K′, projected forwardly from a rock-shaft L, running through hangers l, secured to the under side of the car back of the roller-shaft h. One of these arms is passed through a clevis j', formed on the outer end of the catch J, while the other arm passes below the end h^4 of the shaft h on the opposite side of the car. Both arms are inclined downwardly and reach out forward of the rolled-up apron to a point about two feet distant from the car, where they are curved and drawn in toward each other by a bar g, fastened to a flap g', secured to the outside of the apron. This bar has eyelets or lugs g^2, adapted to be engaged by the outer ends of the spring-arms, which are bent inwardly for this purpose, as at k k'. When they are thus engaged, the flap is kept taut and projecting forward of the apron close to the ground, as shown at Fig. 1; but if the bar from any cause be pushed back, so as to disengage the eyelets, the arms may then spring apart and out in the direction of the arrows in Fig. 3 and forthwith release the spring-pressed frame by pulling out the spring-catch and leaving the apron free to unfold.

It will now be seen that if an obstruction be met on the roadway by a moving car provided with our fender the flap-bar will first be encountered and pushed back and the spring-arms will thereupon be let loose. The arms being sprung, the latch is retracted and the winding mechanism set free, thereby liberating also the fender-frame, which is immediately thrown to the ground by the recoil of the springs hidden in the tubes. As these springs and the frame shoot forward, unrolling the apron, they strike the object with that part of the canvas that was wrapped around the oval roller and repel it from the car as with a cushion, the canvas being yet in such a compact state that the body receiving the blow is not injured thereby.

The elliptical roller begins to act upon the object the instant it is struck, picking it up while turning and sliding forward under it, and lifting it onto the unfolding apron, where it is caught like in a scoop-net. A body thus scooped in by the fender is practically safe from bruises or fractures, as the canvas is soft and yielding and acts like a spring-mattress the moment the body enters. As the apron unrolls from the ground outward a body can never pass under it to the wheels of the car, the fender obstructing the way and reaching across the whole front of the car; but if after the unfolding apparatus is sprung and the apron is stretched out with a body therein the fender should strike a projecting obstacle, such as a stone, it will move back or give, letting the stone pass under the oval roller and not double up or break, as some other fenders would do under these circumstances. The mechanism is so arranged, it will be observed, that no matter where an object strikes the front guard or flap-bar it will spring or unlock the fender, thereby shooting out the apron and acting as described before. After the fender has been brought into operation it can be rewound easily and

reset by first removing the pin of the clevis j', so as to disengage it from the arm that pulled out the catch J and causing the latter to spring again into engagement with the notched flange of the rope-winding drum adjacent to it. Upon turning the roller-shaft h with a crank, as before stated, the apron can then be furled up anew until the front lap and bar have been brought into the required position for engagement with the spring-arms. The ends of these arms having been slipped into the eyelets of the bar, the clevis-pin is dropped back into place, and the fender is reset ready for another operation.

We have provided our fender with guard-rollers or track-wheels M, which will prevent it from being run into the ground when traveling on a hilly street. These wheels are mounted on the lower ends of forwardly-bent rods m, secured to the rock-shaft L, to which the spring-arms K K′ are attached, and they are set so as to normally rest at a very short distance above the track-rails. Now when the car ascends a hill the front of the car will naturally lower itself to or near the road-bed until the trucks assume the pitch of the grade. This would cause the fender to run against the road-bed if its fore part were not sufficiently raised; but as the guard-wheels come into contact with and bear upon the rails as soon as the grade is reached they rock the shaft L and operate to lift the spring-arms, the outer ends of which raise the front bar, so that it will not be sprung by its striking the track or the ground at the foot of the hill.

The front lap and guard-wheels are prevented from reaching too low down on level ground by rests a, upon which the spring-arms bear. The fender will work as well on a single as on a double truck car, giving the same satisfactory results. On double-truck cars the guard-rollers or track-wheels might be abandoned if the trucks were properly constructed and the car well steadied at each end.

Having now described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a car-fender, a spring-actuated endwise-moving frame, a roller carried thereby, an apron connected to and wound upon this roller, a second roller upon the car, and to which the opposite end of the apron is secured, and an automatic releasing mechanism whereby the frame is released and the apron unrolled, substantially as shown.

2. A car-fender, consisting of a supporting-frame attached to the car, a roller journaled under the end of the car, and an apron that is passed around the roller, combined with the telescoping frame for shooting the apron forward, and a roller upon which the apron is rolled, substantially as described.

3. In a car-fender, the combination of a suitably-supported apron, an elliptical roller adapted to fold and unfold said apron from the outer edge thereof and actuating mechanism, substantially as described.

4. In a car-fender, the combination of a suitably-supported apron, a spring-pressed frame fastened to one end thereof, a roller carried by said frame secured to the other end of said apron, and means for rolling up the apron on said roller oppositely to the frame, substantially as described.

5. In a car-fender, the combination of a spring-pressed frame, an oscillating hanger supporting the rear end thereof, an apron fastened by one end in said frame, a roller carried by the frame secured to the other end of said apron, means for holding up the apron, and a winding mechanism connected with said roller, substantially as described.

6. In a car-fender the combination of a spring-pressed frame suitably supported at the rear end, a roller-shaft, an apron passed over said shaft and secured in said frame, a roller also secured in the frame and adapted to furl said apron, means, such as ropes and drums, for turning said roller from said shaft, a catch for checking the backward movement of the shaft, spring-arms adapted to pull out said catch, and a flap connected with the apron and holding said arms, substantially as described.

7. In a car-fender, the rock-shaft L, extending across under the car, and provided with the forwardly-bent rods m, carrying rollers, and the spring-arms K, K′, and the catch J, connected to one of the arms, combined with the spring-actuated frame, a roller upon the front end of the frame, a second roller upon the car and provided with a ratchet, and the apron which is fastened to both of the rollers, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

L. A. HUFSCHMIDT. [L. S.]
R. STYLES. [L. S.]

Witnesses:
DANIEL CALLAGHAN,
A. H. STE. MARIE.