

(No Model.)

W. E. WOODBRIDGE.
CAR FENDER.

No. 546,797.

Patented Sept. 24, 1895.

Fig. 1.

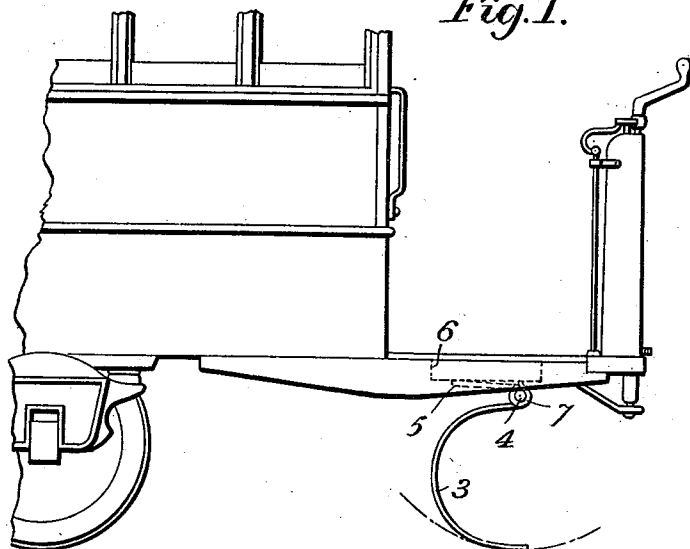


Fig. 2.

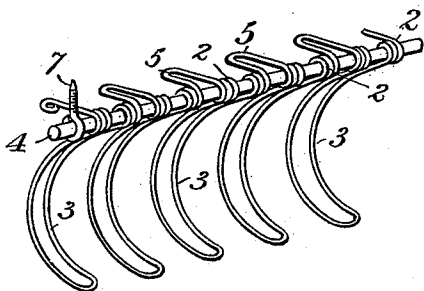


Fig. 3.

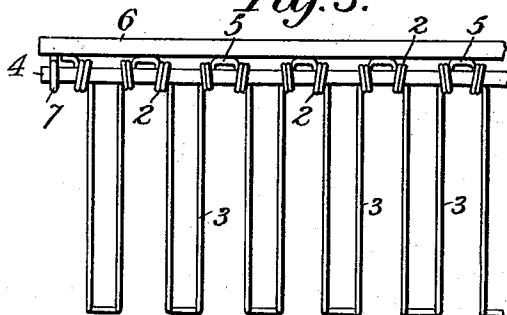


Fig. 4.

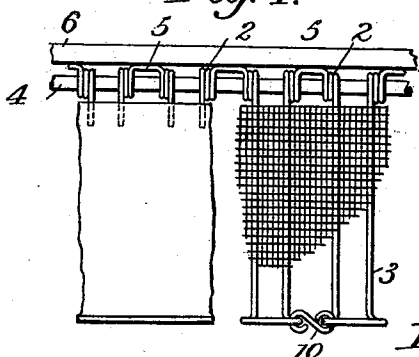


Fig. 7.

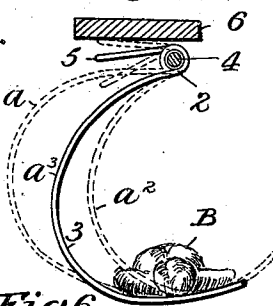


Fig. 5.

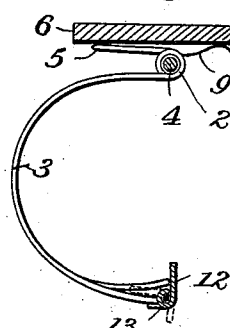


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM E. WOODBRIDGE, OF WASHINGTON, DISTRICT OF COLUMBIA.

CAR-FENDER.

SPECIFICATION forming part of Letters Patent No. 546,797, dated September 24, 1895.

Application filed December 1, 1894. Serial No. 530,604. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. WOODBRIDGE, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Car-Fenders, of which the following is a specification.

This invention relates to certain new and useful improvements in fenders for cars and other similar vehicles; and it consists, substantially, in such features thereof as will hereinafter be more particularly described.

Many forms of car-fenders have been heretofore devised for the purpose of preventing bodily injury and loss of life in the event of a person being struck by the car while the latter is in motion or under speed. In some instances the devices suggested embody the use of means by which the person or object when struck is simply turned off to one side of the track, so as not to be crushed beneath the car; but with this form there is great danger of the person or object being killed or injured by other vehicles which may be passing at the time. In other former instances the fender consists, in the main, of a mattress or net designed to catch or receive the person or object in such manner that no harm or injury will be had; but while these forms may possess more or less valuable characteristics for the performances of their intended functions under some conditions they are yet lacking in the respect that their working parts frequently get out of order, and they are therefore not always to be relied upon in use.

The object of my invention is to provide a fender for cars and other similar vehicles embodying means whereby a person or body when struck will be gently caught, lifted up, and retained without harm or injury and without sudden shock or injury to persons who may be seated within the car.

A further object of the invention is to overcome many of the disadvantages common to former devices for a similar purpose, and to provide a fender that can be relied upon at all times to act with equal effect.

A still further object is to simplify the construction and cheapen the cost of manufacture of the fender, all substantially as will

hereinafter appear, when taken in connection with the accompanying drawings, in which—

Figure 1 represents in side elevation a portion of a car having my improvements embodied in connection therewith. Fig. 2 is a perspective of one form of my improved fender detached from the car. Fig. 3 is a rear elevation thereof. Fig. 4 is a front elevation representing the curved arms as being joined or fastened together, and also indicating in crossed lines the use of a lining for the fender. Fig. 5 is a side view of the fender, illustrating the combined tripper and retaining-flap at the lower extremities of the curved arms, the dotted lines showing the flap in the position assumed when a person or object has been struck and the full lines the normal position. Fig. 6 is a detail view showing the manner of attaching the flaps to the arms, and Fig. 7 is a sectional view illustrating the use of the fender.

In carrying my invention into effect I provide beneath the car, or at or near the forward end thereof, a suitable cradle, which preferably extends for the full width of the car, and which is so suspended in position as to be capable of swinging forwardly and at the same time to offer a yielding resistance whenever an object is struck thereby. In other words, the cradle is formed or provided in any suitable manner with resilient or elastic resistance devices, which are capable of being attached to the cradle in a great many different ways, so that when the cradle is forced backward against the elastic resistance by coming in contact with the body the cradle yields to prevent shock, and as it moves forward with the body caught up under the reaction of the resistance the cradle swings on its support, holding the body therein. Thus the spring cradle or fender may be said to swing bodily upon its fulcrum or support, independent of its resilient action, to hold and retain the body after being caught without shock by means of its spring action. In order to perform this function properly, it is important that the bottom of the cradle should conform in section nearly to a curve having the point of support for its center. This conformation also prevents the crushing

effect which must result from having the forward portion of the fender more remote from the center of motion upon any member or object which might be caught under it.

5 Various constructions could be resorted to in the practice of my invention; but I prefer that shown in the accompanying drawings, wherein I construct the cradle or fender of a single piece of wire, which, by the use of suitable appliances or machinery, is bent into a series of concentric coils 2, a series of downwardly-curved arms or members 3, and between the adjacent coils of each pair of coils 2 the said wire is bent to form horizontally-disposed arms or members 5, which constitute bearings or abutting points for the fender either against the under side of the car-platform or a sill 6, extending across the platform beneath and at or near the forward end thereof. Thus the cradle comprises what may be termed a "continuous" series of springs having the curved arms 3 to receive the body and the bearing or abutting arms 5, the whole being supported by the coils 2 in such a manner as to utilize the resilient action of the springs, as well as the bodily swinging action of the cradle.

The cradle or fender may be suspended to the car or other body in any suitable way, and, as shown, I use a supporting-rod 4, passing through the coils 2 of the springs and secured to the sill 6 by eyebolts 7 or equivalent devices, and the rod may be headed or provided at each end with a pin or nut to retain it in position. Instead of so supporting or suspending the fender, it is obvious that I might use any other preferred means, as long as the curved arms 3 extend downward in sufficiently close proximity to the ground, and the arms or bearing-points 5 are against the sill or under side of the platform, and the cradle is free to swing upon its support. The curved arms are normally in parallelism, with their free ends nearest the ground and preferably directly below the support, and whenever an object is encountered it will be caught up and the impact or weight of the object will force the cradle inwardly against the action of the resilient bearings or abutting points 5, which yield to prevent shock, and as the resilient bearings tend to throw the cradle forward the cradle, being loosely mounted on its support, will swing forward without resistance, and the ends of the springs will project upward and prevent the body being discharged or thrown out. This action of the cradle is indicated in Fig. 7, wherein the dotted lines a^1 show it in its rear position, the dotted lines a^2 in its forward position as it swings under the action of the resilient bearing, and the full lines a^3 in a position with the body B supported or retained thereon.

In order to retain the cradle in its normal position on its support, I provide a retaining device, as the light spring 9, which is sufficient to prevent the cradle swinging under normal

conditions. While it is desirable in some instances that the lower extremities of the curved arms be permitted to exercise a limited independent action with respect to each other, it is yet undesirable that they be permitted to work too freely in this regard, and therefore in some instances I connect the said arms at their extremities or lower ends by links 10, either of wire or other suitable material, (see Fig. 4,) and in this way, while the action thereof is substantially the same, the arms are prevented from distortion and still exercise the functions ascribed to them hereinbefore. I have also hereinbefore defined the action of the lower extremities of the curved arms in serving to trip the object struck and then to retain the object after being caught and held as the cradle or fender swings on its support. To render such action more positive it is desirable to furnish additional devices, which when struck will yield and turn downwardly upon the cradle and be again restored in an automatic manner. Various devices could be resorted to for the purpose, but preferably I employ the combined tripping and retaining device, such as is shown in Figs. 5 and 6, wherein 12 represents a strip of wood or metal or other suitable material, preferably extending the entire length of the cradle, as shown, and being so connected with the lower extremities of the arms as to be capable of turning, substantially as shown in dotted lines in said figures, but hinged in such a way as to be incapable of turning in the reverse direction much beyond the vertical position. The said flap could be attached in different ways; but, as herein shown, it is provided at different points on its inner side with loops or eyes 13, engaging with corresponding curved arms, while the ends of the intermediate arms exert a pressure against said flap, tending to keep the same in an upright position, further motion being restrained by portions of or projections from the lower edge of the flap, which extend a short distance under the arms to which the flap is hinged. Instead, however, of the said flap extending the entire length of the cradle as a whole, it may be formed of a number of sections and still exercise the same effect or function. It will be seen that whether the flap be formed in several sections or of a single section whenever a body is struck the flap will be turned down, as shown in dotted lines, and as soon as relieved by the body passing beyond its edge it will be immediately restored to its vertical position by the action of the lower ends of the curved arms intermediate of those to which the flap is attached or by other means and aid in retaining the body in the cradle. The cradle or fender as thus arranged is sometimes provided on its inner side with a lining of canvas or other suitable material, as indicated in Fig. 4, which will not interfere with the proper working thereof, and which in some instances proves a very

desirable feature. It will be understood that instead of forming my improved fender or cradle of a single piece of wire I may employ several pieces, and also instead of the wire I may use sheet metal for the cradle proper and employ suitable springs for the bearings or abutting points.

My invention is capable of many modifications, both in its general structure as well as in the means of suspending or hanging the same, and therefore while I have herein described and shown certain preferred details I do not wish to be understood as limiting myself thereto. While I have shown the fender as supported under the platform of the car, it can, of course, be otherwise supported in any proper position, and while I have shown a straight fender, it can be curved horizontally or of other desired shape. While the fender is shown as made of one continuous wire, it may be made in sections of contiguous arms of one piece of metal.

I claim—

1. A car fender comprising a freely swinging cradle having resilient bearings or abutting arms swinging with the cradle, and suspended by means of coiled springs from which its resiliency is derived, substantially as described.

2. A car fender comprising a spring cradle pivotally or loosely supported from the car and adapted to swing freely, the lower portion having a curvature whereby it is adapted to retain the object received within or upon it, in opposition to the centrifugal force generated by the partial rotation of the cradle upon its support, substantially as described.

3. A car-fender comprising a swinging cradle having downwardly curved spring arms and resilient bearings or abutting-points composed of projecting loops intermediate to the arms and connecting each arm with the arms adjacent to it on either side, substantially as described.

4. A car-fender comprising a single piece of wire or rod bent or turned into a number of co-axial spring coils, curved arms, and projecting bearings or abutting-points, substantially as described.

5. A car-fender comprising a number of co-axial spring coils and a series of curved arms and of resilient bearings or abutting-points formed in loops of a continuous wire or rod,

combined with a rod passing through said coils and suitable supports or attachments to the car, substantially as described.

6. A car fender comprising a swinging cradle combined with an inwardly folding retaining flap pivoted to the lower edge of the cradle, and means adapted to return it automatically after depression to its normal position, substantially as described.

7. A car fender comprising a series of downwardly curved spring arms, combined with a flap secured to the lower extremities of said arms and adapted to be turned against the arms and automatically restored to position, substantially as described.

8. The combination with the fender or cradle constructed with the downwardly curved spring arms, of the flap loosely attached to the lower extremities of alternating arms and normally maintained in a vertical position by the arms, substantially as described.

9. A car-fender comprising a cradle adapted to swing freely in an outward direction and provided with elastic resistances or bearing-points formed of loops continuous with the coiled springs from which the resiliency is derived and which also serve as a means of suspension or carrier, substantially as described.

10. A car-fender comprising a number of downwardly curved arms flexibly joined or united at their lower ends by means of independent links connecting the adjoining arm, combined with resilient bearings or abutting-points, substantially as described.

11. The combination with a car or other similar vehicle, of a rod supported by suitable attachments to the same, and a swinging cradle suspended from said rod, the said cradle being formed or provided with elastic or resilient portions adapted to act upon the cradle whenever the latter is forced inwardly, and with a retaining flap hinged to the lower edge of the cradle and capable of being turned inwardly against its bottom, and automatically restored to a vertical position by the action of springs, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM E. WOODBRIDGE.

Witnesses:

F. L. FREEMAN,

E. E. ELLIS.