

- [54] **PEDESTRIAN PROTECTING FENDER**
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293/40, 293/71 R

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[58] Field of Search 293/15, 16, 24, 25,
293/31, 32, 33, 34, 35, 36, 37, 38, 40, 71 R

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[57] **ABSTRACT**

A pedestrian life saving apparatus for a motorcar. The apparatus includes a mounting frame secured to the underside of a chassis and bumper of a motorcar for mounting a mechanism of the apparatus, a panel attached to the front portion of a bumper of the car through a cushioning means, a pair of poles having pins at the lower ends thereof and perpendicular to said panel, said poles penetrating through said panel at both ends thereof, a soft net stretched between the upper portion of said poles, a slidable frame with a life net stretched thereon and slidable on said mounting frame, a spring mounted between said mounting frame and said slidable frame. The poles are pivoted at the middle portion thereof on the panel. The pins of the poles are engaged with the front portion of the slidable frame so as to keep the slidable frame under the chassis of the car against the spring, but are disengageable with the slidable frame by the rocking movement of the poles, whereby the slidable frame being projected forward of the bumper by the force of the spring.

12 Claims, 6 Drawing Figures

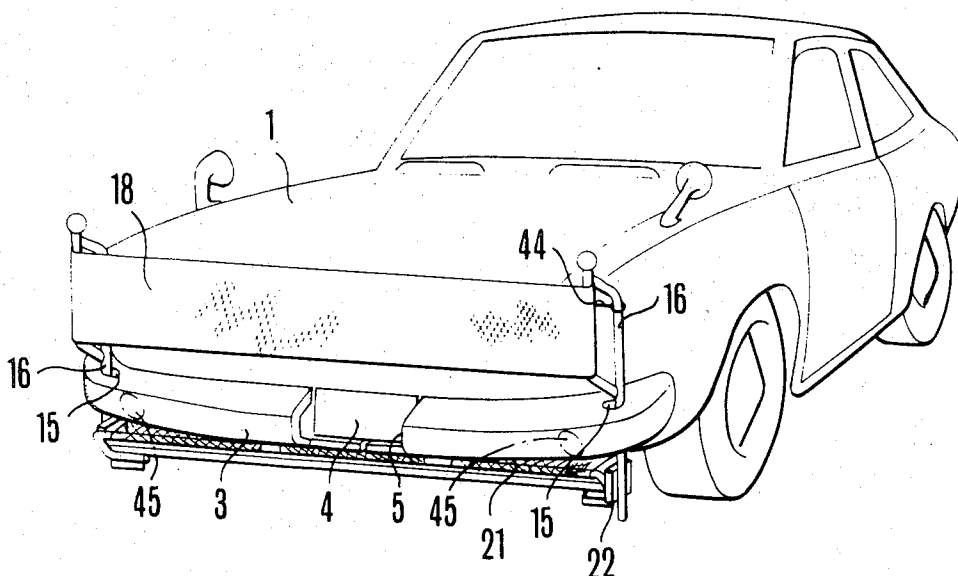


FIG. 1

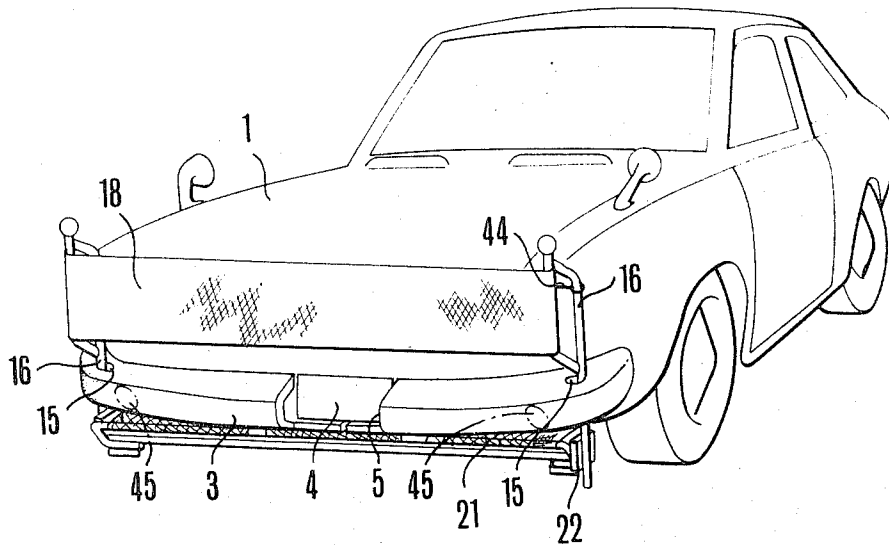
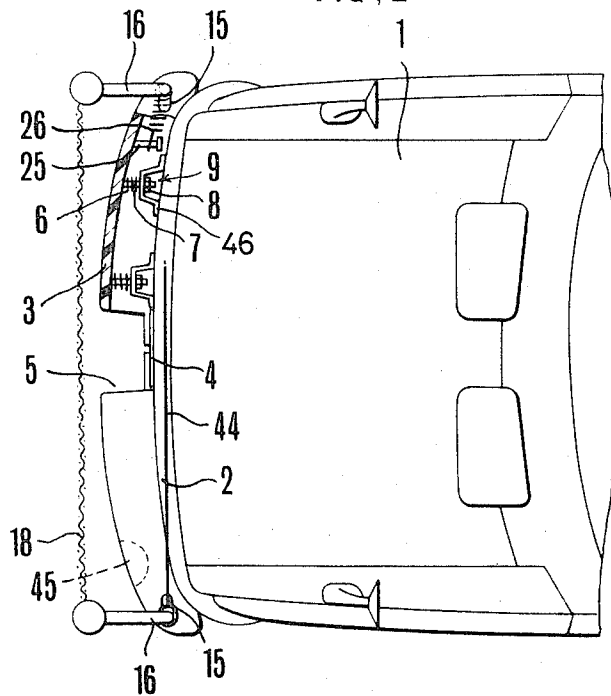
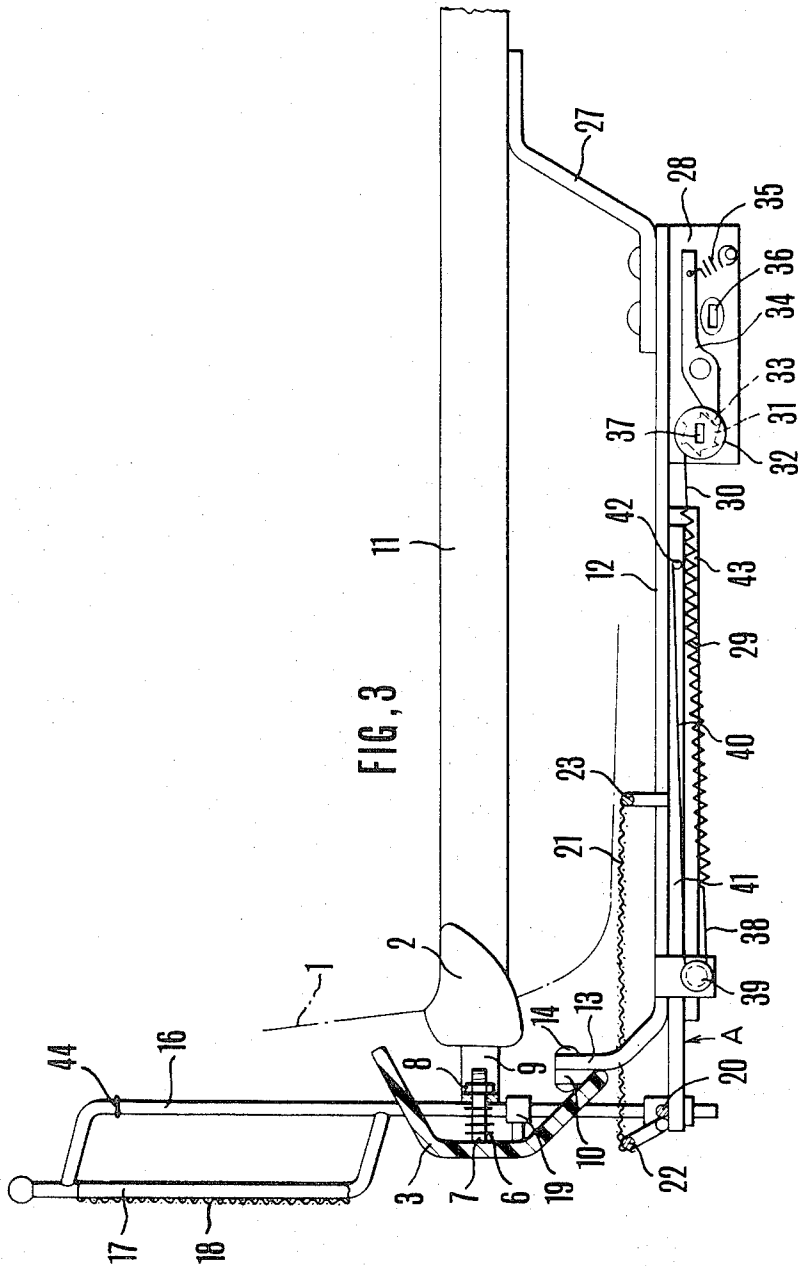


FIG. 2





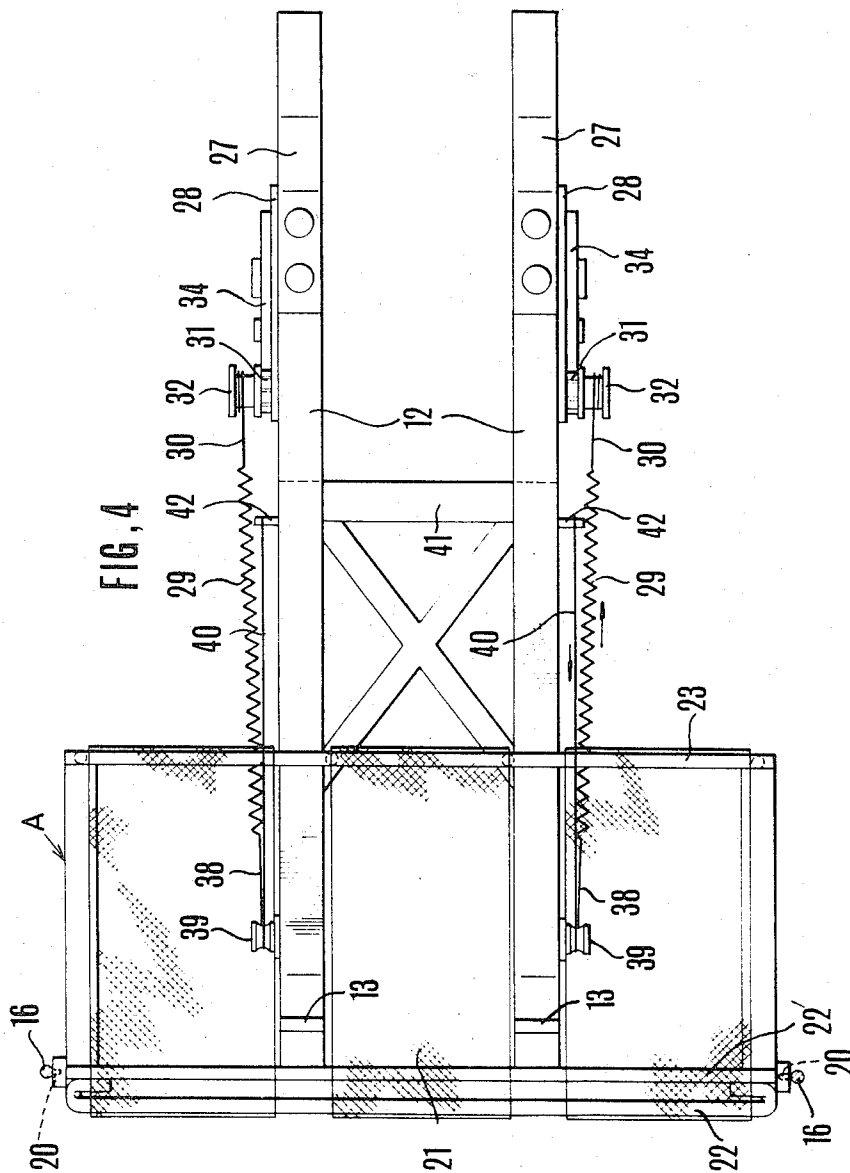


FIG. 5

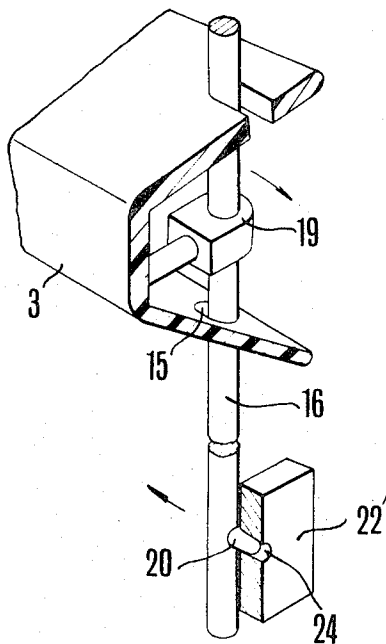
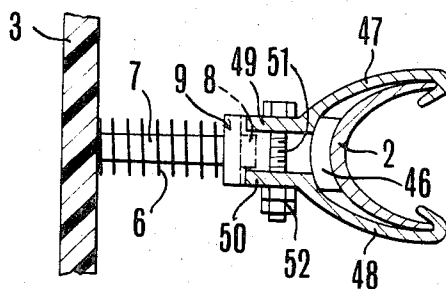


FIG. 6



PEDESTRIAN PROTECTING FENDER

The present invention relates to a life-saving device attached to a motor-car.

The life-saving device according to the present invention is characterized in that it comprises a soft net stretched at the front of a motor-car and a life net mounted in the lower portion of the chassis thereof, and when collision might have taken place between a motor-car and a pedestrian, it will save him by projecting instantaneously the life net adapted to take up him.

The attached drawings show a preferred embodiment of the present invention wherein,

FIG. 1 is an oblique view of a motor-car attached with the device of the present invention,

FIG. 2 is a plan of the front portion of a motor-car attached with the device of the present invention,

FIG. 3 is a side view of the principal part of the device according to the present invention,

FIG. 4 is a plan of the life net,

FIG. 5 is an oblique view showing the lower end portion of the pole illustrated in the upper portion of FIG. 2, and

FIG. 6 is a cross section showing another embodiment of panel attachment.

The detail of the present invention will be explained hereunder, referring to the accompanying drawings.

In FIGS. 1 to 3, 1 indicates a body of a motor-car, and 2 indicates a bumper thereof.

3 indicates a panel, the material of which is composed of soft resilient synthetic rubber or synthetic resin, and the form of which is substantially the same with the bumper 2 and somewhat larger in width.

Said panel 3 is provided at the central portion thereof with an opening 5 for exposing a number plate of the motor-car.

And also, the panel 3 is attached substantially parallel with the bumper 2 so as to cover the front side thereof. Further, the panel 3 is attached to the bumper with a plurality of rods 7 through cushion springs 6 to be slidable in the direction of the bumper. Each of said rod 7 is secured at one end thereof to the panel 3 and the other end thereof is fitted loosely in each holder 9 secured to the bumper 2 and a flange 8 formed at the end of the rod 7 prevents the panel from coming out of the holder 9.

In the drawings, the rods 7 are shown as attached at four positions.

The lower edge of the panel 3 is bent inwardly as shown in FIG. 3 and a bent portion 10 and a bent portion 13 at the front end of a fixing plate 12 mounted at the lower side of a chassis 11 of the motor-car are secured with a bolt 14.

Moreover, at both ends of the panel 3 are bored oblong holes 15 and in the oblong holes are fitted loosely poles 16 uprightly.

The poles are formed with soft resilient material such as synthetic rubber having somewhat rigid slender steel rod as a core, on the portions projected upwardly from the panel 3 are provided overhangs 17 and between both the overhangs 17 is stretched a soft net 18 made of transparent rope.

As shown in FIG. 5, the pole 16 is inserted at the middle portion thereof in a holding ring 19 secured to the panel 3 through an arm to serve as a rocking fulcrum of the pole.

Further, near the lower end of the pole 16 is provided a pin 20 protruded in the direction of the center of the panel 3.

Said pin 20 is fitted disengageably in each hole 24 formed at both ends of a frame 22' located at the rear of a front frame 22 and normally the pin 20 is held in the hole 24 by a holding spring 26, one end of which is fixed to the lower end of the pole 16, and the other end of which to an engaging stud 25 located inside the pole and secured to the panel, as shown in FIG. 2.

And, the holding spring 26 is optional to adjust the strength for holding the pin 20 in the hole 24.

The pole 16 shown in FIG. 5 is the lower portion of the pole shown in the left side of FIG. 1 and also in the upper side of FIG. 2. When the upper portion than the ring 19 of the pole 16 is pulled in the direction of the arrow in FIG. 5 around the holding ring 19 as the center, then the portion of the pole 16 below the holding ring 19 will be moved oppositely to the upper portion around the holding ring as the fulcrum. This movement causes the pin 20 to go out of the hole 24 of the side frame 22' against the holding spring 26.

At the lower portion of the chassis of motor-car are secured parallelly fixing plates 12 through a mounting piece 27, and on the fixing plates 12 is mounted a slidable frame A for receiving a person.

As for the mounting piece 27, those connected with 2 or 3 pieces together may be used according to the kind of a motor-car or the form of a chassis.

Referring to FIGS. 3 and 4, the slidable frame A comprises a front and rear frame 22, 23, a net 21 stretched therebetween, a frame 22' mounted at the rear of said frame 22, and a U-shaped supporting frame 41 on the front portion of which said frames 22, 22' and 23 are mounted securely, the plates 12 being inserted slidably between said supporting frame 41 and said frames 22, 22' and 23, and also said supporting frame 41 being inserted slidably between the mounting plates 12 and a frame 43 fixed to the plates 12.

And, the front frame 22 stretched with the life-net 21 is made of a bar of soft and resilient material and preferably covered with softer material such as sponge to moderate collision if it strikes against a human body when the life-net is projected.

A wire winding-up mechanism 28 is mounted at the rear portion of each of said mounting plate 12.

In the winding-up mechanism, there is disposed a winding cylinder 32 to wind up a wire 30 located at one end of a spring 29 and on the winding cylinder is formed a ratchet wheel 31.

The ratchet wheel 31 is normally engaged with a pawl of a ratchet piece 34. At the other end of the ratchet piece is provided a spring 35 to hold said pawl engaged with the ratchet wheel 31.

Further, in the winding-up mechanism 28 is provided a cam 36 and in the center of the cam is bored a hole. The cam can be turned by a proper operating rod inserted in the hole of the cam to disengage the pawl from the ratchet wheel 31 or to engage the pawl with the ratchet wheel 31.

Similarly, a hole 37 is provided on the winding cylinder 32 which is turned by a proper rod inserted in the hole 37 to wind the wire 30 connected to one end of the spring 29.

A wire 40 connected to the other end of said spring 29 is returned toward the spring through a pulley 39.

The end of the wire 40 is secured to an engaging pin 42 fixed to the frame 41.

A projecting mechanism of the frame A is constructed with said winding-up mechanism, the wire 40 connected with the engaging pin 42 of the frame 41, the spring 29, and the wire 30.

In FIGS. 1, 2 and 3, 44 is a wire stretched tensely between the poles 16, 16, each end of said wire being fixed to the upper portion of the poles 16. This wire is provided to prevent the twist of the poles 16. Without such wire, the power transmitted to the pin 20 provided on the lower end of the pole 16 is much reduced owing to the twist of the pole when the external force is applied to the net 18 stretched between the overhangs 17 of the poles 16.

Numeral 45 is a window formed in the panel 3 to expose a direction indicating light of a motor-car. The window 45 can be changed in position and form according to the kind of a motor-car.

FIG. 6 shows another embodiment wherein the panel 3 is attached to the bumper 2, the holder 9 in FIG. 2 is not to be fixed directly to the bumper 2 with bolts, the base portion 46 of the holder 9 is clamped securely to the bumper 2 with fittings 47, 48. The fittings 47, 48 have engaging portions at one ends thereof engaging with the bumper 2 and the other ends 49, 50 are clamped securely with each other with a bolt 51 and nuts 52. When the base portion 46 of the holder 9 is secured to the bumper 2 with the fittings 47, 48 like this, it is not necessary to make a bolt hole and the like in the bumper 2 when securing the holder 9, and the holder 9 can be mounted easily on any existing motor-car.

And, the mounting position of the wire winding-up mechanism illustrated in FIG. 3 can be changed optionally such as rearward of the front wheels even if the space between the bumper and the front wheels is narrow.

Furthermore, when the life-saving apparatus according to the present invention is mounted on a motor-car, it is required that there will be absolutely no trouble for the control system and the like for safe driving of a motor-car, and if the thickness of the whole apparatus is made as thin as possible and also as light and rigid as possible, the mechanism of the present invention can be mounted only on the underside of the central front portion and on the front portion of the front wheels of a motor-car, so that safety driving can be assured from the point of such arrangement of the mechanism of the invention.

The life-saving apparatus of a motor-car according to the present invention has a construction as above mentioned, when the motor-car collides with a pedestrian during driving, the stretched soft net 18 made with transparent rope is bent by shock of the collision, and the upper portion of both poles 16, 16 stretched with the net is bent inward around the holding ring 19 as the fulcrum.

The lower portions of both poles below the holding rings 19 are rocked oppositely against the spring 26. As the result, the pins 20 at the lower ends of the poles will come out of the holes 24 of the frame 22'. When the pins 20 come out of the holes 24, simultaneously the contracting force of the spring 29 as the projecting mechanism pulls the wire 40 in the direction of the arrow in FIG. 4.

This results in the instantaneous forward projection of the slidable frame A to the front of the motor-car through the engaging pin 42.

At the front of the slidable frame A is stretched the life net 21 between the frames 22, 23, so that a pedestrian may be protected from being damaged with the wheel or the body of motor-car by taking up the lifted foot with the life net.

As mentioned above, when a pedestrian collides with the soft net 18 made with transparent rope, stretched at the front of motor-car, the life net 21 bends the poles 16, 16 around the holding rings 19 as the fulcrums and as the result thereof, the pins 20 at the lower ends of the poles are drawn out of the holes 24 of the frame 22'.

And, the frames 22, 23 fixed to the supporting frame 41 and the life net 21 stretched between the frames 22 and 23 are projected instantaneously to the front of the motor-car by the contracting force of the spring 29 through the wire 40 to save the pedestrian.

To put back the life net 21 projected to the front of motor-car into the lower portion of the motor-car body, the slidable frame A is pushed in the lower portion of the motor-car 1 against the spring 29 and then the pins 20 at the lower ends of the poles 16 are inserted in the holes 24 of the front frame 22 against the holding spring 26, or the slideable frame A will be put back considerably easily in the lower portion of the motor-car body by carrying out the following process; the cam 36 is turned by an operating rod to disengage the pawl 33 from the ratchet wheel 31, and while this state is held, the wire 32 is loosened to keep the spring 31 not to exert contracting force, and then the frame A is put back in the lower portion of the motor-car 1, the pins 20 are inserted in the holes 24 of the side frame 22, and thereafter the cam 36 is turned again, the pawl 33 is engaged to the ratchet wheel 31 to prevent the reverse rotation of the ratchet wheel, the ratchet wheel 31 is turned with an operating rod inserted in the hole 37 of the winding cylinder 32 to wind the wire 30 against the force of the spring 29 and then the spring 29 is stretched.

And, when it is not required for the apparatus according to the present invention to operate, the pawl 33 is disengaged from the ratchet wheel 31, the wire 30 is wound back and the spring 29 is contracted, then even if any shock is applied to the net 18, the apparatus shall never be operated.

And, the projecting mechanism of the slidable frame A according to the present invention is shown in a side view in FIG. 3, and as occasion demands, the side portion thereof may be covered with rubber cover to prevent sand and soil from entering the projecting mechanism and to obtain an effect for arresting sound at operation.

As above mentioned, the life-saving apparatus according to the present invention has a great effect in life-saving as it can be mounted easily in an existing motor-car and also may be manufactured at a relatively low cost, and is feasible to prevent a pedestrian collided by motor-car from contacting against the wheel or the car body by dipping up him with the life net.

What is claimed is:

1. A life saving apparatus for a motor-car comprising a mounting frame secured to the underside of a chassis of a motor-car for mounting a mechanism of the apparatus, a panel attached to the front portion of a bumper

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of the motor-car through a cushioning means, poles erected upright at both ends of said panel and penetrating therethrough, said poles having pins at the lower ends thereof and pivoted at the middle portion thereof on said panel, a soft net stretched between the upper portion of said poles, a slidable frame with a life net stretched thereon and slidable longitudinally on said mounting frame, a spring mounted between said mounting frame and said slidable frame, said pins being engaged with the front portion of said slidable frame to keep said slidable frame under the chassis of the motor-car, but being disengageable therewith by the rocking movement of said poles, thereby said slidable frame being projected forward of the bumper by said spring.

2. A life saving apparatus as claimed in claim 1, wherein said panel comprises a moulded article of soft resilient synthetic rubber or syntetic resin and is formed into substantially the same shape with the bumper of the motor-car but larger in width, said panel having at the central portion thereof an opening large enough to expose a number plate of the car, and being attached parallel to the bumper to cover the front portion thereof through the cushioning means.

3. A life saving apparatus as claimed in claim 2, wherein said panel is attached to the bumper through a cushioning means slidable with respect to the bumper.

4. A life saving apparatus as claimed in claim 3, wherein said cushioning means comprises a holder fixed detachably to the bumper through a clamp, a bolt, one end of which is fixed to the panel and the other end of which is inserted into said holder slidably but not to come out, and a spring mounted around said bolt and between the panel and said holder.

5. A life saving apparatus as claimed in claim 1, wherein said poles with the soft net stretched therebetween are made of soft elastic material having a slight rigidity, said poles being erected uprightly through oblong holes formed at both ends of the panel to allow said poles to pass loosely.

6. A life saving apparatus as claimed in claim 5, wherein said poles with the soft net stretched therebetween are inserted at the middle portion thereof into

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rings fixed to the panel so as to serve as fulcras of the rocking movement of said poles.

7. A life saving apparatus as claimed in claim 1, wherein said pins provided on the lower ends of said poles are engaging detachably with holes provided at both ends of a frame mounted at the front portion of said slidable frame, and springs are provided between the lower ends of said poles and studs fixed to said panel, said springs being holding said pins not to come out of said holes.

8. A life saving apparatus as claimed in claim 1, wherein said slidable frame comprises front and rear frames with the life net stretched therebetween, and a supporting frame supporting said front and rear frames thereon with a space, said supporting frame being mounted slidably between said mounting frame and a frame fixed to said mounting frame.

9. A life saving apparatus as claimed in claim 8, wherein a frame is provided at the rear of said front frame and adjacent to said front frame, said former frame being provided with holes at both ends thereof for the engagement with said pins.

10. A life saving apparatus as claimed in claim 8, wherein said front frame with the life net is covered by a soft resilient material of sponge.

11. A life saving apparatus as claimed in claim 1, wherein a wire winding cylinder for winding a wire connected with one end of said spring is mounted on the rear portion of said mounting frame, and a pulley is mounted on said slidable frame, the other end of said spring being fixed to said slidable frame through said pulley.

12. A life saving apparatus as claimed in claim 11, wherein a ratchet wheel is provided integrally on said cylinder, and a pawl is mounted on said mounting frame so as to prevent the reverse rotation of said cylinder, and a cam is also mounted adjacent to said pawl for enabling said pawl to engage and disengage with said ratchet by rotating said cam, said cylinder being possible to be rotated freely in the state of the disengagement with said pawl.

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