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3,070,829

DOOR CHECKS, NOTABLY FOR AUTOMOBILE DOORS

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2 Sheets-Sheet 1

FIG. 1

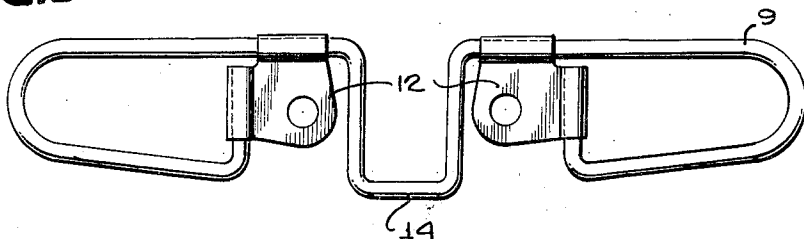


FIG. 2

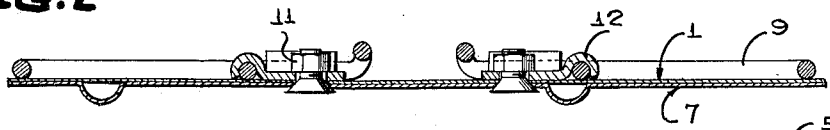


FIG. 3

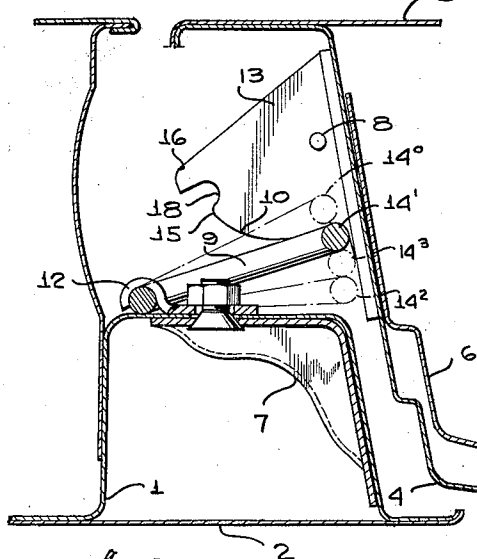
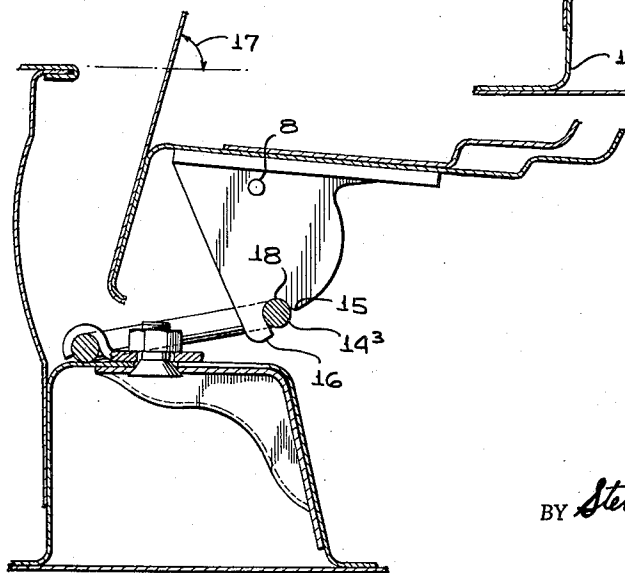


FIG. 4



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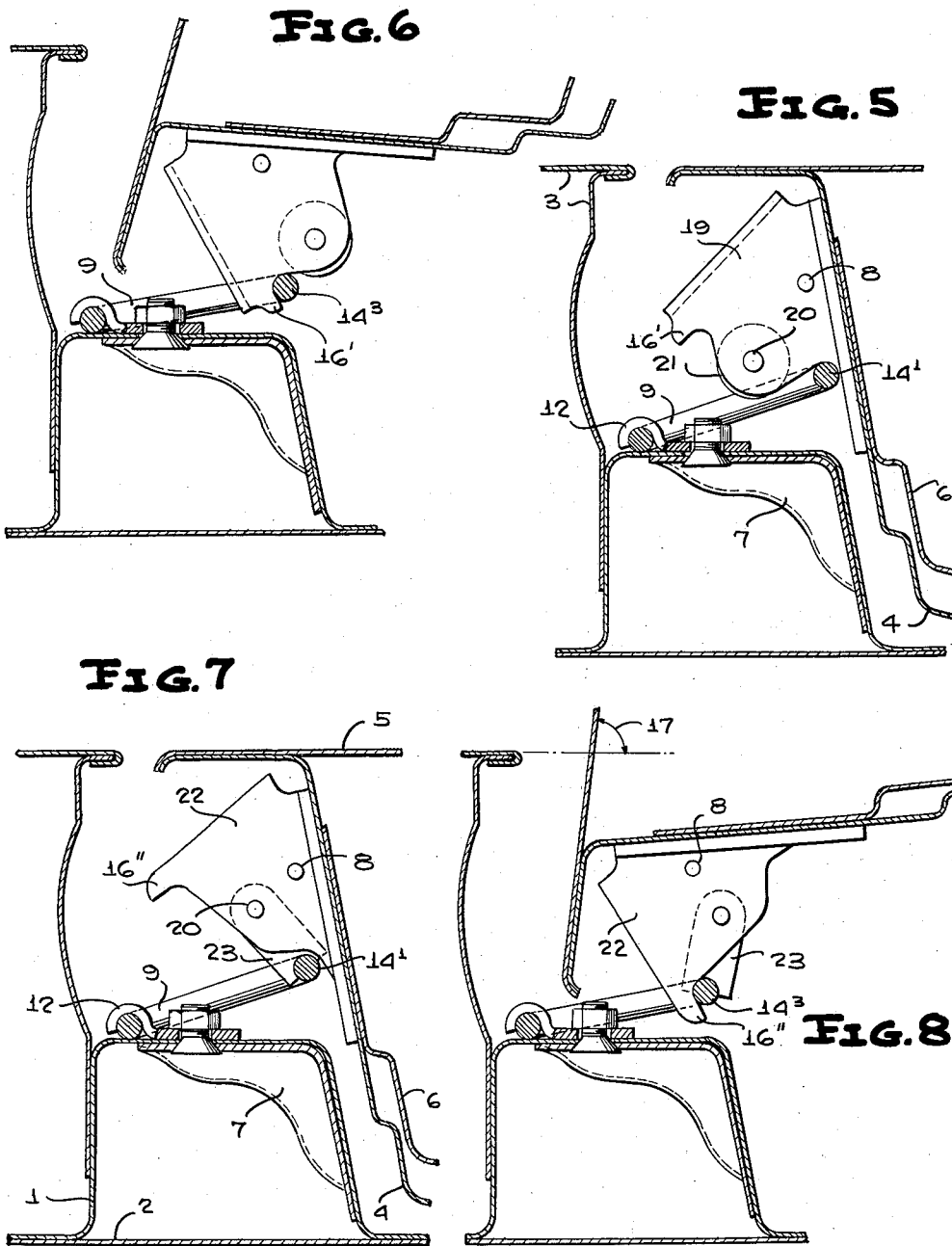
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DOOR CHECKS, NOTABLY FOR AUTOMOBILE DOORS

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2 Sheets-Sheet 2



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1

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DOOR CHECKS, NOTABLY FOR AUTOMOBILE DOORS

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4 Claims. (Cl. 16—85)

This invention relates in general to door checks, notably for automobile construction, and it is the essential object of this invention to improve the construction and operation of door checks of this character by using only simple and economical means, without resorting, as in most cases, to openings formed in the uprights of the body and/or the doors for the passage of the check or catch members.

This invention consists essentially in causing a torsion bar or spring of relatively reduced dimensions to co-act with a cam, roller or link so that the wide-open position of the door is stabilized and a relatively important effort is required for moving the door away from this position.

In order to afford a clearer understanding of this invention and of the manner in which the same may be carried out in practice, reference will now be made to the accompanying drawings showing diagrammatically by way of example a few typical forms of embodiment of the invention. In the drawings:

FIGURE 1 is a plan view showing the torsion bar incorporated in the door check mechanism of this invention;

FIGURE 2 is a longitudinal section taken across this bar;

FIGURE 3 is a section showing a typical form of embodiment of the present invention, the door being closed;

FIGURE 4 is a section similar to FIG. 3 but showing the door in its open position;

FIGURE 5 is another section showing a different form of embodiment of the invention, wherein a roller is used, the door being closed;

FIGURE 6 is a section similar to FIG. 5 but showing the door open;

FIGURE 7 is a section showing another form of embodiment of the invention, with the door closed, and

FIGURE 8 is a section similar to FIG. 7 but showing the door open.

In FIGS. 1 and 2 of the drawings, the torsion bar 9 is shown as being of round steel wire bent so as to form a central stirrup having a bight portion 14 and two symmetrical branches 9 connected at right angles to the stirrup. Each of the branches 9, in turn, is trunnioned in an attaching element 12, and has the end of the branch bent inwardly and anchored in the fastening element 12 at a right angle to the trunnion portion of said element. The fastening means 12 are secured to the bottom element 1 of the body by means of nuts and bolts 11 or other suitable fastening means.

In FIGS. 3 and 4, showing a first form of embodiment of the door check of this invention, the door upright 1 of the body is closed by a lining sheet 2, and the door plate 4 is completed by the outer door panel 5, these views also showing the door hinge reinforcement 6.

The upright is also provided with a hinge reinforcement 7.

During the pivoting movement of the door about its hinge axis 8, the spring 9 co-operates with a cam member 10. This spring is secured on the upright by means of screws, washers and nuts 11 associated with attachment elements or fixation gussets 12.

The member 13 formed with the operative contour of cam 10 is welded on the door plate 4 at the level of the hinge reinforcements 6.

2

Of course, the reverse arrangement may be contemplated, if desired, the cam being secured on the upright and the spring on the door panel, if the design of the vehicle is more appropriate to this specific mounting.

The operative contour of cam 10 is such that when the door is closed the spring 9 is slightly stressed, the bight portion 14 forming a finger engaging the cam in position 14¹, whereas its unstressed position is at 14⁰.

During the door opening movement the spring moves to 14² which is its most stressed position, when the aforesaid finger portion 14 engages the highest point of cam 10.

At the end of the door opening movement the spring is snapped to position 14³ by dropping into the notch 18, and by engaging the catch 16 the door check device limits this opening movement to a well-defined angular position.

Then the door is fully open, as shown in FIG. 4, the angle of opening being designated by the reference numeral 17.

To close the door the cam engaging finger 14 must be driven out from the notch 18; as the spring is stressed, the angle between the inclined ramp connecting this notch 18 to the cam projection 15 is such that a relatively important closing effort is necessary to close the door.

According to another form of embodiment of the invention which is illustrated in FIGS. 5 and 6, the spring portion 14, instead of directly engaging the profile of the cam, engages a roller 21.

The spring portion 14 bears however against the member 19 when the door is closed and on the retaining extension 16' when the door is wide open. The roller 21 has been substituted for the cam profile so that the risk of wear in case of frequent operations of the door are reduced accordingly.

According to a third variation of the door check of this invention, as shown in FIGS. 7 and 8, a link 23 adapted to engage the portion 14 of spring 9 is pivoted on a pin 20 carried by a member 22.

FIGURE 8 shows clearly that when the door is open, the position assumed by this link 23 provides a kind of knee-action in connection with the spring 9, so that the stress is decomposed in such a manner that the door is retained by a sufficient force. In this case too the opening movement of the door is limited by the engagement of the spring portion 14 with the catch 16'.

Although the present invention has been described in conjunction with preferred embodiments, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention, as those skilled in the art will readily understand. Such modifications and variations are considered to be within the purview and scope of the invention and appended claims.

I claim:

1. A door check for an automobile door assembly which includes two elements constituted of an upright and a door panel pivoted to the upright, said door check permitting at the same time the maintenance of the door panel in a selected open position and its return to a closed position and comprising a spring anchored to one of the two elements, a cam integral with the other element, said spring being of a round steel wire bent so as to have two symmetrical branches connecting at right angles to a center stirrup, said stirrup having a bight portion which constitutes an engaging finger resting on and contacting the cam, an attachment element for each of said branches, said branches being trunnioned in said attachment elements parallel to the engaging finger and extending therefrom in the form of a loop terminating in a right angle, bent extremities anchored in the attachment elements at right angles to the trunnioning part of the branches, said

3

cam having at least one notch adjacent its end of the stroke in the open position of the door in which the engaging finger can lodge for a selected open position and from which said finger can be dislodged only by exerting on the door a considerable effort, said cam presenting a profile, the curvature of which is eccentric with respect to the pivotal axis of the door panel so that the effort of the finger resting on the cam produces a coupling which tends to close the door.

2. A door check according to claim 1, wherein the spring is secured to the upright and the cam to the door panel.

3. A door check according to claim 1, wherein the cam is assisted, in order to limit wearing, by a roller, said roller having a shaft secured to the cam perpendicularly to the plane of the cam and the circumference of which follows the theoretical profile of the cam over a portion of its length so that, on this portion, the finger engages the roller and not the cam, the real profile of which is, to this effect, slightly withdrawn.

4. A door check according to claim 1, wherein the cam is assisted, in order to limit wearing, by a small link, a

4

shaft secured to the cam perpendicularly to its plane and about which this link is pivoted, the free end of which being provided with a notch in which lodges the engaging finger of the spring in such a way that over a portion of the course of the finger relative to the cam said finger engages the small link and not the cam which, to this effect, is slightly withdrawn from said course.

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