

United States Patent

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[54] **DOORSTOP MEANS**

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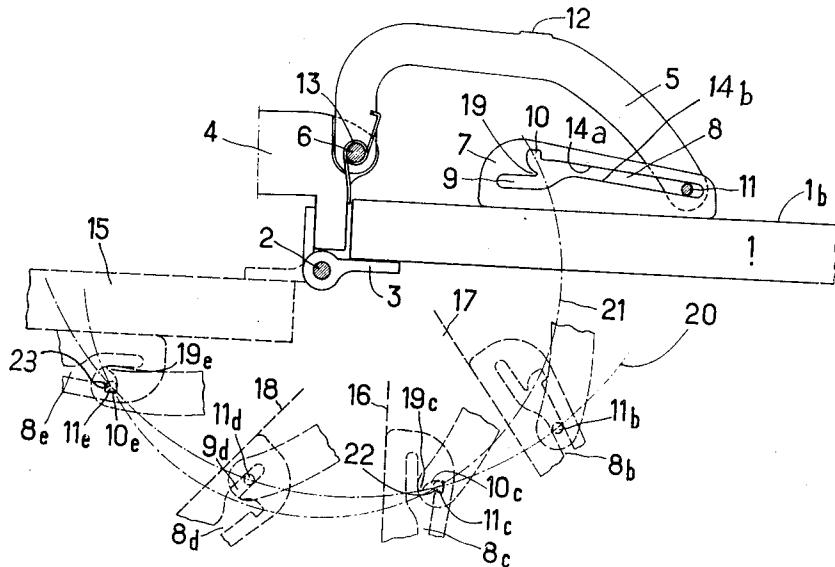
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[57]

ABSTRACT

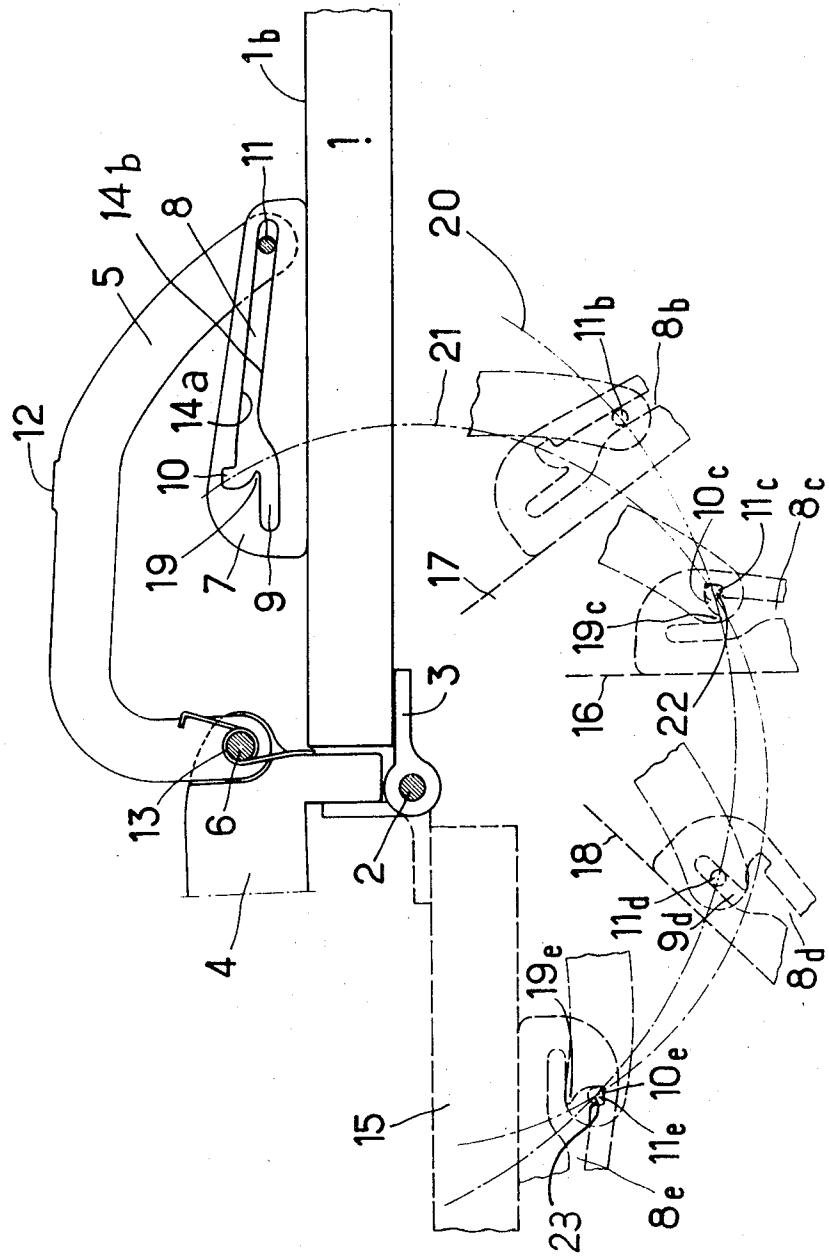
This invention relates to a doorstop means particularly for a motor vehicle, and in which a draw rod is articulated at one end to the door upright by means of a pin that is substantially parallel to and spaced from the hinge pin and the door itself. The other end of the draw rod carries a finger movable in a slotted member secured to the door, the slot running parallel to the door plane but branching into two extensions of the end nearest the hinge pins, one extension curving inwardly towards the door but the other extension extending substantially perpendicularly to the door to form a catch in which the finger on the draw rod engages to lock the door in a fully open or an intermediate position.

2 Claims, 1 Drawing Figure



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DOORSTOP MEANS

Doorstop means are known in the art and are used particularly to prevent the swinging of doors of motor vehicles and are arranged so as to be able to hold the door open in two distinct positions.

However, conventional doorstop means do not make it possible to allow the door to be opened widely so as completely to remove the impediment of the door, or to lock it in an open position automatically while enabling it to be held in an intermediate position but not in any way interfering with the return of the door to the closure position.

It is an object of the invention to remedy this situation and the invention proposes to this end a doorstop means of a novel type which combines effectiveness in operation with robustness and simplicity of construction.

The invention provides a doorstop means for use particularly in motor vehicles, said means comprising a draw rod articulated by one of its end to the upright of a hinged door by means of a pin substantially parallel to the door hinge pin but distinct therefrom, while the other end of said draw rod carries a finger arranged to be movable in slot means associated with a part of said door, said groove means comprising a slideway which extends from a point furthest from said hinge pins and towards said pins, while in the direction of the end of said slot means closest to said pins, said slideway forks into two extensions, one of said extensions curving inwards towards the door, while the other extension extends substantially perpendicular to the plane of the door and away therefrom to form a catch.

The two said extensions advantageously meet in a beak-shaped or hook-shaped portion pointing towards the end of said slot means furthest from said hinge pins. In addition, a flexible retaining member may hold the finger of the draw rod in abutment on the surface of the slot means furthest from the door.

In order that the invention may be more clearly understood, reference will now be made to the accompanying drawing which shows one embodiment thereof by way of example, which shows a view partly in section of a doorstop means, in various possible positions between closed and fully open.

Referring now to the drawing, the door is shown at 1, which is articulated to move about an axis 2 by means of hinges 3. The axis 2 is in the form of a pin secured to the upright 4 of the door. A draw rod 5, which is preferably curved in a concave manner with respect to the inside surface 1b of the door, is articulated on a pin 6, which is itself secured to the upright 4, parallel to the pin 2. On the face 1b of the door there is secured a plate 7 having a slot or groove 8 substantially parallel to the plane of the door and perpendicular to the pins 2 and 6.

The slot or groove 8 extends from the part of the plate 7 furthest from the pins 2 and 6 and towards the said pins and is then extended, branches into two extensions 9 and 10 in that part of the plate 7 adjacent the pins 2 and 6. The extension 9 extends towards the door panel and remains substantially parallel thereto while the extension 10 is substantially at right angles to the plane of the door. The said extension 10 is in fact a catch portion which extends away from the surface 1b. The end of the draw rod 5 remote from the part articulated at 6, carries a finger 11 which rides in the slot or groove 8.

The center zone 12 of the draw rod 5 has a flattened portion which may be pressed manually in the fashion of a pushbutton. A spring 13 is provided in this embodiment to urge the draw rod 5 in the direction away from the surface 1b, thereby holding the finger 11 in abutment on the surface 14a of the slot or groove 8, the surface being that furthest from the door and extended by the catch portion 10. The face of the slot or groove 8 opposite the face 14a is shown at 14b.

The spring 13 has been shown coaxial to the pin 6, but this arrangement is only shown by way of example and may be modified to choice. The various positions which may be taken up by the door 1 as it pivots from its closed position shown in full lines to a fully open position 15, passing through an inter-

mediate locking position 16 and positions 17, between 1 and 16 and 18 between 15 and 16 are shown in chain-dotted lines. At the fully closed position and at the positions 17, 16, 18 and 15 there correspond position 8, 8b, 8c, 8d and 8e of the groove or slot 8, and 11, 11b, 11c, 11d and 11e of the finger 11. The part 9 of the slot is at 9d when the door is in position 18 while the catch is at 10c and 10e when the door is in positions 16 and 15 respectively. At 19, there is a hood- or beak-shaped portion between the extensions 9 and 10 of the slot or groove 8. This hook- or beak-shaped portion 19 is at positions 19c and 19e when the door comes into positions 16 and 15 respectively. The finger 11 moves along the wall of a circle 20 which has its center at 6, whereas the center portion of the catch extension 10 describes a circle 21 having its center at 2, the two circles 20 and 21 intersecting at 22 and 23.

Operation of the arrangement is as follows. In the fully closed position the door is at 1 and the finger at 11. When the door is opened, the finger 11 moves along the slot or groove 8 and takes up intermediate positions such as 11b due to the fact that the respective axes of rotation 6 and 2 are separate and distinct. Still moving along the circle 20, the finger 11 comes to the point of intersection 20 of the two circles at 11c. As a result of the shape of catch 10 the finger, at position 11c, penetrates into the catch which is located at position 10c where it takes up a rear position under the action of the spring 13 which pushes the finger into the catch portion. This is the first locking position of the door at 16.

In this position, any attempt to continue the opening movement has the effect of causing the finger to abut against the walls of the catch. This is thus the first locking position of the door in the intermediate position. In order to lock the door in a more open position, it is necessary to release the finger 11 from the catch extension 10. To do this, it is necessary to push on the center zone 12 of the draw rod 5 so as to counteract the action of the spring 13 while causing the door panel to move slightly backwards. The draw rod 5 is now no longer acted upon by the spring 13, so that the finger 11 moves back into the slot 8 as a result of the backward movement of the door.

The action on the zone 12 has the effect of urging the finger 11 against the surface 14b of the groove or slot 8. It will be seen that under these circumstances continuation of the opening movement causes the finger 11 to engage in the extension 9 of the slot or groove 8. Action on the zone 12 is then no longer necessary, the movement of the finger 11 being continued towards the end of the extension 9 to the point at which the distance between the circles 20 and 21 is at a maximum, i.e., to a point at which the finger 11 is at 11d at the middle of the arc 22, 23 of the circle 20. The face 1b of the door 1 is then in position 18. From this position, the circles 20 and 21 converge towards their point of intersection 23. The distance between them is reduced and the finger 11 moves backwards within the extension 9 toward the hook- or beak-shaped portion 19 and finally falls into the catch extension 10 under the retaining action of the spring 13. This is the second locking position and represents the maximum open position of the door as shown at 15.

From this position, closure of the door is effected by pushing simultaneously on the zone 12 and the door. This releases the finger 11 which is in position 11e in the catch 10 which is itself at position 10e. The finger 11 then moves in the manner described for the opening of the door but in the reverse direction. During the closing movement, the shape and arrangement of the portion 19 are such that the finger 11 passes over the catch 10 without moving into it. Consequently, the closure movement is continued and without interrupting this movement the finger 11 engages in the slot or groove 8 to reassume its initial position.

It will be noted that position 15 of the door (fully open position) is achievable at the end of an angular movement through approximately 180° which is of advantage in certain applications such as in the case of the doors of delivery vehicles and that, from the point of view of operation, in order to ensure that the draw rod 5 accompanied by its finger 11 carries it to

position 15, it is necessary that it turn about the upright 4 and thus that it should be concave.

The invention is not limited to the embodiment herein described and shown but extends to all modifications within the scope of the appended claims.

I claim:

1. Doorstop means for use particularly in connection with motor vehicle doors hinged by means of a pin for pivotal movement relatively to the vehicle body, said stop means comprising a draw rod hinged at one of its ends to the upright of the door by means of a pin substantially parallel to the door hinge pin, means associated with the door and formed with a slot comprising a slideway extending from a point furthest from the hinge pins towards said pins and forking into two extensions, one of which curves inwardly towards the door, and the other extension extending substantially perpendicular to the plane of the door and away therefrom to form a catch, said two extensions meeting in a beak-shaped portion pointing towards the end of said slot furthest from the pins and extending over said other extension, a finger connected to said draw rod adjacent its end remote from the hinge pins and arranged to be movable in said slot in a direction towards said extensions when the door is pivoted towards open position, and means urging said finger into said catch-forming extension when the door is partially open wherefore same is restrained from further movement, said finger and slot cooperating to allow said finger to move into the other of said extensions when same is released from said catch and the door is opened

further and said beak-shaped portion serving upon closure of said door to allow the finger to pass over the catch without moving into it.

2. Doorstop means for use particularly in connection with 5 motor vehicle doors hinged by means of a pin for pivotal movement relatively to the vehicle body, said stop means comprising a draw rod hinged at one of its ends to the upright of the door by means of a pin substantially parallel to the door hinge pin, means associated with the door and formed with a slot comprising a slideway extending from a point furthest from the hinge pins towards said pins and forking into two extensions, one of which curves inwardly towards the door, and the other extension extending substantially perpendicular to the plane of the door and away therefrom to form a catch, a 10 finger connected to said draw rod adjacent its end remote from the hinge pins and arranged to be movable in said slot in a direction towards said extensions when the door is pivoted towards open position, and means urging said finger into said catch-forming extension when the door is partially open wherefore same is restrained from further movement, said finger and slot cooperating to allow said finger to move into the other of said extensions when same is released from said catch and the door is opened further, the respective pivot radii of said finger and catch being so arranged that said finger 15 again enters said catch-forming extension under the influence of said finger-urging means when the door is fully open.

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