July 20, 1965 G. V. WOODLING 3,195,940

TRUNK LID HOLD-DOWN MECHANISM

Filed Aug. 8, 1963

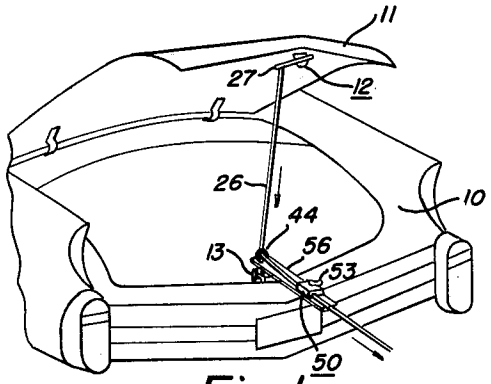


Fig. 1

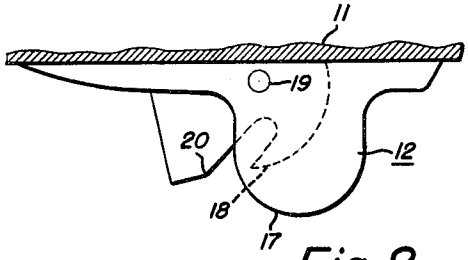


Fig. 2

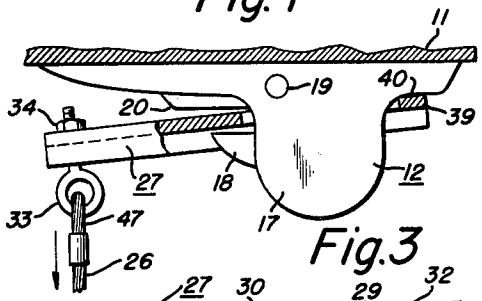


Fig. 3

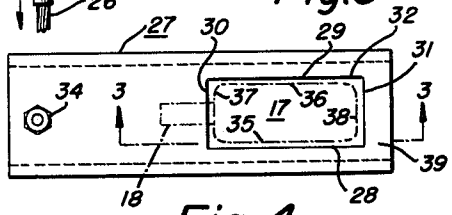


Fig. 4

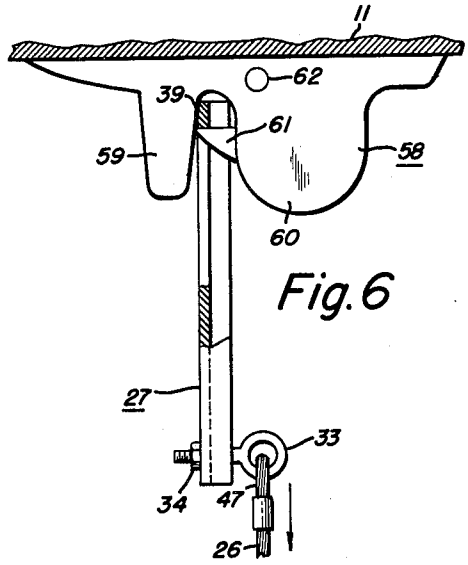


Fig. 6

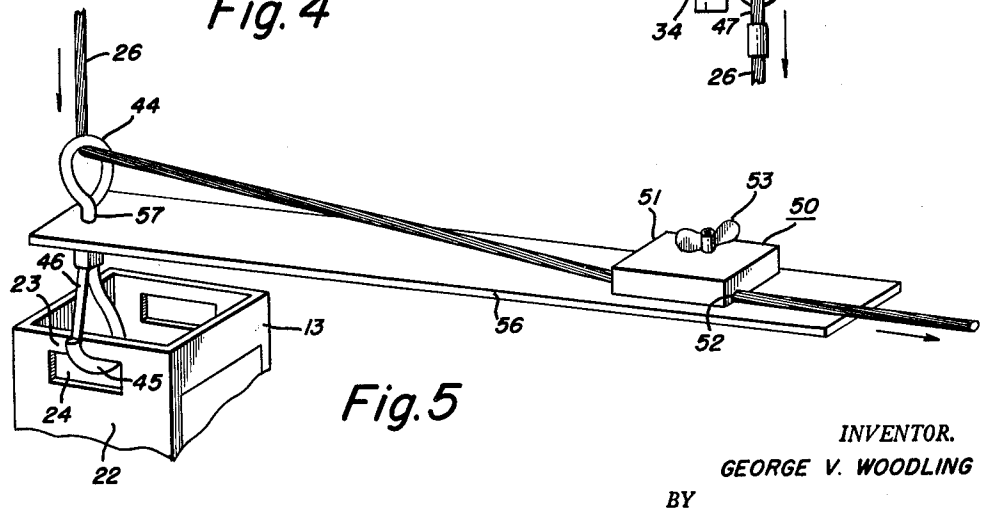


Fig. 5

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TRUNK LID HOLD-DOWN MECHANISM

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This invention relates to a mechanism for holding down an unlocked trunk lid and keeping it from flopping up and down when the contents of the trunk prevent the normal closing and locking of the lid.

An object of the invention is the provision of a trunk lid hold-down mechanism which may be readily attached and detached to and from the latch and catch parts of the conventional trunk lock provided on automobiles.

Another object is the provision of a mechanism for controlling the extent to which the trunk lid may be held down at a place external of the trunk body.

Another object is the provision of a mechanism which is simple in structure and easy to install and operate.

Other objects and fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing, in which:

FIGURE 1 shows a rear end view of an automobile with the trunk lid raised and illustrating the manner in which the invention may be applied thereto;

FIGURE 2 is a view looking directly at the latch part of the trunk lock which in this instance is mounted on the underneath side of the trunk lid, the latch being shown in its release-position;

FIGURE 3 is a view similar to FIGURE 2 showing the latch in its lock-position to which the secondary catch means of my invention may be attached, a portion of the secondary catch means being shown in section taken along the line 3—3 of FIGURE 4;

FIGURE 4 is a view of the secondary catch means of my invention looking down from the top thereof in FIGURE 3, the latch part of the lock being shown in dash-dot lines for purposes of clarity;

FIGURE 5 is a perspective view showing the hold-down portion of the invention which is attached to the catch part of the trunk lock; and

FIGURE 6 shows a modified form of the latch of a trunk lock to which my secondary catch means may be attached.

With reference to FIGURE 1 there is illustrated the rear end of an automobile having a trunk body 10 and a trunk lid 11 which is shown in a raised position. The trunk lock comprises two parts, namely, a latch means 12 mounted underneath the trunk lid and a catch means 13 mounted adjacent the inner edge of the trunk body. My invention comprises a secondary catch means 27 which is adapted to be attached to the latch means 12, a rope-turn means 44 which is detachably connected to the catch means 13, a rope 26 interconnecting the secondary catch means 27 and the rope-turn means 44, and a rope-stop means 50 which arrests the backward movement of the rope through the rope-turn means 44 for holding the trunk lid down to a desired position short of the fully closed position.

As shown in FIGURES 2 and 3, the latch means 12 comprises a latch body 17 extending down from underneath the trunk lid 11. The latch body 17 has mounted therein a latch element 18 which is arranged to pivot around a pivot pin 19.

The catch means 13 comprises a post member fastened to the inner edge of the trunk body. The post is of a box-like construction having a side 22 provided with an aperture 24 to make a catch element 23 which is adapted to be engaged by the latch element 18 of the latch means 12.

In normal operation, when the trunk lid is closed, catch element 23 first engages the latch element 18 at an initial place indicated by the reference character 20. As the trunk lid is further depressed, the initial contact engagement rotates the latch element 18 clockwise to its lock-position, whereupon the latch element 18 is hooked under the catch element 23. When the key is used to unlock the trunk, the turning of the key releases the latch element 18, whereupon the latch element 18 may rotate counter-clockwise to free the latch element 18 from the catch element 23.

In my invention, the secondary catch means 27 is adapted to be detachably connected to the latch means 12 as shown in FIGURE 3. Preferably the secondary catch means 27 comprises a channel element having an opening 32 therein which is defined by two spaced side portions 28 and 29 and two spaced end portions 30 and 31. In mounting the secondary catch means 27 to the latch means 12, the operator simply presses the secondary catch means upwardly against the latch means 12 with the latch body 17 extending through the opening 32 and when the channel means engages the latch element 18 at the place 20, it will rotate the latch element 18 in a clockwise direction to lock the secondary catch means to the latch means.

As shown in FIGURE 4, the latch body 17 has first and second side portions 35 and 36 and first and second ends 37 and 38. When the secondary catch means 27 is locked to the latch means 12, the side portion 28 of the channel member faces the side portion 35 of the latch body, the side portion 36 faces the side portion 29, the end 37 faces the end portion 30 and the end 38 faces the end portion 31. In other words, the opening 32 in the channel completely surrounds the latch body 17 of the latch means 12 and thus the secondary catch means 27 cannot escape downwardly when the latch element 18 is in the lock-position.

The left-hand end of the secondary catch means 27 is provided with an eyelet 33 which is anchored to the channel member by means of a nut 34. The end 47 of the rope 26 is attached to the eyelet 33. When the rope 26 is pulled down, the channel member tends to rotate in a counter-clockwise direction about the place where it rests upon the latch element 18 and causes a lateral portion 39 of the channel member to press against the latch body 17 at 40, whereupon the channel member then is firmly secured in place by the latch element 18.

All latch bodies are not identical in size. Therefore the opening 32 is of such a size to accommodate most of the latch bodies now found on modern cars, and only one secondary catch means 27 need be provided to accommodate most of the latch means on the cars. However, if for example one make of car happens to have an excessively large latch body, then there may be provided on the end of the rope two such secondary catch means whereby the operator may select the one that would fit the latch body on his car. On some latch bodies, the latch element may be in the nature of a ratchet wheel. It is found that this present invention works with a ratchet wheel in the same fashion that it works with the latch element shown in the drawing.

The rope-turn means in the present invention preferably comprises an eyelet which is connected to a hook 45 having a spring-snap 46. In attaching the rope-turn means 44 to the catch means 13, it is only necessary to snap the hook 45 into the aperture 24 whereupon the hook then engages the catch element 23. I find that the snap-hook 45 is a convenient method of anchoring the rope-turn means 44 to the catch means 13, but any suitable means may be employed. The rope-turn means 44 and the snap-hook 45 may be made of an integral piece and is arranged to pass through an opening 57 provided in an extension

strap or means 56, upon which the rope-stop means 50 is mounted. As illustrated in FIGURE 5, the rope-stop means comprises a clamp 51 having a groove 52 on the underneath side thereof through which the rope 26 passes and is pressed against the top surface of the extension strap 56 by means of a wing nut 53. In practice, the length of the extension strap or means 56 is approximately a foot long so that in the event, which occasionally arises, that the trunk lid is lowered to within a short distance of the trunk body, the extension means 56 extends out through this narrow trunk opening whereby the rope-stop means 50 may be operated to clamp the rope externally of the trunk body. The extension means 56 is important particularly in those instances where the trunk lid is almost closed and there is not sufficient room for the operator to get his hand into the trunk to secure the rope to a rope-stop means, if it were located within the trunk. The extension means 56 may comprise a strap member which is sufficiently rigid to withstand the pull of the rope.

In the operation of my invention, it is only necessary for the operator to press the secondary catch means 27 against the latch means 12 until the latch element 18 locks the secondary catch means 27 in place. Next the operator attaches the snap-hook 45 to the catch means 13. The lid of the trunk may then be pulled down to its desired position short of the full closed position by pulling on the rope 26 and when the trunk lid is fully pressed down against the contents within the trunk, the operator then clamps the rope under the rope-stop means 50 by turning the wing nut 53. The rope-stop means may be of any other suitable construction and comprise any mechanism which prevents the backward movement of the rope 26 through the rope-turn means 44. The trunk lid may be released from the trunk hold-down mechanism simply by turning the key in the trunk lock whereby the secondary catch means 27 will snap off the catch means 12. Then the operator may release the snap-hook 45 and place the hold-down mechanism in some convenient place within the trunk until further use.

FIGURE 6 shows a modified latch means which is identified by the reference character 58 and is almost the same as the latch means 12 except that it is provided with a downwardly depending tab 59 which is spaced slightly to the left of the latch body. In this event, the secondary catch means 27 is anchored in a different way than that shown in FIGURE 3. In this arrangement, the lateral extending portion 39 of the secondary catch means 27 is simply pressed upwardly between the latch body 60 and the tab 59 and this upward movement causes the latch element 61 to rotate in a clockwise direction about the pivot 62 until the latch element 61 locks the lateral extending portion 39 in a lock-position. Otherwise, the invention operates the same as that previously described.

The rope in this application is used in a generic sense and comprises any flexible elongated member which may have enough flexibility to operate in my mechanism. Preferably, I find that nylon rope is very satisfactory because it has low sliding friction about the rope-turn means. Also the rope-turn means may comprise pulleys or other arrangement constituting a means to turn the direction of the rope as it is being pulled.

The rope-stop means 50 mounted on the extension means 56 may be swung in an arc about the opening 57 which surrounds the neck between the rope-turn means 44 and the snap-hook 45. Thus the opening 57 and the neck constitute a pivot connection. During the lowering of the trunk lid 11, when the operator is pulling on the rope 26 the rope-stop means 50 may be swung to the right or left about the pivot connection and exteriorly and rearwardly of the trunk body 10, whereby the rope-stop means 50 is readily accessible for clamping the rope. After the clamping operation is completed, the operator may swing the extension means 56 about the pivot connection until the rope-stop means 50 is positioned within the trunk compartment, or at any other position. Regardless of the position to which the rope-stop means 50 may be swung, the extension means 56 fixedly determines the distance between the rope-turn means 44 and the rope-stop means 50. In this invention, the secondary catch means 27, the rope-turn means 44, and the rope-stop means 50 comprise a combination of means forming a triangle with each means located at the respective corners of the triangle. It is readily understood that the pivot connection may be directly attached to the trunk body separate from the rope-turn means 44 so long as there is a relatively fixed relationship between the pivot connection and the rope-turn means. Likewise, the rope-turn means 44 and the snap-hook 45 need not necessarily be directly connected together as shown in the drawing, although the drawing shows the preferred arrangement. The rope-turn means 44 may be mounted at one place near the inner pivoted end of the extension means 56 and the snap-hook 45 or any other suitable attachment means may be mounted to a nearby place on the extension means 56, so long as the mounting relationship is relatively fixed to produce the desired result.

In some cars, the catch means is mounted on the underneath side of the trunk lid and the latch means is mounted on the inner edge of the trunk body, being just the reverse of that shown in the drawings. In this event, the hold-down mechanism would be mounted in a reverse position. The claims cover both circumstances.

Although this invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

1. In combination with a trunk lock having latch means and catch means mounted respectively on the trunk lid and trunk body or vice versa, said latch means having a lock-position and a release-position with respect to said catch means, said latch means upon the closing of the trunk lid being engaged by said catch means and actuated thereby from a release-position to a lock-position for locking the trunk lid, said latch means upon operation by a key moving from a lock-position to a release-position whereby said trunk lid may be opened, a trunk lid hold-down extensible mechanism comprising in combination, first means comprising secondary catch means attachable to said latch means in its lock-position and detachable from said latch means in its release-position, second means comprising rope-turn means attachable to said catch means, third means comprising a hold-down rope having an end connection portion connected to said secondary catch means with the free portion thereof passing through said rope-turn means whereby said trunk lid may be pulled down to a desired position short of the fully closed position by pulling at least a part of said free portion through said rope-turn means and thereby shortening the effective length of the rope between the secondary catch means and the said rope-turn means, fourth means comprising rope-stop means to arrest the backward movement of said rope through said rope-turn means to hold said trunk lid down to said desired position with an open space between the trunk lid and trunk body, and fifth means comprising extension means extending through said open space and between said rope-turn means and said rope-stop means to position said rope-stop means externally of said trunk body, whereby said rope-stop means is readily accessible for operation.

2. In combination with a trunk lock having latch means and catch means mounted respectively on the trunk lid and trunk body or vice versa, said latch means having a lock-position and a release-position with respect to said catch means, said latch means upon the closing of the trunk lid being engaged by said catch means and actuated thereby

from a release-position to a lock position for locking the trunk lid, said latch means upon operation by a key moving from a lock-position to a release-position whereby said trunk lid may be opened, a trunk lid hold-down extensible mechanism comprising in combination, first means comprising secondary catch means attachable to said latch means in its lock-position and detachable from said latch means in its release-position, second means comprising rope-turn means attachable to said catch means, third means comprising a hold-down rope having an end connection portion connected to said secondary catch means with the free portion thereof passing through said rope-turn means whereby said trunk lid may be pulled down to a desired position short of the fully closed position by pulling at least a part of said free portion through said rope-turn means and thereby shortening the effective length of the rope between the secondary catch means and said rope-turn means, fourth means comprising rope-stop means to arrest the backward movement of said rope through said rope-turn means to hold said trunk lid down to said desired position with an open space between the trunk lid and trunk body, and fifth means comprising extension means extending through said open space and between said rope-turn means and said rope-stop means to position said rope-stop means externally of said trunk body, whereby said rope-stop means is readily accessible for operation, said latch means having a latch body and a movable latch element mounted thereon, said latch body having first and second sides and first and second edges with said movable latch element extending outwardly from said first edge, said secondary catch means comprising an encompassing member having first and second spaced side portions facing respectively said sides of said latch body and first and second spaced end portions facing respectively said first and second edges, said side and end portions defining an opening to encompass said latch body, said first end portion constituting a catch element adapted to be engaged by said latch element in its lock-position, said second end portion abutting against said second edge, said hold-down rope being connected to said first end portion and rotating said encompassing member in a direction about said latch element to urge said second end portion against said second edge, said latch element clearing said first end portion in its release-position whereby said secondary catch means may be detached from said latch means.

3. In combination with a trunk lock having latch means and catch means mounted respectively on the trunk lid and trunk body or vice versa, said latch means having a lock-position and a release-position with respect to said catch means, said latch means upon the closing of the trunk lid being engaged by said catch means and actuated thereby from a release-position to a lock-position for locking the trunk lid, said latch means upon operation by a key moving from a lock-position to a release-position whereby said trunk lid may be opened, a trunk lid hold-down extensible mechanism comprising in combination, first means comprising secondary catch means attachable to said latch means in its lock-position and detachable from said latch means in its release-position, second means comprising rope-turn means attachable to said catch means, third means comprising a hold-down rope having an end connection portion connected to said secondary catch means with the free portion thereof passing through said rope-turn means whereby said trunk lid may be pulled down to a desired position short of the fully closed position by pulling at least a part of said free portion through said rope-turn means and thereby shortening the effective length of the rope between the secondary catch means and said rope-turn means, fourth means comprising rope-stop means to arrest the backward movement of said rope through said rope-turn means to hold said trunk lid down to said desired position with an open space between the trunk lid and trunk body, and fifth means comprising extension means extending through said open space and between said rope-turn means and said rope-stop means to position said rope-stop means externally of said trunk body, whereby said rope-stop means is readily accessible for operation, said latch means having a latch body and a movable latch element mounted thereon, said latch body having a side from which said movable element extends, said secondary catch means comprising a member having spaced side portions and at least a lateral portion extending therebetween, said lateral portion constituting a catch element adapted to be engaged by said latch element in its lock-position, means to hold said lateral portion on said latch element in its lock-position, said latch element releasing said lateral portion in its release-position whereby said secondary catch means may be detached from said latch means.

4. In combination with a trunk lock having latch means and catch means mounted respectively on the trunk lid and trunk body or vice versa, said latch means having a lock-position and a release-position with respect to said catch means, said latch means upon the closing of the trunk lid being engaged by said catch means and actuated thereby from a release-position to a lock-position for locking the trunk lid, said latch means upon operation by a key moving from a lock-position to a release-position whereby said trunk lid may be opened, a trunk lid hold-down extensible mechanism comprising in combination, hold-down extensible means interconnecting said latch means and said catch means to hold said trunk lid down to a desired position short of the fully closed position with an open space betwen the trunk lid and the trunk body, adjustable means to vary the effective length of said hold-down extensible means, and extension means extending from a place within said trunk body and through said open space to a place externally of said trunk body for positioning said adjustable means externally of said trunk body whereby said adjustable means is readily accessible for operation.

5. In combination with a trunk body and a trunk lid, hold-down extensible means mounted within said trunk body and interconnecting said trunk lid and said trunk body to hold said trunk lid down to a desired position short of the fully closed position with an open space between the trunk lid and the trunk body, adjustable means to vary the effective length of said hold-down extensible means, and extension means extending from a place within said trunk body and through said open space to a place externally of said trunk body for positioning said adjustable means externally of said trunk body whereby said adjustable means is readily accessible for operation.

6. In combination with a trunk compartment having lid closure means and body closure means, one of said closure means being provided with latch means and the other of said closure means being provided with catch means, the improvement of hold-down means for holding said lid closure means partially closed with respect to said body closure means, said hold-down means comprising, attachment means detachably connected to said latch means, rope-turn means detachably connected to said catch means, rope-stop means, said attachment means, said rope-turn means and said rope-stop means comprising a combination of means forming a triangle with each means located at the respective corners of the triangle, extension means having a first end portion connected to said rope-turn means and having a second end portion connected to said rope-stop means, said extension means fixedly determining the distance between said rope-turn means and said rope-stop means, and rope means having a first portion connected to said attachment means, a second portion making passing engagement with said rope-turn means and a third portion securable to said rope-stop means.

7. In combination with a trunk compartment having lid closure means and body closure means, the improvement of hold-down mechanism for holding said lid closure means partially closed with respect to said body closure means, said hold-down mechanism comprising, first means

connected to one of said closure means, rope-turn means connected to the other of said closure means, rope-stop means, said first means, said rope-turn means, and said rope-stop means comprising a combination of means forming a triangle with each means located at the respective corners of the triangle, extension means having first and second end portions, mounting means to mount said first end portion to one of said closure means, means to mount said rope-stop means to said second end portion of said extension means at a fixed distance from said rope-turn means, and rope means having a first portion connected to said first means, a second portion making passing engagement with said rope-turn means and a third portion securable to said rope-stop means.

8. In combination with a trunk compartment having lid closure means and body closure means, the improvement of hold-down mechanism for holding said lid closure means partially closed with respect to said body closure means, said hold-down mechanism comprising, first means connected to one of said closure means, rope-turn means connected to the other of said closure means, rope-stop means, said first means, said rope-turn means, and said rope-stop means comprising a combination of means forming a triangle with each means located at the respective corners of the triangle, extension means having first and second end portions, mounting means to mount said first end portion to one of said closure means, means to mount said rope-stop means to said second end portion of said extension means at a fixed distance from said rope-turn means, and rope means having a first portion connected to said first means, a second portion making passing engagement with said rope-turn means, and a third portion securable to said rope-stop means.

9. In combination with a trunk compartment having lid closure means and body closure means, one of said closure means including lock means having a lock-position and a release-position, lock connection means attachable to said lock means in its lock-position and detachable from said lock means in its release-position, hold-down extensible means including rope means mounted within said trunk compartment and interconnecting said lock connection means and the other of said closure means to hold said lid closure means down to a desired position short of the fully closed position with an open space between the lid closure means and the body closure means, hold-down fastening means externally of said trunk compartment, said rope means of said hold-down extensible means being operable through said open space and extending externally of said trunk compartment to said hold-down fastening means whereby said rope means may be varied as to its effective length and then fastened to said hold-down fastening means, said lock means releasing said lock connection means therefrom in its released position whereby said lid closure means may be raised with respect to said body closure means without unfastening said rope means from said hold-down fastening means.

10. In combination with latch mechanism having a latch-position and a release-position, said latch mechanism including a latch body having first and second opposed side wall means and edge wall means therebetween defining the outside wall surface means of said latch body, said edge wall means having first and second opposed edge portions, a latch element in its latch-position extendable for a predetermined distance in a first lateral direction from said first opposed edge portion, an abutment surface means extending from said second opposed edge portion in a second lateral direction opposite to said first lateral direction in which said latch element is extendable, the improvement of a secondary catch member for said latch mechanism, said secondary catch member having at one end thereof catch structure means and having at the other end thereof anchoring structure means, flexible hold-down element means connected to said anchoring structure means, said catch structure means having first and second opposed side portions and first and second opposed end portions, said first opposed end portion constituting a catch portion engageable by said latch element in its latch-position, said second opposed end portion constituting an abutting portion for abutting against said abutment surface means, said catch portion being closer than said abutting portion to said anchoring structure means, said secondary catch member being manually attachable to said latch element with said flexible hold-down element urging said catch portion of said secondary catch member to fulcrum about said latch element and constraining said abutting portion of said secondary catch member to abut against said abutment surface means, said first and second opposed side portions and said first and second opposed end portions of said secondary catch member respectively confronting said first and second opposed side wall means and said first and second edge portions of said latch body to limit the movement of said secondary catch member relative to said outside wall surface means of said latch body in said first lateral direction to an extent less than said predetermined distance to prevent unintended release of said secondary catch member from said latch element in its latch-position.

11. The structure of claim **10** wherein said latch body includes said abutment surface means.

12. The structure of claim **10** wherein said side portion means and said end portion means of said catch structure means reside in a substantially flat plane.

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