

June 24, 1941.

E. D. DALL

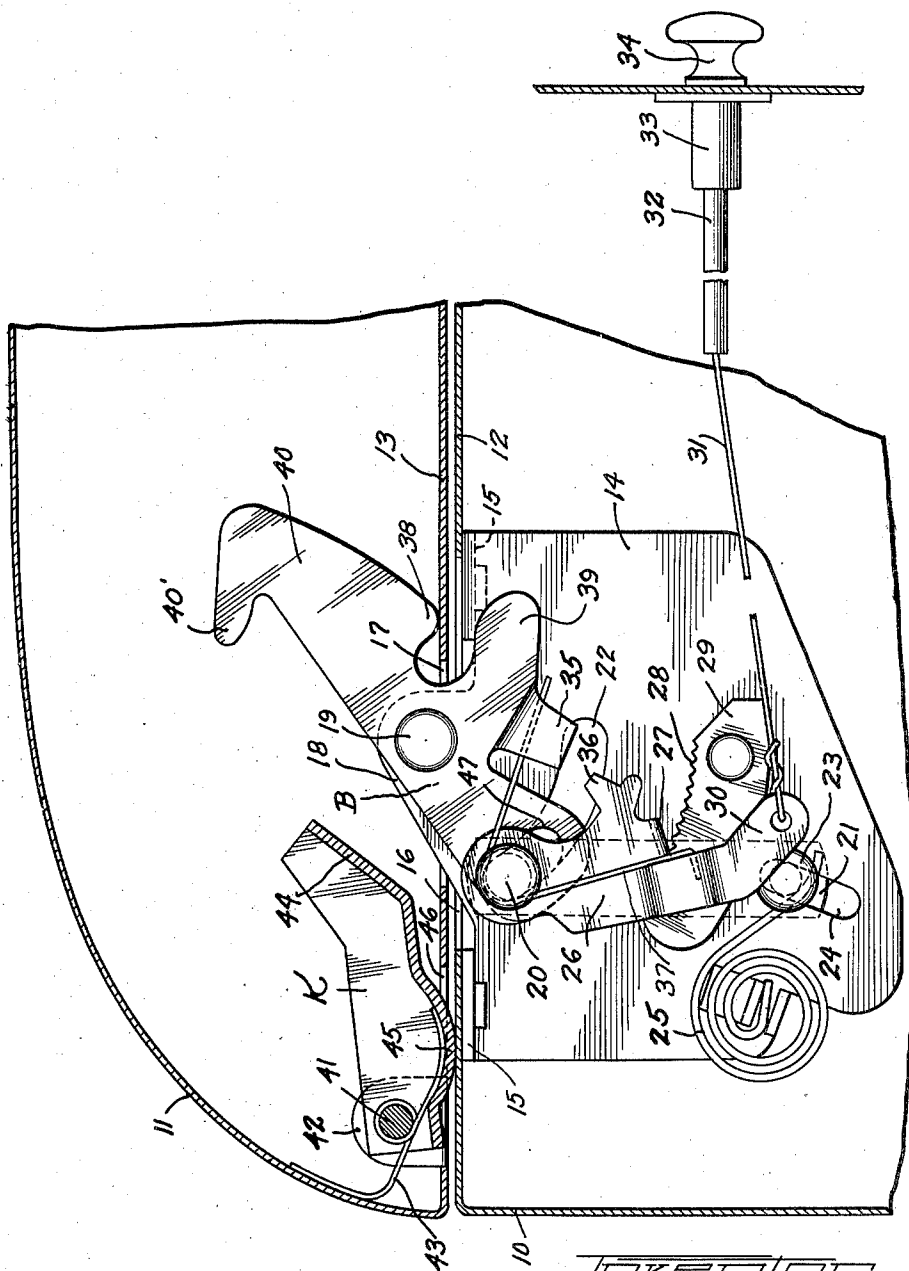
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AUTOMOBILE HOOD LATCHING MEANS

Filed Oct. 31, 1940

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Fig. 1.



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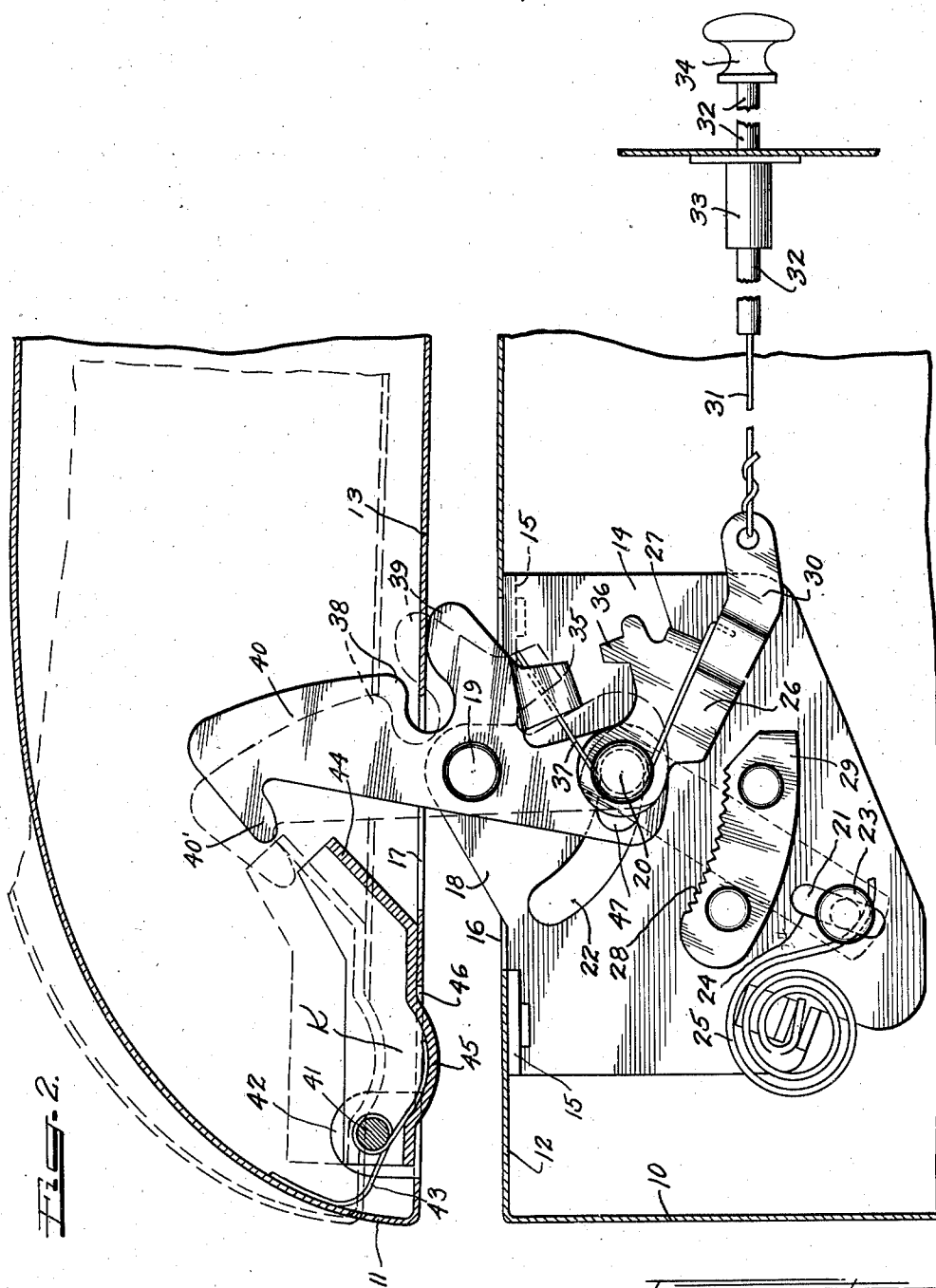
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AUTOMOBILE HOOD LATCHING MEANS

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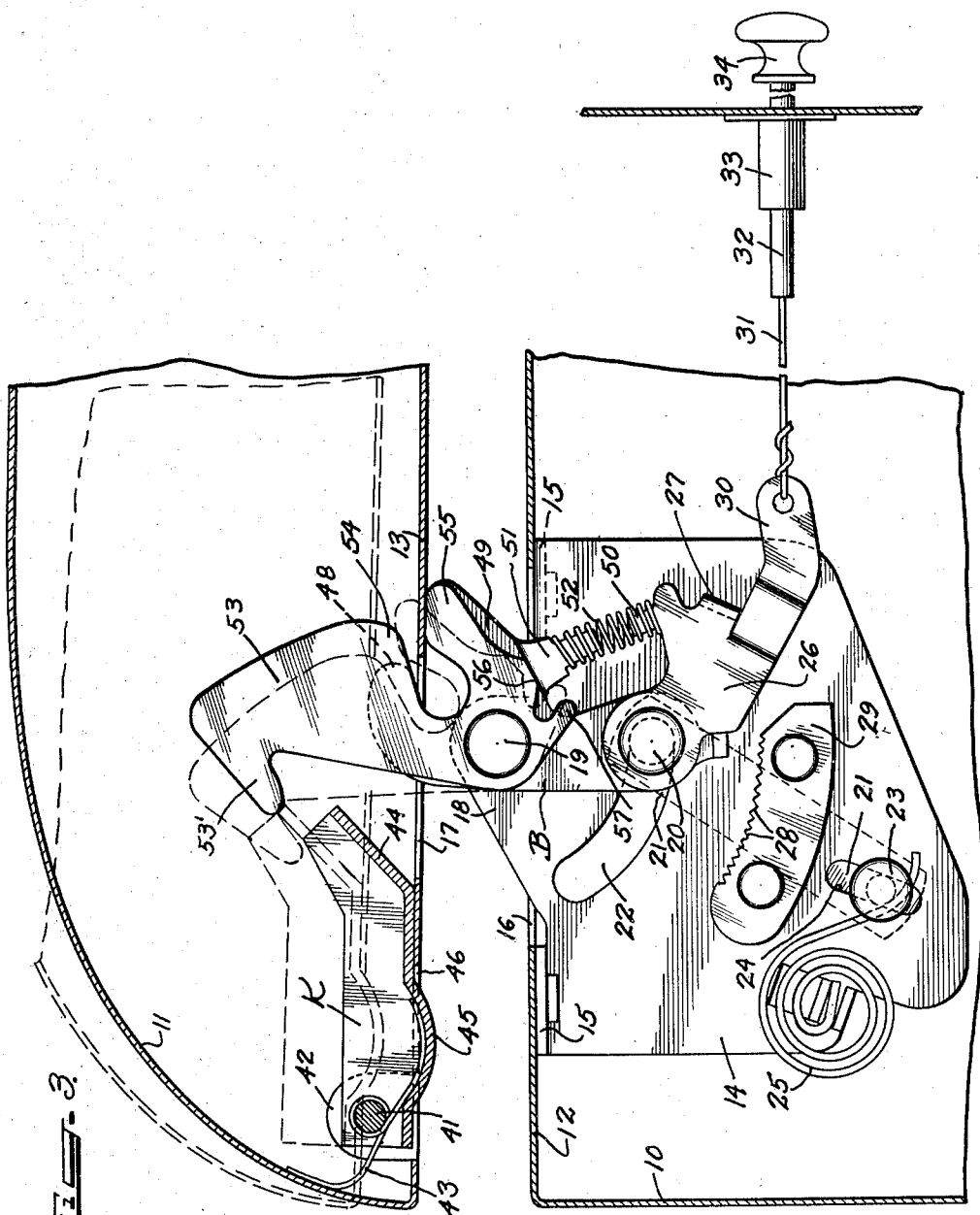
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Filed Oct. 31, 1940

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AUTOMOBILE HOOD LATCHING MEANS



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UNITED STATES PATENT OFFICE

2,246,793

AUTOMOBILE HOOD LATCHING MEANS

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Application October 31, 1940, Serial No. 363,689

5 Claims. (Cl. 292—11)

My invention relates to hood latching means or assembly adapted particularly for hoods of the so-called "alligator" type. In latch assemblies of this type, a main latch mechanism is usually provided for normally locking the hood cover in closed position and controllable from a point within the vehicle body for setting thereof to unlatching position, such unlatching being usually accompanied by a partial raising of the hood.

In addition to the main latch mechanism safety means are usually provided in the form of safety catch structure for limiting the further opening of the cover after a partial opening thereof in order that, if the main latch mechanism is released from within the vehicle during travel of the vehicle and the hood is partially raised, the hood cannot be caught by the wind and swung to its full opening position and thereby obstruct the view of the driver and cause accidents.

Some prior patents disclose arrangements in which unlatching of the main latch and partial opening of the cover is accompanied by setting of the safety catch means to operative or catching position to block further opening of the hood cover until the safety catch means is released by the hand or other means inserted through the partial opening.

An important object of my invention is to provide an arrangement in which, after release of the main latch and partial raising of the cover the safety catch means will still be inoperative or in uncatching condition but will be positively moved or set to such condition by engagement therewith of the cover when it is attempted to further raise the cover.

A further object of the invention is to provide safety catch means which, after unlatching and partial raising of the cover, can be controlled by way of the partial opening to prevent its functioning when the cover is raised further. With my improved arrangement, if the wind should swing the cover further open than the partial opening resulting after unlatching, the cover will set the safety catch means to limit such further opening of the cover and prevent full opening thereof. However, by manually displacing one of the safety catch elements after partial opening of the cover, the cover, upon further opening movement, cannot set the safety catch means to operative condition and the cover can then be swung manually to its full open position.

A further object of the invention is to provide an arrangement in which the safety catch means comprises a hook element operable with the main

latch means on the hood body, and a keeper element on the hood cover manually operable after partial raising of the cover to be displaced so as to prevent catch engagement of the hook element therewith.

The above enumerated and other features of my invention are embodied in the structure shown on the drawings, in which drawings:

Figure 1 is a side elevation of the latching assembly in a hood structure which is shown in vertical section;

Figure 2 is a view similar to Figure 1 showing the latching mechanism in unlatching position; and

Figure 3 is a similar view showing a modified arrangement.

On these drawings 10 indicates the hood body and 11 the hood cover of the alligator type mounted at its inner end along a hinge line extending transversely of the vehicle. Extending across the forward portion of the hood body 10 is a supporting plate 12, and a supporting plate 13 extends across the forward end of the cover 11, these plates serving to support the latching and safety catch elements.

Depending from the plate 12 is the supporting base 14 for the latching mechanism, this base having flanges 15 by which it may be riveted or welded against the lower side of the plate 12. Between the flanges 15 the plate 12 has the passageway 16 which registers with a passageway 17 in the plate 13 of the cover 11. An extension 18 on the base 14 projects upwardly through the passageway 16 and will project through the passageway 17 when the cover is in closed position as shown on Figure 1. The extension 18 supports a fulcrum stud 19 for the latch bolt B. At its lower end the latch bolt receives a pin 20 extending from the upper end of a link 21 disposed at the rear side of the base 14, the pin extending through the arcuate slot 22 in the base 14 which is concentric with the fulcrum 19. A pin 23 extends from the lower end of the link 21 through a guide slot 24 in the base 14, and a spring 25 anchored on the base 14 engages against the pin 23 to exert upward pressure against the link. When the latch bolt swings from latching to unlatching position the pin 20 will move along the slot 22. The neutral line of pressure of the spring extends between the fulcrum 19 and the pin 23, and when the pin 20 moves past this center line, the spring pressure will quickly move the latch bolt to either its latching or unlatching position.

Depending from the pin 20 is a detent or pawl

element 26 which has a portion deflected to provide a tooth 27 engageable with the teeth 28 on a rack bar 29 secured to the body 14. When the latch bolt is in latching position (Figure 1) the pawl tooth engages with one of the teeth on the rack bar and thus locks the latch bolt against movement in unlatching direction. The pawl has the depending arm 30 connected by a wire or rod 31 extending from a bar 32 slidable in a sleeve 33 preferably secured to the instrument board within the vehicle body, the end of the bar 32 having a knob 34 secured thereto. With this arrangement pull on the knob will effect swing of the detent pawl for release thereof from the rack bar 28 to unlock the latch bolt for swing toward its unlatching position. The latch bolt has an abutment arm 35 extending therefrom which is engageable by an abutment arm 36 on the pawl after the pawl has been swung clear of the rack bar 29 so that upon further swing of the pawl the latch bolt will be engaged and positively swung toward its unlatching position, and then as soon as the pin 20 passes through the spring pressure center line, the spring pressure will quickly snap the bolt to its unlatching position.

In the arrangement on Figures 1 and 2, a spring 37 is anchored on the pin 20 with its ends engaging the latch bolt and pawl respectively, this spring tending to hold the pawl in engagement with the rack bar 29 when the latch bolt is in latching position (Figure 1). The latch bolt B has the upper or latching arm 38 and the lower or setting arm 39. When the cover 11 is in closed position the arm 38 abuts against the upper side of the plate 13 and is held in such engagement by the pressure of the spring 25. When the knob 34 is pulled out and the latch bolt is swung toward its latching position, the setting arm 39 engages against the under side of the plate 13 of the cover and the cover is raised to partially opened position as shown on Figure 2, the final movement to unlatching position being rapidly accomplished by the force of the spring 25.

The latching arm 38 of the bolt is extended upwardly to provide a safety catch hook 40 for cooperation with a keeper structure K on the cover 11. The keeper element shown is of U-shape cross-section and is hinged at its outer end on a pin 41 extending between ears 42 which may be deflected upwardly out of the plate 13. A suitable spring 43 tends to hold the keeper normally swung down to its lower position. The outer portion 44 of the keeper is inclined upwardly and rearwardly for engagement along and against its inner side of the hook end 40' of the safety catch 40 when the cover is swung upwardly from the partially open position shown on Figure 2. The keeper is deflected to provide a hand engageable abutment 45 normally projecting downwardly through the opening 46 in the plate 13 so that it may be engaged by the fingers for upward swing of the keeper when the cover is partially opened by the latch mechanism.

In the arrangement of Figures 1 and 2 the latch bolt has the slot 47 receiving the pin 20, this slot being arcuate and concentric with the fulcrum 19. Referring to Figure 2, when the bolt is swung toward its unlatching position after pull on the knob 34, such movement is stopped by the engagement of the pin 20 with the inner end of the slot 22, but the raising arm 39 of the bolt will have raised the cover to a partially open position. However, the latching arm 38 of the bolt will not have fully cleared the plate 13

but will still be above the edge of the plate along the inner end of the passageway 17. The weight of the cover on the bolt arm 39 will hold the bolt in this position with the rear end of the bolt slot 47 against the pin 20. Now if the cover is raised further, the plate 13 will engage with the latching arm 38 and will swing the latch bolt outwardly until the outer end of the bolt slot 47 contacts the pin 20, and if it were not for the keeper K, the cover could be swung to its full open position. However, upon such attempt to further swing the cover open from its partial open position shown on Figure 2, the end 44 of the keeper will engage under the hook end 40' as indicated by dotted lines of Figure 2 and such upward movement of the cover beyond the partial opening caused by the latch mechanism will be limited. Thus, if, while a car is traveling on the road, the knob 34 is accidentally pulled out and the cover unlatched and partly opened, wind pressure cannot swing the cover fully open for as soon as the cover moves beyond its partial opening it will swing the safety hook into the path of the keeper and such wind opening of the cover will be blocked. However, if the car is at rest, as for example, at a service station, and the knob 34 is pulled for unlatching and partial raising of the cover, the driver or a service man can swing the keeper K upwardly by upward pressure against the keeper abutment 45 so that the keeper end will be out of the path of the safety hook 40' and then the cover can be swung to its full open position with the keeper end clearing and moving past the hook end of the bolt which was swung forwardly by the cover upon further raising of the cover.

It will be noted on Figure 2, that after unlatching and partial opening of the cover the hook end 40' will be a sufficient distance above the end of the keeper so that the keeper may be swung upwardly for clearance of the hook end and full opening of the cover. However, if, after unlatching and partial opening of the cover, the cover is raised further without first swinging the keeper upwardly, the bolt end 40 will be swung forwardly by the cover and the hook and 40' will engage around the keeper end 44 and further opening movement will be blocked. Under these conditions, the cover will have to be swung back toward closing position for engagement of the cover plate 13 with the raising arm 39 of the latch bolt and for swing of the latch bolt back to the position shown in full lines on Figure 2 to unhook its end 40' from the keeper so that the keeper may then be swung upwardly out of the path of the hook for full opening of the cover.

Thus, with the arrangement shown on Figures 1 and 2, after unlatching and partial opening of the cover, further swing of the cover will cause the cover to swing the catch hook into the path of the keeper to block further opening movement of the cover, but such catching may be prevented by first swinging the keeper out of range of the hook.

In the modified arrangement shown on Figure 3, the lower end of the latch bolt B is not slotted but receives the pin 20 without swing relative thereto. The latch bolt has the latching arm 48 and the raising arm 49. The detent pawl 26 is the same as in the structures of Figures 1 and 2, and has the abutment arm 50 for cooperation with the abutment arm 51 on the latch bolt, a compression spring 52 between the abutment arms serving to hold the pawl tooth 27 in detent engagement with the teeth 28 of the

rack bar 29 when the latch bolt is in its latching position in the same manner as with the mechanism shown on Figure 1, Figure 3 showing the latch bolt in its unlatching position. When the knob 34 is pulled for swing of the latch bolt to its unlatching position shown on Figure 3, the setting arm 49 swings the cover 11 to its partially open position and the end of the latching arm 48 and the bolt will be clear of the edge of the cover plate 13 at the inner end of the passageway 17.

The keeper structure K means on Figure 3 is the same as that shown on Figures 1 and 2. The safety catch or hook lever 53 does not, like in Figures 1 and 2, form an integral part of the latch bolt B, but is a separate part fulcrumed on the fulcrum stud 19. The lever 53 has the upper abutment arm 54 and the lower abutment arm 55 extending rearwardly. The lever has stop projections 56 and 57 for engagement with the abutment arm 51 on the latch bolt to limit the swing of the lever 53 relative to the latch bolt. When the latch bolt is swung to its unlatching position for engagement of the setting arm 49 with the plate 13, the abutment arm 51 on the bolt engages the abutment projection 56 on the lever 53 and this lever is swung with its abutment arm against the plate 13, as shown on Figure 3. In this position of the lever 53, its upper abutment arm 54 will be above the path of the edge portion of the plate 13 adjacent the inner end of the passageway 17, and if the cover is now manually swung for further opening movement without swinging the keeper K upwardly, the plate 13 will engage the abutment arm 54 and will swing the lever outwardly to bring its hook end 53' into the path of the keeper end portion 44, and further movement of the cover will be blocked. If, however, the keeper K is swung upwardly after unlatching and partial opening of the cover and before further upward swing of the cover, the catch lever 53 will be prevented from catching engagement with the keeper and the cover can then be manually raised to its full open position. On Figure 3, the dotted line shows the safety catching engagement of the lever with the keeper if an attempt is made to raise the cover without first swinging up the keeper to clear the hook end 53' of the lever. Outward swing of the lever 53 by the cover will be limited by the engagement of the stop projection 57 with the bolt or abutment arm 51.

With the arrangements shown in Figures 1 and 2, when the cover has been fully opened, and is eventually swung back to its closed position, the keeper will glide past the hook end of the catch arm 40 and then the plate 13 of the cover will engage with the raising arm 39 of the latch bolt and the weight of the cover will swing the latch bolt back toward its latching position, the final movement being rapidly accomplished by the pressure of the spring 25 and the cover will then be securely held in its closed position. In the arrangement of Figure 3, the keeper can readily glide past the catch arm 53 and the plate 13 will then engage the lifting arm 49 of the latch bolt for restoring of the latch bolt to its latching position.

I thus provide practical, simple and efficient latching and safety catch structures for automobile hoods of the alligator type with which, after unlatching and partial opening of the cover under control from within the vehicle body, full opening of the cover by wind pressure will be blocked by safety catch means which the cover

itself will operate, but which safety catch means may be rendered ineffective after unlatching and partial opening of the cover so that the cover may be manually swung to its full open position.

I have shown practical and efficient embodiment of the features of my invention, but I do not desire to be limited to the exact construction, arrangement and operation shown and described as changes and modifications may be made without departing from the scope of the invention.

I claim as my invention:

1. Latching and safety catch assembly for an automobile hood of the alligator type comprising a main latch within the hood body and a safety catch hook extending therefrom, means controllable from outside said hood body for effecting unlatching of said main latch and partial opening thereby of the hood cover, a keeper structure on the hood cover for said hook accessible only after such partial opening and being normally in catch position, means effective when said cover is raised beyond said partial opening for causing the cover to engage with and move said safety catch into position for engagement with said keeper structure to thereby prevent further opening movement of the cover, and means whereby said keeper structure is movable from its normal position out of the path of said safety catch after said cover has been partially raised by said main latch whereby upon such further opening movement of the cover the keeper structure will not catch the safety catch hook and the cover may be fully opened.

2. Main latch and safety catch assembly for an automobile hood of the alligator type comprising a main latch within the hood body, means controllable from outside of said hood body for effecting unlatching of said main latch and partial opening thereby of the hood cover, a safety latch hook mounted on said main latch for movement therewith and limited movement relative thereto, a keeper element on the cover accessible only after said cover has been partially raised by said main latch, means for holding said hook out of the path of said keeper element when said cover has been partially opened by said main latch, means which upon attempted further opening movement of said cover from said partial opening will cause said cover to engage with said hook and move it relative to said main latch into position for engagement by said keeper element so that such further opening will be prevented, and means adapting said keeper element for movement out of the path of said hook after such partial opening of the cover by said main latch whereby said keeper element will then not be engaged by the hook so that the cover may then be fully opened.

3. Latching and safety catch assembly for an automobile hood of the alligator type comprising a latch bolt within the hood body, means controllable from outside of said hood body for effecting unlatching movement of the latch bolt and partial opening by the latch bolt of the hood cover, a keeper member within the hood cover, a safety catch hook mounted for movement with said latch bolt and limited movement relative thereto, said hook during movement of said latch bolt for partial opening of the cover being moved with the latch bolt to an intermediate position out of range of said keeper member, means whereby upon further opening movement of said cover said hook will be engaged by the cover and moved into the range of said keeper member

whereby full opening of the cover will be prevented by the engagement of the keeper member by the hook, and means adapting said keeper member, after said partial opening and before further opening movement of the cover, to be moved away from said hook so that the keeper element will not be engaged by the hook and the cover may be fully opened.

4. Latching and safety catch assembly for an automobile hood of the alligator type comprising a latch bolt within the hood body, means controllable from outside the said hood body for effecting rocking of said latch bolt to unlatch the hood cover and to partially open the cover, a keeper member within the hood cover, a safety catch hook mounted to rock with the latch bolt and for limited rocking movement independently thereof, means whereby said hook will move with said latch bolt to an intermediate position when said latch bolt unlatches the cover and effects partial opening thereof, means yieldably holding said hook in said intermediate position, said hook in said intermediate position being out of the path of said keeper member, means whereby said cover will engage with and rock said hook into the path of said keeper member if said cover is raised further beyond said partial opening, and means pivoting said keeper member whereby said member may be swung away from said hook after such partial opening of the cover and before 30

further opening movement thereof whereby said cover may then be fully opened.

5. Latching and safety catch assembly for an automobile hood of the alligator type comprising a latch bolt within the hood body, means controllable from outside the said hood body for effecting rocking of said latch bolt to unlatch the hood cover and to partially open the cover, a keeper member within the hood cover, a safety catch hook mounted to rock with the latch bolt and for limited rocking movement independently thereof, means whereby said hook will move with said latch bolt to an intermediate position when said latch bolt unlatches the cover and effects partial opening thereof, means yieldably holding said hook in said intermediate position, said hook in said intermediate position being out of the path of said keeper member, means whereby said cover will engage with and rock said hook into the path of said keeper member if said cover is raised further beyond said partial opening, means pivoting said keeper member for upward swing whereby after said cover has been partially opened said keeper member may be manually swung away from the hook so that after such partial opening of the cover further opening movement thereof will not cause the keeper member to be engaged by the hook and the cover may be then fully opened.

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