July 2, 1957 T. J. SOROKA 2,797,947

LATCH MECHANISM

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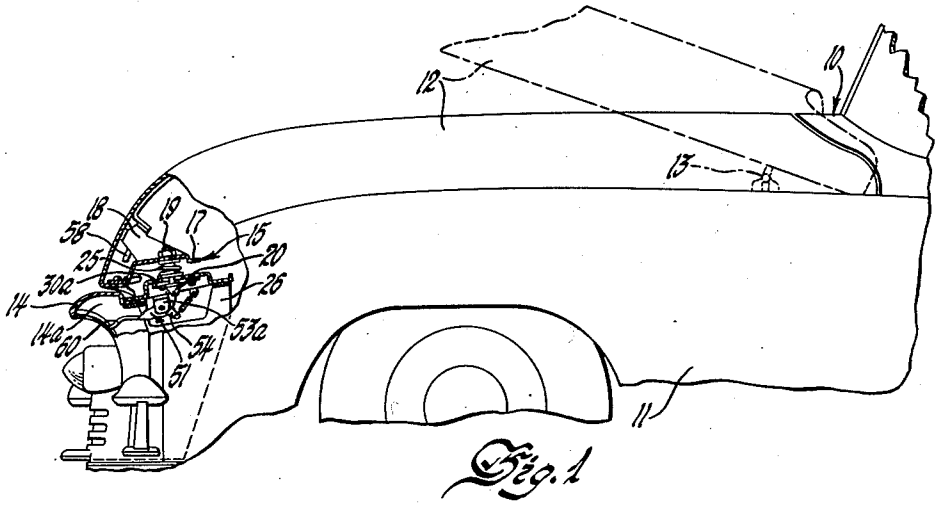


Fig. 1

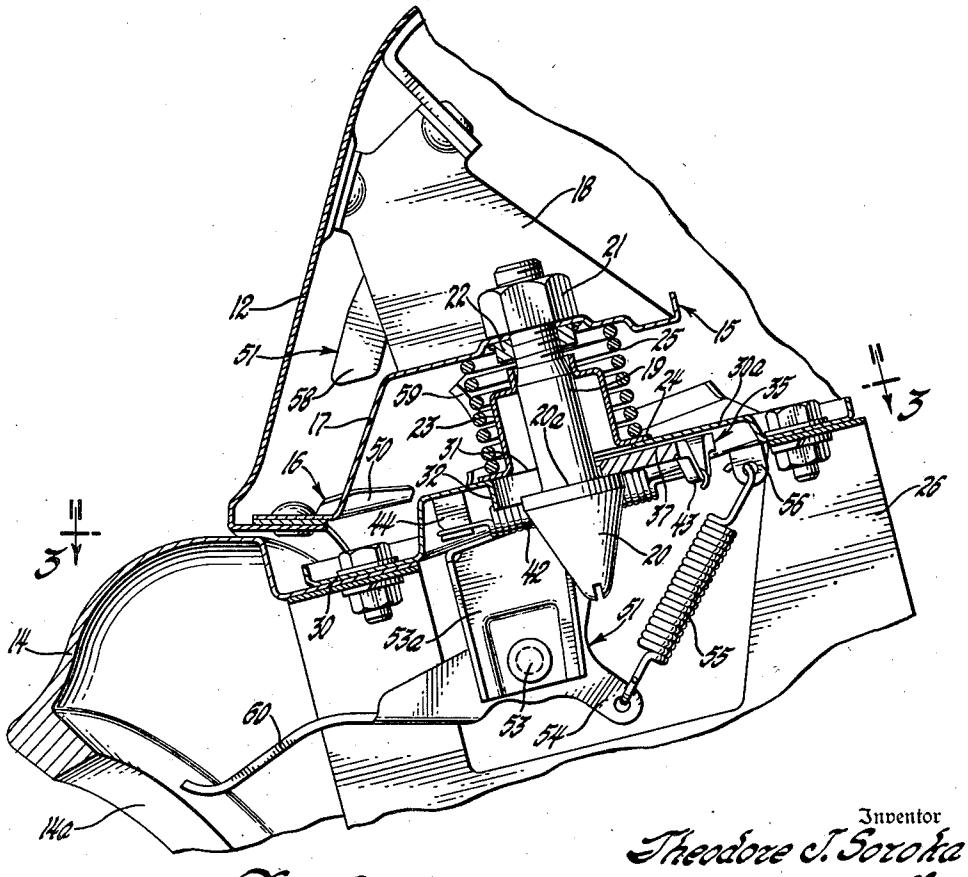


Fig. 2

Inventor
Theodore J. Soroka
By Willits, Helwig & Baillio
Attorneys

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LATCH MECHANISM

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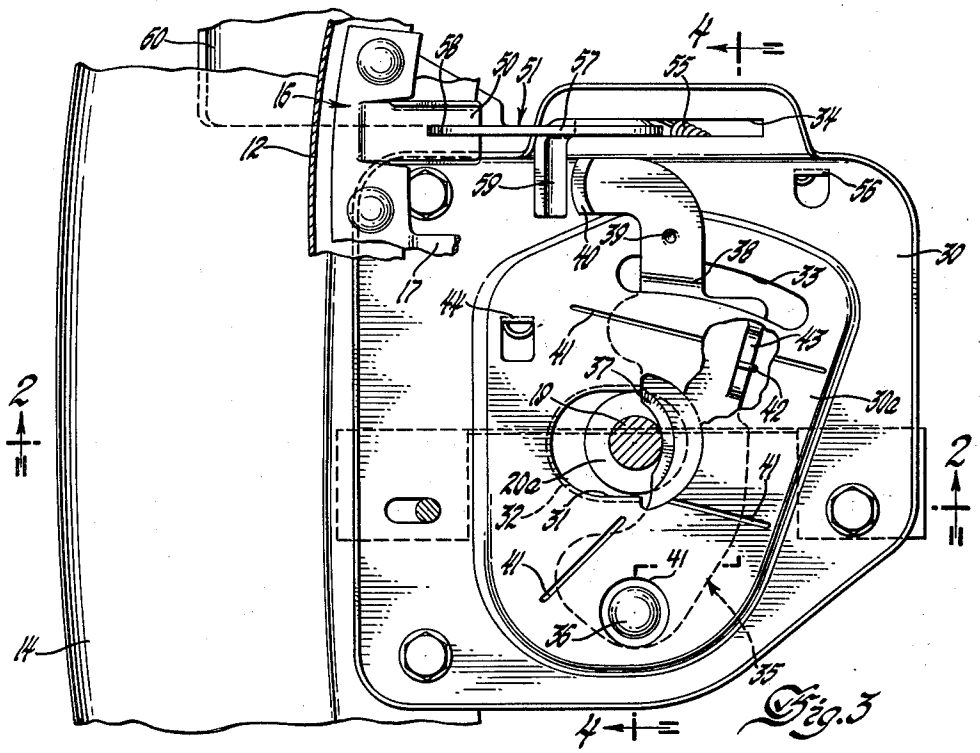


Fig. 3

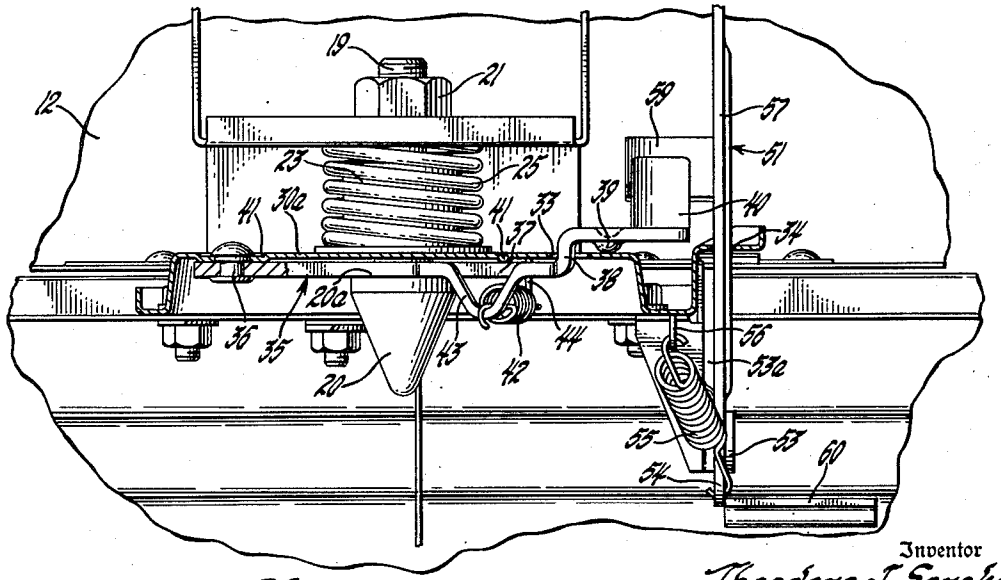


Fig. 4

Inventor
Theodore J. Soroka
By Willis, Helwig & Baillio
Attorneys

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LATCH MECHANISM

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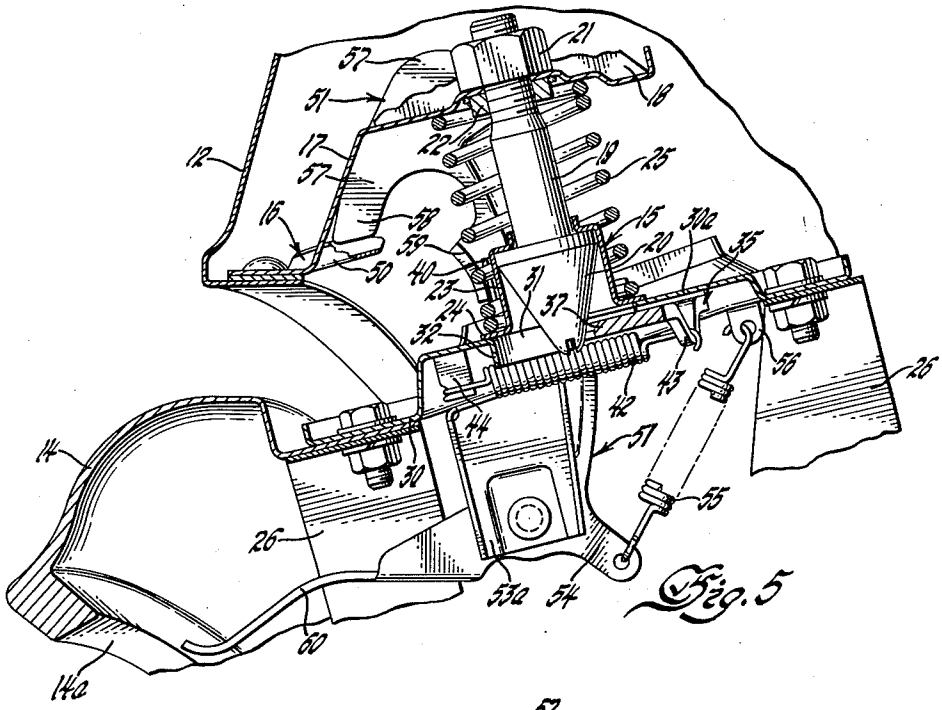


Fig. 5

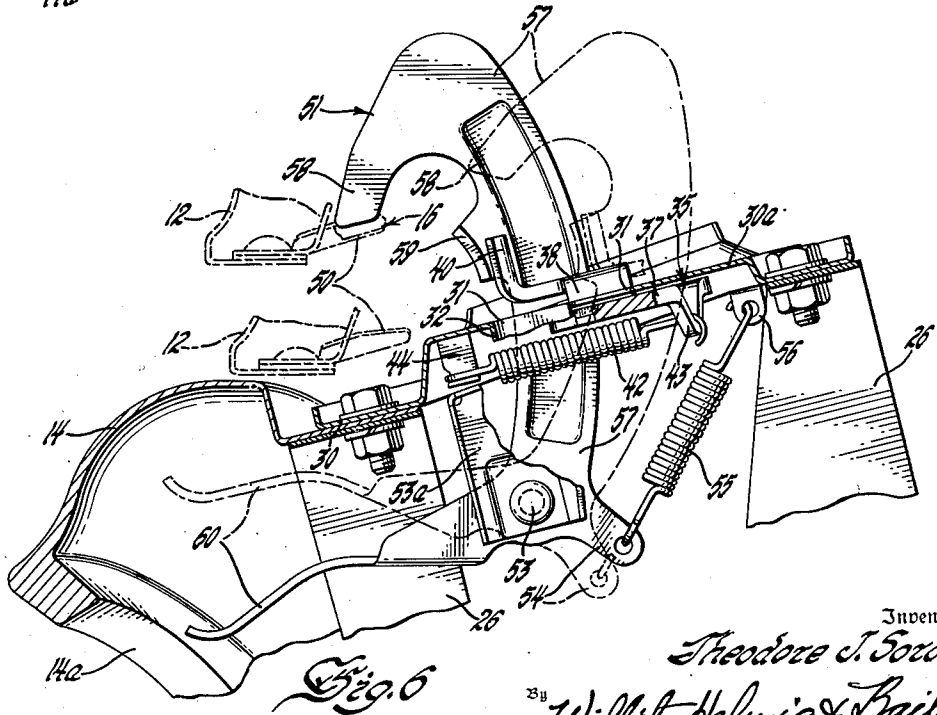


Fig. 6

Inventor
Theodore J. Soroka
By Willets, Helwig & Baillio
Attorneys

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LATCH MECHANISM

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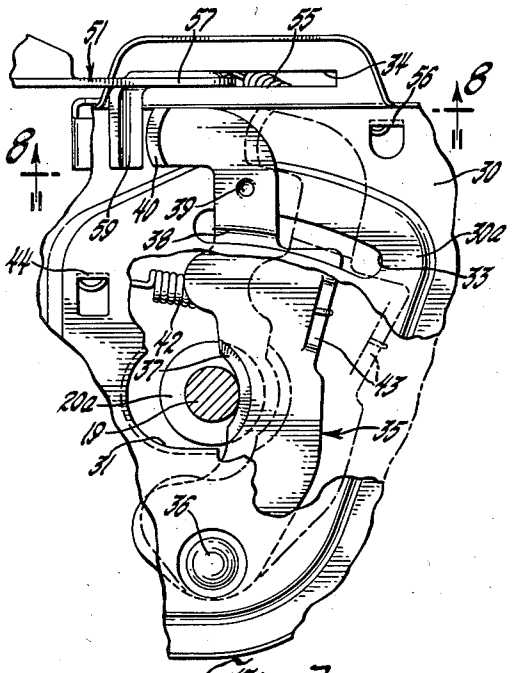


Fig. 7

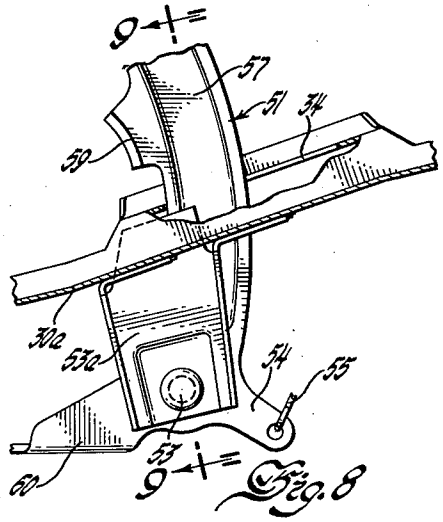


Fig. 8

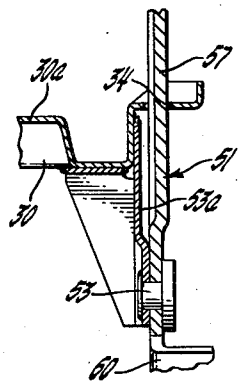


Fig. 9

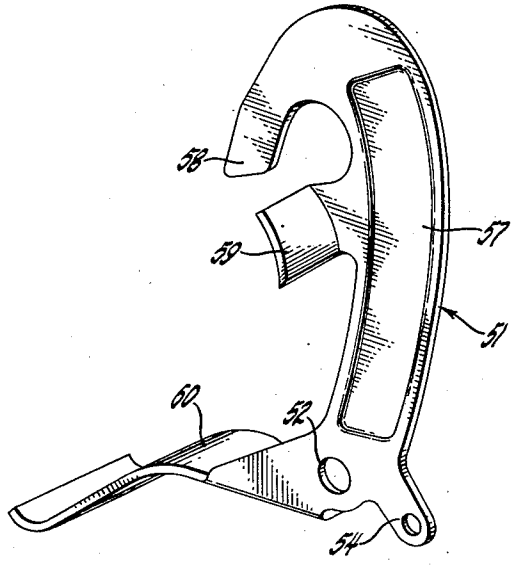


Fig. 10

Inventor
Theodore J. Soroka
By Willits, Helwig & Baillio
Attorneys

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LATCH MECHANISM

Theodore J. Soroka, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application November 17, 1950, Serial No. 196,269

8 Claims. (Cl. 292—11)

This invention relates to a latch mechanism, and more particularly to a hood latch for an automobile.

In many modern automobiles, and particularly in automobiles in which the hood is of the so-called "alligator" type having a single movable top panel member hingedly mounted adjacent its rear edge and opening from the front, a primary latching means is provided for holding the hood closed, and a secondary latch is also provided and acts as a safety latch in the event the primary latch inadvertently becomes unlatched while the automobile is traveling at a high speed or in the event the primary latch was not properly latched when the hood was closed.

The secondary or safety latch generally comprises a catch member on the movable hood portion and a latch member on the fixed hood portion. These parts are so positioned that the latch does not engage the catch when the hood is tightly closed, and upon unlatching the primary latch the hood opens partially under the force of a spring associated with the primary latch keeper. The hood is prevented from opening fully by the safety latch, the safety catch member moving into engagement with the latch member upon said partial opening of the hood. In order to open the hood fully the safety latch must be released.

In most commercial constructions, separate operating means are provided for the primary latch and for the secondary or safety latch. In some automobiles the primary latch operating means comprises a Bowden wire or the like extending from the latch to the interior of the automobile, while the safety latch operating member comprises a lever or handle which may be reached from the front of the automobile and exteriorly thereof after the primary latch has been released. In other constructions the two latches are separately operated from the exterior of the automobile.

Inasmuch as the essential purpose of the secondary latch is to prevent the hood from flying open when the automobile is traveling at a high speed in the event the primary latch is disengaged, the provision of separate operating means for these two latches is unnecessary. The present invention is primarily concerned with an improved latched mechanism wherein a single operating means is provided for simultaneously releasing both the primary and the secondary latch. However, should the primary latch inadvertently become disengaged, the secondary latch will still prevent the hood from opening beyond a very limited point.

One feature of the invention is that it provides an improved latch mechanism; another feature of the invention is that it provides an improved means for simultaneously unlatching the primary hood-locking latch and the secondary latch by a single operating member; a further feature of the invention is that this operating member preferably is rigid with the secondary latch member and may be formed integrally therewith, leaving the primary latch member free for operation independently of the secondary latch member, whereby inadvertent unlatching of the primary member will not also unlatch the secondary latch; still another feature of the invention is that the operating member projects forwardly from the safety latch member so that it may be operated by reaching through an opening in the grille structure of the automobile; yet a further feature of the invention is that the operating member is moved upwardly in the direction of opening movement of the movable hood portion in order to unlatch the hood; and yet another feature is that the primary latch lever has a follower portion and the secondary latch lever has an actuating portion normally closely adjacent the follower at its forward side to provide simultaneous unlatching of both latches upon upward movement of the operating member.

Other features and advantages of the invention will be apparent from the following description, and from the drawings in which:

Figure 1 is a fragmentary side elevational view, partly in section, of the front end of an automobile incorporating the improved latch mechanism, the hood being shown closed in solid lines and open in broken lines; Figure 2 is an enlarged fragmentary vertical longitudinal section through a portion of the hood structure of Figure 1, taken along the line 2—2 of Figure 3; Figure 3 is a generally horizontal section taken along the line 3—3 of Figure 2; Figure 4 is a transverse vertical section taken along the line 4—4 of Figure 3; Figure 5 is a longitudinal section generally similar to Figure 2 but showing the parts with the primary latch disengaged and with the secondary latch engaged; Figure 6 is a section similar to Figure 5, the parts being shown in solid lines in the position of Figure 5 and in broken lines in another position, and the primary keeper and its associated structure being removed; Figure 7 is a fragmentary section generally similar to Figure 3 but with parts removed, and showing the parts in solid lines in one position and in broken lines in another position; Figure 8 is a section along the line 8—8 of Figure 7; Figure 9 is a section along the line 9—9 of Figure 8; and Figure 10 is a perspective view of the secondary latch lever.

Referring now more particularly to the drawings, the body of an automobile is designated generally at 10 in Figure 1, said body having front fenders 11, the inside portion of which may effectively comprise the sides of the lower fixed hood portion of the automobile. An upper movable hood member 12 is hingedly mounted adjacent its rear end on the body 10 by means shown diagrammatically at 13. The hinged mounting means may be conventional, and preferably comprise an over-center spring arrangement, as is well-known in the art.

Affixed to the extreme front end of the automobile is a grille structure 14 having an opening 14*a* therein. As is conventional in the art, primary and secondary latch means are provided, the primary latch means being designated generally at 15 in Figures 1, 2 and 5 and the secondary latch means being designated generally at 16 in said figures.

The primary latch means provides a positive latch which, when latched, holds the hood securely closed; and the secondary latch means provides a safety latch which is provided to prevent the upper hood member 12 from flying to open position when the automobile is traveling at high speed in the event the primary latch 15 becomes unlatched or was not properly latched when the hood was closed. The present invention is concerned primarily with improved coordinating means whereby the primary and secondary latches may be simultaneously unlatched by means of a single operating member.

A mounting bracket 17 which is riveted to or otherwise mounted on the upper movable hood member 12, and which is supported by a bracket 18, carries a downwardly

projecting latch keeper having a shank 19 and an inverted, generally conical head 20 providing a generally horizontal latching shoulder 20*a*, as shown best in Figure 2. The upper end of shank 19 is threaded and is fixedly mounted in an opening in the bracket 17 by means of nuts 21 and 22. While the keeper member is fixedly mounted on the bracket 17 in operation, the threaded shank and the nuts 21 and 22 permit adjustment during assembly. A cup-shaped thrust member 23 is slidably mounted on the shank 19, the inner diameter of the cup-shaped portion being such that it will freely receive the head 20 of the keeper as shown in Figure 5, and the member 23 is provided with an outwardly extending peripheral flange 24 at its lower open end. A compression spring 25 surrounds the shank 19 and the thrust member 23, the upper end of the spring abutting the lower surface of the mounting bracket 17 and the lower end of the spring abutting the flange 24, thereby providing a force to urge the movable hood member 12 away from thrust member 23. When the hood is closed this spring is under compression, as shown in Figure 2. When the hood is being opened, the spring 25 forces the movable hood member 12 up to partially open position and the head 20 of the keeper enters the cup-shaped portion of the thrust member as shown in Figure 5.

A sheet metal bracket 26 is bolted or otherwise secured to the automobile body on the rear side of the grille 14, and a plate member 30 is bolted to the bracket 26 and carries portions of the improved latching mechanism. The plate 30 has a dished portion 30*a* in which an elongated aperture 31 is provided, the aperture preferably being punched to provide a downwardly projecting flange 32. The dished portion 30*a* of the plate 30 is also provided at one side with an arcuate slot 33 and the plate 30 has a straight slot 34 near one side.

A primary latching lever designated generally at 35 is pivotally mounted for movement in a generally horizontal plane on the plate 30 adjacent the underside of the dished portion 30*a* by means of a rivet 36, this point of pivotal mounting being on the opposite side of the aperture 31 from the slot 33. The primary latch lever 35 has a latching portion 37 which, when the latch is in the latched position of Figures 2, 3 and 7, extends across the rear portion of the aperture 31 so that it may abut the latching shoulder 20*a* of the keeper when the hood is closed. The upper inner edges of the latching portion 37 is beveled to provide a cam surface. Near the free end of the lever 35 is an offset portion 38 which, in its upward extension, projects through the slot 33 and up above the plate 30, a boss 39 providing a bearing means for this offset portion of the latch lever. At its free end the latch lever 35 is provided with an upwardly projecting follower ear 40. As seen best in Figures 3 and 4, the lower surface of the dished portion 30*a* is embossed as shown at 41 to provide additional bearing means for the pivotally mounted lever 35. A spring 42 is connected between a punched loop portion 43 on the lever 35 and a lanced tab 44 on the plate 30 to provide force or bias to urge the lever 35 toward latched position (counterclockwise as the parts appear in Figures 3 and 7).

In the operation of the primary latch alone, without reference to the secondary latch, the spring bias normally causes the latch to be positioned as shown in Figures 3 and 7 wherein the latching portion 37 extends across the rear end of the aperture 31 in the path of movement of the keeper head 20. When the hood is closed, downward movement of the movable hood portion 12 causes the head 20 of the keeper to enter the aperture 31, the parts being shown in Figure 5 in this position. Further downward movement of the movable hood portion 12 from the position of Figure 5 will cause the spring 25 to be compressed as the keeper moves down through the aperture 31, camming the lever 35 out of the way during this movement. When the head of the keeper has moved below the under surface of the latching portion 37 of the lever 35, the

spring 42 will move the lever 35 into latching position, as shown in Figure 2 and in solid lines in Figure 7, so that the hood is securely latched. With the parts in this position, if the lever 35 is pivoted in a counterclockwise direction, as the parts appear in Figure 7, to withdraw the latching portion 37 from engagement with the latching shoulder 20*a*, the force of the compression spring 25 will move the parts back to the position of Figure 5 wherein the primary latch is unlatched. Because of the movement of the keeper, the primary latch may move back into latching position without engaging the keeper.

In order to prevent the hood from opening beyond the position of Figure 5 in the event that the primary latch is inadvertently released, safety latch means 16 is provided. This latch means comprises a catch member in the form of a dished plate 50 which is riveted or otherwise secured on the lower front edge of the movable hood member 12 and extends rearwardly therefrom. A secondary or safety latch designated generally at 51 is also provided, being shown best in Figure 10. This latch is formed as a bell crank lever having an opening 52 adjacent the juncture of its legs 57 and 60 for pivoting the latch lever 51 for movement in a vertical plane by means of a rivet 53 on a bracket 53*a* which is welded to the plate 30 and extends downwardly therefrom. An ear 54 projects downwardly and rearwardly from adjacent the juncture of the legs and provides means for securing a spring 55, the other end of the spring being fixed to a lanced tab 56. The spring 55 normally urges the secondary latch lever 51 in a counterclockwise direction as the parts appear in Figure 2, so that the lever is normally in a latching position. The upwardly extending leg 57 of the secondary latch lever projects upwardly through the slot 34 and terminates in a forwardly turned hook portion 58 adapted to engage the safety catch 50. Extending from the leg 57 intermediate the ends thereof, is a bent actuating projection 59 which, when the parts are in their normal latching position, is positioned closely adjacent and forwardly of the follower portion 40 of the primary latch lever 35.

The other leg 60 of the secondary lever extends forwardly and terminates just inside the grille 14, thus providing an operating handle which is rigid with the secondary latch lever 51, preferably being integral therewith, as shown. Referring to Figures 2, 5 and 6, when the hood is closed the secondary latch parts are in the position of Figure 2, the secondary latch hook portion 58 being out of engagement with the secondary catch member 50. In the event the primary latch is inadvertently released the parts assume the position of Figure 5 wherein the hood is partially open, but the secondary latch hook portion 58 engages the catch member 50, thereby preventing further opening of the hood. Referring to Figure 6, if the operating handle 60 is moved upwardly in the direction of opening the hood, the secondary latch lever 51 will be pivoted in a counterclockwise direction, the hook portion 58 moving out of engagement with the cooperating catch member 50, so that the hood may be opened.

In the event the hood is closed so that both latches are latched, the hood may be opened by the operator inserting his hand through the grille opening 14*a* and pushing upwardly on the operating handle 60 to pivot the secondary latch lever 51 counterclockwise from its latched position as shown in Figure 6. During this pivotal movement the actuating projection 59, which is positioned forwardly of and closely adjacent the follower 40 of the lever 35, engages the follower 40 and pivots the lever 35 to unlatching position simultaneously with the lever 51, so that in one operation of a single operating member, both the primary and the secondary latches are released and the hood may be raised to fully open position.

The invention is particularly advantageous in that the safety feature is retained, since inadvertent release of the primary latch will not release the secondary latch. However, when the operator deliberately opens the hood, it is

not necessary and serves no useful purpose to permit the safety latch to prevent full opening of the hood until a second separate release operation is performed.

While I have shown and described one emobdiment of my invention, it is subject to many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. In combination with an automobile hood structure having a lower fixed hood portion with a grille at the front end and an upper movable hood portion and a primary latch member mounted on one hood portion for movement between latching and unlatching positions, the improvement comprising a combined secondary latch and actuating member pivotally mounted on said one hood portion, said member having a latching portion, a manually operable handle portion located beneath the movable hood rearwardly of the grille, and an actuating portion adapted to engage the primary latch member upon movement of the handle so that both primary and secondary latches are released upon movement of said handle portion.

2. In combination with an automobile hood structure having a lower fixed hood portion with a grille at the front end and an upper movable hood portion and a primary latch member mounted on one hood portion for movement between latching and unlatching positions, the improvement comprising a combined secondary latch and actuating member pivotally mounted on said one hood portion, said member having a latching portion, a manually operable handle portion located beneath the movable hood rearwardly of the grille, and an actuating portion located closely adjacent said primary latch member and engaging the primary latch member upon initial movement of the handle so that both primary and secondary latches are simultaneously released upon movement of said handle portion.

3. In combination with an automobile hood structure having a lower fixed hood portion with a grille at the front end and an upper movable hood portion and a primary latch member mounted on the fixed hood portion for pivotal movement between latching and unlatching positions, the improvement comprising a combined secondary latch and actuating member pivotally mounted on said fixed hood portion, said member having a latching portion, a manually operable integral handle portion located beneath the movable hood portion rearwardly of the grille, and an integral actuating projection located closely adjacent said primary latch member and engaging said primary latch member upon initial movement of the handle so that both primary and secondary latches are simultaneously released upon movement of said handle portion.

4. In combination with an automobile hood structure having a lower fixed hood portion with a grille at the front end and an upper movable hood portion, latch apparatus of the character described, including: a primary latch member mounted on one hood portion for movement between latching and unlatching positions, said latch member having a follower portion; and a combined secondary latch and actuating member pivotally mounted on said one hood portion, said member having a latching portion, a manually operable handle portion located beneath the movable hood rearwardly of the grille and an actuating projection located closely adjacent the follower portion of said primary latch and engaging said follower upon movement of the handle so that both primary and secondary latches are released upon movement of the handle.

5. Apparatus of the character claimed in claim 4, wherein the combined secondary latch and actuating member is pivotally mounted on a horizontal axis and the handle portion is movable upwardly in the direction of opening movement of the movable hood portion.

6. In combination with an automobile hood structure having a lower fixed hood portion with a grille at the front end and an upper movable hood portion hingedly mounted on said lower hood portion, latch apparatus of the character described, including: a primary latch member mounted on the fixed hood portion for pivotal movement about a vertical axis between latching and unlatching positions, said latch member having a follower portion projecting therefrom; a combined secondary latch and actuating member pivotally mounted about a horizontal axis on said fixed hood portion, said secondary latch member having a latching portion, a manually operable integral handle portion located beneath the movable hood portion rearwardly of the grille and an integral actuating projection located closely adjacent the follower of said primary latch member and engaging said follower upon initial movement of the handle in an upwardly direction so that both primary and secondary latches are simultaneously released upon movement of said handle portion in the direction of opening movement of the movable hood portion.

7. In a hood latch assembly having a keeper and a latch plate apertured to receive said keeper, a main latch pivoted to said plate and having a surface opposable to the keeper to permit the keeper to override the latch when moved toward locking position, said main latch having an abutment portion, an actuating member pivoted to said plate at a point spaced from said main latch pivot and having a portion in operating contact with said main latch abutment portion, yielding means connected to said latch and actuating lever and positioned to urge together said actuating and latch abutment portions, and to urge said latch toward latching position and means for limiting the travel of said latch and said lever, said last-named means including a slot in said plate and a second main latch portion positioned in said slot for movement therethrough.

8. In a hood latch assembly adaptable for use with automobile hood closures, a fixed base and a movable base, adapted one to be mounted on an automobile hood and the other on an automobile hood closure, a keeper on one base adapted to penetrate an aperture in the other, a main latch lever on the last-mentioned base, and spring means for biasing it toward locking position, the keeper and the main latch lever having opposed surfaces adapted to permit the keeper to override the latch lever when moved toward the locking position, a safety latch mounted on the last-mentioned base, and means for moving said main latch into unlatched position in response to movement of said safety latch toward unlatched position, said means including a manually engageable safety latch actuating portion on said safety latch, an abutment intermediate the ends of said safety latch, a second abutment on said main latch opposed to said first-named abutment, said safety latch being pivoted for greater travel from latched to unlatched position than said main latch.

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