Feb. 22, 1966 C. R. NASH 3,236,551

HOOD LATCH

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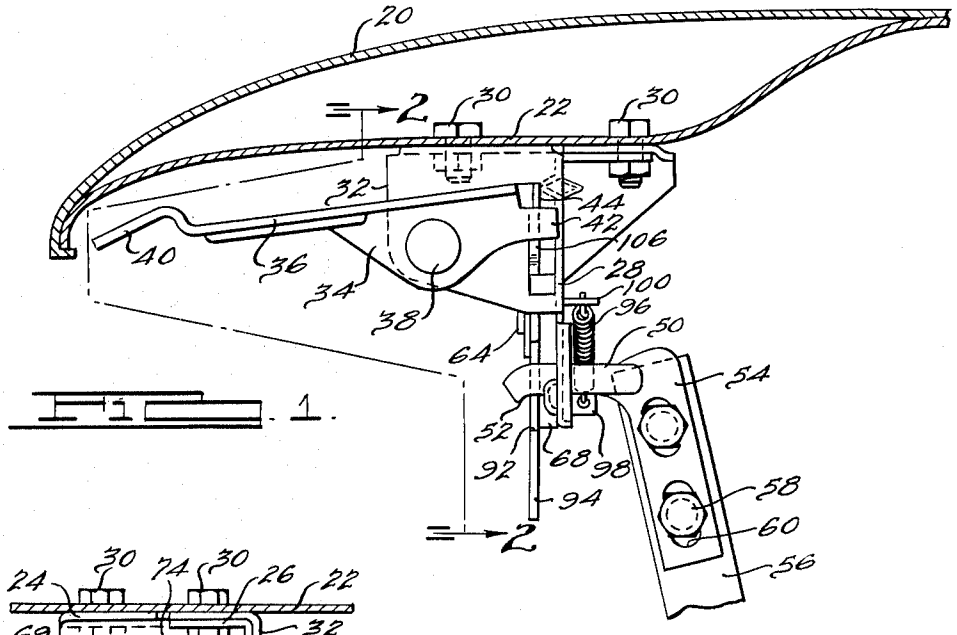


FIG. 1.

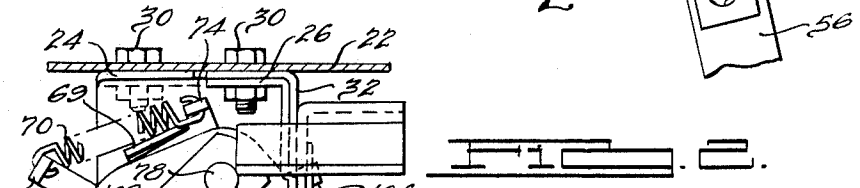


FIG. 2.

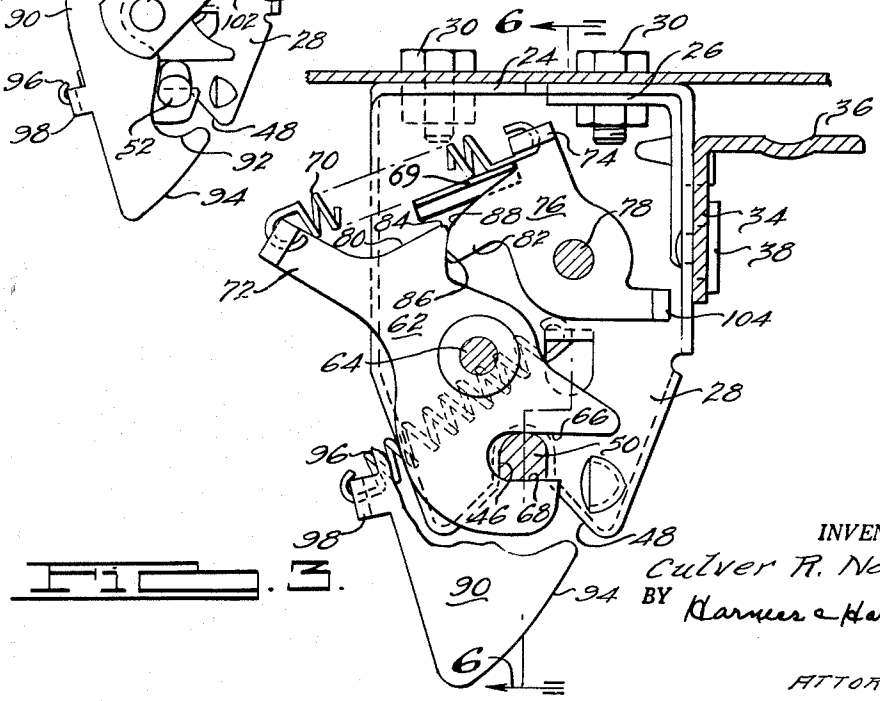


FIG. 3.

INVENTOR.
Culver R. Nash.
BY Harness & Harris
ATTORNEYS.

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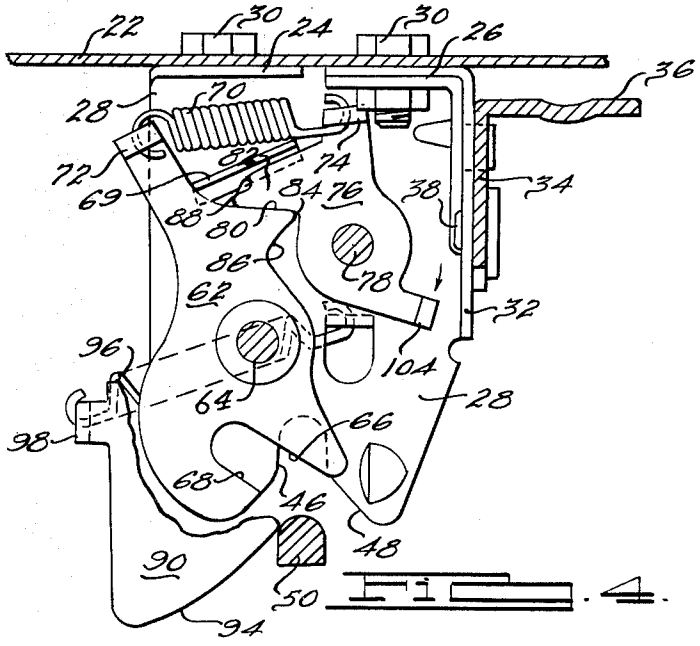


Fig. 4.

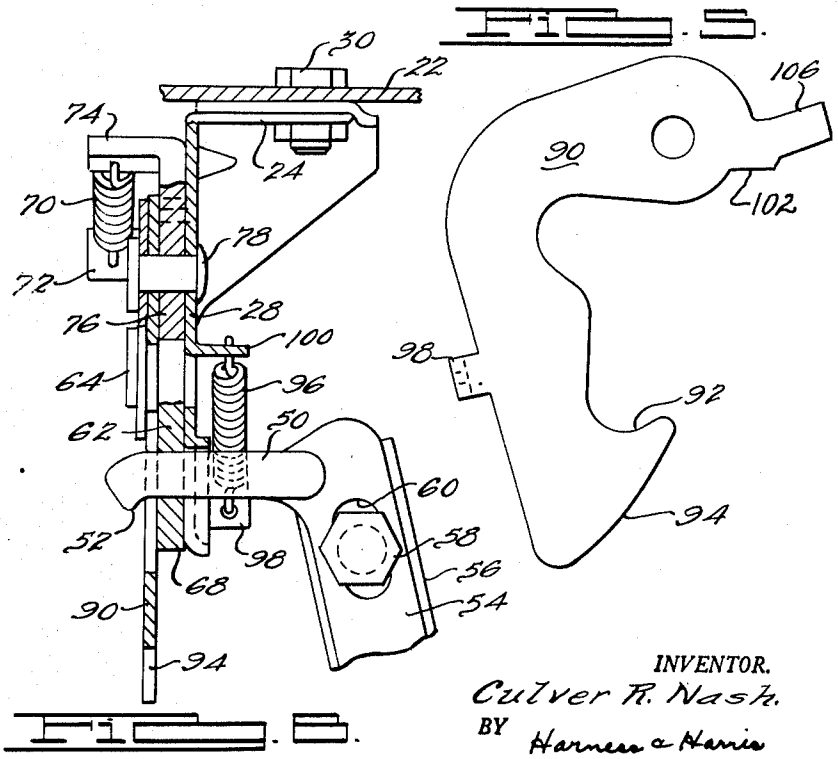


Fig. 5.

INVENTOR.
Culver R. Nash.
BY Harness & Harris

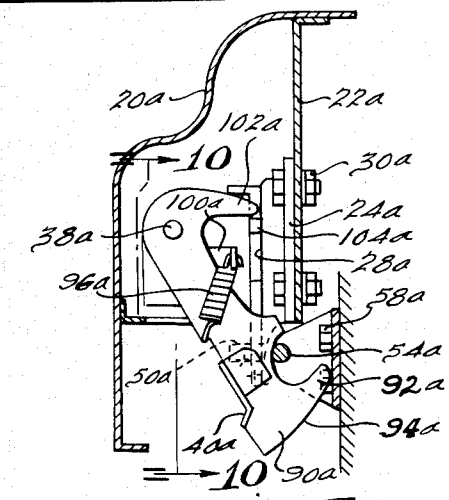
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FIG. 6.



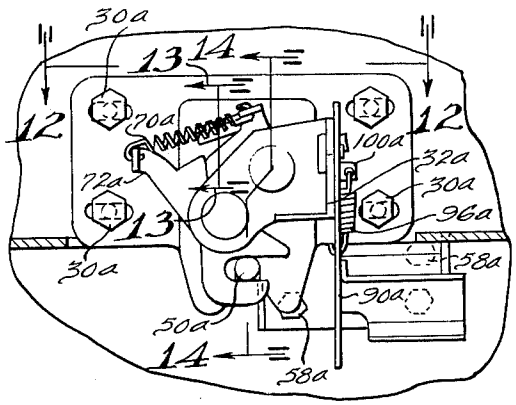


FIG. 7.

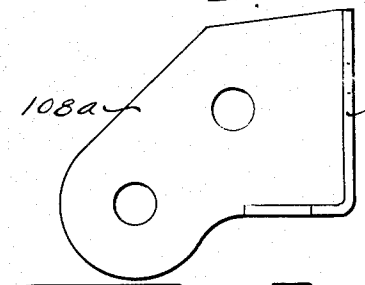


FIG. 9.

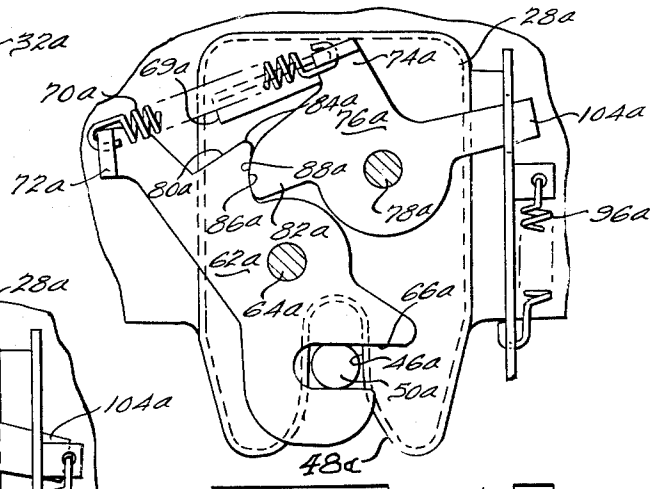


FIG. 10.

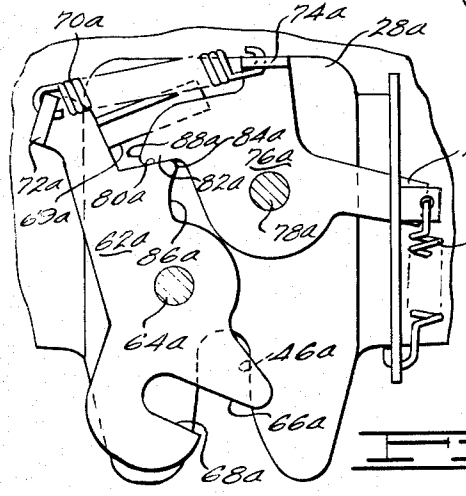


FIG. 11.

INVENTOR.
Culver R. Nash
BY Harness & Harris

ATTORNEYS.

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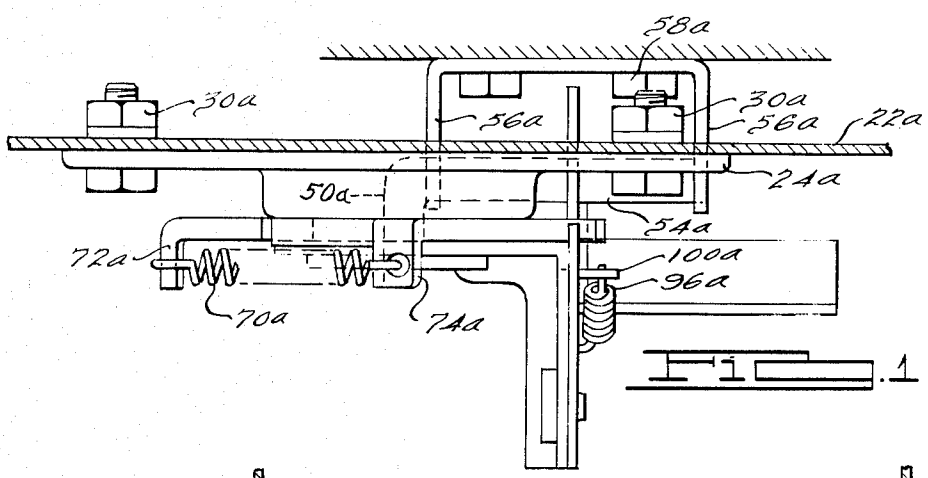


FIG. 12.

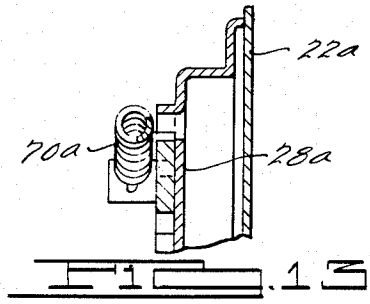


FIG. 13.

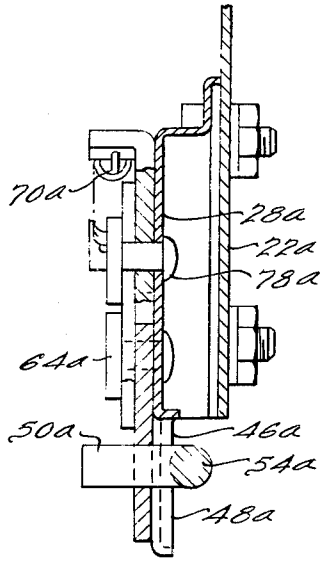


FIG. 14.

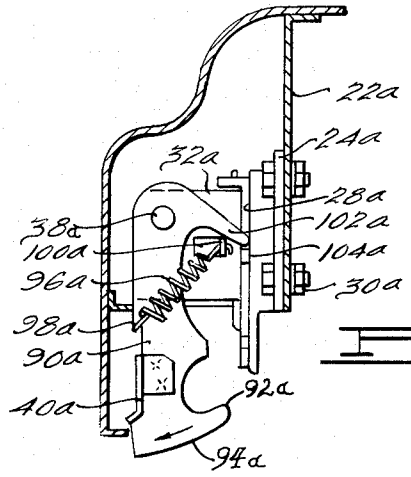


FIG. 15.

INVENTOR.
Culver R. Nash.
BY Harness & Harris
ATTORNEYS.

United States Patent Office 3,236,551 Patented Feb. 22, 1966

3,236,551
HOOD LATCH

Culver R. Nash, Royal Oak, Mich., assignor to Chrysler Corporation, Highland Park, Mich., a corporation of Delaware

Filed Feb. 27, 1961, Ser. No. 91,806
3 Claims. (Cl. 292—11)

This invention relates to latch mechanisms and in particular to a manually releasable latch device suitable for locking an automobile rear deck lid or engine hood in a closed position.

An object of the invention is to provide a comparatively simple and economically fabricated and assembled locking device of the above character which readily locks automatically upon closing of the hood or lid, and which comprises a safety catch cooperable with a resiliently biased and readily manually actuated release mechanism .

Another object is to provide such a mechanism wherein a simple manually actuated release lever unlocks both the safety catch and a main latch.

Still another object is to provide such a locking mechanism wherein the safety catch also serves as the release lever for unlocking the mechanism.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

FIGURE 1 is a fragmentary mid-sectional view through a vehicle front hood and latching mechanism.

FIGURE 2 is a sectional view taken in the direction of the arrows substantially along the line **2—2** of FIGURE 1, showing the latch mechanism in the latching position.

FIGURE 3 is an enlarged fragmentary view similar to FIGURE 2, but with portions of the safety catch broken away to show details of construction.

FIGURE 4 is a view similar to FIGURE 3, showing the latch mechanism in the unlatching position.

FIGURE 5 is an elevational view of the safety catch.

FIGURE 6 is a fragmentary sectional view taken in the direction of the arrows substantially along the line **6—6** of FIGURE 3.

FIGURE 7 is a transverse vertical sectional view through the front end of a vehicle front hood showing a modification of the present invention.

FIGURE 8 is a fragmentary sectional view showing the latch mechanism of FIGURE 7 in side elevation as seen from the right side.

FIGURE 9 is an enlarged view of the reinforcing link removed from FIGURE 7.

FIGURE 10 is a fragmentary sectional view taken in the direction of the arrows substantially along the line **10—10** of FIGURE 8, showing the latch mechanism of FIGURE 7 in the latching position with the reinforcing link removed.

FIGURE 11 is a view similar to FIGURE 10, but showing the mechanism in the unlatching position.

FIGURE 12 is a fragmentary enlarged sectional view taken in the direction of the arrows substantially along the line **12—12** of FIGURE 7.

FIGURE 13 is a fragmentary sectional view taken in the direction of the arrows substantially along the line **13—13** of FIGURE 7.

FIGURE 14 is a fragmentary enlarged sectional view taken in the direction of the arrows substantially along the broken line **14—14** of FIGURE 7.

FIGURE 15 is a view similar to FIGURE 8, showing the mechanism in the unlatching position.

It is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring to the drawings, an embodiment of the present invention is illustrated by way of example in application with the vertically swinging hood **20** at the front end of an automobile body. A support panel **22** is suitably secured to the front end of the hood **20** and is secured to the horizontal flanges **24** and **26** of a vertical depending latch plate **28** by means of bolts **30**, FIGURES 1 and 3. In the present instance, the plate **28** extends transversely of the vertical mid-plane of the vehicle and is provided with an integral forwardly extending flange **32** parallel to said vertical mid-plane and comprising an integral reinforcing web underlying the flange **26**. A flange **34** of a swinging release lever **36** extends parallel to the flange **32** and is pivoted thereto by a pivot pin **38** having oppositely flared ends. From the pivot **38**, the lever **36** extends forwardly to a finger grip portion **40** immediately underlying the forward end of the hood **20**. Rearwardly of the pivot **38**, the lever **36** terminates in a projection **42** underlying a fixed stop **44** integral with the plate **28** and limiting counterclockwise pivoting of lever **36** from the position shown in FIGURE **1**.

The lower edge of the plate **28** is provided with a central keeper-receiving notch **46** which opens downwardly by means of diverging edges **48** effective to engage and cam a keeper **50** into the slot **46** upon downward closing of the hood **20**. The keeper **50** comprises a rod having a down-turned forward end **52** and is secured rearwardly to an arm **54** suitably secured to a fixed bracket **56** of the vehicle body by means of bolts **58** extending through elongated adjusting bolt holes **60** in the bracket **54**.

A main latch **62** is pivotally mounted on the plate **28** by means of a horizontal pivot pin **64** extending parallel to the mid-plane of the vehicle at a location above and to the left of notch **46**. Below the pivot **64** the catch **62** is provided with a keeper engaging cam **66** spaced from a lower keeper engaging jaw **68**. The main portion of the cam **66** declines to the right in FIGURE 4 beyond the pivot **64** and jaw **68** and overlies keeper **50** so as to be engaged by the later upon closing of the hood **20**, thereby the swing catch **62** counterclockwise in FIGURE 4 to the latching position of FIGURES 2 and 3 whereat keeper **50** is snugly confined between the cam **66** above and the jaw **68** below.

The catch **62** is resiliently urged clockwise to the unlatching position of FIGURE 4 to the limit permitted by a stop **69** integral with plate **28** by means of a coil spring **70**. The latter is connected under tension with an arm **72** of catch **62** and an arm **74** of a pawl **76** pivoted on plate **28** by means of a pivot pin **78**. In their unlatching positions, arm **74** extends upwardly from pivot **78**, whereas arm **72** extends upwardly and leftwardly from pivot **64** generally oppositely from the cam **66** and engages stop **69**. As illustrated in FIGURE 4, the pivots **64** and **78** are located at opposite sides of the vertical line through keeper **50**, the pivot **78** being located somewhat above pivot **64**, so that the spring **70** yieldingly urges catch **62** clockwise and pawl **76** counterclockwise.

At a location between pivot **64** and the attachment of arm **72** with spring **70**, the catch **62** is provided with a shoulder **80** which extends horizontally in the unlatching position, FIGURE 4, and comprises an abutment underlying a leftwardly extending arm **82** of pawl **76**. As illustrated, the shoulder **80** comprises a movement limiting stop for pawl **76** holding the latter at the position illus-

trated in FIGURE 4 against the counterclockwise rotation urged by spring **70**. The shoulder **80** terminates at the right in the rounded nose **84** formed at the outer end of a concave seat portion **86** of the catch **62** underlying shoulder **80** and being substantially concentric with the pivot **78** when in the latching position of FIGURE 3. The upper and leftward edge of arm **82** is rounded at **88** concentrically with surface **86** when in the latching position. It is accordingly apparent that the rounded nose **84** comprises a demarcation between the shoulders **80** and **86** whereby, when nose **84** is pivoted to the under side of arm **82**, spring **70** will swing catch **62** and pawl **76** to the unlatching position of FIGURE 4, but when nose **84** is swung upwardly sufficiently on to the curved surface **88**, the spring **70** will swing the catch **62** and pawl **76** to the latching position of FIGURE 3. In the later position, pawl arm **74** engages the right end of stop **69**.

A dog-leg safety catch **90** is also pivoted on the pin **78** forwardly of pawl **76** to swing concentrically therewith. From pivot **78**, the catch **90** extends leftward and then downward around pivot **64** to a keeper-engaging jaw **92** adapted to underlie the keeper **50** in spaced relationship at the closed position. Inclining rightwardly from the lower end of catch **90** to the right edge of jaw **92** is a keeper-engaging cam surface **94** arranged to swing catch **90** clockwise out of the path of keeper **50**, FIGURE 4, upon downward closing movement of hood **20**. Upon further closing movement of hood **20**, the catch **90** is freed from keeper **50** to be swung counterclockwise into the latching position of FIGURE 3 by means of a spring **96** connected under tension to a rearwardly extending arm **98** of catch **90** and to a fixed tab **100** of plate **28**, FIGURES 1 and 6. To the right of pin **78**, FIGURES 3 and 4, a shoulder **102** of catch **90** overlies a release arm **104** of pawl **76** so as to swing the latter downwardly and pivot pawl **76** clockwise from the latching position of FIGURE 3 to the unlatching position of FIGURE 4.

Extending rightward from shoulder **102**, FIGURE 5, is an arm **106** of catch **90** underlying the rearward projection **42** of the release lever **36**. Thus upon clockwise swinging of the latter, arm **106** is swung downwardly to swing shoulder **102** clockwise against the pawl arm **104** and thereby to swing the latter clockwise from the latching to the unlatching position. A reinforcing link **108** engages the forward ends of pivots **64** and **78** forwardly of safety catch **90** to hold the forward ends of these pivots in fixed relationship with respect to each other.

In order to swing the mechanism to the latching position, the hood **20** is merely swung downwardly toward keeper **50**. As the latter engages cam surface **94**, safety catch **90** is swung clockwise out of the path of keeper **50**, enabling the latter to engage cam surface **66** and swing the main latch **62** counterclockwise from the unlatched to the latched position, FIGURES 4 and 3 respectively. Also as the hood **20** moves downwardly until the upper end of jaw **92** moves below the under surface of keeper **50**, spring **96** then swings safety catch **90** counterclockwise to the latching position of FIGURES 2 and 3.

FIGURES 7–15 illustrate a modification of the present invention wherein the main latch and pawl are substantially the same as in the modification of FIGURES 1–6. The primary distinction from the above-described modification is that in FIGURES 7–12, the release arm **36** and safety catch **90** are combined in an integral element. Throughout the modifications of FIGURES 7–15, the various elements are numbered the same as the corresponding elements in FIGURES 1–6, except that the suffix "a" is added to each reference numeral. As in the prior modification, a fragmentary portion of the front end of a vehicle hood **20***a* is illustrated having a vertical support panel **22***a* which is bolted to a vertical flange **24***a* of latch plate **28***a* by a plurality of bolts **30***a*. The

plane of the plate **28***a* extends transversely to the vertical mid-plane of the vehicle body.

In the present instance, a link **108***a* performs the function of link **108** and is provided with a vertical flange **32***a* parallel to the vertical mid-plane of the vehicle. Replacing the release lever **36**, a combined safety catch and release lever **90***a* is pivoted on flange **32***a* by a pivot pin **38***a* for swinging in a vertical plane transversely to the plane of the latch plate **28***a*. From the pivot **38***a*, the safety catch **90***a* extends downwardly and is provided adjacent its lower forward edge with a suitable finger grip flange **40***a* adapted to be gripped by an operator reaching under the forward end of the hood **20***a*.

As in the modification of FIGURES 1–6, the latch plate **28***a* is provided with a keeper engaging notch **46***a* and flared mouth **48***a* for receiving the forward projecting keeper shaft **50***a*, FIGURES 7 and 10. A rearward portion **54***a* of keeper **50***a* extends at right angles to the latter, FIGURE 12, and is suitably secured to the forward projecting ends of a U-shaped bracket **56***a* secured to a fixed portion of the vehicle body by bolts **58***a*.

The main latch **62***a* with its pivot **64***a* and jaw **66***a* is substantially the same in construction and operation as the corresponding parts of FIGURES 1–6 and is yieldingly urged against stop **69***a* by spring **70***a* substantially in the manner described above. As in the earlier modification, the latch **62***a* is provided with the spring engaging arm **72***a* which is connected by means of spring **70***a* with the arm **74***a* of pawl **76***a*. The latter with its arm **82***a* and rounded shoulder **88***a* cooperate with the horizontal shoulder **80***a*, nose **84***a*, and concave seat **86***a* all in the manner above described in regard to the latch **62** and pawl **76**.

Also in the manner of safety catch **90**, the safety catch and releases lever combination **90***a* is provided with the lower keeper engaging cam **92***a* and jaw **94***a* which cooperate with the keeper portion **54***a* in the manner that the corresponding parts of safety catch **90** cooperate with keeper **50**. In the above regard, it is to be noted that the safety catch **90***a* swings perpendicularly to the plane of the main latch **62***a*, whereas in FIGURES 1–6, safety catch **90** swings in parallelism with the main latch **62**.

As indicated in FIGURE 8, when the safety catch **90***a* is swung counterclockwise by spring **96***a* to the latching position shown, the jaw **92***a* underlies keeper portion **54***a* in spaced relationship and an edge portion of the catch **90***a* abuts the keeper portion **54***a* which serves as a movement-limiting stop. Similarly to the spring **96**, a spring **96***a* is connected under tension with a portion **98***a* of catch **90***a* and with an integral projection **100***a* of plate **28***a* so as to yieldingly urge safety catch **90***a* counterclockwise to the latching position.

Extending to the right in FIGURE 15 from pivot **38***a* is a projection **102***a* which overlies a release arm **104***a* extending from pawl **76***a* substantially in the manner of the above-described projection **104**. Upon clockwise swinging of catch **90***a* from the latching position of FIGURE 8 to the unlatching position of FIGURE 15, as for example when the catch **90***a* is manually gripped at **40***a* and pulled forwardly, the projection **102***a* swings arm **104***a* clockwise in FIGURE 10 so as to swing the arcuate abutment surface **88***a* of pawl **76***a* out of engagement with concave shoulder **86***a* and to enable clockwise swinging of main latch **62***a* to the unlatching position of FIGURE 11. At this position the latch arm **72***a* engages stop **69***a* and the shoulder **80***a* engages shoulder **88***a* all in the manner above described in regard to the corresponding parts of FIGURES 1–6.

I claim:

1. In a latch control mechanism for releasably latching a hinged hood element to a car body element, a latch mounting base adapted for attachment for one of the elements and having bifurcated end portion defining a keeper receiving slot, a latch pivotally mounted on said base and having a bifurcated portion formed of a

striker finger and a latching finger defining a keeper engaging slot positioned to overlie the keeper receiving slot in a latched position and to rotate to one side of the keeper receiving slot in an unlatched position, a single nose on said latch formed by two intersecting cam faces, a manually operable safety catch pivotally carried by said base, having a hook rotatable between an unlatched position and a latched position disposed across said slot, said hook including an outer striker surface positioned for engagement by the keeper as the hood element is moved to closed position to deflect the safety catch to unlatched position and an inner edge disposed across the keeper receiving slot in spaced relation to the keeper engaging slot when the hook occupies the latched position, spring means for biasing the safety catch to latched position, manually operable means for moving the safety catch to unlatched position, a latch control pivotally mounted on said base on an axis laterally of the latch pivotal axis, one of said cam faces being disposed in approximately concentric relation with the latch control axis when the latch occupies the latched position, the latch control having a latch control finger on a peripheral edge thereof and a shoulder on a peripheral edge thereof spaced angularly from the latch control finger, spring means connected with said latch and latch control mutually biasing said latch and latch control toward each other to engage said finger against said nose, the latch control finger and said concentric cam face mutually coacting under the bias of said spring means to retain the latch in latching position, the rotative reaction of the latch striker finger when opposed by the keeper during closing movement of the hood being adapted to rotate the latch and thereby move the nose past the latch control finger and effect latching engagement of the latch control finger with the concentric cam face of the latch, and means on the safety catch engageable with said shoulder on the latch control during rotation of the latch in the direction of catch releasing adapted to rotate the latch control for disengaging said latch control finger from said concentric cam face and release the latch from latched position.

2. In a latch control mechanism for releasably latching a hinged hood element to a car body element, a keeper adapted for attachment to one of the elements, a latch mounting base adapted for attachment to the other of the elements and having a bifurcated end portion defining a keeper receiving slot, a latch pivotally mounted on said base and having a bifurcated portion formed of a striker finger and a latching finger defining a keeper engaging slot positioned to overlie the keeper receiving slot in a latched position and to rotate to one side of the keeper receiving slot in an unlatched position, a single nose on said latch formed by two intersecting cam faces, a manually operable safety catch pivotally carried by said base, having a hook rotatable between an unlatched position and a latched position disposed across said keeper, said hook including an outer striker surface positioned for engagement by the keeper as the hood element is moved to closed position to deflect the safety catch to unlatched position and an inner edge adapted to be disposed across the keeper in spaced relation to the keeper engaging slot when the hook occupies the latched position, spring means for biasing the safety catch to latched position, manually operable means for moving the safety catch to unlatched position, a latch control pivotally mounted on said base on an axis laterally of the latch pivotal axis, one of said cam faces being disposed in approximately concentric relation with the latch control axis when the latch occupies the latched position, the latch control having a latch control finger on a peripheral edge thereof and a shoulder on a peripheral edge thereof spaced angularly from the latch control finger, spring means connected with said latch and latch control mutually biasing said latch and

latch control toward each other to engage said finger against said nose, the latch control finger and said concentric cam face mutually coacting under the bias of said spring means to retain the latch in latching position, the rotative reaction of the latch striker finger when opposed by the keeper during closing movement of the hood being adapted to rotate the latch and thereby move the nose past the latch control finger and effect latching engagement of the latch control finger with the concentric cam face of the latch, and means on the safety catch engageable with said shoulder on the latch control during rotation of the latch in the direction of catch releasing adapted to rotate the latch control for disengaging said latch control finger from said concentric cam face and release the latch from latched position.

3. A latch mechanism for releasably latching a hinged hood element to a car body element comprising in combination a latch mounting base adapted for mounting on one of said elements and having a bifurcated end portion defining a keeper receiving slot, a latch pivotally mounted on said base and having a bifurcated portion formed of a striker finger and a latching finger defining a keeper engaging slot positioned to overlie the keeper receiving slot in a latched position and to rotate to one side of the keeper receiving slot in an unlatched position, a single nose on said latch formed by two intersecting cam faces, a manually operable safety catch pivotally carried by said base in face to face overlying relationship with said latch, said safety catch having a hook rotatable between an unlatched position and a latched position disposed across said slot, said hook including an outer striker surface positioned for engagement by the keeper as the hood element is moved to closed position to deflect the safety catch to unlatched position, and an inner edge disposed across the keeper receiving slot in spaced relation to the keeper engaging slot when the hook occupies the latched position, spring means for biasing the safety catch to latched position, manually operable means for moving the safety catch to unlatched position, a pivot pin anchored in said mounting base passing through the latch and the safety catch for pivotally supporting the latch and safety catch on the base, a latch control pivotally mounted on said base on an axis laterally of and parallel to the latch pivotal axis and in approximately coplanar relation to the latch, one of said cam faces being disposed in approximately concentric relation with the latch control axis when the latch occupies the latched position, the latch control having a finger on a peripheral edge thereof and a shoulder on a peripheral edge thereof spaced angularly from the latch control finger, spring means connected with said latch and latch control mutually biasing said latch and latch control toward each other to engage said finger against said nose, the latch control finger and said concentric cam face mutually coacting under the bias of the spring means to retain the latch in latching position, and means on the safety catch engageable with said shoulder on the latch control during rotation of the safety catch in the direction of catch releasing to rotate said latch control for disengaging said latch control finger from the concentric cam face of the latch nose and the latch from latched position.

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ALBERT H. KAMPE, *Primary Examiner.*

JOSEPH D. SEERS, *Examiner.*