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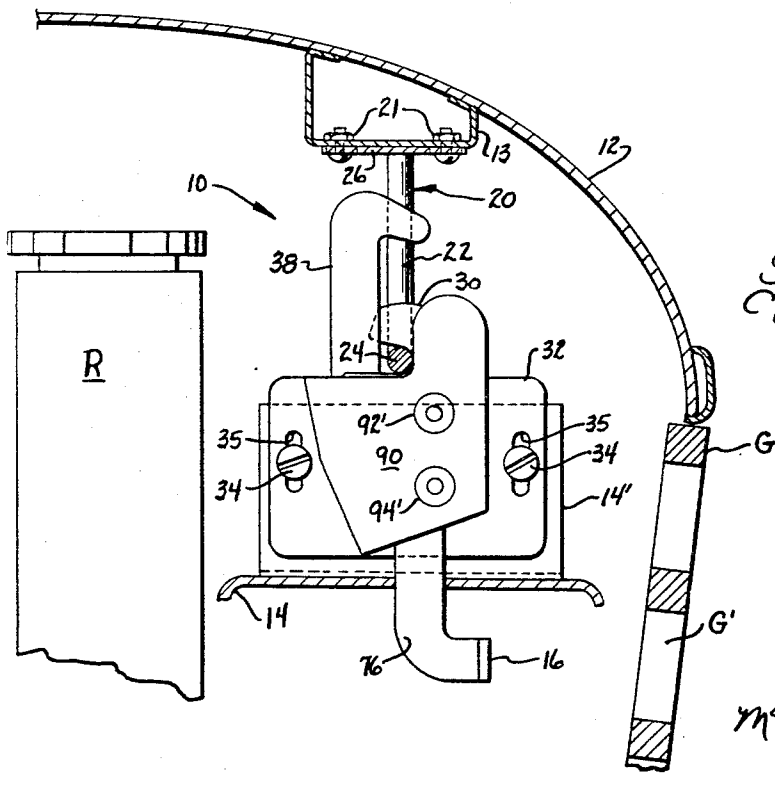
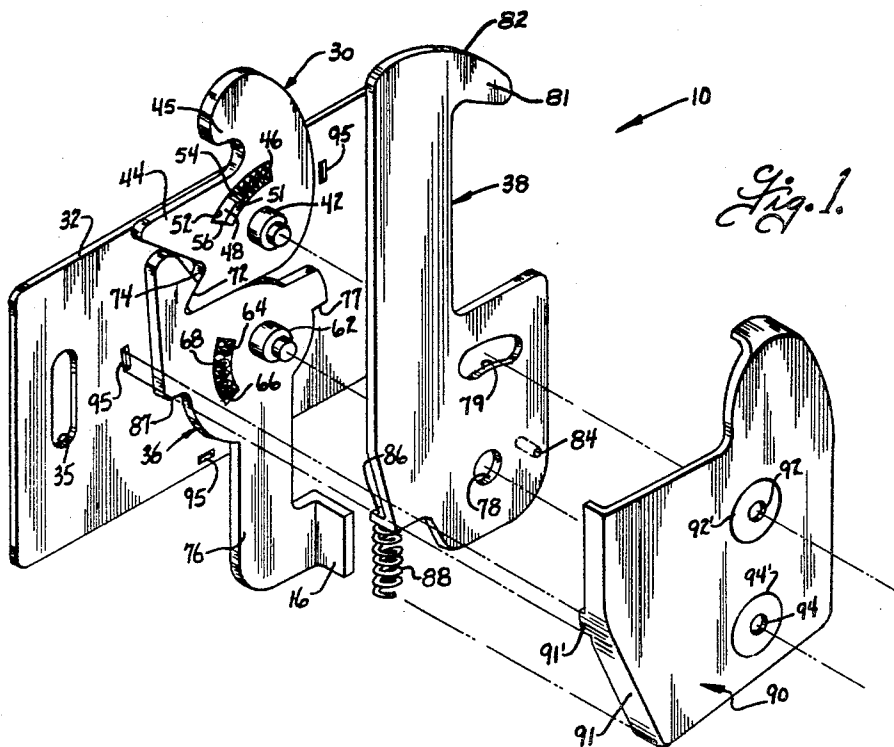
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HOOD AND DECK LATCH

Filed Oct. 15, 1965

2 Sheets-Sheet 1



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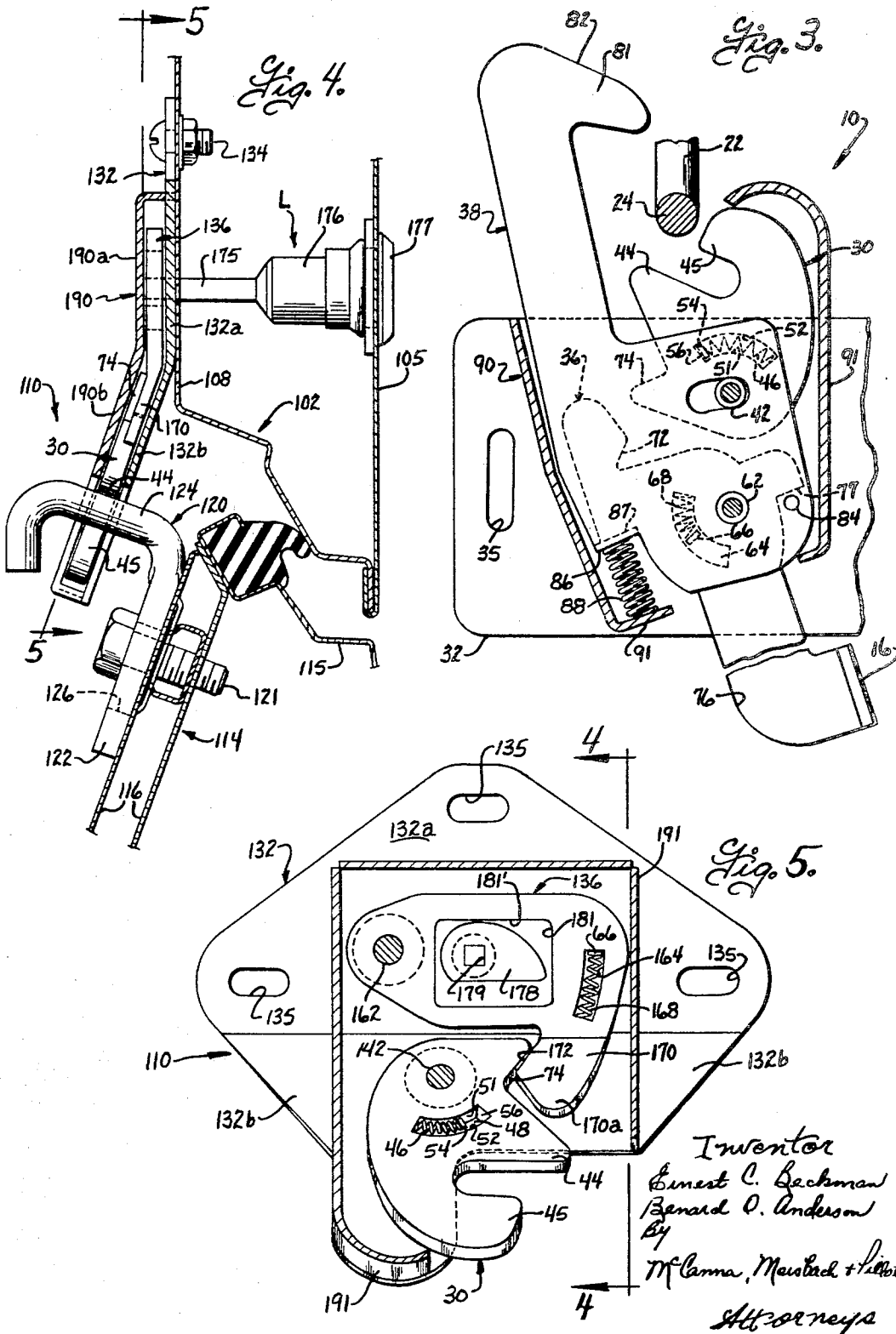
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2 Sheets-Sheet 2



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HOOD AND DECK LATCH

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ABSTRACT OF THE DISCLOSURE

A detent and a latch are pivotally mounted on a plate and each has an arcuate slot located a radial distance from its respective axis. A finger from the plate extends crosswise of each slot. A compression spring is located in each slot between one end and the finger. The latch and detent may be coplanar or oblique to each other. For use as a hood latch, a safety catch is mounted on the detent axis and is operated by the detent.

This invention relates to latching mechanisms and more particularly to an improved form of latching mechanisms for use in latching a hood lid or rear deck lid of an automobile.

It is an object of this invention to provide an improved latch mechanism of the above character which readily latches automatically upon closing of the hood or deck lid.

Another object is to provide an improved latch mechanism having a safety catch and so arranged that one release lever releases both the latch and safety catch.

Still another object of this invention is to provide a latch mechanism in accordance with the foregoing object and so arranged that, if the latch be mischievously or otherwise restored to latching position while the lid is raised, the safety catch will operate to retract the latch so that it will not be damaged during normal closing, after which complete normal closing will cause the latch to swing to latched position.

Yet another object is to provide a latch mechanism having a new and useful arrangement for the spring means which urge the various components to their respective positions.

A further object of this invention is to provide an improved latch mechanism wherein parts may be disposed obliquely to each other when desirable for a particular use.

Other objects are to provide a latch mechanism which is relatively uncomplicated, thin in profile, economically fabricated and assembled, and adaptable for a number of uses in the various embodiments for automobile rear deck lid and front hood lid latching.

Still other objects and advantages will become apparent from the following specification when taken in conjunction with the accompanying drawings wherein:

FIG. 1 is an exploded view of an embodiment of the present invention;

FIG. 2 is a partial sectional view of a hood lid and body element releasably latched together by the latch mechanism of FIG. 1;

FIG. 3 is a view of the mechanism of FIG. 2 showing the components in unlatched position;

FIG. 4 is a sectional view taken generally along line 4—4 of FIG. 5 and showing another embodiment of the instant invention mounted on a rear deck lid of an automobile; and

FIG. 5 is a view taken generally along line 5—5 of FIG. 4.

The latch mechanism herein described and illustrated is particularly advantageous for releasably latching a hinged lid element to a body element of an automobile and comprises a keeper for mounting on one of said ele-

ments and a plate for mounting on the other of said elements. A latch member and a detent member are rotatably mounted on the plate and each is provided with a face or stop which are engageable to hold the latch member in latched position. Spring means are provided to rotate the latch member to an open position and to rotate the detent member to engage the latch member. In one embodiment of the invention, a safety catch is employed for use of the mechanism for releasably latching a hood lid, for which a safety catch is normally employed. The resulting latch mechanism, with or without the safety catch, is characterized by a relatively thin profile.

Referring more particularly to the drawings, FIG. 2 illustrates a latch mechanism, generally designated by the numeral 10, releasably latching a hood lid 12 to a body element 14 of an automobile. As shown, latch mechanism 10 is conveniently disposed between a radiator R and a grill G which has openings, as at G', for passage of fingers to engage a finger grip portion 16 to release the latch mechanism in a manner hereinafter described. A bracket 13 is affixed to hood lid 12 in any convenient manner, and a keeper, generally designated by the numeral 20, is conveniently mounted on the bracket as by fasteners 21. The keeper may be of any convenient construction and, as shown, comprises a generally U-shaped configuration with parallel legs 22 connected by an intermediate portion 24. The legs 22 are attached to mounting plate 26 in any convenient manner. For clarity, FIG. 2 illustrates only one leg 22 and illustrates the intermediate portion in cross section. A latch member, generally designated by the numeral 30, engages the keeper to hold the lid in closed position as hereinafter described. The latch member is mounted upon a base plate 32 which is mounted upon an extension 14' of body element 14 as by fasteners 34. For mounting purposes, a plurality of openings 35 are provided in the base plate, the openings being elongated for adjustment of the position of the latch with respect to the keeper in accordance with the usual practice.

The various parts of the embodiment illustrated in FIG. 2 are best shown in FIGS. 1 and 3. The latch member is identified as 30, a detent member as 36, and a safety catch as 38. Latch member 30 is rotatably mounted on plate 32 as by pivot pin 42 the axis of which is preferably perpendicular to plate 32. As illustrated, the latch member has a bifurcated end portion formed of a striker finger 44 and a latching finger 45 defining a keeper retaining slot. The latching finger is positioned to overlie the keeper in the latched position illustrated in FIGS. 1 and 2, and to rotate in one direction to one side of the keeper to the open position illustrated in FIG. 3. In the open position, striker finger 44 is positioned to be engaged by intermediate portion 24 of the keeper to rotate the keeper to the latched position. A spring means resiliently urges the latch member to open position of FIG. 3 and, in the preferred embodiment shown, the spring means is in the form of a compression-type helical spring 46 disposed in an elongate slot 48 in the latch member. Preferably slot 48 is an arcuate slot having an inner edge 51 and an outer edge 52 substantially radially spaced from the axis of pivot pin 42. A pin or projection 54 extends laterally from plate 32 and into slot 48. Projection 54 may take many forms but preferably extends crosswise of the slot. Slot 48 has a first end 56 for engaging projection 54 and thereby form a stop for the latch member in the open position of FIG. 3. Spring 46 is disposed between projection 54 and the other end of slot 48 to resiliently urge the latch member to open position.

Detent member 36 is pivotally mounted on a post or pivot pin 62 which is preferably perpendicular to plate 32. The detent member preferably has an elongate slot 64 which is similarly shaped to slot 48 in latch member 30.

Slot 64 preferably has inner and outer edges substantially radially spaced from the axis of pivot pin 62. A second finger or projection 66 extends laterally from plate 32, into slot 64, and preferably crosswise of the slot. A spring means in the form of a compression-type helical spring 68 is disposed in slot 64 between projection 66 and an end of the slot for rotating the detent member in the same direction as spring 46 rotates the latch member. The detent member has a stop face 72 for engaging a stop face 74 on the latch member. In this manner, detent 36 serves to retain the latch member in latched position against the force of spring 46. Detent 36 conveniently has a downwardly extending arm 76 which terminates in a finger grip portion 16. When the finger grip portion is pulled against the force of spring 68, stop face 72 is moved out of engagement with stop face 74 on the latch member and the latch member can rotate to open position shown in FIG. 3. After opening, spring 64 resiliently urges the detent to rotate back toward the latch member and, when the latch member is rotated by the keeper as described above, stop face 74 will be rotated back into engagement with stop face 72 of the detent member.

Safety catch 38 is also preferably mounted on pivot pin 62 and has a suitable pivot hole 78 to receive the pivot pin. Pivot 42 extends through a slot 79 in the safety catch to guide the latter. Preferably, the safety catch is shaped to overlie slots 48 and 64 to help retain springs 46 and 68 therein. The safety catch has a hook 81 which coacts with keeper 20 to perform the well-known safety function. The hook has an inclined cam face 82 for engagement by the keeper to rotate the safety catch counterclockwise, as viewed in FIGS. 1 and 3, when the hook is approaching latched position. The instant invention contemplates a particularly advantageous cooperation between the safety catch and the detent 36. Should the latch member be mischievously or otherwise returned to latched position, the apparatus of the present invention provides a means for assuring that the latch member will be released when the keeper is moved toward the same for latching purposes. As best illustrated in FIGS. 1 and 3, safety catch 38 has a laterally extending projection in the form of a pin 84 disposed adjacent a shoulder 77 on the detent member. When the safety catch is cammed by the keeper as the keeper moves toward latched position, pin 84 engages shoulder 77 to move the detent to a released position. A second projection in the form of arm 86 extends laterally from the safety catch for engagement by second shoulder 87 on the detent member. In this manner, when finger grip portion 16 is moved to release the latch member as described above, second shoulder 87 moves against arm 86 to rotate the safety catch. However, as can be best seen in FIG. 3 the finger grip portion must be moved a greater distance to move the hook 81 of the safety catch out of the path of keeper 20 than is necessary to release the latch member to open position. This is because the stop 72 is moved out of engagement with stop 74 prior to the time that the safety catch moves a distance great enough to be moved from the path of the keeper. Thus the operator must move the finger grip portion a great enough distance and hold the safety hook 81 out of the path of the keeper until the hood is opened far enough that the keeper has passed the safety catch. If he does not, the hook may engage the keeper and hold the hood in safety position. As best shown in FIG. 3, a compression-type spring 88 is disposed between arm 86 and a flange portion 91 of a cover plate 90 to resiliently urge the safety catch to a position overlying the path of the keeper. It should be observed that, in the preferred embodiment, the safety catch moves across the path of the keeper in a direction opposite the side of the keeper from that which the latch member moves.

Referring again to FIG. 1, it can be seen that the above described components are conveniently retained in a hous-

ing defined by base plate 32 and a cover plate, generally designated 90. The cover plate is preferably formed by stamping and has openings 92 and 94 for receiving pins 42 and 62, respectively. Conveniently surrounding the openings are inwardly extending circular offset portions 92' and 94' for spacing the safety catch from the cover member to reduce friction during movement of the same. Similar offset portions can be conveniently formed in plate member 32, if desired. During the stamping operation, cover member 90 is formed with a laterally extending flange 91 to engage base plate 32. Projections, as at 91' (FIG. 1) on the flange are conveniently provided for insertion through openings 95 in the base plate and the ends of the projections may be upset during assembly to hold the cover member in assembled relationship with the base plate. The ends of pivot pins 42 and 62 may conveniently be flanged for further securing said assembled relationship.

FIGS. 4 and 5 illustrate a modification of the apparatus of FIGS. 1-3 which is particularly adapted for use on a conventional deck lid of an automobile. When utilized as a latch mechanism for a deck lid, a lock mechanism generally designated by L is provided for releasing the latch in a manner hereinafter described. Referring particularly to FIG. 4, the numeral 102 indicates a conventional deck lid element which may have an outer face member 105 and an inner liner member 108 spaced inwardly from the outer face member to form a part of the lid for reinforcing and mounting purposes. The lid 102 is hinged to the body in the usual fashion. The latch mechanism, generally designated 110, releasably latches the lid 102 to a body element, generally designated 114. The body element may include, for example, an outer member 115 and an inner liner member 116.

The latch mechanism 110 includes a keeper, generally designated 120, which may take any of several shapes. As shown, the keeper is conveniently an L-shaped member having a mounting leg 122 and an outwardly extending arm 124. Mounting leg 122 is conveniently flattened and has a slot 126 therein for passage of fastener 121 and adjustment of the location of arm 124 in the usual manner, for locating the arm in the proper position for engaging the latch member.

The latch mechanism also includes a base plate 132 mounted on inner liner 108 as by fasteners 134 passing through slots 135. While the elements, hereinafter described, may be substantially coplanar to each other, as in the first embodiment described above, it is frequently advantageous that they be disposed obliquely to each other. For that purpose base plate 132 has a first or mounting portion 132a for mounting on inner liner 108 and a second portion 132b disposed obliquely thereto and substantially in the plane of movement of the lid toward closed position. A latch member, generally designated 30, is pivotally mounted on second portion 132b about a pivot pin 142 which is substantially normal to said second portion. Latch member 30 is of similar shape and function as that described above for the first embodiment and the similar numbers in FIGS. 4 and 5 indicate the same parts described above. Likewise, spring 46 and projection 54 are similar to those described above.

A detent member, generally designated 136, is similar in function to that of detent member 36 of the first embodiment described above but of different configuration. As shown, detent member 136 is pivotally mounted on first portion 132a as by pivot pin 162 and preferably has an arcuate slot 164 having edges radially spaced from the axis of pin 162. A projection 66 extends laterally from first portion 132a and generally crosswise of slot 164. A compression-type spring 168 is disposed in slot 164 between projection 166 and an end of the slot. As best illustrated in FIG. 5, the arcuate slot of detent member 136 is conveniently spaced farther from the pivot pin than is slot 64 in the first embodiment best illustrated in FIG. 3. As a consequence, it can be seen that the slot 164 is

less arcuate than slot 64 and, since the movement past projection 66 is a greater distance than in the first embodiment, the slot is of necessity longer, as is spring 168 disposed therein.

While the main portion of detent member 136 is disposed in a plane substantially parallel to first portion 132a, the detent member has an outwardly extending arm 170 disposed obliquely thereto in a plane substantially parallel to second portion 132b. Stop means, in the form of face 172, is arranged at one side of the arm and, in a manner similar to that described above, spring 168 resiliently urges detent member 136 into position whereby stop face 172 may engage stop face 74 and hold the latch member in latched position against the force of spring 46.

Release of the latch mechanism shown in the embodiment in FIGS. 4 and 5 is accomplished by rotating detent member 136 counterclockwise thereby allowing spring 46 to rotate the latch member to open position. For this purpose, means is provided on detent member 136 for actuation by the cylinder lock mechanism, generally designated L. A typical cylinder lock arrangement (FIG. 4) comprises a rod 175 extending into a cylinder lock 176 mounted on the deck lid 105 and having a portion 177 exposed on the exterior of the lid for the reception of a key. A cam 178 is conveniently rotatably mounted on first portion 132a and has an opening 179 for reception of rod 175. Thus it can be seen that rotation of rod 175 serves to rotate the cam 178. In the embodiment illustrated, the cam is disposed in an opening 181 in the detent member which opening describes a cam engaging face 181'. As the cam moves against the cam engaging face, the detent is rotated counterclockwise thereby moving stop face 172 out of engagement with stop face 74 on the latch mechanism and releasing the latch member.

Means is provided to overlie arcuate slots 48 and 164 to assure the retention of the springs therein. In the embodiment illustrated, this means is in the form of a cover member, generally designated 190, which has a first portion 190a generally parallel to base plate portion 132a and a second portion 190b generally parallel to the second base plate portion 132b. The cover plate, preferably formed by stamping, is conveniently formed with flanged edges 191 for engagement with the base plate 132 to form a housing in which the above described components are disposed.

Since the arm 170 is obliquely disposed to detent member 136, it can be seen that the end 170a (FIG. 5) will move toward cover member portion 190b when the detent member is rotated counterclockwise. To provide room for such movement, the cover member may have an opening therein (not shown), or arm 170 may have a slightly narrower cross-section as illustrated in FIGS. 4 and 5 to allow this movement inside the housing.

While we have thus described preferred embodiments of our invention, this has been done by way of illustration and not limitation and we do not wish to be limited except as required by the appended claims.

We claim:

1. A latch mechanism for releasably latching a hinged lid element to a body element and comprising a keeper for mounting on one of said elements, a plate and means for mounting the plate on the other of said elements, a latch member pivotally mounted about a first axis generally normal to the plate for movement between an open position and a latched position engaging the keeper, said latch member having a slot therein having first and second ends and an outer edge substantially radially spaced from said first axis, a finger extending laterally from said plate and into said slot for engaging said first end of the slot for limiting movement of the latch member to said open position, a detent member pivotally mounted about a second axis generally normal to the plate, a safety catch pivotally mounted about said second axis and in a plane generally parallel to said latch member and said detent member, spring means for resiliently urging said latch member to

rotate in one direction to open position and said detent member and said safety catch to rotate in said one direction, said spring means including a compression-type spring disposed in said slot between said finger and said second end for rotating the latch member to open position, said detent member having a detent stop means for engaging the latch member, a latch stop means on the latch member for engagement by the detent stop means to retain the latch member in latched position against the force of said compression-type spring, a manually operable means on the detent for rotating the detent opposite said one direction to disengage the detent stop means from the latch stop means and thereby allow the latch member to rotate to open position, and said safety catch having a finger extending laterally thereof and said detent member having means for engaging said finger to rotate the safety catch opposite said one direction when the detent member is rotated opposite said one direction.

2. The combination of claim 1 including means extending laterally from said plate and spaced from said finger on the safety catch and wherein said spring means includes a safety catch spring disposed between said means and said finger on the safety catch to rotate the safety catch in said one direction.

3. The combination of claim 1 wherein said detent member has an arcuate slot therein having an outer edge substantially radially spaced from said second axis, a second finger extending laterally from said plate and into said arcuate slot, and wherein said spring means includes a second compression-type spring disposed in said arcuate slot between said second finger and an end of the slot for rotating said detent member in said one direction.

4. A latch mechanism for releasably latching a hinged lid element to a body element and comprising a keeper for mounting on one of said elements, a plate and means for mounting the plate on the other of said elements, a latch member pivotally mounted about a first axis generally normal to the plate and having a bifurcated end portion formed of a striker finger and a latching finger positioned to overlie the keeper in a latched position and to rotate in one direction to one side of the keeper in open position, said latch member having a first elongate slot therein having first and second ends and an outer edge substantially radially spaced from said first axis, a first finger extending laterally from said plate and into said first slot for engaging said first end of the slot for limiting movement of the latch member to said open position, first spring means disposed in said first slot between said first finger and said second end for rotating the latch in said one direction, a detent member pivotally mounted about a second axis generally normal to the plate and having a second elongate slot therein having an outer edge substantially radially spaced from said second axis, a second finger extending laterally from said plate and into said second slot, second spring means disposed in said second slot between said second finger and an end of said second slot for rotating the detent member in said one direction, said detent member having a detent stop means for engaging the latch member, a latch stop means on the latch member for engagement by the detent stop means to retain the latch member in latched position against the force of said first spring means, manually operable means for moving the detent member opposite said one direction to disengage the detent stop means from the latch stop means thereby allowing the latch member to rotate to open position, a safety catch pivotally mounted about said second axis and closely overlying said first and second slots, said safety catch having a hook rotatable in said one direction between an open position to a second side of the keeper and a latched position disposed across the path of the keeper as it moves toward the latch member, said hook including an outer cam face positioned for engagement by the keeper as it moves toward the latch member to deflect the safety catch to open position, third spring means for rotating the safety catch in said one direction, said

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detent member having first and second shoulders on a peripheral edge thereof spaced angularly from each other, first means on the safety catch engageable by said first shoulder during rotation of the detent member opposite said one direction to rotate the safety catch to open position, and second means on the safety catch engageable with said second shoulder during deflection of the safety catch by the keeper to rotate the detent member opposite said one direction and release the latch from latched position.

5. A latch mechanism for releasably latching a hinged lid element to a body element and comprising a keeper for mounting on one of said elements, a plate and means for mounting the plate on the other of said elements, a latch member pivotally mounted about a first axis generally normal to the plate for movement between an open position and a latched position engaging the keeper, said latch member having a slot therein having an outer edge substantially radially spaced from said first axis, a finger extending laterally from said plate and generally crosswise of said slot, a latch spring disposed between said finger and an end of said slot for resiliently urging the latch member to open position, a detent member pivotally mounted about a second axis and having a detent stop means for engaging the latch member, a detent spring means for resiliently urging the detent member to position for engaging the latch member, a latch stop means on the latch member for engagement by the detent stop means to retain the latch member in latched position against the force of the latch spring, and means mounted on said plate and overlying said slot.

6. A latch mechanism for releasably latching a hinged lid element to a body element and comprising a keeper for mounting on one of said elements, a plate and means for mounting the plate on the other of said element, a latch member pivotally mounted on the plate for movement between a latched position and an open position, a latch spring for urging the latch member to open position, a detent member pivotally mounted about an axis generally normal to the plate and having a slot therein having an outer edge substantially radially spaced from said axis, a finger extending laterally from said plate and generally crosswise of said slot, means disposed between said finger and an end of said slot for resiliently urging the detent member against the latch member, said detent member having a detent stop means for engaging the latch member, a latch stop means on the latch member for engagement by the detent stop means to retain the latch member in latched position against the force of the latch spring, and means mounted on said plate and overlying said slot.

7. A latch mechanism for releasably latching a hinged lid element to a body element and comprising a keeper for mounting on one of said elements and having a latch engaging portion, a plate and means for mounting the plate on the other of said elements, said plate having a first portion lying in a plane generally parallel to said other element and a second portion lying in a plane generally perpendicular to said latch engaging portion of the keeper, a latch member pivotally mounted about a first axis generally perpendicular to said second portion for movement between an open position and a latched position engaging the keeper, said latch member having a first arcuate slot therein spaced from said first axis, a first finger secured to said second portion of the plate and extending into said first slot, first means disposed between said first finger and an end of said first slot for resiliently urging the latch member to open position, a detent member pivotally mounted about a second axis generally perpendicular to said first portion of the plate and having a second arcuate slot therein spaced from said second axis, a second finger secured to said first portion and extending into said second slot, second means disposed between said second finger and an end of the second slot for resiliently urging the detent member against the latch member, said

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detent member having a detent stop means for engaging the latch member, a latch stop means on the latch member for engagement by the detent stop means to retain the latch member in latched position against the force of said first means, and a cover member on said plate and overlying said latch and detent members.

8. The apparatus of claim 7 wherein said detent member has a detent arm disposed in a plane generally parallel to said second portion of the plate, and wherein said detent stop means is on said detent arm.

9. The apparatus of claim 8 wherein said detent member has an opening therein describing a cam engaging face, an actuating means for releasing said latch member and including a cam means mounted in said opening for engaging said cam engaging face to move the detent member against the force of said second means and thereby release said latch member.

10. A latch mechanism for releasably latching a hinged lid element to a body element and comprising a keeper for mounting on one of said elements, a plate adapted for mounting on the other of said elements, said plate having a first portion and a second portion disposed obliquely to the first portion, a latch member pivotally mounted on said second portion about a first axis generally normal thereto for movement between an open position and a latched position engaging the keeper, said latch member having a first elongate slot therein having an outer edge substantially radially spaced from said first axis, a first finger extending laterally from the second portion of the plate and generally crosswise of the first slot, a first compression spring disposed in said first slot between said first finger and an end of the first slot for urging the latch member to open position, a detent member pivotally mounted on said first portion about a second axis generally normal thereto and having a body portion generally parallel to said first portion, the body portion having a second elongate slot therein, said second elongate slot having an outer edge substantially radially spaced from said second axis, a second finger extending laterally from the first portion of the plate and generally crosswise of the second slot, a second compression spring disposed in said second slot between the second finger and an end of the second slot for urging the detent member against the latch member, said detent member having an arm portion disposed obliquely to the body portion, said arm portion being generally parallel to the second portion of the plate and having a detent stop means for engaging the latch member, a latch stop means on the latch member for engagement by the detent stop means to retain the latch member in latched position against the force of the first compression spring, said detent member having an opening intermediate the second axis and the second slot and defining a cam-engaging face, a cam disposed in said opening and pivotally mounted on said second portion, means for rotating said cam for moving said detent member out of engagement with the latch member thereby unlatching the mechanism, and a cover member attached to said plate and overlying said latch and detent members.

11. In a latch mechanism for releasably latching a hinged lid element to a body element and including a keeper for mounting on one of said elements, a plate and means for mounting the plate on the other of said elements, a latch member pivotally mounted about a first axis generally normal to the plate for movement between an open position and a latched position engaging the keeper, latch spring means for resiliently urging the latch member to open position, a detent member pivotally mounted on the plate about a second axis and having detent stop means for engaging the latch member, detent spring means for resiliently urging the detent member to position for engaging the latch member, and latch stop means on the latch member for engagement by the detent stop means to

retain the latch member in latched position against the force of the latch spring means, the improvement comprising: at least one of said members having a slot therein having ends and an outer edge substantially radially spaced from the axis about which said one member is pivotally mounted, a finger extending laterally from the plate and generally crosswise of the slot, said finger arranged for engaging one end of the slot when the member is in its spring means urged position, and the spring means associated with said one member being mounted in the slot between said finger and the other end of the slot.

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