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3,206,237

AUTOMOTIVE DOOR LOCK

Filed Sept. 3, 1963

2 Sheets-Sheet 1

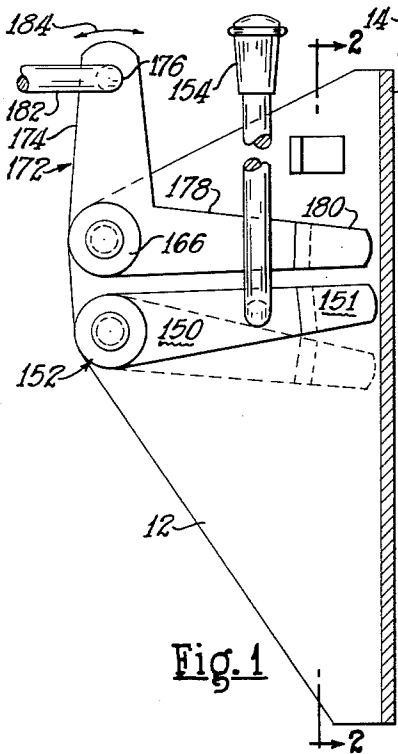


Fig. 1

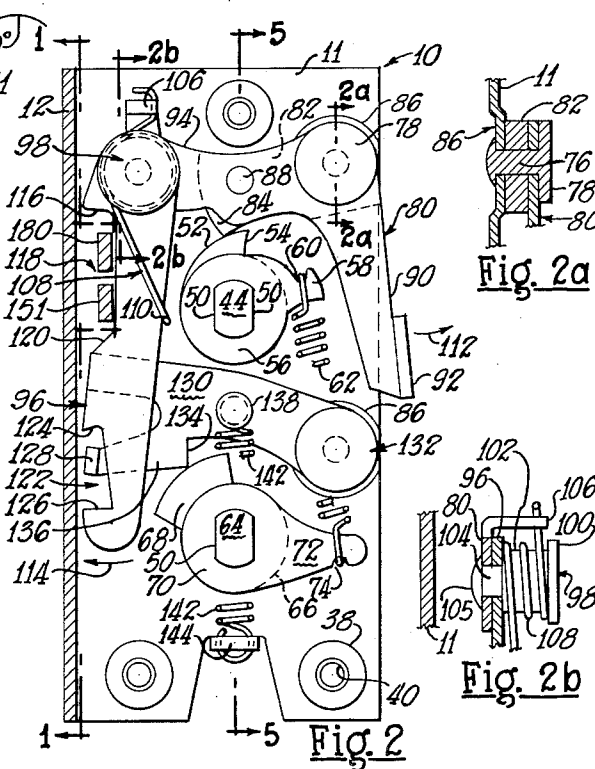


Fig. 2

Fig. 2a

Fig. 2b

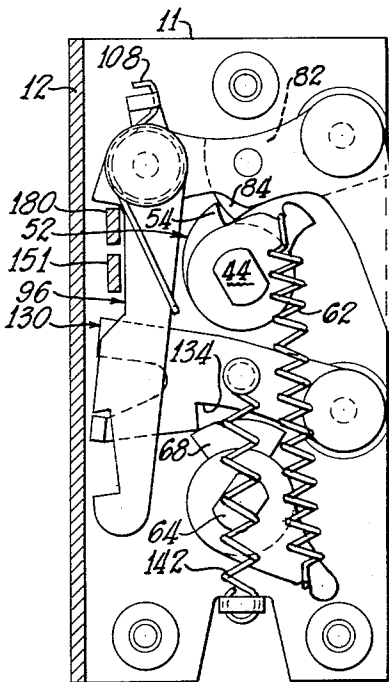


Fig. 3

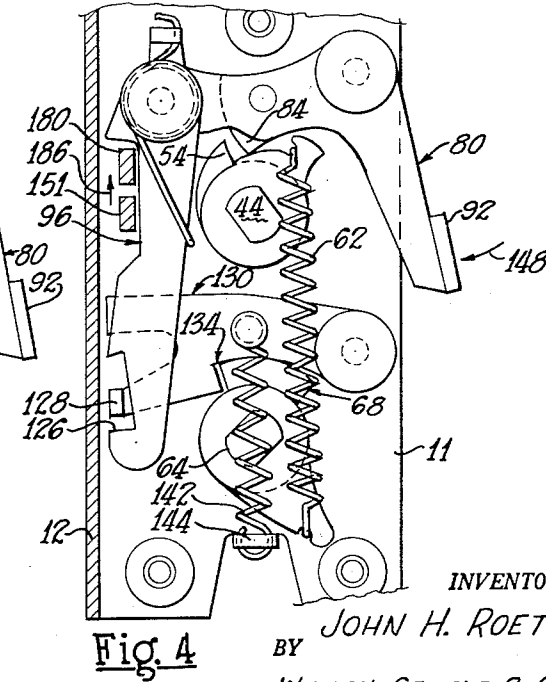


Fig. 4

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2 Sheets-Sheet 2

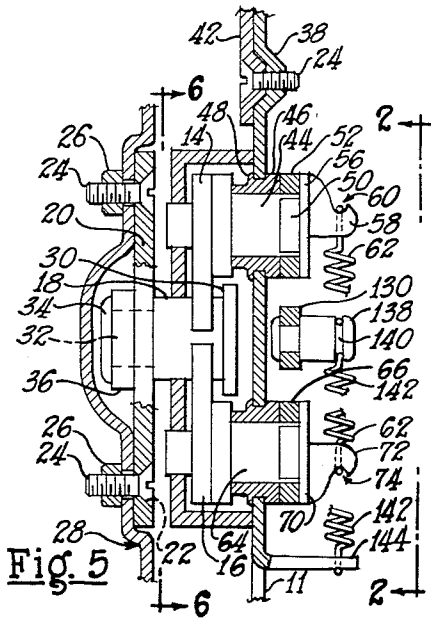


Fig. 5

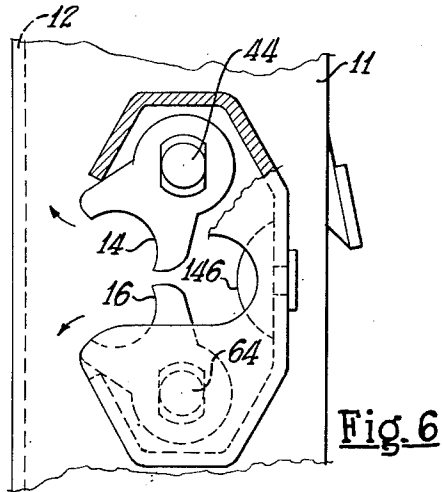


Fig. 6

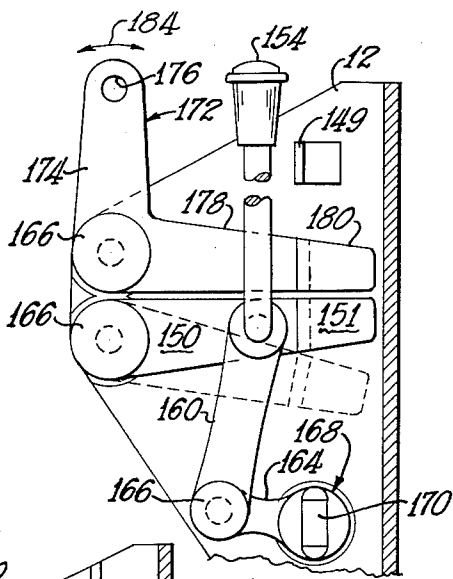


Fig. 8

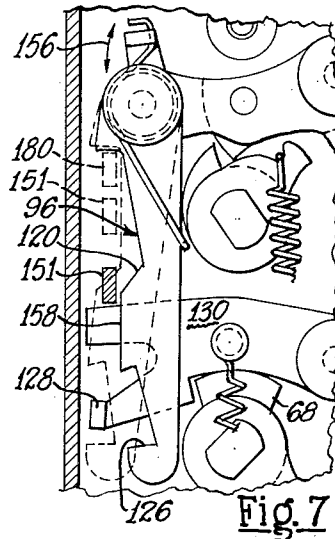


Fig. 7

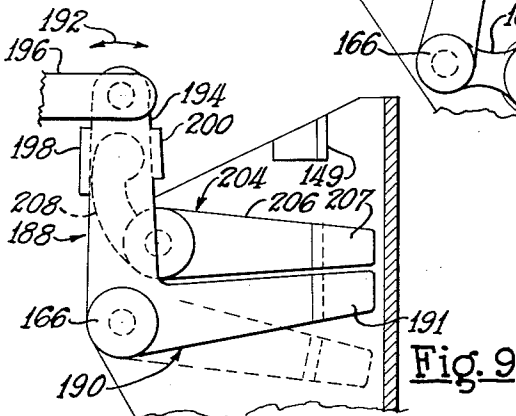


Fig. 9

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AUTOMOTIVE DOOR LOCK

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8 Claims. (Cl. 292-48)

This invention relates to an improved door latch mechanism, and more particularly to a door lock for automotive doors, characterized by improved resistance against accidental impact opening and devoid of expensive gears as characterizing the present state of the art locks.

The problem

It is an undesirable characteristic of door locks of the present state of the art that they have little resistance to opening from either the safety latched or final latched positions. This, of course, is a necessary safety feature for an automobile door. However, upon accidental impact of the automobile, doors of the present art readily fly open because the small tooth of the lock holding the door closed, readily shears off at a very low pressure and endangers the occupants who are often thrown therefrom. Many deaths have resulted from this type of accidental door opening.

Another disadvantage of locks of the present state of the art is that even in the fully locked position, they are very prone to accidental impact opening, as is well known by newspaper reports of accidents wherein occupants are thrown from vehicles, resulting in broken necks and other typical fatal injuries.

It would, therefore, provide a substantial advance to the art if a door lock could be provided which had greatly improved resistance against accidental opening either in the partial or fully closed position.

It is accordingly an important object of the present invention to provide an improved automatic door lock.

A further object is to provide an automatic door lock particularly adapted for use in automobile doors and characterized by greatly improved resistance against accidental impact opening.

A still further object is to provide an improved door lock for automotive vehicles characterized by the absence of expensive gears as now found in the present state of the art locks.

A still further object is to provide a novel door lock characterized by a unique sequential ratchet locking mechanism.

A still further object is to provide a door lock which will hold an automobile door against accidental impact opening in even the partially closed position, under a pressure resistance of 6,000 pounds.

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.

In the drawings:

FIGURE 1 is a front elevational view of the flange of the door lock case taken along the line 1-1 of FIGURE 2, and showing the lock and remote control handles;

FIGURE 2 is a front elevational view of the plate member of the case holding the locking mechanism of invention, and taken along the line 2-2 of FIGURE 1, and showing the lock in door open position;

FIGURE 2a is a sectional view taken along the line 2a-2a of FIGURE 2;

FIGURE 2b is a sectional view taken along the line 2b-2b of FIGURE 2;

FIGURE 3 is a front elevational view similar to FIGURE 2 and showing the lock in a door safety latched condition;

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FIGURE 4 is a front elevational view similar to FIGURE 2, and showing the lock in a door final latched condition;

FIGURE 5 is a sectional view taken along the line 5-5 of FIGURE 2;

FIGURE 6 is a rear elevational view of FIGURE 2;

FIGURE 7 is a fragmentary front elevational view similar to FIGURE 4, but with the mechanism further moved to "locked" condition;

FIGURE 8 is a front elevational view similar to FIGURE 1 and showing addition of a key unlock mechanism; and

FIGURE 9 is a front elevational view similar to FIGURES 1 and 8, illustrating simultaneous remote control and unlock latch mechanism as operated by the inside door handle of an automobile door.

Before explaining the present invention in detail, 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.

The environment

In the drawings, there are illustrated by way of example, certain embodiments of the present invention as applied to the doors and door-frame structures of an automobile body. Adapted to be secured, as by means of screws to the inner side of the free edge wall of a vehicle door, as a case 10 that includes a body plate 11 that carries the latch mechanism; and a 90° oriented flange plate 12 that carries the locking and unlocking latches, as will become apparent. The plate 11 and flange 12 as indicated by the arrows 14 are oriented 90° relative to one another. Thus, FIGURES 1 and 2 show the unit as having been laid open for better illustration purposes.

As shown in FIGURE 6, the present latch mechanism is provided with a pair of co-acting, pivoted latch jaw elements 14 and 16. These are on the other side of the plate 11 from FIGURE 2 and embrace a latch post or keeper 18, best seen in FIGURE 5, when the door is closed. The latch post 18 is fastened to the car door frame; and the aforementioned embracement is effective to hold the door closed.

Looking at the keeper 18 in detail, we note that it is attached to a plate 20 of generally rectangular configuration, having screw holes 22 at each end through which screws 24 are passed into nuts 26 or equivalent threaded apertures in the sheet metal body or plate metal structure 28 forming the door frame.

Note that the keeper 18 has a disc-like head 30, effective to prevent disengagement of the jaw elements 14 and 16 from the keeper 18 in a direction longitudinally of the pin, as will be readily apparent. This protective feature is invaluable in preventing the vehicle door from being pulled away from its surrounding frame in the event the vehicle is involved in a collision or upset. At the other end, the keeper post 18 is shouldered down to a rivet portion 32 that passes through the plate 20 and is headed over at 34, an annular washer 36 being provided for additional strength.

Turning back now to FIGURES 1 and 2, we note that dimpled formations 38 with a central threaded hole 40 are provided to accept screws in the manner shown at the top of FIGURE 5 for attachment to a door frame element 42.

The latch components associated with the jaw elements 14 and 16

Continuing to refer to FIGURES 1 and 2, and ad-

ditionally to FIGURE 5, we observe that the pivot pin 44 for a jaw 14 is rotatably mounted within a bushing element 46 that is staked in a suitable aperture in case plate body 11, the stake being indicated at 48. At its concealed end, the pivot pin 44 is provided with opposed flats as at 50 and a cam washer 52 applied. This is generally circular as indicated in FIGURE 2, having a ratchet tooth 54 of substantial body formed thereon. Overlying the cam washer 52 is a spring hook washer 56 also fitted on the flat 50, so as to rotate with the shaft 44 and having an upturned hook lip 58 with a hook notch 60 therein. This receives one end of a spring 62. Connection of the other end of the spring will be described subsequently.

Referring back to FIGURE 5 for a moment, we note that the lower jaw 16 is carried upon a pivot pin 64 rotatably mounted in a bushing the same as 46, similarly staked into an aperture in plate 11. On the other side of plate 11, to the shaft 64, there is first provided a cam plate 66, having a cam lobe 68 thereon and over the cam plate 66, there is applied a spring hook washer 70 having a hook lip 72 with a hook notch 74 therein. The notch 74 receives the other end of the spring 62. It will be observed that the spring 62 is effective to bias the shafts 44 and 64 in opposite directions, tending to force the latch jaws 14 and 16 in the manner indicated in FIGURE 6.

The further constituents of the partial or safety latch: cam washer 52—ratchet tooth 54

In the upper part of FIGURE 2 and as further sectioned in FIGURE 2a, there is shown a pivot pin 76 having an enlarged head 78. The body of the pin 76 is passed through an L-shaped primary lever 80. Beneath the lever 80 there is carried a detent or dog member 82, shown partially in dotted outline in FIGURE 2 and having a tooth 84 to drop in behind the ratchet tooth 54 of cam washer 52 upon counterclockwise rotation of the cam washer, as viewed in FIGURE 2, effected by engagement of jaw 14 with keeper 18 on closing a car door.

From FIGURE 2a, it will be noted that the metal of plate 11 is dimpled upwardly as at 86 to provide a pivot pad between the plate 11 and the detent or dog member 82. As noted in FIGURE 2, the dog member 82 and L-shaped lever 80 are connected together by a flush rivet 88 so that they are movable together. It is to be noted that the free end 90 of the L-shaped release lever 80 carries an abutment pad 92 to be engaged by a suitable actuator, not shown, as operated by a door handle.

The other end 94 of lever 80 extends toward flange 12 and is pivotally connected to a secondary latch lever 96, as best shown in FIGURE 2b. As there shown, a pivot pin 98 having an enlarged head 100 and a reduced body portion 102 has a further terminal reduced end portion 104. Both the uppermost lever 96 and the lowermost lever 80 are provided with alignable apertures to receive the terminal reduced end portion 104 that is staked over on the bottom side of the lever 80 which, with the shoulder formed between the reduced body portion 102 and the terminal reduced end portion 104, provides a pivot for the levers 80 and 96. A spring hook tab 106 is turned up from the lowermost lever 80 and is notched to receive one end of a spring 108. The central body of the spring 108 is coiled around the reduced body portion 102 of pin 98 and the tail end 110 extends across and hooks over lever 96 as indicated in FIGURE 2. This spring wrap arrangement is effective to bias the levers 80 and 96 away from one another; that is, the abutment pad 92 end of lever 80 in the counterclockwise arrow direction 112, and the lever 96 in the clockwise direction 114.

Lever 96 in detail

Referring to FIGURE 2, we note that lever 96 is of elongated configuration, having a shoulder 116 at the back thereof, and defining the back end of an elongated notch 118, terminating at the forward end and an angular

cam surface 120. The purpose of the cam surface in cooperating with a locking mechanism will become apparent as the description proceeds.

At the forward end, there is a notch 122 of lesser length than the elongated notch 118, terminating at each end in slightly inwardly tapering shoulders 124 and 126. The forward notch 122 embraces a tab 128 on a secondary latch lever 130 for operation, as will become apparent.

The secondary lever 130 is pivotally mounted at its right hand end in a manner analogous to FIGURE 2a by means of a pivot pin 132 having a reduced diameter body to pass through an appropriate aperture in the end of the secondary cam release lever 130 and through a dimpled portion similar to 86 in FIGURE 2a, which provides a pivot surface. The lever 130 is provided with a cam-catching notch 134 to embrace the cam lobe 68 of plate 66 in the final latched position.

A finger element 136 is also formed on lever 130 terminating in the upstanding tab 128, embraced within the notch 122 previously described.

Centrally, the secondary lever 130 is provided with a pin 138, also shown on FIGURE 5, having a spring end receiving groove 140 adjacent the upper end. The bottom portion of this pin is reduced as shown in FIGURE 5 to perform a positioning shoulder and the reduced portion passed through the lever 130 and staked over for rigid attachment. The spring end receiving groove 140 receives one end of a spring 142. The plate 11 is cut and a tab 144 turned up as indicated in FIGURE 2 and notched close to the end to receive the other hook end of the spring 142. The bias of spring 142 is effective to pull lever 130 in a direction constantly toward the cam lobe 68, placing it in a position to embrace the lobe 68 when the lobe 68 is aligned with the notch 134.

The function of the lock of invention

By reference to FIGURE 3 as a result of the keeper 18 engaging the jaw elements 14 and 16, the shaft 44 for cam washer 52 has been rotated in a counterclockwise direction to the place where the ratchet tooth 54 has moved past the tooth 84 on L-shaped lever 80. When this happens, referring now to FIGURE 2, the spring 108 has caused the lever 80 to be moved in the direction 112, forcing the tooth 84 to drop in behind the ratchet tooth 54. Thus, the door is now closed as securely as in prior art locks, which use a tooth of about the substance of 54 to hold the door in the fully locked position, and an even lesser tooth having been employed for the safety latched position. Further, as an improvement over the prior art, attention is called to the substantial body of the detent or dog member 82 resisting the clockwise rotation of cam washer 52, as distinguished from a small bodied hook member on a small pivot shaft as utilized in the prior art.

Looking now down to the bottom of FIGURE 3, we note that the cam lobe 68 has not been embraced by the cam catch notch 134 of secondary lever 130. However, by a very slight further closing of the door, it will be evident that the fully locked position can be achieved. This will now be described with reference to FIGURE 4.

The fully locked position of FIGURE 4

With continued movement of the door toward the closed position, as shown in FIGURE 5, engagement of the jaw elements 14 and 16 with the keeper 18 causes further counterclockwise rotation of pin 44 and clockwise rotation of pin 64 to move the cam lobe 68 into alignment with the cam-catch notch 134 where the bias of the spring 142 causes secondary latch lever 130 to be snapped downwardly and the notch 134 to embrace the lobe 68. This effects the fully locked position.

Referring to FIGURE 6, we note a rubber bumper 146 against which the latches 14 and 16 can engage and rebound therefrom. This provides a degree of overtravel

to the cam lobe 68, now referring to FIGURE 4, so that when the door is slammed, the fully latched position will be assured.

Unlatching the lock

Referring to either FIGURES 3 or 4, it will be evident that application of force in the arrow direction 148 will be effective to pivot the L-shaped lever 30 in a clockwise direction, lifting the tooth 84. This also moves lever 96 so that shoulder 126 pulls tab 128 and the secondary lever 130 upwardly in the same direction a sufficient distance to clear the cam lobe 68. This permits spring 62 to rotate shafts 44 and 64 in clockwise and counterclockwise reverse directions to their original movement respectively, producing the position of FIGURE 2. This again is back to the open door position.

The locking or anti-opening feature

Referring to FIGURE 1, we note that a straight lock lever 150 is pivoted at its left hand end by means of a pivot pin 152, applied in the manner of FIGURE 2a, having an enlarged head, a reduced body portion passing through the lever 150 and the plate 12 and peened over at the back. This lever is movable between the solid non-locking position and the dotted outline locking position. The lever 150 has an offset portion 151. In the door open position of FIGURE 2, the lever 150 cannot be moved, however. In the FIGURE 2 position, it will be noted that the top side of the secondary lever 130 has a remote corner in engageable alignment with offset portion 151 to prevent it from moving up the angular cam surface 120 and pushing lever 196 in a counterclockwise direction. At this point, it should be brought out that in order to lock the door lock of invention against unlocking, it is necessary that the shoulder 126 of lever 96 be moved counterclockwise enough to be out of alignment with the tab 128 of lever 130.

As is shown in FIGURE 7 of the drawings where the dotted outline represents the door closed position in FIGURE 4, the lever 130 being moved down to expose the angular cam surface 120 so that the lock lever 150 can traverse the cam surface 120 and force the secondary lever 96 to the solid outline position, or the door locked position. It will be observed that the shoulder 126 is out of alignment with tab 128, and thus any movement of intermediate lever 96 is a free movement of that lever because out of contact with the tab 128. Thus, operating the door handle produces no effect upon releasing the lock or releasing the catch. It simply has free play.

As will be observed from FIGURE 7, the door lock knob 154, FIGURE 1, has been pushed down to move the lever portion 151 to the solid outline position, and the lever end 151 has ridden up the cam surface 120, forcing the lever 96 to the right in FIGURE 7, throwing the shoulder 126 out of alignment with the tab 128 of secondary cam release lever 130. Note that the top edge of the secondary lever 130 has provided a stop or limit for the downward movement of the lock lever 150. Thus, when the lever 96 is moved back and forth in the arrow 156 direction, FIGURE 7, the flat 158 of the lever 96 will slide along the inside surface of the lever end 151, maintaining the shoulder 126 out of engagement with the tab 128.

The door key lock-unlock of FIGURE 8

FIGURE 8 is similar to FIGURE 1 but with the addition of a link arm 160 that is pivotally connected at its upper end with the pivot 162 of a door lock knob. At its lower end, the link arm 160 is pivotally attached to a lock lever 164, the pivot pin being indicated by the reference number 166. The numeral 168 represents the lock tumbler having a lug 170. The lug 170 is peened over to provide a fastened relationship. It will be understood that when the tumbler 168 is rotated, either the solid or dotted outline positions of the lever 150 can be established as desired for locking or unlocking the unit.

The remote control aspect

It should be pointed out with respect to FIGURES 1 and 8 that the door lock knob 154 is utilized when the lock is applied to the front door of an automobile with the door knob 154 directly above the lock at the rear post of the front door. In those situations where the lock is used for the back doors of cars, it is customary to place the door lock knob at the front post of the door and make connection by a remote control arm, working through a pivoted link. Such structure has not been shown because it is not part of the invention. However, it is within the scope of the invention to so operate the lock aspect of the present door lock.

Referring to FIGURE 1 and also to FIGURE 8, we note a pivoted bell crank lever 172 or L-shaped lever arm, pivoted centrally upon a pivot pin 166. This is carried on a dimpled area of the case plate flange 12 in the manner illustrated in FIGURE 2a and has an upstanding arm portion 174, with an attachment hole 176. At terminal end of the lower horizontal arm 178, such arm is offset as at 180 away from the plate 12 to give the spacing indicated in FIGURE 2. Thus by reference to FIGURE 2, it will be noted that both the offset portion 151 of straight lock lever 150 and the offset portion 180 of the horizontal arm 178 are in alignment. It is to be understood that an attachment rod 182, as in FIGURE 1, is pivotally connected to the attachment hole 176 of upstanding arm 174 to move the lever 172 in the double headed arrow direction 184. Presuming that the door handle is connected to the unshown end of control rod 182, it will be apparent that two actions can be produced by opposite movement thereof as follows:

(a) Movement of the handle to produce clockwise movement of lever 172 will cause that lever to engage lever 150 and, when the door is fully closed, produce the locking action by forcing lever portion 151 to ride up the cam surface 120, providing the condition of parts shown in FIGURE 7.

(b) By operating the door handle to move the bell crank lever 172 in counterclockwise direction, the door can be opened, but only after the door lock knob 154 has been raised to release the secondary release lever 96 to the dotted outline position shown in FIGURE 7, the same as the condition of parts in FIGURE 4. Movement of the lever end 180 in the arrow direction 186, FIGURE 4, will cause the lever 96 to be moved longitudinally in the arrow 186 direction, the same as provided by application of force to the abutment pad 92, as previously described. This will cause the shoulder 126 to engage tab 128, lifting lever 130 off the cam lobe 68 and open the lock or release the door. Thus, by use of a door handle connected to control rod 182, remote control operation or opening of the lock can be affected. In the aspect of invention shown in FIGURE 1, the function of the inside door handle therefore is as follows:

(1) With the door closed, the door handle can be used to lock the door;

(2) However, to open the door from the inside, it is necessary that the door lock knob 154 be raised before the inside door knob can be effective to open the door. This is a particularly good safeguard in the case of children in the back seat, as a safety factor;

(3) With the door lock knob 154 lifted and the lock released, the door handle can then be effective to open the door by moving the bell crank lever 172 in counterclockwise direction as viewed in FIGURE 1.

The remote control aspect of FIGURE 9 totally by use of the inside door handle

The embodiments of FIGURES 1 and 8 are analogous in that the door lock knob 154 must be raised before the door can be opened by the inside handle. As a further extension of the invention, it is to be understood that the bell crank lever 172 and straight lock lever 150 can be

simultaneously operated by suitable interconnection so that the inside door handle can lock, unlock and open the door—all by one handle, thus making it possible to omit the door lock knob 154.

Now referring to FIGURE 9, we note that there is a slight change in that the lever 150 shown in FIGURES 1 and 8 now takes the general form of the lever 172 as shown in such figures.

More particularly, in FIGURE 9, the lock lever, as designated by the reference numeral 188, includes a horizontal arm 190, movable between the solid and dotted outline positions on movement of arm 188 in the double headed arrow direction 192. Arm 188 is pivoted by means of an enlarged head pivot pin 166 and the upper arm 194 is pivotally attached at its upper end to a remote control rod 196.

Continuing to refer to FIGURE 9, note that lugs 198 and 200 are turned back out of the stock of the metal of arm 194 for cooperation with the door opening lever now to be described.

The door opening lever is also of the bell crank variety, designated 204. This has a horizontal actuating arm 206 and an upstanding bell end arm 208 of circular configuration at the top, embraced between the lugs 198 and 200 of arm 194, previously described. Lever 204 is pivoted as indicated. It will be obvious from FIGURE 9 that the levers 204 and 188 are now simultaneously operable.

It can be visualized that if the inside door knob is moved in a manner to rock lever 188 clockwise with the condition of parts of FIGURE 4, the door will be locked.

To unlock the door, the inside door handle is moved in a manner to move levers 188 and 204 counterclockwise, the effect of such being as follows:

(a) First unlocking, as in the condition in parts of FIGURE 9; and

(b) Further movement in the counterclockwise direction to produce the unlocking action indicated by movement of the 180 end in the arrow direction 186 in FIGURE 4, so that the lever 96 moves the tab 128 to lift lever 130 off the cam lobe 68.

In this respect, note that lifting lever 130 causes a simultaneous lifting of the tooth 84 out of the way of the ratchet tooth 54, permitting full and instantaneous opening, as distinguished from sequential action on closing.

Advantages of the invention

From the foregoing, it will be evident that there are a number of advantages and advancements to the art inherent in the present invention, and these are briefly summarized as follows:

(1) The use of individual sequential ratchets, providing a novel step forward in the art wherein a first ratchet tooth provides a safety latched position with as much strength of material as available in the final latched position of the locks of the prior art. Reference is made to Kramer Patent 2,987,336, FIGURE 1, the element 34 representing the fully latched position for the amount of metal resisting door opening. Compare the size of this tooth 34 to the tooth 54 of FIGURE 2 of the present invention, and note that there is as much body in the tooth 54 used to provide the safety latched position of the present invention as there is for the full latched position of the prior art typified by the Kramer showing. In this regard, note the greatly improved final latched holding power position of the present invention embodied in the cam lobe 68 of the figures of the drawings. This cam lobe is able to withstand a 6,000 pound impact blow before being sheared off as distinguished from much lesser resistance to shearing exemplified by the small holding tooth of the prior art.

The present invention also includes great versatility to locking and unlocking by either direct or remote control. Thus, as shown in FIGURE 1 of the drawings, locking

can be effected by an adjacent button 154 directly connected to the locking lever 150.

By reference to FIGURE 8, this can be worked with the outside door key.

Further, by reference to FIGURES 1 and 8, unlatching can be effected from a remote position by use of a bell crank lever 172 to a remote control rod 182, actuated by the inside door handle.

In the foregoing aspect of the invention, unlocking is necessary either by turning the key or lifting the inside door lock knob 154.

Proceeding further through the versatility of operation of the invention, we observe FIGURE 9 where locking, unlocking and opening are effected by the inside door handle, moved in both directions, but by interconnection of the lock levers 188 and 204.

The present invention represents the combination of thirty years of work by the present inventor and is submitted as advancing the state of the art to provide improved safety to automobiles, the motoring public and all of these with a greater economy of manufacture in the face of rising costs.

I claim:

1. In a latch mechanism,

a plate,

first and second spaced pivot pins rotatably mounted through said plate and carrying aligned and coacting latch jaws,

said latch jaws engageable with a latch post to be rotated in opposite directions and thus rotate said pins in opposite directions,

a first cam having an abutment face, and carried on one of said pins,

a second cam having an abutment face, and carried on the other of said pins,

a primary lever pivotally mounted on said plate and carrying an abutment movable into blocking relation to said first cam abutment face upon rotation of the first cam to a position to expose the abutment face,

a secondary lever pivoted on said plate and carrying an abutment movable into blocking relation to said second cam abutment face upon rotation of the second cam to a position to expose the abutment face, and sequentially of the blocking of the first abutment face,

and means interconnecting said primary and secondary levers,

whereby movement of said primary lever is effective to free both said abutments from blocking relation to said cam abutment faces.

2. In a latch mechanism according to claim 1 in which the means interconnecting said primary and secondary levers is disengageable from said secondary lever,

and means operable to disengage said interconnecting means from said secondary lever so that the abutment thereon remains in blocking relation to the respective cam abutment face blocked thereby regardless of movement of said primary lever.

3. In a latch mechanism,

a plate,

first and second spaced pivot pins rotatably mounted through said plate and carrying aligned and opposed latch jaws,

said jaws disposed to coact upon engagement with a latch keeper and move rotatively toward one another upon engagement with said keeper,

a first cam secured to one of said pivot pins and having an abutment face,

a second cam secured to the other of said pivot pins and having an abutment face,

a first latch lever pivotally mounted on said plate and carrying a stop element engageable in blocking relation with said first cam abutment face upon rotation

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of the first cam to a position exposing the abutment face to the stop element,
 a second latch lever pivotally mounted on said plate and carrying a stop element engageable in blocking relation with said second cam abutment face upon rotation of the second cam to a position exposing the abutment face to the second lever stop element,
 an intermediate lever pivotally connected to said first latch lever,
 and an abutment on said second latch lever engageable by said intermediate lever,
 whereby movement of said first latch lever is effective to free both said stop elements from blocking relation to said cam abutment faces.

4. In a latch mechanism according to claim 2 in which said intermediate lever is shiftable to a position in which it is nonengageable with said abutment on said second latch lever,
 and means operable to shift said intermediate lever into said second latch lever abutment nonengageable position whereby movement of said first latch lever is ineffective to free said second latch lever stop element from blocking relation to said second cam abutment face.

5. In a latch mechanism,
 a plate,
 first and second pivot pins rotatably mounted on said plate and carrying coacting latch jaws,
 said latch jaws engageable with a keeper to be rotated and thus rotate said pins,
 a first abutment carried on one of said pins,
 a second abutment carried on the other pin,
 first movable stop means carried by said plate to engage said first abutment on movement of said first pin,
 second movable stop means carried by said plate to engage said second abutment on movement of said second pin,
 first means to move said first stop means out of engagement with said first abutment,
 second means to move said second stop means out of engagement with said second abutment,
 and means operable by said first means to move said second means.

6. In a latch mechanism according to claim 5 in which the means operable by said first means to move said sec-

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ond means is selectively positionable in a second means moving position or in a second means nonmoving position,
 and means operable to shift said means operable by said first means from said second means moving to nonmoving position.

7. In a latch mechanism,
 a plate,
 first and second pivot pins rotatably mounted on said plate and carrying coacting latch jaws,
 said jaws engageable with a keeper to be rotated and thus rotate said pins,
 a first abutment carried on one of said pins,
 a second abutment carried on the other pin,
 a first movable latch arm carrying a stop engageable with said first abutment on movement of said one pin,
 a second movable latch arm carrying a stop engageable with said second abutment on movement of said second pin,
 and an intermediate arm pivotally connected to said first latch arm and engageable with said second arm to move the same,
 whereby movement of said first arm is effective to move said second arm to release said stops from engagement with said abutments.

8. In a latch mechanism according to claim 1 in which said intermediate arm is shiftable to a position in which it is nonengageable with said second arm,
 and means operable to shift said intermediate arm into said second arm nonengageable relationship whereby movement of said first movable latch arm is ineffective to free said second movable latch arm stop from engagement with said second abutment carried on said other pin.

References Cited by the Examiner

UNITED STATES PATENTS

| | | | | |
|-----------|-------|--------|-------|--------|
| 2,181,393 | 11/39 | Crooks | ----- | 292—45 |
| 2,943,878 | 7/60 | Rigaud | ----- | 292—44 |
| 2,987,336 | 6/61 | Kramer | ----- | 292—52 |

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