Jan. 5, 1954 E. L. ALLEN 2,665,159

DOOR CONTROL MECHANISM

Filed Dec. 6, 1949 5 Sheets-Sheet 1

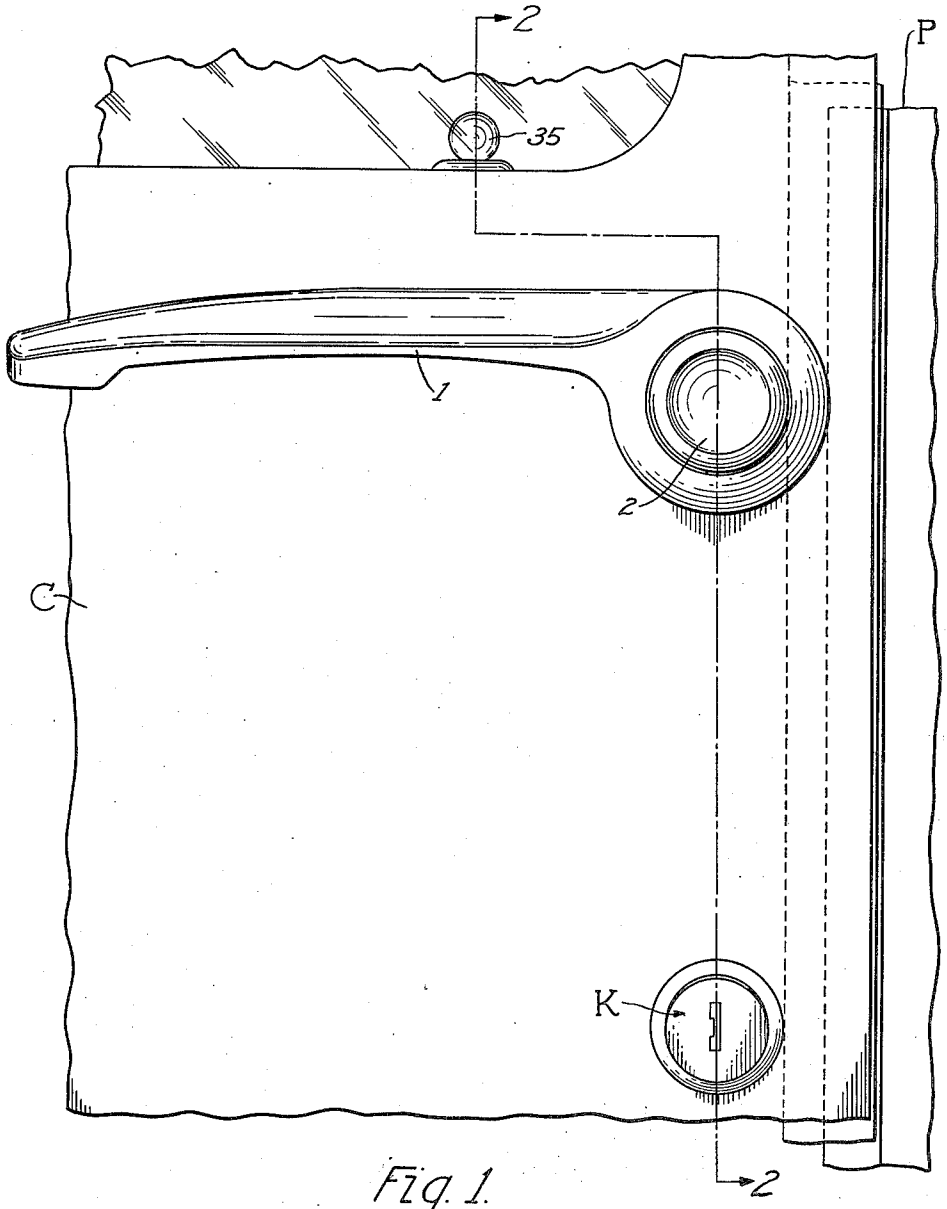


Fig. 1.

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DOOR CONTROL MECHANISM

Filed Dec. 6, 1949 5 Sheets-Sheet 2

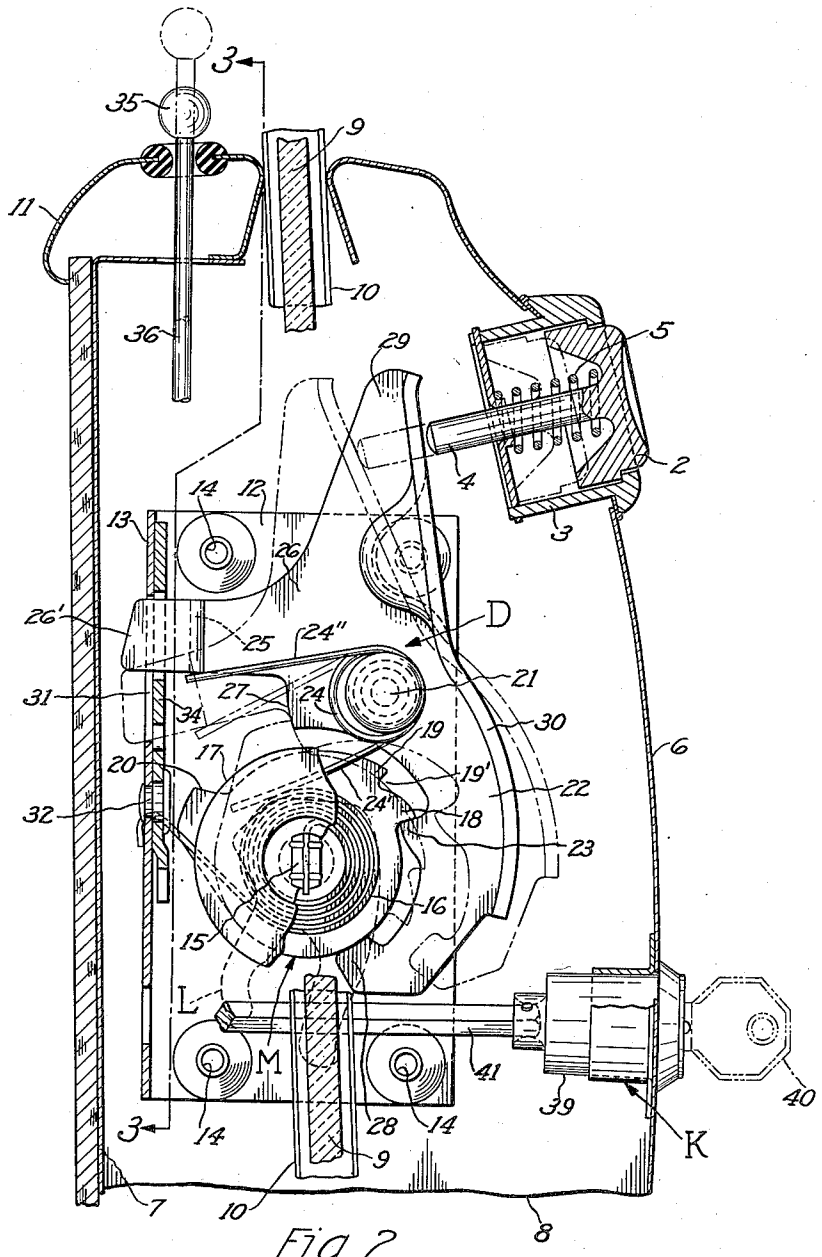


Fig. 2.

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DOOR CONTROL MECHANISM

Filed Dec. 6, 1949 5 Sheets-Sheet 3

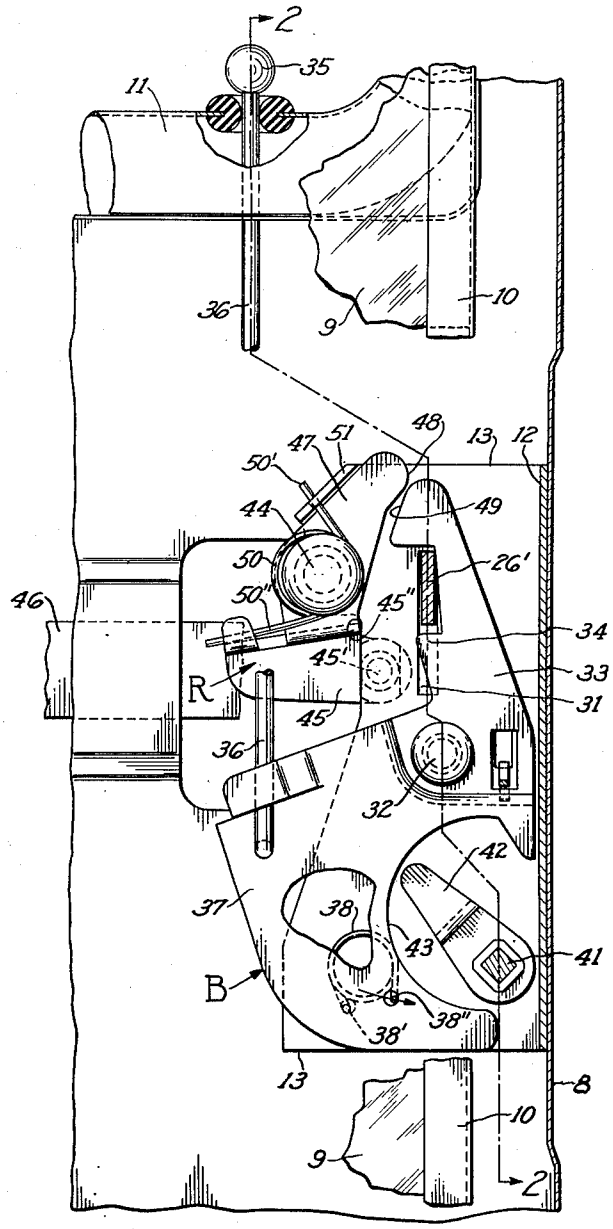


Fig. 3.

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DOOR CONTROL MECHANISM

Filed Dec. 6, 1949 5 Sheets-Sheet 4

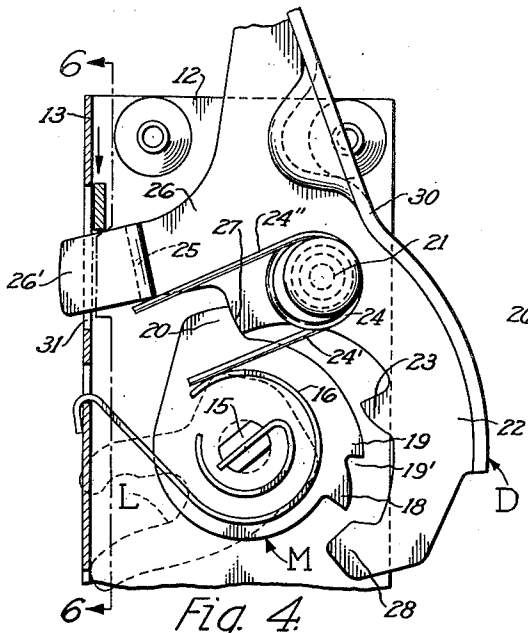


Fig. 4.

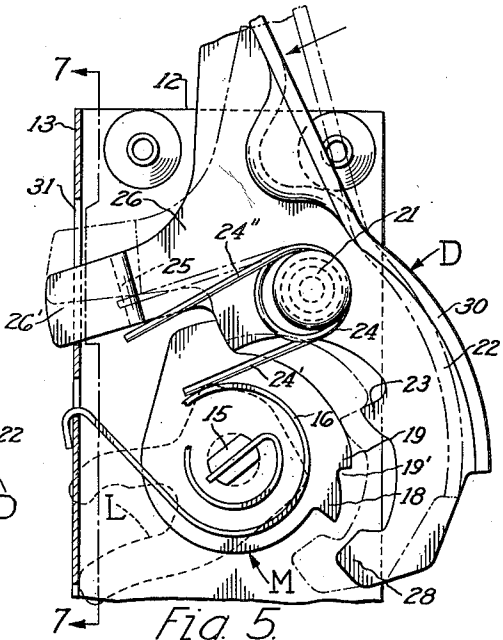


Fig. 5.

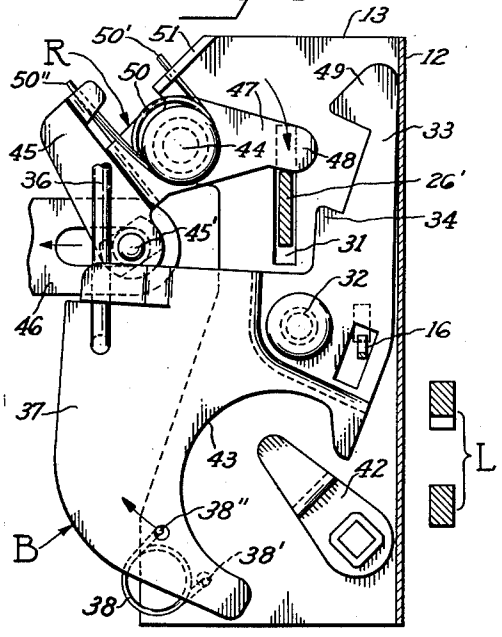


Fig. 6.

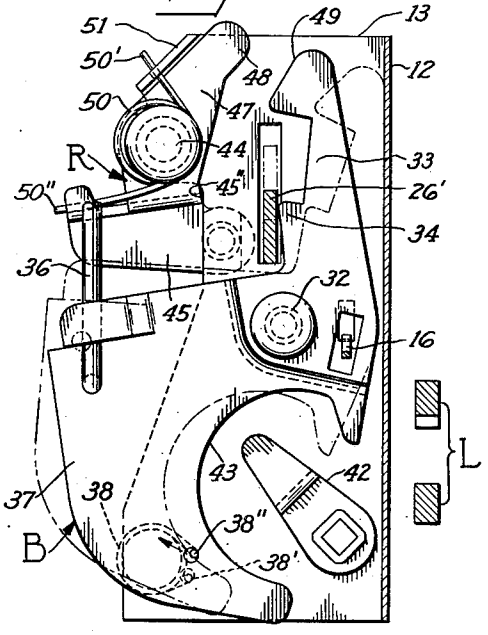


Fig. 7.

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Jan. 5, 1954 E. L. ALLEN 2,665,159

DOOR CONTROL MECHANISM

Filed Dec. 6, 1949 5 Sheets-Sheet 5

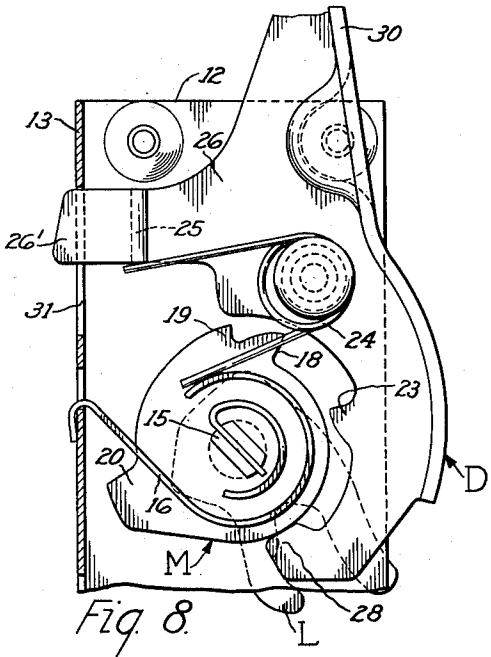


Fig. 8.

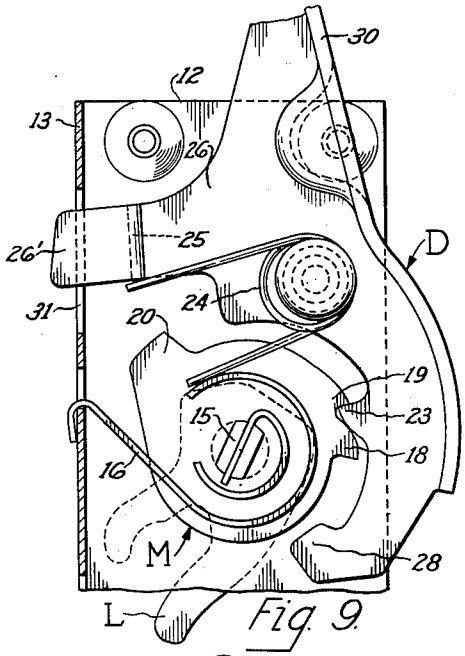


Fig. 9.

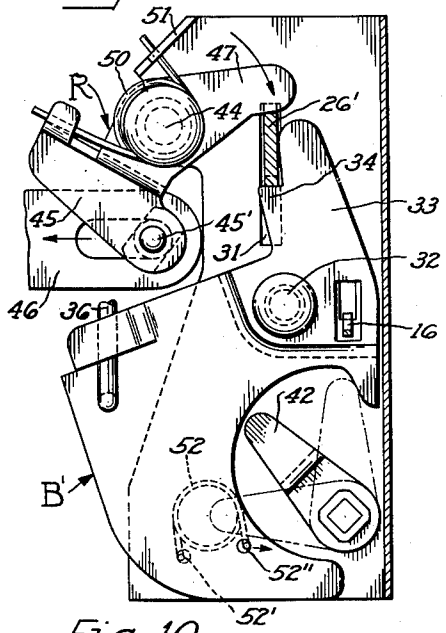


Fig. 10.

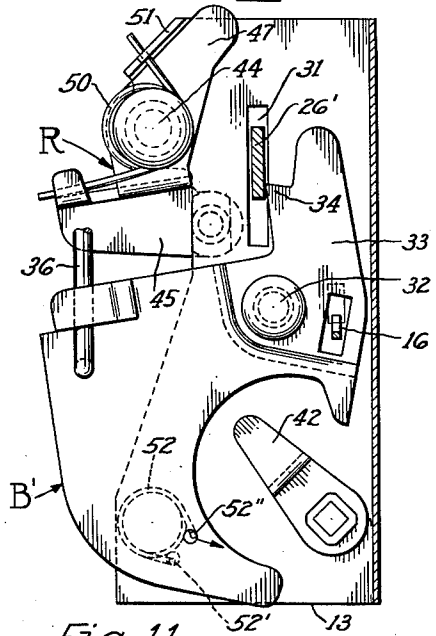


Fig. 11.

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Patented Jan. 5, 1954 2,665,159

UNITED STATES PATENT OFFICE

2,665,159

DOOR CONTROL MECHANISM

Edwin L. Allen, Cleveland Heights, Ohio, assignor, by mesne assignments, to Rudolph I. Schonitzer, Cleveland, Ohio

Application December 6, 1949, Serial No. 131,296

10 Claims. (Cl. 292—216)

1

This invention relates to door control mechanisms and more particularly to an improved door latch apparatus which is especially suited for use in automotive vehicle bodies.

It will be understood by those skilled in the art that my present invention may be utilized in connection with doors and closures of many different types. However, as the illustrated embodiments are designed for use with the doors of automobile bodies, the following discussion will be directed particularly to this type of installation. In my copending United States Patent Application Serial No. 76,023, filed February 12, 1949, I have described and claimed an improved door control mechanism of the general type in which the door may be latched and held in closed position by a latch member and coacting keeper, and which includes detent means whereby the latch member is releasably retained in door latched position when the door is closed. When this type of apparatus is actuated to permit opening of the door the detent means is moved to release the latch member and permit it to be moved into door unlatched position concurrently with opening movement of the door. The latch member in this type of latch normally remains in unlatched position until the door is closed whereupon the latch member is moved to latched position by the closing movement of the door. The present invention is illustrated herein as embodied in a latch mechanism which includes some of the features of the latch mechanism disclosed in my said copending United States patent application and cross-reference is hereby made thereto.

It is an object of my invention to provide a door control apparatus in which the latch member and the outside operating member, such as a push button, handle, or the like, may be spaced in the general direction of the hinge line of the door a substantial distance without the use of complex and costly interconnecting parts.

Other objects of my invention include the provision of a door control mechanism which contains a minimum of parts, which is extremely rugged in design, which is especially well adapted for economical mass production, and which will have a long and trouble-free service life.

The above and other objects of my invention will appear from the following description of several embodiments thereof, reference being had to the accompanying drawings in which:

Figure 1 is a fragmentary outside side elevational view of an automobile door in which my improved door control mechanism is installed, the door being shown in closed and locked position;

2

Figure 2 is a vertical cross-sectional view taken substantially on lines 2—2 of Figures 1 and 3;

Figure 3 is a vertical cross-sectional view taken substantially on line 3—3 of Figure 2;

Figure 4 is a detached view of the door control mechanism of Figures 2 and 3, taken substantially on the same plane as Figure 2 but with certain parts omitted for clearness, showing the illustrated parts as they appear when the detent has been moved into unlatched position by the inside remote control operating means;

Figure 5 is a view generally similar to Figure 4 but illustrating the permissible override or extra travel of the detent in unlatching direction beyond that required for latch release;

Figure 6 is a cross-sectional view taken substantially on line 6—6 of Figure 4, the lock being shown in full unlocked position;

Figure 7 is a cross-sectional view taken substantially on line 7—7 of Figure 5 and showing the lock member blocked out of locked position by the detent member. The view illustrates that, as shown, the lock cannot be preset for automatic locking;

Figure 8 is a view generally similar to Figures 4 and 5 but illustrating the override of the latch member in latch closing direction;

Figure 9 is a view generally similar to Figure 8 but showing the latch member and detent in their secondary latched positions;

Figure 10 is a view generally similar to Figures 6 and 7 but illustrating a modified form of my invention in which the lock member cannot be unlocked by the inside remote control mechanism and having the lock member arranged to be preset for automatic locking, the lock being shown in locked position; and

Figure 11 is a view, generally similar to Figure 10 and illustrating the same mechanism, the lock member being shown in preset position and the detent in secondary latched position as in Figure 9.

Referring particularly to Figures 1 and 2, a fragmentary portion of what may be considered to be the left-hand front door of an automobile is indicated at C. The body pillar P carries a keeper member (not shown) which coacts with the latch mechanism mounted within the door C. Handle 1 is fixed to the door and houses at one end an outside operating member which, as illustrated, takes the form of a push button 2 suitably supported in a tubular guide 3 and provided with an operating plunger 4. The spring 5 holds

push button 2 in its normal non-operating position, seen in Figure 2, except when pressure is exerted by the operator.

It will be understood that although I have illustrated the outside operating means for the door control mechanism as a push button, a suitable lever, pull handle, turn handle, or other device might be employed to effect outside operation of the door control mechanism and accordingly the push button 2 is to be considered as being merely illustrative of one form of outside operating means.

The push button guide or housing 3 is suitably mounted on and extends through the outside panel 6 of door C. The inner door panel 7 and a door free edge wall 8 enclose the latch mechanism in usual manner. In Figure 2 the window glass is seen at 9 suitably supported in a glass-run channel 10 and the inside garnish molding is indicated at 11.

As is clearly seen in Figures 2 and 3 my latch mechanism includes a frame structure having a base plate portion 12 and a side flange portion 13. Supporting screws extend through the free edge wall 8 into the threaded holes 14 (Figure 2) to secure the latch frame structure firmly in position on the door. A bifurcated latch member L is secured on a latch shaft 15, the flattened end of which is seen in Figure 2, and which is rotatably supported by a suitable bearing (not shown) carried by base plate 12. Shaft 15 extends through an aperture (also not shown) in the edge wall 8 of the door and the latch member L is mounted at its outer end on the outer side of edge wall 8 in position to coact with a keeper pin (not shown) mounted on the adjacent door frame in a well known manner and as is fully described in the Rudolph I. Schonitzer Patent No. 2,094,413 and in the Edwin L. Allen copending United States Patent Application Serial No. 746,521 filed May 7, 1947. Mounted on the shaft 15 adjacent the inner surface of base plate 12 is a latch element or plate member generally indicated at M. The spiral latch spring 16 has its inner end secured to the inner end of shaft 15 and its outer end anchored to the side flange 13 of the latch frame.

In common with the latches of the above-referred to patent and application, latch spring 16 at all times urges the latch member L in unlatching direction (clockwise as seen in Figure 2) and, as latch plate M is mounted on shaft 15 for movement with latch member L, it will have corresponding rotary movement. A cover plate or disc 17 for the spring 16 is also mounted on the end of shaft 15 and is shown partially broken away in Figure 2 to permit a direct view of the main latching tooth 18 and secondary latching tooth 19 of the latch plate M. Circumferentially spaced from secondary tooth 19 on the latch plate M is an unlatching stop lug 20, the function of which will be later described.

As seen in Figure 2, the parts are in door latched and door locked positions. The latch member L has its depending bifurcated legs in position to encompass the keeper pin (not shown) and hold the door in closed position. In order to maintain the latch member L in the full latched position of Figure 2 a detent member, generally indicated at D, is provided. A pin 21 carried by base plate 12 forms a pivotal support for detent D and the downwardly projecting latch control arm portion 22 of detent D has formed thereon a latch holding portion or pawl 23. To constantly urge detent member D in latch holding direction (clockwise as seen in Figure 2) a spring 24 is provided which is supported and held in position by an enlarged head on pivot pin 21 and which has its end 24' fixed by bearing against the outer convolution of spring 16 and its free end portion 24'' engaging the offset portion 25 of the transversely extending locking arm 26 of detent D to urge same in latch holding (clockwise in Figure 2) direction.

Figures 4 and 6 illustrate the unlatched position of latch member L and the latch released position of detent D, the detent being held in latch released position by the remote control bell crank R against the action of spring 24. It will be understood that detent D may also be moved into latch released position by the push button 2 and when the door is closed latch member L moves in counterclockwise direction into the latched position of Figure 2. As spring 24 urges detent D in latch holding direction the latch holding pawl 23 of detent D will, after release of remote control bell crank R or push button 2 and during closing of the door, first drop into the notch 19' behind the secondary latching tooth 19 and then, as the door reaches full latched position, drop down into latch holding position as seen in Figure 2 in engagement with main latching tooth 18. To release the latch mechanism the detent D is actuated, either by remote control bell crank R or push button 2 as will be later more fully described, to move the lower arm portion 22 thereof in counterclockwise direction (Figure 2) to clear the outer end of tooth 18 to permit the latch member L to rotate in clockwise or unlatching direction until it reaches the unlatched position of Figure 4 in which the unlatching stop lug 20 on latch plate M is in engagement with a corresponding stop lug 27 on detent D. Movement of detent D in latch holding direction is limited by engagement of a projection 28 on the end of lower arm 22 of detent D with the outer face of latch plate M as seen in Figure 2. This engagement prevents the pawl 23 from striking the edge of latch plate M when it snaps into latch holding position under the influence of spring 24.

The detent D, generally speaking, lies substantially in the plane of the latch plate M and in close proximity to the base plate 12. However, an offset portion 25 of transverse arm 26 extends inwardly and the end portion 25' is disposed in generally parallel but substantially spaced relation to the base plate 12 to accommodate the locking mechanism which will be later described. Detent member D also includes an upwardly extending operating arm portion 29 and an inwardly projecting flange 30 extends from the upper end of arm 29 to the lower portion of arm 22. This flange serves to stiffen the detent structure and also provides an abutment against which the push button plunger 4 engages when push button 2 is moved to operate the latch mechanism.

The center of pivot pin 21 constitutes the center of rotation of detent D and the center of shaft 15 constitutes the center of rotation of latch plate M and latch member L. For purposes of reference and description the common center line drawn through the center of pin 21 and the center of shaft 15 will be used in this specification and the appended claims. It is to be noted that the arm portion 22 of detent D extends toward the latch plate M in the general direction of said common center line and that the latch holding tooth portion or pawl 23 on arm 22 lies on one side of this common center line and the stop lug

27 of detent D lies on the opposite side thereof. It will also be noted that when the parts are in latched position (Figure 2) the main latching tooth 18 and secondary latching tooth 19 of latch plate 10 lie beyond this common center line in the direction of unlatching movement of latch plate M (to the right of the common center line as the parts are seen in Figure 2). This relation of the parts makes it possible to effect actuation of the detent D by inward pressure thereon exerted at a point substantially removed, in a vertical direction as seen in Figure 2, from the latch member L without increasing the space required to accommodate the upper part of the latch mechanism. This is a very desirable and advantageous feature which greatly assists in meeting the restrictions imposed on door latch mechanisms by modern automobile body designs.

When the door is closed and the parts are in their latched positions (Figure 2) any opening force on the door will tend to move latch member L and latch plate M in unlatching (clockwise) direction. The latch holding face or edge of tooth 18 of latch plate M will push against the corresponding latch holding face or edge of pawl 23 of detent D and the portion of lower arm 22 of detent D between pawl 23 and pivot pin 21 will be placed in tension. As illustrated, the radii drawn respectively from the center of shaft 15 and from the center of pivot pin 21 to the center of the latch holding faces of tooth 18 and pawl 23 are disposed at approximately 90 degrees to each other. It will be noted that pawl 23 on detent D is in the form of a hook which engages the tooth 18 on latch plate or element M. This arrangement, as pointed out herein, possesses certain advantages and to facilitate claiming my improved structure the pawl 23 may be described as being disposed on the opposite side of its latch holding face or edge from the center of rotation of the detent (pivot pin 21). Latch holding face or edge of pawl 23 of detent D is formed on an arc about the center of rotation of detent D and is concave in shape. The co-acting latch holding face or edge of tooth 18 of latch plate M is convex in shape and is formed on the same arc as pawl 23 when the two latch holding faces are in latch holding position as seen in Figure 2.

The end 26' of transverse detent locking arm 26 acts as a lock hold out portion as will appear later and extends through and is guided by an elongated slot 31 in the side flange 13 (see Figures 2, 5, etc.). As the detent member D is moved between its latch holding position seen in Figure 2 and its latch released position seen in Figure 4 the end 26' moves in the slot 31.

In order to lock the detent D in latch holding position (Figure 2), and thus prevent unlatching and opening of the door C, a lock member, generally indicated at B in Figure 3, is pivotally mounted on the side flange 13 on a suitable pin 32. The upwardly extending portion 33 of lock member B has a detent restraining projection 34 which, when the lock member B is in locked position as seen in Figures 2 and 3, is disposed across the slot 31 below the lower edge of end 26' of transverse detent arm 26. It will be observed that when in this position the detent D cannot be moved in unlatching direction sufficiently to permit pawl 23 to clear tooth 18 to release the latch member L for door opening movement.

When the detent member D is in latch holding position (Figures 2 and 3) the lock member B may be moved at will into and out of locked position. The unlocked position of lock member B is clearly seen in Figure 6. This locking and unlocking movement may be effected by the inside lock knob 35 mounted on the operating rod 36, which is secured at its lower end to the lower portion 37 of lock member B, or by the outside key operated mechanism to be later described. Rod 36 extends up through the garnish molding 11 of the door in well known manner. When knob 35 is in its lower position, seen in full lines in Figure 2, the lock member B is in locked position and when the knob 35 is lifted into its upper position, seen in phantom lines in Figure 2, the accompanying upward movement of rod 36 will move lock member B from the locked position of Figure 3 into the unlocked position of Figure 6. It will be understood that the knob 35 is illustrative of only one of various inside lock operating means which can be used. For example, the lock member B can be connected to be operated from locations other than on the garnish molding or by suitable movement of the usual remote control handle.

A snap-over spring 38 has one end 38' fixed to the side flange 13 of the frame structure and its other movable end 38'' connected to the lower portion 37 of lock member B. As the ends of this spring 38 are constantly urged apart the lock member B will be urged in locking direction (counterclockwise as indicated by the arrow in Figure 3) when in locked position and in unlocking direction (clockwise as seen in Figure 6) when in unlocked position. The action of the spring 38 changes or snaps over when the movable end 38'' thereof crosses the common center line drawn between center of the pivot pin 32 and the fixed end 38' of spring 38. As will be again referred to later, in the mechanism of Figures 2 to 7 this snap-over action occurs after the outer corner of detent restraining portion 34 of lock member B has passed, when moving in locking direction, its intermediate or blocked out position seen in Figure 7. Thus, when lock member B is in its intermediate or blocked out position, the function of which will be later described, spring 38 urges it in unlocking direction.

The result of this arrangement of spring 38 is that lock member B will not remain in intermediate position (Figure 7) if moved thereinto by operation of the inside lock knob 35 but will spring back into unlocked position as soon as knob 35 is released. In like manner lock member B will not remain in intermediate position in engagement with the side face of end portion 26' of detent D if placed in this position by means of the key-actuated mechanism generally indicated at K in Figure 2.

This key controlled lock operating means is substantially identical with that disclosed and claimed in the copending United States Patent Application of Edwin L. Allen, Serial No. 76,023, filed February 12, 1949, and will be only briefly described here. A cylinder lock 39 of suitable type is adapted to be operated by a key 40 and the connecting shaft 41 operates the rotatable finger 42 (Figure 3) which is supported by the side flange 13 and operates within a generally "C" shaped recess 43 in the lower portion 37 of lock member B. As seen in Figures 3, 6 and 7 of the drawings the finger 42 is in a mid or neutral position. Rotation of finger 42 through a predetermined arc in either direction from its mid-position to the locking and unlocking positions indicated in phantom lines in Figure 10 may be effected by proper turning of the key 40. Cylinder lock 39 is of the type wherein the key

cannot be removed except when the lock is in its neutral or mid-position and thus finger 42 must always be returned to mid-position after locking or unlocking operation in order to permit the operator to remove the key. This arrangement permits lock member B to be moved into and out of locked and unlocked positions, when the latch member is held in door fully latched position (Figures 2 and 3) by detent D, either by the inside knob 35 or the outside key mechanism K regardless of the position the lock member B may be in.

In addition to means for operating the latch mechanism from outside the door, it is of course necessary to provide mechanism for releasing the latch from inside the door. Referring particularly to Figure 3, the inside operating means includes the bell crank member R pivotally supported on a headed pin 44 carried by the side flange 13. The lower arm 45 of bell crank R carries a headed pin 45' by which the inside remote control strap 46 is operatively connected to the bell crank. The upper arm 47 of bell crank R has a camming end face 48 which, under conditions to be later described, will engage the inclined edge surface 49 at the end of upper portion 33 of lock member B. The bell crank spring 50 is positioned by the pivot pin 44 and has a fixed end 50' held by a lug 51 on side flange 13 and a free end 50'' engaging the lower arm 45 of bell crank R. Spring 50 always urges the bell crank toward its normal non-operating position seen in Figure 3. Movement of bell crank R in retracting direction beyond this normal non-operating position is prevented by engagement of an offset 45'' on the lower arm 45 with the edge of side flange 13 as seen in Figures 3, 7 and 11.

When a pull is exerted on the strap 46 by suitable inside remote control means such as a handle or the like (not shown) mounted on the inner panel of the door, the bell crank R may be moved in latch releasing (clockwise) direction into the position shown in Figure 6. Assuming that the lock member B is in locked position as seen in Figure 3 when the remote control mechanism is so operated, the first movement of bell crank R in clockwise direction will cause the camming face 48 to strike the inclined face 49 on lock member B pushing it in unlocking direction. As lock member B moves in unlocking direction under pressure from remote control bell crank R, the lock member B, before the lower edge of upper bell crank arm 47 engages the upper edge of end portion 26' of detent D, will have been cammed in unlocking direction a distance sufficient to cause the snap-over spring 38 to change its direction of pressure and the lock member B will be moved by spring 38 into its unlocked position as seen in Figure 6. Further rotation of bell crank R in unlatching direction will cause the upper end 47 thereof to engage the end portion 26' of detent D and move it downwardly from the position shown in Figure 3 into the position shown in Figure 4 in which the pawl 23 clears the main latching tooth 18, releasing the latch mechanism and permitting the door to open.

From the above it will be seen that if the door is closed, latched, and locked, and the inside remote control means is operated, the mechanism will first automatically be unlocked and then unlatched.

In some cases, particularly for rear doors of four-doored vehicles, it is deemed desirable to have the remote control mechanism so arranged that unlatching movement thereof will not effect unlocking of the door provided it has previously been locked. Figure 10 illustrates a modification of the apparatus of Figures 2 to 7 wherein the remote control bell crank R cannot be actuated to unlock and unlatch the door if it is locked. To accomplish this change in the mode of operation of the remote control mechanism it is only necessary to omit the upper end of arm 33 of lock member B' thus eliminating the inclined face 49 as clearly seen in Figure 10. As shown in this view the lock member B' is in locked position and pull is being exerted on the remote control strap 46 to swing bell crank R in latch releasing (clockwise) direction. The upper arm 47 thereof has engaged the end portion 26' of detent D and pushed it down against the detent restraining portion 34 of lock member B'. Due to the omission of the camming face 49 the lock member B' has remained in locked position.

It will be seen from the previous description of the apparatus of Figures 2 to 7 that when this mechanism is in full latched position as seen in Figures 2 and 3, and the lock member B is in unlocked position as seen in Figure 6, the detent D may be operated to release the latch member L and permit opening of the door either by the inside remote control bell crank R or the outside operating member (push button 2). Figure 5 illustrates that detent D may be moved in latch releasing direction by either the remote control or the outside push button distance somewhat greater than that needed for release of the latch member L. Latch releasing movement of detent D is limited by engagement with end portion 26' thereof with the bottom of slot 31 in side flange 13 and this extra movement eliminates the necessity for close precision in manufacture and installation.

In Figure 7 the detent restraining portion 34 of lock member B is seen in engagement with the side face of end portion 26' of detent D. The full line position of end portion 26' is the same as in Figure 5, i. e., at the limit of its latch releasing movement, while the phantom line position of end portion 26' in Figures 6 and 7 shows the normal unlatched position thereof. It will be observed that in either the full line or phantom line position of end portion 26' in Figure 7, or at any point in between, the restraining portion 34 of lock member B will be blocked by the side face of end portion 26' against further movement in locking direction. As indicated by the arrow in Figure 7, the spring 38 is still urging the lock member B in unlocking direction when it reaches the illustrated blocked position. This is evident from the fact that the free end 38'' of snap-over spring 38 has not crossed the common center line of pin 32 and fixed end 38'.

Thus, assuming that the door is unlatched and open and that the operator has pushed down on the lock knob 35 in an attempt to lock the door, he can only move lock member B into the position of Figure 7 and, upon release of knob 35, the spring 38 will move lock member B from the intermediate or blocked out position seen in full lines in Figure 7 back into unlocked position seen in phantom lines. The same action will take place if the operator attempts to lock the door, when it is open and unlatched, by use of the key and accordingly the mechanism of Figures 2 to 7 may only be locked when the door is closed and latched in which case it may be locked either by the inside knob 35 or the outside key mechanism K.

Figure 8 illustrates how the latch member L may, under unusual circumstances, override and move in latching direction beyond its normal latched position of Figure 2 without interfering with or changing the latch holding position of the detent D. This overriding of the latch member might occur if the latch member L were inadvertently moved into latched position with the door open and an attempt then made to close the door. It might also occur due to wear or omission of the usual rubber door seal which normally acts as a stop to limit inward movement of the door.

In Figure 9 the detent D and latch member L are shown in their secondary latched positions in which they may stop if the door is not closed with sufficient force to cause full closing and latching thereof. Figure 11 corresponds to Figure 9 and thus the end portion 26' of detent D as seen in Figure 11 is also in secondary latched position. This view shows that the lock member B' cannot be moved into locked position when the latch and detent are in secondary latched positions and this same result is obtained by the mechanism of Figures 1 to 7.

In Figure 11 the lock member B' is provided with a snap-over spring 52 having a fixed end portion 52' anchored to the side flange 13 and free end portion 52'' operably connected to the lower end of locking member B'. This snap-over spring is so arranged relative to the common center line between the pivot pin 32 and the fixed end 52' of spring 52 that, when lock member B' is moved into the intermediate or preset position shown in Figure 11, with the restraining portion 34 in engagement with the side face of end portion 26' of detent D, the spring 52 will urge the lock member B' in locking direction as indicated by the arrow. This action occurs because the end 52'' of spring 52 has moved across the common center line from the left-hand side thereof to the right-hand side thereof (as seen in Figure 11) and thus its action has been reversed.

The arrangement just described for presetting the lock member permits the operator, when the door is open and unlatched, to manipulate the inside knob 35 to move lock member B' into preset position (Figure 11). After this presetting operation the operator moves the door into full closed position whereupon the end portion 26' of detent D moves upwardly into its full latched position as seen in Figure 3, and spring 52 then moves lock member B' on into full locked position. With this arrangement the operator may lock the door upon leaving the vehicle without use of his key as distinguished from the arrangement shown in Figures 2 to 7 in which the operator must use his key to lock the door from outside the vehicle. In my United States patent application Serial No. 769,638, filed August 20, 1947, Patent Number 2,480,638, dated August 30, 1949 I have described and claimed a latch mechanism having automatic locking features of the general type shown in Figure 11 and cross-reference is accordingly made to this patent. As previously noted, the mechanism of Figures 9, 10 and 11 cannot accidentally become locked in its secondary latched position. This will be seen from inspection of Figures 9 and 11 and is considered to be advantageous as it eliminates the possibility of the door becoming locked in secondary latched position which would necessitate the operator getting out his key to unlock the door and then again manipulating the inside knob 35 to preset the lock. With the described arrangement, if the door should stop in secondary latched position when the operator is utilizing the automatic locking procedure he need only push the outside button 2 inwardly to release the latch and then when the door opens, shut it again, this time with sufficient force to effect full closing and latching thereof.

Although I have described in considerable detail the illustrated embodiments of my invention it will be understood by those skilled in the art that various modifications may be made in the form and the arrangement of the parts of the mechanism without departing from the teachings and disclosures herein contained. I do not therefore wish to be limited to the specific structures herein shown and described but claim as my invention all embodiments thereof coming within the scope of the appended claims.

I claim:

1. Door control mechanism comprising a frame structure having a base portion adapted to face the jamb of the door and provided at its inner edge with a side flange portion, a latch member rotatably supported on said base portion for movement between latched and unlatched positions, a latch plate member supported for rotary movement with said latch member and having a latching tooth formed thereon, and a detent member rotatably supported on said base portion with its axis of rotation spaced from the axis of rotation of said latch plate member, said detent member having a control arm portion extending toward said latch plate member in the general direction of the common center line drawn between the centers of rotation of said latch plate member and said detent member, said control arm portion having a holding pawl disposed to be moved toward said side flange portion and said latch plate member into holding relation with said tooth on said latch plate member, said detent member also having an operating arm portion, extending away from said latch plate member in a direction generally opposite to that of said control arm portion, a locking arm portion extending toward said side flange portion transversely of said control arm portion and said operating arm portion, said locking arm portion having a lock engaging portion, a lock member movably mounted on said frame structure and having a locking portion disposed for cooperation with said lock engaging portion of said detent member locking arm portion, and manually operable means for moving said lock member to place said locking portion thereof in blocking position relative to said lock engaging portion of said locking arm portion of said detent member, said tooth on said latch plate member being positioned relative to said common center line to remain on one side only thereof during movement between latched and unlatched positions, said operating arm portion being adapted when moved toward said side flange portion to rotate said detent member and move said control arm portion and pawl away from said side flange portion out of holding relation with said tooth.

2. Door control mechanism comprising a frame structure, a latch member rotatably supported on said frame structure for movement between latched and unlatched positions, a latch plate member supported for rotary movement with said latch member and having a latching tooth formed thereon, a detent member rotatably supported on said frame with its axis of rotation spaced from the axis of rotation of said latch plate member, said detent member having a control arm portion extending toward said latch plate member in the general direction of the common

center line drawn between the centers of rotation of said latch plate members and said detent member, said control arm portion having a holding pawl disposed to be moved toward said latch plate member into holding relation with said tooth on said latch plate member, said detent member also having an operating arm portion extending away from said latch plate member in a direction generally opposite to that of said control arm portion, a locking arm portion extending transversely of said control arm portion and said operating arm portion, and a projection on said control arm portion in spaced relation to said pawl, said latch plate member having a portion disposed to be engaged by said projection when said pawl and said tooth are in holding engagement whereby further movement of said detent member in latching direction is prevented.

3. Door control mechanism comprising a frame structure, a latch member rotatably supported on said frame structure for movement between latched and unlatched positions, a latch plate member supported for rotary movement with said latch member and having a latching tooth formed thereon, a detent member rotatably supported on said frame with its axis of rotation spaced from the axis of rotation of said latch plate member, said detent member having a control arm portion extending toward said latch plate member in the general direction of the common center line drawn between the centers of rotation of said latch plate member and said detent member, said control arm portion having a holding pawl disposed to be moved toward said latch plate member into holding relation with said tooth on said latch plate member, said detent member also having an operating arm portion extending away from said latch plate member in a direction generally opposite to that of said control arm portion, a locking arm portion extending transversely of said control arm portion and said operating arm portion, said tooth on said latch plate member being positioned relative to said common center line to remain on one side only thereof during movement between latched and unlatched positions, and a projection on said control arm portion in spaced relation to said pawl, said latch plate member having a portion disposed to be engaged by said projection when said pawl and said tooth are in holding engagement whereby further movement of said detent member in latching direction is prevented.

4. Door control mechanism comprising a frame structure, a latch member rotatably supported on said frame structure for movement between latched and unlatched positions, a latch plate member supported for rotary movement with said latch member and having a latching tooth formed thereon, a detent member rotatably supported on said frame with its axis of rotation spaced from the axis of rotation of said latch plate member, said detent member having a control arm portion extending toward said latch plate member in the general direction of the common center line drawn between the centers of rotation of said latch plate member and said detent member, said control arm portion having a holding pawl disposed to be moved toward said latch plate member into holding relation with said tooth on said latch plate member, said detent member also having an operating arm portion extending away from said latch plate member in a direction generally opposite to that of said control arm portion and a locking arm portion extending transversely of said control arm portion and said operating arm portion, a stop lug on said latch plate member in spaced relation to said tooth, and a coacting stop lug on said locking arm portion of said detent member disposed, when said detent member is in latch released position, to engage said latch plate member stop lug and limit the movement of said latch plate member and latch member in unlatching direction.

5. Door control mechanism comprising a frame structure, a latch member rotatably supported on said frame structure for movement between latched and unlatched positions, a latch plate member supported for rotary movement with said latch member and having a latching tooth formed thereon, a detent member rotatably supported on said frame with its axis of rotation spaced from the axis of rotation of said latch plate member, said detent member having a control arm portion extending toward said latch plate member in the general direction of the common center line drawn between the centers of rotation of said latch plate member and said detent member, said control arm portion having a holding pawl disposed to be moved toward said latch plate member into holding relation with said tooth on said latch plate member, said detent member also having an operating arm portion extending away from said latch plate member in a direction generally opposite to that of said control arm portion and a locking arm portion extending transversely of said control arm portion and said operating arm portion, said tooth on said latch plate member being positioned relative to said common center line to remain on one side only thereof during movement between latched and unlatched positions, a stop lug on said latch plate member in spaced relation to said tooth, and a coacting stop lug on said locking arm portion of said detent member disposed, when said detent is in latch released position, to engage said latch plate member stop lug and limit the movement of said latch plate member and latch member in unlatching direction.

6. Door control mechanism comprising a frame structure, a latch member supported on said frame structure for movement between latched and unlatched positions, a latch plate member supported for movement with said latch member and having a latching tooth formed thereon, a detent member supported on said frame spaced from said latch plate member, said detent member having a control arm portion extending toward said latch plate member, said control arm portion having a holding pawl disposed to be moved toward said latch plate member into holding relation with said tooth on said latch plate member, said detent member also having an operating arm portion extending away from said latch plate member in a direction generally opposite to that of said control arm portion, a locking arm portion extending transversely of said control arm portion and said operating arm portion, and a projection on said control arm portion in spaced relation to said pawl, said latch plate member having a portion disposed to be engaged by said projection when said pawl and said tooth are in holding engagement whereby further movement of said detent member in latching direction is prevented.

7. Door control mechanism comprising a frame structure, a latch member supported on said frame structure for movement between latched

and unlatched positions, a latch plate member supported for movement with said latch member and having a latching tooth formed thereon, a detent member supported on said frame spaced from said latch plate member, said detent member having a control arm portion extending toward said latch plate member, said control arm portion having a holding pawl disposed to be moved toward said latch plate member into holding relation with said tooth on said latch plate member, said detent member also having an operating arm portion extending away from said latch plate member in a direction generally opposite to that of said control arm portion and a locking arm portion extending transversely of said control arm portion and said operating arm portion, a stop lug on said latch plate member in spaced relation to said tooth, and a coacting stop lug on said locking arm portion of said detent member disposed, when said detent member is in latch released position, to engage said latch plate member stop lug and limit the movement of said latch plate member and latch member in unlatching direction.

8. Door control mechanism including a frame structure having a base plate portion, a shaft member carried by said frame structure and having its axis of rotation extending substantially normally to said base plate portion, a latch member carried by said shaft on one side of said base plate portion, a latch plate carried by said shaft on the opposite side of said base plate portion for rotary movement with said latch member between a latched position and an unlatched position, a holding face on said latch plate, a stop face on said latch plate angularly spaced from said latch holding face, at least a portion of said stop face being disposed at a different radial distance from said axis of rotation than said latch holding face, a detent member movable between a holding position and a released position, a pivotal support on said base plate portion for said detent member, a holding face on said detent adapted to coact with said holding face on said latch plate to hold said latch plate and latch member in latched position, and a stop face on said detent member angularly spaced from said holding face of said detent member, said detent member stop face being adapted to coact with said latch plate stop face to limit movement of said latch plate in unlatching direction, said holding face and said stop face of said detent member being disposed on opposite sides of a common center line drawn between said shaft axis and the axis of the pivotal support of said detent member.

9. Door control mechanism comprising a frame structure, a latch member supported on said frame structure for movement between latched and unlatched positions, a latch plate member supported for movement with said latch member and having a latching tooth formed thereon, a detent member supported on said frame spaced from said latch plate member, said detent member having a holding pawl disposed to be moved toward said latch plate member into holding relation with said tooth on said latch plate member, a stop portion on said latch plate member in spaced relation to said tooth, and a co-acting stop portion on said detent member in spaced relation to said pawl, said co-acting stop portion being disposed, when said detent member is in latch plate member released position, to engage said latch plate member stop portion and limit movement of said latch plate member and latch member in unlatching direction.

10. Door control mechanism comprising a frame structure, a latch member supported on said frame structure for movement between latched and unlatched positions, a latch plate member supported for movement with said latch member and having a latching tooth formed thereon, a detent member supported on said frame spaced from said latch plate member, said detent member having a holding pawl disposed to be moved toward said latch plate member into holding relation with said tooth on said latch plate member, a stop portion on said latch plate member in spaced relation to said tooth, a co-acting stop portion on said detent member in spaced relation to said pawl and disposed, when said detent member is in latch plate member released position, to engage said latch plate member stop portion and limit movement of said latch plate member and latch member in unlatching direction, spring means for urging said detent member pawl in latching direction and said co-acting stop portion thereof in a direction out of the path of movement of said latch plate member stop portion, a cam face on said latch plate member, and a co-acting face on said detent member, said cam face being disposed to engage said co-acting face when said latch member and latch plate member are in said unlatched position and block said detent member against movement in latching direction sufficient to move said detent member stop portion out of the path of movement of said latch plate member stop portion.

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