July 6, 1954 E. L. ALLEN 2,683,050

DOOR CONTROL MECHANISM

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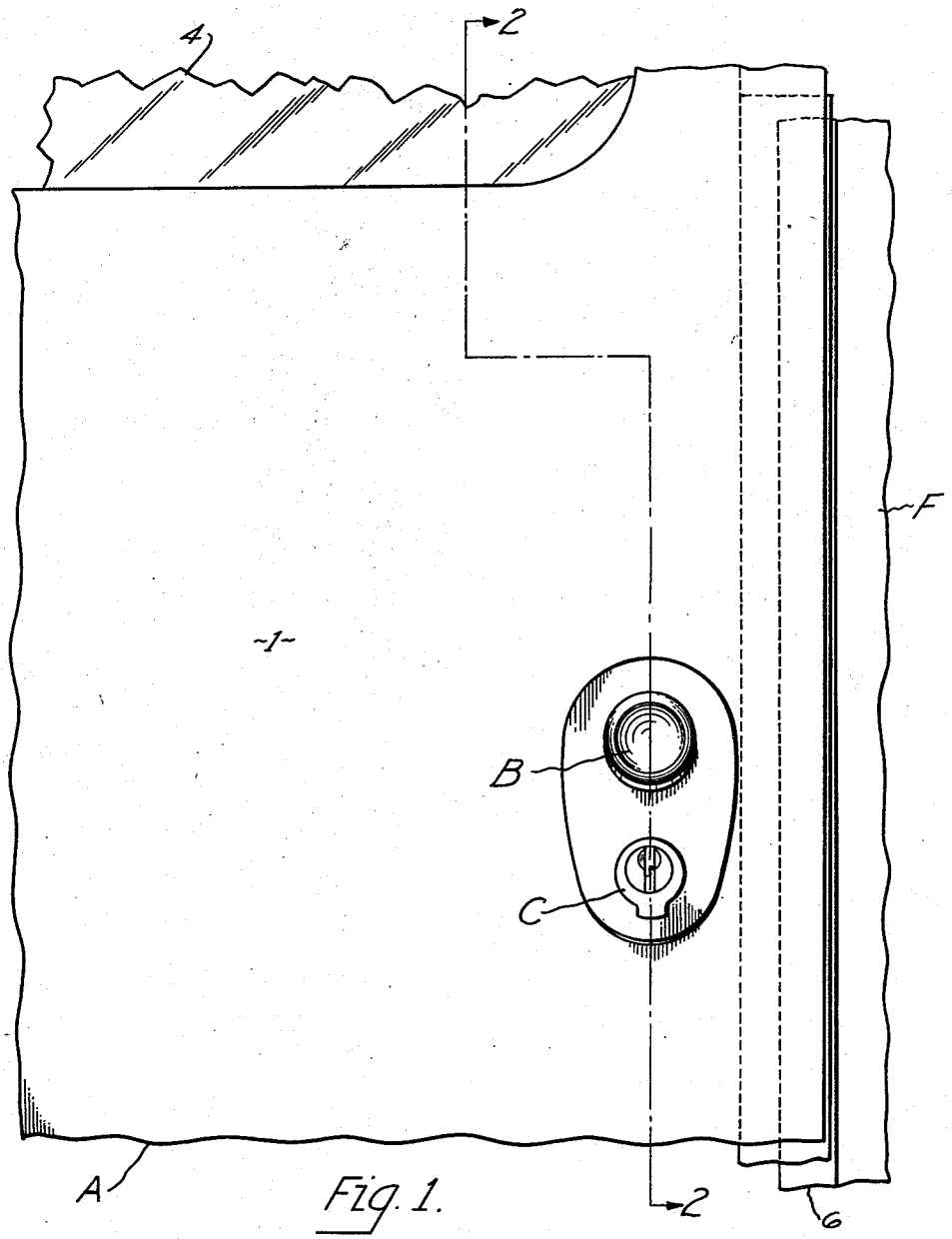


Fig. 1.

INVENTOR.
EDWIN L. ALLEN
BY
Bosworth & Sessions
ATTORNEYS

July 6, 1954 E. L. ALLEN 2,683,050

DOOR CONTROL MECHANISM

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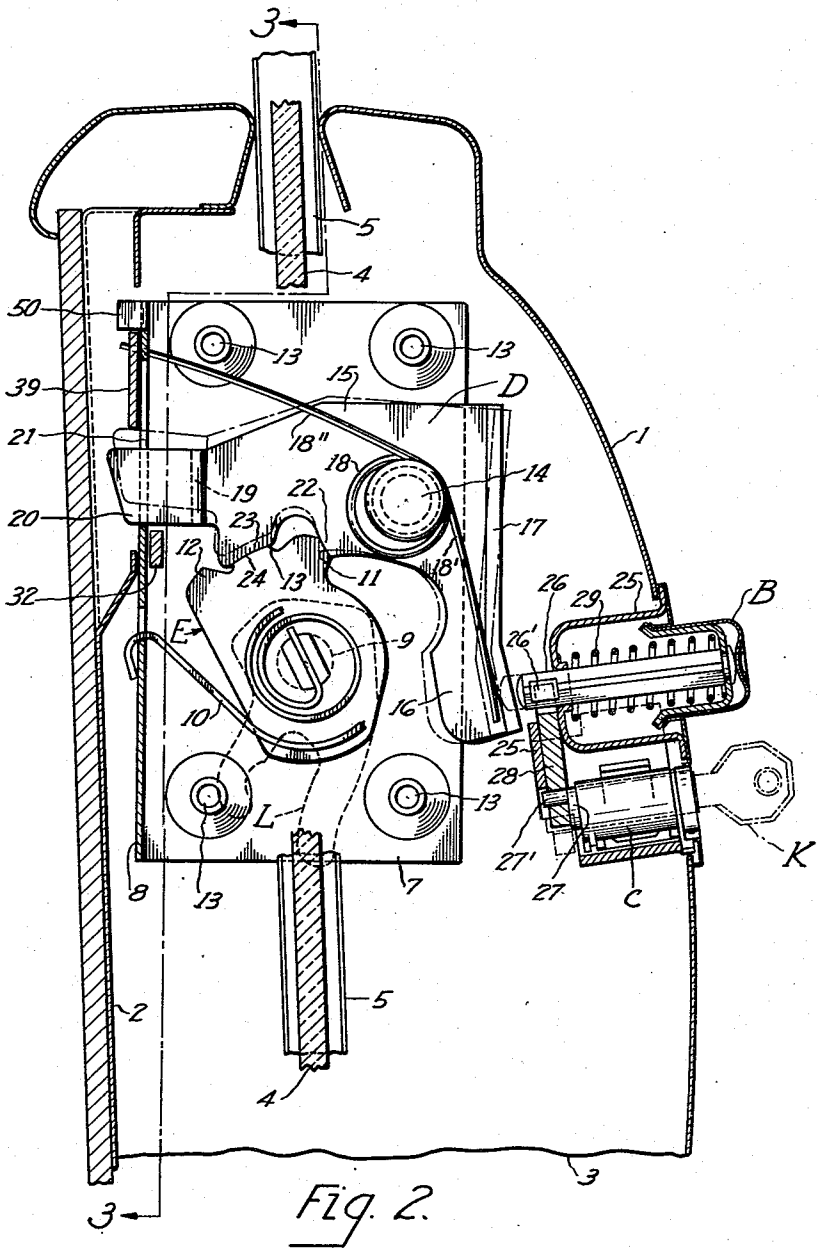


Fig. 2.

INVENTOR.
EDWIN L. ALLEN
BY
Bosworth & Sessions
ATTORNEYS.

July 6, 1954 E. L. ALLEN 2,683,050

DOOR CONTROL MECHANISM

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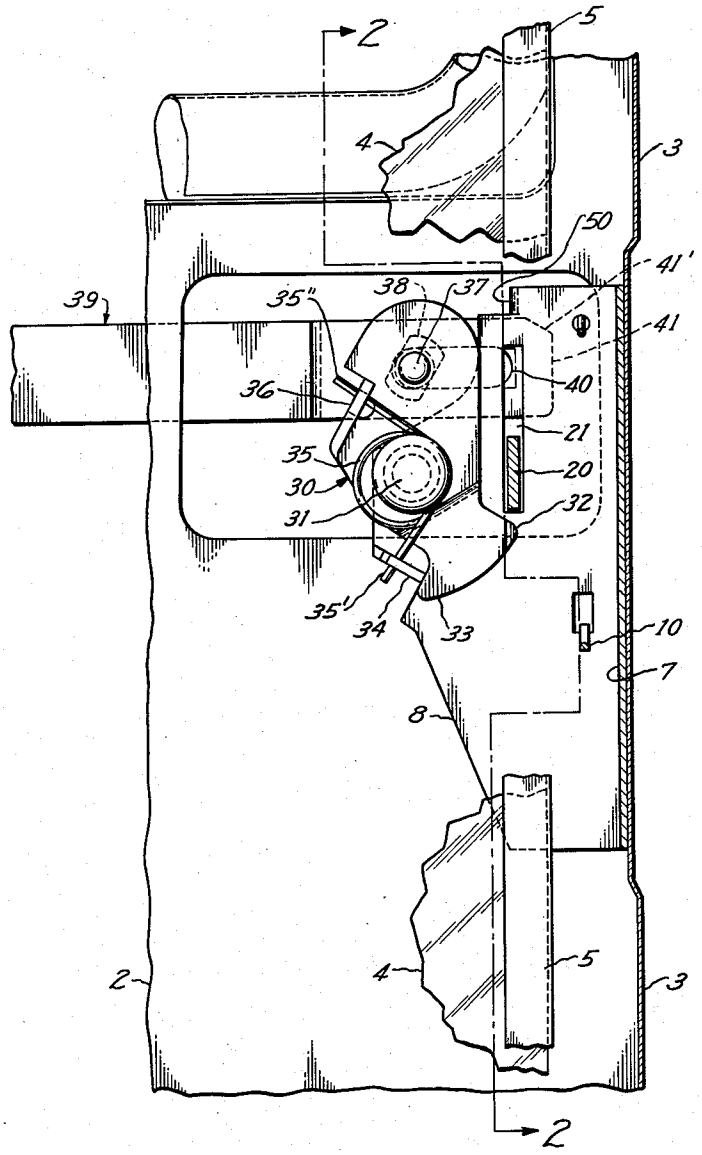


Fig. 3.

INVENTOR.
EDWIN L. ALLEN
BY
Bosworth & Sessions
ATTORNEYS.

July 6, 1954 E. L. ALLEN 2,683,050

DOOR CONTROL MECHANISM

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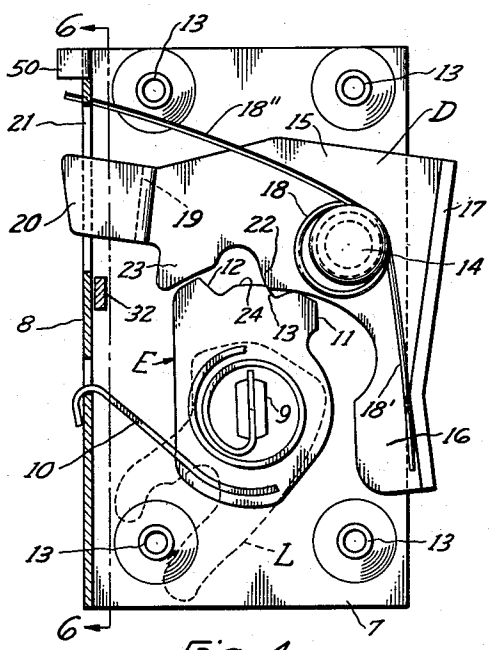


Fig. 4.

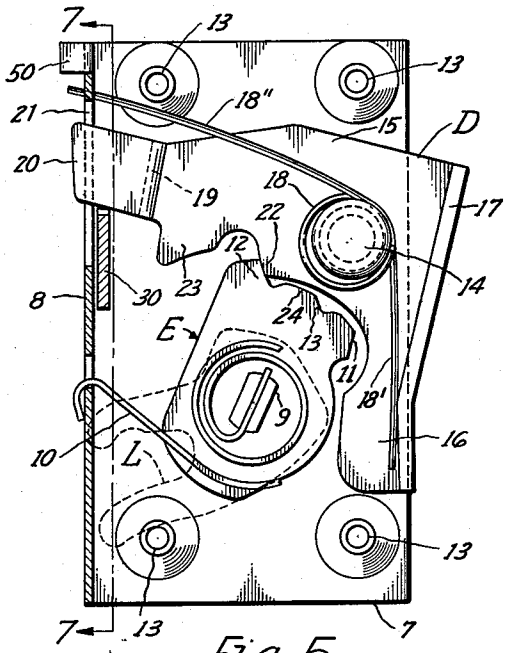


Fig 5.

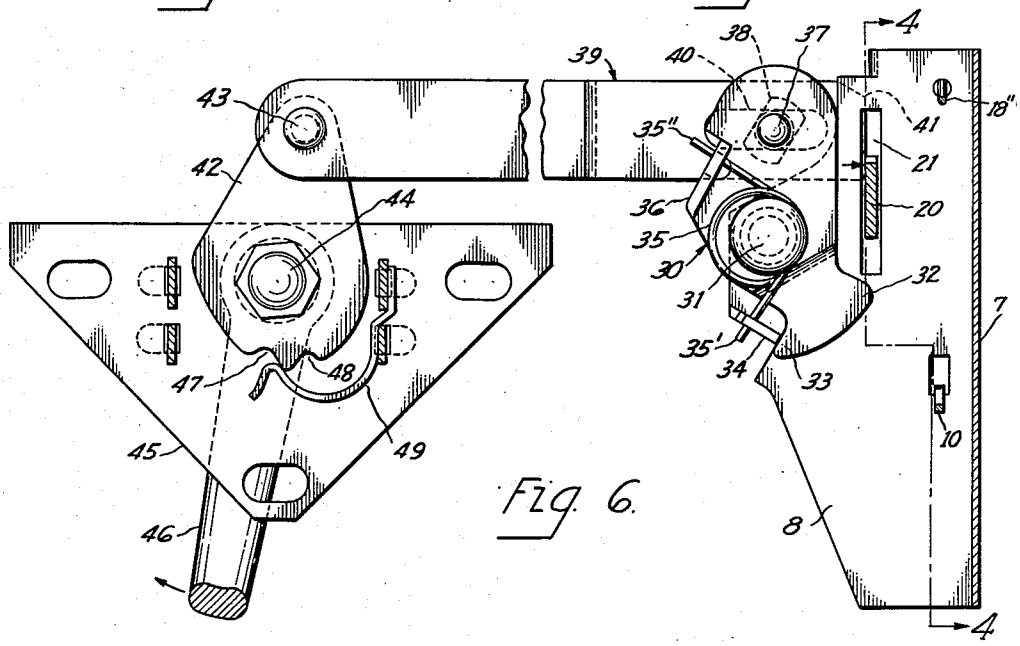


Fig. 6.

INVENTOR.
EDWIN L. ALLEN
BY
Bosworth & Sessions
ATTORNEYS.

July 6, 1954 E. L. ALLEN 2,683,050

DOOR CONTROL MECHANISM

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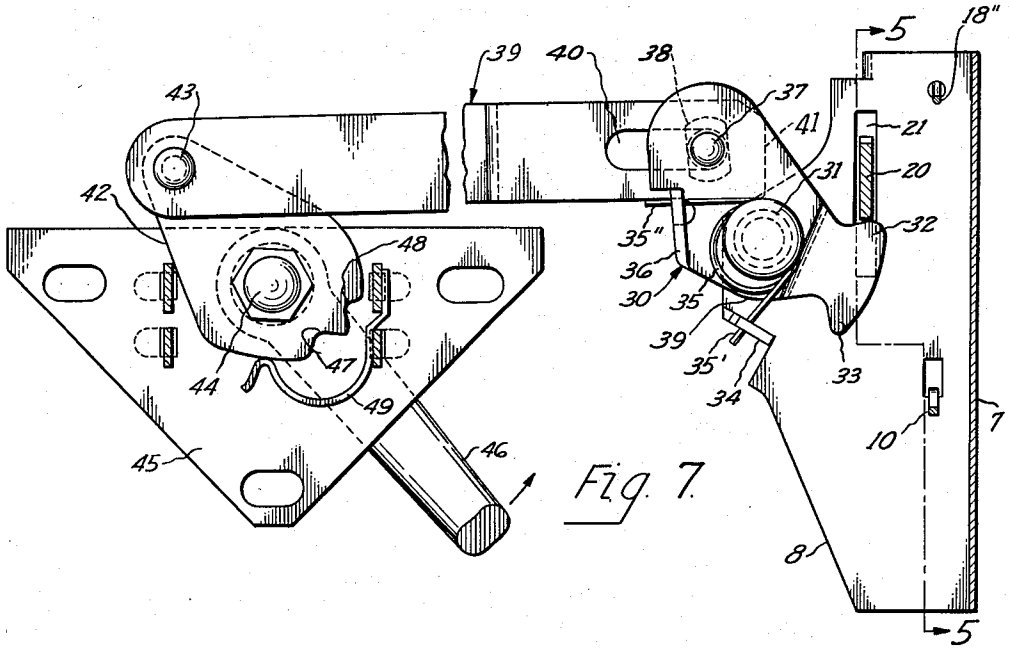


Fig. 7.

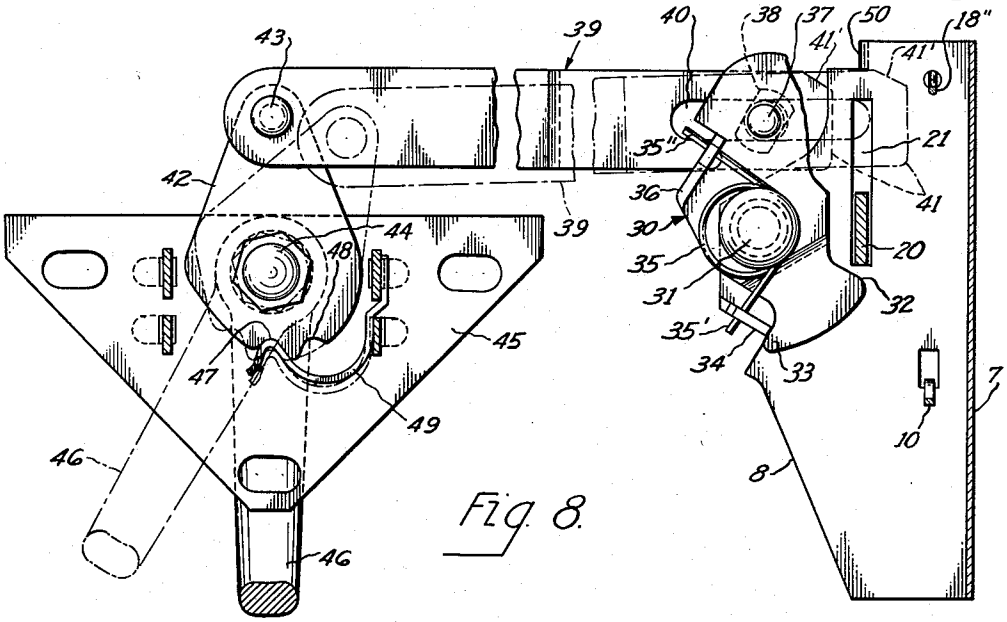


Fig. 8.

INVENTOR.
EDWIN L. ALLEN
BY
Bosworth & Sessions
ATTORNEYS.

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DOOR CONTROL MECHANISM

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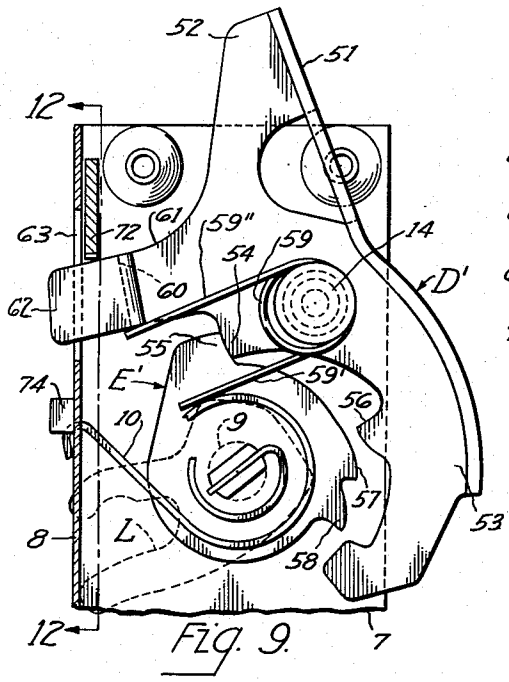


Fig. 9.

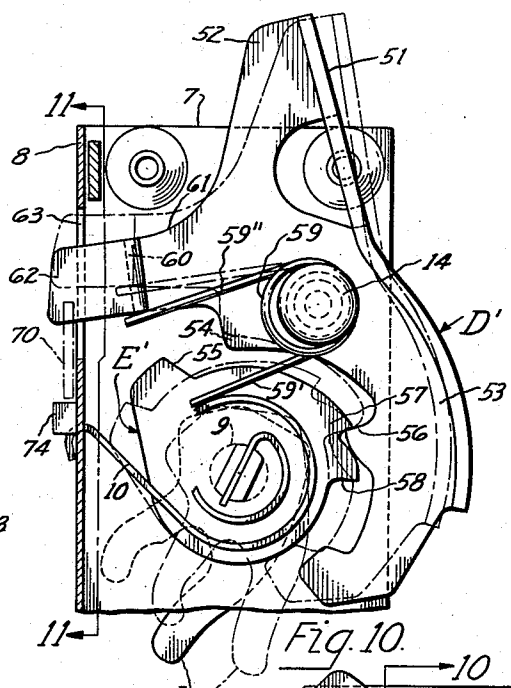


Fig. 10.

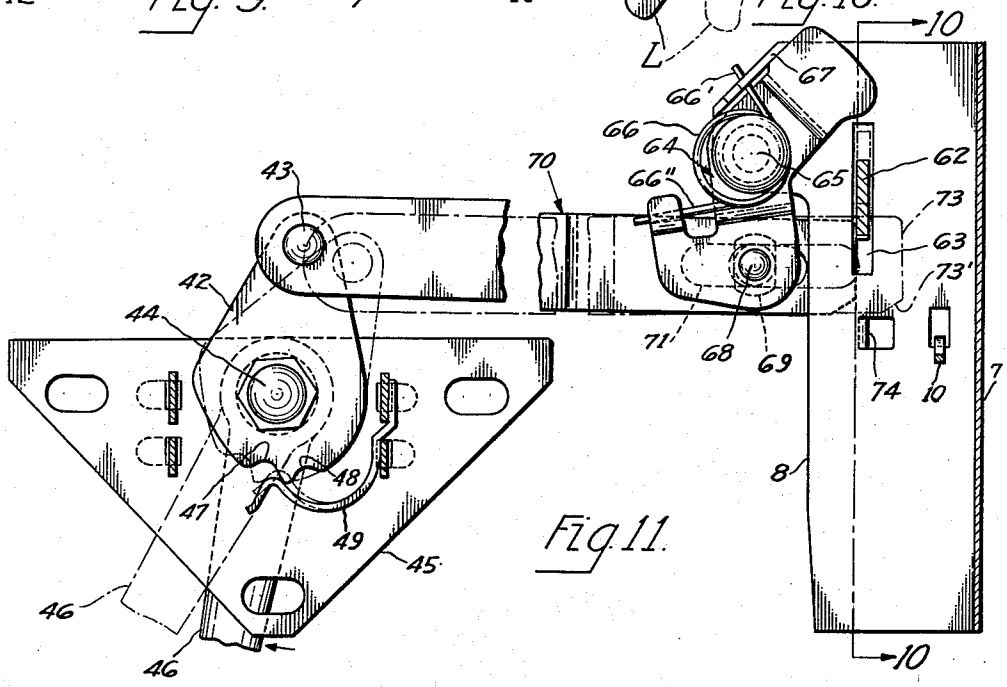


Fig. 11.

INVENTOR.
EDWIN L. ALLEN
BY
Bozworth & Sessions
ATTORNEYS.

July 6, 1954 E. L. ALLEN 2,683,050

DOOR CONTROL MECHANISM

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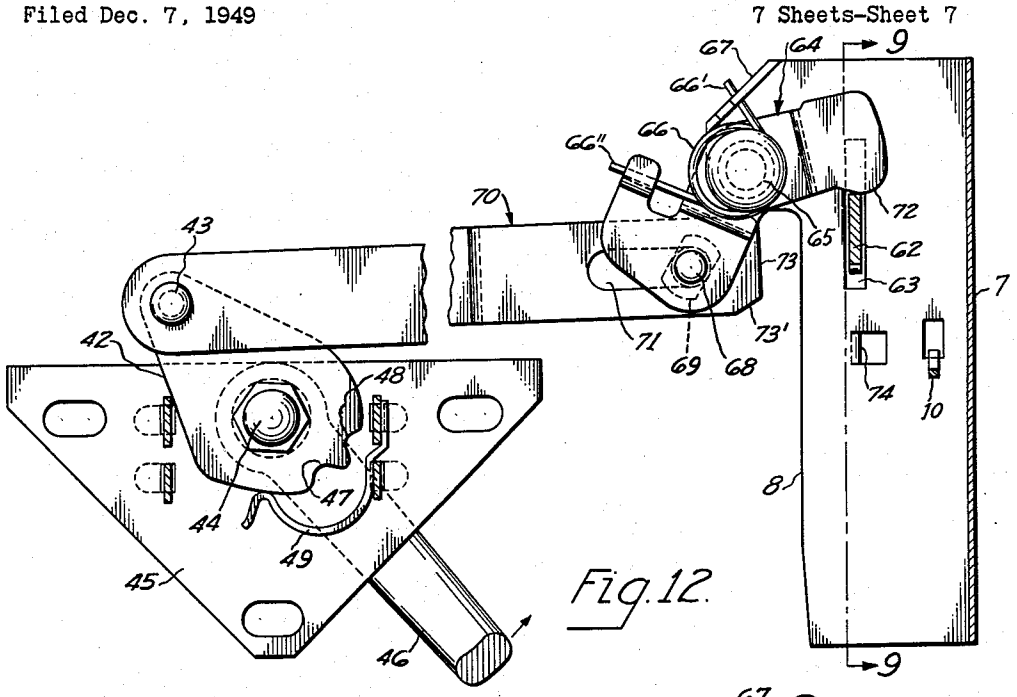


Fig. 12.

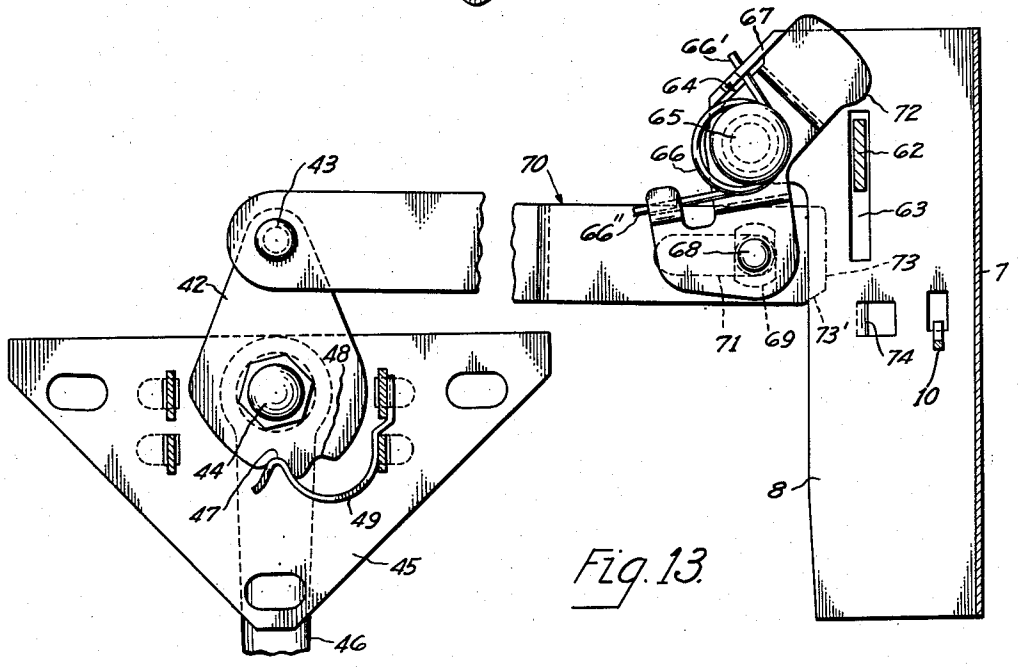


Fig. 13.

INVENTOR.
EDWIN L. ALLEN
BY
Bosworth & Sessions
ATTORNEYS.

Patented July 6, 1954 2,683,050

UNITED STATES PATENT OFFICE

2,683,050

DOOR CONTROL MECHANISM

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

Application December 7, 1949, Serial No. 131,659

5 Claims. (Cl. 292—216)

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This invention relates to door control mechanisms and more particularly to an improved inside remote control and locking apparatus for latch mechanisms of the type used on the doors of automotive vehicles.

In automobile door installations it is customary practice to provide remote control means for actuating the latch mechanism from the inside of the door. Such means are required because it is usually desirable to locate the inside latch operating handle or push button at a location spaced away from the door free edge at which the latch mechanism proper is located. In addition to inside remote control mechanism for effecting unlatching of the door it is necessary to provide means for operating the locking mechanism from inside the door. In rear doors of automobiles, which are commonly hinged at their forward edges, it is customary to locate the inside lock operating means at a point remote from the free edge of the door so that it may more readily be reached from the front seat of the vehicle.

It is an object of my present invention to provide an improved remote control mechanism for automotive vehicle doors or the like which is effective to perform both the latch releasing and the door locking and unlocking functions. In my co-pending United States patent applications Serial No. 76,023 filed February 12, 1949 and Serial No. 131,296, filed December 6, 1949 I have disclosed and claimed certain door control mechanisms. My present invention is illustrated and described herein as incorporated in latch mechanisms of the general type shown in my said co-pending applications and cross-reference is hereby made thereto. Accordingly, it is a further object of my invention to provide an improved remote control and inside lock operating mechanism particularly adapted for the type of latch mechanisms shown in my said co-pending applications.

Other objects of my invention include: the provision of a combined remote control and locking means whereby movement of a remote control handle in one direction will release the latch mechanism while movement thereof in the opposite direction will effect locking of the door; the provision of a combined remote control and locking apparatus which cannot be moved to locked position when the latch mechanism is out of its door latched position, thus preventing accidental locking of the door when open by inadvertent manipulation of the remote control handle; and the provision of latch locking means which is so

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combined with the remote control mechanism that a most effective, rugged and economical inside locking and remote control assembly is provided.

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 side elevation of a portion of an automobile door and door frame in which my improved mechanism is incorporated;

Figure 2 is a vertical cross-sectional view taken substantially on line 2—2 of Figure 1, and showing my door control mechanism in latched and locked position;

Figure 3 is a vertical cross-sectional view taken substantially on line 3—3 of Figure 2, a portion only of the remote control link or strap being shown;

Figure 4 is a view taken substantially on line 4—4 of Figure 6 and generally similar to Figure 2 but omitting the door structure and showing the mechanism in secondary latched and unlocked position;

Figure 5 is a view taken substantially on line 5—5 of Figure 7 and generally similar to Figure 4 but showing the latch member in unlatched position and the inside latch operating member in unlatched position;

Figure 6 is an illustrative view taken substantially on line 6—6 of Figure 4 and generally similar to Figure 3 but omitting the door structure and including the remote control handle assembly, the locking end portion of the remote control link being shown as blocked out of locking position;

Figure 7 is a view taken substantially on line 7—7 of Figure 5 and generally similar to Figure 6, the latch mechanism being shown in its unlatched position and the inside remote control handle and link being in their unlatching positions;

Figure 8 is a view generally similar to Figures 6 and 7 but showing the remote control handle and link in their neutral non-operating positions, the latch operating member in its non-operating position, and the latch member in latched position;

Figure 9 is a view taken substantially on line 9—9 of Figure 12. This view illustrates a modified form of my invention from that shown in Figures 1–8. The positions of the parts correspond generally to those of Figure 5;

Figure 10 is a view of the apparatus of Figure

9, taken substantially on line 10—10 of Figure 11 and illustrating the latch mechanism in secondary latched position;

Figure 11 is a view taken substantially on line 11—11 of Figure 10 and generally similar to Figure 6 but illustrating the modified form of my invention, the latch member being in secondary position and the locking portion of the remote control link being blocked against movement into locked position;

Figure 12 is a view taken substantially on line 12—12 of Figure 9 and generally similar to Figure 11 but showing the parts in their latch releasing positions; and

Figure 13 is a view generally similar to Figures 11 and 12 but showing the parts in their neutral or non-operating positions.

Referring now to the drawings, in Figure 1 there is illustrated a portion of what may be considered to be the left-hand front door A of an automobile and a portion of its associated frame F. The door A includes an outer panel 1, an inner panel 2 and a free edge wall 3. The usual window glass is seen at 4 supported in a glass run channel 5. As seen in Figures 1, 2 and 3, the door is in its closed, latched, and locked (both from inside and outside the door) position. The door frame structure F includes a body pillar 6 on the edge face of which is mounted a keeper pin (not shown) but which may be of the well known type fully disclosed in the Rudolph I. Schonitzer United States Patent No. 2,094,413 and in my said co-pending United States patent application Serial No. 76,023.

Referring particularly to Figures 2 and 3, the latch mechanism includes a frame structure having a base plate portion 7 and a side flange portion 8, the base plate 7 being secured to the free edge wall 3 of the door as by screws 13. The side flange 8 is angularly disposed relative to the base plate 7 and extends away from the free edge wall 3 adjacent and generally parallel to the inner door panel 2. Rotatably supported in a suitable bearing in the base plate 7 is a shaft 9 having a latch member L secured to its outer end and a latch plate or element E secured to its inner end on the opposite side of base plate 7. It will be understood that the latch member L is disposed on the outside of the free edge wall 3 of the door while the latch plate E and its associated mechanism is disposed on the inside of the door free edge wall.

A spiral spring 10 has its inner end secured to the inner end of shaft 9, as by clinching in a slot in the end of the shaft, and its outer end anchored in a suitable aperture in the side flange 8 (see Figure 2). This spring 10 urges the shaft 9, latch plate E, and latch member L toward their unlatched positions (clockwise as seen in Figures 2, 4 and 5). Latch plate or element E, as clearly seen in Figures 2, 4 and 5, includes a latching abutment portion or member 11, a circumferentially spaced limiting abutment portion or member 12, and a secondary latching abutment portion or member 13 between said abutments 11 and 12.

Pivotally mounted on a pin 14 carried by base plate 7 is a detent member generally indicated at D. In the mechanism illustrated in Figures 1 to 8, the detent D is of generally L-shape having a transversely extending arm portion 15 and a longitudinally extending arm portion 16 provided with an edge flange 17. Surrounding the pivot pin 14 and held in place by an enlarged head thereon is a detent spring 18 having its lower

end 18' engaging the flange 17 of detent arm 16 and its upper arm 18'' anchored in a suitable aperture in the side flange 8. This spring tends to urge the detent D about its pivotal support 14 toward latch holding position (counterclockwise as seen in Figures 2, 4 and 5).

The outer end of transverse arm portion 15 of detent D is offset at 19 (see Figure 2) in a direction away from base plate 7 and has an outer end portion 20 which extends through an elongated slot 21 in side flange 8 for vertical movement therein. The detent D is also provided with a latch holding abutment 22 and, outwardly spaced therefrom, a stop shoe portion 23 which limits movement of the detent in latching direction.

The operation of the mechanism described above may be understood by referring to Figures 2, 4 and 5. In Figure 5 the detent D, latch plate E, and latch member L are seen in their unlatched positions which they assume when the door is open and the latch mechanism is in unlatched position. When the door is moved from open toward closed position the latch member L strikes the keeper pin (not shown) and, as the door continues to close, the latch member L is swung about its pivotal support in latching direction (counterclockwise as seen in Figures 2, 4 and 5). This causes the outer corner of the latch holding abutment 22 of detent D to ride on the surface 24 of latch element E until the secondary abutment 13 comes into alignment whereupon detent D drops down into the secondary latched position seen in Figure 4.

In this so-called "secondary" position the latch member L engages the keeper on the door frame to prevent opening of the door but, as the door is not fully closed, proper latching has not yet been effected. The door normally stops in this secondary position only if it is not closed with sufficient force. In ordiniary usage the element E continues to move through the secondary position shown in Figure 4 without hesitation until the corner of abutment 11 reaches the corner of abutment 22 on the detent D whereupon detent spring 18 moves the detent D and abutment 22 thereof into latched position as seen in Figure 2. The stop shoe 23 on the transverse arm 15 of detent D is disposed to engage the face portion or limiting member 24 on latch plate E to limit the movement of the detent in latching direction. When the parts are in the latched position of Figure 2 the latch member L, shaft 9, and the latch plate or element E are effectively blocked against rotation in unlatching direction by the abutment portion 22 of detent D.

To release the latch and permit the door to be opened requires that the detent D be moved in clockwise direction from its latch holding position of Figure 2 as by pressure on the flange 17 by manually operable outside actuating means such as the push button generally indicated at B. The button B is supported in a suitable frame or housing 25 and carries a plunger member 26 the inner end of which is adapted to engage the flange 17 on detent D. Thus when push button B is moved inwardly from the position shown in Figure 2 the plunger 26 will engage flange 17 and swing the detent D in clockwise direction into latch releasing position substantially as seen in Figure 5. It will be understood that various forms of handles or other outside actuating means may be employed in place of the push button mechanism herein illustrated.

As soon as detent abutment 22 clears the latch

plate abutment 11 the plate E, shaft 9, and latch member L are free to rotate in unlatching direction (clockwise in Figure 2) with concurrent opening movement of the door. When the latch member L reaches the unlatched position of Figure 5 the latch holding abutment 22 of the detent D engages the limiting abutment 12 on the latch plate E, thus effectively holding the latch member L in unlatched position readily for the next latching operation.

The mechanism thus far described is substantially the same as that described and claimed in my co-pending application Serial No. 76,023. It is of course important to provide means for locking the door both from inside and from outside the vehicle. In order to lock the door from outside the vehicle I provide a cylinder lock assembly generally indicated at C which is illustrated as supported in the same housing 25 as the push button B. The rotatable plug 27 of the cylinder lock C carries an eccentric pin 27' which is operatively connected to a slide member 28 guided for movement toward and away from the plunger 26 by the frame 25. As seen in Figure 2 the cylinder lock C and the slide member 28 are in their locked positions with the bifurcated upper ends of slide 28 disposed in locking engagement in the opposed flat spots 26' on plunger 26. When in this position inward unlatching movement of the push button B and plunger 26 is effectively prevented. When the plug 27 of the cylinder lock C is rotated by a key K in well known manner the eccentric pin 27 moves the slide 28 to the phantom line position of Figure 2 out of locking engagement with the plunger 26 and thus unlocks and releases the plunger and push button B for free unlatching movement. It will be understood that other means may be employed for locking the push button B against latch releasing movement to prevent unauthorized entry from outside the vehicle and it will be seen that the spring 29 at all times urges the push button B and plunger 26 toward their latch released positions seen in Figure 2.

My improved mechanism for selectively effecting unlatching, locking, and unlocking of the door from inside of the vehicle will now be described. As seen in Figure 3 a latch operating member 30 is pivotally supported on the side flange 8 on a pin 31. The lower end of operating member 30 includes a detent engaging portion 32 and a stop portion 33 adapted to engage an inwardly bent tang 34 on side flange 8. In order to urge operating member 30 toward its non-operating position as seen in Figure 3 a spring 35 is provided. This spring is positioned by an enlarged head on the pin 31 and its lower end 35' is anchored in the tang 34 while its upper end 35'' is operatively connected to the operating member through an inturned flange 36 formed thereon. Thus the spring 35 tends at all times to move the operating member 30 in clockwise direction (as seen in Figure 3) and normally holds it in non-operating position with the stop portion 33 against the tang 34 (also seen in Figure 3).

Secured to the upper end of operating member 30 is a pin 37 which projects outwardly therefrom and has an elongated T head portion 38. The head 38 serves to retain the remote control link or strap 39 in position and connect it to the member 30 which effects the operating connection between link 39 and detent D. An elongated slot 40 is provided in the link 39 adjacent its inner or locking end. As will later appear, this slot is effective to secure the desired operation of the remote control mechanism and it also forms a convenient means of assembling the link 39 with the operating member 30. In such assembly the link 39 is first positioned with the long axis of slot 40 extending parallel to the long axis of the T head 38 on pin 37. The slot is then passed over the head 38 and the link rotated into the position seen in Figure 3 whereupon the link is supported on the pin but cannot slip off because of the T head 38. It will be understood that the underside of the elongated head portion 38 of pin 37 is spaced from the adjacent side face of operating member 30 a distance slightly greater than the thickness of the link 39.

In Figure 6 the assembled relation of the remote control latch operating and inside locking means is illustrated, the door structure being omitted for the sake of clearness and simplicity. As shown, the link 39 extends away from the base plate 7 and door edge wall 3 adjacent and generally parallel to the inner door panel 2. As is apparent from Figures 2 and 3 the inner or locking end portion 41 of link 39 is here shown disposed on the outer side of the side flange 8 of the latch mechanism and has sliding movement along flange 8 between locked and unlocked positions as will be later explained. The outer end of link 39, opposite to its inner locking end portion 41, is pivotally connected to the upper end of remote control lever 42 by pin 43. Lever 42 is carried by and movable with a remote control shaft 44 extending through and having a bearing in supporting plate 45. As will be understood by those skilled in the art, the supporting plate 45 is mounted on the inner door panel 2 by any suitable means (not shown) such as screws or the like. The inside remote control handle 46 is secured to the shaft 44 on the opposite side of plate 45 and inner door panel 2 from the lever 42 and it will be seen that swinging movement of handle 46 will result in longitudinal movement of link 39. In order resiliently to retain the handle 46 and lever 42 in their neutral or non-operating, unlocked positions as seen in Figure 8 a notch 47 is formed in the lower end portion of lever 42. A generally similar notch 48 is disposed adjacent notch 47. As best seen in Figure 8, when the parts are in their neutral and unlocked positions the spring 49 is disposed in notch 47 while, after the handle 46 is moved from neutral into locked position (seen in phantom lines in Figure 8) the spring 49 is disposed in notch 48 and holds the handle 46, lever 42, and link 39 in their locked positions. The notches 47 and 48 are so contoured that handle 46 may readily be moved out of its neutral position or its locked position without undue effort but will not move out of these positions due merely to vibration or other accidental force.

As previously noted, the inside latch and lock control mechanism is shown in its neutral or non-operating position in Figure 8. In this view the outer end portion 20 of detent arm 15 is seen in its latched position (as also seen in Figure 2). If the operator now desires to unlatch the door from inside he moves the handle 46 counterclockwise (as seen in Figure 8) into the position shown in Figure 7. When the parts are in their neutral positions of Figure 8 the outer end of slot 40 is closely adjacent the pin 37 on operating member 30 and thus movement from neutral position (Figure 8) to latch releasing position (Figure 7) causes corresponding counterclockwise move-

ment of the operating member 30. During this movement the detent engaging portion 32 of member 30 engages the lower edge of outer end portion 20 of detent arm 15 and lifts same from the latch holding position shown in Figures 2 and 8 into the latch released position shown in Figures 5 and 7. This, as previously explained, permits latch plate E, shaft 9, and latch member L to rotate into the unlatched positions seen in Figure 5 with accompanying opening of the door. When the operator releases his unlatching pressure on handle 46 the spring 35 returns the operating member 39 to its neutral position (Figure 8) and, through link 39, lever 42, and shaft 44, also returns the handle 46 to its neutral position (Figure 8). During this return movement of the remote control parts the detent D however remains in its latch released position substantially as seen in Figure 5.

Thus the door control mechanism can be unlatched from inside the vehicle at any time by moving the handle 46 into the unlatched position of Figure 7. This can be accomplished regardless of whether or not the key controlled cylinder lock C is in locked or unlocked position.

If it is desired to lock the door from inside the vehicle to prevent unauthorized entry from outside, the operator merely moves the inside remote control handle 46 from its neutral position (Figure 8) in clockwise direction into the locked position illustrated in phantom lines in Figure 8. This locking movement of handle 46 causes corresponding locking movement of link 39 (to the right in Figure 8) but without movement of the operating member 30 due to the lost motion provided by slot 40 and pin 37. As link 39 moves into its locked position (seen in full lines in Figures 2 and 3 and in phantom lines in Figure 8) slot 40 merely slides over the pin 37 and the inner locking end portion 41 of link 39 moves across the slot 21 in side flange 8 and under an outwardly bent tang 50 on side flange 8. If, when link 39 is in its locked position, an attempt is made to move the detent D from latch holding to latch released position by pressure on the outside push button B, the movement of detent D will be limited by engagement of the upper edge of end portion 20 thereof with the lower edge of the locking end 41 of link 39. As seen in phantom lines in Figure 2, such movement of detent D is not sufficient to disengage the abutment portion 22 from the corresponding abutment portion 11 of the latch plate E and thus the latch remains latched and the door cannot be opened.

The tang or stop member 50 on side flange 8 absorbs the upward force which may be exerted by end portion 20 of detent D when an attempt is made to open the door by pushing on push button B when the inside locking mechanism is locked. Thus any load which otherwise might be transmitted to the pin 37 and operating member 30 is absorbed and an extremely strong and rigid block is provided. As is clearly seen in Figure 3 the upper corner 41' of the locking end portion 41 of link 39 is preferably beveled or relieved to facilitate sliding entry of end portion 41 under the tang 50 during locking movement.

As previously explained, the handle 46 and link 39 are held in locked position by the co-action of notch 48 in lever 42 and spring 49 which is supported on the face plate 45.

If the operator desires to unlock the door from inside he moves the handle 46 from its phantom line locked position of Figure 8 into its full line position of Figure 8. This movement slides the link 39 longitudinally out of locked position and does not actuate the operating member 30. However, if the operator desires not only to unlock the door but also to unlatch it for opening, he continues to move the handle 46 beyond its neutral position into the unlatched position of Figure 7.

From the above description it will be seen that my improved door control mechanism provides a simple, rugged and effective means for controlling the latching and locking of the door from inside by means of a single handle, movement of which in one direction from a neutral position effects unlatching alone while movement in the opposite direction from neutral position effects locking thereof.

Another feature of my invention is the provision of means for preventing movement of the inside locking mechanism into locked position when the latch mechanism is in either its unlatched position of Figure 5 or its secondary latched position of Figure 4. In Figures 4 and 6 the detent D and its outer end portion 20 are seen in their secondary latched positions and it will be observed from Figure 6 that the upper edge of end portion 20 is disposed above the path of travel of the locking end portion 41 of link 39 as it moves in locking direction. Thus, if an attempt is made to lock the door by the inside handle 46 when the latch mechanism is in its secondary latched position, the handle 46 can be moved from its neutral position of Figure 8 only into the position seen in Figure 6 in which the inner end of link 39 has engaged the side face of end portion 20 of detent D and is blocked thereby against movement into locking position.

It will also be seen from Figure 6 that when link 39 reaches its blocked position the spring 49 is still in engagement with the inclined side face of notch 47 and, upon release of pressure by the operator on handle 46, spring 49 will return the link 39, lever 42, and handle 46 to their neutral positions of Figure 8. It will be apparent that when the latch mechanism is in unlatched position as seen in Figure 5 the end portion 20 of detent D will act in the same manner as has just been described to block the link 39 against movement into locked position. Accordingly, when the door is open and unlatched, or when it is in its secondary latched position, the inside remote control handle 46 cannot be operated to effect locking of the latch mechanism.

In Figures 9 to 13 I have illustrated my improved inside remote control mechanism as incorporated in a latch of the type described and claimed in my said co-pending United States patent application Serial No. 131,296. In these views of the drawings similar parts have been given the same reference characters as previously employed. The latch plate E' is mounted on shaft 9 for rotation therewith in the same manner as latch plate E previously described. In like manner the detent D' is pivotally supported on a pin 14 carried by the base plate 7. A flange 51, corresponding generally to flange 17 of Figures 1 to 8, is formed on the detent D' and extends along the upper arm portion 52 thereof and down for part of the length of the lower arm portion 53 thereof and serves to stiffen same and also to provide, at the upper arm portion 52, an abutment for the outside operating means such as plunger 26 of a push button assembly as illustrated in Figures 1 to 8.

In Figure 9 the detent D', latch member L,

and latch plate E' are shown in latch released and unlatched positions with the blocking abutment portion 54 of detent D' in engagement with the corresponding abutment portion 55 of latch plate E'. As the door is closed the latch member L engages the keeper pin on the door frame (not shown but as previously described) and moves in counterclockwise direction through the secondary position seen in full lines in Figure 10 into the latched position seen in phantom lines in Figure 10. When in the secondary position the latch holding pawl portion 56 of detent D' is in engagement with secondary tooth 57 on latch plate E' and when the latch member L reaches latched position the pawl 56 engages the main tooth 58 on latch plate E' and holds latch plate L in latched position.

The detent spring 59 is retained in position by the head of the pivot pin 14 and the lower end portion 59' has fixed abutment against the outer coil of spring 10 and the upper end portion 59'' engages the offset 60 on the transverse arm portion 61 of detent D'. Spring 59 urges detent D' in clockwise direction as seen in Figures 9 and 10 toward its latch holding position and the outer end portion 62 of transverse arm 61 extends through and is guided by a slot 63 in side flange 8.

It will be observed that in order to effect unlatching movement of detent D' the transverse arm 61 must move downwardly in slot 63 as distinguished from the upward latch releasing movement of end portion 20 of detent D in Figures 1–8. The operation of detent D' from outside the vehicle to effect unlatching may be effected by substantially the same means as previously described, the plunger 26 being disposed to engage flange 51 on upper arm 52, and similar outside locking means, i. e., a cylinder lock C and its associated parts, may be employed.

To effect unlatching of the door from inside it is necessary to provide means for exerting a downward pressure on the end portion 62 of detent D'. This means comprises a pivoted operating member or lever 64 supported on a pin 65 carried by side flange 8 of the frame structure. A spring 66 is located by the head of pin 65 and has its upper end 66' anchored against an inwardly bent tang 67 on side flange 8. Lower end portion 66'' of spring 66 operatively engages the lower end portion of operating lever 64 and tends to urge same in counterclockwise direction (Figure 11) and hold it in its neutral or non-operating position with its upper end portion in engagement with tang 67.

A pin 68 provided with an elongated T head portion 69 is carried by the lower end of operating member 64 and serves the same functions and operates in the same manner as pin 37 and head 38 of the previously described embodiment. The remote control link 70 is provided with a slot 71 which, together with pin 68, provides the lost motion connection between link 70 and operating lever 64. The actuating parts which are connected to the opposite end of link 70 are substantially identical with those previously described and are referred to by like reference characters.

As seen in Figure 13 the latch is in latched position, the end portion 62 of transverse detent arm 61 being in its upper position in slot 63, and the remote control latch actuating and locking elements are in their neutral and unlocked positions. When the handle 46 is moved from the neutral position of Figure 13 counterclockwise into the position of Figure 12 the link 70 moves to the left and swings the operating lever 64 in clockwise direction causing the detent engaging portion 72 thereof to engage end portion 62 of the detent and move it downwardly from latch holding position into latch released position as seen in Figure 9. When the operator releases the handle 46 the spring 66 returns lever 64, link 70, and handle 46 to their neutral non-operating positions of Figure 13.

The locking action of the mechanism just described is generally similar to that of the first embodiment except that when handle 46 is moved in clockwise direction from its neutral position of Figure 13 the link 70 moves to the right, without moving operating lever 64, and the locking end portion 73 moves across the slot 63 below the end portion 62 of detent D'. This locked position of link 70 is seen in phantom lines in Figure 11 and it will be observed that a tang 74 is bent outwardly from the side flange 8 to form an abutment for the end portion 73 of link 70 which absorbs latch releasing pressure which may be exerted on detent D' by the outside push button or the like. The lower corner 73' of end portion 73 is also preferably beveled as shown to facilitate locking movement of link 70.

Figures 10 and 11 show the detent D' in secondary latched position and indicate that the link 70 cannot be moved into locked position when the latch mechanism is in either secondary or unlatched position.

The mode of operation of the apparatus of Figures 9 to 13 is substantially the same as that of the mechanism shown in Figures 1 to 8 and it will be understood that, although I have described the illustrated embodiments of my invention in some detail, modifications and variations may be made in the form and arrangement of parts without departing from the spirit of my invention. I do not therefore wish to be limited to the exact mechanisms herein shown and described but claim as my invention all forms thereof coming within the scope of the appended claims.

I claim:

1. In a door control mechanism, a latch member supported for movement between a door latched position and a different door unlatched and open position, detent means for releasably holding said latch member in said door latched position, means for pivotally supporting said detent means for movement between a latch member holding position in which said latch member is held in said door latched position and a latch member released position in which said latch member may move from said door latched position toward said door unlatched position, a limiting member movable with said latch member and disposed to engage and hold said detent means out of said latch holding position when said latch member is out of said door latched position, a remote control link member supported for movement in one direction from a neutral position to a latch member releasing position and in another direction from said neutral position to a locking position, operating connections between said link member and said detent means, said link member including a locking portion positioned to prevent release of said latch member from door latched position when said link member is moved to said locking position, said detent means including a blocking element positioned in the path of said link member when said detent means is held out of said latch member holding

position and said latch member is out of said door latched position, manually operable means for moving said remote control link member between its said neutral, latch member releasing, and locking positions, and spring means effective on said manually operable means to return said link member and said manually operable means to said neutral position when moved therefrom until said link member engages said blocking element.

2. In a door control mechanism, a frame structure including a base portion and a side flange portion extending transversely of said base portion, a latch member pivotally supported on said base portion for movement between door latched position and door unlatched position, detent means pivotally supported on said base portion for movement between latch member holding position and latch member released position, a limiting member movable with said latch member and disposed to engage and hold said detent means out of said latch member holding position when said latch member is out of said door latched position, said side flange portion having a detent guide slot formed therein, said detent means having an arm portion extending through said guide slot and movable therein between said latch member holding and latch member released positions, an operating member pivotally mounted on said side flange portion and having a detent actuating portion disposed to engage said arm of said detent means, a remote control link supported for longitudinal movement in a plane generally parallel to said side flange portion, manually operable means for moving said remote control link in a latch member releasing direction from a neutral position to a latch member releasing position and in a locking direction from said neutral position to a locking position, cooperating pin and slot connecting elements on said operating member and link, said pin and slot connections being operatively engaged when said link is moved from said neutral position to said latch member releasing position and being free for independent movement when said link is moved from said neutral position to said locking position, said link having a locking portion disposed in withdrawn relation to said detent guide slot when said link is in its said neutral or latch releasing positions and disposed across said detent guide slot when said link is in its said locking position, said locking portion when disposed across said detent guide slot being in the path of movement of said detent arm portion from latch member holding to latch member released position, and a stop member on said side flange portion disposed to block movement of said locking portion under pressure of said detent arm portion when said locking portion is in said locking position.

3. In a door control mechanism, a frame structure including a base portion and a side flange portion extending transversely of said base portion, a latch member pivotally supported on said base portion for movement between door latched position and door unlatched position, detent means pivotally supported on said base portion for movement between latch member holding position and latch member released position, a limiting member movable with said latch member and disposed to engage and hold said detent means out of said latch member holding position when said latch member is out of said door latched position, said side flange portion having a detent guide slot formed therein, said detent means having an arm portion extending through said guide slot and movable therein between said latch member holding and latch member released positions, an operating member pivotally mounted on said side flange portion and having a detent actuating portion disposed to engage said arm of said detent means, a remote control link supported for longitudinal movement in a plane generally parallel to said side flange portion, manually operable means for moving said remote control link in a latch member releasing direction from a neutral position to a latch member releasing position and in a locking direction from said neutral position to a locking position, cooperating pin and slot connecting elements on said operating member and link, said pin and slot connections being operatively engaged when said link is moved from said neutral position to said latch member releasing position and being free for independent movement when said link is moved from said neutral position to said locking position, said link having a locking portion disposed in withdrawn relation to said detent guide slot when said link is in its said neutral or latch member releasing positions and disposed across said detent guide slot when said link is in its said locking position, said locking portion when disposed across said detent guide slot being in the path of movement of said detent arm portion from latch member holding to latch member released position, said detent arm having a portion disposed in blocking relation to said link when said detent means is held out of latch member holding position by said limiting member.

4. In a door control mechanism, a frame structure including a base portion and a side flange portion extending transversely of said base portion, a latch member pivotally supported on said base portion for movement between door latched position and door unlatched position, detent means pivotally supported on said base portion for movement between latch member holding position and latch member released position, a limiting member movable with said latch member and disposed to engage and hold said detent means out of said latch member holding position when said latch member is out of said door latched position, said detent means having an arm portion extending from the pivotal support therefor toward said side flange portion and movable with said detent means between said latch member holding and latch member released positions, an operating member pivotally mounted on said side flange portion and having a detent actuating portion disposed to engage said arm of said detent means, a remote control link supported for longitudinal movement in a plane generally parallel to said side flange portion, manually operable means for moving said remote control link in a latch member releasing direction from a neutral position to a latch member releasing position and in a locking direction from said neutral position to a locking position, and cooperating connecting elements on said operating member and link, said connecting elements being operatively engaged when said link is moved from said neutral position to said latch member releasing position and being free for independent movement when said link is moved from said neutral position to said locking position, said link having a locking portion disposed in withdrawn relation to said detent arm when said link is in its said neutral or latch member

releasing positions and disposed in the path of movement of said detent arm portion from latch member holding to latch member released position when said link is in its said locking position, said detent arm having a blocking portion disposed in blocking relation to said link when said detent means is held out of latch member holding position by said limiting member.

5. In a door control mechanism, a frame structure including a base portion and a side flange portion extending transversely of said base portion, a latch member pivotally supported on said base portion for movement between door latched position and door unlatched position, detent means pivotally supported on said base portion for movement between latch member holding position and latch member released position, a limiting member movable with said latch member and disposed to engage and hold said detent means out of said latch member holding position when said latch member is out of said door latched position, said detent means having an arm portion extending from the pivotal support therefor toward said side flange portion and movable with said detent means between said latch member holding and latch member released positions, an operating member pivotally mounted on said side flange portion and having a detent actuating portion disposed to engage said arm of said detent means, a remote control link supported for longitudinal movement in a plane generally parallel to said side flange, manually operable means for moving said remote control link in a latch member releasing direction from a neutral position to a latch member releasing position and in a locking direction from said neutral position to a locking position, cooperating connecting elements on said operating member and link, said connecting elements being operatively engaged when said link is moved from said neutral position to said latch member releasing position and being free for independent movement when said link is moved from said neutral position to said locking position, said link having a locking portion disposed in withdrawn relation to said detent arm when said link is in its said neutral or latch member releasing positions and disposed in the path of movement of said detent arm portion from latch member holding to latch member released position when said link is in its said locking position, said detent arm having a blocking portion disposed in blocking relation to said link when said detent means is held out of latch member holding position by said limiting member, manually operable means for moving said remote control link between its said neutral, latch member releasing, and locking positions, and spring means effective on said manually operable means to return said link and said manually operable means to said neutral position when moved therefrom in locking direction until said link engages said blocking portion of said detent arm.

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