July 5, 1960 E. L. ALLEN 2,943,879

LATCH MECHANISM

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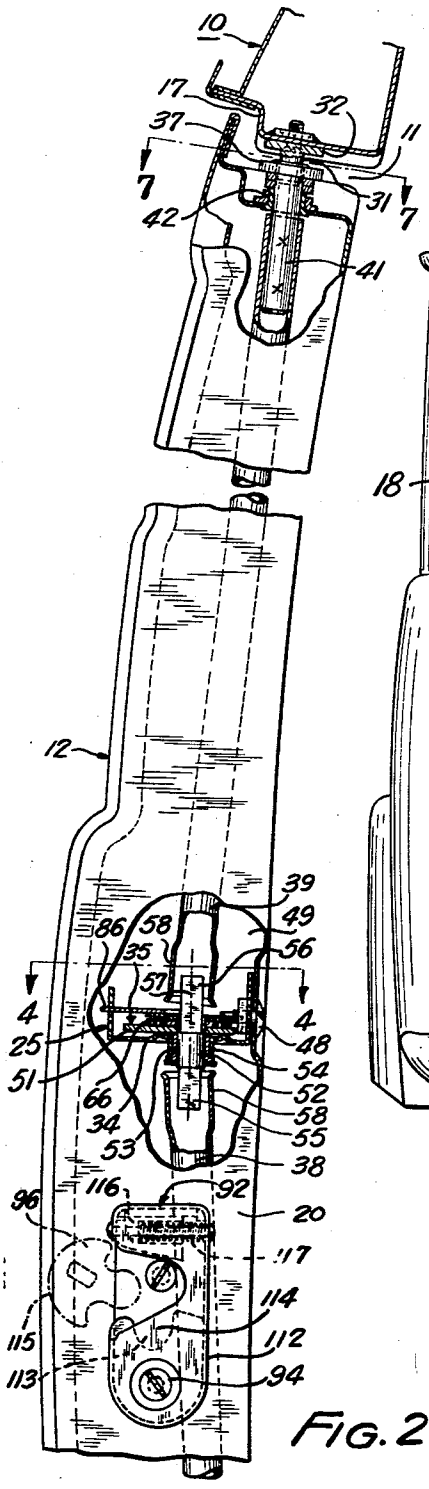


FIG. 2

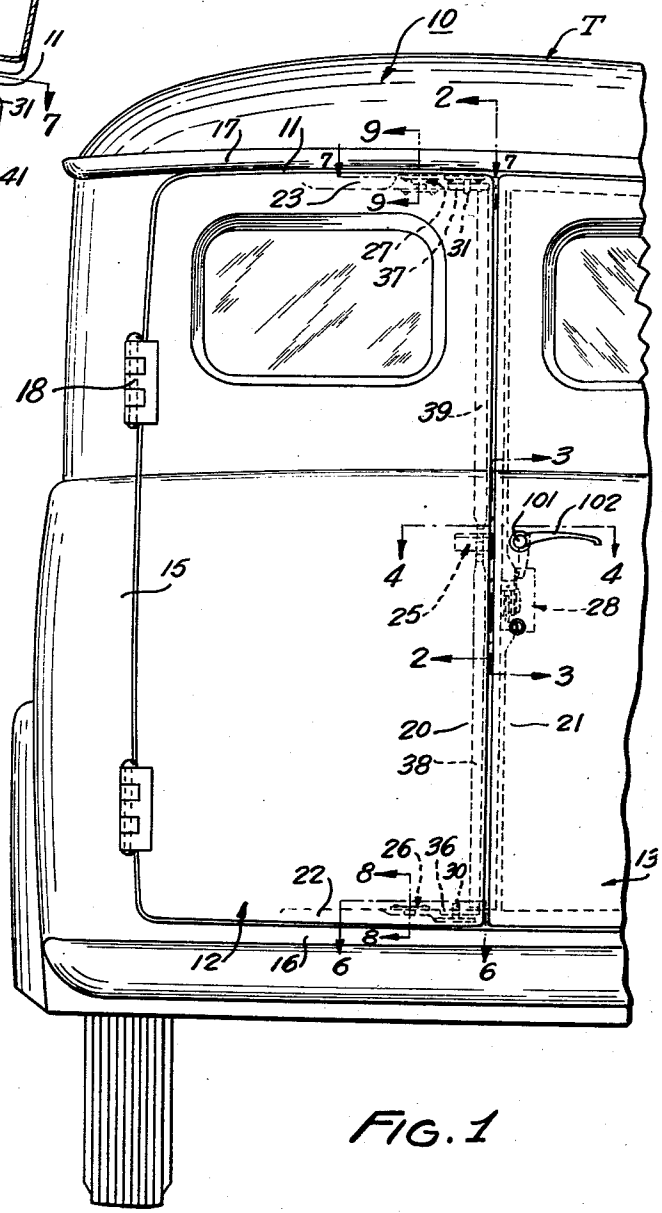


FIG. 1

INVENTOR.
EDWIN L. ALLEN
BY Hudson, Boughton, Williams, David & Hoffmann
ATTORNEYS

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LATCH MECHANISM

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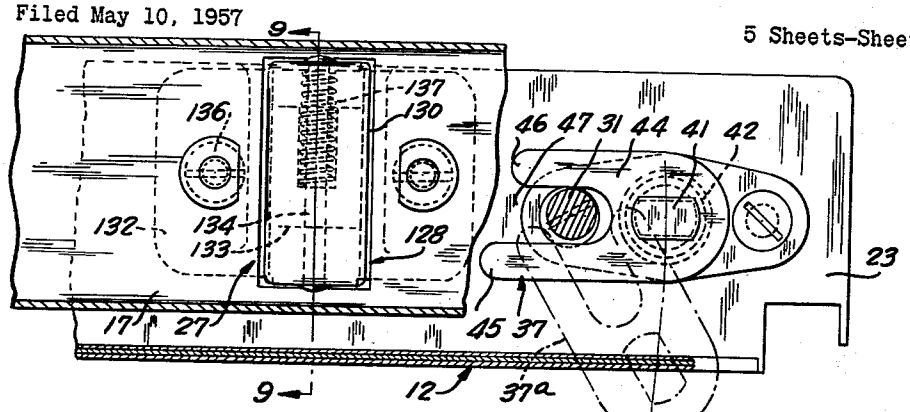


FIG. 7

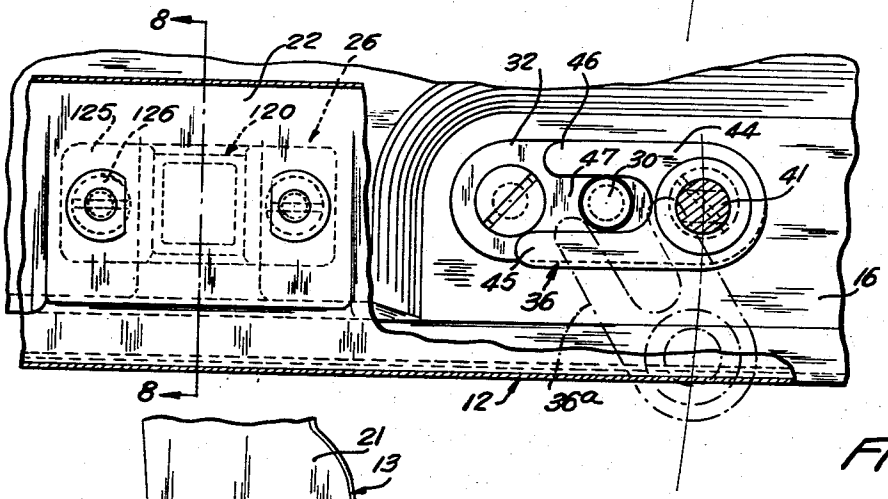


FIG. 6

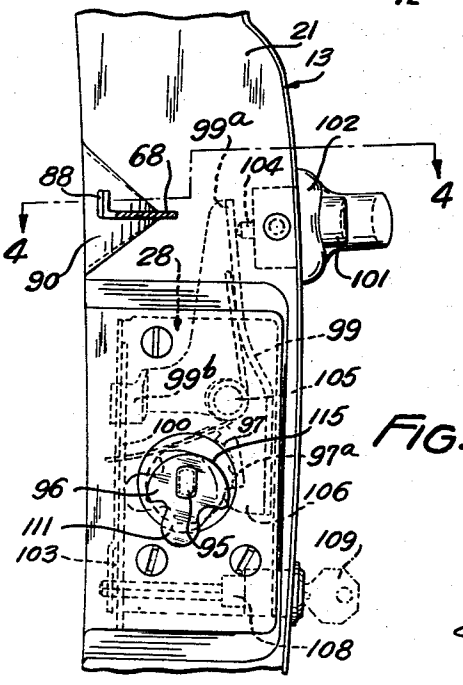


FIG. 3

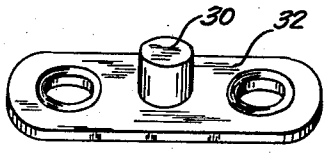


FIG. 11

INVENTOR.
EDWIN L. ALLEN
BY Hudson, Young, Linton, Williams, David & Hoffmann
ATTORNEYS

July 5, 1960 E. L. ALLEN 2,943,879

LATCH MECHANISM

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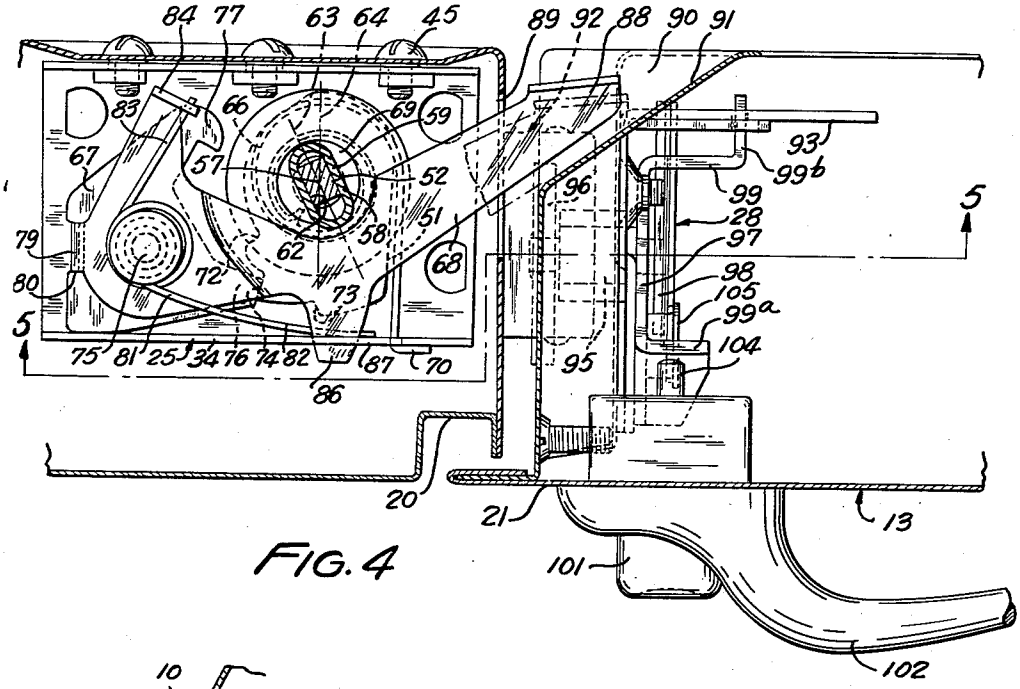


FIG. 4

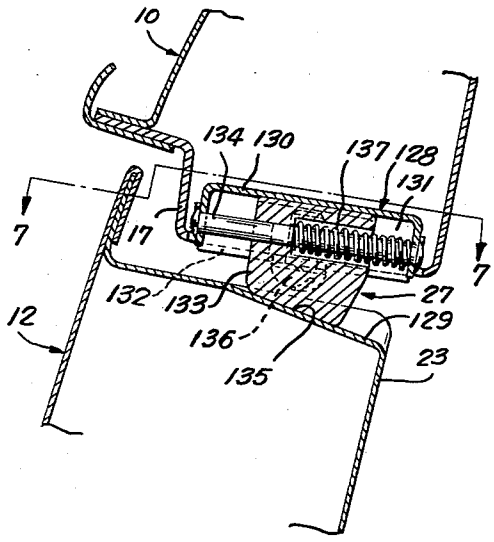


FIG. 9

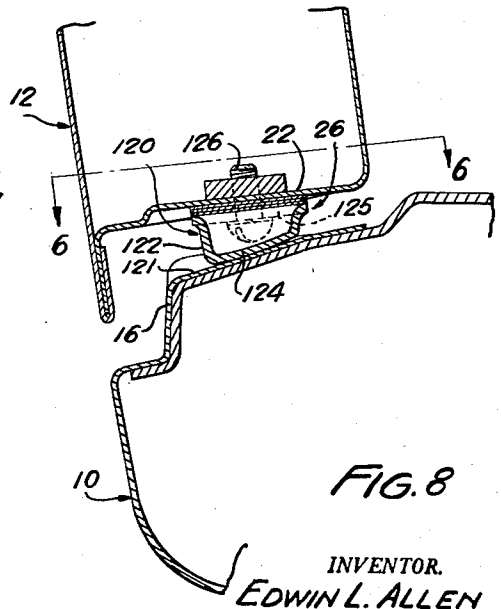


FIG. 8

INVENTOR.
EDWIN L. ALLEN
BY Hudson, Boughton, Williams, David & Hoffmann
ATTORNEYS

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LATCH MECHANISM

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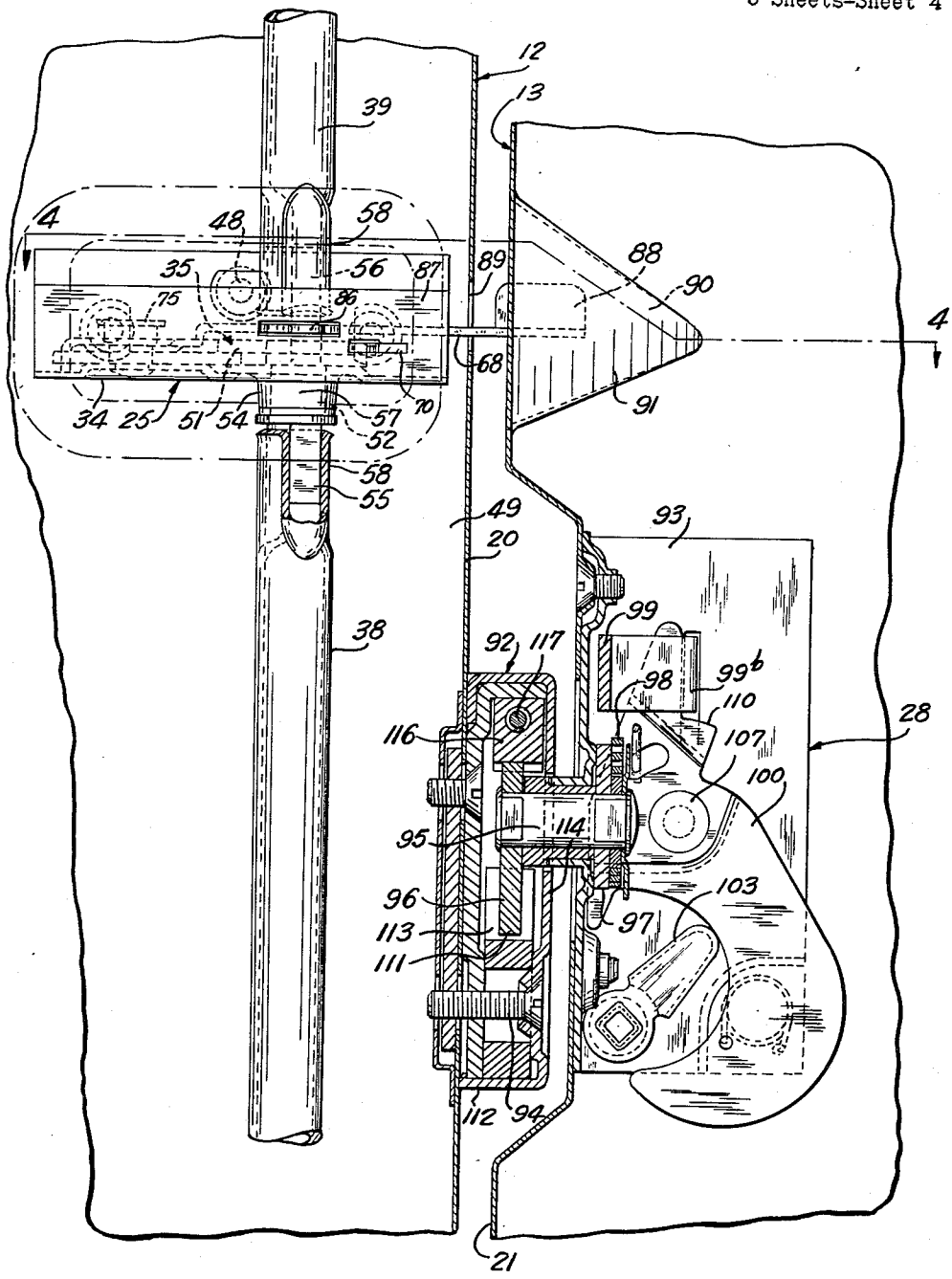


FIG. 5

INVENTOR.
EDWIN L. ALLEN
BY Hudson, Boughton, Williams, David & Hoffmann
ATTORNEYS

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LATCH MECHANISM

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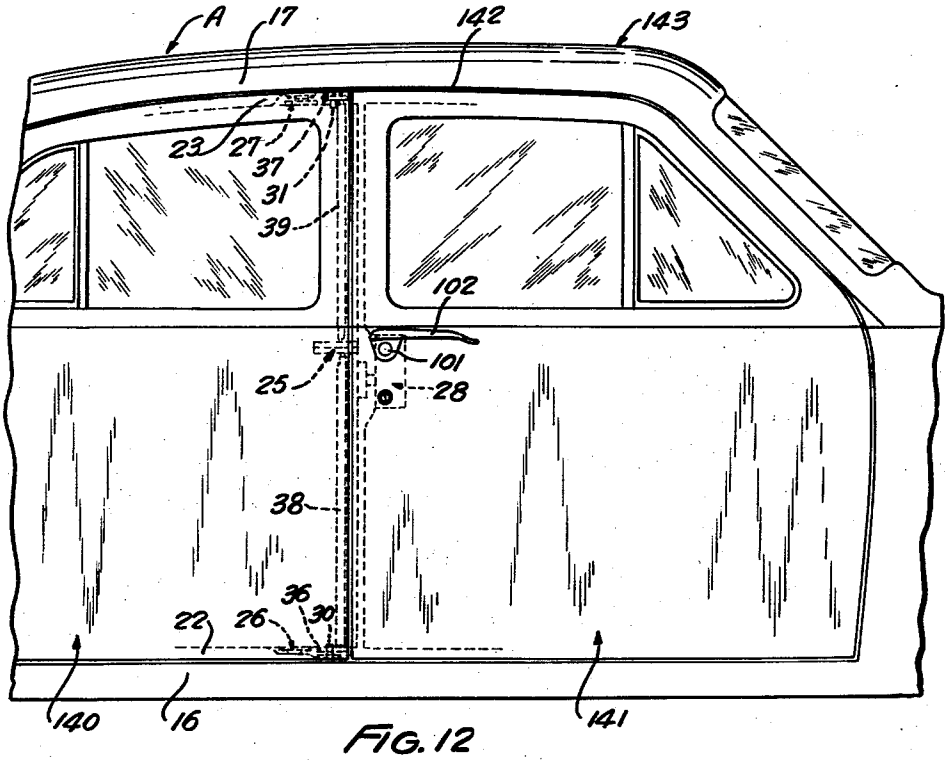


FIG. 12

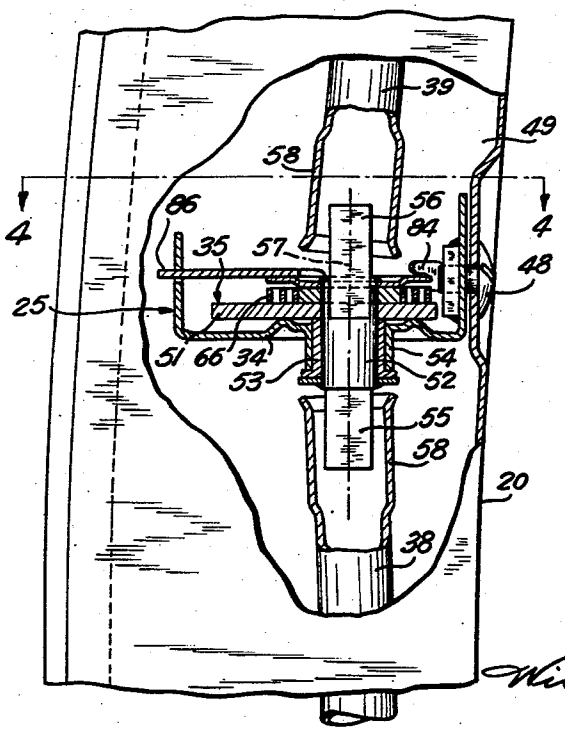


FIG. 10

INVENTOR.
EDWIN L. ALLEN
BY Hudson, Boughton, Williams, David & Hoffmann
ATTORNEYS

United States Patent Office

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LATCH MECHANISM

Edwin L. Allen, Cleveland Heights, Ohio, assignor, by mesne assignments, to Lisle W. Menzimer, trustee, Rockford, Ill.

Filed May 10, 1957, Ser. No. 658,289

8 Claims. (Cl. 292—44)

This invention relates to closure control apparatus and, more particularly, to latch mechanism of the multiple-point type for strongly but releasably holding a closure or door in a closed position.

The latch mechanism of this invention can be applied to various uses and to different kinds of closures but is especially suitable for vehicle use where a need therefor arises, particularly in connection with the rear doors of panel trucks and the like, the end gates or doors of station wagons and the like, and the side doors of passenger automobiles. In the vehicles just referred to, a pair of swingable doors is frequently provided for closing an access opening of a body structure and, when the access opening is not provided with a transverse post or pillar, the free edges of the doors cooperate directly with each other when the doors are in their closed position.

When such paired doors are used in a pillarless opening or doorway, the free edge of one of the doors serves as a temporary pillar or frame portion and the free edge of the other door cooperates therewith when the doors are in their closed position. The door, whose free edge serves as such a pillar or frame portion, thus temporarily becomes a structural portion of the vehicle body and it is therefore important that this door be strongly held in its closed position and be rigidly confined against jolting, shifting or weaving. The securement of a vehicle closure in such a rigid manner, mainly for tamper-proof reasons, is also desirable where the closure is the hinged door or lid of a luggage compartment or trunk.

Certain of the vehicle doors mentioned above, such as the automobile side doors, may be of a curved or bowed shape to conform to the overall contour or styling of the vehicle body. The present invention takes such door curvature into consideration, and as one of its objects, provides a novel multiple-point latch mechanism which can be used with doors of either a flat or bowed shape.

Another object is to provide novel latch mechanism for use on the cooperating free edges of a pair of doors, comprising a first latch device on one door for cooperation with a keeper on the other door, and a second latch device on such other door and having a pair of spaced latch members for cooperation with a pair of spaced keepers, and a detent means common to the pair of latch members for releasably holding the latter in a door-latched position.

A further object is to provide novel latch mechanism comprising a multiple-point latch device located on the free edge of a swingable door and having spaced latch members engageable with a pair of spaced keepers for retaining the door in a closed position in relation to an opening of a vehicle body; and a door support means, effective between the body and door at substantially opposed points of the latter located adjacent the free edge thereof, for preventing shifting or jolting of the door relative to the vehicle body while the door is in such closed position.

Still another object is to provide latch mechanism of the kind, and for the purposes, mentioned above and in which the latch device having the pair of latch members also comprises substantially oppositely extending rotatable shaft members having the latch members on the outer ends thereof and a pivoted detent member having the inner ends of the shaft members flexibly connected therewith.

Additionally, this invention provides latch mechanism of the kind above referred to in which the latch device having the pair of latch members includes a manually operable actuating member for the detent means thereof, and in which the free edge of the adjacent door has means thereon for rendering the actuating member inoperative while the doors are closed.

Other objects and advantages of the present invention will be apparent in the following detailed description and in the accompanying drawings forming a part of this specification, and in which

Fig. 1 is a partial rear elevation of a vehicle having the door control mechanism of the present invention applied thereto.

Fig. 2 is a partial vertical section on a larger scale and taken through the vehicle adjacent the free edge of one of a pair of doors thereof as indicated by section line 2—2 of Fig. 1.

Fig. 3 is a partial vertical section taken through the vehicle adjacent the free edge of the other door of the pair, as indicated by section line 3—3 of Fig. 1.

Fig. 4 is a partial transverse sectional view taken across the cooperating free edges of the pair of doors, as indicated by section line 4—4 of Figs. 1, 2, 3 and 5, and showing the latch devices thereof.

Fig. 5 is a partial vertical sectional view taken through the adjacent free edges of the pair of doors, as indicated by section line 5—5 of Fig. 4, and further illustrating the latch devices of the doors.

Fig. 6 is a partial transverse section taken through one of the doors adjacent one end thereof, as indicated by section line 6—6 of Figs. 1 and 8, and showing the latch means and door support means provided for the door adjacent such one end thereof.

Fig. 7 is a similar transverse section taken through the same door adjacent the opposite end thereof, as indicated by section line 7—7 of Figs. 1, 2 and 9, and showing the latch means and door support means associated with such other end.

Fig. 8 is a partial vertical sectional view taken through the door support means associated with one end of one of the doors, as indicated by section line 8—8 of Figs. 1 and 6.

Fig. 9 is a similar vertical sectional view taken through the door support means associated with the opposite end of the same door, as indicated by section line 9—9 of Figs. 1 and 7.

Fig. 10 is a sectional view corresponding with a portion of Fig. 2 and showing the latch device thereof on a larger scale.

Fig. 11 is a detail view showing one of the pair of keepers in detached relation; and

Fig. 12 is a side elevation showing another vehicle having the same door control mechanism applied to a pair of doors thereof.

In Fig. 1 of the drawings the door control mechanism of the present invention is shown applied to a truck T of the panel type having a body 10 provided with an access opening 11 which is controlled by a pair of doors 12 and 13. The access opening 11 is defined by doorframe portions, in this instance upright doorframe portions 15 located on the opposite sides of the access opening, and by other door frame portions, in this instance horizontal doorframe portions 16 and 17 located at the

lower and upper edges of the access opening. The doors 12 and 13 are swingably connected with the vehicle body 10 by pairs of suitable hinges, in this instance hinges 18 connecting the doors with the upright doorframe portions 15.

The doors 12 and 13 are disposed so that when in their closed position as shown in Fig. 1, their free edge portions 20 and 21 are in a cooperating substantially opposed relation. Likewise, when the doors 12 and 13 are in their closed position their end portions 22 and 23 cooperate with the door frame portions 16 and 17 of the vehicle body.

As has already been indicated in a general way in the foregoing objects, the present invention contemplates that the access opening 11 is a pillarless opening and that when the door 12 is in its closed position its free edge 20 forms a doorframe member for the door 13. The door control mechanism of this invention provides for strongly holding the door 12 in its closed position to constitute a temporary structural portion of the vehicle body 10 and while the free edge 20 of the door is serving as a temporary doorframe member for the adjacent door 13. For this purpose, the door 12 is provided with a door latch device 25 located adjacent the free edge 20 thereof and, in addition, door support means 26 and 27 are provided and are associated with the end portions 22 and 23. As will be further explained hereinafter the latch mechanism 25 releasably holds the door 12 in its closed position, and the door support means 26 and 27 hold the door against shifting edgewise thereof in its own plane while the door is in such closed position. The door 13 is also provided, adjacent the free edge 21 thereof, with a latch device 28 for releasably holding this door in a closed position.

The doorframe portions 16 and 17 of the vehicle body 10 are provided with suitable keepers 30 and 31 which, in this instance, are in the form of pins (see Figs. 1 and 11) extending toward the opening 11 and are connected with the door frame portions by suitable screws extending through attaching plates 32 of the keepers. The keepers 30 and 31 are mounted on the door-frame portions 16 and 17 so as to be located at points lying adjacent the free edge 20 of the door 12 when the latter is in its closed position.

The door latch device 25 comprises in general a mounting plate 34 having a detent means 35 thereon, and a pair of latch member 36 and 37 operably connected with the detent means by shaft means comprising a pair of rotatable shaft members 38 and 39. The detent means 35 of the latch device 25 is located at an intermediate point of the free edge 20 and is common to the two latch members 36 and 37.

The shaft members 38 and 39 extend generally parallel with the free edge 20 and have their inner or adjacent ends operably connected with the detent means 35 and their outer ends extending toward the keepers 30 and 31. The shaft members 38 and 39 are preferably tubular in form and the latch members 36 and 37 are connected therewith by having stems 41 extending into the shaft members and secured therein as by welding. The outer ends of the shaft member 38 and 39 are rotatably supported on the end portions 22 and 23 of the door 12 as by having the stems 41 of the latch members 36 and 37 journalled in suitable bearings 42 mounted on such end portions of the door.

The latch members 36 and 37 can be of any form of construction suitable for cooperation with the keepers of the door-frame portions 16 and 17 and, in this instance, are shown as being forked arms (see Figs. 6 and 7) for straddling cooperation with the keeper pins 30 and 31 when the door 12 is in its closed position. The latch members 36 and 37 each comprises such a forked arm 44 which is fixed on the stem 41 and has a pair of spaced fingers 45 and 46 at the free end thereof with an open slot 47 extending between the fingers and in a radial relation to the rotation axis of the stem 41.

When the door 12 is swung toward its closed position, the latch members 36 and 37 occupy the broken-line positions 36*a* and 37*a* of Figs. 6 and 7, such that the outer end of the slot 47 of these members is presented toward the keeper pins 30 and 31, and as the door moves to its fully closed position, the forked ends of the latch members move into straddling engagement with the keeper pins. During this final closing movement of the door, the keeper pins are engaged by the relatively longer fingers 45 of the latch members 36 and 37 whereby the latch members are swung about the axes of the shaft members 38 and 39 and assume their door-latched position shown in full lines in Figs. 6 and 7.

The mounting plate 34 of the latch device 25 forms a support for the detent means 35 and can be suitably secured to the door 12 as by means of the screws 48. The door 12 is preferably of a hollow construction, as here shown, and contains a space or chamber 49 in which the detent means 35 and the shaft members 38 and 39 are located. The door 12 may be of a bowed shape as shown in Figs. 1 and 2 to conform with the body design or styling of the vehicle 10 and, by reason of such bowed shape, the shaft members 38 and 39 are disposed with their axes in an inclined relation to each other.

The detent means 35 can be of any appropriate type or construction and, as here shown, comprise a pivoted detent member 51 fixed on a pivot shaft 52 which is rotatable in a bushing 53. The bushing 53 is disposed in a hollow projection 54 of the mounting plate 34, such that the pivot shaft 52 has the ends 55 and 56 thereof projecting in opposite directions from the detent means 35 for connection of the inner ends of the shaft members 38 and 39 therewith.

Because of the above-mentioned inclined position of the shaft members 38 and 39 relative to the axis 57 of the pivot shaft 52, their inner ends are required to be flexibly connected with the pivot shaft and this is accomplished by means of flexible couplings. These flexible couplings are here shown as comprising the sockets 58 in the inner ends of the shaft members 38 and 39 and the end portions 55 and 56 of the pivot shaft 52 which are engaged in these sockets.

As shown in Fig. 4 the inner ends of the hollow shaft members 38 and 39 are flattened, such that the sockets 58 are of a non-circular cross-section and have flat parallel sides 59. The end portions 55 and 56 of the pivot shaft 52 are likewise of a non-circular cross-section and have a driving engagement in the sockets 58. These end portions have flat parallel side faces 62 which are in sliding engagement with the flat side walls 59 of the sockets during relative tilting between the shaft members 38 and 39 and the pivot shaft 52.

The flexible couplings thus provided for the shaft members 38 and 39 are disposed so that the amount of rotational movement of these shaft members, needed to actuate the latch members 36 and 37 through their swinging movement to door-latched and door-unlatched positions, will cause the common plane 63 of each coupling to be rotated through substantially equal arcuate distances on opposite sides of a neutral plane 64 extending through the rotation axis 57 of the pivot shaft 52. By thus dividing the extent of rotary actuating movement of the shaft members 38 and 39 into equal arcuate distances on opposite sides of the neutral plane 64 extending through the rotation axis 57, the flexible couplings can be of the above-described simple and economical form which is also desirable from the standpoint of ease of assembly, and will enable the shaft means to operate smoothly and efficiently for transmitting the rotational actuating forces between the latch members 36 and 37 and the detent means 35.

The detent means 35 also comprises a spiral spring 66 disposed around the pivot shaft 52, a pawl 67 and a

control lever 68. The spiral spring 66 has the inner end thereof secured to the pivot shaft 52 by engagement in a radial slot of a collar 69 carried by the pivot shaft and has its outer end anchored on the mounting plate 34 by means of a hook portion 70 engaged in a suitable opening of the plate.

The spiral spring 66 is disposed so that it will be loaded by the rotation of the pivot shaft 52 in response to swinging of the latch members 36 and 37 by their engagement with the keeper pins 30 and 31 during the final closing movement of the door 12. The spring 66 is maintained in this loaded condition while the door 12 remains closed, but when the detent means 35 is tripped or released in the manner to be presently explained to permit opening of the door 12, the spring exerts a rotative force on the pivot shaft 52 and swings the latch members 36 and 37 in a direction to react against the keeper pins 30 and 31 to assist the initial opening movement of the door.

The pivoted detent member 35 is provided with a pair of arcuately spaced detent shoulders 72 and 73 and with an intermediate detent shoulder 74 located therebetween. The pawl 67 is swingably mounted on the support plate 34 by a pivot member 75 and is of a forked shape having two detent arms 76 and 77. The pawl 67 is swingable on the pivot member 75 by means of the control lever 68 through an operating connection provided therebetween and which is here shown as comprising a lug 79 carried by the pawl and engaging in a recess 80 of the lever.

A biasing spring 81 is provided for the control lever and pawl and has the intermediate portion thereof disposed around the pivot member 75. The outer ends of the spring 81 form thrust arms 82 and 83 of which the arm 82 is in engagement with the support plate 34 and the arm 83 is in engagement with a lug 84 of the control lever 68. The action of the spring 81 is to normally swing the lever 68 about the pivot member 75 in a counterclockwise direction, as seen in Fig. 4, to thereby swing the pawl 67 in a similar direction for engaging the pawl arm 76 with one of above-mentioned detent shoulders of the detent member 51.

When the door 12 is moved to its closed position and the spiral spring 66 is loaded by rotation of the detent member 51 in a counterclockwise direction as seen in Fig. 4, the detent arm 76 comes into holding engagement with the detent shoulder 74 to retain the latch members 36 and 37 in their door-latched position. The condition of the detent mechanism 35 which is shown in Fig. 4 is that corresponding with the door-latched position of the latch members 36 and 37, at which time the detent arm 76 is in holding engagement with the detent shoulder 74.

To release the latch members 36 and 37 to permit opening of the door 12, the control lever 68 is manually moved in a clockwise direction about the pivot member 75 thereby actuating the pawl 67 through the lug and slot connection 79, 80 to swing the pawl in a clockwise direction in opposition to the force of the spring 81 and thus disengage the pawl arm 76 from the detent shoulder 74. The spiral spring 66 thereupon rotates the detent member 51 in a clockwise direction causing the latch members 36 and 37 to assist the initial opening movement of the door 12, as explained above, and permitting movement of the latch members to their door-unlatched position. By the time that the latch members arrive at their door-unlatched position, the detent shoulder 72 comes into engagement with the hook-shaped pawl arm 77 whereby further rotation of the detent member 51 in the clockwise direction is prevented and the latch members 36 and 37 are retained in a ready position for reengagement with the keepers 30 and 31 when the door 12 is again swung to its closed position.

If, in the closing movement of the door 12, the latch members 36 and 37 are swung through a portion only

of their arcuate travel they will assume an intermediate door-latched position for holding the door in a partially closed or safety-latched position. The latch members are retained in this intermediate door-latched position by the engagement of the detent shoulder 73 with the pawl arm 76. This intermediate position of the door 12 is a safety position from which it can be moved to either a fully closed position to bring the detent shoulder 74 into engagement with the pawl arm 76 or to an open position by manually actuating the lever 68 to cause the pawl 67 to release the detent member 51.

The control lever 68 includes a guide lug 86 operable in a slot 87 of the support plate 34 and an outer arm portion 88 which projects in an inclined relation from the edge portion 20 of the door 12 through an opening 89 thereof and extends into the portion of the access opening 11 which is occupied by the door 13 when the latter is in its closed position. As shown in Fig. 4, the edge portion 21 of the door 13 is provided with a recess 90 which is formed in part by an inclined wall portion 91 of this door and into which recess the lever portion 88 of the control lever 68 extends, such that this lever portion will be housed in the recess 90 and the lever will thereby be rendered substantially inoperative for releasing the latch members 36 and 37 when the door 13 is in its closed position. As shown in Figs. 4 and 5, the recess 90 is in the form of a notch extending diagonally across the inner upright corner of the edge portion 21 of the door 13 and faces toward the vehicle compartment when this door is in its closed position.

When the door 12 is in its door-latched position and the door 13 has also been closed, the lever portion 88 will be in such proximity to the inclined wall 91 that the lever 68 will engage this inclined wall portion before it has been swung through a sufficient distance to cause the detent means 35 to release the latch members 36 and 37. However, when the door 13 is moved to an open position the lever portion 88 will be exposed and readily accessible for manual swinging of the lever 68 to cause the detent means 35 to release the latch members 36 and 37.

The door 13 is retained in its closed position by cooperation of the latch device 28 thereof with a suitable keeper 92 mounted on the free edge 20 of the door 12. The latch device 28 is mounted on the free edge portion 21 of the door 13 at an intermediate point thereof, and similarly, the keeper 92 is mounted on the door 12 at an intermediate point of its free edge portion 20. The latch device 28 and its associated keeper 92 can be of any suitable type and construction and are here shown as being of the form disclosed in co-pending application Serial No. 571,560, filed March 14, 1956, and which is related to the present application through common ownership.

The latch device 28 comprises an L-shaped support plate 93 having a pivot shaft 95 rotatably mounted thereon, and a latch member 96 fixed on such pivot shaft for movement to a door-latched position in engagement with the keeper 92. The latch device 28 also comprises a detent member 97 fixed on the pivot shaft 95, and a spiral spring 98 disposed around the pivot shaft and effective thereon for rotating the latter in a direction to swing the latch member 96 in a door-unlatching direction.

The latch device 28 further comprises a detent lever 99 for cooperation with the detent member 97 and a locking lever 100 for cooperation with the detent lever to control the movements of the latter. Additionally, the latch device 28 includes a manually operable push button 101 associated with a door handle 102 mounted on the door 13, and a key-operated finger 103 for actuating the locking lever 100 to locking and unlocking positions relative to the detent lever 99.

The push button 101 has an inwardly extending stem 104 engageable with an arm 99a of the detent lever

99 for swinging the latter about a pivot member 105 and in a direction to cause the detent arm 106 to disengage a detent shoulder 97*a* of the detent member 97. The finger 103 is actuatable to swing the locking lever 100 about its pivot member 107 in locking and unlocking directions by rotation of a cylinder barrel 108 by means of a key 109 inserted into the latter.

When the door 13 is closed, the detent arm 106 of the lever 99 is in engagement with the detent shoulder 97*a* as shown in Fig. 3, and prevents the spiral spring 98 from moving the latch member 96 to its door-unlatched position until the detent lever is swung by actuation of the push button 101. As shown in Fig. 5, the locking lever 100 has a locking shoulder 110 which is movable to a locking position adjacent the arm 99*b* of the detent lever 99 when the locking lever is swung about its pivot 107 by the key-actuated finger 103.

The latch member 96 can be of any suitable type but is here shown as being of the kind having a single latch finger 111 and is swingable during rotation of the pivot shaft 95 for engaging or disengaging the latch finger with respect to the keeper 92. The latch member 96 also has a convex arcuate cam portion 115 on the edge of the body thereof and located on the side of the pivot shaft axis which is remote from the latch finger 111.

The keeper 92 is here shown as being of the type comprising a housing 112 having a latch recess 113 therein into which the latch finger 111 is movable with a combined and rotary endwise movement which is described in greater detail in the abovementioned co-pending application. The housing 112 of the keeper 92 includes a cover portion 114 overlying the latch recess 113 and by which the latch finger 111 is prevented from disengaging movement out of the latch recess by a separating movement of the door 13 in its own plane relative to and away from the door 12.

The keeper 92 preferably also comprises a wedge block 116 shiftable therein along a guide rod 117 and engageable with the cam portion 115 of the latch member 96 when the latter is engaged in the keeper and has been swung to its door-latched position in which it is shown in full lines in Figs. 3 and 5. When the latch member 96 has been thus engaged in the keeper 92 and is in its door-latched position, the engagement of the rounded free end of the latch member in the bottom portion of the latch recess 113 and the engagement of the wedge block 116 with the cam portion 118 causes the latch member to be securely held by the keeper 92, such that shifting of the door 13 in its own plane will be substantially prevented.

The door support means 26 and 27 which are associated with the door 12 and shown in Figs. 6 to 9 will be described next. The door support means 26 comprises a support device 120 mounted on the lower edge portion 22 of the door 12 and a bearing surface or element 121 provided on the doorframe portion 16. The support device 120 is here shown as comprising a body member 122 having an inclined top bearing wall 124 and oppositely extending connecting flanges 125 located on opposite sides of the elevated bearing wall 124.

The support device 120 is mounted on the door portion 22 by means of suitable screws 126 extending through the connecting flanges 125. When the door 12 is swung to its closed position, the bearing portion 124 of the support device 120 comes into slidable bearing engagement with the inclined bearing element 121 of the doorframe portion 16 for supporting the door on the latter.

The door support means 27 comprises a support device 128 mounted on the doorframe portion 17 of the vehicle body 10, and an inclined bearing surface or element 129 provided on the edge portion 23 of the door 12. The support device 128 comprises a housing 130 defining a thrust chamber 131 and having a pair of connecting flanges 132 located on opposite sides of the thrust chamber. The support device 130 also comprises a thrust block 133 movable in the thrust chamber 131 and along a guide pin 134 extending across this chamber. The thrust block 133 has an inclined top surface 135 for slidable bearing engagement on the inclined bearing surface 129 of the door 12.

The support device 130 is mounted on the door frame portion 17 of the vehicle body as by means of suitable screws 136 extending through the connecting flanges 132. A compression spring 137 disposed around the guide pin 134 is effective on the thrust block 133 for urging the latter in a direction to wedge the inclined top surface 135 against the bearing surface 129 of the door 12 when the latter has been moved to its fully closed position, to thereby take up looseness or play between the door 12 and the doorframe portions 16 and 17 such that this door will be strongly held between the latter against movement in its own plane.

Fig. 12 of the drawings shows the same door control mechanism applied to a pair of rear and front side doors 140 and 141 of an automobile A and which doors control an access opening 142 leading into the passenger compartment of the vehicle body 143. The access opening 142 is of the above-described pillarless type, such that when the rear door 140 is in its closed position it forms a structural part of the vehicle body 143 as well as a temporary door frame portion with which the free edge portion of the front door 141 cooperates when the latter is moved to its closed position. Since the door control mechanism applied to the doors 140 and 141 is the same as that above described for the doors 12 and 13, the same reference characters have been applied to the corresponding components and parts thereof.

From the accompanying drawings and the foregoing detailed description, it will now be readily understood that this invention provides door control mechanism in which a multiple-point latch device strongly holds a door in its closed position by the use of a pair of substantially oppositely located latch members having a common detent means with which they are connected by rotatable shaft means. It will now also be seen that the present invention provides novel door control mechanism in which one of a pair of cooperating closures or doors is strongly held in its closed position by a pair of latch members having a common detent means and by a pair of substantially oppositely located door support devices, such that the said one door will temporarily constitute a pillar or door frame portion of a pillarless access opening and with which the free edge of an adjacent door will cooperate when the latter door is moved to its closed position. Additionally, it will be seen that the door control mechanism provided by this invention includes a manually actuated control lever for the common detent means of the oppositely located latch members and which lever extends into the portion of the access opening which is closed by the other door of the pair, such that the manually operable lever is rendered substantially inoperative when such other door has been closed and can be actuated to release the latch members of the first door only after such other door has been opened. It will now likewise be understood that the novel control mechanism is applicable to doors of a curved shape by reason of the flexible couplings forming the operative connections between the rotatable shaft members and the detent means which is common to the pair of latch members.

Although the door control mechanism of the present invention has been illustrated and described herein to a somewhat detailed extent, it will be understood of course that the invention is not to be regarded as limited correspondingly in scope, but includes all changes and

modifications coming within the terms of the claims hereof.

Having thus described my invention, I claim:

1. In latch mechanism intended for use with a pair of keepers mounted on a support; a base adapted for mounting on a closure swingably associated with said support; detent means including a detent member pivoted on said base and having oppositely extending shaft portions rotatable on a common axis; a pair of rotatable extension shaft members extending generally axially away from said shaft portions and disposed with their axes inclined relative to the common axis of said shaft portions; a pair of latch members mounted on the outer ends of said shaft members and being movable to and from a latched engagement with said keepers during a combined swinging movement of said closure and rotation of said shaft members; and flexible couplings connecting the inner ends of said shaft members with said shaft portions for rotation of said shaft members with the latter; said couplings comprising sockets of a noncircular cross-sectional shape on the inner ends of said shaft members, and said shaft portions being of a noncircular cross-section and engaged in said sockets; said shaft portions being rotatable through substantially equal angular distances on opposite sides of a neutral plane passing through the axes of said shaft members and said shaft portions.

2. In vehicle door control mechanism for use with a doorframe defining an access opening of a vehicle compartment and having keeper means thereon, and a pair of doors swingably connected with said doorframe and having free edge portions disposed in a substantially opposed relation when the doors are in their closed position; a latch device adapted for mounting on the free edge portion of one of said doors and including latch means movable to a door-latched position in engagement with said keeper means; the other of said doors having a recess in the free edge portion thereof and located on the latter so as to face toward said compartment and be disposed adjacent said latch device when said doors are in said closed position; said latch device having an actuating lever swingable in a door-unlatching direction away from said compartment for causing a keeper-releasing actuation of said latch means; said lever normally being in a door-latched position with a projecting portion thereof extending beyond the free edge portion of said one door and lying in said recess when said doors are in said closed position; said projecting portion being engageable with a portion of said other door at the location of said recess for preventing a door-unlatching swinging movement of said lever.

3. In door control mechanism for a vehicle having body structure defining a pillarless access opening for a compartment and provided with keepers at the top and bottom of said opening, and a pair of doors swingably connected with the body structure and having co-operating upright free edge portions; a latch device adapted to be mounted on one of said doors at an intermediate height of the free edge portion thereof and comprising a single detent means and a pivoted upright shaft means; said shaft means having an intermediate portion connected with said detent means and also having end portions adapted to extend to points adjacent the top and bottom portions of said one door; a pair of latch members attached to said end portions and movable to and from door-latched engagement with said keepers during a combined swinging movement of said one door and pivotal movement of said shaft means; said detent means being common to said pair of latch members and effective to releasably hold the latter in said door-latched engagement; and door support means comprising pairs of door support elements co-operably effective between said body structure and the top and bottom portions of said one door when the latter is in its closed position; said one door when in its closed and door-latched condition being positionably held in said opening in a substantially rigid body-pillar relation to said structure for co-operation of the free edge portion of the other door therewith.

4. Door control mechanism as defined in claim 3 wherein said latch members have fork-shaped free ends for latching co-operation with pin-shaped keepers; and wherein spiral spring means associated with the common detent means is effective on said latch members through said shaft means; said spring means being subject to loading during the pivotal movement of said latch members to their door-latched engagement with said keepers and acting continuously in an expansive direction tending to reactively assist the opening movement of said one door.

5. In door control mechanism for a vehicle having body structure defining an access opening for a compartment and provided with keepers at the top and bottom of said opening, and a pair of doors swingably connected with the body structure and having co-operating upright free edge portions; a latch device adapted to be mounted on one of said doors at an intermediate height of the free edge portion thereof and comprising a single detent means and a pivoted upright shaft means; said shaft means having an intermediate portion connected with said detent means and also having end portions adapted to extend to points adjacent the top and bottom portions of said one door; a pair of latch members attached to said end portions and movable to and from door-latched engagement with said keepers during a combined swinging movement of said one door and pivotal movement of said shaft means; said detent means being common to said pair of latch members and effective to releasably hold the latter in said door-latched engagement; a lever extending from the detent means of said latch device and having a portion projecting beyond the free edge portion of said one door; said lever being manually movable for actuating said detent means to release said pair of latch members for disengagement of the latter from said pair of keepers; the other door of said pair having a recess in the free edge portion thereof and located to receive the projecting lever portion; and means on said other door at the location of said recess and being engageable by said lever portion for preventing the latch-releasing actuation of said detent means when said other door is in its closed position.

6. Door control mechanism as defined in claim 5 wherein said recess faces toward said compartment and the free end of said lever portion lies wholly within said recess, when said other door is in its closed position.

7. Door control mechanism as defined in claim 5 wherein said lever portion projects from said one door in an inclined relation to the free edge portion thereof; and wherein said recess is a notch extending diagonally across the inner upright corner of the free edge portion of said other door.

8. In door control mechanism for a vehicle having body structure defining a pillarless access opening for a compartment and provided with keepers at the top and bottom of said opening, and a pair of doors swingably connected with the body structure and having co-operating upright free edge portions; a latch device adapted to be mounted on one of said doors at an intermediate height of the free edge portion thereof and comprising a single detent means and a pivoted upright shaft means; said shaft means having an intermediate portion connected with said detent means and also having end portions adapted to extend to points adjacent the top and bottom portions of said one door; a pair of latch members attached to said end portions and movable to and from door-latched engagement with said keepers during a combined swinging movement of said one door and pivotal movement of said shaft means; said detent means being common to said pair of latch members and effective to releasably hold the latter in said door-latched engagement; a lever extending from the detent means of said latch device and having a portion projecting beyond the free edge portion of said one door; said lever being manually movable for actuating said detent means to release said pair

of latch members for disengagement of the latter from said pair of keepers; the other door of said pair having a recess in the free edge portion thereof and located to receive the projecting lever portion; means on said other door at the location of said recess and being engageable by said lever portion for preventing the latch-releasing actuation of said detent means when said other door is in is closed position; and door support means comprising pairs of door support elements co-operably effective between said body structure and the top and bottom portions of said one door when the latter is in its closed position; said one door when in its closed and door-latched condition being positionably held in said opening in a substantially rigid body-pillar relation to said structure for co-operation of the free edge portion of the other door therewith.

References Cited in the file of this patent

UNITED STATES PATENTS

2,024,886	Schonitzer	Dec. 17, 1935
2,030,677	Avels	Feb. 11, 1936
2,608,428	Allen	Aug. 26, 1952
2,827,321	Leslie et al.	Mar. 18, 1958