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VEHICLE DOOR LATCH

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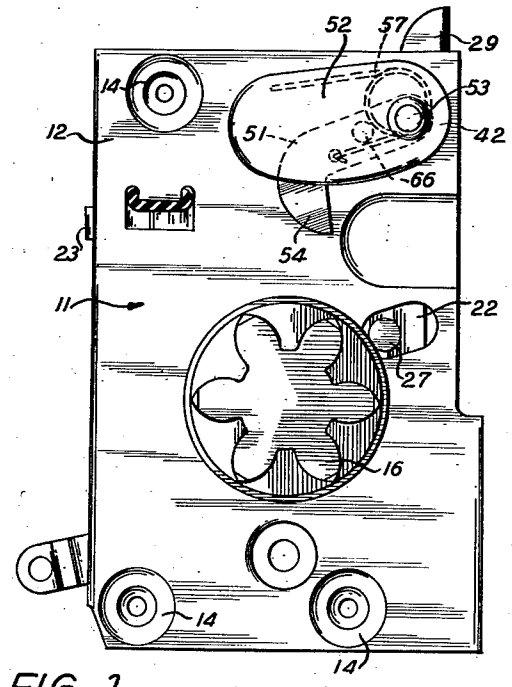


FIG. 1

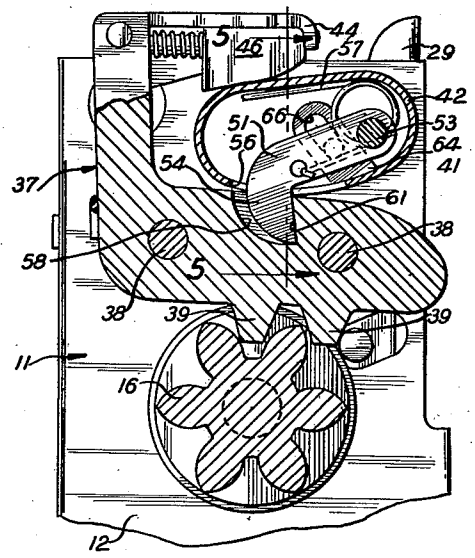


FIG. 2

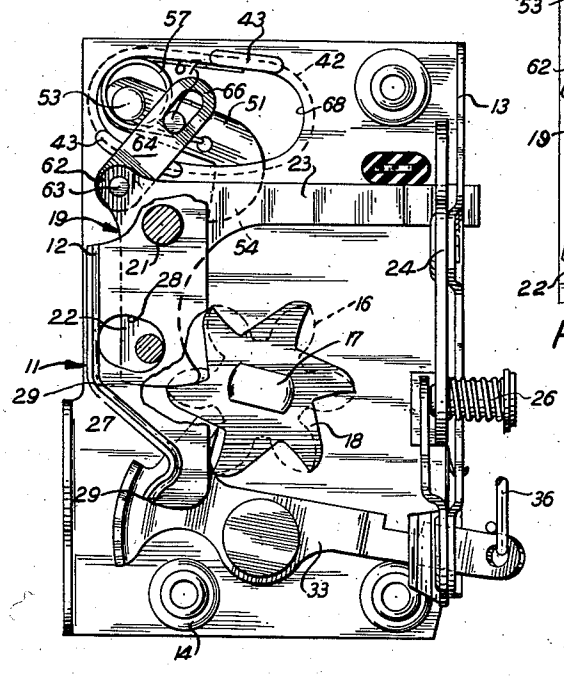


FIG. 3

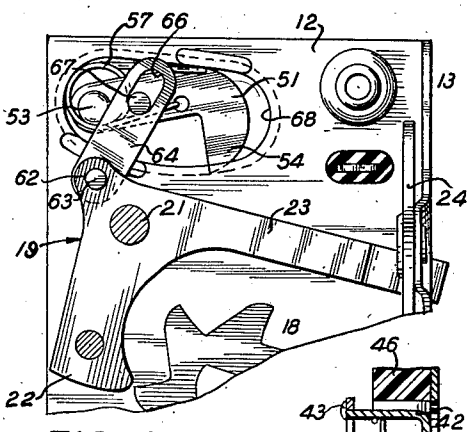


FIG. 4

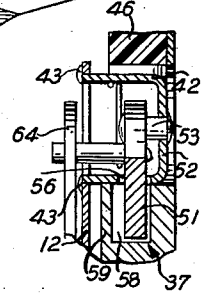


FIG. 5

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VEHICLE DOOR LATCH

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2 Claims. (Cl. 292—11)

This invention relates generally to latch mechanisms for motor vehicle doors and particularly to safety mechanism for use in connection with such latches.

An object of the invention is to provide an improved door latch mechanism incorporating an automatically operated safety latch preventing the vehicle door from being inadvertently opened due either to failure of the regular latch mechanism or to the vehicle being involved in an accident. During a collision the vehicle body may distort sufficiently to permit the locking engagement between the striker and the regular latch mechanism to be interrupted, allowing the door to fly open. In the present construction a safety latch is pivotally carried by the latch mechanism and is spring urged into interlocking engagement with a notch in the adjacent striker. The striker is provided with a reinforcing plate or wall at the outer side of the striker plate to retain the safety latch in engagement with the notch even during distortion of the vehicle body. The safety latch is interconnected to the pawl of the regular latch mechanism so that it will be automatically withdrawn from engagement with the striker plate notch when the latch mechanism is operated either by the interior or exterior handles to disengage the regular latch.

Other objects and advantages of this invention will be made more apparent as this description proceeds, particularly when considered in connection with the accompanying drawings, wherein:

Figure 1 is an elevation view of the latch mechanism of the present invention.

Figure 2 is a view similar to a portion of Figure 1 but is partially sectioned for clearness and also illustrates the striker plate.

Figure 3 is an elevational view of the latch mechanism looking from the opposite side thereof.

Figure 4 is a view similar to a portion of Figure 3 but showing the parts thereof in an alternate or unlatched position.

Figure 5 is an enlarged cross sectional view taken on the plane indicated by the line 5—5 of Figure 2.

The door lock shown in the drawing is a right front door lock for a motor vehicle. The lock mechanism is mounted upon an L-shaped mounting plate 11 having flanges 12 and 13 extending at right angles to each other. The flange 12 is provided with screw bosses 14 by means of which the mounting plate may be secured to the inner side of the jamb face of the door. The flange 13 of the plate extends along the inner side of the inner door panel.

The lock is provided with a rotatable toothed latch or rotor 16 rotatably mounted on the outer side of the flange 12 of the mounting plate 11. The end of the shank 17 of the rotor is flat and extends through a correspondingly shaped aperture in a rotatable toothed ratchet 18 on the inner side of the flange, being riveted to the shank. Referring now to Figure 3, a pawl 19 is pivotally mounted upon a shouldered rivet 21 and is formed with a downwardly depending arm 22 engageable with the teeth of the ratchet 18 to hold the ratchet and rotor locked against rotation in a clockwise direction as viewed in Figure 3. The pawl is also provided with a second arm 23 extending generally horizontally and protruding through a vertical slot in the side flange 13 of the mounting plate. This arm is adapted to be engaged by a bell crank lever 24 having a connection 26 with a conventional handle located inside the door to permit the pawl to be released from the ratchet from inside the vehicle body.

The downwardly depending arm 22 of the pawl carries a pin 27 projecting through a slot 28 in the release lever 29. The release lever 29 is pivotally mounted upon the shouldered rivet 21 carried by the flange 12 of the mounting plate, and the upper portion of the release lever 29 is adapted to be operated by a conventional push button or other outside door handle. Through the pin and slot connection with the arm 22 of the pawl 19, the release lever is operative to swing the pawl to an inoperative position out of engagement with the teeth of the ratchet, as shown in Figure 4.

A pivoted locking lever 33 adapted to be operated either by a conventional lock cylinder (not shown) or a conventional inside locking button connected to a rod 36, is selectively engageable with the lower extremity of the release lever 29 to lock the latter against pivotal movement toward a latch releasing position.

Referring to Figure 2, the rotor 16 is adapted to be engaged by a keeper or striker 37 adapted to be rigidly mounted upon the jamb face of the adjacent door pillar by means of a pair of bolts 38. The striker is generally C-shaped and is formed along its lower edge with two integral projecting teeth 39 adapted to mesh with the teeth on the rotor 16 to hold the vehicle door in a locked position. The lower portion of the C-shaped striker 37 is provided on its upper edge with an inclined face 41 engaged by a dovetail 42. The dovetail 42 is formed of sheet metal and is generally cup-shaped with tongues 43 projecting through slots in the flange 12 of the mounting plate and riveted or welded thereto. The lower surface of the dovetail is curved to provide a line engagement with the upper face 41 of the striker. The upper portion 44 of the C-shaped striker 37 is conventionally provided with a spring urged slidable nylon wedge 46 engageable with the upper edge of the dovetail 42.

As best seen in Figures 2 and 5, a safety latch 51 is pivotally mounted upon the outer wall 52 of the dovetail by means of a shouldered pivot stud 53. The safety latch 51 is generally L-shaped and is provided with a downwardly depending hook-shaped terminal end 54 adapted to project through a slot 56 in the lower wall of the dovetail 42. The latch is normally urged by a coil spring 57 to the position shown in Figures 1 and 2 in which the hook-shaped end 54 of the latch projects through the slot and into the path of the striker plate 37.

The striker plate 37 is formed with a notch 58 in the inclined upper edge 41 thereof to receive the hook-shaped end 54 of the safety latch. It will be noted from Figure 5 that the notch 58 is located between the side walls of the striker plate so that an integral flange 59 is formed on the outer side of the striker plate adjacent the notch. It will thus be apparent that the safety latch 51 and the notch 58 in the striker plate form an interlocking engagement between the striker plate and the latch mechanism preventing both lateral and longitudinal relative displacement therebetween. For example, the hook-shaped end 54 of the safety latch engages the straight outer face 61 of the notch 58 in the striker to prevent the door from being opened until the safety latch is withdrawn from the notch. At the same time, the integral flange 59 of the striker plate adjacent the notch 58 serves to retain the

safety latch in the notch and consequently to prevent the latch mechanism from being moved longitudinally of the vehicle sufficiently to disengage the teeth **39** of the striker plate from the teeth of the rotor **16** in the event an accident or other cause tends to distort the vehicle body or door in such manner as to disengage the striker from the rotor. If desired the integral flange **59** of the striker plate can be in the form of a separate plate secured to the striker.

Referring now to Figures 3 and 4, it will be noted that the pawl **19** is formed, near its pivotal mounting **21**, with a projecting ear **62** to which is pivotally connected by means of a pin **63** a link **64**. The opposite end of the link **64** is formed with an elongated slot **66** for receiving an elongated pin **67** carried by the safety latch **51** and projecting therefrom. An opening **68** is formed in the flange **12** of the mounting plate **11** to provide clearance for the pin **67** during the swinging movement of the safety latch and to permit assembly of the parts in the dovetail.

The arrangement is such that when the pawl **19** is moved from its latched position as shown in Figure 3 to its unlatched position as shown in Figure 4, the link **64** through its pin and slot connection with the safety latch **51** moves the safety latch to the position shown in Figure 4 in which the downwardly depending hook-shaped end **54** thereof is completely retracted from the notch **58** in the striker plate and is wholly contained within the dovetail **42**. Thus, unlocking the latch mechanism in the usual manner either by the inside handle or outside push button is effective to simultaneously release the safety latch.

When the door is closed, the curved rearward edge of the downwardly depending hook-shaped end **54** of the safety latch engages the curved and inclined edge **41** of the striker plate and is automatically moved against the action of the coil spring **57** into its retracted position within the dovetail. When the door closing movement has been completed, however, the hook-shaped end **54** of the safety latch automatically drops into the notch **58** in the striker and is retained there until retracted by the pawl and link mechanism heretofore described. The slot **66** in the link **41** permits the necessary movement of the safety latch during the door closing operation.

It will be understood that the invention is not to be limited to the exact construction shown and described, but that various changes and modifications may be made without departing from the spirit and scope of the invention, as defined in the appended claims.

What is claimed is:

1. In a door latch mechanism for latching a vehicle door to a vehicle body, a toothed rotor rotatably mounted upon said vehicle door, a manually operated pawl adapted in one position to hold said rotor against rotation in one direction, a hollow dovetail mounted upon said vehicle door in vertically spaced relationship with said rotor, said dovetail having an opening in one side thereof, a striker

mounted upon said vehicle body extending between said rotor and said dovetail, said striker having an opening in the side thereof facing said dovetail, the opening in said striker having a width less than the width of said striker to provide an abutment wall on the side of said striker nearest said vehicle door, a latch movably mounted upon said vehicle door and having a retaining portion adapted to extend through the opening in said dovetail and into the opening in said striker in overlapping relationship with said abutment wall, the engagement between the said retaining portion of said latch and the abutment wall of said striker limiting movement of said striker away from said vehicle door and preventing disengagement of said striker from said toothed rotor, and a link having one end pivotally connected to said pawl and its opposite end having a lost motion connection with said latch to withdraw said latch from engagement with said striker upon movement of said pawl to a position releasing said rotor.

2. In a door latch mechanism for latching a vehicle door to a vehicle body, a latch plate mounted upon the vehicle door adjacent the jamb face thereof, a toothed rotor rotatably mounted upon said latch plate, a pawl pivotally mounted upon said latch plate and having an arm engageable with said rotor to hold the latter against rotation in one direction, a sheet metal dovetail mounted upon said latch plate, a striker mounted upon said body and having a toothed portion engageable with said toothed rotor and a second portion engageable with said dovetail, a latch pivotally mounted upon said dovetail and overlapping said striker when the door is closed to limit relative movement between said rotor and said striker in a direction longitudinally of the vehicle, and a short link having one end pivotally connected to said pawl at a point spaced radially from the pivotal mounting of said pawl upon said latch plate, said link having a pin and slot lost motion connection at its opposite end with said safety latch at a point spaced radially from the pivotal mounting of said safety latch on said dovetail.

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