Nov. 22, 1966 H. J. SHAY 3,287,049

VEHICLE LATCH

Filed Dec. 4, 1963 2 Sheets-Sheet 1

Fig. 1

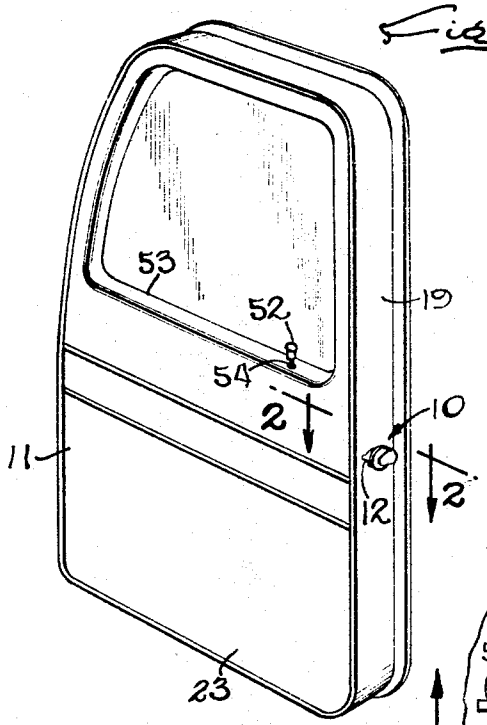


Fig. 2

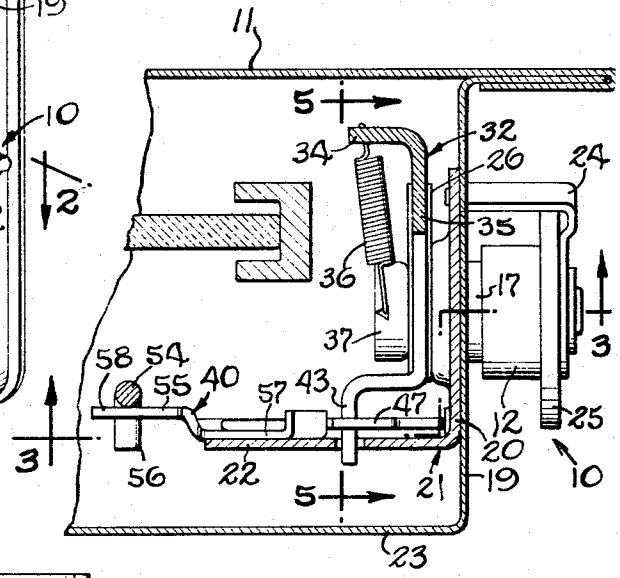
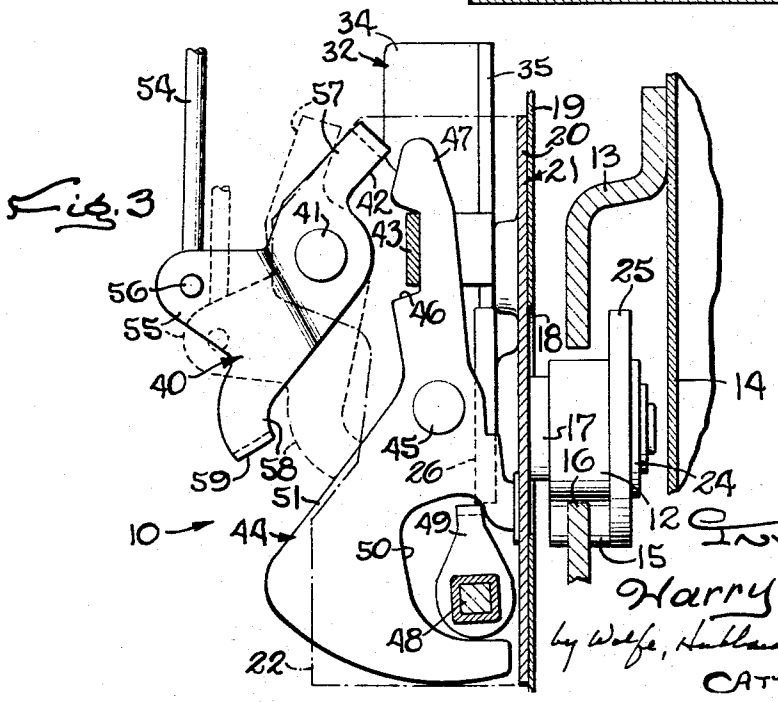


Fig. 3



INVENTOR
Harry J. Shay
by Wolfe, Hubbard, Voit & Osann
ATTORNEYS

Nov. 22, 1966 H. J. SHAY 3,287,049

VEHICLE LATCH

Filed Dec. 4, 1963 2 Sheets-Sheet 2

Fig. 4

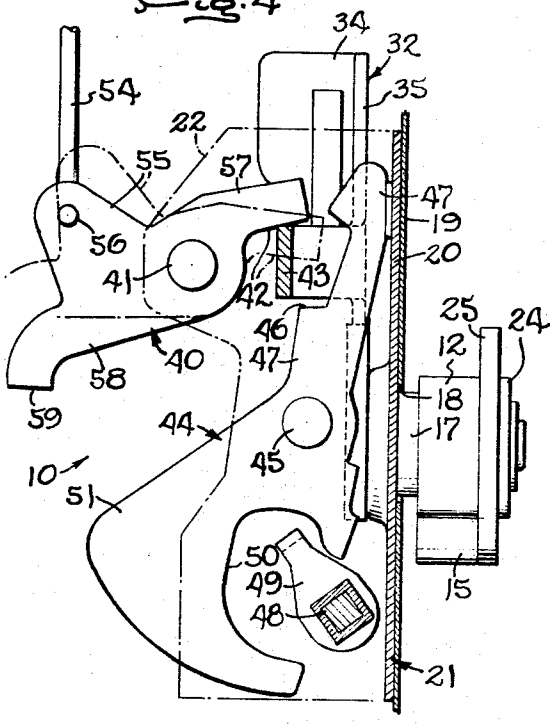


Fig. 5

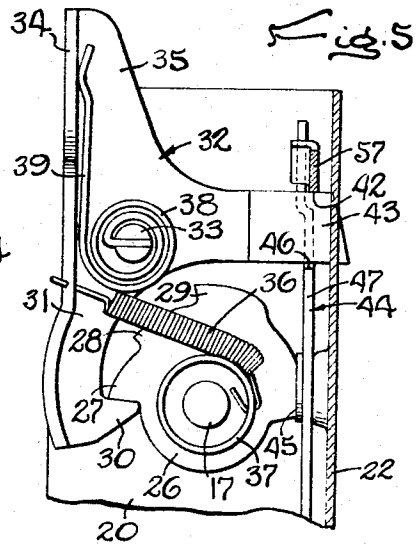


Fig. 6

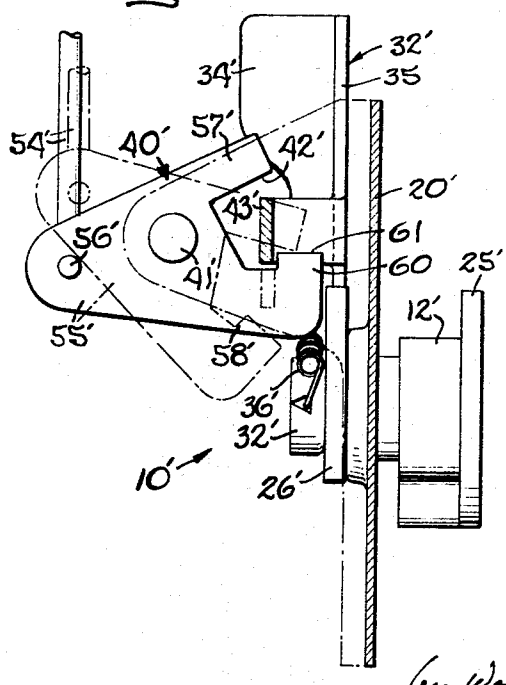


Fig. 7

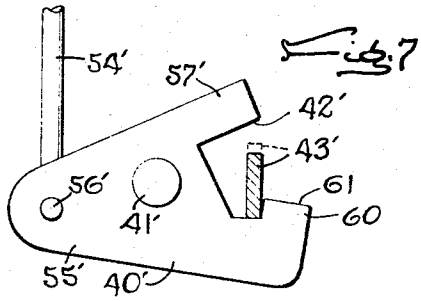
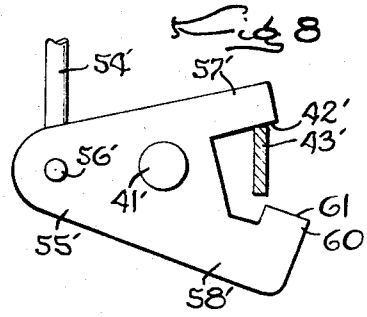


Fig. 8



INVENTOR
Harry J. Shay
by Wolfe, Hubbard, Voit & Osann
ATTORNEYS

United States Patent Office 3,287,049 Patented Nov. 22, 1966

3,287,049

VEHICLE LATCH

Harry J. Shay, Rockford, Ill., assignor to L. W. Menzimer, Rockford, Ill., as trustee

Filed Dec. 4, 1963, Ser. No. 327,965
2 Claims. (Cl. 292—229)

This invention relates to a latch of the type commonly used on the doors of automotive vehicles and, more particularly, to a latch which is operated by manually moving an operating member between latched and unlatched positions. Such latches usually include a latch locking means which is selectively positioned to prevent the operating member from moving to the unlatched position.

The general object of the present invention is to provide a new and improved latch of the above character in which all of the functions of the latch, namely, locking, unlocking and unlatching, may be performed by the simple motions of a single manual actuator in the form of a button disposed adjacent the garnish molding of the door.

A more detailed object is to provide the latch with a member which is turned back and forth by the garnish button and which cooperates with both the operating member and the latch locking means so that, in one direction of turning, the locking means is activated while the latching means is inactivated and the operating member is moved to the unlatched position upon turning in the opposite direction.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which—

FIGURE 1 is a perspective view of a vehicle door utilizing the novel latch of the present invention.

FIG. 2 is an enlarged fragmentary sectional view taken along the line 2—2 in FIG. 1.

FIG. 3 is a fragmentary sectional view taken along the line 3—3 in FIG. 2.

FIG. 4 is a sectional view similar to FIG. 3 but shows the parts in a novel position.

FIG. 5 is a fragmentary sectional view taken along the line 5—5 in FIG. 2.

FIG. 6 is a fragmentary sectional view similar to FIG. 3 but illustrates a modified form of the invention.

FIG. 7 is a view similar to FIG. 6 but shows the parts in a moved position.

FIG. 8 is a view similar to FIG. 6 but shows the parts in another moved position.

For purposes of illustration, the invention is shown in the drawings as embodied in a door latch **10** for use with the door **11** of an automotive vehicle and includes a latching member **12** carried by the door to coact with a striker **13** (FIG. 3) which is mounted on a post **14** of the vehicle frame. Herein, the latching member is of the gear type and includes a plurality of teeth **15** which cooperate in the usual manner with a tooth **16** on the striker **13**, that is, the gear teeth engage the striker tooth as the door is closed and this turns the gear **12** into latching engagement with the striker.

To support the gear **12** for turning, the latter is fast on a horizontal shaft **17** which projects through a hole **18** in the end wall **19** of the door **11** and is journaled on one leg **20** of an angle bracket **21**. The bracket is disposed within the door with the leg **20** fastened to the inner side of the end wall **19** and with the other leg **22** extending alongside the inner wall **23** of the door. The outboard end of the shaft **17** is supported by an L-shaped bracket **24** which projects outwardly from the leg **20** and over the gear **12**. The usual anti-burst disk **25** is disposed between the bracket **24** and the gear **12**.

Fast on the inner end of the shaft **17** is a ratchet **26** (FIG. 5) with three teeth **27**, **28** and **29** which cooperate with a pawl **30**. The latter is formed on the lower end of a downwardly projecting arm **31** of an operating lever **32** fulcrumed on the leg **20** of the bracket **21** by means of a pin **33**. When the parts are in the latching position as shown in FIG. 5, the pawl **30** engages the tooth **27** on the ratchet **26** and, to open the door **11** from the outside, a conventional push button (not shown) is depressed and bears against a flange **34** on an upright contactor arm **35** on the operating lever **32**. This swings the lever clockwise and releases the pawl from the tooth **27**. A contractile spring **36** acting between the flange **34** and a cup **37** on the shaft urges the ratchet **26** in a counterclockwise direction and this, together with the action of the gear teeth **15** and the striker tooth **16** upon the opening of the door, turns the ratchet so that the intermediate safety position tooth **28** passes the pawl and the tooth **29** engages the pawl. At that time, the parts are in the unlatched position. A torsion spring **38** anchored to the pin **33** has a free end **39** which bears against the flange **34** to urge the pawl toward the ratchet.

In order to open the door from the inside, a manually operable member **40**, which herein is in the form of a lever, is mounted on the leg **22** of the mounting bracket **21** by a pin **41** to turn about an axis generally perpendicular to the fulcrum axis of the operating lever **32**. The member **40** is formed with a downwardly facing abutment surface **42** which, when the member **40** is turned clockwise as viewed in FIG. 4, engages the upper edge of a horizontal arm **43** on the operating lever **32**. Continued turning of the member **40** pushes the arm **43** downwardly and swings the pawl **30** away from the ratchet **26**.

Means is provided for locking the latch **10** in the latched position to prevent unauthorized opening of the door **11**. In the form shown in FIGS. 1 through 5, this means comprises a blocking lever **44** fulcrumed by a pin **45** on the leg **22** of the angle bracket **21** and operable selectively to hold the operating lever **32** in the latched position or to release this lever. For this purpose a notch **46** is formed in one side of an upwardly extending arm **47** of the blocking lever **44** and the notch is disposed at the level of the arm **43** of the operating lever **32** when the latter is in the latched position. Thus, the blocking lever may be swung counterclockwise to the position shown in FIG. 3 in which the arm **43** of the lever **32** is disposed within the notch and is prevented from moving toward the unlatched position. Swinging of the lever **44** in the opposite direction to the position shown in FIG. 4 unblocks the operating lever **32** and permits the pawl **30** to be released from the ratchet **26**. As is customary in latches of this type, the blocking lever **44** may be swung back and forth from outside the vehicle by a key (not shown) which turns a shaft **48** (FIGS. 4 and 5) extending transversely of the door. The shaft **48** carries a finger **49** which projects into a notch **50** in the lower arm **51** of the blocking lever and which, by abutting one side or the other of the notch, swings the blocking lever between its two positions.

In accordance with the present invention, the latch **10** is constructed in a novel manner so that all the functions of the latch may be performed from the inside by the simple motion of a single manual actuator in the form of a shiftable button disposed adjacent the garnish molding **53** of the door **11** (FIG. 1). Thus, the button may be moved in one direction to lock the latch while movement of the button in the opposite direction shifts the parts first to the unlocked position and then the unlatched position. For this purpose, the member or lever **40** is rocked back and forth by the button **52** and, in this motion, not only moves the arm **43** of the operating lever

32 to the unlatching position but also coacts with the latch locking means to lock and unlock the latch.

In the form of the invention illustrated in FIGS. 1 through 5, the button is connected to the lever **40** by a vertical link **54**. The latter is pivotally coupled to an arm **55** of the lever **40** so that the pivot **56** is radially spaced from the fulcrum **41** and angularly spaced from the abutment surface **42**. Herein, the abutment surface is one edge of a second arm **57** on the lever **40** and this arm is arranged so the upper end of the blocking lever **44** is in the path of the arm as the latter is swung in a clockwise direction. Thus, in one continued motion, the arm **57** swings the blocking lever **44** to the unlocked position and pushes the operating lever **32** to the unlatched position. This is achieved by simply lifting the button **52**.

When swung in the opposite direction (counterclockwise in FIG. 3), the lever **40** cooperates with the blocking lever **44** to turn the latter to the locked position. For this purpose, the lever **40** is formed with a third arm **58** angularly spaced from both the arm **55** and the arm **57** and a surface **59** on the end of the arm **58** abuts the side of the lower arm **51** of the blocking lever when the lever is turned in a counterclockwise direction as shown in broken lines in FIG. 3. Thus, by depressing the button **52** when the door **11** is latched closed, the lever **40** turns the blocking lever to the position in which the notch **46** receives the arm **43** of the operating lever **32** and the latch **10** is locked.

In a modified form of the invention, the latch locking means is formed integrally with the lever **40'** as illustrated in FIGS. 6 through 8 in which the corresponding parts are indicated by the same but primed reference characters. As in the preferred embodiment, the lever **40'** includes a first arm **55'** pivotally connected to the push button rod **54'** and a second arm **57'** angularly spaced from the first arm to engage and turn the arm **43'** of the operating lever **32'**. In this instance, however, the third arm **58'** projects in under the operating lever arm **43'** and the latch locking means is a finger **60** projecting upwardly from the outer end of the arm **58'** to be disposed behind the arm **43'**.

With the modified arrangement, the parts are in the locked position when the rod **54'** is in its lowermost position as illustrated in full lines in FIG. 6. At such a time, an attempt to open the door from the outside starts the turning of the operating lever **32'** but, after turning through a small angle, the arm **43'** of the operating lever **32'** engages the arm **58'** of the lever **40'**. Thereafter, the operating lever turns the lever **40'** slightly in the clockwise direction until the arm **43'** becomes wedged against the side of the finger **60** as shown in FIG. 7. At that time, further movement of the operating lever is prevented and, since the permitted movement of the operating lever is not sufficient to disengage the pawl from the ratchet, the latch **10** is locked.

By lifting the rod **54'** and turning the lever **40** clockwise from the full line position to the broken line position in FIG. 6, the locking finger **60** swings away from the arm **43'** of the operating lever **32'** and, at the same time, the arm **57'** of the lever **40'** engages the arm **43'** which thus is turned downwardly to release the latch **10'** and permit opening of the door. When the rod **54'** is placed in an intermediate position with the arm **57'** of the lever **40'** merely adjacent the arm **43'** as illustrated in FIG. 8, the latch **10'** is in the unlocked condition and the door may be opened from the outside. Thus, in this position of the parts, the arm **43'** is above the end **61** of the finger

60 as shown in full lines so that the arm engages the finger end (broken lines) as the operating lever **32'** starts to turn in the unlatching direction. This permits further turning of the operating lever since the arm pushes the finger **60** ahead of it upon such turning.

It will be observed that with a latch arranged in accordance with the invention, all of the functions of the latch may be performed by a single manual operator **52**. At the same time, the latch is comparatively simple in construction. Moreover, the operation of the latch requires only a rectilinear motion making possible to use a button at the garnish molding **53** for the operator **52**. Thus, the latch is especially suited for use with doors which are comparatively narrow.

I claim as my invention:

1. In a vehicle door, the combination of, a latch having an operating element movable back and forth along a predetermined path between latched and unlatched positions, a lever fulcrumed to turn about a predetermined axis and having three arms projecting outwardly from and angularly spaced around said axis, a shiftable garnish molding button connected to a first one of said arms and operable to swing said lever from a locked position through an unlocked position to an unlatching position and back, an abutment carried by a second one of said arms and operable as said lever is swung to said unlatching position to engage and turn said operating element to said unlatched position, and a wedging member carried by the third one of said arms and projecting into the path of said operating element when said lever is in said locked position to engage and wedge said element against movement to said unlatched position.

2. In a vehicle door, the combination of, a latch having an operating element movable back and forth between latched and unlatched positions, a member mounted to turn about a predetermined axis, a button extending through the garnish molding of said door and manually movable relative thereto, a connection coupling said button to said member at a point radially spaced from said axis whereby the button turns the member back and forth about said axis, an abutment surface rigid with said member and angularly spaced from said connection to engage said operating element in one direction of turning of said member and move said element toward said unlatched position, a part rigid with said member and angularly spaced from both said connection and said surface, and a wedging member carried by said part and disposed in the path of said element when said member is turned in the opposite direction to engage and wedge said element against movement to said unlatched position.

References Cited by the Examiner

UNITED STATES PATENTS

1,094,550	4/1914	Fleischauer et al.	
1,332,876	3/1920	Appleby.	
2,131,506	9/1938	Gasstrom.	
2,644,707	7/1953	Dall.	
2,835,526	5/1958	Van Voorhees	292—216
3,027,185	3/1962	Allen et al.	
3,047,325	7/1962	De Vito.	
3,049,372	8/1962	Pickles	292—216

EDWARD C. ALLEN, *Primary Examiner.*

JOSEPH D. SEERS, PATRICK A. CLIFFORD, RICHARD E. MOORE, *Examiners,*