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R. BERINGER

LATCH

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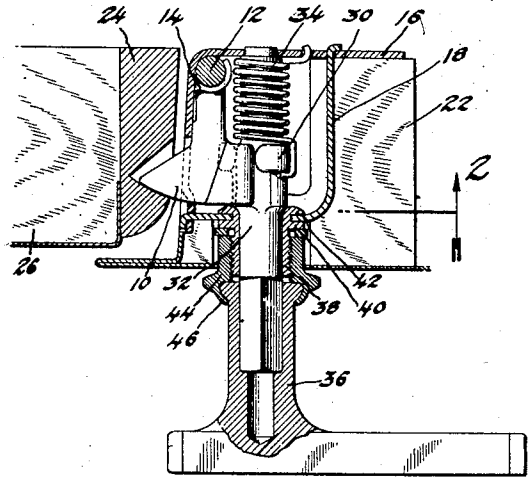


Fig. 1

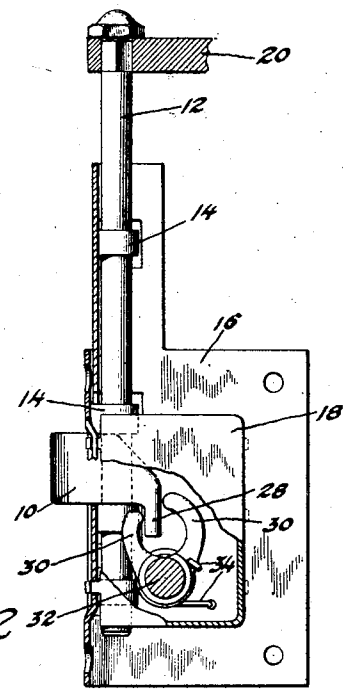


Fig. 2

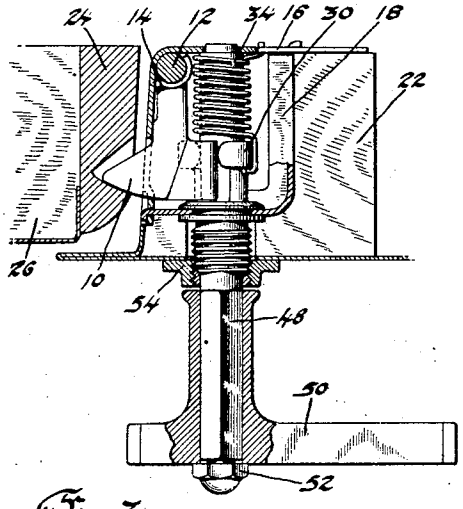


Fig. 3

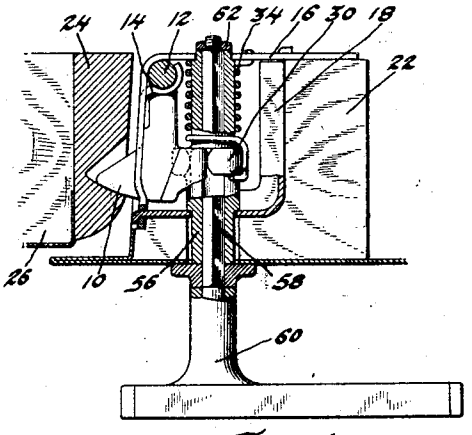


Fig. 4

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UNITED STATES PATENT OFFICE.

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LATCH.

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This invention relates to door-latching devices, and is illustrated as embodied in the door of an automobile.

In a latching device for an automobile door it is important that the latch mechanism and the casing, if any, be of as small horizontal cross-section as possible, to minimize the weakening of the door frame involved in cutting a latch recess, and, in closed cars to offer the smallest possible obstruction to sliding the glass down into the door. An object of the invention is the provision of a novel latching device having a minimum cross-sectional area by utilizing in an improved manner a swinging or oscillatable latch, in lieu of the usual sliding latch, the latch lying across the end of the door where it takes up very little space extending back into the door.

According to an important feature of the invention, the latch is arranged to be operated either from inside and at the top of the door, or from outside and at the mid portion of the door by alternatively-operable devices of novel and efficient construction. While either latch-operating device can be used alone with substantial advantage, they are especially adapted for use in combination with one another.

From this point of view, one form of the invention involves the mounting of a latch-operating rock shaft, preferably integral with or secured directly to the latch, vertically of the door. In the illustrated embodiment of the invention the rock-shaft is arranged to extend above the top of the door, where it is provided with a handle, so that it can be readily operated from inside the automobile.

The alternatively-operable latch-controlling device, in a preferred form, comprises a horizontal rock-shaft arranged to oscillate the latch, as for example by being connected thereto by inter-engaging lugs.

Other features of the invention, including an improved latch-casing, a novel arrangement by which the latch automatically throws the door open again unless it is completely closed, and other novel combinations and desirable particular constructions, will be apparent from the following description of the illustrative embodiment of the invention shown in the accompanying drawings, in which:

Fig. 1 is a horizontal section through a door and jamb or door post just above the latch;

Fig. 2 is a section through the latching device on the line 2—2, Fig. 1; and

Figs. 3 and 4 are views corresponding to Fig. 1, but showing two differently modified constructions.

Each of the latching devices shown in the drawings comprises a latch 10, integral with or secured to a vertical rock shaft 12 journaled in a bearing formed by bending out tongues 14 cut from a sheet-metal piece 16 of angular cross-section. The piece 16 is formed with openings into which extend lugs formed on the edges of a second sheet-metal piece 18, the two pieces together forming a latch-casing with shaft 12 journaled along one edge and with latch 10 extending across the side. Shaft 12 is arranged to extend above the door, and is provided with an operating handle 20.

When the latching device is seated in a recess cut in the frame 22 of an automobile door, latch 10 is arranged to seat in a notch in a striker plate 24 secured to a door post 26. It is to be noted that the outer surface of latch 10 is a cylindrical surface having its axis coincident with the axis of shaft 12, and that the notch in striker plate 24 is correspondingly cylindrical, so that when the latch is seated in the notch it fits closely, and any strain tending to open the door will come longitudinally of the latch and will be transmitted to shaft 12. According to one of the more important minor features of the invention, the striker surface of the plate 24 is curved in such a manner as to be substantially perpendicular to the closing pressure of latch 10 at all points, when the latch is cammed back by the plate when the door is closed. Thus, unless and until the door is completely closed and the latch is seated in its notch, the closing pressure of the latch will act in such a direction as to throw the door open again if it is released. This prevents accidents to the unexpected opening of an insecurely-latched door.

Handle 20 is intended to be manipulated from inside the automobile, and preferably alternatively-operable means is provided on

the outside of the door. In the form shown in Figs. 1 and 2, latch 10 is provided with a downwardly-extending lug 28 received between two upstanding lugs 30 formed on or carried by a horizontal rock-shaft 32. A coil torsion spring 34 surrounds the rock shaft 32 and yieldingly urges latch 10 to closed position. Rock-shaft 32 is squared at its outer end to seat in a squared socket in a handle 36, and is journaled at its end in one side of the latch-casing and centrally in a bushing 38 secured to the casing by a fixed flange 40 and an upsettable flange 42 riveted down against the casing. The handle is held by an escutcheon nut 44 having a flange 46 spun over an annular flange on the handle.

In the modification shown in Fig. 3, shaft 48 corresponds to shaft 32 of Fig. 1, but handle 50 is held by a nut 52, and the escutcheon nut 54 is not connected to the handle. In the modification shown in Fig. 4, shaft 32 is replaced by a sleeve 56, having a squared opening for a stem 58 integral with or secured to handle 60, and held by an inner nut 62. In this form the escutcheon nut may conveniently be integral with the handle.

From the foregoing description it will be seen that the improved latching device, in its several illustrated modifications and in the many other obvious forms, is compact and efficient, of minimum horizontal cross-sectional area, operable from either the inside or outside of an automobile and well adapted for quantity production, and further that there is no need for an uncovered opening in the top edge of the door, so that dirt and water are kept out of the latching mechanism. It is not my intention to limit the scope of the invention to the illustrated modifications, or otherwise than by the terms of the appended claims, as many features of the invention are adapted for use in latches not intended for automobiles, or for latches mounted in door posts or jambs instead of in the doors themselves, and many structural features of the invention are of value in themselves even when used with previously known latching devices.

I claim:

1. In a vehicle which has relatively-movable jamb members with cooperating edge walls extending in a generally vertical direction, and a striker plate carried by one of said members, a manually-oscillatable shaft vertically mounted in the other of said members, a latch angularly movable with the shaft to cooperate with the striker plate, and auxiliary latch-turning means operable from the side of the latch-carrying member.

2. In a vehicle which has relatively-movable jamb members with cooperating edge walls extending in a generally vertical direction, and a striker plate carried by one of said members, a manually-oscillatable shaft vertically mounted in the other of said members, a latch angularly movable with the shaft to cooperate with the striker plate, auxiliary latch-turning means operable from the side of the latch-carrying member, and a spring urging the latch into latching position.

3. In a vehicle which has relatively-movable door and jamb members with cooperating edge walls extending in a generally vertical direction, and a striker plate carried by one of said members, an oscillatable shaft mounted in the other of said members and extending above its top edge and there provided with an operating handle, a latch angularly movable with the shaft to cooperate with the striker plate and yieldingly urged toward latching position, and an auxiliary latch-operating device extending through the outer side of the shaft-carrying member.

4. In a vehicle which has relatively-movable door and jamb members with cooperating edge walls extending in a generally vertical direction, and a striker plate carried by one of said members, an oscillatable shaft mounted in the other of said members and extending above its top edge and there provided with an operating handle, a latch angularly movable with the shaft to cooperate with the striker plate and yieldingly urged toward latching position, and an auxiliary latch-operating shaft extending through the outer side of the shaft carrying member, and there provided with an operating handle.

5. In a vehicle which has relatively movable door and jamb members with cooperating edge walls extending in a generally vertical direction, and a striker plate carried by one of said members, a vertically-extending rock-shaft having an operating handle and operable from inside the vehicle, a latch carried by and angularly movable with said rock-shaft, an auxiliary horizontally-extending rock-shaft having an operating handle and operable from outside the vehicle, the latch and auxiliary rock-shaft being interconnected for oscillation about axes in mutually perpendicular planes, and a spring urging the latch into latching position with respect to the striker plate.

6. In a vehicle which has relatively-movable door and jamb members with cooperating edge walls extending in a generally vertical direction, and a striker plate carried by one of said members, a pivotally mounted latch carried by the other of said members, and a pair of latch-oscillating members alternatively operable respectively from inside and outside the vehicle.

7. In a vehicle which has relatively-movable door and jamb members with cooperating edge walls extending in a generally vertical direction, and a striker plate carried

by one of said members, a pivotally mounted latch carried by the other of said members, means operable from near the top of and inside said latch-carrying member for turning the pivotally mounted latch, and auxiliary means operable from a mid position, and outside of said latch-carrying member for turning the latch.

8. In a vehicle which has relatively-movable door and jamb members with cooperating edge walls extending in a generally vertical direction, and a striker plate carried by one of said members, a pivotally mounted latch carried by the other of said members, means operable from near the top of and inside said latch-carrying member for turning the pivotally mounted latch, and a latch-operating rock-shaft extending through the side of the latch-carrying member.

9. In a vehicle which has relatively-movable door and jamb members with cooperating edge walls extending in a generally vertical direction, and a striker plate carried by one of said members, a pivotally mounted latch carried by the other of said members, means operable from near the top of and inside said latch-carrying member for turning the pivotally mounted latch, and a latch-operating rock-shaft extending through the side of the latch-carrying member, said latch and rock-shaft having inter-engaging lugs.

10. A door-latching device comprising, in combination, a striker plate and a pivotally-mounted latch for a door yieldingly urged toward latching position, the striker plate having a latch-receiving recess with an arcuate wall corresponding to the angular movement of the latch, and an adjacent striker surface for wedging the latch back in closing, the direction in which the latch is yieldingly urged being such that the yielding action of the latch will open the door again unless it is completely closed and latched.

11. A door-latching device comprising, in combination, a striker plate and a pivotally-mounted latch for a door yieldingly urged toward latching position, the striker plate having a striker surface for wedging the latch back in closing, the direction in which the latch is yieldingly urged being such that the yielding action of the latch will open the door again unless it is completely closed and latched.

12. A door-latching device comprising, in combination, a striker plate and a yieldingly-oscillated latch arranged to push against the striker plate at such an angle as to open a door carrying the plate or latch automatically unless it is completely closed.

13. A door-latching device comprising, in combination, a pivotally-mounted latch, and alternatively-operable latch-turning rock-shafts arranged substantially at right angles to one another.

14. A door-latching device comprising, in combination, a pivotally-mounted latch, a rock-shaft arranged to extend vertically when in place in a vehicle, and an auxiliary rock-shaft arranged to extend horizontally when in place in a vehicle, both of the rock-shafts being connected to the latch, the latch being arranged to turn about a substantially vertical axis.

15. A door-latching device comprising, in combination, a manually-oscillatable shaft arranged to extend in a generally vertical direction when in place in a vehicle, a latch carried by and oscillatable with the shaft, and an auxiliary oscillatable latch-operating shaft extending substantially at right angles to the vertical shaft.

16. A door-latching device comprising, in combination, a manually-oscillatable shaft arranged to extend in a generally vertical direction when in place in a vehicle, a latch carried by and oscillatable with the shaft, and an auxiliary oscillatable latch-operating shaft extending substantially at right angles to the vertical shaft, the latch and the auxiliary shaft having inter-engaging lugs.

17. A door-latching device comprising, in combination, a manually-oscillatable rock shaft arranged to extend in a generally vertical direction when in place in a vehicle, a latch carried by and oscillatable with the shaft, and an auxiliary oscillatable latch-operating shaft extending substantially at right angles to the vertical shaft, and a torsion spring surrounding one of said shafts and connected thereto to urge the latch into latching position.

18. A vehicle door having a rock-shaft extending vertically of its end and rotatable about its longitudinal axis, a latch secured to or integral with said rock-shaft, and a handle at the upper end of the rock-shaft.

19. A vehicle door having a longitudinally-fixed rock-shaft extending vertically of its end and rotatable about its longitudinal axis, and a latch secured to or integral with said rock-shaft.

20. A vehicle door having a rock-shaft extending along one of the vertical edges of its end and rotatable about its longitudinal axis, and a latch secured to or integral with the rock-shaft and arranged to extend part way across the mid portion of the end.

21. A vehicle door having a latch mounted to swing on a vertical pivot, and a horizontal rock-shaft operatively connected to the latch and extending through the side of the door.

22. A vehicle door having a latch mounted to swing on a vertical pivot, and a horizontal rock-shaft, the latch and rock-shaft being provided with inter-engaging lugs.

23. A vehicle door having, in combination, a latch mounted to swing on a vertical pivot, a horizontal rock-shaft having a part engag-

ing the latch, and a spring urging the latch to latching position.

24. A vehicle door having, in combination, a latch mounted to swing on a vertical pivot, a horizontal rock-shaft operatively connected to the latch, and a torsion spring connected to the rock-shaft.

25. A vehicle door having, in combination, a latch mounted to swing on a vertical pivot, a horizontal rock-shaft operatively connected to the latch and extending through the side of the door, a handle on the rock-shaft, and an escutcheon nut spun over a portion of the handle.

26. A latching device comprising, in combination, a pair of angular sheet metal members interconnected to form a latch casing and having portions at one corner of the casing bent into a bearing, and a pivotally-mounted latch having a shaft carried by said bearing.

27. A latching device comprising, in combination, a sheet-metal piece of substantially right angular cross-section to form part of the end and side faces of a door, a shaft journaled in said piece at the angle of said piece, and a latch operated by the shaft.

28. A latching device comprising, in combination, connected sheet metal pieces, each of substantially right-angular cross section and together forming a latch casing, a shaft journaled in one of the pieces at the angle thereof, and a latch operated by the shaft.

29. A latching device comprising, in combination, connected sheet metal pieces, each of substantially right-angular cross section and together forming a latch casing, a shaft journaled in one of the pieces at the angle thereof, a latch operated by said shaft, and a cross shaft journaled in opposite sides of the casing and operatively connected to the latch.

30. A latching device having, in combination, a latch mounted to oscillate on a vertical pivot, a horizontal shaft operatively connected to the latch, a handle on the shaft, and a nut on the end of the shaft holding the handle in place.

31. A latching device having, in combination, a latch mounted to oscillate on a vertical pivot, and a handle having an integral extension forming a horizontal shaft operatively connected to the latch.

32. A latch for a swinging member comprising a horizontally swinging latch carried by a vertically oscillating rock shaft, the said rock shaft having a rigidly connected operating arm.

33. A latch for a swinging member comprising a horizontally swinging latch carried rigidly by a vertical rock shaft mounted in the swinging member, an operating arm on the rock shaft, a horizontal rock shaft extending through the swinging member and engaging a lug on the latch whereby the latch may be operated by movement of either shaft.

In testimony whereof I affix my signature.

ROSCOE BERINGER.