Aug. 23, 1927. 1,639,862

C. S. SHILLING ET AL

LATCH

Filed Jan. 15, 1923

Fig. 1

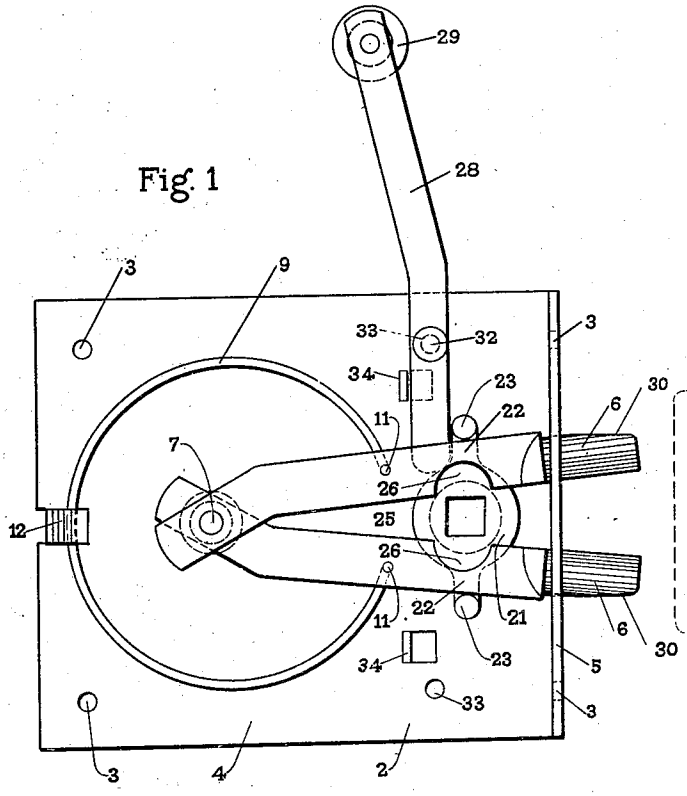


Fig. 2

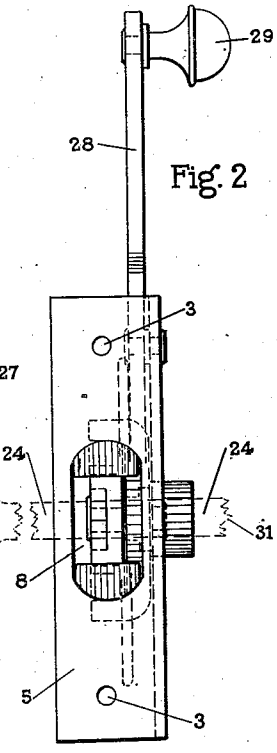


Fig. 3

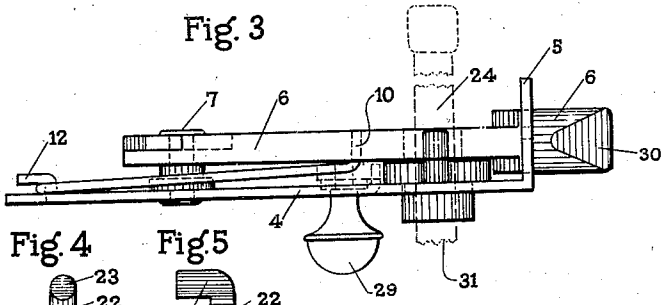


Fig. 6

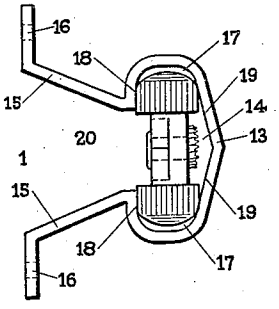


Fig. 4

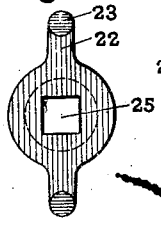
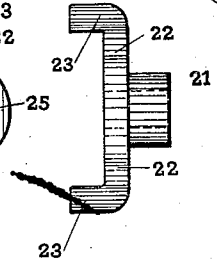


Fig. 5



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Patented Aug. 23, 1927. 1,639,862

UNITED STATES PATENT OFFICE.

CARL S. SHILLING AND DUFFEY B. LOUZON, OF CHICAGO, ILLINOIS.

LATCH.

Application filed January 15, 1923. Serial No. 612,616.

The invention relates to improvements in latches for doors, windows, gates, or the like, and more particularly to latches operable to automatically lock the door on which it is mounted whenever the door is closed.

The object of the invention is to provide a simple practical and inexpensive latch, especially adapted for use with automobile doors, which can be easily operated from either within or without the car and is proof against the rattling which often accompanies the use of latches of this general type when the car on which it is mounted is in motion. Such rattling is due not only to pivotal movement of the door on its vertical axis but also to up and down movement of the door in the door frame as the door hinges and other parts wear.

The invention embraces other advantages which will appear in the following specification in which reference is made to the accompanying drawing forming a part hereof, wherein Figures 1, 2 and 3 are the side elevation, end elevation and bottom plan view, respectively of the latch. Figs. 4 and 5 are detail views of a cam forming part of the latch mechanism, and Fig. 6 is an elevation of the keeper showing the latch bars in operative engagement therewith.

In the embodiment herein shown of this invention, the numeral 1 designates a keeper preferably adapted to be mounted on a door frame and the numeral 2 designates a casing for mounting on a door which is arranged to swing in respect to the frame, the casing being preferably mounted on the inside of the door. The construction is such, however, that the keeper can well be mounted on the door and the casing on the door frame, should such an arrangement be desirable for any reason. Views of the frame and the door are omitted as not being necessary to disclose the invention.

The casing 2 may be mortised into the door on which it is mounted, or it may be fastened thereto by means of screws inserted through the holes 3, the casing being for this purpose preferably made angular in section with a long leg 4 adapted for mounting on the side of the door and a short leg 5 on the end of the door.

A pair of pivotally supported opposed latch bars 6 are mounted on the casing 2, being fastened together and to the casing by a rivet or bolt 7. The latch bars 6 project through a slot 8 formed in the leg 5 sufficiently to engage the keeper 1 when the door is closed.

A substantially circular or arcuate spring 9 is mounted on the inner edge of the casing 2 with its ends bent to form pins 10 which are inserted in holes 11 formed in the latch bars 6.

The middle portion of the spring 9 is firmly fastened to the casing 2 by means of a finger 12 formed by bending down a portion of the outer edge of the leg 4. The spring is constructed so as to exert a constant force which yieldingly holds the bars apart as shown.

The keeper 1 is constructed from a bar 13 to form a loop 14 although it may well be constructed by providing a plate or casting correspondingly apertured to receive the latch bars. The keeper 1 is preferably mounted on the door frame with which the latch is associated and is provided with outwardly extending arms 15 which converge toward the loop to form a guideway 20 for the latch bars 6 which are mounted on the door in alinement with the guideway. The keeper 1 may be mortised into the door frame and fastened by inserting screws through holes 16 formed in the arms 15.

The arms 15 are spaced apart sufficiently to receive the latch bars 6 when the door with which the latch is associated approaches its closed position and converge to force the latch bars together as the door is further moved to its closed position. The free ends of the latch bars 6 are each provided with an outer bevelled face 30 which presents a bearing surface of substantial area for contacting with the arms 15 and prevents any undue wear of the contacting parts.

The loop 14 converges slightly to form upper and lower wedge shaped recesses 17 into which the latch bars 6 are forced by the action of the spring 9 when the door is closed. The recesses 17 are bounded on the open side of the loop by the square shoulders 18 and on the closed side by the inclined portion 19. The latch bars 6 are held tightly wedged in position in the recesses 17 by the spring 9 which exerts a constant pressure sufficient to prevent removal of the bars other than by manual operation of the latch. The outer face of the latch bars 6 bears squarely against the shoulder 18 thereby

effectively preventing the latch bars from being forced together and the door opened by exerting lateral pressure thereon. The loop 14 is elongated vertically to provide clearance between the upper and lower faces of the latch bars 6 and the top and bottom walls respectively of the recesses 17. This clearance is sufficient to allow for wear at the points of contact between the sides of the latch bars and the loop, so that the latch bars never contact with the upper and lower portions of the loop, and rattling of the parts is effectively prevented, such rattling being an objectionable feature of latches of this general character as heretofore constructed.

The latch bars 6 are released from engagement with the keeper 1 by rotating a cam 21 which is pivotally mounted on the casing 2. The cam 21 is provided with radially extending arms 22 having their ends laterally projecting to form lugs 23, which engage the outer face of the latch bars 6 thereby forcing these bars together when the cam is rotated. As may be seen by comparing Figs. 1 and 2 with Fig. 6, the arms or lugs 23 on the cam member 21 are out of restraining contact with the latch bars 6 when the latter are in engagement with the keeper as shown in Fig. 6. Consequently, when the door is closed and latched, the force of the spring 9 is exerted directly through the latch bars to the keeper to hold the door against up and down movement as well as horizontal movement, thus effectively preventing rattling.

The cam 21 is rotated by mounting a shaft 24 in an axial aperture 25 which is formed in the cam, the inner sides of the bars 6 being provided with recesses 26 so as to clear the shaft 24 when the bars are closed. A handle 27 is mounted on the end of the shaft 24, which for this purpose is shown projecting from the inside of the casing 2. The casing is preferably mounted on the inside of the door so that the handle 27 projects from the outside of the door, and the door can thus be opened from the outside by turning the handle in a clockwise direction.

To unlatch the door from the inside, a lever 28 is pivotally mounted on the casing 2 by means of a pin 32 extending through a hole 33 provided in the casing for that purpose. The upper end of the lever projects above the door and its lower end engages with the adjacent arm 22 to cause rotation of the cam as the lever 28 is moved. A knob 29 is mounted on the upper end of the lever so as to be easily accessible to the occupant of the car, the lever being rotatable thereby in a counter-clockwise direction as observed in Fig. 1 to cause the cam to rotate in a clockwise direction and release the bars 6 from engagement with the keeper-plate 1. If desired, the shaft 24 can be extended through the casing and an additional handle provided therefor at 31 on the inside of the car.

A lug 34 limits the forward motion of the lever 28 and the corresponding backward motion of its lower portion so as to prevent the lever from striking the spring 9. An additional lug 34 and hole 33 are provided on the lower portion of the casing so that the casing is adapted for mounting on doors which swing outwardly either to the right or the left dependent upon where the lever 28 is mounted. In the drawing the casing is shown with the lever 28 positioned thereon for mounting on the inside of a door which swings outwardly to the right. A lock adapted for mounting on a door swinging outwardly to the left is provided by mounting the lever 28 in the lower hole 33 instead of the upper one as shown.

Upon reference to Fig. 1, it will be noted that the latch bars 6 are pivoted near their inner ends, that the cam 21 is located between the pivot 7 and the outer ends of the latch bar, and that the cam engages the outer sides of the latch bars at points relatively remote from the pivot 7. The cam is therefore advantageously located and arranged to operate the latch bars with a relatively small amount of force applied to the handle. This is of practical importance, inasmuch as the spring 9 must be fairly strong in order to hold the door securely locked and to prevent rattling. The construction herein shown is such that a spring of ample strength to attain the desired results may be employed without making the lock hard to operate.

We claim as our invention:

1. A latch of the class described having, in combination, a casing, a pair of pivotally supported opposed latch bars, a spring yieldingly holding said bars a predetermined distance apart, a cam operable to force said bars together, said cam comprising a plate pivotally mounted in said casing with an axis transverse to the plane of said bars and having a pair of arms oppositely extending from said plate with a lateral projection formed thereon adapted to engage the outer edge of the latch bars, a shaft on which the cam is mounted, a handle for rotating said shaft, a lever mounted on the casing so as to rotate the cam independently of said shaft, and a keeper adapted to receive and automatically lock said bars when the door with which said latch is associated is moved to closed position.

2. A latch of the class described comprising a casing, a pair of latch bars pivoted on the casing near their inner ends, a resilient member yieldingly holding the outer ends of said bars apart, a cam pivoted on the casing between the pivot of the latch bars and the outer ends of said bars and operatively

engaging the outer sides of said latch bars to force said bars together as the cam is rotated, and a handle for turning said cam.

3. An anti-rattling door latch comprising, in combination, a pair of pivoted latch bars arranged to be mounted on a door and adapted to swing toward and away from each other, a keeper arranged to be mounted on a door frame in position to receive said bars in latching relation when said door is closed, spring means acting on said bars tending to hold them in the keeper and tending to prevent pivotal movement of said bars, and unlatching means adapted to engage said bars and move them against the action of said spring, said keeper being adapted to hold said bars out of restraining contact with said unlatching means when the door is in latched position.

4. A keeper for a latch comprising a member having a recess formed therein, said recess being adapted to receive and hold latch bars when the door with which the latch is associated is closed, said member having oppositely disposed portions projecting into the recess to form shoulders partially closing said recess, said portions having their outer edges inclined to cause the outer portion of the recess to converge inwardly and their inner edges forming square shoulders against which the latch bars are adapted to bear when said door is closed, the wall of said recess opposite said square shoulders being inclined to force the latch bars against said shoulders to prevent rattling.

5. An automobile door latch comprising two pivoted latch bars arranged to be mounted on a door, a keeper arranged to be mounted on a door frame, said keeper having a guideway to receive the ends of said latch bars laterally, and upper and lower wedge-shape recesses communicating with said guideway to receive the ends of said latch bars, and spring means to hold the bars against movement vertically or horizontally in said recesses.

In testimoney whereof we have hereunto affixed our signatures.

CARL S. SHILLING.
DUFFEY. B. LOUZON.