Nov. 27, 1923. 1,475,692

S. D. FARMER

LATCH

Filed April 29, 1922

Fig. 1.

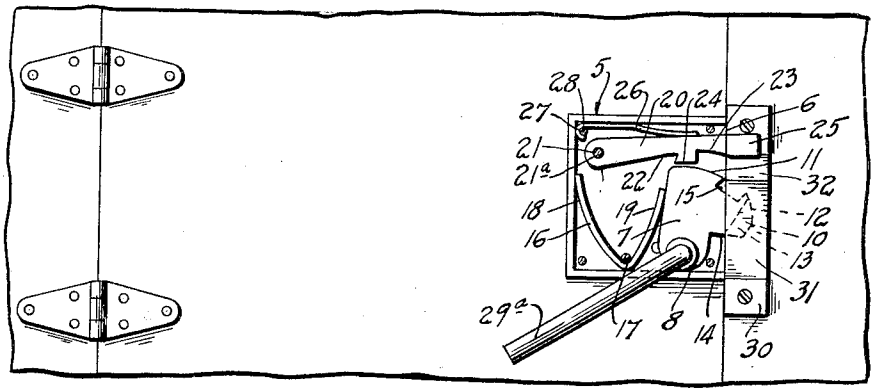



Fig. 2.

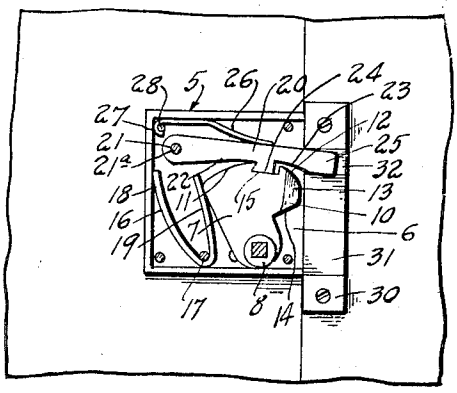



Fig. 4.

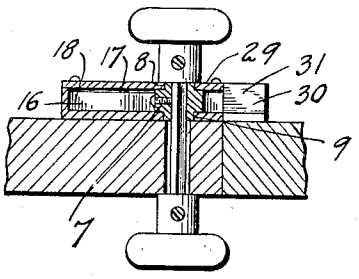



Fig. 3.

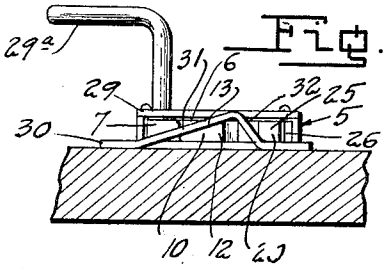
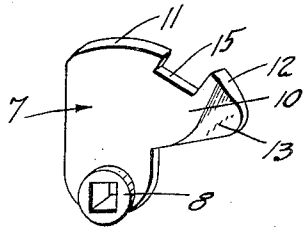



Fig. 5.




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Attorney

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# UNITED STATES PATENT OFFICE.

SILAS D. FARMER, OF HERRIN, ILLINOIS.

## LATCH.

Application filed April 29. 1922. Serial No. 557,463.

*To all whom it may concern:*

Be it known that I, SILAS D. FARMER, a citizen of the United States, residing at Herrin, in the county of Williamson and State of Illinois, have invented certain new and useful Improvements in Latches, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to latches, and has for its object to provide a lock wherein the latch bolt is maintained in its retracted or unlocked position upon actuation of the shaft of the latch, and wherein means are provided for automatically releasing the latch bolt when the object or member on which the latch is used is moved to its closed position.

The disadvantage of latches such as used on refrigerator doors, doors of automobiles, and the like, is that if the latch or main spring is made strong enough, so as to hold the door tight and prevent rattling when the door is in its latched position, it prevents the bolt from automatically engaging the keeper when the door is moved to its closed position. On the other hand, if the spring is made weak enough to permit the bolt to climb upon or engage the keeper automatically, it is not sufficient to properly hold the door in its closed position.

It is, therefore, the primary object of the invention to provide a latch wherein a relatively strong main spring is used for actuating the latch bolt, the latch bolt being maintained in its retracted position during closing movement of the member supporting the latch, means being provided and controlled by a relatively weak spring for releasing the latch bolt upon contact of said means with a keeper.

It is a further object of the invention to provide a latch of this character wherein a sustantially wedge shaped latch bolt is provided, having a relatively strong spring for urging the bolt in engagement with the keeper, the movement of said bolt being limited only by the keeper, so that a wedging action is produced, which prevents rattling or accidental opening of the door.

With these and other objects in view, the invention consists in the improved construction and arrangement of parts to be hereinafter more particularly described, fully claimed, and illustrated in the accompanying drawings, in which:—

Figure 1 is a view in elevation of a latch constructed in accordance with an embodiment of the invention, the front of the latch casing being removed, showing the latch in its latched position;

Figure 2 is a view in elevation of the cover of the latch removed, showing the latch in its unlatched position;

Figure 3 is an end elevation of the structure shown in Figure 1; and

Figure 4 is a sectional plan view showing the latch applied to a door with knobs on both sides of the casing;

Figure 5 is a perspective view of the latch bolt.

Referring to the drawings, 5 designates a latch casing consisting of a plate having three of its edges turned upwardly to provide casing flanges, the end portion 6 of the casing being open. Mounted within the casing is a latch bolt 7, said bolt having a hub member 8 in one end portion thereof, said hub member extending on both sides of the latch bolt and having a square bore. One of the projecting portions of the hub extends through an opening 9 provided in the casing. Projecting from one side of the bolt is an extension 10 which serves as the latching portion of the bolt, or that portion adapted to engage the keeper, the extremity 11 of the bolt and the adjacent face 12 of the extension being curved substantially in the same plane.

The extension 12 has its face 13 thereof tapered, said tapered portion cooperating with the curved face 12 and the opposite face 14 of the extension to provide a wedge. The extension 10 is provided with a recess 15, said recess being disposed at the junction of the extension with the end portion of the bolt. The side or face 14 of the extension is disposed substantially at right angles to the hub member 8 to permit the bolt to readily engage the keeper.

A leaf spring 16 is disposed within the casing, said spring being bent at its central portion and engaged with a pin or screw 17 which extends through the casing. The arm

18 of the spring is adapted to engage one end of the casing, while the opposite arm 19 is adapted to engage the side of the bolt remote from the extension 10, the spring being sprung outwardly so as to constantly urge the bolt through the open end 6 of the casing. This spring is relatively strong, so that when in its latched position the bolt will prevent rattling, or accidental opening of the door. In order to permit automatic operation of the bolt 7, regardless of the use of the strong spring, there is provided a novel trip lever 20, said lever having an opening 21 in one end thereof adapted to receive a pivot pin 21a. One longitudinal edge of the pin is cut away as at 22 and 23 to provide a tumbler lug 24, said tumbler lug being adapted to enter the recess 15 of the bolt 7, the recess being considerably longer than the tumbler lug.

It will be noted that the cut away portions 22 and 23 adjacent the extension are curved so as to conform to the curvature of the faces 11 and 12 of the bolt. The end portion 25 of the trip lever projects beyond the open end 6 of the casing and is constantly maintained in its projected position. The lever 20 is urged into engagement with the bolt 7 through the medium of a spring 26, the end 27 of the spring being coiled and adapted to engage a pin 28 carried by the casing. The opposite end portion is extended in angular relation and adapted to engage the opposite longitudinal edge of the trip lever 20, directly opposite the tumbler lug 24, so that the tumbler is urged toward the bolt.

A cover 29 is provided for the casing, having openings corresponding to the pivot pins carried by the casing 5 and also a relatively large bearing opening for the reception of the adjacent hub portion of the bolt. If the latch is to be used in connection with a refrigerator or ice box, a latch shaft 29a having a handle of any desired shape on one end is carried by the latch, the shaft extending through the hub of the bolt in any desired manner. When the device is used in connection with an automobile door or door of a building, the shaft is extended entirely through the hub and secured by use of a cotter pin. The portion of the shaft extending through the hub is, of course, squared and larger than the portion of the shaft extending through the openings in the cover and casing, so that accidental disengagement of the handle is prevented, and removal can only be accomplished by removing the cover 29.

In connection with the latch, a novel keeper 30 is provided, said keeper consisting of a strip of material having its end portion 31 inclined to a point beyond the center of the strip and then extended abruptly upwardly and inwardly to provide a cam face 32, the extremity of the cam face 32 being formed into a foot. An opening is provided in the foot and the opposite end portion 31 of the strip for the reception of the fastening means.

In the application of the latch, the keeper is positioned so that the cam face 32 will be disposed in the path of movement of the projecting end 25 of the trip lever, the inclined portion of the end portion 31 cooperating with the door jamb post or object to which it is connected to provide a wedge shaped compartment adapted to receive the wedge shaped portion of the bolt.

When the latch is in its latching condition, the extension 10, as above described, is engaged with the inner face of the inclined portion 31 of the keeper, the end portion 25 of the trip lever being disposed in engagement with the outer face of the cam face 32. In this position, the weak spring 26 of the trip lever is compressed and the tumbler lug 24 engaged with the face 11 of the bolt, thereby holding the trip lever substantially in spaced relation to the cam face 32.

To release the latch, the shaft 29a is rotated so as to swing the bolt 7 inwardly of the casing, whereupon the spring 26 urges the tumbler lug 24 into the recess 15 of the bolt, thereby holding the bolt in its retracted position, whereupon the door may be readily opened. The bolt by this means is maintained in its retracted position indefinitely, or in other words, until the trip lever 20 is operated.

The operation of the bolt 7, as well as the operation of the trip lever 20, is automatic, and is accomplished by the projecting end portion 25 of the trip lever striking the cam face 32 of the keeper. This moves the trip lever away from the bolt, disengaging the tumbler lug 24 from the recess 15 and permitting the spring 16 to urge the bolt into the keeper.

From the foregoing it will be readily seen that this invention provides a novel form of latch which will operate automatically without fail upon movement of the latch toward the keeper in view of the provision of springs of various strengths, the utility of the latch being unlimited. All of these features are possessed by a device that is composed of only six parts, which can be produced in large quantities from a small amount of material.

What is claimed is:—

1. An automatic closure latch including a spring projected bolt, a keeper embodying a fixed side member having an inclined external side face, said keeper further having an open inner end into which said bolt is adapted to be projected when the closure is shut, manually operable means for retracting said bolt from said keeper, a spring

actuated locking lever adapted to engage said bolt to hold the latter retracted, said locking lever and said bolt being movable in a general direction at right angles to the direction in which the closure moves when being opened or closed, said lever projecting beyond the outer end of the latch in the direction of the keeper, and means on the bolt for holding the lever released from the bolt when the latter is projected into the keeper, whereby the bolt may be freely retracted without manipulation of said lever, said inclined external side face of the keeper acting as a fixed oblique guiding face engaged by the free end of the locking lever for automatically releasing the latter from the bolt when the closure is shut.

2. An automatic closure latch including a spring projected bolt, a keeper embodying a fixed side member having an inclined external side face, said keeper further having an open inner end into which said bolt is adapted to be projected when the closure is shut, manually operable means for retracting said bolt from said keeper, a spring actuated locking lever adapted to engage said bolt to hold the latter retracted, said locking lever and said bolt being movable in a general direction at right angles to the direction in which the closure moves when being opened or closed, said lever projecting beyond the outer end of the latch in the direction of the keeper, and means on the bolt for holding the lever released from the bolt when the latter is projected into the keeper, whereby the bolt may be freely retracted without manipulation of said lever, said inclined external side face of the keeper acting as a fixed oblique guiding face engaged by the free end of the locking lever for automatically releasing the latter from the bolt when the closure is shut, said bolt being pivoted for swinging movement and having the side face of its keeper-engaging portion beveled to form a wedge tapering smaller in the direction in which the bolt moves to engage the keeper, said keeper having an internal side face inclined in the latter direction and cooperating with the beveled side face of the bolt to wedge the closure in the direction of its closing movement for preventing rattling of the latter when shut.

3. An automatic closure latch including a spring projected bolt, a keeper embodying a fixed side member having an inclined external side face, said keeper further having an open inner end into which said bolt is adapted to be projected when the closure is shut, manually operable means for retracting said bolt from said keeper, a spring actuated locking lever adapted to engage said bolt to hold the latter retracted, said locking lever and said bolt being movable in a general direction at right angles to the direction in which the closure moves when being opened or closed, said lever projecting beyond the outer end of the latch in the direction of the keeper, and means on the bolt for holding the lever released from the bolt when the latter is projected into the keeper, whereby the bolt may be freely retracted without manipulation of said lever, said inclined external side face of the keeper acting as a fixed oblique guiding face engaged by the free end of the locking lever for automatically releasing the latter from the bolt when the closure is shut, said bolt being pivoted for swinging movement and having the side face of its keeper-engaging portion beveled to form a wedge tapering smaller in the direction in which the bolt moves to engage the keeper, said keeper having an internal side face inclined in the latter direction and cooperating with the beveled side face of the bolt to wedge the closure in the direction of its closing movement for preventing rattling of the latter when shut, said keeper comprising a strip of metal with its intermediate portions of angular form longitudinally to provide said inclined external and internal faces and having its ends formed for reception of fastening means whereby the strip may be secured to a side of the jamb of the closure with said ends flatly engaging said jamb and with the intermediate portion in spaced relation to the latter.

4. In a closure latch, a keeper, a bolt projectable into engagement with said keeper, said bolt being pivoted for swinging movement and having the side face of its keeper engaging portion beveled to form a wedge tapering smaller in the direction in which the bolt moves to engage the keeper, said keeper having an internal side face inclined in the latter direction and cooperating with the beveled side face of the bolt to wedge the closure in the direction of its closing movement for preventing rattling of the latter when shut.

5. An automatic closure latch including a spring projected bolt, a keeper embodying a fixed side member having an inclined external side face, said keeper further having an open inner end into which said bolt is adapted to be projected when the closure is shut, manually operable means for retracting said bolt from said keeper, a spring actuated locking lever adapted to engage said bolt to hold the latter retracted, said locking lever and said bolt being movable in a general direction at right angles to the direction in which the closure moves when being opened or closed, said lever projecting beyond the outer end of the latter in the direction of the keeper, and means on the bolt for holding the lever released from the bolt when the latter is projected into the keeper, whereby the bolt may be freely retracted without manipulation of said lever, said inclined external side face of the keeper acting as a

fixed oblique guiding face engaged by the free end of the locking lever for automatically releasing the latter from the bolt when the closure is shut, said bolt being pivoted for swinging movement and having an arcuate edge formed with a notch, said lever having a tumbler lug, adapted to engage said notch to hold the bolt retracted and to lie adjacent said arcuate edge when the bolt is projected for free movement into the notch upon retraction of the bolt.

In testimony whereof I hereunto affix my signature.

SILAS D. FARMER.