Dec. 18, 1945. H. BLOSS 2,390,984

LATCH FOR SCREEN DOORS AND THE LIKE

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Fig. 1.

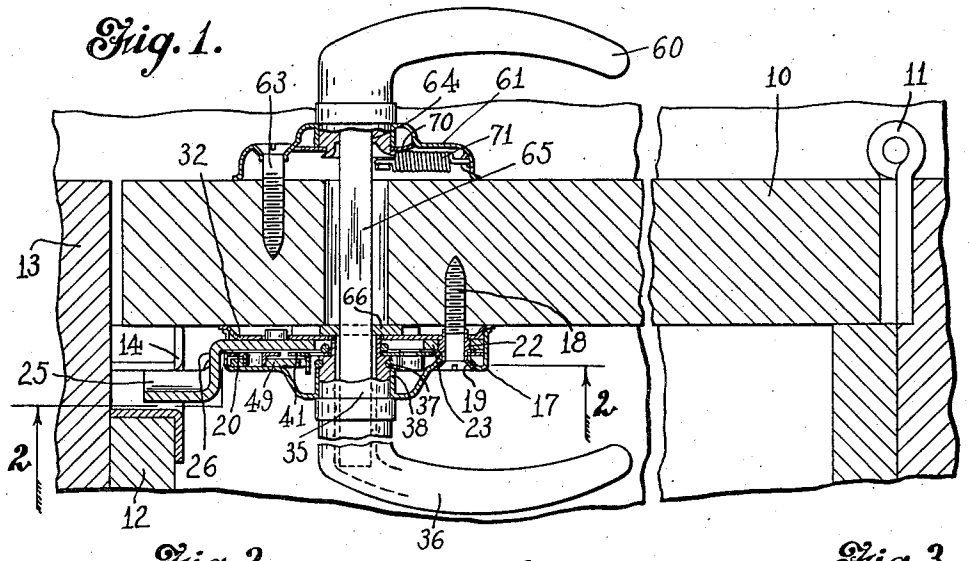


Fig. 2.

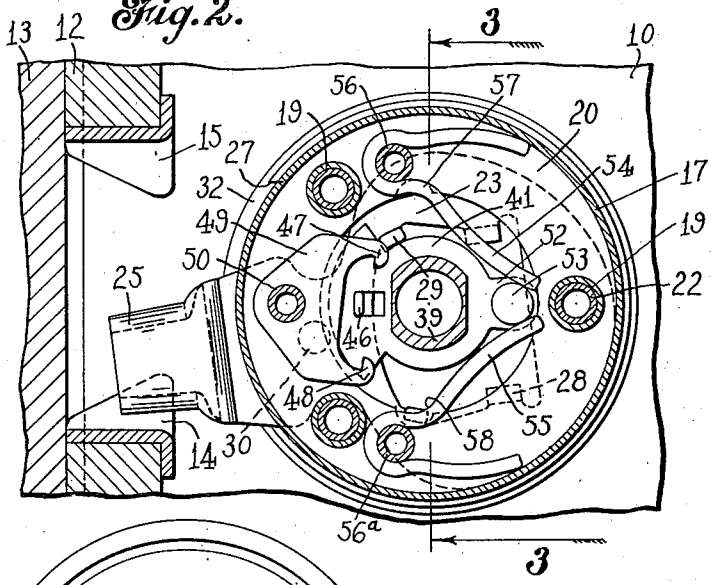


Fig. 3

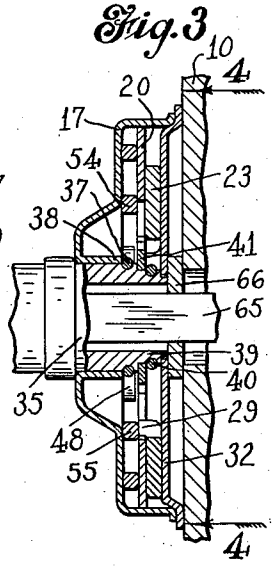
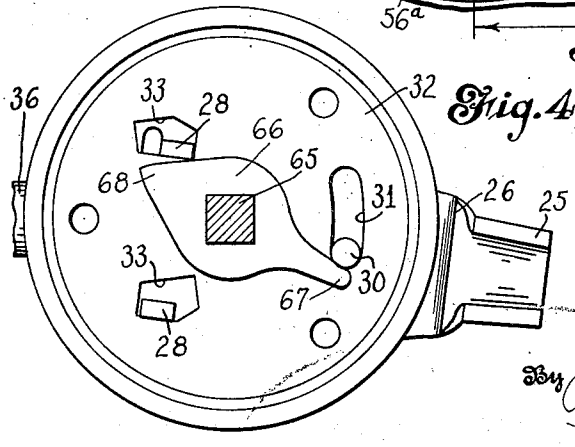


Fig. 4.



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Fig. 5.

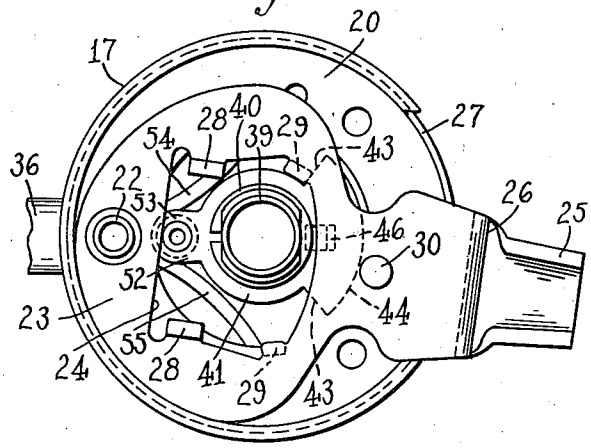


Fig. 7.

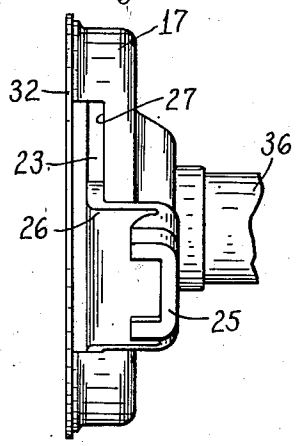


Fig. 6.

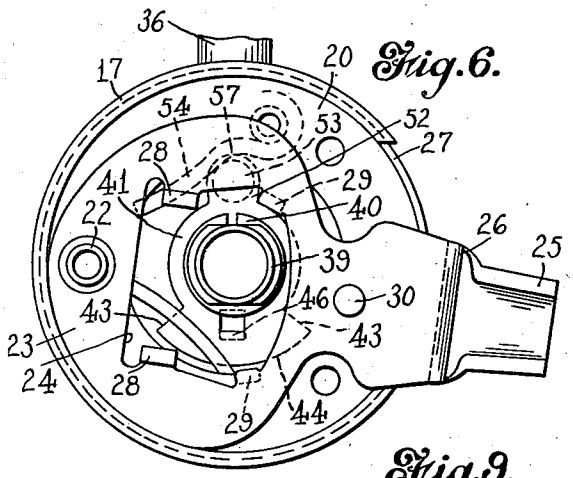


Fig. 8.

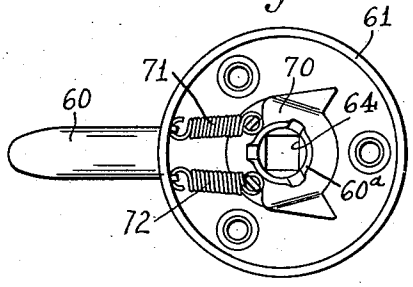


Fig. 9.

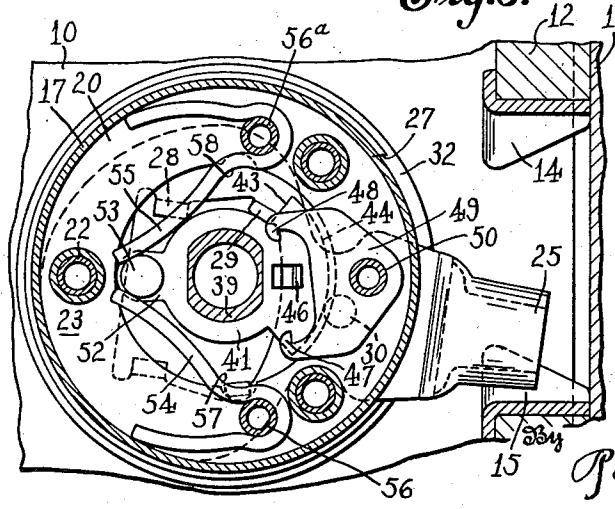
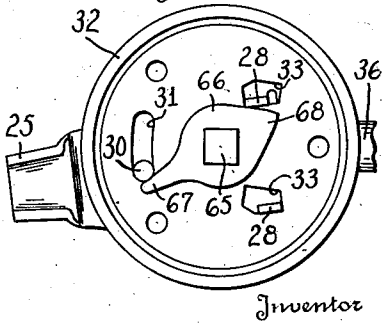


Fig. 10.



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UNITED STATES PATENT OFFICE

2,390,984

LATCH FOR SCREEN DOORS AND THE LIKE

Herman Bloss, Shelton, Conn., assignor to The H. B. Ives Company, New Haven, Conn., a corporation of Connecticut

Application October 16, 1943, Serial No. 506,541

13 Claims. (Cl. 292—210)

This invention relates to door latches and more particularly to a latch to be employed upon light doors such as screen doors or the like, although it will be understood that the latch mechanism shown herein is applicable for use with other types of doors if desired.

In the manufacture of latches for screen doors and the like, it is desirable that the latch be simply constructed and be composed of parts which may be economically made, such as by stamping operations for example. It is necessary, however, that the latch be capable of the usual functions, and that the mechanism be provided with means for dogging the latch against being operated from the outside of the door to prevent unauthorized entrance. It is also a very desirable feature of such latches that they be made for use upon either right or left hand doors so that it will be unnecessary to make one latch for a door of one hand and another latch or a latch having other specially-made elements for a door of the other hand.

The above advantages are present in the lock of this application in that the parts may be cheaply and economically made. Also, the latch may be employed upon either right or left hand doors, as desired, without the use of any additional or specially-made parts, and the latch may be dogged against movement from the outside of the door by a rotation of the inner handle in a direction reverse to that employed to move the latch. Moreover, the mechanism is so arranged that the inner handle normally stands in a horizontal position and when the handle is moved to a position to dog the latch against movement, it stands in a vertical position. Thus the user of the latch is always able to tell at a glance whether the latch bolt is dogged or free, in that the position of the handle is at once an indication of the condition of the parts. This arises from the fact that the handle is permitted a rotation of substantially 90° from its normal position to its dogging position as well as from the fact that the handle stands in an upright or vertical position when the latch is dogged.

One object of the invention is to provide a new and improved latch for screen or other doors of light weight.

A still further object of the invention is to provide a new and improved latch mechanism for screen doors or the like which may be made cheaply and economically, and which will be capable of performing all the functions desired in a latch mechanism of this type.

A still further object of the invention is to provide a latch mechanism for screen doors or the like which may be used with a door of either hand without the employment of any different or specially-made parts.

A still further object of the invention is to provide a latch mechanism for screen doors or the like, so arranged that the latch may be dogged against movement by a reverse rotation of the inside handle, the position of the handle, when so rotated, being such that an indication or signal will be given to the user that the latch is dogged against movement.

To these and other ends the invention relates to the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a sectional view of a latch mechanism embodying my invention mounted upon a door;

Fig. 2 is a sectional view on line 2—2 of Fig. 1, showing the interior construction;

Fig. 3 is a sectional view on line 3—3 of Fig. 2;

Fig. 4 is a sectional view on line 4—4 of Fig. 3, showing the operation of the rollback operated by the outside handle;

Fig. 5 is a view similar to Fig. 4 with the inner cover plate of the latch casing removed to show the interior construction;

Fig. 6 is a view similar to Fig. 5 but showing the inside latch operating mechanism or inside rollback in another position;

Fig. 7 is a front view of the latch mechanism at the inside of the door;

Fig. 8 is an inside elevational view of the escutcheon and associated parts at the outside of the door;

Fig. 9 is a view similar to Fig. 2, showing the application of the latch mechanism to a door of the opposite hand; and

Fig. 10 is a view similar to Fig. 4, showing the parts in the position occupied when applied to a door of the other hand.

To illustrate a preferred embodiment of my invention, I have shown in the drawings a door 10, such as a screen door, for example, hinged at 11 and adapted to close against a stop 12 mounted on the door jamb 13. Upon the stop 12 is mounted a strike mechanism provided with keepers 14 and 15, which keepers are adapted to cooperate with the latch as hereinafter described, to hold the door in closed position. It will be understood that only one of the keepers is actually used when the lock is applied to a door but that the two keepers are provided in order that the same strike mechanism may be used

with either right or left hand doors. As shown in Figs. 2 and 9, when the mechanism is mounted on the doors of opposite "hands," the strike mechanism will be reversed. In each case the latch will cooperate with the lower one of the two keepers, this being the keeper 14 in Fig. 2 and the keeper 15 in Fig. 9.

The latch mechanism is mounted at the inside of the door and enclosed within the case 17, secured to the door by screws 18 passing through openings 19 in the case. Secured within the case, within spaced relation to the outer wall thereof, is a partition plate 20, which plate is spaced from the outside of the case by the displacement of the wall of the latter about the openings 19, so that certain parts of the mechanism may be mounted between the plate 20 and the outer wall of the case.

A stud 22 is secured to this plate adjacent one edge thereof and a latch member 23 is pivoted upon this stud. This member, as shown more particularly in Figs. 5 and 6, has a relatively large opening 24 in the body thereof, through which projects the hub of the inner handle, as will be hereinafter described, and a projecting end portion 25 adapted to cooperate with one of the keepers. As shown in Fig. 1 at 26, this end portion is displaced inwardly from the body 23 of the latch member and, as shown more particularly in Fig. 7, projects through an opening or slot 27 of arcuate shape in the front of the case so that the latch may be swung pivotally or lifted about its pivot 22 in the case. The body of the latch member 23 is provided with a pair of lugs 28 projecting toward the outside of the door and with a pair of lugs 29 projecting in the opposite direction or toward the inside of the door. As will be hereinafter explained, these lugs constitute the means by which the inner and outer handles operate the latch member and they are symmetrically arranged with respect to the longitudinal axis of the latch member so that one of each of these lugs is in operation when the latch is used with a door of one hand and the other of each of these lugs is in operation when the latch is used with a door of the other hand.

The latch member is also provided with a stud 30 projected toward the outside of the door, which stud projects through a slot 31 in a cover plate 32 serving as the inner cover of the case 17. It will be understood that this cover holds the latch member in place and the movement of the latch member is limited by the travel of the stud 30 in the slot 31. The plate 32 is also provided with openings 33 which permit the projection therethrough of the lugs 28.

Rotatably mounted in the outer portion of case 17 is the hub 35 of the inner handle 36, the hub being held in place by a spring ring 37 mounted in an annular groove in the hub 35 and engaging against the flange 38 formed on the case which surrounds the hub 35. Mounted on an inner reduced end 39 of this hub and held in place by the split ring 40 is a latch actuating member or rollback 41 so that the rollback is rotated by rotation of the handle 36 about the axis of the hub 35, and, it may be noted, eccentric to the pivot 22 of the latch member.

As shown in Fig. 3, this rollback lies substantially in the plane of the plate 20 and is provided with symmetrically arranged shoulders 43 adapted to engage one or the other of the lugs 29 to operate the latch. It is also provided with an arcuate edge portion 44 generally concentric with the axis of the hub 35 to engage one or the other of the lugs 29 and dog the latch against movement, as will be hereinafter more fully explained.

It will be apparent that, as shown in Fig. 5, for example, when the rollback is rotated in a counter-clockwise direction it will engage the upper of the lugs 29 and thus move the latch member 23 in a counter-clockwise direction about its pivot 22, thus raising the latch member until its projecting end 25 disengages the keeper 14. As the rollback 41 and latch 23 move about different axes, the lug 29 will ride upwardly on the shoulder 43 and ordinarily would be moved out of engagement with this shoulder. It is therefore desirable to limit the rotation of the rollback in a direction to operate the latch so that the lug 29 will not be moved beyond the edge of the shoulder 43.

For this purpose, the rollback is provided with a lug 46 projecting inwardly, which lug is adapted to be engaged by the hooked ends 47 and 48 of an escapement member 49 freely pivoted at 50 between the outside of the case and the plate 20. Thus, as shown in Fig. 2, when the rollback 41 is rotated in a clockwise direction, the lug 46 will be engaged by the hooked end 47 of the escapement member 49 and will be prevented from further rotation. When, however, the rollback 41 is rotated in a counter-clockwise direction as the parts are shown in Fig. 2, the lug 46 will pass freely above the hooked end 48 of the escapement 49.

In order that the rollback 41 and the inside handle 36 to which it is secured be normally restrained in the position shown in Fig. 2 in which the handle projects in a horizontal direction and the latch member is engaged with the keeper 14, the roll-back 41 is provided with a projecting lug 52 carrying a stud 53 engaged by the ends of springs 54 and 55 mounted upon studs 56 and 56a in the case. These springs are also provided, respectively, with bent portions 57 and 58 adapted to engage these studs when the inner handle and rollback are moved to position substantially 90° from that shown in Fig. 2 or to the position shown in Fig. 6 so that the inner handle will also be releasably held in these positions. In order that the latch mechanism may be operated at the outside of the door, an outside handle 60 is rotatably mounted in an escutcheon 61 secured to the door by screws 63, which handle is provided with a square opening 64 to receive a similarly shaped spindle 65 which extends through the door and has its other end loosely and rotatably received in the hub 35. Mounted on this spindle, adjacent the inner cover 32 of the latch mechanism, is an outside rollback 66 of the form shown in Fig. 4, this rollback having an arm 67 engaged below the stud 30 on the latch member 23 and also having a cam shaped end 68 engaging one or the other of the lugs 28. It will be seen, therefore, that the latch may be lifted or disengaged from the keeper by operation of the outside handle in either direction. If, for example, the outside handle is moved in a counter-clockwise direction, as the parts are shown in Fig. 4, the end 67 of the rollback 66 will engage the stud 30 and serve to lift the latch, while, if the outside handle and spindle 65 are rotated in a clockwise direction, the upper surface of the cam shaped portion 68 will engage the lug 28 and also serve to lift the latch or rotate it in a counter-clockwise direction out of engagement with the keeper 14.

In order to normally maintain the outside handle in a horizontal position in alignment with the inside handle, the hub 60a of the outside handle has secured thereto within the escutcheon 61 a plate 70, and springs 71 and 72 are secured at one of their ends to the plate 70 and at the other of their ends to the escutcheon 61. Thus it will be seen that rotation of the handle in either direction extends one or the other of these springs and that when the handle is released the spring which is placed under tension will return it to the neutral position shown in Fig. 8 where the springs are substantially at rest.

The operation of the latch mechanism is as follows.

The door is shown in closed position in Fig. 1 and the parts of the latch when the door is in this position are shown in Figs. 1 to 5. The door, as previously stated, may be readily opened from the outside by turning the handle 60 in either direction and as shown in Fig. 4 the rollback 66 will engage with the stud 30 on the latch member when the handle is rotated in one direction and will engage with the upper lug 28 on the latch when the handle is rotated in the other direction. This will raise the latch out of engagement with the keeper 14, rotating it about the pivot 22. The movement of the latch will be limited by the length of the slot 31 in plate 32 shown in Fig. 4.

If it is desired to open the door from the inside, the inside handle is rotated by turning it away from the observer as shown in Fig. 1 or in a counter-clockwise direction as shown in Fig. 5. This rotates the rollback 41 in a clockwise direction, shown in Fig. 2, or in a counter-clockwise direction shown in Fig. 5, as the views of Figs. 2 and 5 are looking in opposite directions. During this movement of the rollback, the shoulder 43 engages the upper of the lugs 29 shown in these figures and serves to lift the latch out of engagement with the keeper 14 by rotating it about the pivot 22. As heretofore stated, the rollback 41 and latch member 23 are eccentrically pivoted and therefore continuous movement of the rollback would push the lug 29 beyond the end of the surface 43 if the rollback were rotated through a sufficient angle. To prevent this occurrence, the rotation of the rollback is limited in this direction by engagement of the lug 46 with the hooked end 47 of the escapement member 49 so that while the latch is raised to a sufficient extent to clear the keeper 14 when the handle is released, the handle will be returned to its original position by engagement of the spring 55 with the stud 53 and the latch will again drop back to the position shown. It will be understood that the end 25 of the latch is cam shaped so that the latch will ride over the keeper when moved to closed position.

If it is desired to dog the latch against operation by the outside handle, the inside handle is rotated in a direction opposite to that just described, from the position shown in Figs. 1 and 5 to the position shown in Fig. 6, in which position it is vertically disposed. This rotation of the handle 36 serves to turn the rollback 41 from the position shown in Fig. 5 to that shown in Fig. 6, in which position the arcuate surface 44 stands over the lower of the two lugs 29 and thus dogs the latch against movement by the outside knob as it prevents the lifting of the latch about the pivot 22. It will be noted that, as shown in Fig. 2, when the rollback is moved in this direction, the lug 46 clears the hooked end 48 of the escapement member 49 so that the rotation of the rollback is not limited in this direction by the escapement member. Likewise, the lower shoulder 43, as shown in this figure, does not engage with the lower of the lugs 29 but, in this position of the parts, passes this lug. Also, as shown in Fig. 6, the stud 53 is engaged by the curved portion 57 of the spring 54 and the rollback and inner knob releasably held against accidental displacement, with the inner handle vertically disposed so that a user may instantly tell that the door is locked or the latch dogged against movement.

If it is desired to mount the latch on a door of the other hand, the lock case is simply inverted or turned through an angle of 180° about a horizontal axis so that the parts will be moved from the position shown in Fig. 2 to that shown in Fig. 9. It will be noted that the latch member 23 thereupon drops to the opposite end of the slot 27 and also the escapement member 49 drops about its pivot 50 to the position shown in Fig. 9. That is to say, the escapement member drops by gravity when the lock case is inverted so that in the position shown in Fig. 9 the opposite hooked end 48 will be contacted by the lug 46 to limit the movement of the rollback. With the latch member 23 and the escapement member 49 in the positions shown in Fig. 9, the operation of the inside handle will be exactly as previously described except that the rollback 49 will contact the other of the two lugs 29 to lift the latch, due to the fact that the rollback and latch member are both symmetrical with respect to center lines drawn through their pivots and due to the fact that the latch member occupies a different position of rest when the mechanism is inverted for a door of the other hand. That is to say, in one case one of the surfaces 43 contacts with one of the lugs 29 to lift the latch while in the other position as used with a door of the other hand, the other surface 43 will engage the other lug 29 to lift the latch, which other lug is brought into range of movement of the surface 43 by the movement of the latch, when inverted, from one end to the other of the slot 27.

When inverting the mechanism for use with a door of the other hand, it is necessary to change the position of the rollback 66. This is done by sliding the spindle 65 outwardly from the hub 35 of the inner handle to a slight extent and rotating this spindle until the end 67 of the rollback stands upon the other side of the stud 30. This will bring the cam surface 68 in engagement with the other of the two lugs 28 when the stud 30 is at the other end of the slot 31 from that shown in Fig. 4, as it will be when the latch is inverted. This slight change in the position of the rollback 66 is the only alteration necessary to change the latch from use upon a lefthand door to use upon a righthand door. This position of the parts is shown in Fig. 10. It may be noted that the rollback 66 is disposed nearer one end of the spindle 65 than the other end. With this arrangement, the spindle may be turned end for end and thus compensate for doors of different thicknesses.

While I have shown and described a preferred embodiment of my invention, it will be understood that it is not to be limited to all of the details shown but is capable of modification and variation within the spirit of the inventon and within the scope of the appended claims.

What I claim is:

1. A door latch mechanism comprising a case,

a latch member pivotally mounted in the case to swing about a horizontal axis and projecting from the case for engagement with a keeper, a latch actuating element carried by the case, said element being movable in one direction to swing the latch member upwardly and movable in the opposite direction to dog the latch member against movement, and a handle connected to said element to operate the latter, and means releasably holding said handle in a horizontal position when the latch member is engaged with the keeper and in a vertical position when the latch is dogged against movement.

2. A door latch mechanism comprising a case, a latch member pivotally mounted in the case to swing about a horizontal axis and projecting from the case for engagement with a keeper, a latch actuating element rotatably carried by the case, said element being rotatable in one direction to engage a part of the latch member and swing the latter upwardly and rotatable in the opposite direction to engage another part of the latch member and dog the latter against movement, a handle connected to said element to operate the latter, and means releasably holding said handle in a horizontal position when the latch member is engaged with the keeper and in a vertical position when the latch is dogged against movement.

3. A door latch mechanism comprising a case, a latch member pivotally mounted in the case and projecting therefrom to engage a keeper, a latch actuating element rotatably mounted in the case to swing about an axis eccentric to the pivot of said latch member, a lug on said member, said element having a part engaging below said lug when said element is moved to lift the latch, and means to limit movement of said element to hold said part in engagement with said lug.

4. A door latch mechanism comprising a case, a latch member pivotally mounted in the case and projecting through an elongated opening in the case to engage a keeper, a latch actuating element rotatably mounted in the case to swing about an axis eccentric to the pivot of said latch member, a pair of lugs on the latch member between which said element is disposed, said latch member lying adjacent one end of said opening in one position of the case and adjacent the other end of the opening when the case is turned through an angle of 180°, and said element when said latch member is in one of said positions being adapted when rotated in one direction to engage one of said lugs and move the latch member and when rotated in the other direction being adapted to engage the other lug and dog the latch member against movement and when said latch member is in the other position to engage said second lug to move the latch member and engage said first lug to dog the latch member against movement.

5. A door latch mechanism comprising a case, a latch member pivotally mounted in the case and projecting therefrom to engage a keeper, a latch actuating element rotatably mounted in the case to swing about an axis eccentric to the pivot of said latch member, a pair of lugs on said latch member between which said element is disposed, said element having spaced shoulders to engage one of said lugs to lift the latch member when the mechanism is mounted in one position on a door and being adapted to engage the other of said lugs to lift the latch member when the mechanism is turned through an angle of 180° about a horizontal axis, and means rotatably mounted in the case to engage and to limit movement of said element in a direction to lift the latch member.

6. A door latch mechanism comprising a case, a latch member pivotally mounted in the case and projecting therefrom to engage a keeper, a latch actuating element rotatably mounted in the case to swing about an axis eccentric to the pivot of said latch member, a pair of lugs on said latch member between which said element is disposed, said element having spaced shoulders to engage one of said lugs to lift the latch member when the mechanism is mounted in one position on a door and being adapted to engage the other of said lugs to lift the latch member when the mechanism is turned through an angle of 180° about a horizontal axis, and means having spaced stops thereon to engage and to limit movement of said element in a direction to lift the latch member, said means being movably mounted in the case to shift this position when the mechanism is inverted to limit movement of the element in the opposite direction to lift the latch member.

7. A door latch mechanism comprising a case, a latch member pivotally mounted in the case and projecting therefrom to engage a keeper, a latch actuating element rotatably mounted in the case to swing about an axis eccentric to the pivot of said latch member, a pair of lugs on said latch member between which said element is disposed, said element having spaced shoulders thereon to engage one of said lugs to lift the latch member when the mechanism is mounted in one position on a door and being adapted to engage the other of said lugs to lift the latch member when the mechanism is turned through an angle of 180° about a horizontal axis, an escapement member pivoted in the case having projecting ends, and one of said ends being disposed in the path of movement of a part of said element when turned in one direction in either position of the mechanism.

8. A door latch mechanism comprising a case, a latch member pivotally mounted in the case and projecting therefrom to engage a keeper, a latch actuating element rotatably mounted in the case to swing about an axis eccentric to the pivot of said latch member, a pair of lugs on said member between which said element is disposed, said element when turned in opposite directions being adapted to engage one of said lugs to lift the latch and the other lug to dog the latch against movement, and a swinging stop member to limit movement of said element when lifting the latch.

9. A door latch mechanism comprising a case, a latch member pivotally mounted in the case, a spindle rotatably mounted in the case, a handle at the outside of the door to operate said spindle, said latch member having a pair of outwardly projecting lugs thereon at one side of said spindle and an outwardly projecting stud at the other side of said spindle, and a rollback on said spindle having a part lying below and adapted to engage said stud and an opposite portion disposed between said lugs.

10. A door latch comprising a case, a latch member pivoted therein having a free end extending from the case to engage a keeper, a latch actuating element rotatably carried by the case to move about an axis disposed between the pivot and the free end of the latch member, said latch member having a pair of vertically spaced abutments thereon intermediate its ends, and said element being disposed between said abutments and serving, when moved in one direction, to en-

gage one of said abutments to actuate the latch and when moved in the other direction to engage the other of said abutments to dog the latch against movement.

11. A door latch comprising a case, a latch member pivoted therein having a free end extending from the case to engage a keeper, a latch actuating element rotatably carried by the case to move about an axis disposed between the pivot and the free end of the latch member, said latch member having a pair of vertically spaced abutments thereon intermediate its ends, and said element being disposed between said abutments and serving, when moved in one direction, to engage one of said abutments to actuate the latch and when moved in the other direction to engage the other of said abutments to dog the latch against movement, and an escapement member pivoted in the case to limit movement of said element when moved in a latch actuating direction.

12. A door latch comprising a case, a latch member pivoted therein having a free end extending from the case to engage a keeper, a latch actuating element rotatably carried by the case to move about an axis disposed between the pivot and the free end of the latch member, said latch member having a pair of vertically spaced abutments thereon intermediate its ends, said element being disposed between said abutments and serving, when moved in one direction, to engage one of said abutments to actuate the latch and when moved in the other direction to engage the other of said abutments to dog the latch against movement, an escapement member pivoted in the case to limit movement of said element when moved in a latch actuating direction, and said escapement member being freely pivoted in the case to drop by gravity when the case is turned through an angle of 180° about a horizontal axis to limit movement of the latch actuating element when turned in the opposite direction.

13. A door latch comprising a case, a latch member pivoted therein having a free end extending from the case to engage a keeper, a latch actuating element rotatably carried by the case to move about an axis disposed between the pivot and the free end of the latch member, said latch member having a pair of vertically spaced abutments thereon intermediate its ends, and said element being disposed between said abutments and serving, when moved in one direction, to engage one of said abutments to actuate the latch and when moved in the other direction to engage the other of said abutments to dog the latch against movement, said abutments being symmetrically disposed on said latch member, and means normally supporting said member in an inclined position.

HERMAN BLOSS.