Dec. 2, 1947. A. F. LICKTEIG 2,431,814

LOCKING LATCH

Filed Nov. 20, 1944 2 Sheets-Sheet 1

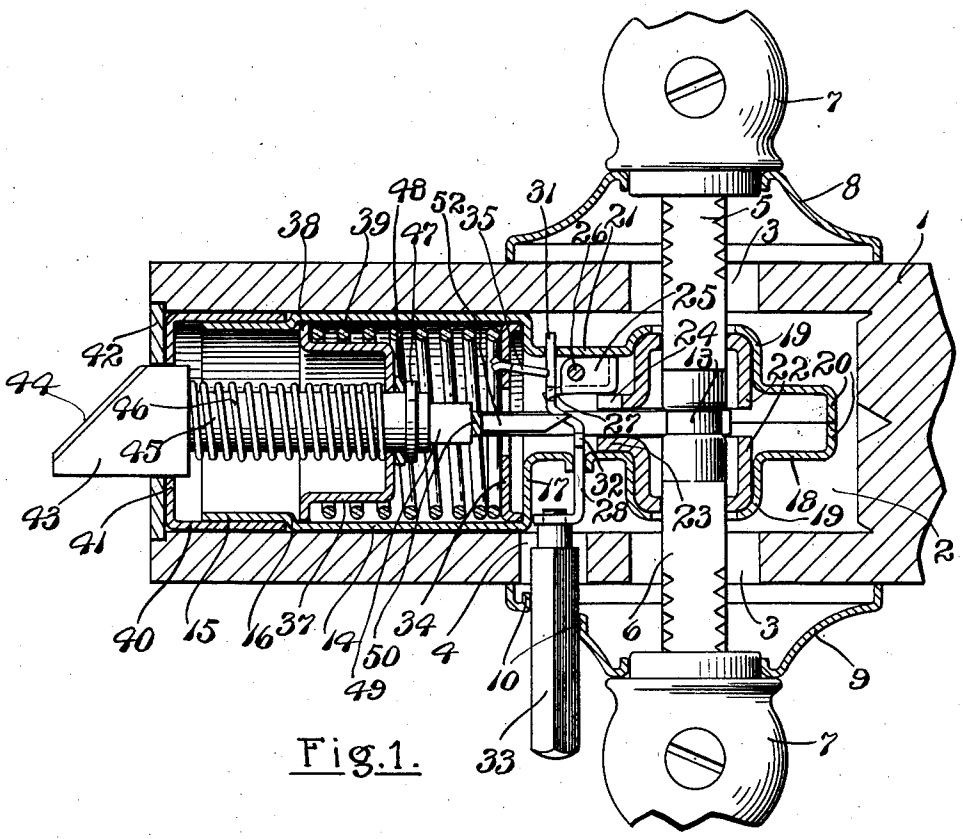


Fig. 1.

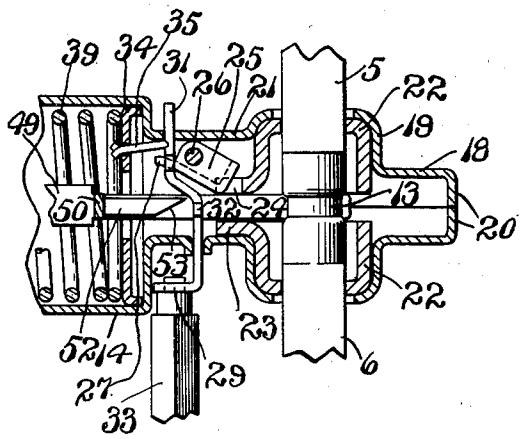


Fig. 2.

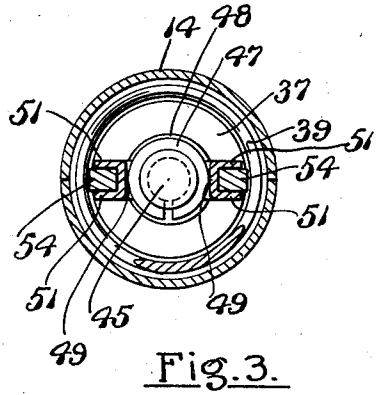


Fig. 3.

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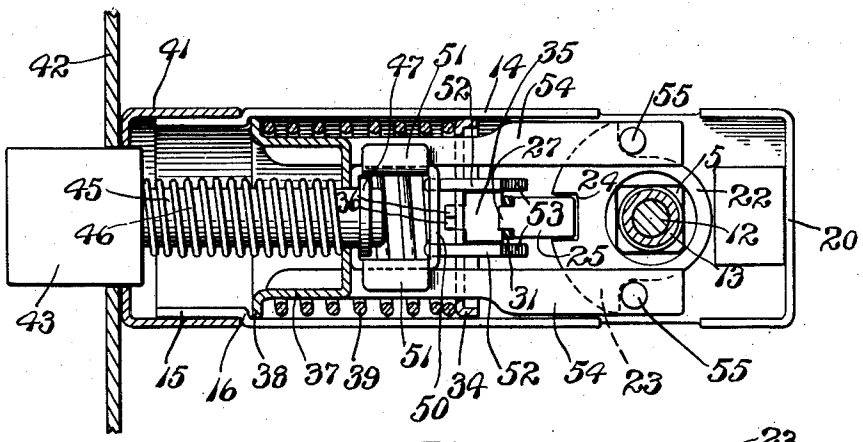


Fig. 4.

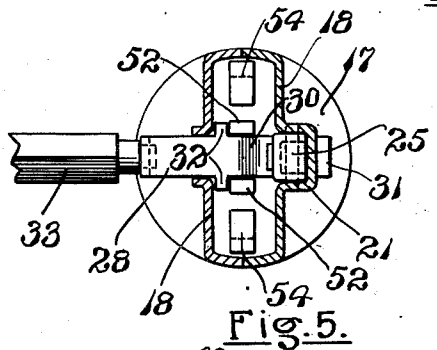


Fig. 5.

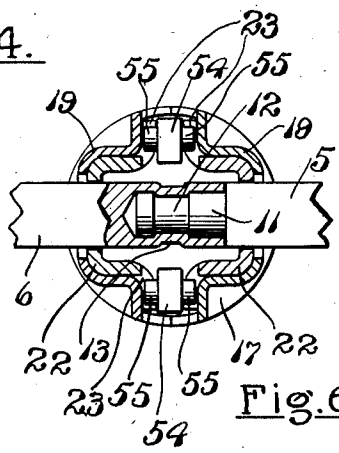


Fig. 6.

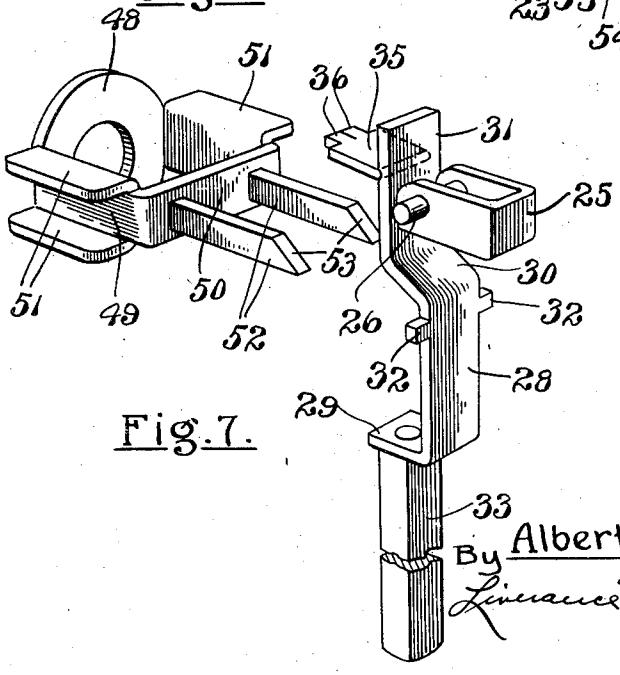


Fig. 7.

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LOCKING LATCH

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Application November 20, 1944, Serial No. 564,211

4 Claims. (Cl. 292—169)

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I have heretofore on August 16, 1944, made application for a locking latch construction, having Ser. No. 549,644. The present invention relates to door latches of the same type which may be locked against operation from the outer side of the door but readily operated at the inner side thereof. The same advantages and results of simplicity and economy of construction, ease of installation and surety in operation are obtained in a particularly practical and effective manner, and with a locking of the manual operating means at the outside of the door against operation through a direct but releasable connection thereof with the housing of the latch, with a greater strength and durability than previously obtained. Novel structure for the accomplishments of the ends stated and with the same or greater shortening of the over all length of the latch because of such construction will be apparent upon an understanding of the invention from the following description of a practical and preferred embodiment of the invention, shown in the accompanying drawings, in which,

Fig. 1 is a fragmentary horizontal section at the free edge portion of a hinged door having the locking latch of my invention installed therein, said latch also being shown in horizontal section and in its unlocked position.

Fig. 2 is a fragmentary view of the inner portion of the latch structure shown in Fig. 1, in the position of the parts when the latch is locked against operation from the outer side of the door.

Fig. 3 is a transverse vertical section through the latch in a plane immediately back of the inner end of the latch keeper engaging bolt.

Fig. 4 is a side elevation of the latch structure with one side of the housing removed and with parts of the interior latch structure shown in section.

Fig. 5 is a transverse section through the housing at the place of mounting of the manually operable means used therewith.

Fig. 6 is a transverse vertical section through the latch at the operating means therefor, and

Fig. 7 is a somewhat enlarged perspective view of the lock operating means, and the means used to automatically render it ineffective upon inward movement of the keeper engaging bolt as when a door carrying the latch is closed.

Like reference characters refer to like parts in the different figures of the drawings.

The latch is adapted to be mounted at the free vertical edge portion of a hinged door shown at 1, which door for the installation of the latch is bored inwardly to make a cylindrical opening 2

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for reception of the latch housing, and also bored transversely at 3 for the passage of the operating bars to which door knobs or the like are secured. In addition an opening 4 is bored transversely from the inner side of the door to the interior opening 2 for the passage of the manually operable means used to render the locking effective. As in my previously filed application above identified, a similar opening like that at 4 may be directly in line therewith at the outer side of the door for the same purpose but it is not shown in the present application, being fully shown in the one earlier filed.

Thorugh the openings 3 spindle bars 5 and 6 are passed each being square in cross section and at their outer ends having knobs 7 or the like connected thereto for manual turning. At the outer side of the door a sheet metal escutcheon 8 of conventional form is located between the knob and the side of the door. A similar escutcheon 9 is located at the inner side of the door and at one side in alignment with the opening 4 in the door has an opening of non-circular shape, with guides 10 turned inwardly for guiding the manually operable locking bar which as will later be described, is preferably polygonal in cross section and in any event will be on a non-circular cross sectional form. The spindle bars 5 and 6 at their adjacent ends within the opening 2 of the door and within the latch housing therein are connected together, one of the bars as 5 (Fig. 6) being formed with a cylindrical stem 11 extending from its inner end which between its ends is grooved annularly to make a reduced section 12, the opposite bar 6 at its inner end portion being interiorly bored to receive the cylindrical stem 11 and the parts connected together by spinning the metal inwardly as at 13 around the grooved section 12, connecting said bars 5 and 6 against longitudinal separation but permitting free rotative movement of each with respect to the other.

The latch includes a housing in which the major portion of the mechanism is mounted, made of two parts of substantially identical form which when brought together, with their edges in contact, complete the housing of the latch. When thus brought together and assembled the latch housing includes a cylindrical section 14 between its ends but toward the front portion thereof, with a second cylindrical section 15 of lesser diameter outwardly from the cylindrical section 14 with an annular shoulder 16 between and connecting the two cylindrical sections 14 and 15. At the inner end of the cylindrical sec-

tion 14 the metal is pressed inwardly at both sides of the housing providing a relatively large shoulder 17, and the housing is changed in shape to be of a substantially rectangular form as indicated at 18 (Fig. 5), from each side of which roll-back housing 19 are pressed outwardly. The inner ends of the housing are closed by inturned flanges 20 and at one side of the housing between the adjacent roll-back housing 19 and shoulder at 17 it is pressed outwardly as at 21 forming a housing section in which the immediate locking member, as hereinafter described, is located and mounted.

Within the roll-back housing portions 19 two roll-backs 22, one for each of said housings 19, are mounted to turn about a horizontal axis. They are made from sheet metal in a substantially cup like form and at their forward sides provided with arc-shaped flanges 23 in one at least of which a slot or recess 24 is cut. The flanges 23 as shown partly in dotted lines in Fig. 4 have shoulders at each end and the recess 24 is substantially midway between them.

A locking member or lever 25, also made from sheet metal, is pivotally mounted at 26 between the sides of the housing portion 21 in a position such that when turned about its pivot in a clockwise direction (Fig. 2) its free end portion will enter the slot 24 locking the roll-back adjacent the outer side of the door against rotative movement, while the opposite roll-back is free to be turned by manual operation of the knob connected to the bar 6. It is to be understood that the bars 5 and 6 are square in cross section and pass through squared openings in their respective roll-backs. When the locking member 25 is at its normal position, as in Fig. 1, it lies parallel to and against the inner side of the housing section 21, and the roll-back 22 adjacent the outer side of the door is also free to be turned on rotation of the bar 5 by its connected door knob. The locking member 25 at its other end has a projecting tongue 27 (Figs. 1 and 2). An operating bar of flat metal for the lever 25 is formed with a section 28 which passes slidably through one side of the housing between the adjacent shoulder 17 and the inner roll-back housing portion 19 and at one end is turned at right angles to make a section 29. Within the housing it is bent in the same direction at an obtuse angle to the section 28, forming an intermediate offsetting section 30, and terminated in an end section 31 which passes through a grinder opening in the lock housing portion 21 of the housing. The tongue 27 of the locking member 25 extends through an opening made for its passing in said section 31. From the section 28 near its joinder with the offsetting section 30 projections 32 one at each side extend outwardly therefrom (Fig. 7). A member 33 passes through the opening in the escutcheon plate 9 and is guided by the guides 10; and at its inner end is formed with a short screw portion to thread into an interiorly threaded opening made in the section 29 previously described. It is evident that by pushing against the outer end of the member 33, the locking member 25 is turned in a clockwise direction about its pivot 26 from the position in Fig. 1 to that in Fig. 2, thereby moving the locking member 25 into the recess 24 of the outer roll-back to hold in against movement and thus lock the bar 5 and the knob 7 connected therewith against operation.

At the inner end of the cylindrical portion 14 of the latch housing a disk 34 of metal is located

having edges which bear against the shoulders 17. Said plate is provided with openings for the passage of certain parts of the latch bolt and mechanism associated therewith. Between said plate and the inner section 31 of the bar previously described a member 35 of flat metal is disposed. Said member 35 at its end engaging said section 31 is preferably rounded and the adjacent side of the part 31 similarly recessed to receive it. At its opposite end the member 35 is reduced in width and provided with two side by side tongues 36 which may pass through an opening in the plate 34 and are bent in opposite directions.

A cup-like member 37 of sheet metal is located within the cylindrical portion 14 of the housing and at its open end has an outwardly extending flange 38 normally bearing against the annular shoulder 16. A heavy coiled compression spring 39 bears at one end against the flange 38 and at the other against the disk 34. It is evident that in the movements of the lock operating mechanism including the member 33 and the bar connected therewith, that the member 35 between the plate 34 and section 31 of said bar, in moving from the position in Fig. 1 to that in Fig. 2 and back moves the plate 34 against the spring 39, the greatest extent of movement being at the intermediate position of said member 35, whereby the force of the spring is exerted to normally yieldingly hold the roll-back lock 25 in either position to which it may take.

The outer end of the housing is closed by a sheet metal cup-like member 40 having a cylindrical skirt passing over the outer cylindrical section of the latch housing, and having an outer end 41 to which a rectangular plate of metal 42 is normally secured in the usual manner of latches of this character, both the end 41 of the cup housing member and the plate 42 having alined rectangular openings for the passage of the keeper engaging head of the latch bolt. In the installation of the latch the housing is entered into the cylindrical opening 2 until said plate comes to the edge of the door, which normally is mortised a sufficient depth to receive it, this being conventional practice.

The keeper engaging head 43 of a latch bolt passes through said alined openings, said head having a beveled side 44 of conventional structure and at its inner end being connected with a cylindrical rod 45 which passes through an opening in the bottom of the cup-shaped member 37. A relatively light coiled compression spring 46 is disposed around the rod and seated at its ends against the inner side of the head 43 and against the bottom of the member 37. The rod at its inner end is annularly grooved for the reception of a split spring ring 47 having an exterior diameter larger than the opening in the bottom of the member 37. Before applying said split ring to the rod, a member (Fig. 7) is located over the inner end of the rod to normally engage against the other side of the bottom of the cup member 37. Such member has a disk shaped outer end 48 with a central opening for the passage of rod 45, from opposite sides of which bars 49 extend inwardly, being connected integrally by the cross bar 50, and from the upper and lower edges of the inwardly extending bars 49 flanges 51 are bent to extend in an outward direction. Two fingers 52 spaced from each other are connected at one end to the cross bar 50 and extend rearwardly therefrom, at their free ends being beveled as shown at 53.

Two bars 54 are permanently connected at their outer ends to the cup member 37 and extend inwardly into the housing to and beyond the flanges 23 of the roll-backs, said bars at their rear end portions being widened so as to bear substantially against diametrically opposite inner sides of the housing. Each bar adjacent its inner end is provided with a pin 55 the end portions of which extend to each side of the bars 54 back of the shoulders of the roll-back flanges 23 (Fig. 4).

With the construction as described the springs 39 and 46 move the parts associated therewith to outer position, as in Fig. 1, under normal conditions. With the latch mounted on a door, as in Fig. 1, on closing the door the inclined side 44 of the projecting head 43 of the latch bolt, striking the keeper, causes the head 43 and rod 45 to be moved inwardly with a compression of the lighter spring 46. After the head and the attached rod 45 have moved inwardly a predetermined distance the inner end of the rod strikes the bar 50 and moves the member of which bar 50 is a part inwardly, the flanges 51 sliding upon bars 54 and carrying the fingers 52 inwardlly. If the outer roll-back lock 25 has been moved to the position shown in Fig. 2, the beveled ends of the fingers ride against the projections 32 with the result that the lock 25 is disengaged from the recess at 24 and moved to the position shown in Fig. 1.

With the outer roll-back 25 unlocked as in Fig. 1, the latch bolt may be retracted from either side of the door by turning the selected knob 7. For example, if the knob 7 at the outer side of the door is operated and spindle bar 5 turned about its axis, the roll-back 22 associated therewith, by engagement of the shoulders of its flange 23 with the pins 55 on bars 54 will retract the cup member 37 against the heavier spring 39, and such inward movement of the cup member 37 will cause an inward movement of the latch bolt head 43 to disengage from the keeper with a simultaneous inward movement of the fingers 52. Such operation of the outer knob and its connected bar 5 is prevented when the locking member or lever 25 is in the notch or recess at 24, as in Fig. 2, therefore the latch is locked against operation from the outer side of the door under such conditions.

But the spindle bar 6 may still be operated by the knob 7 at the inner side of the door to retract the latch bolt, and under such conditions the fingers 52 will, upon their movement inwardly, engage with the projections 32 and move the locking member 25 from its locking position in Fig. 2 to that shown in Fig. 1. In other words, any inward movement of the latch bolt to or approaching its extreme position either by a closing of the door or by a latch bolt retraction through operation from the inner side of the door will automatically move the locking member 25 from locking operative to unlocking inoperative position.

In the use of the latch it is primarily directed for application to and installation on bathroom doors. After the door is closed the member 33 may be pushed upon at its outer end from within the room and the locking lever 25 moved to operative position (Fig. 2). It is not necessary to pull outwardly on the member 33 to unlock the latch bolt, as opening the door from its inner side will automatically perform such function. From the outer side of the door the latch bolt cannot be retracted as long as the door is closed under such conditions.

The construction described is economical to produce, durable, sure in its operation and readily manufactured and assembled. The locking member or lever 25 mounted directly on the housing is strong and sturdy and there is no liability of any of the parts getting out of order. The pressure exerted upon the terminal section 31 of the locking member operating means by the spring 39 as described holds the locking lever 25 in either of its positions against accidental or aimless movement, thereby insuring against an accidental positioning of the locking member 25 in the notch 24 while the door is closed with an impossibility of opening the door from its outer side.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. A latch comprising, an elongated tubular housing open at one end, a spring actuated latch bolt adapted to normally project at the open end of the housing, two operating spindle bars extending into opposite sides of the housing and meeting therewithin, means rotatably connecting said spindle bars at their meeting ends and holding them against longitudinal separation, a roll-back on each of said spindle bars within the housing connected therewith to turn each with the bar to which connected, one of said roll-backs having a recess therein, a locking member pivotally mounted and located within the housing in one position entering said recess of said roll-back and locking it and associated spindle bar against turning movement, and a manually operable bar connected with said locking member slidably passing through the housing and adapted to be manually moved to turn said locking member to position it in the recess of said roll-back.

2. A locking means for a retractable latch having a housing in which a retractable latch bolt is mounted comprising, a movably mounted locking member mounted on and within the housing, a roll-back mounted for rocking movement within the housing having a recess to receive said locking member, said roll-back being connected with a manually operable means for turning it located at one side of the latch, and a manually operable bar passing slidably through said housing and connected with the locking member for moving it to position in the recess of said roll-back, thereby locking the roll-back and associated manual operating means therefor against movement, said movably mounted locking member being pivotally mounted between its ends with the free end located adjacent and adapted to move into said recess of the roll-back, and the opposite end being pivotally connected to said slidably mounted bar.

3. A locking means for a retractable latch having a housing in which a retractable latch bolt is mounted comprising, a movably mounted locking member mounted on and within the housing, a roll-back mounted for rocking movement within the housing having a recess to receive said locking member, said roll-back being connected with a manually operable means for turning it located at one side of the latch, and a manually operable bar passing slidably through said housing and connected with the locking member for moving it to position it in the recess of said roll-back, thereby locking the roll-back and associated manual operating means therefor against movement, said locking member comprising a lever pivotally mounted between its ends and car-

ried on and within said housing with the free end of the lever movable into and out of said recess in the roll-back, said opposite end of the lever having a pivotal connection with said slidably mounted bar, and spring means acting against said bar to move said bar to and yieldingly hold it in the two extreme positions which it may occupy, in one of which the locking member is located in said recess of the roll-back and in the other of which it is out of said recess.

4. A latch comprising a housing, a latch bolt retractably mounted in said housing, a roll back rotatably mounted in said housing, means for rotating said roll back, means for retracting said latch bolt actuated by rotation of said roll-back, a notch in said roll back, a recess in said housing, a locking member pivoted within said recess on an axis transverse to the axis of the roll-back and

closely fitting against the sides of the recess and manual means for pivoting said locking member to enter the notch in said roll-back to prevent rotation thereof.

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