June 14, 1949. A. VANDER HENST 2,473,080

BATHROOM LOCKING LATCH

Filed March 14, 1945 2 Sheets-Sheet 1

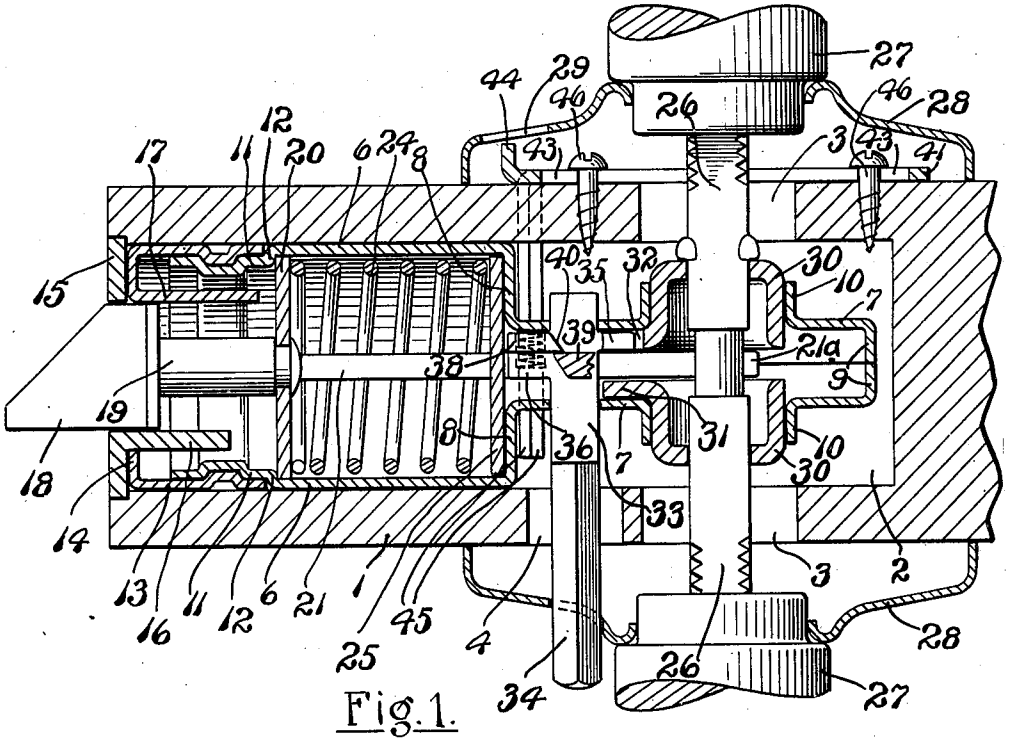


Fig. 1.

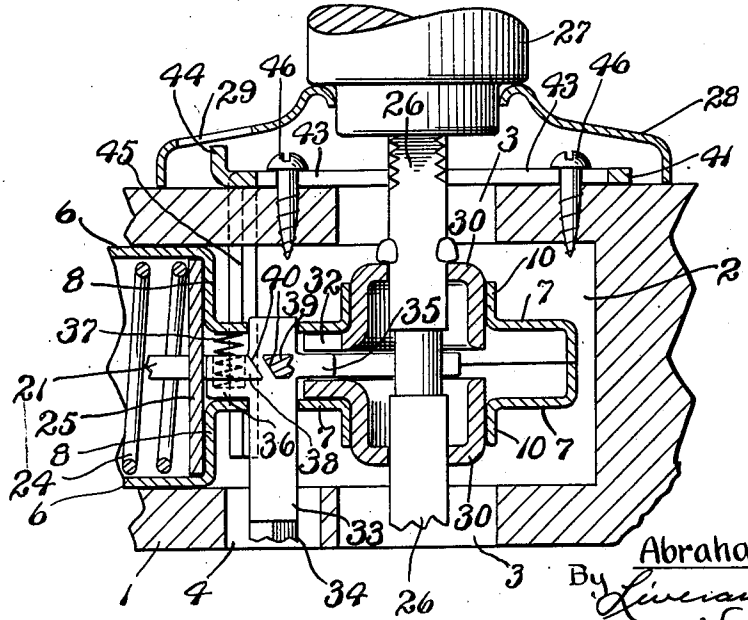


Fig. 2.

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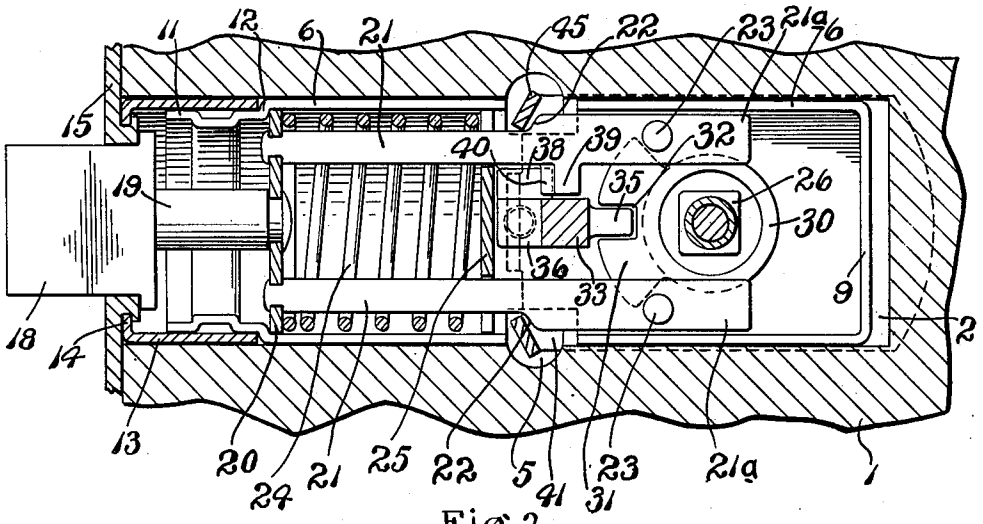


Fig.3.

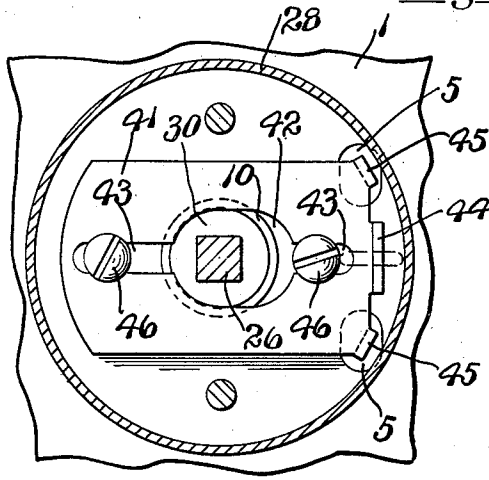


Fig.4.

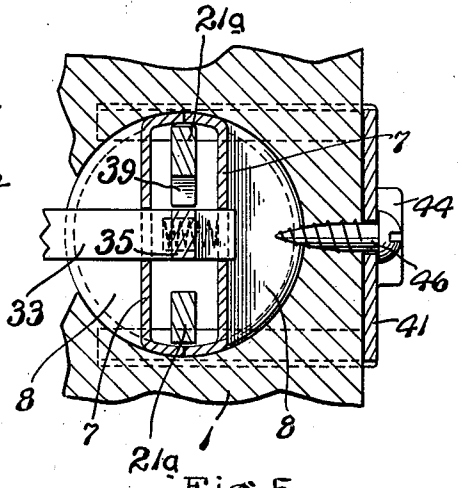


Fig.5.

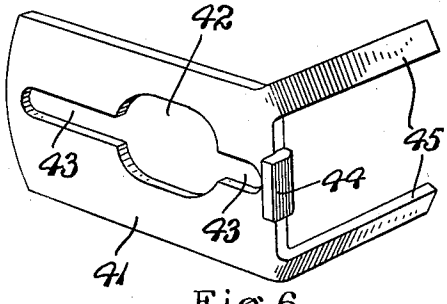


Fig.6.

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BATHROOM LOCKING LATCH

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5 Claims. (Cl. 292—169)

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This invention relates to locking latches, that is, latches of the type which have been commonly designated as bathroom latches, in which the latch bolt may be locked from the inner side of the door against operation from the outer side thereof, but which bolt is readily retracted by turning the knob at the inner side of the door.

The present invention is directed to the provision of a novel means for an emergency release of the locking which has been done at the inner side of the door, so that the door may be opened from its outer side should it become necessary. Such emergency mechanism normally would not need to be utilized, and for its operation there will be required a getting of a key to be used for manually operating the release mechanism installed as a part of and upon the door on which the entire latch mechanism is mounted; such key in practice being usually conveniently positioned near the door for ready use when needed.

The invention is of a simple, very practical and easily installed character, is sure in its operation and sturdy and durable in service. An understanding thereof may be had from the following description, taken in connection with the accompanying drawings, in which,

Fig. 1 is a horizontal section through a free edge portion of a door on which a latch is installed, the latch structure being likewise shown in horizontal section, and with the parts in the positions accepted when the latch bolt is locked against operation from the outer side of the door.

Fig. 2 is a fragmentary horizontal section similar to Fig. 1, with the lock in its normal position in which the latch bolt is free for retraction by turning the knob at either side of the door.

Fig. 3 is a vertical longitudinal section through the latch structure and the adjacent portions of the door.

Fig. 4 is a vertical section through the escutcheon at the outer side of the door and showing the movable lock release plate in elevation, the plate of said section being substantially parallel to the plate of the adjacent side of the door.

Fig. 5 is a fragmentary transverse vertical section through the latch housing and mechanism, the plane of the section being substantially at the location of the locking push rod, and

Fig. 6 is a perspective view of the manually operable movable release plate mounted against the outer side of the door within the covering outer escutcheon.

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

The door 1, for the installation of the latch, is bored from its free vertical edge into the body of the door for a distance to provide a cylindrical receiving opening 2. Transverse openings 3 are made through the door communicating with the opening 2 for the passage of the operating

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spindle bars. An additional transverse opening 4 is made from the inner side of the door to said interior opening 2 for passage of the locking push rod, and from the outer side of the door two spaced apart openings 5 are made to the inner cylindrical opening 2 (Fig. 4) for the passage of the operating fingers of the lock releasing plate. Such openings are very readily and easily made and the door may be prepared for the latch installation with a minimum of work and expense.

In the construction of the latch shown, an elongated housing made from sheet metal includes two substantially identical parts, the forward portions of which are of semi-cylindrical form as shown at 6, and the inner portions of substantially channel shape indicated at 7, the inner and outer portions of the housing members being connected by vertical transverse shoulders 8 as shown. In the assembly of the housing, the two members are placed with their edges in contact and the inner end is closed by the end members 9 which may be secured together in any preferred manner. In the length of the inner part of the housing the webs of the channel shaped sections 7 are pressed outwardly to provide cylindrical bearing sleeves 10 for the mounting of roll-backs, hereinafter described.

At their outer end portions the semi-cylindrical parts 6 of the housing are reduced in diameter, as at 11, providing an inwardly extending continuous annular shoulder 12 within the housing when the parts are assembled. Over the reduced diameter outer end portion of the housing a cup of sheet metal, having walls 13 and a bottom 14, is located to maintain the parts in fixed relation to each other, being releasably secured thereto in an old and well known manner, the detail of which is no part of the present invention. A face plate 15 is permanently secured to the bottom 14, both said plate and said bottom 14 having openings in conjunction for the passage of the projecting latch bolt head, and with inwardly extending guides 16 and 17, respectively, on said plate and the bottom 14 of the cup member formed integral therewith.

The bolt head 18 is of a conventional structure, beveled at one side for riding over a strike plate of a keeper on the door jamb, with which keeper the latch bolt engages in closing the door. It passes through the openings in plate 15 and the cup bottom 14 previously mentioned, and at its inner end has connected thereto a short rod 19 which is secured, as shown in a manner permitting ready turning of the head and rod through 180° for right and left doors, to the central portion of a disk 20 located in the larger diameter part of the housing and stopped against outer movement beyond a predetermined position by engagement against the annular shoulder 12 previously described. Two retractor bars are con-

nected at their outer ends to the plate 20, extend inwardly lengthwise of the housing and centrally thereof, and at their inner portions (Fig. 3) are widened, as shown at 21a, with shoulders 22 at the juncture of the narrower and wider portions of said bars. Pins 23 pass one through each of the inner wider portions 21a of each bar, extending at each end beyond the sides of said bars. A relatively heavy coiled spring 24 is located within the housing bearing at its front end against the inner side of the plate 20 and, at its rear end against a transverse plate 25 which is notched for the passage of the bars 21 in opposite sides, and which seats against the transverse shoulders 8.

Operating spindles 26 preferably square in cross section and each adapted to have a door knob 27 secured thereto at its outer end are passed through the openings 3 into the latch housing substantially centrally of the bearing sleeves 10, and are connected at their inter-meeting ends so as to be held against lengthwise displacement or disconnection but to permit independent rocking of either about the common longitudinal axis of each. The detail of the means used for thus connecting the spindle bars 26 at their inner ends is old and need not be further described. Between the door knobs and adjacent sides of the door the usual escutcheon plates or roses 28 of a decorative character are located and secured. The outer escutcheon 28 at the proper place therein has an opening 29 through it as shown in Figs. 1 and 2.

Roll-backs 30 of conventional form and structure are mounted in each of the bearing sleeves 10 and have squared openings for the passage of the spindle bars 26, requiring each roll-back to turn or rock with the rocking movement of its respective spindle bar. Each of the roll-backs within the housing has an arcuate flange 31 extending in an outward direction, and the ends of said flanges reach substantially to the projecting end portions of the pins 23 previously described (see Fig. 3), whereby on turning either of the operating spindle bars 26 about its longitudinal axis the latch bolt as a whole is retracted, compressing spring 24 and moving the bolt head 18 to the right (Fig. 1) between the guides 16 and 17. The ends of the bars 21a coming against the ends 9 of the housing members limit the extent of rocking movement of the spindle bars and their associated roll-backs. The flange 31 of the roll-back adjacent the outer side of the door has a substantially rectangular shaped notch 32 formed therein midway between the ends of said flange (Fig. 3). The flanges 31 of the roll-back are spaced a distance from each other within the housing so that the bar sections 21a may move freely therebetween.

A locking push bar 33 is mounted transversely of and passes through the spaced webs of the channel inner portions 7 of the housing, and at its end adjacent the inner side of the door has a non-circular, preferably square operating bar 34 usually screw connected therewith for ease of assembly, which passes through an opening in the escutcheon 28 at the inner side of the door of the same non-circular shape so as to hold the bar 34 against rotation.

The push bar 33 is located immediately outward of the flanges 31 of the roll-backs and at the side thereof adjacent the edges of said roll-back flanges has a laterally projecting lug 35, preferably rectangular in cross section which, upon a longitudinal movement of the push bar imparted thereto by pushing upon the end of the bar 34 at the inner side of the door, enters the recess at 32 in the flange of the outer roll-back, locking it and its associated spindle bar and outer door knob against movement.

At the opposite side of the locking push bar 33 a lateral arm 36 is formed integrally with the push bar and is normally acted upon by a light compression spring 37 (Fig. 2) to cause the push bar to occupy the position shown in Fig. 2 against the web of the channel 7 of the latch housing nearest the inner side of the door. A lug 38 integral with the arm 36 extends above it and above the push bar 33 as shown, normally occupying a central position between the opposed webs of the channel section 7 of the inner end portion of the latch housing (Fig. 2). The retractor bar 21 has integral therewith a downward extending projection 39 which, when the locking push bar is in its normal position, as in Fig. 2, is located in the same plane with the projection 38. Said projections 38 and 39, at their adjacent edges are cut at an angle providing inclined edge faces 40 located in substantial parallelism with each other. It is of course evident that projection 39 may be duplicated on the other bar 21 and a second cooperating projection 38 provided at the opposite side of the part 36.

With the parts in the position shown in Fig. 2 when the locking push bar 33 is moved transversely of the housing to the position shown in Fig. 1 the inclined faces 40 of the parts 38 and 39, previously described, come into contact engagement and the inclined faces 40 of the parts 38 will bear against the similar faces on the projections 39, causing the latch bolt as a whole to be moved slightly inward or until the nose at the inner edge of the parts 38 have passed by the projections 39, whereupon the latch bolt will move outwardly under the influence of the spring 24, which previously has been slightly compressed and the locking bar 33 is securely held in position against the normal tendency of the spring 37 to return it to its initial position, and with the lug 35 received within the recess 32 of the outer roll-back flange. Under such conditions it is evident that while the inner door knob 27 may be freely operated the outer door knob cannot be and the door is thereupon locked against opening from its outer side.

It is also apparent that upon any turning of the inner door knob 27 a retraction of the latch bolt as a whole occurs moving projection 39 inwardly to disengage it from the projection 38 thus freeing the locking push bar which will return to its normal position in Fig. 2 under the action of the spring 37. Also a pressure against the outer end of the latch bolt head 18 with a consequent inward movement of the retractor bars 21 will result in the same release and return of the locking push bar 33. But without the further mechanism about to be described, it would be impossible to release the lock from the outer side of the door when the door is closed with the latch bolt head 18 and the inner door knob inaccessible from the outer side of the door, which is very desirable in case of an emergency, which would otherwise require breaking down the door, getting into the locked room through a window, or otherwise with delay and usually damage.

With my invention, located within and covered by the outer escutcheon 28 a flat plate 41 is placed against the outer side of the door. Such plate has an opening 42 through it large enough for

the passage of the outside spindle bar **26**, and to permit a limited longitudinal movement of the plate with respect to said spindle. From opposite ends of the opening **42** slots **43** are cut as shown. At the end of the plate directly in line with the opening **29** in the escutcheon **28** a tongue **44** is turned outwardly. At the same end of the plate, at each corner, relatively long fingers **45** are turned inwardly passed through the openings **5** in the door and alongside the shoulders **22** (Fig. 3) made where the bars **21** are increased in width to make their inner sections **21***a*. Such plate **41** is secured to the outer side of the door by means of screws **46** which pass through the slots **43**. The screws **46** are not tightened against the plate but the heads thereof are stopped a short distance from the outer side of the plate whereby said plate **41** may have a face but limited longitudinal movement. Accordingly when for any emergency purpose it is desirable to open a locked door equipped with the previously described latch structure, a key may be inserted through the opening **29** against the ear **44** and by pressure to the right (Fig. 1), the fingers **45** engaging the shoulders **22** will move the latch bolt, and particularly the retractor bar **21** which has the finger **39** thereon, inwardly so as to free the projection **38** from the part **39**, whereupon the spring actuated locking bar **33** will move to its unlocked position, as in Fig. 2, and the latch will be freed for operation by turning the knob **27** at the outer side of the door.

The construction described is very practical and useful. It is based upon the principle of construction that by reaching the retractable latch bolt through the outer side of the door by a movable means engaging with such latch bolt, so that the bolt may be sufficiently moved to render the locking bar inoperative, such emergency release of the locked bolt from the outer side of the door may be accomplished. The specific structure described, while a very practical and useful one, is not to be considered the sole lock releasing mechanism operating upon such principle, but the invention is to be comprehensive of all structures of mechanically equivalent form and nature coming within the scope of the appended claims which define the invention.

I claim:

1. In a latch structure, an elongated housing open at one end, a spring actuated latch bolt having a head normally projecting at the open end of the housing, said latch bolt having a length approximating the length of the housing, two manually operable retractor means mounted on at each side of the inner portion of the housing, each being operatively connected with the latch bolt and each being independently operable, a locking push bar passing transversely through the housing and movably mounted thereon for longitudinal movement located between the bolt head and retracting means, means carried by said push bar and means on one of said retractor means engageable thereby for locking said retractor means against operation, spring means associated with said locking push bar normally moving it to a neutral unlocked position, cooperating lugs having substantially parallel angularly positioned adjacent faces on said push bar and latch bolt, said angular faces engaging with each other and by cam action slightly retracting the latch bolt when the push bar is moved to locking position, said lugs passing by each other and the lug on the latch bolt on spring return of the latch bolt to its fully projected position interposing in the path of movement of the lug on said push bar to hold it in locked position, and a member extending into said housing at the same side thereof as the lockable bolt retracting means, combined with means on the latch bolt with which said member engages, said member being manually movable to retract the latch bolt a slight distance to free said locking bar for spring return to its normal position.

2. A construction as defined in claim 1, said locking bar release means comprising, a plate adapted to be slidably connected to a side of a door on which the latch mechanism is installed, and a finger extending from said plate to and into engaging proximity with a part of the latch bolt, said part on the latch comprising a shoulder for engagement of the finger thereagainst, whereby on moving said plate to press said finger against said shoulder and move the latch bolt to slightly retract it, said locking push bar is released from its locked position to return to neutral unlocked position.

3. A construction as defined in claim 1, said locking push bar release comprising, a plate adapted to be mounted at the other side of the door and having a central opening and opposite slots extending from the opening for the passage of screws through said slots to attach to a door, the central opening permitting the passage of a manually operated spindle at the outer side of the door as a part of one of the independent means for retracting the latch bolt, an escutcheon adapted to be secured to said door to cover said plate, said plate at one end having two spaced fingers adapted to extend through openings made in the door to and into said housing of the latch bolt, said latch bolt having shoulders for the fingers to engage against and said plate having an upturned tongue, the covering escutcheon having an opening for access to the tongue permitting engagement thereof to move the plate and press said fingers against the shoulders of the latch bolt and move said latch bolt to release the locking push bar from its locking position.

4. A latch comprising a casing, a latch bolt slidably mounted in said casing, means for retracting said latch bolt, two independently rotatable knobs each having means for operating said retracting means, means extending adjacent one knob for locking the other knob, a spring acting to move the locking means to unlocked position, means on said retracting means for holding said locking means in locking position and for releasing the locking means upon retraction of said retracting means, and means extending adjacent said other knob manually operable to retract said retracting means.

5. The elements of claim 4 in which said latch is adapted to be embedded in a door and said last named means is slidably mounted upon a face of said door.

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