Feb. 25, 1941. H. TER MEER ET AL 2,233,353

DOOR LATCH

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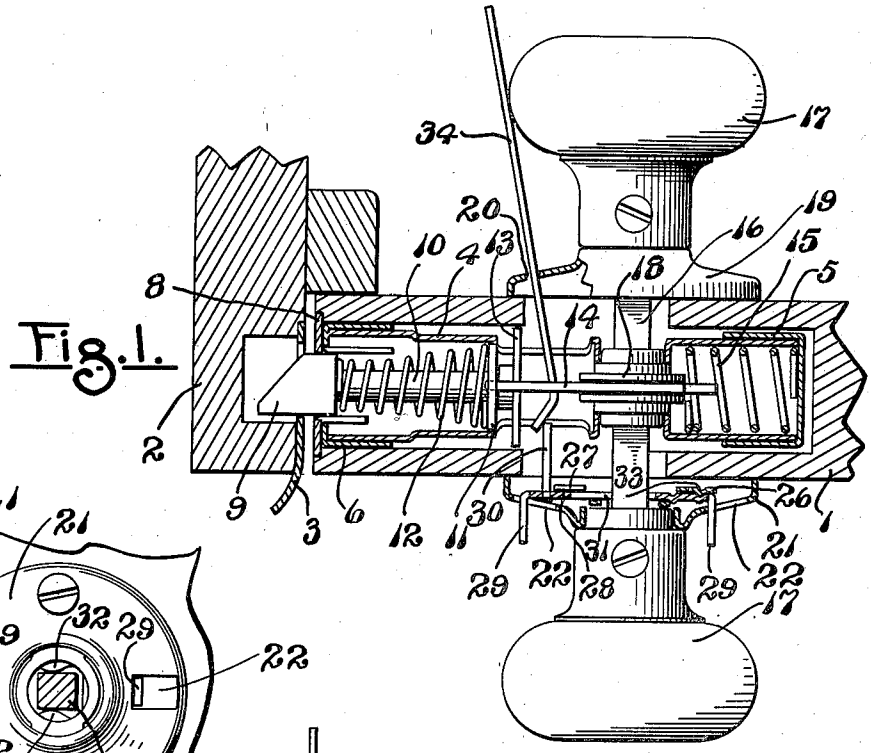


Fig. 1.

Fig. 3.

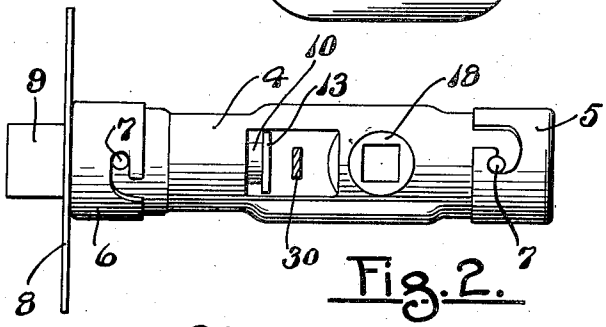


Fig. 2.

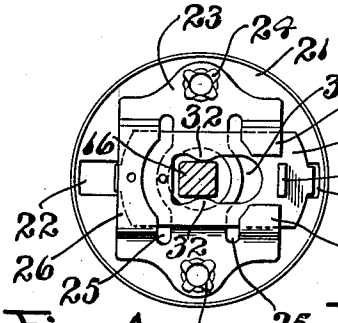


Fig. 4.

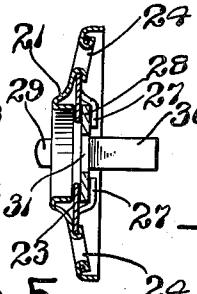


Fig. 5.

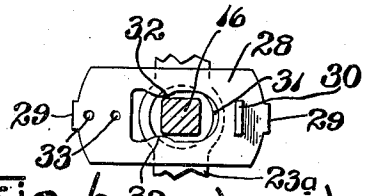


Fig. 6.

Inventors
Herman Ter Meer
Abraham VanderHenst
Charles F. Bradfield

By Livernace and Van Antwerp
Attorneys

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DOOR LATCH

Herman Ter Meer and Abraham Vander Henst, Grand Rapids, Mich., and Charles F. Bradfield, Portland, Oreg., assignors to National Brass Company, Grand Rapids, Mich., a corporation of Michigan

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5 Claims. (Cl. 292—359)

This invention relates to a door latch or lock and it is primarily concerned with a novel improvement upon a door latch by means of which it can be very quickly and easily locked against movement and quite as readily released from movement. The latch with the lock of our invention thereon is particularly applicable to bathroom doors, for example, which are to be locked from the inside.

One object and purpose of the present invention is to provide a lock which being manually operable may be readily moved either to its locked or unlocked position and also which if moved to its locked position when the door is open, is automatically returned to unlocked position upon closing the door, therefore from the side of the door opposite that to which the lock is mounted it is substantially insured that when the door is closed on leaving the room irrespective of what may have been the position of the lock when the door is closed it will be in unlocked position for entrance into the room.

A further object of the invention is to provide a means for releasing the lock from the outside in case of emergency as, for example, when a child operates the lock to its locking position and does not know what to do to release the lock.

A further object of the invention is to provide a lock which will work under the conditions named and this irrespective of the fact that with a swelling or shrinking of the door the extent of the inward movement of the latch bolt automatically taking place when the door is closed, at times does not fully and completely release the lock, yet in all cases it will sufficiently release the lock that by turning a knob of the latch the lock will then be fully released. Furthermore, when the lock has been moved to its locked position any attempt to turn the door knob will act to more firmly hold the locking mechanism in locked position.

These and many other novel features of operation with novel constructions to produce the same may be understood from the following description taken in connection with the accompanying drawing, in which,

Fig. 1 is a horizontal section through a fragmentary portion of a door and door casing showing a preferred construction embodying our invention.

Fig. 2 is a side elevation of the construction to which our invention is applied.

Fig. 3 is an elevation of the escutcheon plate at the inner side of the door upon which the manually operable lock is mounted.

Fig. 4 is an inner elevation of such an escutcheon plate and the locking mechanism mounted thereon.

Fig. 5 is a vertical section therethrough, and

Fig. 6 is an elevation illustrating a position of the movable locking plate when it has not been moved to fully unlocked position.

Like reference characters refer to like parts throughout the various views.

The latch to which our invention is applied is mounted in a mortised opening bored horizontally at the edge of the door 1, which door at its free vertical edge comes to a door casing 2 when it is closed upon which is a strike plate 3. The latch consists of a substantial cylindrical elongated housing 4 made in two parts which are held together at their ends by closure caps 5 and 6 which detachably connect with pins 7 on the parts of the housing 4, using bayonet slots as shown in Fig. 2. The cap 6 has a plate 8 secured at its outer end which is directly screw connected to the door and through this plate and the end of the cap the beveled head 9 of the latch bolt passes.

The latch bolt in addition to the head 9 includes a rod 10 which extends lengthwise through the outer part of the housing, on which a transverse plate 11 is mounted with a coiled spring 12 between the head 9 and the plate. The plate 11 is held against inward movement in the housing but the rod and the head 9 may move inwardly with a consequent compression of the spring 12. At the inner end of the rod 10 a second plate 13 is permanently connected and is movable with the rod, at its ends extending through openings made on opposite sides of the housing 4. A yoke 14 of flat metal is secured at one end to the plate 11 and extends lengthwise through the middle portion of the housing and bears at its inner end against a coiled spring 15 which is seated against the closure cap 5.

A rock shaft or spindle 16 square in cross section passes transversely through the door and has a door knob 17 secured at each end thereof. The spindle 16 extends through a rotatable actuating member 18 which is associated with the yoke 14 in such a manner that on rotation of the spindle 16 by turning either knob in either direction the latch bolt is retracted with a compression of the spring 15.

The structure so far described is a substantial duplicate of the latch construction shown in Patent No. 1,868,984, issued July 26, 1932, upon the application of Albert F. Lickteig.

With our invention the escutcheon plate 19 at

the outer side of the door is provided with an opening 20. The transverse openings through the door through which the squared spindle 16 passes are elongated toward the edge of the door for a considerable distance and greater than is required for the passing of the spindle 16 so that, as will hereinafter appear, an emergency unlocking tool may be inserted through said opening 20.

The escutcheon plate 21 at the inner side of the door is provided with dametrically opposed openings 22. A mounting plate 23 extends across the escutcheon plate and is housed therein and has a connection at 24 at each end firmly securing the mounting plate to the escutcheon. This mounting plate is slotted at two places at 25 symmetrically with respect to the center line of the mounting plate 23 and the metal at one side thereof is pressed inwardly to make a guide 26. The metal at the other side of the mounting plate is likewise pressed inwardly in the same manner but has the central portion of it removed providing two offset lips 27. A locking plate 28 is slidably mounted to ride upon the central portion 23*a* (Fig. 6) of the mounting plate 23 and between such central portion and the parts 26 and 27. The locking plate at each end has an outturned finger engageable tongue 29 passing each through an opening 22 in the escutcheon 21. At the end of the locking plate nearest the edge of the door a flat ear 30 is permanently secured and extends inwardly substantially to the housing 4 of the latch and into the path of the plate 13 on the rod 10 (Fig. 1).

The locking plate 28 has an opening 31 therethrough of the form shown in Figs. 4 and 5 substantially at its middle portion. At one end this opening is large enough so that the spindle 16 which passes through the plate may be freely turned or rocked about its axis. Toward the opposite end portion the opening is reduced in width by the humps 32 which extend toward each other. These humps or projections are spaced apart a distance substantially equal to the diameter of the spindle 16 between its flat sides and have convex edges and where they nearest approach each other are far enough apart that the spindle 16 may pass therebetween but when between them cannot be turned. The locking plate 28 and the part 26 of the guide or mounting plate 23 are provided with cooperating indents 33 so that the locking plate is yieldingly held at its two extreme positions of movement.

It is evident that with the locking plate 28 moved to the position shown in Figs. 1 and 4, the projections or humps at 32 are disposed at opposite sides of the squared spindle 16 and the latch is held against operation and the door locked against opening. The highest points of the humps 32 in such position are disposed (as in Fig. 4) a slight distance to one side of the center of the bar 16 whereby any attempted rocking movement of the bar will have a tendency to move the locking plate further to the right in Fig. 4; therefore, there is insurance against the lock failing as its operative locking position is maintained and it is rendered more positive by attempted rocking of the spindle 16. If, however, the parts were in locking position with the door in an open position and then the door was closed, and inward movement of the latch bolt as the head thereof rides over the strike plate 3 moves the inner end plate 13 inwardly against the bar 30 and moves the plate 28 to unlocked position. If, as occurs at times, through a shrinking of the door the inward movement of the locking bolt is not sufficient that the plate 28 is moved to its extreme position but occupies a position relative to the spindle 16 similar to that shown in Fig. 6, an attempted rocking of the spindle 16 will thereupon carry the plate further toward its unlocking position. This, by reason of the fact that the corners of the spindle will be closely adjacent or will bear against the convex edges of the humps 32 and, when the spindle is turned, a camming action will take place moving the locking plate toward the left in Fig. 6.

If the door for any reason is locked at the inside and is in closed position the lock may be released from the outside by inserting an implement such as a flat bar 34 of the form shown through the opening 20 to engage with the ear 30 and move the locking plate 28 to its unlocked position, as indicated in Fig. 1.

The construction described is very practical and useful, easily and simply made, effective in operation and has proved commercially practical. The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

We claim:

1. In a lock having a retractable latching bolt and a rock shaft, the rocking of which in either direction will retract the bolt, the combination of an escutcheon plate associated with the rock shaft and through which said shaft passes, a locking plate slidably mounted at the inner side of said escutcheon plate having an elongated opening through which the rock shaft passes, said opening being of substantially the same width at each end thereof and having inwardly extending projections nearer one end than the other sufficiently spaced that the rock shaft may lie therebetween when the locking plate is moved in one direction, said rock shaft having opposed flat surfaces substantially against which the projections engage, as and for the purpose specified.

2. A construction containing the elements in combination defined in claim 1, said projections having rounded convex edges, as and for the purposes specified.

3. In a latch construction adapted to be applied to a door, said latch construction having a retractable bolt and provided with a rock shaft operably associated with said bolt to retract it on rocking the shaft in either direction, and said bolt at its outer portion being adapted for inward movement without operation of said rock shaft, the combination of an escutcheon plate adapted to be attached to the door through which the rock shaft passes, a locking plate movably mounted at the inner side of the escutcheon plate and having a part extending through said escutcheon plate for manual operation, said locking plate having an elongated slot through which the rock shaft passes of a size at one end whereby the rock shaft may freely rock in either direction, the other end of said slot being of the same width as the first end but being reduced in width for a short distance adjacent said other end portion by an inwardly extending projection, whereby when the plate is moved to bring said projection to a side of the rock shaft, said rock shaft is held against rotation, said rock shaft having a flat surface substantially against which said projection engages when thus moved.

4. A construction containing the elements in combination defined in claim 3, combined with a bar attached to the locking plate and adapted to extend inwardly into the path of movement

of the inner end of said locking bolt, whereby it is engaged by the locking bolt and the locking plate moved from operative locking to unlocking position on inward movement of the locking bolt produced other than by the operation of said rock shaft.

5. A latch comprising, a retractable bolt, an oscillatable spindle having opposed flat sides and connected to retract said bolt, and a movable plate to permit and prevent oscillation of said spindle, said plate having an elongated opening therein through which said spindle passes having enlarged portions at each end thereof and a smaller portion therebetween, said spindle being freely rotatable in one of said enlarged portions, but not rotatable when within said smaller portion, as specified.

HERMAN TER MEER.
ABRAHAM VANDER HENST.
CHARLES F. BRADFIELD.