Feb. 16, 1932. W. R. SCHLAGE 1,845,197

DOOR LATCH

Filed Dec. 19, 1928

Fig. 3.

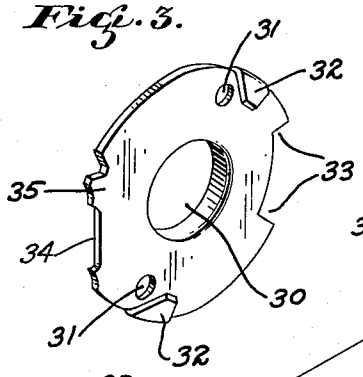
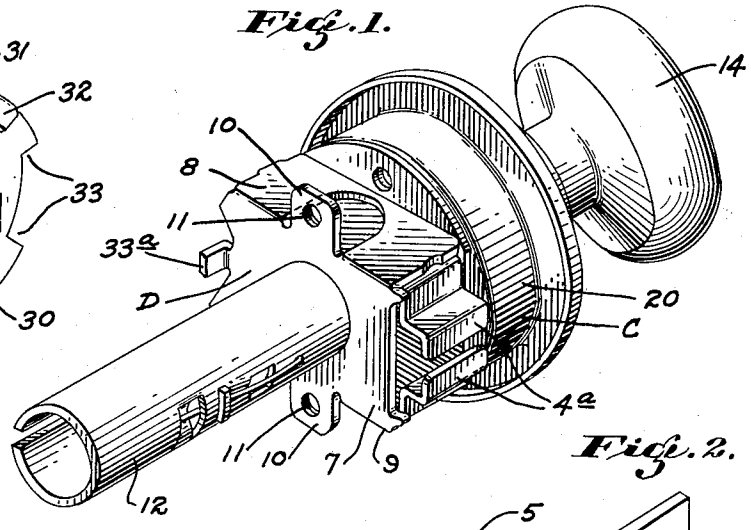


Fig. 1.



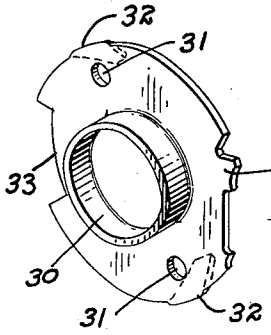


Fig. 4.

Fig. 2.

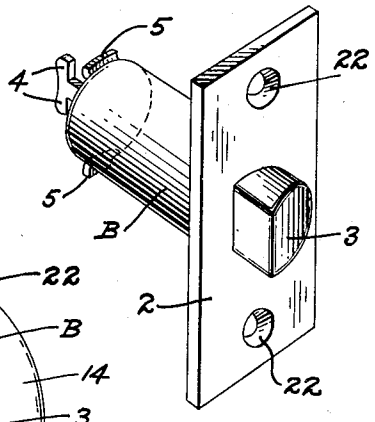


Fig. 5.

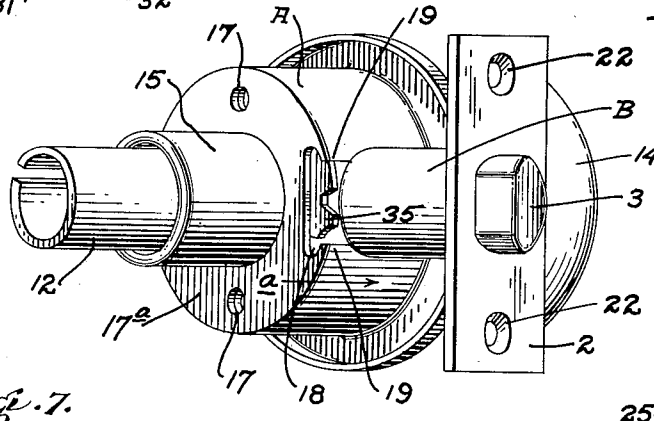


Fig. 6.

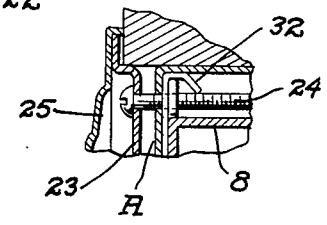
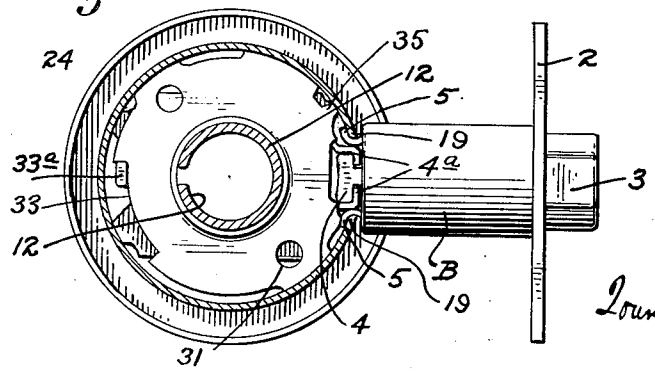


Fig. 7.



INVENTOR.
Walter R. Schlage.

BY
Townsend, Loftus & Offett
ATTORNEYS.

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UNITED STATES PATENT OFFICE

WALTER R. SCHLAGE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO SCHLAGE LOCK COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA

DOOR LATCH

Application filed December 19, 1928. Serial No. 327,114.

This invention relates to door latches, and especially to improvements in the door latch illustrated in my former patent entitled "Door latch", issued June 26, 1928, Patent Number 1,674,841.

The door latch illustrated in Patent Number 167,841, embodies a knob-actuated reacting unit and a latching unit, each unit being enclosed in a housing, and each unit being self-contained. Means are disclosed for interlocking the housings and the contained mechanisms when they are assembled in a door. Means are disclosed whereby lateral adjustment between the housings and the contained mechanisms is permitted, thereby making it possible to fit the two units to doors of varying thicknesses, and means are provided for securing the units with relation to the door when installed, the last named means being a pair of screws. These screws will at times gradually work loose due to constant vibration and jars produced by turning and releasing the door knobs, and by slamming of the doors, and when this happens there is a possibility of partial or complete separation of the two units, which will either jam or render the mechanism inoperative.

The object of the present invention is twofold; first to provide means for positively preventing separation of the two units when connected and installed in a door, and secondly to prevent releasing of the fastening or securing screws.

The door latch, and the improvements made thereon are shown by way of illustration in the accompanying drawings, in which:

Fig. 1 is a perspective view of the latch actuating unit, said view showing the housing removed,

Fig. 2 is a perspective view of the latch unit,

Fig. 3 is a perspective view of the shutter plate, showing the inner face of the same,

Fig. 4 is another perspective view of the shutter plate, showing the exterior face of the same,

Fig. 5 is a perspective view showing the latch actuating unit and the latching unit connected and assembled,

Fig. 6 is a detailed sectional view showing one of the securing screws,

Fig. 7 is an end view showing the latch actuating unit and the latching unit connected, said view showing the housing with the latch actuating unit and one of the cylinders in section.

Referring to the drawings in detail, particularly to Figs. 2 and 5, A indicates the housing of the latch actuating unit and B the housing of the latching unit. This last named housing is cylindrical and elongated in shape, as shown in Fig. 2 and it is secured to a face plate indicated at 2 in any suitable manner. The latch or bolt proper is indicated at 3. It is provided with an extension which extends through the rear end of the housing and the extension terminates in a pair of lugs 4. The rear end of the housing B is similarly provided with a pair of lugs, indicated at 5, 5. The lugs 5, 5 serve the function of interlocking the housings A and B, as will hereinafter be described, while the lugs 4 on the extension of the bolt 3 serve the function of interlocking the mechanisms of the latch actuating unit and the latching unit.

The latch actuating unit is best shown in Figs. 1 and 5. It consists of an end cover plate generally indicated at C, to which is secured a retractor guide generally indicated at D, the retractor guide consisting of a face plate 7 and top and bottom plates 8 and 9, lugs being formed from the top and bottom plates 8 and 9 as indicated at 10, and being turned at right angles thereto so as to be parallel with the face plates 7. The lugs 10 are perforated and threaded, as shown at 11, and they serve the function of receiving the securing screws as will hereinafter be described.

Slidably mounted within the retractor guide D is a retractor, the forward end of which is shown. The forward end consists of a pair of sparated fingers, as indicated at 4*a*, these fingers interlocking with the lugs 4, 4 when the two units are assembled. The face plate 7, together with the end plates 8 and 9 and the cover plate C function as a guide for the retractor. The face plate 7 also forms a support for a spindle member

12 and a similar spindle is journalled in the cover plate C. Both spindles carry a knob, such as indicated at 14, only one knob being illustrated in the present instance.

The housing A covers the mechanism shown in Fig. 1, to wit the retractor guide and the retractor proper. It also forms a journal member for the inner end of the spindle indicated at 12 as it is provided with a hub or bearing extension, such as shown at 15, see Fig. 5. The housing is provided with perforations 17, 17 which are adapted to align with the threaded openings 11, 11 of the lugs 10, and the housing is also cut away or slotted, as indicated at 18, to form a pair of lips 19, 19 with which the lugs 5 of the latch housing B are adapted to engage. When the retractor and the retractor guide has been placed in position on the cover section D, and the spindles are applied, it is only necessary to place the housing A in position by slipping it endwise over the spindle 12, and the retractor guide. When so positioned it is supported by the annular surface 20 formed on the cover plate. If it is then desired to connect the two units, it is only necessary to place the lugs 5 in alignment with the lips 19 of the housing A and the lugs 4 in alignment with the fingers 4*a* of the retractor and then to move the housing B in the direction of arrow *a*, see Fig. 5. When this is accomplished an interlock has been formed between the housings A and B and similarly an interlock between the retractor and the lugs 4, hence when the retractor is actuated by either of the spindles, reciprocal movement will be imparted by the retractor to the latch or bolt 3, and it will be moved inwardly or outwardly with relation to the face plate 2 as the case may be.

When the mechanism as a whole is to be installed in a door it is first necessary to drill a hole through the door from face to face which has a diameter substantially equal to that of the exterior covering A, and secondly to drill a hole edgewise through the door which is equal in diameter to the outside diameter of the housing B. When these holes are drilled the housing B is inserted through the opening drilled through the edge of the door and the housing A is then inserted through the other hole, in a direction transversely to the unit B.

When the housing A is being inserted lips 19 will engage and slide over the lugs 5 and the fingers 4*a* will similarly engage and slide over the lugs 4. An end lock is thus formed between the housings and the contained mechanisms and after this has been accomplished it is necessary to secure both units with relation to the door.

The latching unit is secured by inserting screws through the openings shown at 22, while the latch actuating unit is secured by a clamping plate 23 and a pair of securing screws, one of which is indicated at 24. The screws 24 pass through perforations in the clamping plate and they then pass through the perforations 17. These align with the threaded lugs 10, and a threaded engagement is thus made, the screws being turned until the clamping plate tightly engages the face of the door.

An escutcheon plate 25 is then applied and finally the inner knob, which is not here illustrated. This completes the installation of the two units.

It has already been stated that the screws 24 have a tendency to work loose due to vibration and jars, and that when this happens it is possible that the two units may become partially or wholly separated, causing the mechanism either to jam or to become inoperative. The present invention consists in providing means for preventing separation of the two units and also in providing means for preventing, or at least resisting release of the securing screws 24. This is accomplished as follows:

By referring to Figs. 3 and 4 a substantially circular plate is illustrated. This plate is provided with a central opening 30, to permit it to be shipped endwise over the spindle 12. The peripheral edges of the plate are provided with perforations or openings 31, which are adapted to align with the threaded openings 11 and the peripheral edges are also provided with two inwardly bent retaining lugs 32. One edge of the plate is cut away, as indicated at 33 for the purpose of limiting rotation of the plate, and the opposite edge of the plate is cut away, as indicated at 34 to permit the lugs 4 and 5 to clear and enter the housing A when the two units are being assembled. The clearance allowed by the cutting away of the edge of the plate, as indicated at 34 is clearly shown in Fig. 7.

When the mechanism of the latch actuating unit has been assembled as shown in Fig. 1, and before the housing A is applied, the shutter plate is slipped over the spindle 12 and moved inwardly on the same until it snugly engages the face plate 7 of the retractor guide. The housing A is then applied and the shutter plate is thus interposed between the end plate 17*a* of the housing and the face plate 7 of the retractor guide, see Figs. 5 and 6. When the shutter plate is applied it is positioned so that the cut away portion 34 will register with the fingers 4*a* of the retractor, and also with the cut away portion 18 of the housing, or in other words it is positioned as shown in Fig. 7. Hence, when the housing A is applied, unit B may be connected as previously described.

After the unit B has been connected or interlocked, as shown in Fig. 5 a partial rotation is transmitted to the shutter plate, this rotational movement being limited by the cut away portion 33 and a lug 33*a* is formed on

the face plate 7. Lug 33*a* engages one end of the portion 33 when the cut away portion 34 registers with the slot 18 and the lug 33*a* engages the opposite end of the portion 33 when the perforations 31 align with the perforations 17 and 11, and as the lugs 32 align with the perforations 31, all will be brought into register while the portion of the shutter plate indicated at 35 will extend across the slotted end 18 of the housing, and thus prevent removal of the unit B. Hence the shutter plate serves its first function, to wit that of preventing separation of the two units.

The second function of the shutter plate is to prevent release of the securing screws 24. This is accomplished by means of the lugs 32. When the screws 24 are inserted, after the units have been placed in position in the door, it will pass in under the lugs 32. These lugs extend into the path of the screws and are slightly displaced in a forward position as the screws are inserted and as they are made of spring or yielding metal they bite, or frictionally engage the screws to such an extent that vibration or jars will not permit the screws to rotate or release. Hence, it will be seen that the insertion of the shutter plate shown in Figs. 3 and 4 is important, as it prevents separation of the two units when installed, it prevents release of the securing screws, and furthermore the securing screws themselves, by passing through the perforations 31 of the shutter plates in turn serve as a means for preventing rotation of the shutter plate.

While the shutter plate is more or less specifically described, I wish it understood that this and other features of the invention may be changed within the scope of the appended claims, similarly that the materials and finishes of the several parts employed may be such as the manufacturer may decide, or varying conditions or uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a device of the character described a latch actuating unit comprising a housing, a retractor and a retractor guide mounted within the housing, a spindle extending through the housing and adapted to actuate the retractor, a shutter plate interposed between the housing and the retractor guide, a clamping plate cooperating with the latch actuating unit, a pair of screws extending through the clamping plate, the housing and the shutter plate and having threaded engagement with the latch actuating unit, and means carried by the shutter plate for frictionally securing the screws against rotation.

2. In a device of the character described a latch actuating unit comprising a housing, a retractor and a retractor guide mounted within the housing, a spindle extending through the housing and adapted to actuate the retractor, a shutter plate interposed between the housing and the retractor guide, a clamping plate cooperating with the latch actuating unit, a pair of screws extending through the clamping plate, the housing and the shutter plate and having threaded engagement with the latch actuating unit, and a pair of lugs carried by the shutter plate and frictionally engaging the screws to secure them against rotation.

3. In a device of the character described a latch actuating unit comprising a housing, a retractor and a retractor guide mounted within the housing, a spindle extending through the housing and adapted to actuate the retractor, a shutter plate interposed between the housing and the retractor guide, a clamping plate cooperating with the latch actuating unit, a pair of screws extending through the clamping plate, the housing and the shutter plate and having threaded engagement with the latch actuating unit, a latch unit, means whereby an interlock is formed between the latch unit and the latch actuating unit when they are assembled means carried by the shutter plate for preventing separation of the latch unit and the latch actuating unit, and other means carried by the shutter plate for frictionally securing the screws against rotation.

4. In a device of the character described a latch actuating unit and a latch unit, each adapted to be independently assembled in a door, a slidable interlocking connection formed between the latch and the latch actuating unit whereby they are operatively connected when assembled in a door, and a rotatable member carried by one of the units and having a portion movable into the path of the slidable interlock formed between the units to prevent separation of the units.

5. In a device of the character described a housing, a self-contained latch actuating unit mounted therein, a second housing, a self-contained latch mechanism mounted therein, a slidable interlock formed between the housings and the mechanisms contained therein, and means movable into the path of the slidable interlock to prevent separation of the housings and the contained mechanisms when assembled.

6. In a device of the character described, a housing, a self contained latch actuating unit mounted therein, a second housing, a self contained latch mechanism mounted therein, a slidable interlock formed between the housings and the mechanisms contained therein, means movable into the path of the slidable interlock to prevent separation of the housing and the contained mechanism when assembled, and other means to secure said movable means when moved into the path of the slidable interlock.

7. In a device of the character described, a housing, a self contained latch actuating

unit mounted therein, a second housing, a self contained latch mechanism mounted therein, a slidable interlock formed between the housings and the mechanisms contained therein, said housings being disposed at right angles to each other when assembled, a rotatable member carried by the latch actuating unit and having a cut out portion registering with the slidable interlock when the housings and mechanisms are being assembled, said rotatable member being rotated after assembly of the housings and mechanisms and presenting a blocking member to prevent separation of the housings and contained mechanisms, and means for securing the rotary member against rotation when the block is in position.

WALTER R. SCHLAGE.