Nov. 27, 1945. W. R. SCHLAGE 2,389,819

DOOR LOCK

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Fig. 1.

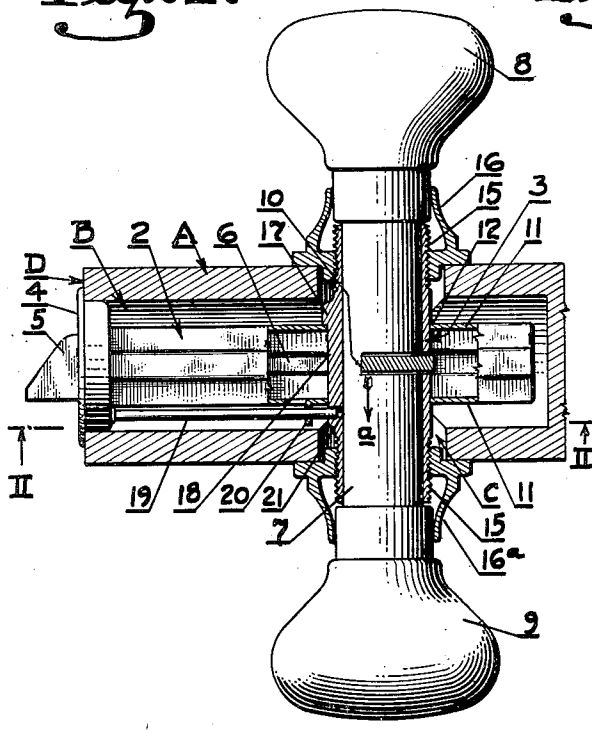


Fig. 3.

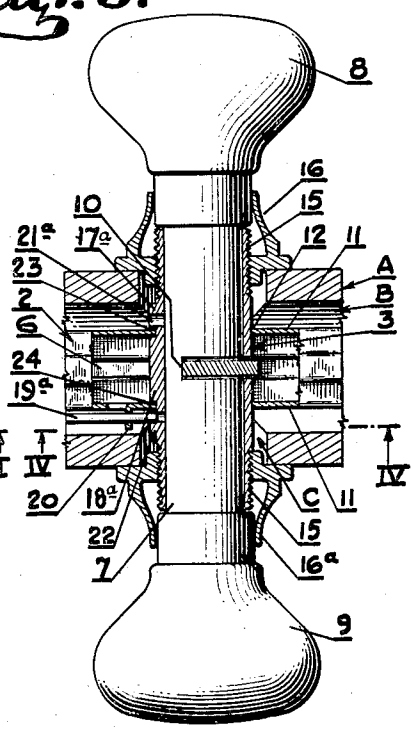


Fig. 2.

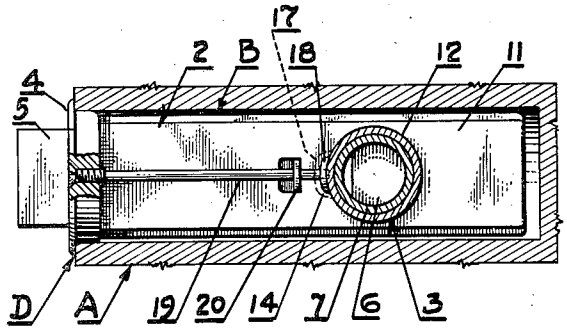
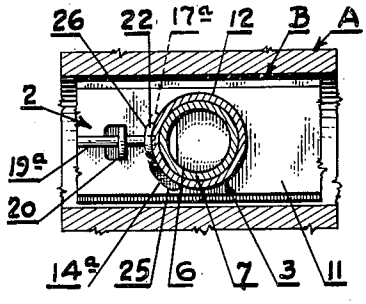


Fig. 4.



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Fig. 5.

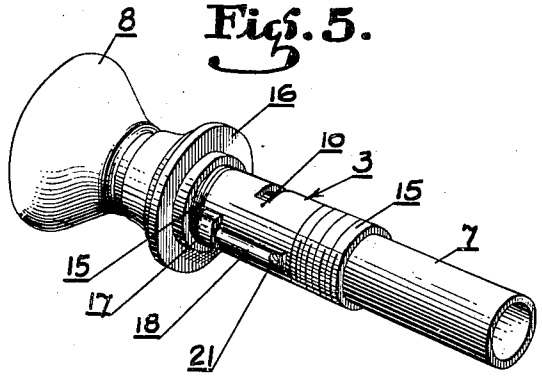


Fig. 6.

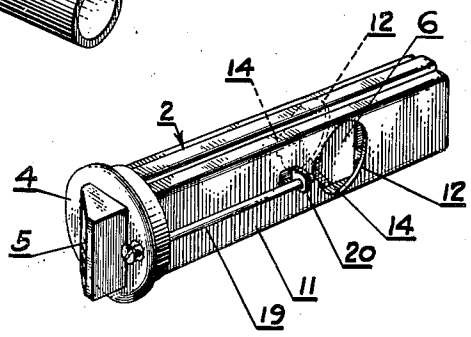


Fig. 7.

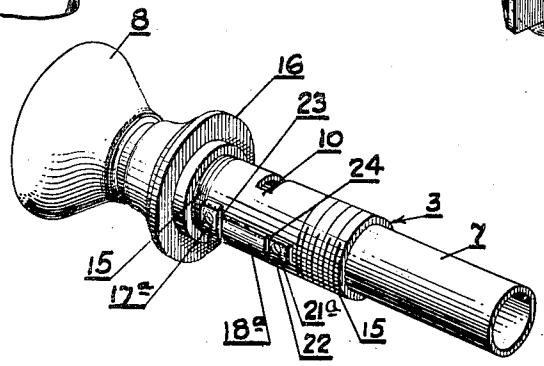


Fig. 8.

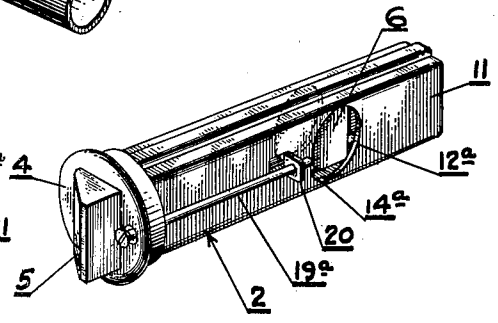
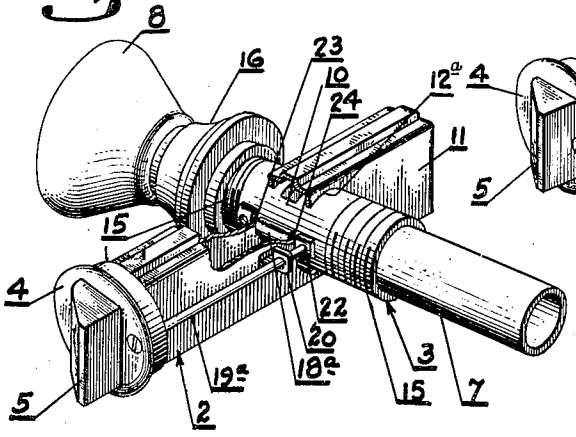


Fig. 9.



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Patented Nov. 27, 1945 2,389,819

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2,389,819

DOOR LOCK

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Application July 13, 1944, Serial No. 544,682

4 Claims. (Cl. 292—337)

This invention relates to door locks which employ two housings, one housing containing a latch bolt mechanism and the second housing containing a spindle and roll-back mechanism whereby the latch bolt is actuated. In this structure one housing extends through the other and the present invention relates to means for interlocking and securing the housings against separation when assembled in a door.

The object of the present invention is generally to improve and simplify the construction and operation of locks of the character described; to provide a door lock employing two housings, one containing a latch bolt and a retractor plate, and the other a spindle and a roll-back member, said last named housing and contained spindle and roll-back member extending through the latch bolt housing and being disposed at right angles thereto, and means operable from the exterior of the lock for interlocking and securing the housings against separation or removal when installed in a door; to provide means whereby partial movement or rotation of one housing with relation to the other causes interlocking of the housings; to provide other means for securing the housings against relative movement or rotation when interlocked; to provide means which insures proper positioning or alignment of the mechanisms contained in the representative housings; to provide an interlock which re-enforces or supports the side walls of the latch bolt housing so as to prevent any clamping or jamming of the contained mechanism; and further to provide screw means operable from the edge of the door and only when the door is open for securing the housings against separation or removal when installed in the door.

This invention is shown by way of illustration in the accompanying drawings in which:

Fig. 1 is a horizontal section of a door showing the door lock inserted therein, said view also showing portions of the door lock in section;

Fig. 2 is a vertical section taken on line II—II of Fig. 1;

Fig. 3 is a view similar to Fig. 1 showing a modification;

Fig. 4 is a vertical section taken on line IV—IV of Fig. 3;

Fig. 5 is the perspective view of the type of spindle housing used in the structure shown in Fig. 1;

Fig. 6 is a perspective view of the latch bolt housing employed in the structure shown in Fig. 1;

Fig. 7 is a perspective view of the spindle housing employed in the structure shown in Fig. 3;

Fig. 8 is the perspective view of the latch bolt housing employed in the structure shown in Fig. 3; and

Fig. 9 is a perspective view partially broken away showing the structures of Figs. 7 and 8 assembled.

Referring to the drawings in detail, and particularly Fig. 1, A indicates a portion of a door in which is bored or otherwise formed two holes B and C. The hole B is disposed parallel to and centrally of the inner and outer faces of the door and opens through the edge D of the door, while hole C is disposed at right angles to the hole B and opens through the outer and inner faces of the door.

Disposed in the hole B is a latch bolt housing, generally indicated at 2. Extending through the hole C and the latch bolt housing is a spindle housing, generally indicated at 3. Extending through the latch bolt housing 2 and the face plate 4 disposed at the outer end thereof is a latch bolt 5 and secured to the latch bolt and extending towards the inner end of the latch bolt housing is the retractor plate 6. Extending through the spindle housing 3 is a spindle 7 on opposite ends of which are secured door knobs 8 and 9, respectively, and formed midway of the spindle is the rollback member 10 which must align with and engage the retractor plate 6.

The present invention is directed to mechanism whereby the two housings are interlocked and secured against separation and endwise removal when installed in a door, said mechanism also insuring alignment and engagement of the rollback member with the retractor plate.

By referring to Figs. 6, 8 and 9, it will be noted that the side walls 11 of the latch bolt housing 2 are provided with openings 12 through which the spindle housing 3 extends and that notches 14 are formed in the peripheral edges of said openings. It will further be noted that the spindle housing (see Fig. 5) is threaded at opposite ends as indicated at 15 to receive escutcheon plates 16 and 16a, and that two lugs are formed on the spindle housing as indicated at 17 and 18, the lug 18 extending longitudinally on the spindle housing, and the lug 17 circumferentially thereof. The notches 14 are formed to permit the lug 18 to pass through when the spindle housing is passed through the openings 12 in the latch bolt housing. The lug 18 serves one function, to wit, that of preventing rotation of the spindle housing with relation to the latch bolt housing, while lug 17 functions as a stop to limit movement of the spindle housing with relation to the latch bolt

housing, and to align the roll-back member with the retractor plate.

In actual practice when the lock is to be inserted in a door, the latch bolt housing **2** is first inserted in the opening B to assume the position shown in Fig. 1. One of the escutcheon plates **16** is then applied to one end of the spindle housing and the spindle **17** is inserted and thereafter one of the knobs **8** may be applied and secured to the spindle, the unit so far assembled being shown in Fig. 5. This unit is then inserted through the opening C and the openings **12** formed in the side walls of the latch bolt housing and when fully inserted, lug **18** will rest in the notches **14** and secure the spindle housing against rotation with relation to the latch bolt housing, while lug **17** will engage one side wall of the latch bolt housing and prevent further movement between the housings. Then by applying the second escutcheon plate indicated at **16***a* in Fig. 1 and tightening it, and by finally applying the knob **9** the installation will be substantially completed. However, one more securing member is required and that is the elongated screw indicated at **19** (see Fig. 1). This screw passes through the face plate **4** of a latch bolt. It has threaded engagement therewith as shown in Fig. 2, while its inner end passes through a guide lug **20** and finally into a hole **21** formed in the spindle housing. With this screw in place the spindle housing is positively secured both against rotation and endwise removal with relation to the latch bolt housing. Furthermore, this screw together with the lug **17** insures alignment and engagement of the roll-back member wtih the retractor plate and proper functioning of the lock as a whole is thus assured.

The lock structure shown in Fig. 1 is exceedingly simple and substantial in construction. It it readily and quickly installed, but it has one weakness if installed by one not familiar with this type of lock. This weakness can be described as follows:

After the lock has been installed in a door, as shown in Fig. 1, if the escutcheon plate **16***a* is turned or tightened too much, it will tend to pull the spindle housing in the direction of arrow *a* and in doing so the stop lug **17** would tend to force the adjacent side wall of the latch bolt housing inwardly. In doing this it would tend to jam or clamp the retractor plate against operation and would furthermore partially destroy the desired alignment required between the roll-back member and the retractor plate. To overcome this weakness an improvement or modification is disclosed in Figs. 3, 4, 7, 8 and 9. In this instance the spindle housing is provided with an additional lug as indicated at **22** and the hole **21***a* is formed on that lug. Furthermore, it will be noted that spacing is formed between the lugs **22**, **18***a* and **17***a*, as indicated at **23** and **24**. Also by referring to Figs. 4 and 8, it will be noted that the notches indicated at **14***a* which are formed in the peripheral edge of the openings **12***a* are disposed on a plane a little lower than the notches **14** shown in Figs. 2 and 6. Hence, when the spindle housing unit shown in Fig. 7 is to be inserted, the spindle housing must be rotated until the lugs **22** and **18***a* register with the notches **14***a*. When they do so, the spindle housing may be inserted and inward movement will be limited when the lug **17***a* engages the outer side wall of the latch bolt housing. Then by rotating the spindle housing about one-quarter revolution or from the position indicated at **25** to that shown at **26** in Fig. 4, the opposite side walls of the latch bolt housing will enter the spaces **23** and **24** formed between the lugs **17***a*, **18***a* and **22** (see Fig. 9). Then when the screw indicated at **19***a* is finally inserted, the spindle housing will be secured against rotation with relation to the latch bolt housing, and it will be secured against endwise removal as lug **18***a* engages the inner faces of the side walls of the latch bolt housing, while the lugs **17***a* and **22** engage the outer faces of the side walls of the latch bolt housing. Now when the inner escutcheon plate **16***a* is finally applied, as shown in Fig. 3, and tightened there can be no jamming of the retractor plate, nor any misalignment of the roll-back member and the retractor plate for the simple reason that even though the escutcheon plate **16***a* is tightened excessively or to such an extent as to impart movement to the spindle housing in the direction of arrow *a*, the latch bolt housing would merely move with it a similar distance without any clamping action or misalignment or any other detrimental effect. Hence, the structure shown in Figs. 3, 4, 7, 8 and 9 may be considered as the perfected form of structure and a form of structure which is foolproof whether installed by an expert or a novice.

The screw **19** is in both instances shown as having threaded engagement with the face plate **4**, but obviously the inner end of the screw may be threaded where it enters the lug or the spindle housing, and while this and other features of the invention have been more or less specifically described and illustrated, it should be understood that various changes may be resorted to within the scope of the appended claims, and that the materials and finish of the parts employed may be changed according to the judgment or experience of the manufacturer or as 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 lock of the character described, an elongated latch bolt housing presenting spaced side walls with aligned openings formed in said walls, a sleeve shaped spindle housing insertible through said openings and being disposed at right angles to the latch bolt housing when inserted, a central lug on the spindle housing extending longitudinally thereof, a stop lug disposed at one end thereof and spaced therefrom, an end lug at the opposite end of the central lug and spaced therefrom, a notch formed in each side wall of the latch bolt housing and in communication with the openings formed therein, said notches forming a clearance for the lugs on the spindle housing when inserted, and said stop lug limiting endwise movement of the spindle housing when inserted, said spindle housing being rotatable when the stop lug engages one side wall of the latch bolt housing and when rotated bringing the end lug in engagement with the opposite side wall of the latch bolt housing and the ends of the central lug into engagement with the inner faces of the side walls of the latch bolt housing, and means for positioning and securing the spindle housing against rotation and against endwise removal when rotated.

2. In a lock of the character described, an elongated latch bolt housing presenting spaced side walls with aligned openings formed in said walls, a sleeve shaped spindle housing insertible through said openings and being disposed at right angles to the latch bolt housing when inserted, a central

lug on the spindle housing extending longitudinally thereof, a stop lug disposed at one end thereof and spaced therefrom, an end lug at the opposite end of the central lug and spaced therefrom, a notch formed in each side wall of the latch bolt housing and in communication with the openings formed therein, said notches forming a clearance for the lugs on the spindle housing when inserted, said spindle housing being rotatable when the stop lug engages one side wall of the latch bolt housing, and when rotated bringing the central lug into engagement with the inner faces of the side walls of the latch bolt housing to form an interlock between the housings.

3. In a lock of the character described, an elongated latch bolt housing presenting spaced side walls with aligned openings formed in said walls, a sleeve shaped spindle housing insertible through said openings and being disposed at right angles to the latch bolt housing when inserted, a central lug on the spindle housing extending longitudinally thereof, a stop lug disposed at one end thereof and spaced therefrom, an end lug at the opposite end of the central lug and spaced therefrom, a notch formed in each side wall of the latch bolt housing and in communication with the openings formed therein, said notches forming a clearance for the lugs on the spindle housing when inserted, said spindle housing being rotatable when the stop lug engages one side wall of the latch bolt housing, and when rotated bringing the central lug into engagement with the inner faces of the side walls of the latch bolt housing to form an interlock between the housings, and means for positioning the spindle housing after the rotational interlock has been made and for securing the spindle housing against rotation.

4. In a lock of the character described, an elongated latch bolt housing presenting spaced side walls with aligned openings formed in said walls, a sleeve shaped spindle housing insertible through said openings and being disposed at right angles to the latch bolt housing when inserted, a central lug on the spindle housing extending longitudinally thereof, a stop lug disposed at one end thereof and spaced therefrom, an end lug at the opposite end of the central lug and spaced therefrom, a notch formed in each side wall of the latch bolt housing and in communication with the openings formed therein, said notches forming a clearance for the lugs on the spindle housing when inserted, said spindle housing being rotatable when the stop lug engages one side wall of the latch bolt housing, and when rotated bringing the central lug into engagement with the inner faces of the side walls of the latch bolt housing to form an interlock between the housings, and screw means engageable with the spindle housing to position and secure the spindle housing after the rotational interlock has been made.

WALTER R. SCHLAGE.