

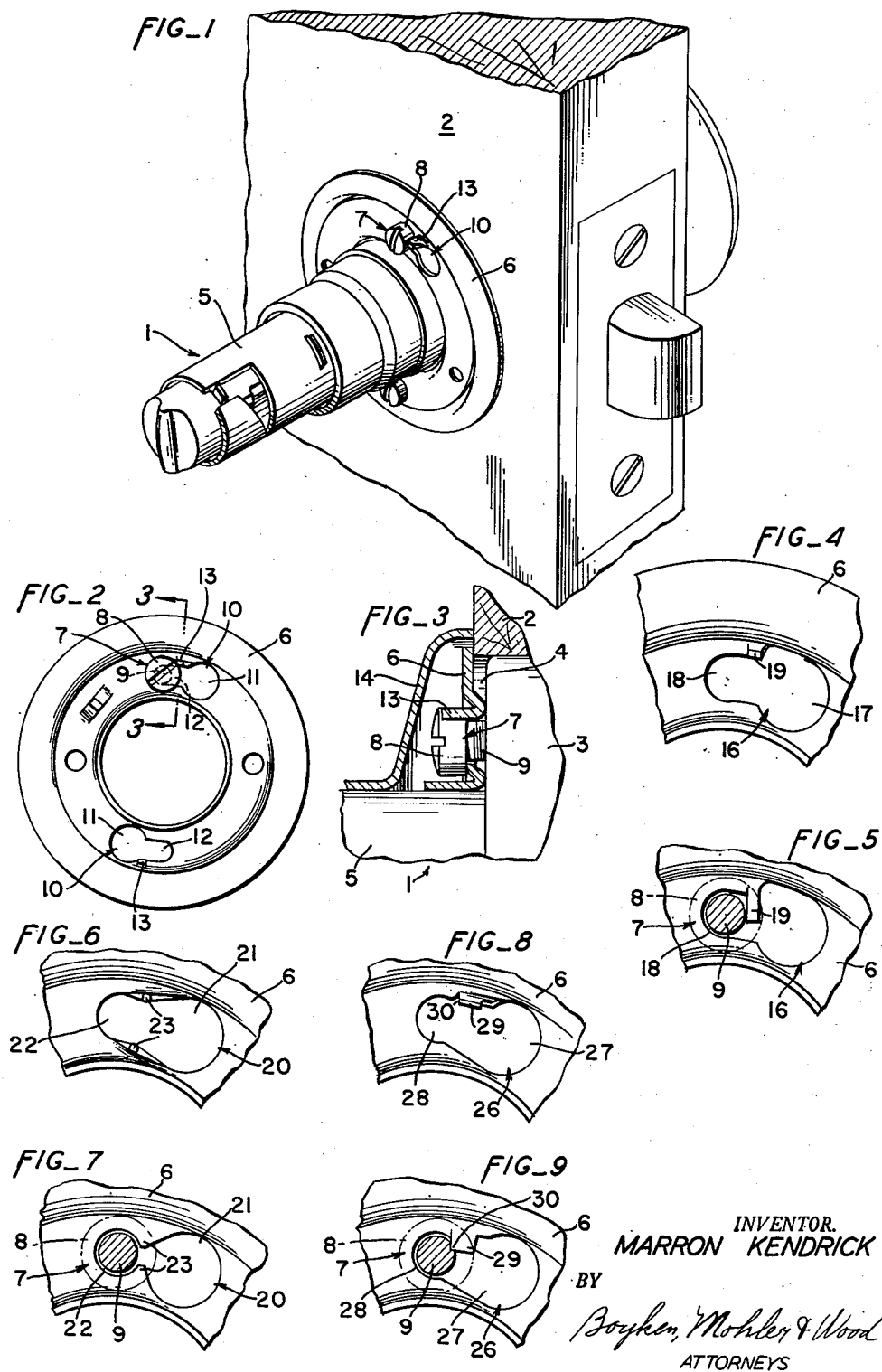
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M. KENDRICK

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NONREVERSIBLE KEYHOLE CONNECTION FOR MOUNTING PLATES

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NONREVERSIBLE KEYHOLE CONNECTION FOR MOUNTING PLATES

Marron Kendrick, Atherton, Calif., assignor to Schlage Lock Company, a corporation

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1 Claim. (Cl. 292—357)

This invention relates to keyhole connections and more particularly to means for rendering such connections nonreversible.

Keyhole connections are well known in the art as an expedient for rapidly joining a pair of members. Keyhole connections of the type herein described incorporate one or more slots in a first member which is adapted to be secured to a second member by screws or bolts. The slots are each formed with an enlarged portion which will pass the bolt head and a portion which is reduced in width to pass the bolt shank but not the head.

The slotted member may then be slipped over the bolt heads, which protrude from the second member, and the members moved relatively to bring the bolt shanks into the reduced portions of the slots. Tightening of the bolts onto the first member secures it in place.

In many instances the members which are thus secured are subject to frequent vibratory forces which tend to loosen the bolts. In such cases the first member can easily become displaced and loose with respect to the second member by accidental reversal of the securing process above described.

It is therefore an object of this invention to provide a nonreversible keyhole connection.

Another object of this invention is the provision of means for preventing disconnecting of a keyhole connection.

It is still another object of this invention to provide lugs adjacent a keyhole slot for interfering with bolts inserted in such slots to prevent a withdrawal of such bolts.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of a portion of a door and door lock showing the preferred form of the device of this invention in use on the mounting plate of such lock;

Fig. 2 is a plan view of the mounting plate of Fig. 1 in association with a bolt;

Fig. 3 is an enlarged cross sectional view taken substantially along line 3—3 of Fig. 2 and incorporating other portions of the door and lock not shown in Fig. 1;

Fig. 4 is an enlarged plan view of a portion of a mounting plate constructed in accordance with a modified form of the invention;

Fig. 5 is a view similar to Fig. 4 showing the device thereof associated with a bolt tightened on said mounting plate;

Fig. 6, 7 are views similar to Figs. 4, 5, respectively, showing another modification of the invention; and,

Figs. 8, 9 are views similar to Figs. 4, 5, respectively, showing a third modification of the invention.

In detail, the device of this invention is described for use with a cylinder door lock, generally designated 1, and the door 2 upon which said lock is mounted (Fig. 1). The main body portion or housing 3 (Fig. 3) of door lock 1 is inserted in a hole 4, bored in door 2, and the

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spindles 5 (Fig. 1) extend outwardly therefrom. In order to retain said housing in said door the lock is provided on at least one side with a circular mounting plate 6. Said mounting plate is secured to housing 3 by means of bolts 7, threadedly received in said housing, and the outer edge of said mounting plate overlaps door 2 at hole 4 (Fig. 3).

In installing lock 1 in door 2 it is most expedient to thread bolts 7 into housing 3 before inserting the lock into hole 4. Also, since the thickness of the door may vary, bolts 7 may be of considerable length, to accommodate all the door sizes, and are each formed with the conventional enlarged head 8 and reduced shank 9 (Figs. 1, 2, 3).

In order to rapidly install mounting plate 6 in the position shown in Fig. 1, said mounting plate is formed with keyhole or bayonet slots 10 therethrough. Said slots each comprises circular hole or enlarged portion 11 and a portion 12, reduced in width and communicating with portion 11. Portion 11 of slot 10 is of sufficient size or extent to pass head 8 of bolt 7, whereas reduced portion 12 will pass only shank 9 of said bolt and not the head thereof.

Hence, housing 3 may be inserted into hole 4 with bolts 7 protruding therefrom and circular mounting plate 6 slipped over spindle 5. Plate 6 is then positioned so that heads 8 of bolts 7 may be inserted through enlarged portions 11 of keyhole slots 10 and mounting plate 6 placed adjacent the face of door 2. Upon rotation of said mounting plate shanks 9 of bolt 7 slip into reduced portions 12 of said keyhole slots. Bolts 7 may then be further screwed into housing 3 to tighten said bolts against said mounting plate and said mounting plate against the face of the door.

The spindles and associated portions of door lock 1 are subjected to frequent rotational and vibrational forces which cause accidental loosening of bolts 7 and may result in disconnecting of mounting plate 6 thereby rendering door lock 1 loose with respect to the door. To prevent this undesirable result, mounting plate 6 is, by the present invention, formed with a lug 13 extending outwardly from one side of said plate at the edge of each reduced portion 12 of each keyhole slot 10. Said lug is of sufficient extent and is so placed (Fig. 3) to lie alongside head 8 of bolt 7 to prevent displacement of said bolt from reduced portion 12 to enlarged portion 11 of slot 10.

It is obvious that in assembling mounting plate 6, as previously described, bolts 7 must protrude sufficiently for lug 13 to pass under head 8 of said bolts. Once bolts 7 are tightened against plate 6, lugs 13 prevent displacement of bolts 7 longitudinally of slot 10. Only after substantial unscrewing of bolt 7 is head 8 permitted to pass over lug 13. A pair of lugs 13 may be provided for each keyhole slot if desired.

To prevent this amount of unscrewing of bolts 7 lock 1 may be provided with a cover member or escutcheon plate 14 (Fig. 3) which slips over spindle 5 and overlies mounting plate 6. Plate 14 may be secured to spindle 5 and is so positioned that there is not sufficient space for head 8 of bolt 7 to pass between said escutcheon plate and the outer end of lug 13. Hence, the combination of the keyhole slot with lug 13 and escutcheon plate 14 prevents accidental disconnecting of the connection described.

Figs. 4, 5 illustrate a modification of the keyhole connection of this invention in which a keyhole slot 16, formed in mounting plate 6 has a similar enlarged portion 17 and a reduced portion 18. At the juncture between said portions plate 6 is formed with an upstanding

lug 19 which is inclined slightly toward the center of slot 16.

The operation of keyhole slot 16 in association with bolt 7 (Fig. 5) is substantially similar to that described for keyhole slot 10, except that lug 19 is positioned so as to lie under head 8 of bolt 7 when shank 9 is received in reduced portion 18 of slot 16 (Fig. 5).

Tightening bolt 7 against mounting plate 6, as previously described, deforms lug 19 to a position substantially coplanar with plate 6 and lying alongside shank 9 of said bolt. As seen in Fig. 5, it is then impossible to reverse the keyhole connection and plate 6 will remain fixed with respect to bolt 7 against all but complete axial withdrawal of said bolt.

In the modification shown in Figs. 6, 7 keyhole slot 20, formed in mounting plate 6, having enlarged portion 21 and reduced portion 22 is provided with a pair of lugs 23 extending outwardly from mounting plate 6 on either side of the juncture between said portions of said slot. Head 8 of bolt 7 is inserted through enlarged portion 21 of slot 20 in a like manner and mounting plate 6 rotated to bring shank 9 into reduced portion 22 (Fig. 7).

Lugs 23 are inclined slightly inwardly so as to be deformed to the position shown in Fig. 7 by tightening bolt 7 against plate 6. Head 8 of said bolt thereby forces lugs 23 into a position substantially coplanar with plate 6 and restricting the juncture between the portions of keyhole slot 20 to prevent displacement of bolt 7 out of reduced portion 22 toward enlarged portion 21. Disconnecting of this modification of the connection of this invention is thereby prevented.

Figs. 8, 9 illustrate an even more positive lock of bolt 7 in the keyhole slot, generally designated 26. In this modification, slot 26 is formed with similar enlarged portion 27 with reduced portion 28 extending therefrom. Extending outwardly from plate 6 at the juncture between said enlarged and said reduced portions and inclined slightly inwardly is lug 29. Upon insertion of bolt 7 into reduced portion 28 of keyhole slot 26, as previously described, lug 29 lies under head 8 of said bolt.

Upon tightening bolt 7 toward plate 6 head 8 causes lug 29 to be deformed toward a position coplanar with mounting plate 6. The placement of lug 29 is such that upon deformation the corner 30 of said lug is forced to dig into or gall bolt 7 near the juncture between the head and shank thereof.

Lug 29 therefore not only prevents disconnecting of the connection, but also prevents accidental unscrewing of bolt 7. The modification of Figs. 8, 9 thereby provides the features of a stop nut and a nonreversible keyhole connection.

Although the invention has been described and illustrated in detail such is not to be taken as restrictive thereof since it is obvious that modifications could be made therein without departing from the spirit and scope of the invention.

I claim:

In combination with a door lock in which the cylindrical retractor housing is adapted to be inserted in a transverse hole in a door, means for retaining said housing therein, comprising: an annular mounting plate, a pair of bolts having enlarged heads and reduced shanks screw threadedly secured to said housing and projecting therefrom in the same direction on opposite sides of and parallel to the central axis of said housing, said plate being provided with a pair of opposed keyhole slots therein, corresponding to the location of said bolts when said plate is superimposed over the end of said housing from which said bolts project, each of said slots having an enlarged portion of sufficient extent to pass said head of said bolt and a reduced portion of sufficient extent to pass said shank but not said head, a lug extending outwardly from the side of said plate opposite said housing at the juncture between said portions of each of said slots and slanting toward said slot under the head of the bolt received in said reduced portion, said lug being deformable by said head during tightening of said bolt to a position extending across said slot for preventing displacement of said bolt from said reduced portion to said enlarged portion of said slot.

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