April 15, 1941. W. FALK 2,238,314

LOCK MECHANISM FOR DOORS

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Fig. 1.

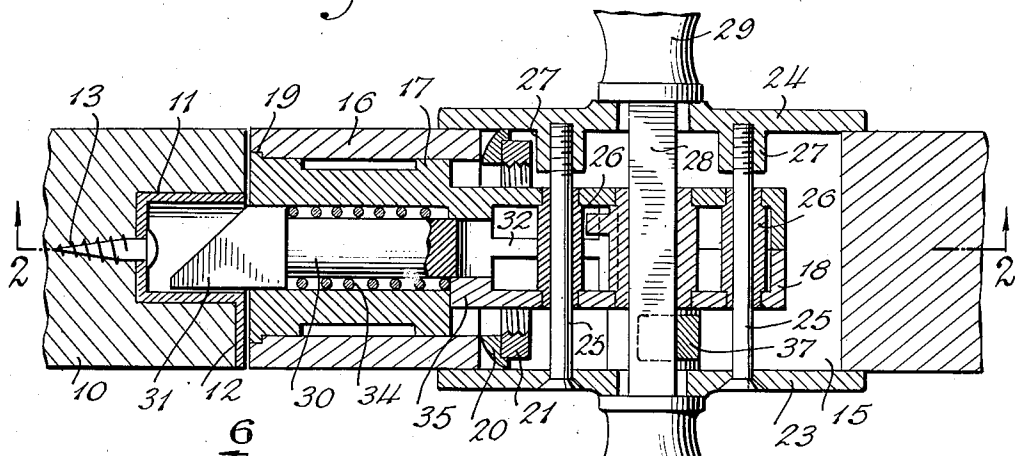
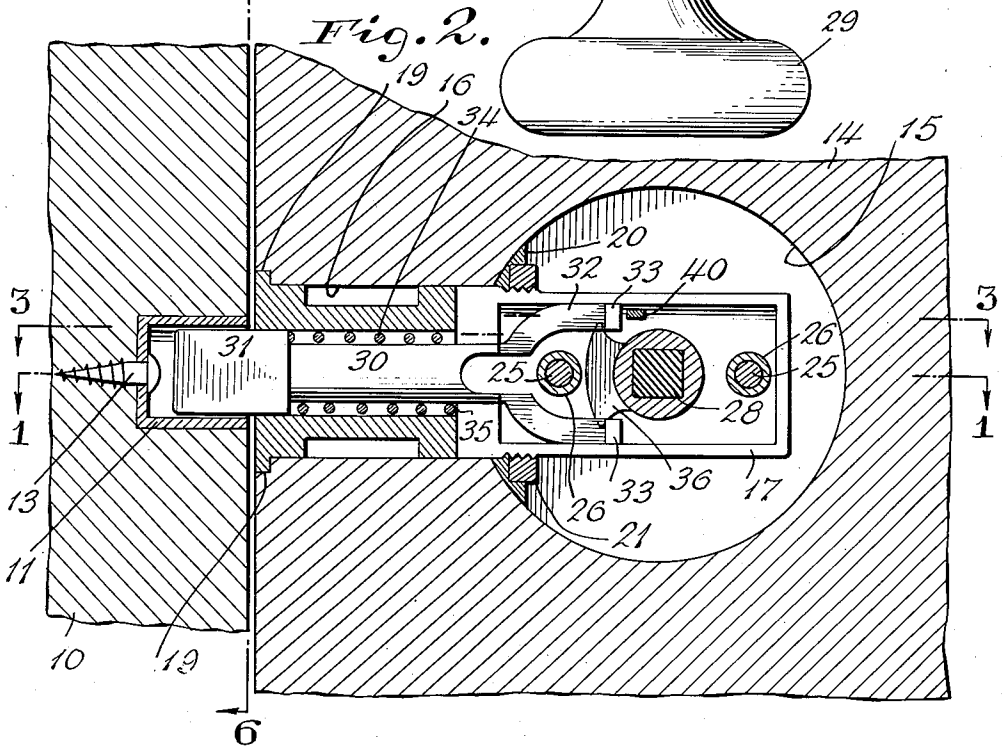


Fig. 2.



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Fig. 3.

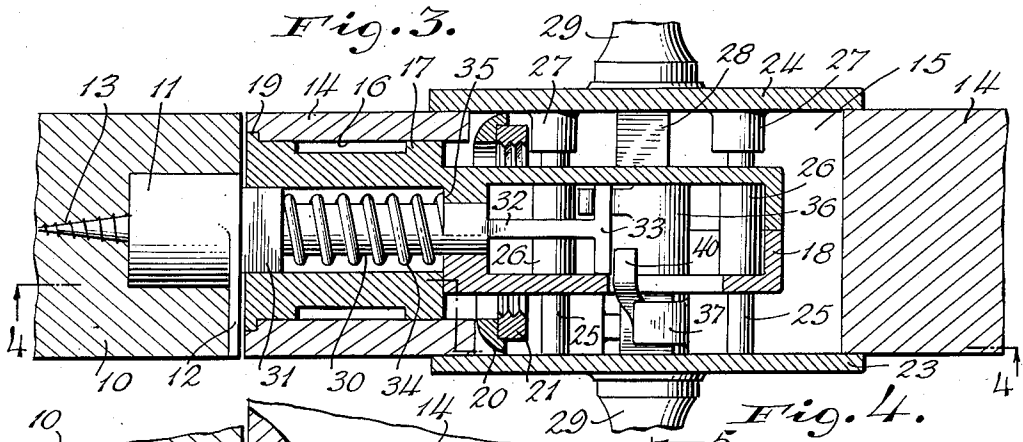


Fig. 4.

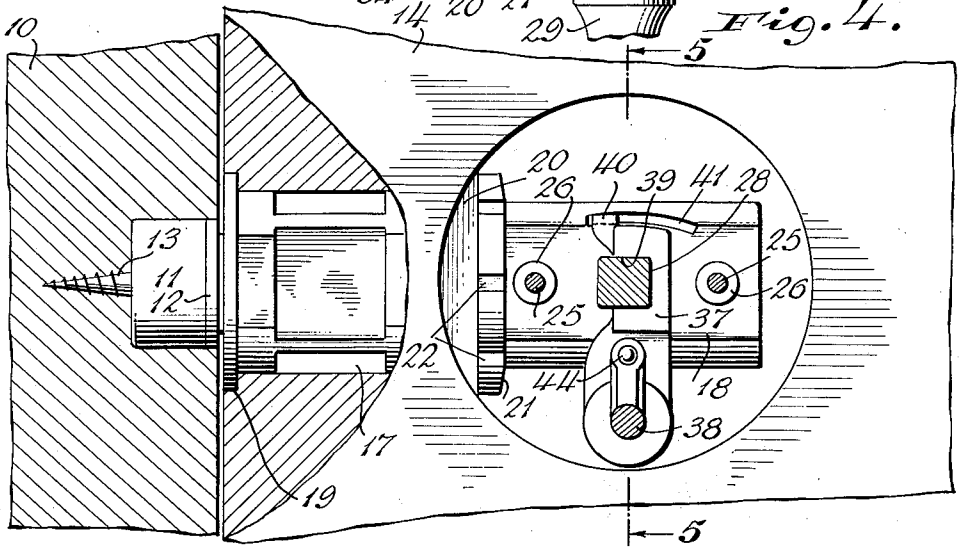


Fig. 5.

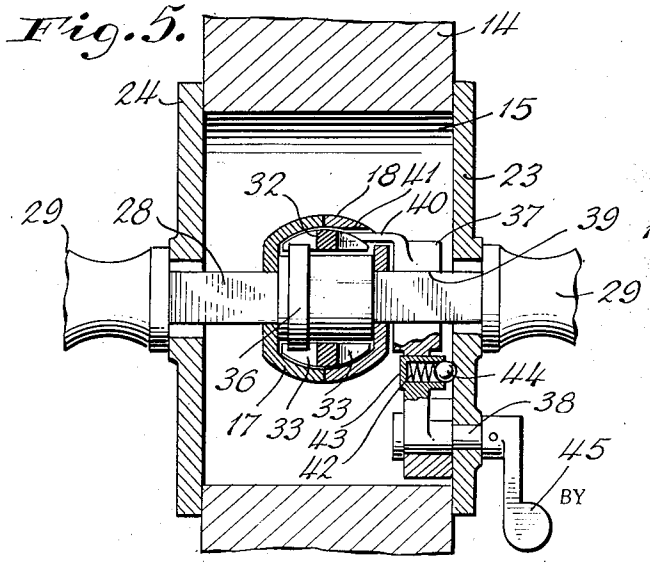
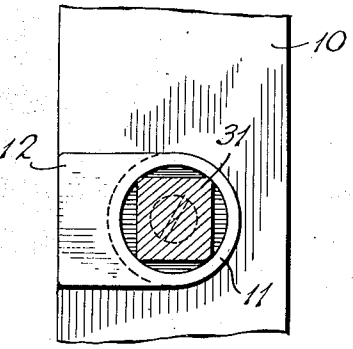


Fig. 6.



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UNITED STATES PATENT OFFICE

2,238,314

LOCK MECHANISM FOR DOORS

William Falk, Far Rockaway, N. Y., assignor to Independent Lock Company, Fitchburg, Mass., a corporation of Massachusetts

Application May 12, 1939, Serial No. 273,187

8 Claims. (Cl. 292—337)

The present invention relates to locks of the type generally used for doors of homes, apartments, offices and the like, which are operated by rotation of a knob or handle on both sides of the door.

The principal object of the present invention is to provide a door lock of improved construction and design which may be conveniently installed and which is adapted to be securely and rigidly retained within the door against possible displacement. Another object of the invention is to provide a door lock of the character described, which is economical to manufacture and efficient in use. A further object of the invention is to provide in a door lock of the type hereinabove mentioned, improved mechanism for the purpose of locking the knobs or handles against rotation in order to prevent movement of the latch. A still further object of the invention is to provide locking mechanism for the aforesaid purpose which is designed to be automatically thrown out of locking position when the door is being shut, thus insuring against accidental or unintentional locking of the door. Other objects and advantages of the present invention will in part be pointed out hereinafter and will in part be apparent to those skilled in the art to which the present invention relates.

With the above and other objects in view the invention consists of the novel features of construction, combination of elements and operative arrangements of parts hereinafter described and shown in the accompanying drawings which illustrate a preferred embodiment of the invention.

In the accompanying drawings which form an integral part of this specification,

Fig. 1 is a transverse sectional view through the door and lock constructed in accordance with the present invention taken on line 1—1 of Fig. 2;

Fig. 2 is a vertical longitudinal sectional view through the door and lock taken on line 2—2 of Fig. 1;

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a vertical longitudinal sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a vertical transverse sectional view taken on the line 5—5 of Fig. 4; and

Fig. 6 is a side elevational view of the door jamb looking on the face of the striker, taken on the line 6—6 of Fig. 2.

Referring now to the drawings wherein like reference characters indicate corresponding parts throughout the several views, 10 represents the door jamb which is bored to provide a recess therein into which is fitted a cup-shape keeper 11 having a laterally extending wing at its outer end forming a striker 12. The keeper 11 is secured within the door jamb by means of a suitable stud 13 and is adapted to receive therein the head of the latchbolt to be referred to hereinafter.

The door 14, which is adapted for housing the lock mechanism, is provided with a recess formed therein by hole 15 which is bored through the face of the door and a hole 16 communicating with the hole 15 which is bored through the edge of the door. The door lock comprises a casing 17 which is positioned in the recess of the door and extends through the bore 16 into the bore 15. The casing 17 is provided with an opening at the outer end through which the latch is adapted to project, and with a removable cover portion 18 adjacent the inner end to permit access to the mechanism contained therein. The outer end of the casing 17 is preferably also provided with an annular flange 19 which is adapted to bear against a shoulder formed at the outer end of the bore 16, the face of said flange 19 lying flush with the edge of the door. Mounted on the casing 17 within the bore 15 is a spacer washer 20 and threaded on the casing is a spanner nut 21 which bears against the washer 20 in a manner to securely and rigidly retain the casing within the recess of the door. The spanner nut 21 is preferably provided with grooves 22 in the periphery thereof to permit adjustment with a suitable tool. The casing 17 is thus held securely against movement and may be easily and conveniently removed from the door when desired.

On the inner side of the door there is provided a cover plate 23 and on the outer side of the door there is provided another cover plate 24. The plates 23 and 24 are provided primarily to cover the bore 15 and are preferably secured on opposite sides of the door by means of bolts 25 which extend through apertures formed in the inner cover plates 23, and through suitable bushings 26 provided in the casing 17, the threaded ends of the bolts 25 entering into bosses 27 formed on the inner surface of the outer cover plate 24. Extending also through apertures formed in the cover plates 23 and 24 and through the casing 17, from the inside to the outside of the door, is a square shaped spindle 28 to the ends of which are secured knobs or handles 29 in a manner to rotate therewith. This arrangement and con-

struction facilitates the assembling of the various parts of the lock in proper alignment and permits disassembling only from the inner side of the door. The knobs are also thus insured against binding with the inner cover plates.

Within the casing 17 there is slidably mounted a latch bolt 30 having a beveled head 31 at its outer end and an open yoke 32 at its inner end. The ends of the yoke 32 are provided with ears 33 the purpose of which will be described hereinafter. Mounted on the latch bolt 30 is a compression spring 34 one end of which is adapted to bear against the head of the bolt 31 and the other end adapted to bear against a shoulder 35 formed within the casing, in a manner to normally urge the latch bolt 30 into locking position. Mounted on the spindle 28, within the casing, is a cam 36 which is keyed or splined to the spindle in a manner to rotate therewith. Thus, upon rotating the spindle 28 by means of one of the knobs or handles 29, the cam 36 is actuated so as to engage the ears 33 of the yoke 32, thereby drawing the latch bolt 30 against the action of the compression spring 34 into unlocked position. Releasing the knob or handle 29 causes the latch bolt to return to locking position due to the action of the compression spring 34.

For the purpose of locking the knobs or handles of the door against rotation so as to keep the latch in locked position, I provide a lock arm 37 positioned within the recess of the door between the cover plates and secured at one end to a rotatable shaft 38 which extends through an aperture in the inner cover plate 23. The lock arm 37 is provided with a groove 39 which is adapted to receive therein the spindle 28, and with a lug 40 which extends through an arcuate slot 41 in the cover portion of the casing 18 and is adapted to bear against one of the ears 33 of the yoke 32, when the lock arm 37 is placed in locking position. A compression spring 42 is positioned within a recess 43 formed in the lock arm 37, which normally urges a ball bearing 44 against the inner side of the cover plate 23. A recess formed on the inner side of the cover plate 23 is adapted to receive the ball bearing 44 when the lock arm 37 is placed in locking position. A rotating lever 45 is secured to the end of the shaft 38 on the inner side of the door, which operates to throw the lock arm 37 into and out of locking engagement with the spindle 28.

It will be observed that the construction and design of my invention facilitates installation for it eliminates the attendant difficulties of mortising the door, as required for present installations, and obviates the use of the usual studs for the purpose of securing the lock within the door. Furthermore, my improved construction provides for more secure retention of the lock against displacement for the spanner nut 21 provides more effective retaining means and is less likely to become dislodged and may be easily adjusted when required.

It will be observed also that when the door is in closed position and the lever 45 is moved in the direction for throwing the lock arm 37 into locking engagement with the spindle, the knobs on both sides of the door are held against rotation, thus preventing movement of the latch bolt and opening of the door. The door may thereafter be opened only after disengaging the lock arm from the spindle by means of the lever 45. In the event that the door is in open position and the lock arm 37 accidentally or unintentionally is thrown into locking engagement with the spindle 28, then, upon shutting of the door the pressure of the striker 12 against the bolt head 31 would move the latch bolt 30 inwardly within the casing 17. Thereupon the ear 33 of the yoke 32 would bear against the lug 40 of the lock arm 37 and the lock arm would thus be urged out of locking engagement with the spindle 28. There is thus no danger of being locked out after leaving the inner room and shutting the door from the outside, as is often the case with the locking mechanism presently in common usage. Other advantages may become obvious with use.

While I have described the construction of my improved lock mechanism in detail, I am aware that the invention may be embodied in other specific forms, and I desire it to be understood that I do not intend to limit myself to the specific embodiment herein described and illustrated, but to include any obvious changes which would come within the scope of my invention as defined in the appended claims.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is—

1. In combination with a door having a recess therein formed by intercommunicating bores through the face and edge of the door, of a unitary latch casing assembly extending through the edge bore into the face bore and having a shoulder at the outer end abutting the edge of the door, and retaining means mounted on the casing adjustable in relation to said casing and bore and adapted to be drawn into engagement with the wall of the face bore, whereby the casing is anchored within the door.

2. In combination with a door having a recess therein formed by intercommunicating bores through the face and edge of the door, of a latch casing extending through the edge bore into the face bore and having a shoulder at the outer end abutting the edge of the door, and a retaining nut threaded on the casing adjustable in relation to said casing and bore and adapted to be drawn into engagement with the wall of the face bore, whereby the casing is anchored within the door.

3. In combination with a door having a recess therein formed by intercommunicating bores through the faces and edge of the door, of a latch casing extending through the edge bore into the face bore and having a shoulder abutting the edge of the door, an adjustable nut threaded on the casing within the face bore, and a spacer member interposed between the nut and the wall of the face bore, whereby the casing is anchored within the door.

4. In a door lock, a latch casing having a shoulder at the outer end, a portion of the body of said casing which is arranged to be within the door being threaded and a retaining nut threaded on said portion, whereby the casing may be drawn into engagement with a portion of the wall of the door orifice which is arranged to receive the casing.

5. In combination with a door having a recess therein formed by intercommunicating bores through the face and edge of the door, of a latch casing extending through the edge bore into the face bore and having a shoulder at the outer end abutting the edge of the door, a retaining nut threaded on the casing and adapted to be drawn against the wall of the face bore for anchoring the casing, cover plates for the face bore on op-

posite sides of the door, and bolts extending through the inside cover plate and latch casing and threaded into the inner face of the outside cover plate.

6. In combination with a door having a recess therein formed by intercommunicating bores through the face and edge of the door, of a latch casing extending through the edge bore into the face bore and having a shoulder at the outer end abutting the edge of the door, a retaining nut threaded on the casing, a spacer member interposed between the nut and the wall of the face bore for anchoring the casing, cover plates for the face bore on opposite sides of the door, and bolts extending through the inside cover plate and latch casing and threaded into the inner face of the outside cover plate.

7. In a door lock, a latch casing having a shoulder at the outer end and a body portion thereof being formed to be within the door body, a portion of said casing adjacent the inner end including adjustable means adapted to engage said casing and to be drawn against the walls of the orifice arranged to receive said casing.

8. In a door lock, a latch casing assembly having a shoulder at the outer end and a body portion which is arranged to be disposed on the inner part of the door, a retaining nut adjustably threaded on the body of said casing and a spacer member interposed between the shoulder and said retaining nut, whereby the casing may be drawn into a door orifice which is arranged to receive the casing by the action of said nut against said spacer member.

WM. FALK.

CERTIFICATE OF CORRECTION.

Patent No. 2,238,314. April 15, 1941.

WILLIAM FALK.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the heading to the printed specification, line 6, for "Application May 12, 1939, Serial No. 273,187" read --Substituted for abandoned application Serial No. 190,207, February 12, 1938. This application May 12, 1939, Serial No. 273,187--; page 1, first column, line 1, before the words "The present invention" insert the following paragraph-

This application is a substitute for abandoned application Serial No. 190,207, filed February 12, 1938.;

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 20th day of May, A. D. 1941.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)