May 11, 1943. E. V. KIDDER 2,318,947

DOOR LOCK

Filed Aug. 23, 1940 2 Sheets-Sheet 1

FIG. 1.

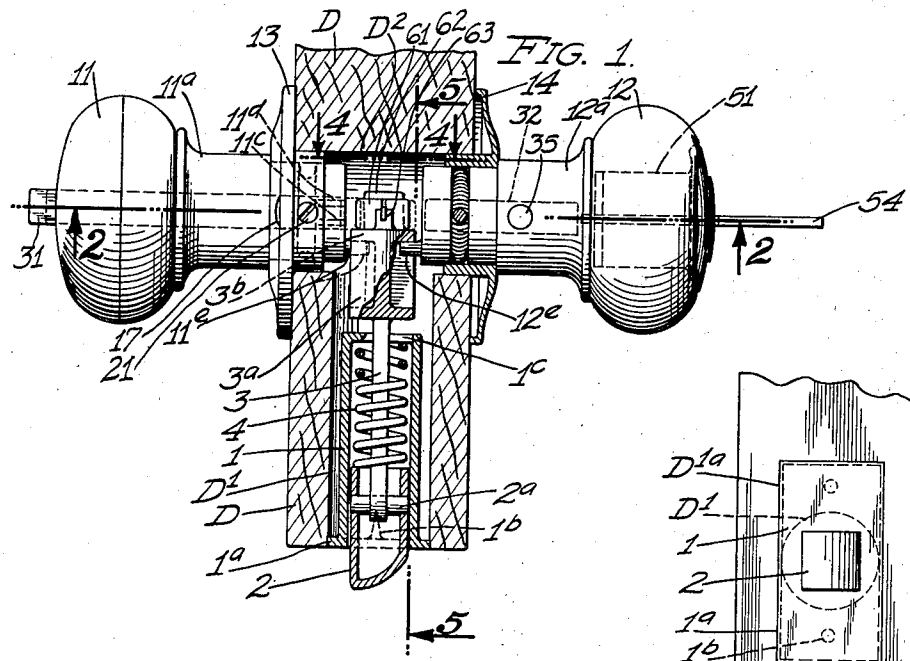


FIG. 2.

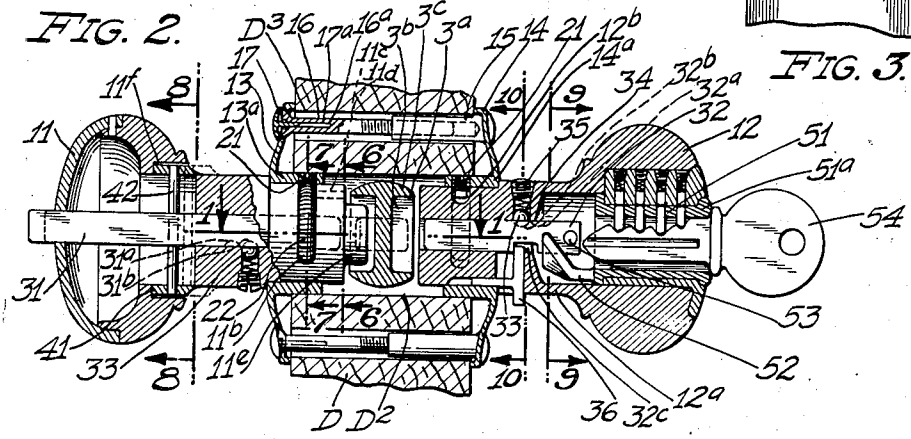
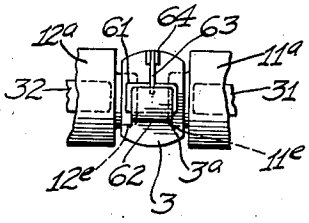


FIG. 3.

FIG. 4.



Inventor

EUGENE V. KIDDER

By William C. Hall

Attorney

May 11, 1943. E. V. KIDDER 2,318,947

DOOR LOCK

Filed Aug. 23, 1940 2 Sheets-Sheet 2

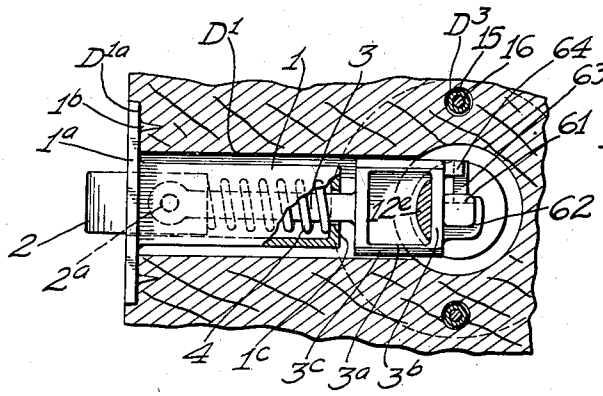


FIG. 5.

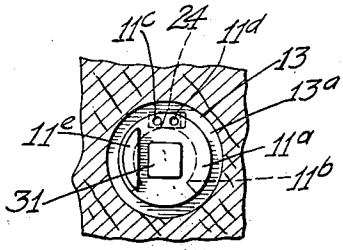


FIG. 6.

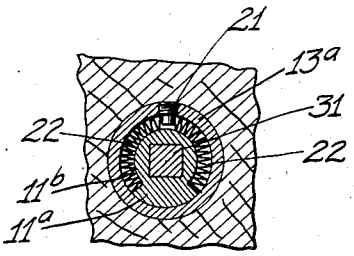


FIG. 7.

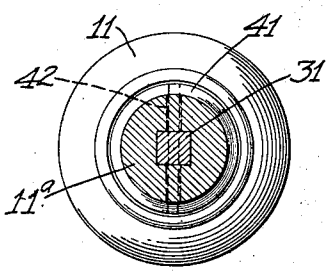


FIG. 8.

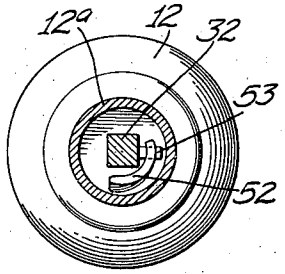


FIG. 9.

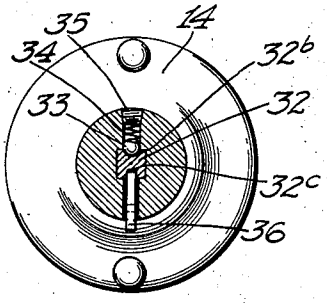


FIG. 10.

Inventor

EUGENE V. KIDDER

By William E. Hall.

Attorney

Patented May 11, 1943 2,318,947

UNITED STATES PATENT OFFICE

2,318,947

DOOR LOCK

Eugene V. Kidder, Los Angeles, Calif., assignor to Harry E. Fendring, Los Angeles, Calif.

Application August 23, 1940, Serial No. 353,798

8 Claims. (Cl. 70—152)

My invention relates to a lock particularly adapted for doors.

One of the principal objects of this invention is to provide a lock of this class which is particularly simple and economical of construction, one which may be readily and economically installed, and one which is durable and which will not readily deteriorate or get out of order.

An important object also of this invention is the provision of a novel and simple latch bolt mechanism and knobs which may be readily installed and effectively operated even though the several elements are not properly aligned, or even if the several parts are considerably out of line.

Another important object of this invention is to provide a novel operative connection between the inner end of the bolt operating mechanism and the knobs, whereby the latter may be easily connected to the former by depressing the bolt and inserting the retracting means of the knob.

A further important object of this invention is to provide a novel and simple means for locking or blocking the bolt against withdrawal or retraction.

A still further important object of this invention is to provide a novel arrangement for unlocking from one side of the door the unlocking or locking means at the other side.

Still another important object of this invention is to provide novel and simple means for retaining the knobs in position on the door as well as centralizing or neutralizing the knobs after the same are operated.

It is also an object of this invention to provide novel and simple means for covering otherwise exposed bolt or screw heads.

An important object also of this invention is to provide a lock of this class which may be used as an outside door lock and in which features thereof may be also used as an inside or room door latch or lock.

With these and other objects in view, as will appear hereinafter, I have devised a door lock having certain novel features of construction, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, which form a part of this application, in which:

Fig. 1 is a transverse section of the free edge of a door showing my lock, in a preferred form of construction, installed therein, portions being broken away and in section to facilitate the illustration, the sectional portion being taken substantially at 1—1 of Fig. 2;

Fig. 2 is a fragmentary sectional view thereof, taken through 2—2 of Fig. 1;

Fig. 3 is a fragmentary edge view of the door showing the latch bolt and housing;

Fig. 4 is an elevational view of the inner end of the bolt means, showing its relation to the adjacent ends of the hubs of the knobs, taken at 4—4 of Fig. 1;

Fig. 5 is a fragmentary sectional elevational view thereof, taken through 5—5 of Fig. 1, showing essentially the bolt mechanism; and,

Figs. 6, 7, 8, 9, and 10 are transverse sectional views taken respectively through 6—6, 7—7, 8—8, 9—9, and 10—10 of Fig. 2.

The latch bolt mechanism consists essentially of a bolt housing 1, a bolt 2, a bolt retracting member 3, and a compression spring 4.

The bolt housing 1 is located in a hole D^1 provided in the outer edge of the door D. The outer end of the housing has a plate portion 1^a which fits into a mortised recess D^{1a} at the free edge of the door. The edges of the plate portion 1^a are preferably bevelled inwardly to insure a tight fit in the recess. The plate portion has inwardly extending prongs 1^b at its inner side which may be driven into the door for securing the housing 1 into place.

The bolt is reciprocally mounted in the housing and is normally forced outward by the compression spring 4. The bolt is preferably made hollow and is provided with a transverse pin 2^a near its inner end. The forward or outer end of the bolt retracting or operating member 3 is mounted on the pin 2^a in such a manner that the member 3 may be moved laterally with respect to the bolt and the housing, as indicated by dotted lines. The inner end of the housing has a transverse slot 1^c, through which the bolt operating member 3 extends and which permits the lateral movement of the member 3.

The portion of the bolt operating member 3 which extends inwardly from the housing 1 is provided with box-like structures 3^a at the opposite sides of its inner end. The extreme inner end of the member 3 has laterally extending flanges 3^b which are engaged by suitable means for drawing the member 3 inwardly, as will be described hereafter. Above and below the box-like structures are also flanges, as indicated by 3^c, in Figs. 2 and 5, which form laterally extending flanges which guide the bolt operating member within the hole D^1.

In the drawings, I have shown two knobs 11 and 12 having hubs 11^a and 12^a. These knobs are axially aligned and are separately rotatably mounted in annular flanges or bearings 13^a and 14^a at the central portions of escutcheon plates or discs 13 and 14. These annular flanges extend into the opposite ends of a transverse bore D^2 of the door, and thereby locate the escutcheon plates. These escutcheon plates are secured at the opposite sides of the door 1, the axes being at right angles to the latch bolt mechanism. These plates are secured together by bolt and nut means, as shown. The nuts consist of tubular

members 15 which are secured and extend inwardly from the escutcheon plates 14, which are preferably located at the outside of the door. The bolts or screws 16 of the bolt and nut means extend through the other escutcheon plates and into the nuts 15. The bolts and nuts extend through holes D^3 in the door, which holes are spaced from the bore D^2.

The tubular nuts 15 prevent the escutcheon plates of the lock from turning with respect to the door.

The heads of the screws 16 are concealed or covered by buttons 17 which have round heads and a central shank 17^a, similar to the ordinary furniture nail. The shank of the button is inserted into conforming axially extending holes 16^a at the head end of the screws, thus securing the buttons frictionally in position.

The knobs are held against axial movement within the bearings of the escutcheon plates by set screws 21 which are provided in the bosses or annular flanges of the escutcheon plates and which extend with their inner ends into circumferential grooves 11^b and 12^b. The knobs are centered or held in neutral positions by compression springs 22 and 23, a part of which is positioned in each of the grooves. The adjacent ends of the springs of each pair are located at the opposite sides of the set screw 21, while the other ends abut against the ends of the grooves, as shown best in Fig. 7.

In this manner, the knob assumes a neutral position in which both springs 22 and 23 are under the same compression.

To facilitate assembly of the springs in the grooves of the hub, I have provided a tool, shown by dotted lines and designated 24 in Fig. 6. This tool is in the form of a spanner wrench and is provided with spaced lugs which are adapted to be inserted into holes designated 11^c and 11^d in Fig. 6. The springs are located in the grooves between the ends thereof and between the pins extending through the holes 11^c and 11^d. When the hubs are assembled in the escutcheon plates and the screws 21 inserted, the tool 24 is removed.

The inner ends of the hubs are provided with bolt actuating lugs 11^e and 12^e which extend into the box-like structure 3^a at the inner end of the bolt actuating member 3. These lugs are segmental in shape, as indicated in Fig. 5, and are formed by cutting off the major portion of one side of a reduced inner end of the hubs, thereby providing eccentric lugs. The flat side of these eccentric segmental lugs are positioned against the inner or front sides of the laterally extended flanges 3^b at the inner end of the bolt actuating member. Thus, rotation of the knobs in either direction causes the ends of the lugs to force the bolt actuating member inwardly and thereby retract the bolt.

The bolt actuating member is prevented from being drawn inwardly by locking rods 31 and 32, axially aligned with and reciprocally mounted in the knobs 11 and 12. Both locking rods are arranged to be forced inwardly so that their inner ends are located behind the bolt actuating member and thereby prevent the inward movement of the latter. In the hubs of both knobs are ball checks 33 which are arranged to enter one of two depressions in the locking rods, the depressions in the rod 31 being designated 31^a and 31^b, and the depressions in the rod 32 being designated 32^a and 32^b. These ball checks are forced toward the locking rods by springs 34, which are held in position by plugs 35.

The locking rod 31 is forced into locking position by forcing inwardly the outer end of the locking rod which extends axially from the knob 11. The outer locking rod 32 is forced inwardly by a latch 36 which extends upwardly through the under side of the hub 12^a into an elongated notch 32^c in the locking rod 32.

The locking rods 31 and 32 are drawn outwardly or free from the inner end of the bolt actuating member by suitable manual means, the withdrawal of the locking rod 31 in the inside knob being by means of a latch, whereas the withdrawal of the locking rod 32 in the outside knob being by means of a tumbler lock.

The locking rod withdrawing latch is here shown as consisting of a ring 41, encircling the hub of the inner knob 11, and a pin 42 extending diametrically across the ring. The pin extends through and is fixed in the rod 31 so that shifting of the ring 41 shifts also the rod. The knob 11 is provided with an annular recess 11^f at its inner side for receiving and substantially concealing the latch ring 41 when the rod 31 is withdrawn.

In the outer knob 12 is located the tumbler lock 51, having a plug 51^a. This plug 51^a is provided at its inner end with a wedge cam 52 which is adapted to engage a pin 53 at the inner end of the outer locking rod 32. When the locking rod 32 is forced into its inward position by the latch 36, the pin 53 engages the end of the wedge cam 52, and rotation of the plug 51^a by the key 54 in a clockwise direction causes the locking rod 32 to be drawn outwardly free from engagement with the bolt actuating member 3.

If either of the locking rods 31 or 32 is shifted to its inner or locking position, it is difficult to eject or shift the same to its unlocked position from the opposite side of the door, without providing relatively intricate mechanism. However, I have provided means whereby the locking rod at one side of the door may be shifted to its unlocked position by shifting the other locking rod inwardly, and then withdrawing the latter rod by either the manual latch 41 or the cylinder lock 51 above referred to. To facilitate the ejection or unlocking of one locking rod by means of the inward shifting of the other, I have provided a short rod or slide 61 at the inner end of the bolt actuating member 3. This slide is reciprocable transversely with respect to the bolt actuating member and is held in such sliding position by a bracket 62. This slide is resiliently maintained in a neutral or self-centering position by a leaf spring 63 which is held at its upper end by a lug 64 at the inner end of the bolt actuating member, but spaced above the slide. Thus, when the locking rod 31 is shifted to its inward position, indicated by dotted lines, the slide is slightly displaced, as also indicated by dotted lines. The locking rod 31 is held in such position by the ball check 33 entering the recess 31^a. In order to open the door from the outside, the locking rod 32 is shifted inwardly by means of the latch 36 which causes the inner end of the locking rod 32 to engage the slide 61 and force the locking rod 31 to its unlocked position, as shown by solid lines in Figs. 1 and 2. When the locking rod 32 is forced inwardly, as stated, it is held in said inward position by the ball check 33 which enters the recess 32^a. The locking rod 32 is then withdrawn by inserting the key 54 and causing the plug 51^a to be rotated and the wedge cam 52 to engage the pin 53 and thereby withdraw the locking bolt 32 and thus permit the bolt 2 to be withdrawn by the rotation of either knob.

Though I have shown and described a particular construction, combination, and arrangement of parts and portions, I do not wish to be limited to the same, but desire to include in the scope of my invention the construction, combination, and arrangement substantially as set forth in the appended claims.

I claim:

1. In a lock, a pair of opposed axially aligned knobs having hubs at their adjacent ends, a latch bolt housing located at right angles to the axis of the knobs, a bolt means reciprocally mounted in the housing, said bolt means having at the opposite sides of its inner end laterally extended flanges, the inner ends of the hubs having eccentric lugs, said lugs being positioned at and adapted to engage the inner sides of the corresponding flanges for retracting the bolt means with the rotation of either knob, separate locking rods reciprocally mounted in the hub of each knob, manual means in association with each knob for forcing its respective locking rod behind the inner end of the bolt means to prevent retraction thereof, and other means in association with the locking rods for shifting one out of bolt-locking position when shifting the other into bolt-locking position.

2. In a lock, a pair of opposed axially aligned knobs having hubs at their adjacent ends, a latch bolt housing located at right angles to the axis of the knobs, a bolt means reciprocally mounted in the housing, said bolt means having at the opposite sides of its inner end laterally extended flanges, the inner ends of the hubs having eccentric lugs, said lugs being positioned at and adapted to engage the inner sides of the corresponding flanges for retracting the bolt means with the rotation of either knob, separate locking rods reciprocally mounted in the hub of each knob, manual means in association with each knob for forcing its respective locking rod behind the inner end of the bolt means to prevent retraction thereof, and means at the inner end of the bolt means for shifting one locking rod outwardly with the inward shifting of the other locking rod.

3. In a lock, a pair of opposed axially aligned knobs having hubs at their adjacent ends, a latch bolt housing located at right angles to the axis of the knobs, a bolt means reciprocally mounted in the housing, said bolt means having at the opposite sides of its inner end laterally extended flanges, the inner ends of the hubs having eccentric lugs, said lugs being positioned at and adapted to engage the inner sides of the corresponding flanges for retracting the bolt means with the rotation of either knob, separate locking rods reciprocally mounted in the hub of each knob, manual means in association with each knob for forcing its respective locking rod behind the inner end of the bolt means to prevent retraction thereof, and a self-centering plunger reciprocally mounted transversely with respect to the bolt means and in normal alignment with the locking rods for shifting one locking rod outwardly with the inward shifting of the other locking rod.

4. In a lock, a pair of opposed axially aligned knobs having hubs at their adjacent ends, a latch bolt housing located at right angles to the axis of the knobs, a bolt means reciprocally mounted in the housing, said bolt means having at the opposite sides of its inner end laterally extended flanges, the inner ends of the hubs having eccentric lugs, said lugs being positioned at and adapted to engage the inner sides of the corresponding flanges for retracting the bolt means with the rotation of either knob, separate locking rods reciprocally mounted in the hub of each knob, manual means in association with each knob for forcing its respective locking rod behind the inner end of the bolt means to prevent retraction thereof, means at the inner end of the bolt means for shifting one locking rod outwardly with the inward shifting of the other locking rod, and other manual means in association with each knob for withdrawing the locking rod in the corresponding knob.

5. In a lock, a latch housing, a latch member movably mounted therein, operating members at the opposite sides of the housing for operating the latch member, separate locking members at the opposite sides of the housing, manual means in association with each of the operating members for forcing its respective locking member into the path of the latch member to prevent retraction of the latter, and means in association with the inner portion of the latch member for shifting one locking member outwardly with the inward shifting of the other locking member.

6. In a lock, a latch housing, a latch member movably mounted therein, operating members at the opposite sides of the housing for operating the latch member, separate locking members at the opposite sides of the housing, manual means in association with each of the operating members for forcing its respective locking member into the path of the latch member to prevent retraction of the latter, and a self-centering locking member shiftably mounted at the inner portion of the latch member and in normal alignment with the first mentioned locking members for shifting one of the latter outwardly with the inward shifting of the other of the latter.

7. In a lock, a latch housing, a latch member movably mounted therein, operating members at the opposite sides of the housing for operating the latch member, separate locking members at the opposite sides of the housing, manual means in association with each of the operating members for forcing its respective locking member into the path of the latch member to prevent retraction of the latter, means in association with the inner portion of the latch member for shifting one locking member outwardly with the inward shifting of the other locking member, and other manual means in association with each of the operating members for withdrawing the locking member in the corresponding operating member.

8. In a lock, a knob having a hub and an annular groove at the inner side of the knob around the hub, bolt means cooperating with the knob, a locking rod extending through the hub to prevent retraction of the bolt means, said hub having a transverse slot connecting diametrically opposite sides of the groove, a locking ring reciprocally mounted on the hub and adapted to enter the groove, and a pin extending diametrically across the ring through the slot and fixed to the rod for axially shifting the rod with the axial movement of the ring.

EUGENE V. KIDDER.