Jan. 1, 1929. 1,697,569

LA FOREST KNOWLES

DOOR LOCK

Filed June 14, 1927 2 Sheets-Sheet 1

Fig. 1.

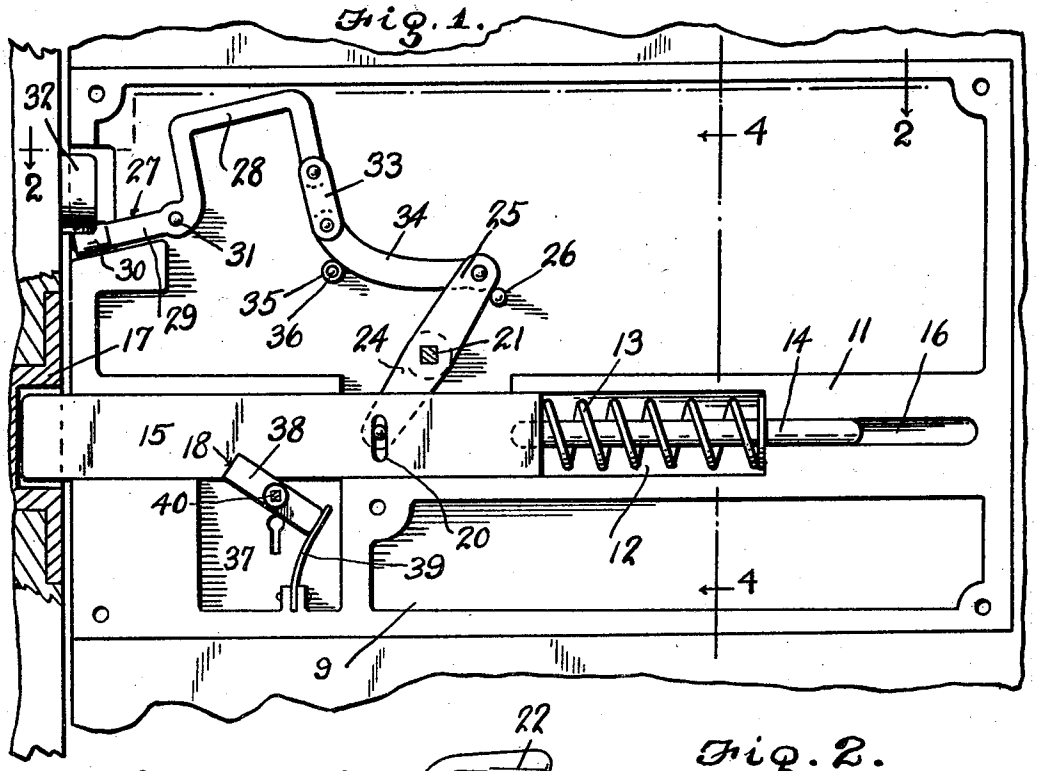


Fig. 2.

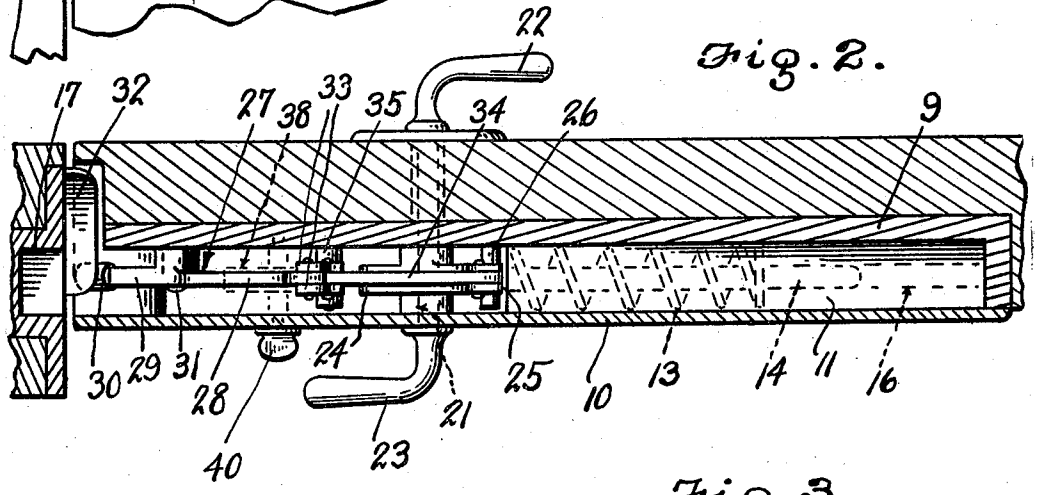
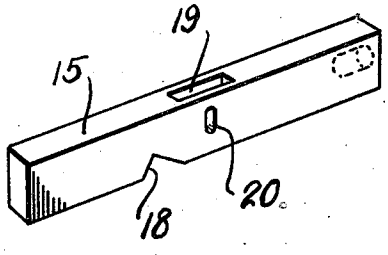


Fig. 3.



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Fig. 4.

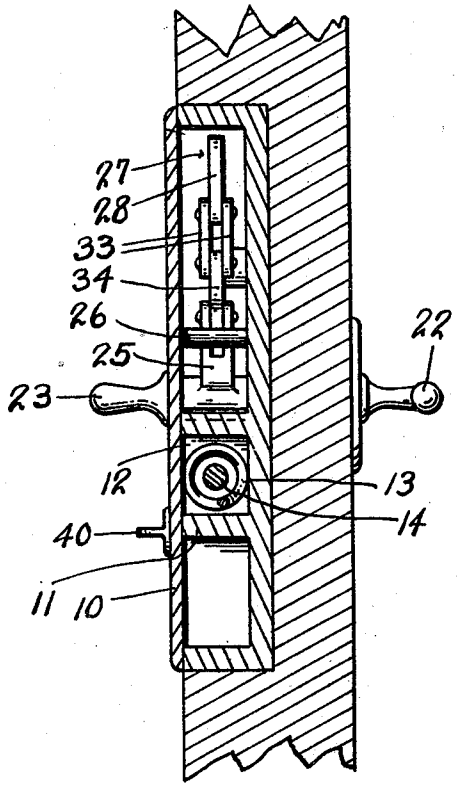


Fig. 5.

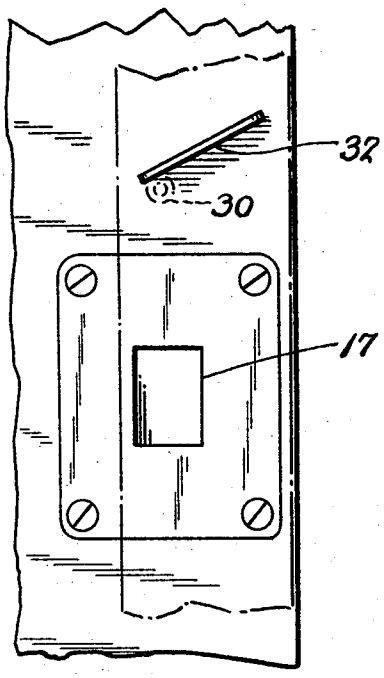


Fig. 7.

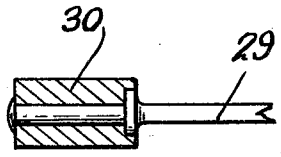


Fig. 6.

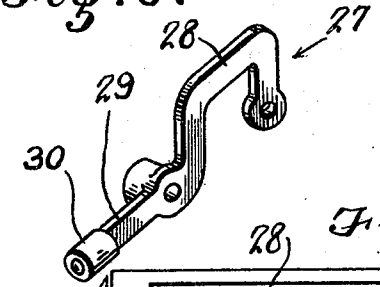
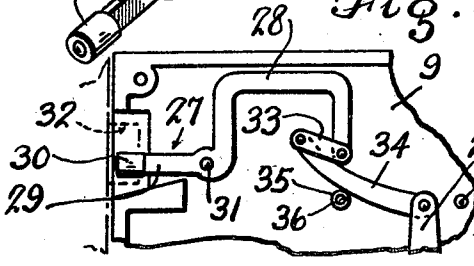


Fig. 8.



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Patented Jan. 1, 1929. 1,697,569

UNITED STATES PATENT OFFICE.

LA FOREST KNOWLES, OF PORTLAND, MAINE.

DOOR LOCK.

Application filed June 14, 1927. Serial No. 198,787.

The present invention relates to an improved door lock of the type provided more particularly for use on swingably mounted doors.

Briefly, the invention has reference to a structure of this class which embodies a casing, a spring projected latch bolt slidable in a guide therein, a key operated retainer for the bolt, a handle operated means for retracting the bolt against the tension of the spring, and novel trip mechanism associated with said means.

My primary aim is to generally improve upon structures of this class by providing one which is characterized by a novel arrangement of details cooperating and associated in such a manner as to provide a highly efficient and dependable structure.

Additional features and advantages predicated upon this new arrangement of parts will become more readily apparent from the following description and drawings.

In the drawings:

Figure 1 is a side elevational view with the cover plate of the casing removed to expose the internal mechanism.

Figure 2 is a horizontal section taken approximately upon the plane of the line 2—2 looking in the direction of the arrows and showing the cover plate in position.

Figure 3 is a detail perspective view of the slidable retaining bolt.

Figure 4 is a cross section taken approximately upon the plane of the line 4—4 of Figure 1 looking in the direction of the arrows.

Figure 5 is a fragmentary view showing the door jamb, keeper plate and trip operating abutment.

Figure 6 is a perspective view of one of the principal parts of the trip mechanism.

Figure 7 is an enlarged detail view of the roller equipped end of parts shown in Figure 6.

Figure 8 is a fragmentary view on a reduced scale showing the trip mechanism in a position for holding the bolt retracted.

Referring now to the drawings in detail it will be seen that the reference character 9 designates generally the body portion of the casing. This is open on one side and the open side is closed by a cover plate 10. The body 9 is cast to accommodate the various internal details and it includes a separately disposed raised portion 11 (see Figure 1) having a socket 12 to accommodate a coiled spring 13. The coil spring surrounds a guide pin 14 which has its outer end located in a small socket in the inner end of the slidable latch bolt 15 and has its opposite end slidable in a groove 16. The spring bears against the bottom of the socket and against the inner end of the bolt 15 in order to project the locking end of this bolt through the customary opening in the end of the casing into the receiver in the keeper plate 17. As shown in Figure 3 this bolt is provided on its bottom and intermediate its ends with a substantially V-shaped notch 18 which serves a purpose to be hereinafter described. It is provided on its top with a transverse socket 19 communicating with elongated slots 20. The body 1 is of course fashioned to provide a guide through which the bolt slides. At this time attention is invited to an oscillatory rocker shaft 21 journaled for oscillation in appropriate bearings and provided at its opposite ends with operating handles 22 and 23. This shaft is provided with oppositely extending arms 24 and 25, the lower arm 24 extending into the socket 19 and being provided with a pin projectable through and slidable in the slot 20. The upper end of the arm 25 is bifurcated. Incidentally, the movement of this arm 25 in one direction is limited by an appropriate stop 26.

Cooperable with the bifurcated end portion of the arm 25 is a novel trip mechanism. This mechanism includes a rocker 27 which, as shown plainly in Figure 6, embodies a U-shaped portion 28, an arm extension 29, and an anti-friction roller 30 on the extremity of this arm 29. Moreover the arm 29 is provided with an appropriate bearing mounted for rocking movement on the pivot 31 (see Figure 1).

The arm 29 is movable in an appropriate opening in the casing and is located to dispose the roller 30 for cooperation with an inclined abutment plate 32 rigidly mounted on the door jamb. Connected to the U-shaped portion 28 through the medium of a pair of short links 33 is a longitudinally curved link 34. These various links are pivotally connected to each other and the link 34 is pivotally connected to the furcations on the aforesaid arm 25. It will be noted that the curved lower edge of the link 34 rides on a roller 35 carried by the stud 36. When the bolt 15 is projected into the keeper 17, the trip mechanism is in the posi-

tion shown in Figure 1. However, when the bolt is retracted by manipulating either of the handles 22 or 23, the trip mechanism takes the approximate position represented in Figure 8 where the links are temporarily locked to hold the bolt retracted against the tension of the spring 13.

As shown in Figure 1, an appropriately shaped pocket 37 is formed in the casing to accommodate a rockably mounted button 38. One end of this button is movable into the aforesaid notch 18 (see Figure 3). The opposite end however, is cooperable with a suitably anchored flat spring 39. A keyhole is formed in one wall of the socket and permits the insertion of a key to be employed in turning the button in a manner to release it. If desired, a finger piece 40, (see Figure 2) may be mounted on the shaft which carries the button 38 for operating the button from the inside of the door. In other words, the finger piece 40 is for releasing the button from the inside and the key is employed for releasing it from the outside, and it is of course necessary to release the button in order to operate the latch bolt 15.

Assuming that the parts are in the position shown in Figure 1, wherein the door is shown closed, it is obvious that the finger piece 40 is turned to release the button 38. Then, the handle 23 is grasped and moved in a manner to slide bolt 15 inwardly against the spring 13. This is accomplished as already described. In so doing, the links 33 and 34 serve to rock the rocker 27 upon its pivot 31 until these parts assume the position shown in Figure 8. When thus positioned, this mechanism serves to hold the bolt 15 retracted. However, when the door is closed, the roller 30 on the end of the rocker 27 comes into engagement with the abutment plate 32. This releases the trip mechanism and this then comes into play to operate upon the arms 25 and 26 in a manner to permit the spring 13 to project the bolt 15 into the keeper seat.

It is believed that the details as well as their arrangement and method of cooperation will be quite clear after considering the description in connection with the drawings. Therefore, a more lengthy description is believed to be unnecessary.

While the preferred embodiment of the invention has been shown and described, it is to be understood that changes in shape, size, and rearrangement of parts coming within the field of invention may be resorted to if desired.

I claim:

1. In combination, a relatively stationary door jamb, a swingably mounted door, a keeper carried by said jamb, an abutment plate also carried by said jamb, a lock casing carried by said door, a spring pressed locking bolt mounted for sliding movement in said casing and projectable through an opening into the receiver seat in said keeper, a rock shaft carried by said casing, an operating handle for said rock shaft, an operating connection between said rock shaft and said bolt for retracting said bolt, and automatically operable trip mechanism in said casing having operating connection with said shaft for holding said bolt retracted when the door is open and for cooperating with said abutment plate and releasing said bolt for projection when the door is closed.

2. In a structure of the class described, a lock casing having a guide, a spring pressed locking bolt mounted for sliding movement in said guide, said bolt being provided with a notch, a pocket in said casing, a button pivotally mounted in said pocket and having one end engageable in said notch, a spring in said pocket engageable with the opposite end of the button, and operating means for the button.

3. In a structure of the class described, a lock casing provided with a guide and a raised internal portion in alinement with said guide, said raised portion having a socket and a groove, a locking bolt slidable in said guide and into said socket, said locking bolt having a small socket in its inner end, a guide pin having one end extending into said small socket and having its opposite end extending into said groove, and a spring surrounding said pin and located in said socket and bearing at one end against the bottom of the socket and at its opposite end against said bolt.

4. In a structure of the class described, a casing, a locking bolt mounted for sliding movement in said casing, spring means for projecting said bolt, a rock shaft journaled for rocking motion in said casing, an operating connection between said shaft and bolt, an operating handle for said shaft, a rocker pivotally mounted in said casing, and linkage connecting said rocker with said rock shaft, said rocker comprising a substantially U-shaped part with which said linkage is connected and an arm provided on its free end with an anti-friction roller.

5. In a structure of the class described, a casing, a locking bolt slidable in said casing, spring means for projecting said bolt, manually manipulated operating means for retracting said bolt against the action of said spring, and trip mechanism associated with said operating means, said trip mechanism comprising a rocker, a pair of short links connected with said rocker, a relatively long longitudinally curved link connected with said short links, a stop, and a roller with which said curved link is cooperable.

In testimony whereof I affix my signature.

LA FOREST KNOWLES.