July 29, 1958 C. C. HILLGREN 2,844,953

FRONT DOOR LOCK

Filed Sept. 6, 1955 2 Sheets-Sheet 1

FIG. 1.

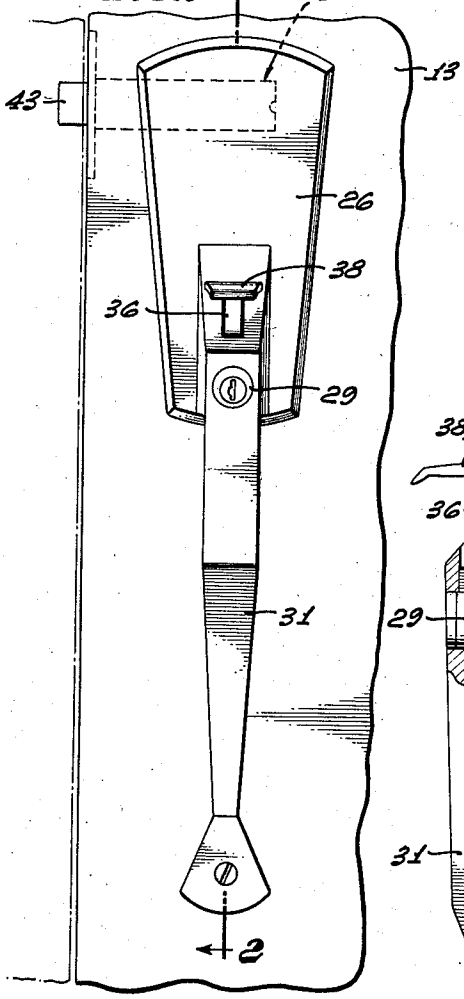


FIG. 2.

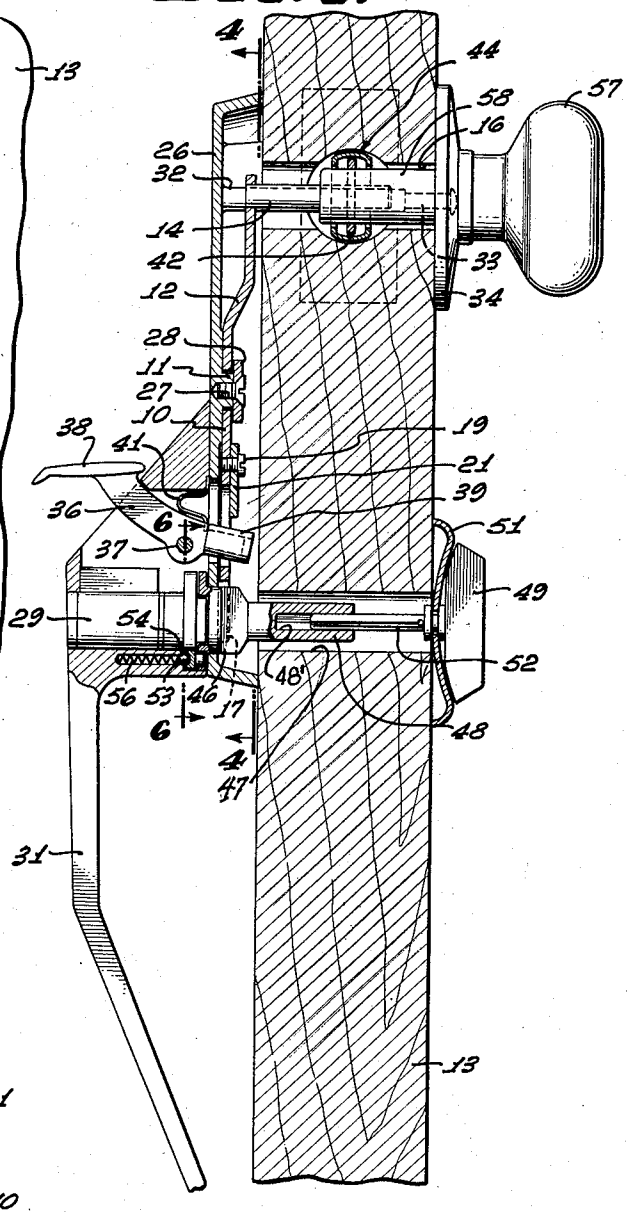
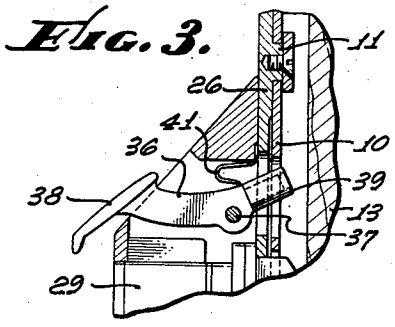


FIG. 3.



CARL C. HILLGREN
INVENTOR.

Huebner, Beehler, Worrel & Herzig
BY
Vernon D. Beehler

ATTORNEYS.

July 29, 1958 C. C. HILLGREN 2,844,953

FRONT DOOR LOCK

Filed Sept. 6, 1955 2 Sheets-Sheet 2

Fig. 4.

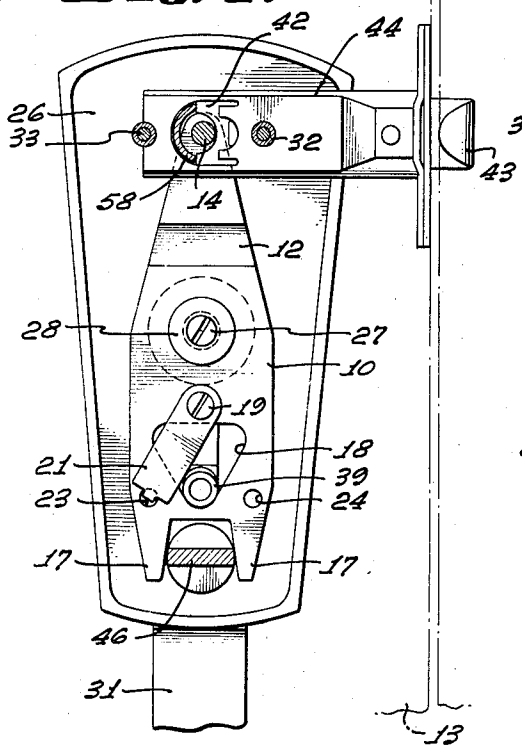


Fig. 5.

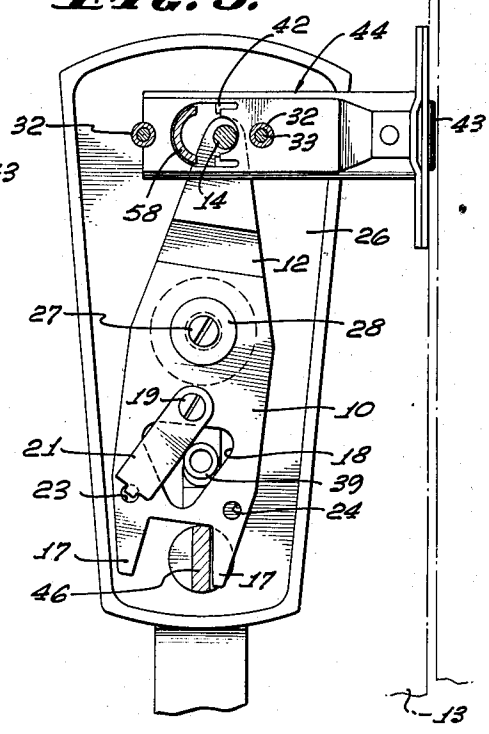


Fig. 6.

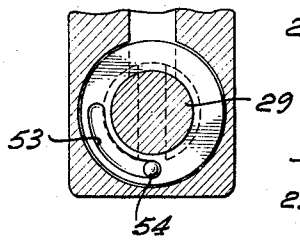


Fig. 7.

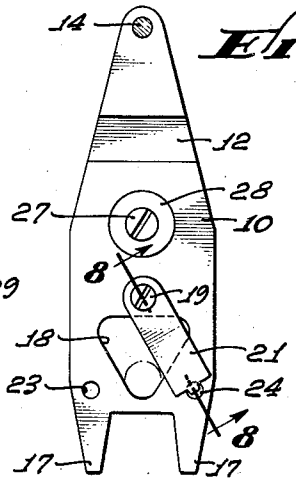
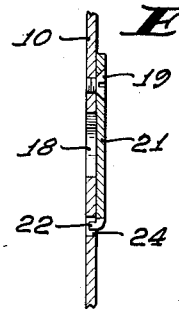


Fig. 8.



CARL C. HILLGREN
INVENTOR.

Huebner, Beehler, Worrel & Herzig
BY
Vernon D. Beehler

ATTORNEYS.

United States Patent Office 2,844,953 Patented July 29, 1958

2,844,953

FRONT DOOR LOCK

Carl C. Hillgren, Newport Beach, Calif.

Application September 6, 1955, Serial No. 532,703

7 Claims. (Cl. 70—146)

The present invention relates to a lock set, and particularly to a lock set for a front door.

Present day locks, such as front door locks, are required to be rugged and reliable and of efficient and economical design. In addition, they should be attractive and present an appearance of strength and security. Furthermore, modern door locks are called upon to serve as locks and latches capable of being operated from both sides of the door and at the same time are required to be of integrated and compact construction.

Accordingly, it is an important object of my invention to provide a rugged and reliable lock of efficient and economical design.

Another object is to provide a highly reliable and economical lock of compact construction and capable of serving as a lock and a latch operable from both sides of the lock assembly.

A further object is to provide a front door lock set of compact and rugged construction and design and affording a high degree of versatility.

Additional objects will become apparent from the following description:

In general terms, my invention comprises a lock set containing a bolt and lock cooperatively associated with a pivotally mounted plate means arranged to operatively engage both the bolt and the lock. A handle is cooperatively associated with the plate means for pivoting it and urging the bolt into an unbolted position. This preferably is accomplished by a lever connected to the handle and projecting into a slot, preferably cut through the plate means at an angle to produce a pivotal movement in the plate means as the lever is moved longitudinally through the slot. A stop means is operatively connected between the lock and the plate means to prevent or stop pivotal movement of the plate means when the lock is in the locked position and to permit pivotal movement when in the unlocked position.

A more detailed description of a specific embodiment of the invention as applied to a front door is given with reference to the drawings, wherein:

Figure 1 is a front elevational view showing the lock set mounted on a right-hand door;

Figure 2 is a cross-sectional view taken on line 2—2 of Figure 1 showing a handle projecting from the front of the lock set in a normal position;

Figure 3 is a partial detailed view showing the handle in a depressed position for unlatching the door;

Figure 4 is a cross-sectional view taken on the line 4—4 of Figure 2 and showing the condition of the lock set when the door is locked;

Figure 5 is a view similar to that of Figure 4 showing the condition of the lock set when the door is unlocked;

Figure 6 is a partial cross-sectional view taken on the line 6—6 of Figure 2 showing a lost motion bearing and groove;

Figure 7 is a partial detail view showing a plate of the lock set arranged for use on a left-hand door; and

Figure 8 is a partial cross-sectional view taken on the line 8—8 of Figure 7.

In the embodiment shown in the drawings, an elongated anchor plate 10 is pivotally mounted on a pivot bearing 11 at a central point in the plate about midway between its ends. The upper portion of the plate 10 is offset inwardly at 12 so that the upper end of the plate is adjacent the surface of the door 13, on which the lock set is shown mounted. A spindle 14 is fixed to the upper end of plate 10 at right angles thereto in any convenient manner and is made to extend centrally into a cylindrical hole 16 bored through the door 13. The lower end of plate 10 is bifurcated. The prongs 17 forming the lower bifurcated end of the plate are made to converge both on their inside and outside edges toward their tips, as shown. Intermediate the middle and lower end, the plate 10 is provided with triangular aperture 18, having its apex toward the lower end of the plate and its base toward the upper end of the plate. Pivotally mounted on a screw 19, threaded in plate 10 adjacent the center of the base of aperture 18, is a bar 21. The lower end of bar 21 is provided with a finger 22 bent inward, as best shown in Figure 8, to engage in either a left side aperture 23, or a right side aperture 24, formed through plate 10 at either side of the apex of triangular aperture 18. It will be seen that bar 21 can be fastened either across the left side of triangular aperture 18, as shown in Figures 4 and 5, or across the right side of triangular aperture 18, as shown in Figure 7, to form an elongated, inclined slot.

The anchor plate 10 is pivotally mounted on the bearing 11 formed on the inside of lock set housing 26 by a screw 27 and washer 28, as best shown in Figure 2. The housing 26 is dished, as shown, to form a hollow space between the front door 13 and the housing wall. It can be made of any convenient and preferably attractive design, such as the compact design shown. A tumbler latch or cylinder lock 29 and a door handle 31 are made integral with or attached to the housing 26, in any convenient manner. Extending from the inside wall of housing 26, and vertical thereto, are two internally threaded anchor posts 32. The lock set is mounted on the front door 13 by screws 33 threaded into anchor posts 32 through door knob flange 34.

A lever 36 pivotally mounted at 37 is provided at the outer end thereof with a handle 38 extending from the lock set and at the inner end thereof with a stub spindle carrying a rotatably mounted hardened cylinder 39. The cylinder 39 is dimensioned to fit slidably in the slot formed by aperture 18 and bar 21 in plate 10 and normally is urged to the bottom of the aperture by a spring 41. When the handle 38 is depressed manually, as shown in Figure 3, the stub spindle is urged upward against the lower inclined edge of bar 21 and imparts a forceful pivotal movement to plate 10 in either a clockwise or counterclockwise direction, depending upon the positioning of finger 22 of bar 21 in either aperture 23 or aperture 24. The pivotal movement of plate 10 in a clockwise direction, for example, as shown in Figures 4 and 5, causes spindle 14 to urge latch bolt actuator 42 to the right and retract latch bolt 43 into latch bolt assembly housing 44 to thereby unlatch the door, as shown in Figure 5. This unlatching action can take place when cylinder lock 29 is in the unlocked position shown in Figure 5, but not when the cylinder lock is in the locked position as shown in Figure 4. In the latter position, a wedge 46 acts as a stop means and stops or prevents any pivotal movement of plate 10 by acting against the inside edges of prongs 17, as shown in Figure 4. In the unlocked position of cylinder lock 29, wedge 46 is rotated from a horizontal, locked position, to a vertical, unlocked position, as shown in Figures 4 and 5, and plate 10 can,

in the latter case, be pivoted until one of the prongs **17** engages a side of the wedge **46**.

More particularly the wedge **46** includes a tubular stem **48** provided with a bore **48'** of square cross section. An inside bolt consisting of a handle **49** is rotatably mounted in a rosette **51** and is fixed to a stem **52** of square cross section. The stem **52** is slidably received in the bore **48'** of stem **48**, and can be used to independently turn wedge **46** to the horizontal or vertical position for locking or unlocking the door from the inside. The movement described is made possible by employment of a lost motion device consisting of a curved groove **53** and a ball bearing **54** spring loaded by coil spring **56**.

When the door is unlocked but closed, it can be opened from the inside by turning door knob **57** to thus turn stub spindle **58**. This action urges latch bolt actuator **42** into latch bolt assembly housing **44** and retracts bolt head **43** into assembly housing **44** to unlatch the door, as shown in Figures 4 and 5. The opening action through knob **57** is independent of the position of anchor plate **10**, cylinder lock **29** or inside lock handle **49**.

Anchor posts **32** position latch bolt housing **44**. When it is desired to convert the lock set from a right-hand door, as shown in the drawings, to a left-hand door, the latch bolt housing **44** is removed from anchor posts **32** by simply sliding the latch bolt assembly over the ends of the anchor posts. The latch bolt assembly **44** is then turned around 180 degrees and again slipped back into position on the anchor posts **32**. The bar **21** is loosened by unscrewing screw **19** and moving finger **22** from aperture **23** to aperture **24** and again tightening screw **19**.

It will be observed that the lock set described above is of rugged and compact construction, and is efficiently and economically designed. Relatively few moving parts are employed in the lock set construction, and their design and cooperation is such that an exceptionally high degree of reliability in the operation of the set is assured. The adaptability of the lock set for both right-hand and left-hand doors, with a minimum of adjustment, is a valuable feature resulting in a high degree of versatility and flexibility.

The foregoing description given in connection with a particular embodiment of the lock set of my invention is given primarily to illustrate that particular embodiment. It is understood that many variations in structure and changes or modifications of design and detail of the illustrated lock set will occur to one skilled in the art and that the invention can be applied to a variety of lock set and lock hardware constructions, in addition to the right-hand and left-hand door application illustrated. Accordingly, it is understood that such applications of the invention and such changes, modifications or variations in structure, design, and details of the specific embodiment illustrated and described above may be made within the scope of the appended claims without departing from the spirit of the invention.

What I claim is:

1. In a door lock set containing a main lock accessible from the outside thereof, a bolt operatively connected to a door knob operable from inside a door on which the set is mounted, and a bolt independent from the main lock and operable from inside the door, the improvement comprising an elongated plate having two opposed ends and pivotally mounted intermediate its ends on pivot means in the set, a rod fixed to one end of the plate and operatively engaging the bolt for urging the bolt into an unbolted position when the plate is pivoted, a bifurcated portion at the other end of the plate, a wedge member disposed between prongs of the bifurcated portion and carried on a pivotally mounted connector establishing a rotatably engaging lost motion connection between inner ends of the main lock and the bolt, the wedge being adapted for wedging the plate against pivotal movement in a locked position of the main and second locks and for freeing the plate for pivotal movement in the unlocked position of the locks, the plate being provided with a triangular aperture therethrough, an arm movably mounted adjacent the aperture and adapted for fastening across a right side portion of the aperture in one setting and a left side portion in another setting for forming a slot inclined to the right and to the left, respectively, of a longitudinal center line of the plate for adapting the lock set for either right or left-hand doors, and a pivotally mounted lever arm connected to a handle and projecting into the slot for pivoting the plate by sliding longitudinally therein.

2. A combination lock and latch set for a door having outside and inside faces comprising a housing having a closed outer side and an open inner side adapted to be mounted against a face of the door, a plate pivotally secured between opposite ends thereof on said housing, a latch bolt mounted horizontally in said door, and a spindle fixed on one end of said plate and extending through the open side of said housing into operative engagement with the latch bolt, a door handle on the closed side of said housing, a plate tilting member pivotally mounted on a horizontal axis on said housing, said member having an operating handle extending outwardly of the housing and having a plate moving element extending to a position adjacent the end of said plate opposite from said spindle, and means in operative engagement between the plate moving element and said plate whereby to enable operation of said latch bolt by said operating handle.

3. A combination lock and latch set for a door having outside and inside faces comprising a housing having an open inner side adapted to be mounted against a face of the door and having a closed outer side, a plate pivotally secured between opposite ends thereof on said housing, a latch bolt mounted horizontally in said door and a spindle extending through the open side of the housing between one end of said plate and the latch bolt and in operative engagement with the latch bolt, a door handle on the closed side of said housing, a plate tilting member pivotally mounted on a horizontal axis on said housing, said member having an operating handle extending outwardly through the closed side of the housing to a position adjacent said door handle and having a plate moving element extending to a position adjacent the end of the plate opposite said spindle, means in operating engagement between the plate and said plate moving element whereby to enable operation of said latch bolt by said operating handle, means forming a recess at one end of said plate, a bolting member rotatably mounted in the door and having a bolting handle at the inside face of the door, said bolting member having an end extending through the open side of said housing, a wedge on the end of said bolting member within said recess and having alternative positions respectively blocking and unblocking operation of said plate.

4. A combination lock and latch set for a door having outside and inside faces comprising a housing having an open side adapted to be applied to the door, a knob assembly adapted to be mounted on the inside face of the door and anchoring means adapted to be secured between the knob assembly and said housing, a plate pivotally secured between opopsite ends of said housing, a latch bolt adapted to be mounted horizontally in said door in operative engagement with the knob assembly and a spindle extending between one end of said plate and said latch bolt in operative engagement with the latch bolt, said plate having an aperture adjacent the other end, a door handle on said casing, a plate tilting member pivotally mounted on a horizontal axis on said housing, said member having an operating handle extending outwardly of the housing and a plate moving element extending into said aperture, and a cam element having alternative tilted positions at opposite sides of said aper-

ture for right-hand and left-hand operation, said cam element being subject to camming engagement with said plate moving element whereby to enable operation of said latch bolt by said operating handle, means forming a recess at one end of said plate, a bolting member rotatably mounted in the door and having a bolting handle at the inside face of the door, a wedge on said bolting member lying within said recess and having alternative positions respectively blocking and unblocking operation of said plate.

5. A combination lock and latch set for a door having outside and inside faces comprising an exterior housing having an open side adapted to be applied to the outside face of the door, a knob assembly adapted to be mounted on the inside face of the door and anchor posts adapted to extend through the door and to secure the knob assembly to said housing, a plate pivotally secured between opposite ends of said housing, a latch bolt in said door in operative engagement with the knob assembly and a spindle on one end of said plate in operative engagement with the latch bolt, said plate having an aperture adjacent the other end, a door handle on said casing, a plate tilting member pivotally mounted on a horizontal axis on said housing, said member having an operating handle extending outwardly of the housing and a plate moving element extending into said aperture, and a bar having alternative tilted positions at opposite sides of said aperture for right-hand and left-hand operation, said bar being subject to camming engagement with said plate moving element whereby to enable operation of said latch bolt by said operating handle, means forming a recess at one end of said plate, a bolting member rotatably mounted in the door and having a bolting handle at the inside face of the door, a wedge on said bolting member lying within said recess and having alternative positions respectively blocking and unblocking operation of said plate, and a keylock in said housing having a lost motion attachment to said bolting member and movable to a position wherein said bolting member is released from blocking position.

6. A combination lock and latch set for a door having outside and inside faces comprising a relatively shallow exterior housing having an open side adapted to be applied to the outside face of the door, a knob assembly on the inside face of the door and anchor posts secured between the knob assembly and said housing, a plate pivotally secured between upper and lower ends of said housing, a horizontal latch bolt in said door in operative engagement with the knob and a spindle fixed on the upper end of said plate in operative engagement with the latch bolt, said plate having adjacent the lower end a

triangular aperture with the apex thereof extending vertically, a vertically elongated door handle on said casing, a plate tilting member pivotally mounted on a horizontal axis on said housing, said member having an operating handle extending outwardly of the housing and a plate moving element extending into said aperture, and a bar having alternative tilted positions at opposite sides of said aperture for right-hand and left-hand operation, said bar being subject to camming engagement with said plate moving element whereby to enable operation of said latch bolt by said operating handle, means forming a recess at the lower end of said plate, a bolting member rotatably mounted in the door and having a bolting handle at the inside face of the door, a wedge on said bolting member lying within said recess and having alternative positions respectively blocking and unblocking operation of said plate, and a keylock in said housing having a lost motion attachment to said bolting member and movable to a position wherein said bolting member is released from blocking position.

7. In a lock set containing bolt means and lock means, plate means mounted on pivot means for operative engagement of the bolt means, handle means cooperatively associated with the plate means for pivoting the plate means and urging the bolt means into an unbolted position, and stop means operatively connecting the lock means to the plate means for preventing pivotal movement of the plate means in the locked position of the lock means and permitting pivotal movement in the unlocked position, said plate means comprising a generally elongated plate provided with a slot running at an angle to a longitudinal center line of the plate, the handle means comprising a pivotally mounted lever arm connected to a handle and projecting into the slot for pivoting the plate by sliding longitudinally therein, said slot being formed by a triangular aperture through the plate, an arm movably mounted adjacent the aperture and adapted for fastening across a right side portion of the aperture in one setting and a left side portion in another setting for forming a slot inclined to the right and to the left, respectively, of the longitudinal center line for a lock set wherein the bolt operates to the right side and the left side, respectively, thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

1,169,541	Hurd	Jan. 25, 1916
1,380,116	Solaini	May 31, 1921
1,563,060	Augenbraun	Nov. 24, 1925
1,629,764	Wread	May 24, 1927
2,346,618	Schlage	Apr. 11, 1944