Aug. 16, 1960 F. KAISER 2,949,328

DOOR LOCK SET

Filed Nov. 7, 1957

2 Sheets-Sheet 1

Fig. 1

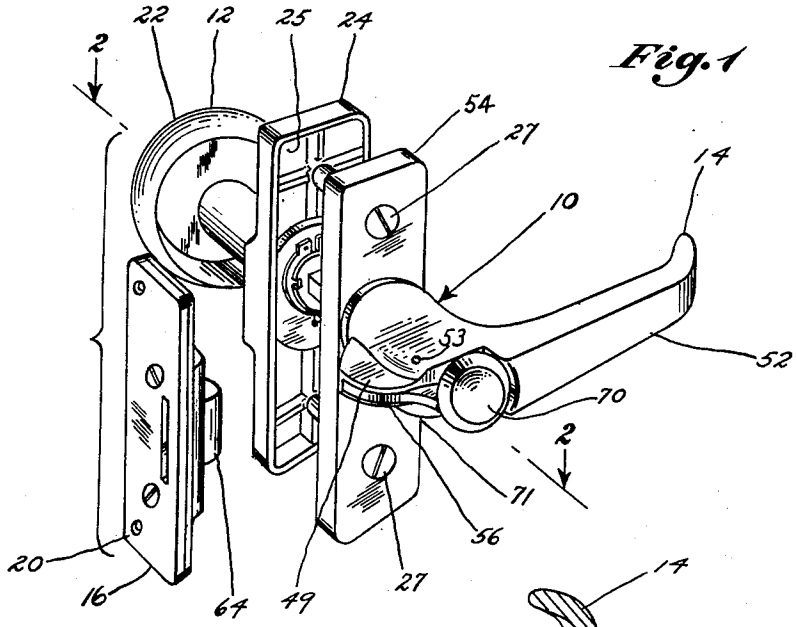


Fig. 2

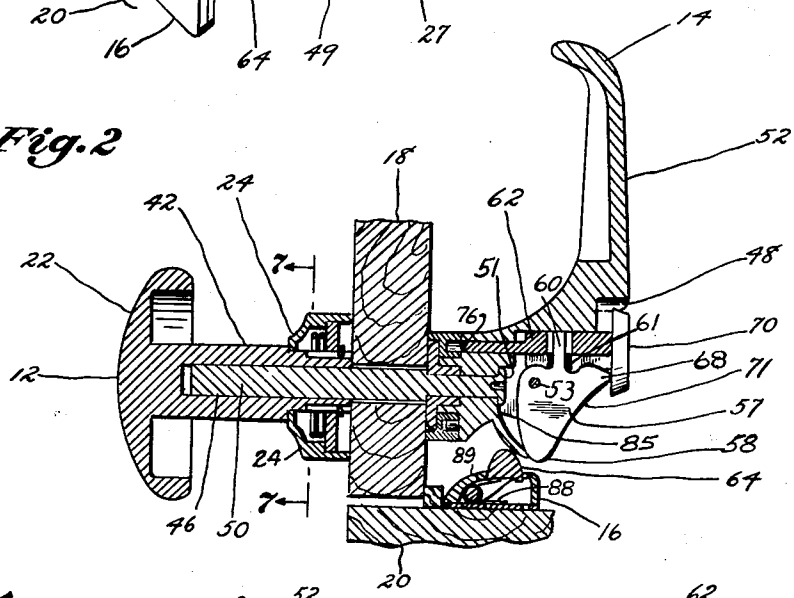


Fig. 4

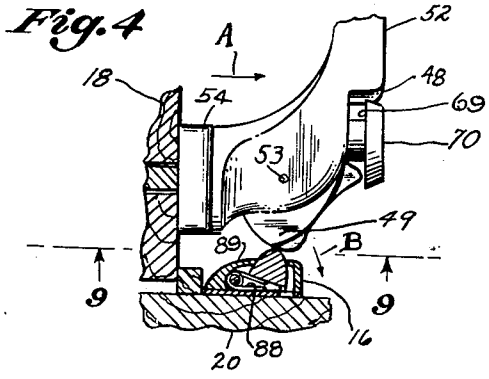
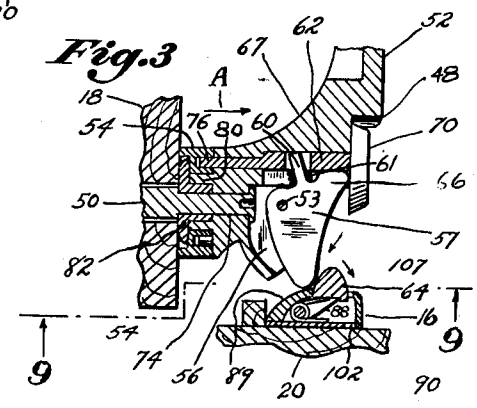


Fig. 3



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2 Sheets-Sheet 2

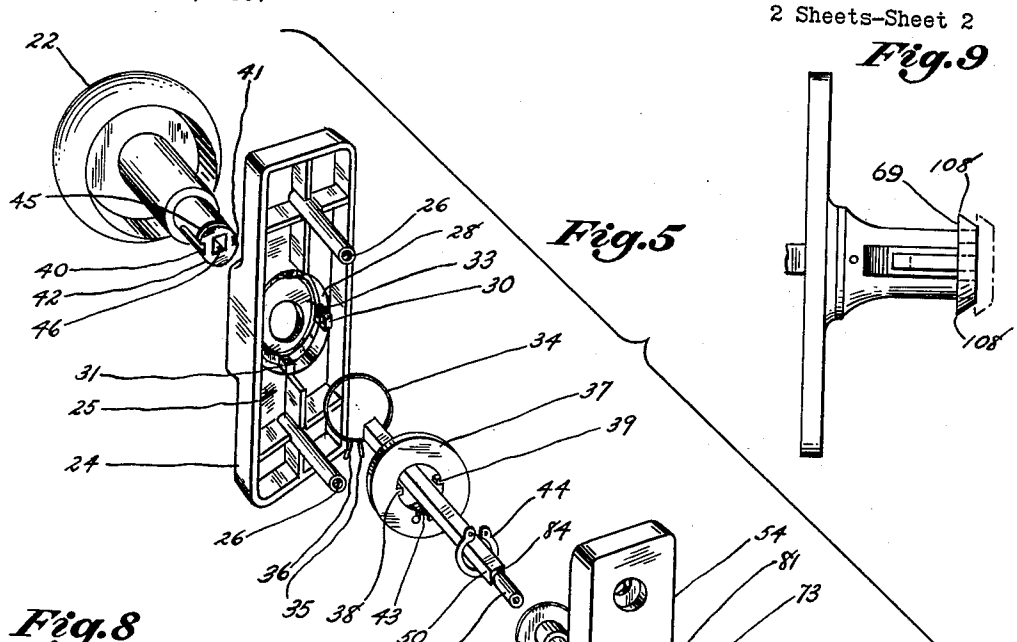


Fig. 5

Fig. 9

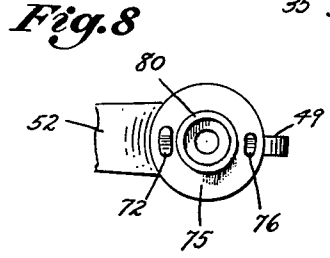


Fig. 8

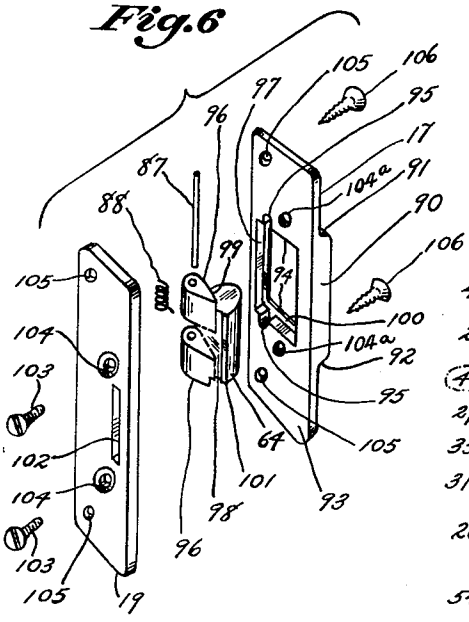


Fig. 6

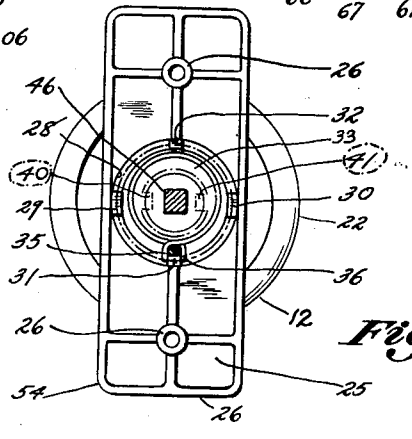


Fig. 7

United States Patent Office 2,949,328
Patented Aug. 16, 1960

2,949,328

DOOR LOCK SET

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Filed Nov. 7, 1957, Ser. No. 694,976

4 Claims. (Cl. 292—207)

This invention relates generally to door hardware and more particularly to door lock set construction particularly suited to light weight doors, such as screen doors, and the like.

It is among the objects of the present invention to provide a door lock set in which only very small holes are required in the door, just large enough to allow passage of the knob spindle and plate bushings. This permits installation on narrow stile doors while preserving a maximum of rigidity.

Another object lies in the provision of structure of the class described in which the handle element has a relatively stationary latch bolt element which coacts with a movable strike member.

Another object is the provision of a movable strike element which provides a positive one way latching.

Another object lies in the provision of a push button lock which is easily manually operable into either its locked or unlocked position by the use of one hand.

A further object of the invention is to provide a push button lock with an automatic release operated by the mounted strike element to prevent accidentally locking out the user, since devices of the present class are not ordinarily provided with this feature.

A feature of the present device is that when the door is closing, once it has passed an over center position of the stationary latch bolt and the movable strike member, the door is unable to rebound to an open position and the blowing of the wind or other pressure will cause the door to become latched more securely.

These objects and other incidental ends and advantages will more fully appear in the progress of this disclosure and be pointed out in the appended claims.

In the drawings, in which similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a view in perspective of a preferred embodiment of the invention.

Figure 2 is a horizontal sectional view, as seen from the plane 2—2 of Figure 1 with the strike element in a position it occupies when the door is latched.

Figure 3 is a fragmentary sectional view corresponding generally to Figure 2 but showing the lock release as it is about to be shifted from a locked to an unlocked position.

Figure 4 is a fragmentary plan view, partly in section, corresponding to Figure 3 but showing the lock release in its unlocked position, and the stationary latch bolt is in its at-center position.

Figure 5 is an exploded perspective view of the inside handle unit and the outside knob unit.

Figure 6 is an exploded perspective view of the strike element.

Figure 7 is a sectional view, mostly in elevation, from the plane 7—7 on Figure 2.

Figure 8 is a fragmentary elevational view from the plane 8—8 on Figure 5.

Figure 9 is an elevational view from plane 9—9 on Fig. 3.

In accordance with the invention the lock set, generally indicated by reference character 10 is preferably

arranged in three separate units 12, 14 and 16. This affords ease of handling and mounting on the door 18 and frame 20.

The outside knob unit 12 is described thus for purposes of clarity since under some conditions it may be desirable to have this unit inside of the building. The knob 22 may have any desired external shape.

The outer body element 24 on the inner wall 25 is provided with internally threaded bosses 26 which are engaged by the screws 27, thereby holding units 12 and 14 together and on the door 18. The inner wall 25 has recess 28, with knob ring detents 29 and 30, knob spring anchor 31 and spring positioning lug 32. The body element 24 in the recess 28 has a spring receiving annular groove 33. Body element 24 is symmetrical about its horizontal axis to aid in manufacture so that if inverted, the lug 32 may act as a spring anchor and the anchor 31 may act as a spring positioning lug.

The knob spring 34 is disposed in the groove 33 inwardly of the lug 32 and the detents 29 and 30, while its ends 35 and 36 lie to the left and right respectively of the anchor 31 (Figure 7) under light tension. In Figure 5 where the spring 34 is relaxed the ends are not crossed.

The knob ring 37 has a pair of opposed keys 38 and 39 which slidably engage the keyways 40 and 41 in the knob shank 42. Ring 37 has a dog 43 which is disposed between the ends 35 and 36 of the spring 34. The parts in the knob unit 12 are held together as an assembly by a split spring washer 44 which seats in the annular groove 45 in the shaft 42. If a permanent assembly is desired the shank 42 may be swaged and upset at this area against the exposed surface of the ring 37.

The knob shank 42 is provided with a non-circular bore 46 which slidably receives the correspondingly shaped main spindle 50.

The inside handle unit 14 is also so referred to herein, for clarity since it may be located outside the building, depending upon the direction against which locking is desired. The handle element 52 may have any desired external shape and is provided with stationary latch bolt 49, preferably integral therewith; spindle receiving hole 74, stepped lock bolt bore 47, and button way 48.

The handle element is provided with a slot 56 which extends from the lock bolt bore 47 outward, and may extend into the latch bolt 49 (see Figures 2, 3, and 5) and within which a lock release lever 57 is pivotally mounted on the pintle 53. The lever 57 is of irregular shape, including a strike engaging edge 58, fulcrum hole 59, and lock bolt engaging arm 60. Surrounding the arm 60 is the lever spring 61 which normally urges the lever toward lock releasing position. The inner end of the spring 61 seats in a pocket in the lock bolt 62. Spring 61 however, also urges the lock bolt 62 against the wall of the bore 47. The friction of the lock bolt 62 in the bore is sufficient to retain said bolt in any displaced position thereof even against the action of the spring 61 but when the strike engaging edge 58 meets the movable strike member 64, or the casing leading wall portion 89, said spring 61 assists the movement of the lever 57 and hence the movement of the lock bolt 62 to the released or open position thereof. The lever 57 has an extension member 66 which performs several functions. The inner edge 67 abuts against the lock bolt 62 in the groove 63, when the lock bolt 62 is moved to its locked position acting as an auxiliary stop. The tip 68 by engaging the inner surface 69; the lock bolt button 70 can shift the lever to its locking position; and the outer edge 71 can serve to close the opening of the slot 56 to prevent dirt and water from entering the inside of the handle element 52.

The inner end 72 of the lock bolt 62 is adapted to enter the socket 73 in the inner body element 54, while the inner face 75 of the handle element 52 is provided with a projection 76 which swings in the arcuate channel 77, the ends 78 and 79 of which limit rotational movement of the handle member preferably to 45 degrees above and below horizontal so that partial rotation of the knob or handle will permit the latch bolt 49 to clear the strike member 64 when it is desired to open the door 18. The handle 52 may be retained in assembled condition with respect to the inner body element 54 so that the shank 80 is journaled in the bearing 81, by the bushing 82 which is held in place on the round portion 83 against the shoulder 84 of the square shaft of the main spindle 50. The round portion 83 which is the inner end of the main spindle 50 is secured in the portion 85 in any suitable manner such as a force fit, and/or heading over its end at 51. This can be reached through the hole 74 before the lever 57 is put into place.

The strike unit 16 may comprise a casing or outer strike body 17, a strike base plate 19, strike member 64, axle 87 and strike spring 88. The outer strike body is of irregular configuration including a leading wall portion 89, opposing wall portion 90, top wall 91, bottom wall 92, inner surface 93, opening 94 and rim 100 for the movable strike member. The body 17 is provided with journals 95, for the ends of the axle 87 which when assembled penetrates the ears 96 on the strike member 64. The spring 88 encircles the axle 87 between the ears 96 and one end pushes against the inner surface of the base plate 19 while the other end pushes against the inner surface 98 of the strike member. Spring 88 thus serves to urge the strike member to its normal outermost projecting position in which the outer surfaces 99 of the ears 96 abut against the inner surface of the rim 100. The inner surface of the strike member 64 is provided with a rib 101 which when the strike member is in its fully depressed or retracted position enters into the orifice 102. The strike unit is held assembled by the base plate 19 being secured against the surface 93 in a suitable manner as by the screws 103 which pass through holes 104 and engage the threaded holes 104*a*. The plate 19 forms a closure to complete the journals 95 and the holes 105 line up so that screws 106 may be used to secure the strike unit in position on the frame 20.

In use when the door 18 is closed in the direction of the arrows A, the stationary latch bolt 49 cams against the strike member 64 which, as a follower swings in the direction of the arrow B (Figure 4). As soon as the highest point of the bolt 49 has passed, the spring 88 pushes the strike member 64 to the position shown in Figure 2. Since any exposed portion of the strike member is beyond dead center, any movement of the door toward opening will force the latch bolt tighter against the strike member and make the resistance to opening of the door greater. This feature allows a substantial tolerance in the spacing between the position of the latch bolt and the strike member while maintaining satisfactory operation.

When it is desired to lock the door mere finger pressure on the button 70 pushes the lock bolt 62 into the socket 73. This may very easily be done with the thumb while the fingers grasp the handle 52. To manually release the lock, the upper and lower edge portions 108 of the button 70 are conveniently squeezed between thumb and forefinger and pulled so as to withdraw the bolt 62 from the socket 73. If the button 70 should be pushed inadvertently while the door is open, the door will not accidentally become locked when closed because when the lever 57 reaches the casing at 89 or strike member 64, which offers greater resistance to movement than the lever 57, said strike member or casing pushes the lever 57 so as to unlock the bolt 62. This automatic feature prevents accidental lockout of the user.

Thus, since the normal opening of the door requires that the handle 52 be turned so that the relatively stationary latch bolt 49 may be moved above or below the movable strike member 64 (the handle 52 being limited in such movement by the projection 76 in the channel 77); and the closing of the door does not require a movement of the handle 52; inadvertent pressure on the button 70 would allow the door to slam shut in a locked condition. The action of the lever prevents this. Figures 3 and 4 illustrate this action.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described for obvious modifications will occur to a person skilled in the art to which the present invention pertains.

I claim:

1. In a door lock set construction including a body which is attachable to a door, a handle element rotatably mounted on said body, a shaft rotated by said handle and a strike unit mounted on a door frame, improved lock bolt means comprising: an elongated lock bolt member arranged for substantially axial movement parallel to the axis of said shaft and rotation with said shaft, said body having a socket into which a portion of said lock bolt member is selectively engageable for locking said shaft against rotation, said handle element having a relatively stationary latch bolt thereon, of hollow configuration; a pivotally mounted lever member disposed within said latch bolt and having a first portion thereof projectable into the path of said strike unit, and a second portion pivotally engaged with said lock bolt member, whereby contact of the lever with said strike unit and relative movement therebetween causes shifting of the lock bolt member to the unlocked position thereof.

2. In a door lock set construction including a body which is attachable to a door, a handle element rotatably mounted on said body, a shaft rotated by said handle and a strike unit mounted on a door frame, improved lock bolt means comprising: an elongated lock bolt member arranged for substantially axial movement parallel to the axis of said shaft and rotation with said shaft, said body having a socket into which a portion of said lock bolt member is selectively engageable for locking said shaft against rotation, means disposed on an opposite end of said lock bolt member for manual manipulation of said lock bolt member, said handle element having a relatively stationary latch bolt thereon, of hollow configuration; a pivotally mounted lever member disposed within said latch bolt and having a first portion thereof projectable into the path of said strike unit, and a second portion pivotally engaged with said lock bolt member, whereby contact of the lever with said strike unit and relative movement therebetween causes shifting of the lock bolt member to the unlocked position thereof.

3. In a door lock set construction including a body which is attachable to a door, a handle element rotatably mounted on said body, a shaft rotated by said handle and a strike unit mounted on a door frame, improved lock bolt means comprising: an elongated lock bolt member arranged for substantially axial movement parallel to the axis of said shaft and rotation with said shaft, said body having a socket into which a portion of said lock bolt member is selectively engageable for locking said shaft against rotation, said handle element having a relatively stationary latch bolt thereon, of hollow configuration; a pivotally mounted lever member disposed within said latch bolt and having a first portion thereof projectable into the path of said strike unit, and a second portion pivotally engaged with said lock bolt member, whereby contact of the lever with said strike unit and relative movement therebetween causes shifting of the lock bolt member to the unlocked position thereof; said last-mentioned first portion being disposed within said latch bolt when said lock bolt member is in unlocked position.

4. In a door lock set construction including a body

which is attachable to a door, a handle element rotatably mounted on said body, a shaft rotated by said handle and a strike unit mounted on a door frame, improved lock bolt means comprising: an elongated lock bolt member arranged for substantially axial movement parallel to the axis of said shaft and rotation with said shaft, said body having a socket into which a portion of said lock bolt member is selectively engageable for locking said shaft against rotation, means disposed on an opposite end of said lock bolt member for manual manipulation of said lock bolt member, said handle element having a relatively stationary latch bolt thereon, of hollow configuration; a pivotally mounted lever member disposed within said latch bolt and having a first portion thereof projectable into the path of said strike unit, and a second portion pivotally engaged with said lock bolt member, whereby contact of the lever with said strike unit and

relative movement therebetween causes shifting of the lock bolt member to the unlocked position thereof; said last-mentioned first portion being disposed within said latch bolt when said lock bolt member is in unlocked position.

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