

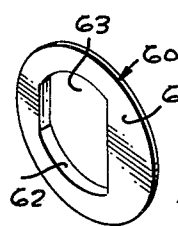
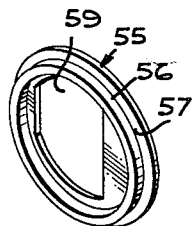
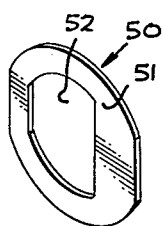
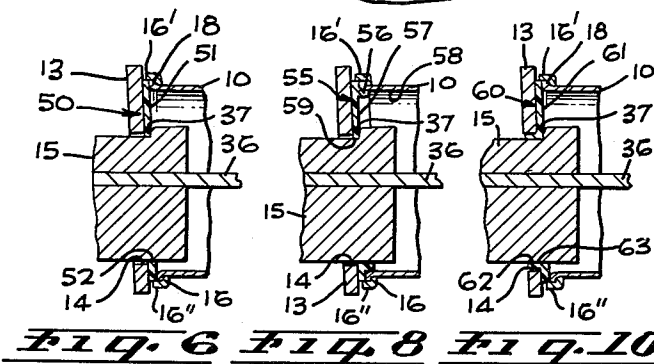
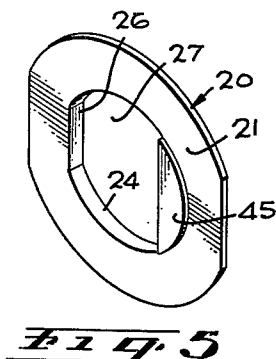
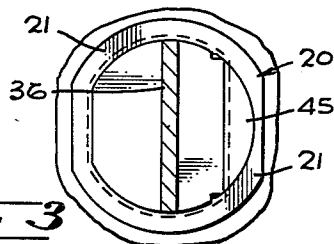
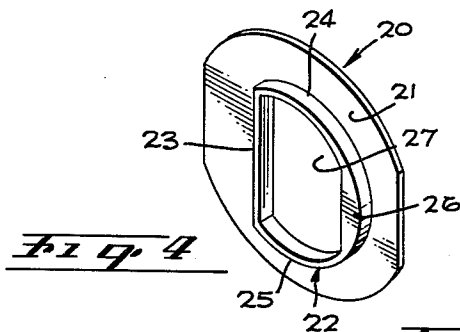
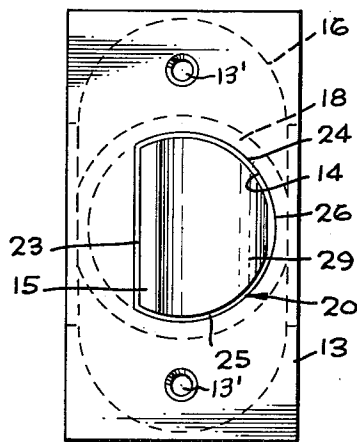
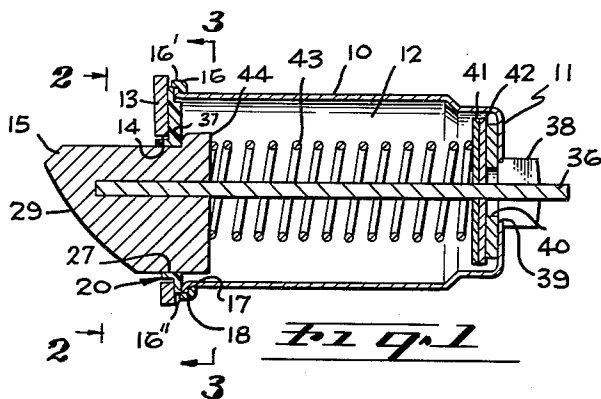
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LOW FRICTION LATCH BOLT GUIDE

Filed Feb. 6, 1963



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1

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LOW FRICTION LATCH BOLT GUIDE

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8 Claims. (Cl. 292-163)

The invention relates to door lock parts. More particularly, the invention relates to a low friction guide for the latch bolt itself.

A great many door locks of currently popular types make use of a more or less cylindrical latch bolt casing in which is mounted a latch bolt assembly featuring a latch bolt which projects outwardly from the front end of the casing through an appropriate front plate in a position where it can engage a conventional strike plate on the door jamb when the door is closed. The latch bolts are provided with an oblique camming surface on the side which normally strikes the strike plate, so that the camming action which takes place when the latch bolt hits the strike plate forces the latch bolt to a retracted position until the door is fully closed, after which the strike bolt is extended by spring action into an appropriate conventional aperture in the strike plate to hold the door closed. Normally, the front plate is of metallic material and accordingly, the usual hole in the front plate through which the latch bolt protrudes, forms a metal-to-metal sliding contact with the latch bolt. This metal-to-metal contact has sundry drawbacks in that considerable wear occurs on one or another or both of the parts, ultimately causing a loose sliding engagement, with attendant rattling and looseness of operation. Although it would be possible to reduce wear and friction by employment of one of the customary lubricants, this is objectionable because lubricant would collect on the surfaces of the latch bolt which are exposed when the latch bolt is extended and could soil either the person or the clothes of persons using the door.

It is therefore among the objects of the invention to provide a new and improved low friction guide for a latch bolt.

Another object of the invention is to provide a new and improved construction which is capable of minimizing wear on the latch bolt.

Still another object of the invention is to provide a new and improved low friction guide for a latch bolt mounting which is sufficiently simple in its construction and assembly to permit it to be used with substantially conventional latch bolt structures without appreciable change.

Still another object of the invention is to provide a new and improved latch bolt assembly in which a low friction guide for the latch bolt action is incorporated which makes it possible to continue employment of standard connecting means for the various parts of the assembly.

Still another object of the invention is to provide a new and improved low friction guide for latch bolt action wherein a low friction material is employed which need not comprise any of the structural parts used to hold the latch bolt assembly together and which therefore may be selected for its low friction characteristics irrespective of its compressive or tensile strength. Still further among the objects of the invention is to provide a new and improved guide for a reciprocating latch bolt which is sufficiently simple in its construction and relationship to remaining portions of the latch assembly so that virtually no extra assembly time is needed.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter set forth, pointed

2

out in the appended claims and illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a longitudinal sectional view of a latch assembly incorporating the low friction guide.

FIGURE 2 is an end elevational view on the line 2-2 of FIGURE 1.

FIGURE 3 is a cross sectional view on the line 3-3 of FIGURE 1.

FIGURE 4 is a front perspective view of the low friction guide of FIGURES 1, 2 and 3.

FIGURE 5 is a rear perspective view of the same low friction guide of FIGURE 4.

FIGURE 6 is a fragmentary longitudinal sectional view of a second form of low friction guide in assembled position.

FIGURE 7 is a front perspective view of the low friction guide of FIGURE 6.

FIGURE 8 is a fragmentary longitudinal sectional view showing a third form of the low friction guide in assembled position.

FIGURE 9 is a rear perspective view of the low friction guide of FIGURE 8.

FIGURE 10 is a fragmentary longitudinal sectional view showing a fourth form of low friction guide in assembled position.

FIGURE 11 is a rear perspective view of the low friction guide of FIGURE 10.

In one embodiment of the invention chosen for the purpose of illustration, there is shown a latch assembly consisting of a substantially cylindrical casing 10 having an end wall 11 and within which is a chamber 12. At the outside end of the casing is a front plate 13 in which is a hole 14 through which extends a latch bolt 15. To fasten the front plate 13 to the casing 10, there is provided a fastening plate 16, the form of which is shown in broken lines in FIGURE 2. In the fastening plate is an opening 17 which is just slightly greater in diameter than the exterior diameter of the casing 10, so that when the fastening plate 16 is drawn into position against the front plate 13, the casing 10 will be clamped in between by virtue of the fact that there is provided a flange 18 at the outer end of the casing 10 which overlies the front face of the fastening plate 16 around the opening 17. Flanges 16', 16'' at opposite sides of the fastening plate 16 overlie adjacent sides of the flange 18 and may abut the inside face of the front plate 13. Normally, the front plate 13 and fastening plate 16 are held in the assembled relationship described by bosses 13', 13' which extend from the rear of front plate 13 through holes (not shown) in the fastening plate 16, the edge of which bosses are staked or spun to hold the front plate 13 and fastening plate 16 together.

Interposed between the front plate 13 and the fastening plate 16 is a low friction guide indicated generally by the reference character 20, the form of which is shown appropriately in FIGURES 4 and 5. The low friction guide includes a relatively flat area 21, a large portion of the perimeter of which lies between the inside face of the front plate 13 and the outermost edge of the flange 18 as clearly shown in FIGURE 1.

Extending from the front face of the low friction guide 20 is an irregularly shaped flange 22 which consists of a straight side 23, opposite arcuate sides 24 and 25, and a slightly thickened side 26. These sides, namely, the straight side 23, the arcuate sides 24 and 25, and the thickened side 26 at their innermost faces define an aperture 27, the exterior of which coincides substantially with the perimeter of the latch bolt 15.

From the inner end of the latch bolt 15 extends a tail-piece 36 which is fastened to the latch bolt by some appropriate fastening means (not shown). A shoulder 37

3

at the inner end of the latch bolt 15 abuts against the inside face of the low friction guide 20, as shown in FIGURE 1.

At the end wall 11 of the casing 10 is a fastening fixture 38 which is made use of when securing the casing 10 to an appropriate retract mechanism (not shown). Portions of the fastening fixture 38 extend through a hole 39 in the end wall 11, and a hole 40 in the fixture is made large enough so that the tailpiece 36 can extend outwardly through it. Washers 41 and 42 overlie the interior face of the fastening fixture 38, and a spring 43 presses at one end against the washer 41 and at the other end against an inner wall 44 of the latch bolt 15. Mounted as shown, the spring 43 is under compression, is biased to urge the latch bolt 15 outwardly to the position shown in FIGURE 1, and is compressed when the latch bolt strikes an appropriate conventional strike plate (not shown) or when retracted by a retract mechanism (not shown).

As is clearly shown, the hole 14 in the front plate 13 is slightly larger than the outside perimeter of the flange 22 on the low friction guide 20, so that the flange 22 in effect forms a lining for the hole 14. The aperture 27 which is formed by the inner perimeter of the flange 22 may provide a relatively snug sliding fit for the latch bolt 15 because of the fact that the material of which the low friction guide is constructed forms a very smooth sliding contact with the latch bolt 15 when it reciprocates in and out during use. The contact thus provided for the most important moving portions of the assembly is accordingly a low friction contact which is achieved without the use of any lubricant and is, at the same time, a sliding engagement capable of minimizing wear on the latch bolt 15 because of the fact that the latch bolt 15 is of metallic material harder than the material of the low friction guide 20. Further still, the presence of the low friction guide 20, by reason of the nature of the material of which it is constructed, and by reason of its position between the inside face of the front plate 13 and the outermost end of the flange 18 of the casing 10, provides a washer for packing-like effect when the parts are assembled, which greatly enhances the snug fit of the parts with relation to each other.

A somewhat simpler form of low friction guide indicated generally by the reference character 50 is shown in FIGURES 6 and 7. In this form of the invention, the low friction guide comprises a flat area 51 which is of uniform thickness and which is devoid of the flange 22 made use of in the form of the invention of FIGURES 4 and 5. In this form of the device, identified in FIGURES 6 and 7, an aperture 52 provides an inner perimeter or inner edge having a thickness no greater than the thickness of the flat area 51 and having a size providing a sliding low friction fit with the outside perimeter of the latch bolt 15. In this form of the invention also, the low friction guide 50 is fastened between the front plate 13 and the outermost end of the flange 18 of the casing 10, serving again as a washer.

In still another form of the invention shown in FIGURES 8 and 9 of the drawing, a low friction guide indicated generally by the reference character 55 is provided. In this form of the invention, an annular ridge 56 is made use of on the inside face of a flat area 57 of the low friction guide 55. The annular ridge 56 is of such size that it fits snugly around the inside wall 58 of the casing 10 and serves to properly position the low friction guide 55 with respect to the casing 10. Whereas the annular ridge is shown to be continuous it could be discontinuous and still act effectively. There is sufficient portion of the flat area 57 on the outer side of the annular ridge 56 to provide a washer-like engagement between the front plate 13 and the flange 18, as shown in FIGURE 8. An opening 59 is provided substantially like the opening 52 of FIGURES 6 and 7 and the opening 27 of FIGURES 4 and 5 to accommodate the latch bolt 15 with a sliding, low friction fit.

4

Still another form of the invention is shown in FIGURES 10 and 11 which makes use of a low friction guide indicated generally by the reference character 60.

In this form of the invention, a flat area 61 is of uniform thickness throughout, having no thick portion like a thick portion 45 of FIGURES 4 and 5 of the invention. In the form of invention of FIGURES 10 and 11, there is nevertheless provided a flange 62 of substantially uniform thickness throughout its perimeter which surrounds an aperture 63, again of such size as to provide a sliding, low friction fit for the latch bolt 15. Here again, the flat area extends outwardly far enough to be positioned between the inside face of the front plate 13 and the outer end of the flange 18 of the casing 10.

In all of the examples shown and described, the low friction guide may comprise a single piece of molded synthetic plastic resinous material, such as nylon or Delrin, so formed and sized that it can be slipped over the latch bolt 15 when it is applied to the assembly. In the position thus occupied, it is capable of being anchored in position by the usual fastening means employed for attaching the casing 10 to the front plate 13 through the agency of the fastening plate 16.

While the invention has herein been shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

Having described the invention, what is claimed as new in support of Letters Patent is:

1. In a latch assembly for a lock, a casing, a latch bolt reciprocatably mounted in said casing, and a low friction guide for said latch bolt, and retaining means having a location clear of said latch bolt, said retaining means being attached respectively to the casing and to a portion of the guide whereby the guide is retained, said guide comprising a material having lower friction characteristics than said retaining means, said guide having another portion thereof in sliding engagement with said latch bolt when in position attached to the casing.

2. In a latch assembly for a lock, a casing and a front plate positioned over one end of said casing, a latch bolt reciprocatably mounted in said casing and extending through said front plate at a location clear of said front plate, and a low friction guide for said latch bolt, said guide comprising a member of material having lower friction characteristics than said front plate, and means retaining one portion thereof between said casing and said front plate, said guide having another portion thereof in sliding engagement with said latch bolt.

3. In a latch assembly, a casing, a latch bolt reciprocatably mounted in said casing, a front plate and means attaching said front plate to the casing in position overlying the outer end of the casing, said front plate having an opening therein for said latch bolt, and a guide of low friction material held in position against the inside face of said front plate, said guide having an opening therein smaller than the opening in said front plate.

4. In a latch assembly, a casing, a latch bolt reciprocatably mounted in said casing, a front plate and means attaching the front plate to the casing in position overlying the outer end of the casing, said front plate having an opening therein for said latch bolt, and a guide of low friction material positioned adjacent the inside face of said front plate, said guide having an opening therein smaller than the opening in said front plate, and a portion of said guide surrounding the opening therein and extending into the opening in said front plate, laterally facing areas of said portion being located within the opening in said front plate, said guide opening being in sliding engagement with said latch bolt.

5. In a latch assembly, a casing having a chamber therein with inside and outside walls, a latch bolt reciprocatably mounted in said casing, and a low friction guide for said latch bolt, said guide being positioned between the inside face of the front plate and the outer end of the flange of the casing, said guide having an opening therein for said latch bolt, and a portion of said guide surrounding the opening therein and extending into the opening in said front plate, laterally facing areas of said portion being located within the opening in said front plate, said guide opening being in sliding engagement with said latch bolt.

5

catably mounted in said casing, a front plate attached to the casing in position overlying the outer end of the casing, said front plate having an opening therein for said latch bolt, and a guide of low friction material having an opening therein smaller than the opening in said front plate, and means holding a portion of said guide in engagement with at least one of the walls of said casing.

6. In a latch assembly, a casing having a chamber therein, a latch bolt reciprocatably mounted in said casing, a front plate attached to the casing in position overlying the outer end of the casing, said front plate having an opening therein for said latch bolt, said casing including retaining means for said front plate, said retaining means including a portion facing laterally inwardly, and a guide of low friction material having an opening therein smaller than the opening in said front plate and providing a sliding support for said latch bolt, at least one diametrically opposite portion of said guide having a laterally facing position and being in engagement with said retaining means whereby to position said guide relative to the casing.

7. In a latch assembly, a casing having a chamber therein with inside and outside walls, a latch bolt reciprocatably mounted in said casing, a front plate, attachment means acting between the front plate and the casing whereby to secure the front plate to the casing in position overlying the outer end of the casing, said front plate having an opening therein for said latch bolt, and a guide comprising a disc of low friction material having an opening therein for the latch bolt smaller than the opening in

6

said front plate, a side wall structure of said disc being in a position of engagement respectively with said attachment means and said front plate, whereby the front plate and the guide are secured together to the casing.

8. In a latch assembly, a casing having a chamber therein with inside and outside walls, an outwardly facing flange on the casing at the outer end of said chamber, a latch bolt reciprocatably mounted in said casing, a front plate attached to the casing in position overlying the outer end of the casing, said front plate having an opening therein for said latch bolt, a fastening plate surrounding said casing at a location behind said flange, a guide of low friction material lying between said flange and said front plate, and fastening means securing said front plate, said guide, and said fastening plate to the flange, said guide having an opening therein smaller than the opening in said front plate and in sliding engagement with said latch bolt.

References Cited by the Examiner

UNITED STATES PATENTS

2,390,756	12/45	Voight	70—449 X
2,653,046	9/53	Erkkila	292—337
2,804,181	8/57	Haynes	16—0
2,841,974	7/58	Hensel	

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