March 25, 1969 F. J. RUSSELL ET AL 3,434,752

HANDHOLD SHANK BEARING

Filed Oct. 23, 1967

Fig. 1

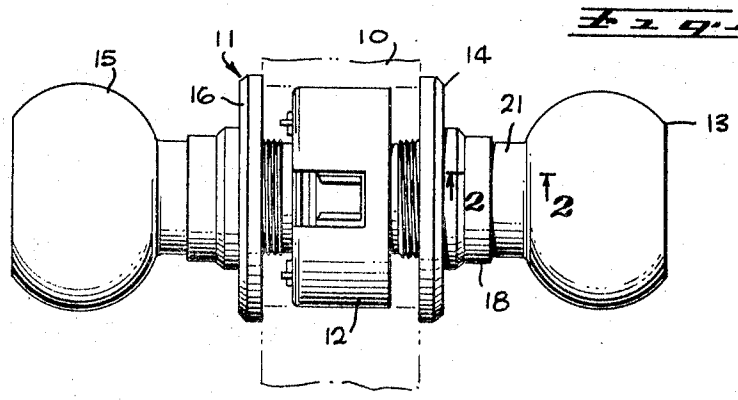


Fig. 2

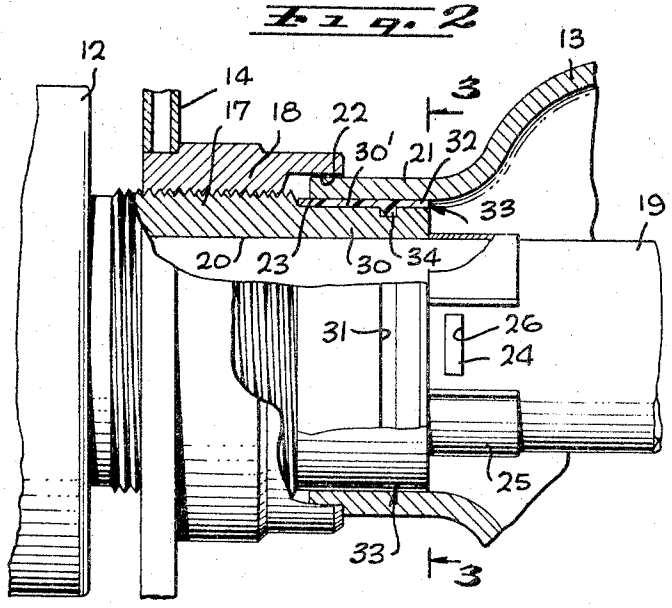


Fig. 4

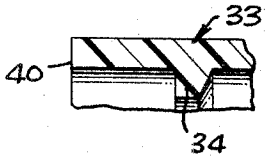
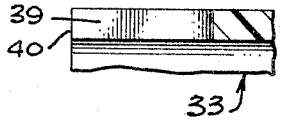


Fig. 5



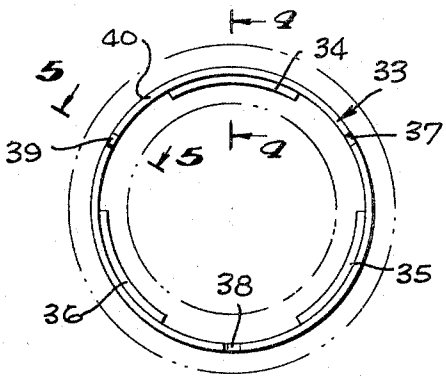


Fig. 3

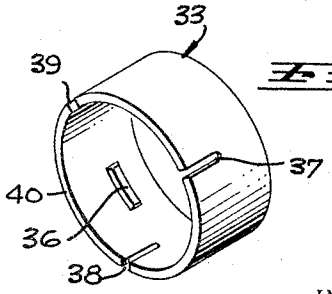


Fig. 6

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HANDHOLD SHANK BEARING

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U.S. Cl. 292—356 4 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure makes use of a door lock wherein a spindle is rotatably mounted in a stationary portion of the lock exemplified by a journal sleeve and wherein a handhold is releasably secured to the spindle, so that the spindle and handhold rotate together. On the handhold is a neck surrounding and spaced from the exterior of the sleeve. Filling the space is a tubular section, of low-friction material consisting of one of the commercially available synthetic plastics, so that the neck of the knob, as it is rotated when rotating the spindle, rotates with a snug, though friction-free movement with respect to the stationary portion of the lock.

Unlike some types of door locks, wherein the neck of the handhold or knob is made with an inside diameter such that it is in substantial engagement with the exterior of the spindle to which it is nonrotatably fastened, special advantages reside in a construction wherein there is provided a journal sleeve which rotatably supports the spindle and wherein the neck of the knob is spaced a considerable distance from the exterior of the spindle, namely on the exterior of the journal sleeve. Where this type of construction is taken advantage of and the knob is not actually mounted on the spindle, other means need be provided for mounting the neck of the knob. However, when there is a metal-to-metal engagement, there is a certain amount of friction. This especially is true when the knob is made of aluminum.

It therefore is among the objects of the invention to provide in an operating mechanism for use with a door lock wherein the neck of the handhold is spaced from the conventional spindle, a new and improved means for rotatably mounting and guiding the handhold.

Another object of the invention is to provide a new and improved combination of parts in an operating mechanism for use with a door lock wherein the handhold has a very snug rotatable attachment to a journal sleeve upon which it is rotatably supported, but wherein the parts which create the snug engagement are of such character that the engagement of one rotating part with relation to the other has such low-friction characteristics that there is both a snugness in the mounting of the moving parts and a freely rotating fit.

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

In the drawings:

FIGURE 1 is a side elevational view of the operating mechanism of the door lock in which the invention is incorporated.

FIGURE 2 is a fragmentary longitudinal, sectional view of the portions of the operating mechanism which fit together with a low-friction fit, taken on line 2—2 of FIGURE 1.

FIGURE 3 is a cross-sectional view on the line 3—3 of FIGURE 2.

FIGURE 4 is a fragmentary longitudinal, sectional view on the line 4—4 of FIGURE 3.

FIGURE 5 is a fragmentary longitudinal, sectional view on the line 5—5 of FIGURE 3.

FIGURE 6 is an end perspective view of the low-friction insert.

In an embodiment of the invention chosen for the purpose of illustration, there is shown mounted on a door 10 a lock assembly indicated generally by the reference character 11, which consists in part of a frame 12, a knob 13 and a rose 14 on one side, and a similar knob 15 and rose assembly 16 on the other side. For purposes of illustration, the details of the operating mechanism which is manipulated by the knob 13 are shown.

As shown in particular in FIGURE 2, there is a journal sleeve 17 which is a stationary portion of the frame 12 and which in the present instance has a threaded exterior, so that it can be threadedly engaged by an internally threaded collar 18, the collar 18 being part of the rose assembly 14, which is the expedient for drawing the rose assembly 14 into snug engagement with the door 10 during installation.

A spindle 19 is rotatably mounted in a bore 20 within the journal sleeve 17.

The knob 13 has extending from the left-hand side, as viewed in FIGURES 1 and 2, a neck 21 of such size that it extends freely into a pocket 22 within the collar 18. Although an inside circumference 23 of the neck 21 is substantially larger than the outside diameter of the spindle 19, the neck 21 is nevertheless nonrotatably attached to the spindle 19 by means of a spring pressed detent 24, held in position by an arcuate leaf spring 25, the detent 24 extending in a conventional manner through opposite holes in the spindle 19, like the hole 26 shown in FIGURE 2. In the neck 21 is a complementary hole (not shown) into which the detent 24 projects when the neck 21 is assembled in position, as shown in FIGURE 1.

On the journal sleeve 17 is an outer end section 30 which has a smooth cylindrical exterior 30' except for the provision of an annular recess 31.

As clearly appears in FIGURE 2, the diameter of the cylindrical exterior 30' of the outer end section 30 is appreciably smaller than the inside circumference 23 of the neck 21. This difference in size forms an annular space which is located between the cylindrical exterior 30' of the outer end section 30 and the inside circumference 23.

The annular space 32 just defined is occupied by a bushing hub 33. The bushing hub 33, preferably of some acceptable commercial synthetic plastic resin, such, for example, as Delrin, is cylindrical in form, as best seen in FIGURE 6. On the inside circumference of the bushing hub 33 is a series of three circumferentially spaced projections 34, 35, and 36, these projections being about equally spaced around the inside circumference. The bushing hub 33 is additionally provided with a series of three slits 37, 38, 39, these slits extending in an axial direction from one edge 40 to a depth moderately beyond the location of the projections 34, 35, 36.

The bushing hub 33 is applied over the outer end section 30, the bushing hub 33 being sufficiently yieldable so that the projections 34, 35, 36 can be forced over the exterior circumference of the outer end section 30 until they snap into the annular recess 31, thereby anchoring the bushing hub 33 against endwise dislodgment. The knob 13 is then applied by pushing the neck 21 over the yieldable detent 24, causing it to be partially depressed to permit the neck to pass over it. The neck 21 is then pushed into position surrounding the outside circumference of the bushing hub 33 and is extended with-

in the pocket **22** until the neck **21** is engaged by the detent **24**. After this has taken place, the neck **21** will be firmly in position, surrounding the bushing hub **33**. The bushing hub **33** has sufficient length to surround the entire exterior of the outer end section **30** and in that way be long enough to accommodate and engage almost the entire length of the neck **21**. Under these circumstances, the knob **13** is mounted with a high degree of firmness in its rotative position upon the outer end section **30**, while at the same time providing a low-friction bearing surface between the inside circumference **23** and the bushing hub **33**.

Of course, it should be recognized that the provision against dislodgment of the bushing hub **33** is not important to the fully assembled lock; rather, it is helpful to keeping the bushing hub **33** in place during removal and replacement of the knob **13**.

While the invention has herein been shown and described in what is conceived to be a practical and effective 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. An operating mechanism for use with a door lock comprising a journal sleeve forming a stationary portion of the mechanism, an outer end section of said sleeve having a cylindrical exterior, said outer end section having at least one recess extending inwardly from said cylindrical exterior, a handhold having a neck surrounding said outer end section, the inside diameter of said neck being larger than the outside diameter of said outer

end section and forming an annular space therebetween, and a bushing hub of low-friction synthetic plastic resin material of cylindrical form filling said annular space, at least one projection extending inwardly from the inside surface of said bushing hub, said projection being located in said recess whereby the bushing hub is anchored against axial dislodgment from said journal sleeve.

2. An operating mechanism for use with a door lock according to claim **1**, wherein there is a spindle rotatably mounted within said journal sleeve and a releasable detent in engagement respectively with said spindle and said neck, whereby said handhold is nonrotatably secured to said spindle when in engagement with said bushing hub.

3. An operating mechanism for use with a door lock according to claim **1**, wherein the recess in the journal sleeve is annular in shape.

4. An operating mechanism for use with a door lock according to claim **1**, wherein the bushing hub has a series of circumferentially spaced projections at various locations on the inside circumference, all of which are received in said recess.

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