Dec. 3, 1968 F. J. RUSSELL 3,413,829

DOUBLE CUTOUT SPINDLE CAP

Filed Feb. 20, 1967

Fig. 1

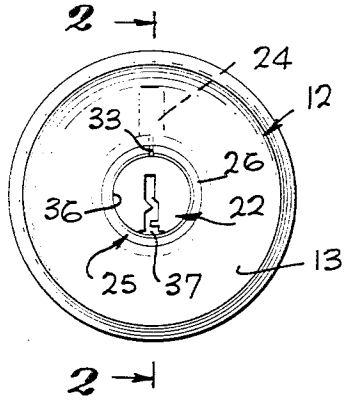


Fig. 1a

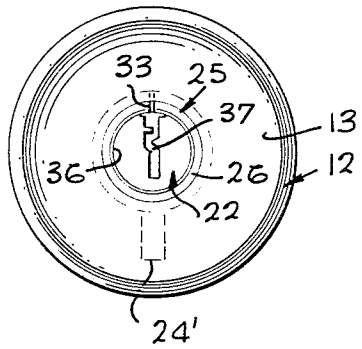


Fig. 2

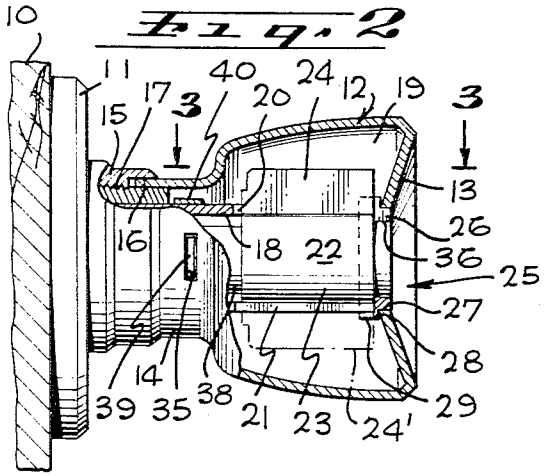


Fig. 3

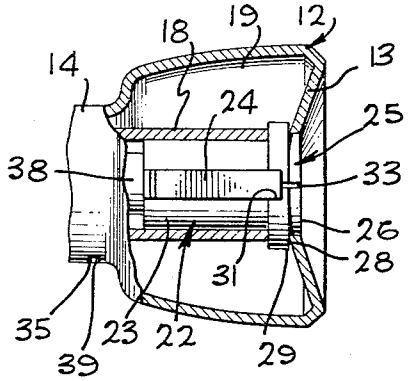


Fig. 4

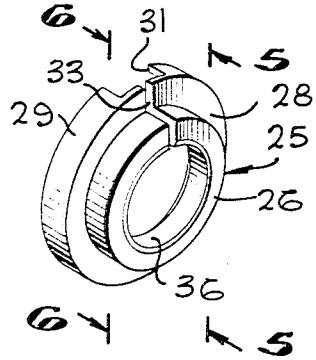


Fig. 5

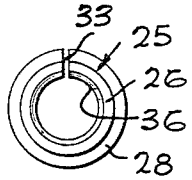
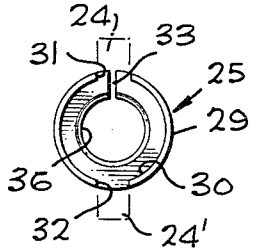


Fig. 6



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United States Patent Office

3,413,829

Patented Dec. 3, 1968

3,413,829

DOUBLE CUTOUT SPINDLE CAP

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Filed Feb. 20, 1967, Ser. No. 617,350
3 Claims. (Cl. 70—224)

ABSTRACT OF THE DISCLOSURE

The invention relates to door locks wherein a key-actuated mechanism is located in the handhold, such as a knob or lever handle. In the structure to which the invention is applicable, the handhold is nonrotatably attached to an interior tubular spindle by a releasable detent, so that the handhold can be removed from the spindle. The spindle, when rotated, actuates a conventional lock mechanism. A key-actuated mechanism or core, which consists of a separate, removable unit, is located within the handhold and also within the outer end of the spindle. A protrusion of the key-actuated core, known to the trade as a pin tumbler chamber, extends outwardly and is received within one of two oppositely located slots in the spindle. Practice requires that the key-actuated mechanism or core be capable of being reversed 90 degrees to appropriately invert the keyway on left hand and right hand doors, respectively. It is for this purpose that the spindle has two slots, one on each side. Between the spindle and the face of the handhold is a ring which interconnects the spindle with the face of the handhold. The ring is adapted to have a snug fit in an appropriate hole in the handhold face so that it can be placed in position where it will tend to remain. On a rearwardly extending flange of the ring are two cutout portions which correspond to the slots in the spindle. The ring is positioned in the handhold so that the cutout portions will align with the slots in the spindle. Accordingly, the key-actuated mechanism, when positioned in one of the slots and the corresponding cutout portion, can be reversed in position upon removal of the handhold and the handhold reapplied without it being necessary to disturb the position of the ring in the face of the handhold and even though the handhold is not relocated rotationally.

The prior art is exemplified by applicant's prior Patent No. 3,149,485 issued Sept. 22, 1964, and Patent No. 3,190,684 issued June 22, 1965. Patent No. 3,190,684 shows a cap interconnecting a knob face with a spindle for the purpose of stabilizing the knob with respect to the spindle under circumstances where the knob has a shank of relatively large diameter rotatably mounted on a hub forming a bearing for the opposite end of the knob. There was no provision at all for reversing the orientation of a key-actuated mechanism, although a single cutout provision was made for such an accessory.

In Patent No. 3,149,485, a key-actuated mechanism was provided for, but here again no provision was made for reversing its orientation. However, a single wide passageway was provided through the ring, but this was to permit extracting the key-actuated mechanism outwardly through the knob face.

It is often desirable to be able to reverse the direction of the keyway. Unless there is provision in the spindle for reversing the key-actuated mechanism, it may have to be inserted in a position reverse from that desired. Moreover, where a stabilizing ring is also part of the installation, there is another element which must be taken into consideration when the key-actuated mechanism is to be reversed.

It is therefore among the objects of the invention to provide a new and improved double cutout spindle cap or stabilizing ring which can be easily placed in proper position in the handhold face, which can remain in that position in the handhold face when the key-actuated mechanism is reversed, and which will accommodate the key-actuated mechanism in reversed position.

Another object of the invention is to provide a new and improved double cutout spindle cap or stabilizing ring which can be inserted into an opening in the handhold face with relative ease by finger pressure. Once in position, it expands slightly to provide a firm grip, positioning it in selected orientation in the handhold face and which will constitute a relatively permanent position even though an accompanying key-actuated mechanism may be reversed in position.

Still another object of the invention is to provide a new and improved double cutout spindle cap or stabilizing ring which is small and compact, easy to manipulate, which holds itself firmly in position once a proper position of adjustment is established, which is neat and trim in its appearance, which provides the desirable amount of bearing support between the handhold and the spindle, and which, at the same time, permits reversal of orientation of the key-actuated mechanism without need for disturbing the position of the ring in the handhold face.

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 front elevational view of a knob showing a key-actuated mechanism in one position of orientation.

FIGURE 1*a* is a front elevational view similar to FIGURE 1, but showing the key-actuated mechanism in a reverse position of orientation.

FIGURE 2 is a sectional view on the line 2—2 of FIGURE 1.

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

FIGURE 4 is a front perspective view of the spindle cap or stabilizing ring.

FIGURE 5 is a front elevational view taken on the line 5—5 of FIGURE 4.

FIGURE 6 is a rear elevational view taken on the line 6—6 of FIGURE 4, showing, in phantom lines, two different positions of the pin tumbler chamber which forms part of the key-actuated mechanism.

In an embodiment of the invention chosen for the purpose of illustration, there is shown the exterior portion of a lock mechanism mounted upon a fragment of door **10** over which is applied a rose **11**. Although the device has reference to handholds generally, the handhold in the chosen embodiment consists of a knob **12** having a knob face **13** and a shank or neck **14**. A ring **15** extends outwardly from the rose **11** and is provided with a recess **16** which clears the end of the shank **14**. A hub **17** has a threaded engagement with the interior of the ring **15** and forms an exterior surface over which the inside of the shank **14** is adapted to rotate. A spindle **18** is rotatably mounted within the hub **17** and extends outwardly into a chamber **19** of the knob **12**. The spindle **18** is adapted by conventional means to manipulate parts of the lock which are not shown, but which customarily include a reciprocating latch bolt (not shown).

In the outer end of the spindle **18** are slots **20** and **21**, the slot **20** being on the upper side and the slot **21** on the lower side, as viewed in FIGURE 2. The slots **20**, **21**

extend outwardly through the end of the spindle **18**, which is adjacent the interior of the knob face **13**.

A key-actuated mechanism, indicated generally by the reference character **22**, consists in the main of a cylinder plug housing **23** adapted to fit inside the spindle **18** and from which a pin tumbler chamber **24** protrudes on one side. In FIGURE 2, the pin tumbler chamber **24** is shown extending upwardly and is accommodated by the upper slot **20**. It could be reversed to the broken line position **24'** and would be accommodated by the slot **21**.

For interconnecting the outer end of the knob **12** with the outer end of the spindle **18**, there is provided what has herein been termed a spindle cap or stabilizing ring **25**, shown in perspective view in FIGURE 4. On the outer side of the stabilizing ring **25** is an annular projection **26** which is adapted to extend into an opening **27** in the knob face **13**. An annular shoulder **28** underlies the knob face **13** at the edge of the opening **27**, and at the outer perimeter of the shoulder **28** is a flange **29**. The flange **29** helps form a recess **30** for reception of the outer end of the spindle **18**.

In the flange **29** are two cutout portions **31** and **32**, the cutout portion **31** being the one on the upper side as viewed in FIGURES 2, 4, and 6. In the chosen embodiment, a split **33** extends entirely through the stabilizing ring **25** and arbitrarily is located so as to communicate with the cutout portion **31**.

In use, the stabilizing ring **25** is inserted in the opening **27** of the knob face **13** from the rear by pressing the projection **26** into the opening **27**. If the stabilizing ring **25** is a split ring, as shown, the stabilizing ring **25** is contracted slightly when it is pressed into place. The stabilizing ring **25** expands slightly, due to its inherent resiliency, and forms a snug engagement with the opening **27**. Should the stabilizing ring **25** not be split, then a light press fit would need to be provided between the exterior of the projection **26** and the opening **27**. When the stabilizing ring **25** is positioned, it is oriented so that one of the cutout portions, the cutout portion **31** for example, faces upwardly when a hole **35** on the shank **14** of the knob **12** extends sidewise. The key-actuated mechanism **22** is then inserted in the chamber **19** and into a central opening **36** of the stabilizing ring **25**, so that its outer end is relatively flush with the center of the knob face **13**. At the same time, the pin tumbler chamber **24** is received in the cutout portion **31**, and a keyway **37** is in the orientation shown in FIGURE 1. The knob **12** with the key-actuated mechanism **22** thus inserted is then applied over the end of the spindle **18**, and the pin tumbler chamber **24** is pushed into the slot **20**, until a rear portion **38** of the key-actuated mechanism **22**, carrying a customary tailpiece (not shown), engages other related portions of the lock. When the knob **12** is finally in position, a detent **39**, spring-pressed by means of a spring **40**, will extend into the hole **35** and, in this way, following conventional practice, retain the knob **12** on the spindle **18** in nonrotatable position.

When it becomes desirable to reverse the position of the key-actuated mechanism and the keyway **37**, the detent **39** is depressed, the knob **12** is removed, together with the key-actuated mechanism **22**, the key-actuated mechanism **22** is then released from engagement of its pin tumbler

chamber **24** with the cutout portion **31**, and is rotated 180 degrees, to the position suggested by FIGURES 1*a* and 6. In this position, the pin tumbler chamber **24** is engaged in the lower cutout portion **32**, without there being any need to disturb the position of the stabilizing ring **25** in the knob face **13**. The knob **12** and accompanying key-actuated mechanism **22** is then reapplied over the end of the spindle **18**. This time, the pin tumbler chamber **24** will be received in the slot **21** in the position **24'** shown in FIGURES 1*a*, 2 and 6. The detent **39** will then re-enter the hole **35**, in the same manner as has been previously described, and the knob **12** will then be reassembled with the spindle **18**, but with the keyway **37** reversed in position as shown in FIGURE 1*a*.

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 door lock having a hub, a spindle mounted in the hub with slots therein adjacent a free end on diametrically opposite sides of said spindle, a handhold having a nonrotatable engagement with the spindle, a face on the handhold having an opening therein in axial alignment with the spindle, and a removable key-actuated mechanism comprising a cylinder plug housing adapted to fit slidably in said spindle and a pin tumbler chamber extending from one side of said cylinder plug housing and adapted to extend outwardly through one of the slots in said spindle, the combination of a positioning ring having an annular outwardly extending projection fitting in said opening with a light press-fit, a shoulder on said ring lodged against the inside of said face and an inwardly extending flange on said shoulder overlying said spindle and provide a recess for reception of the free end of said spindle, said ring having cutout portions in said flange on diametrically opposite sides releasably receiving said pin tumbler chamber therein when the pin tumbler chamber is in a respectively adjacent slot in said spindle.

2. A door lock as claimed in claim **1**, wherein said ring has a split therethrough and wherein the outwardly extending projection on said ring has an initial diameter slightly greater than the diameter of the opening in said knob face.

3. A door lock as claimed in claim **2**, wherein the split in the ring is located adjacent to and in communication with one of the cutout portions.

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