Aug. 20, 1957 A. B. ZION 2,803,482

KNOB AND ESCUTCHEON ASSEMBLY

Filed Nov. 7, 1955

Fig. 1.

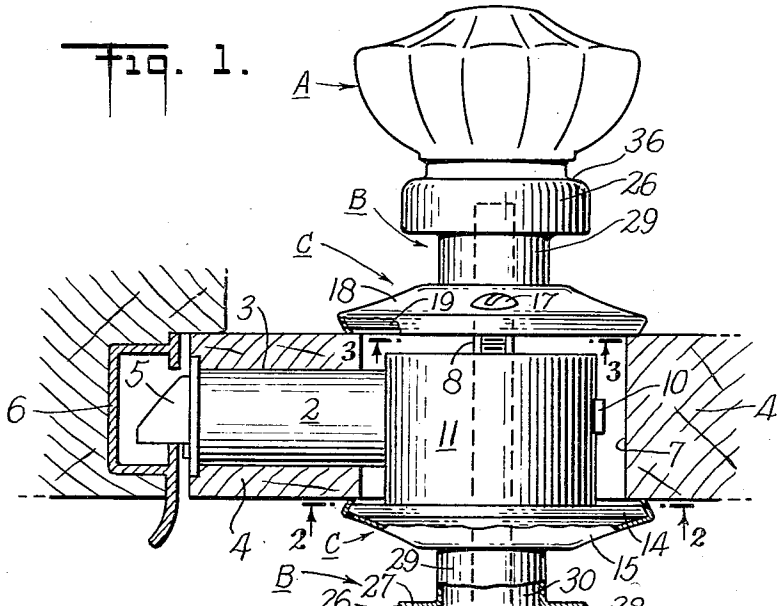


Fig. 2.

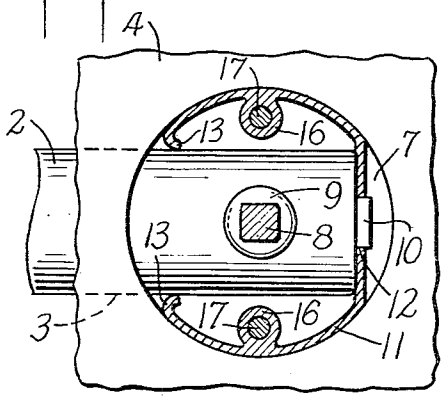


Fig. 4.

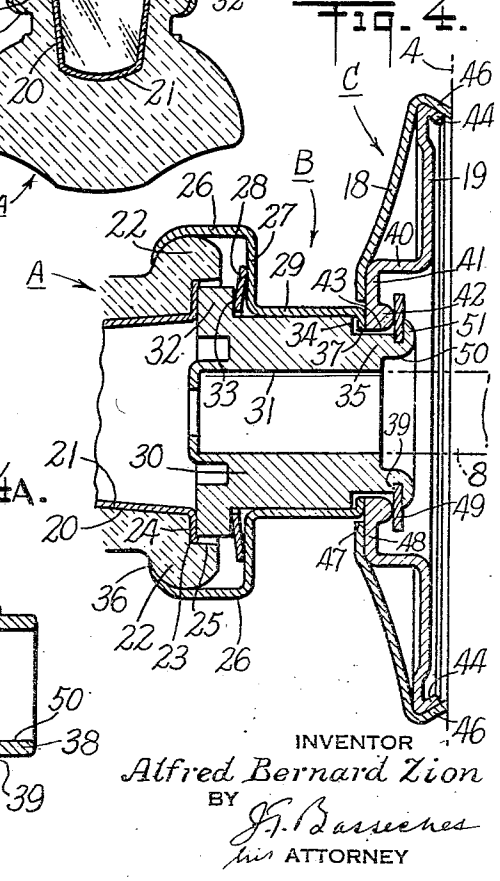


Fig. 3.

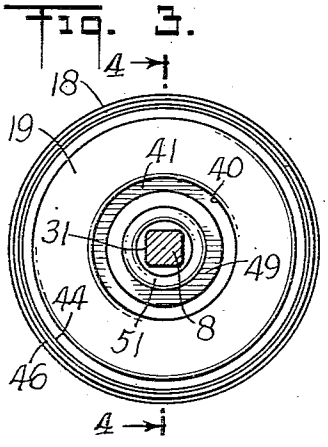
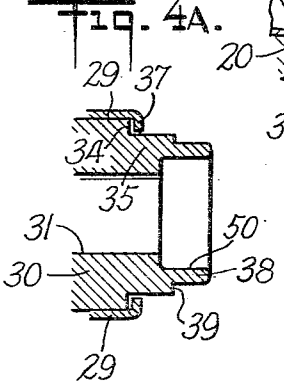


Fig. 4A.



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KNOB AND ESCUTCHEON ASSEMBLY

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This invention relates to an improved, self-aligning knob and escutcheon assembly; more particularly to a knob and escutcheon assembly utilizing knobs made from glass, porcelain and plastic type compositions and still more particularly to a spindle operable knob and escutcheon assembly for a cylindrical latch.

It is an object of my invention to provide a knob and escutcheon assembly wherein the knob retaining shank is rotatably secured within the escutcheon bearing, with a predetermined amount of play relative to the escutcheon.

The invention has for its object the provision of a knob construction having the additional advantages of being stronger and more resistant to wear than comparable structures now in the market, and of retaining the above advantages while allowing the use in the invention of comparatively cheap, low grade alloys.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, I make reference to the accompanying drawings, forming a part hereof, in which:

Figure 1 is a longitudinal plan view of a knob assembly in a door frame with portions partly in section to show details;

Figure 2 is a fragmentary cross-sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a fragmentary cross-sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a vertical cross-sectional view taken on the line 4—4 of Figure 3.

Figure 4*a* is a fragmentary view of a portion of the knob shank at an intermediate point of manufacture.

In the drawings, the knob and escutcheon assembly is illustrated in the form of a latch casing **2**, mounted in a boring **3** of a door **4**, projecting a latch bolt **5** edgewise into the frame strike **6**. The latch casing **2** is coupled to a retractor extending in the cross boring **7** and is operable by a floating spindle **8**, extending through the hub **9**, connected with retractor mechanism (not shown).

The casing **2** has the extension **10** engaging the spacer housing **11** at a slotted portion **12**. Forwardly, the housing **11** has edge portions **13**, **13** engaging the edges of the latch casing **2** to provide an inter-connection of the latch casing **2** and the spacer housing **11**.

The spacer housing **11** is extended at one side to provide a rose plate coupling **14** and a rose plate covering **15**. The spacer housing is integrally formed with sleeves **16**, **16** which are screw-threaded to receive the bolts **17** extending through the escutcheon assembly C including rose cover **18** and the rose plate **19**.

My invention has as its object to assemble with the escutcheon assemblies **14**, **15**, **18** and **19**, knob actuation for the spindle **8** which may eliminate any positive set screw coupling between the spindle **8** and the knob assembly whereby a variety of knobs may be employed to provide an ornamental knob assembly including non-metallic knobs, of which glass and ceramic materials are examples.

In the illustration, the knob assembly comprises a knob A and a shank cup B, and the previously described escutcheon assembly C.

The knob A illustrated is of transparent glass, ornamentally faceted and having a central cavity **20** lined with mirrored material, such as foil **21**. The knob is molded to provide a flange **22** peripherally bitted at **23** to provide a shoulder **24** and an annulus **25**. The knob may

be coupled to the shank cup B frictionally. In the preferred form of my invention, the shank cup B has a knob holding cup **26** outlining a shoulder **27**, arranged to receive a spring washer **28**. The shank cup has a shank neck **29** into which there is fitted the insert **30**. The insert **30** is axially formed with a keyed aperture **31** to receive the correspondingly shaped spindle **8**, previously described.

The insert, adjacent one end, is formed with a flange **32**, having a shoulder **33** overlapping the shoulder **27** of the cup. The opposite end of the insert has a shoulder portion **34** to one side of a neck **35**, which will be described in greater detail as this description proceeds.

The insert **30** is projected into the shank piece B to have the shoulder **33** engage the spring washer **28**. The flange **22** of the knob A is then positioned within the still unformed free edge **36** of the cup **26**, thereby providing an assembly in which the flange **22** temporarily rests on the shoulder **32**, which rests on the washer **28** held on the shoulder **27**, as previously outlined. The shank neck **29** has an inwardly directed flange **37**, towards which the insert is directed, whereupon the shoulder **36** is turned inwardly by suitable means such as spinning, thereby frictionally and resiliently engaging the flange **22**, the shoulder **32** and the washer **28** against relative movement to each other and the shoulder **27**, yet avoiding any strained condition of the non-metallic knob. The flange **37** extending beyond the shoulder **34** also forms an end thrust bearing on the exterior face, as will be described hereinafter.

With the parts thus assembled, I refer to the neck portion **35** which is formed with a tubular neck portion **38** having an internal cylindrical surface and outlining a shoulder **39** externally, the cylindrical portion being extended to one side of the square keyed aperture **31**. The knob and shank thus provided is thereupon joined to the rose plate and rose cover **18** and **19**, previously described. The rose plate consists of a metal stamping, preferably steel or other good bearing material, having an axially extended boss **40**, including an inwardly directed flange **41**, terminating in a downwardly directed bead **42**, outlining the axial bearing aperture **43**. The rose plate, at its peripheral portion, is formed with a bead **44** and is arranged to receive the rose cover **18** by crimping or otherwise forming the peripheral portion **46** thereof.

The rose cover is formed with an axially positioned opening **47** to receive the shank assembly **29**, previously described, in a position to overlap the underlying rose plate also formed with an opening to bring the bearing portion **37** into engagement with the outer face **48** of the rose plate about the bearing aperture **43**. In this position, the insert **30** is then extended to project into the bearing aperture **43**. In this position, the bearing keeper washer **49** is sleeved on the tubular neck portion **38** to abut the shoulder **39** and to overlap the beaded bearing portion **41** of the rose plate, whereupon the tubular neck portion **38** is spun outwardly from the wall **50** to form the locking flange **51** and non-rotatably jam said keeper washer to the neck portion **38**. It will be observed that the relative spacing of the shoulders **34** and **39** from each other is calculated to embrace the bearing bead **42** of the rose plate, rotationally to mount the knob and escutcheon to each other, providing adequate strength and at the same time assuring enough play or tolerance to allow for some degree of misalignment of the axes of the relatively movable parts, particularly when the units are fitted upon the spindle of the latch mechanism on the door.

It will be observed that while there has been described a union of the rose plate with the insert for one knob and escutcheon assembly, the same type of connection is employed in completing the assembly of the escutcheon carrying the casing **11** and its corresponding knob as-

sembly. It will be understood that identical parts bear identical reference characters.

The novelty providing new and unobvious advantages of the above described construction over the type of screwless knob assembly commonly in use are readily recognized when the two are compared. In the common construction a knob containing shank is passed through an escutcheon bearing until a shoulder on the shank bears against the outside surface of the bearing. A washer is then placed over the portion of the shank extending within the escutcheon, and this shank portion spun outward, locking the knob shank assembly within the escutcheon orifice.

Such a construction has the disadvantage of requiring extreme criticality in the final spinning operation, as the application of too much pressure would result in a knob assembly not freely rotatable within the escutcheon while, conversely, the application of too little pressure would leave too much play in the knob and escutcheon assembly.

A further disadvantage resultant if too little pressure is applied during the spinning operation is that the retaining washer is rotatable relative to the turned portion of the shank, and the latter will thus act as a bearing surface during rotation of the knob.

To have the spun portion of the insert act as a bearing surface is obviously disadvantageous since spinning has a tendency to crystallize low grade alloys, and using such crystallized portions as bearing surfaces results in the further weakening of the crystallized portions. The use of non-crystallizing metals to form the knob shank would greatly increase the cost of the knob assembly.

It may be readily recognized that my invention overcomes these disadvantages by providing a structure wherein the amount of play in the final assembly is independent of the pressure applied in the final spinning operation. Furthermore, the structure may be constructed of low grade alloys since the spun portion does not act as a bearing surface.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. A knob and escutcheon assembly for actuation of a latch spindle, said assembly including a shank, a knob retaining cup at one end of said shank, an insert retained in said shank, a tubular neck portion extending to one side of said insert and a spindle engaging portion within said insert, an escutcheon having a bearing through which said neck extends, the inner surface of said escutcheon having a raised, beaded portion surrounding said bearing forming a face bearing portion, a keeper comprising a washer affixed to a shoulder portion formed on said neck portion and spun over said washer against said last shoulder portion, said keeper rotatably bearing against said beaded portion on said escutcheon, said knob shank in fixed spaced relation to said keeper, said shoulder rotatably engaging said escutcheon bearing at a position opposed to said keeper engaging portion.

2. A knob and escutcheon assembly for actuation of a latch spindle, said assembly including a shank, a knob retaining cup at one end of said shank, an insert retained in said shank, a tubular neck portion extending to one side of said insert and a spindle engaging portion within said insert, said insert comprising a malleable metal, an escutcheon having a bearing through which said neck extends, the inner surface of said escutcheon having a friction reducing portion surrounding said bearing, a keeper comprising a bearing washer affixed to a shoulder portion formed on said neck portion, said keeper rotatably bearing against said friction reducing portion on said escutcheon, a shoulder on said knob shank in fixed spaced relation to said keeper, said shoulder rotatably engaging said escutcheon bearing at a position opposed to said keeper engaging portion, a shoulder adjacent one end of said insert, said knob shank having at the base of said cup portion a shoulder corresponding and opposed to said insert shoulder, a spring washer separating said insert shoulder from said knob shank shoulder, a knob having adjacent one end an annular recession and a shoulder portion at said end of said knob, the upper edge of said knob retaining cup having a flanged portion engaging said shoulder at said knob and holding the end portion of said knob in resilient frictional contact against the end portion of said insert, said frictional contact being of a magnitude sufficient to hold said insert, knob and washer against rotation relative to said knob shank.

3. A knob and escutcheon assembly for actuation of a latch spindle, said assembly including a shank, a knob retaining cup at one end of said shank, an insert retained in said shank, a tubular neck portion extending to one side of said insert and a spindle engaging portion within said insert, said insert comprising a malleable metal, an escutcheon having a bearing through which said neck extends, the inner surface of said escutcheon having a friction reducing portion surrounding said bearing, a keeper comprising a bearing washer affixed to a shoulder portion formed on said neck portion, said keeper rotatably bearing against said friction reducing portion on said escutcheon, a shoulder on said knob shank in fixed spaced relation to said keeper, said shoulder rotatably engaging said escutcheon bearing at a position opposed to said keeper engaging portion, a shoulder adjacent one end of said insert, said knob shank having at the base of said cup portion a shoulder corresponding and opposed to said insert shoulder, a spring washer separating said insert shoulder from said knob shank shoulder, a non-metallic knob having adjacent one end an annular recess and a shoulder portion at said end of said knob, the edge of said knob retaining cup having a shoulder engaging said shoulder in said knob and holding the end portion of said knob in resilient frictional contact against the end portion of said insert, said frictional contact of a magnitude sufficient to hold said insert, knob, and washer against rotation relative to said knob shank, said magnitude remaining within the range whereby said knob will not be fractured.

4. A knob and escutecheon assembly for actuation of a latch spindle, said assembly including a shank, a knob retaining cup at one end of said shank, an insert retained in said shank, a tubular neck portion extending to one side of said insert and a spindle engaging portion within said insert, said insert comprising a malleable metal, an escutcheon having a bearing through which said neck extends, the inner surface of said escutcheon having a friction reducing portion surrounding said bearing, a keeper comprising a bearing washer affixed to a shoulder portion formed on said neck portion, said keeper rotatably bearing against said friction reducing portion on said escutcheon, a shoulder on said knob shank in fixed spaced relation to said keeper, said shoulder rotatably engaging said escutcheon bearing at a position opposed to said keeper engaging portion, a shoulder adjacent one end of said insert, said knob shank having at the base of said cup portion a shoulder corresponding and opposed to said insert shoulder, a spring washer separating said insert shoulder from said knob shank shoulder, a non-metallic knob having adjacent one end an annular recess and a shoulder portion at said end of said knob, the edge of said knob retaining cup having a shoulder engaging said shoulder in said knob and holding the end portion of said knob in resilient frictional contact against the end portion of said insert, said frictional contact of a magnitude sufficient to hold said insert, knob, and washer against rotation relative to said knob shank, said magnitude remaining within the range whereby said knob will not be fractured, said non-metallic knob comprising glass.

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