Nov. 12, 1957 H. W. FALK 2,812,967

DOOR KNOB

Filed Oct. 5, 1956

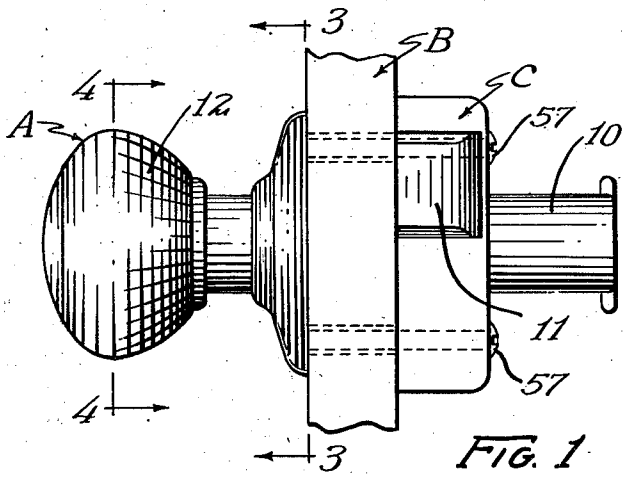


FIG. 1

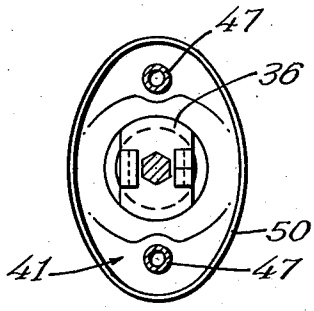


FIG. 3

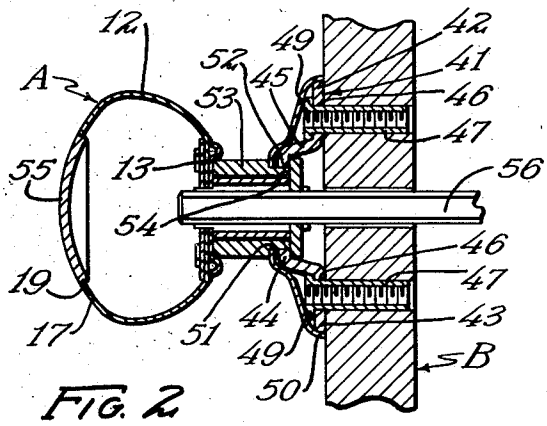


FIG. 2

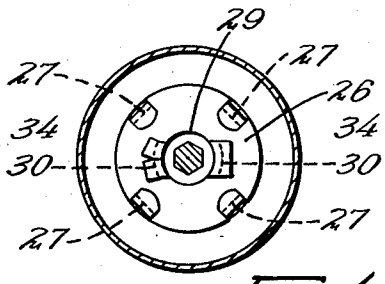


FIG. 4

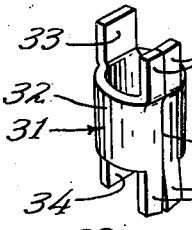


FIG. 6

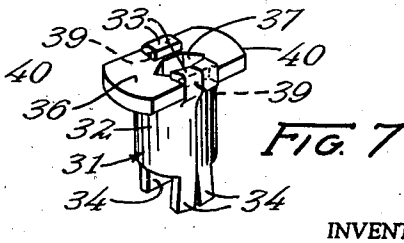


FIG. 7

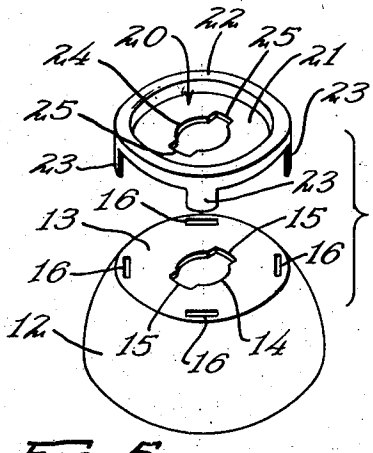


FIG. 5

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DOOR KNOB

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10 Claims. (Cl. 292—347)

This invention relates to an improvement in door knobs and deals particularly with a novel and effective manner of constructing door knobs.

Door knobs of the type used in relatively light weight door latch constructions are difficult and costly to produce. If the knobs are cast in one solid piece they are quite heavy and add very materially to shipping expense. Furthermore, when the knobs are used for screen door hardware or the like, and are heavy in weight, they add materially to the weight of the door and to the difficulty experienced in opening and closing the door. This is particularly true if the latch happens to be of the type which is automatically operated when the lock bolt is retracted during the closing of the door.

An object of the present invention resides in the provision of a door knob constructed of a series of parts which may be inexpensively formed and assembled. These parts are made of light weight material which are stamped or rolled from sheet form and which are readily assembled together. As a result of this operation, a light weight practical durable door knob is formed which may be produced and sold at a relatively low cost.

A feature of the present invention resides in the fact that the body of the door knob may be formed of light weight material such as aluminum which does not in itself possess any high degree of strength. This light weight handle body is reinforced by reinforcing plates on either side of the base of the knob which may be assembled together by a stamping operation to produce a handle which is extremely strong where strength is required.

A further feature of the present invention resides in the provision of a door knob including an escutcheon plate which may be formed of light weight material such as aluminum and which is reinforced at the bearing by means of a reinforcing sleeve which extends through the escutcheon plate. A rolled inner sleeve having oppositely directed projections at opposite ends thereof rotates within the reinforcing sleeve. One pair of projections at one end of the sleeve extend through the reinforcing discs of the knob body and are clinched over to hold the reinforcing plates and knob body from rotation relative to this inner sleeve. The projections at the other end of the sleeve act to connect the inner sleeve to a plate having a multi-sided aperture extending therethrough. Thus, the inner sleeve is held from rotation from the knob body and from the apertured plate. The aperture in the plate is designed to accommodate the multi-sided shank of the lock which operates the latch bolt in any suitable way.

A further feature of the present invention resides in the provision of a reinforcing plate inwardly of the escutcheon plate and concealed thereby. This inner plate is provided with a pair of integrally attached parallel sleeves or bolt shanks. In the event sleeves are used, these sleeves are internally threaded to accommodate attaching bolts.

A further feature of the present invention resides in

the provision of a door knob body which includes a hollow shell which is rolled so that one end of the body is flat and the walls of the body are curved so that the other extremity of the wall is directed inwardly. The closure plate is forced into place in this open end of the body to complete the hollow enclosure.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of the specification:

Figure 1 is an elevational view of the door knob in place upon a door.

Figure 2 is a vertical sectional view through the door knob and its attaching means.

Figure 3 is a cross-sectional view at the base of the door knob, the position of the section being indicated by the line 3—3 of Figure 1.

Figure 4 is a sectional view through the body of the knob, the position of the section being indicated by the line 4—4 of Figure 1.

Figure 5 of the drawings is a perspective view of the body of the knob and one of the reinforcing plates used in conjunction therewith in exploded relation.

Figure 6 of the drawings is a perspective view of the inner sleeve which acts to connect the knob with the rotatable lock shank.

Figure 7 is a view similar to Figure 6 showing the inner sleeve attached to one of the anchoring plates.

The door knob is indicated in general by the letter A and is designed for attachment to a door B. A lock mechanism C is mounted on or in the door B and is provided with a handle 10 by means of which the lock may be operated from one side of the door. The lock mechanism C is normally mounted on the inner surface of the door so that the lock may be latched from the inside. The details of the lock are not a part of the present invention and therefore not illustrated. However, the lock C is provided with a latch bolt 11 which is designed to engage into a suitable keeper on the door frame to hold the door closed.

The door knob A includes a hollow body portion 12 which is shaped as best illustrated in Figures 2 and 5 of the drawings. The knob body 12 is provided with a flat end portion 13 having a central aperture 14 extending therethrough. The aperture 14 is provided with a pair of diametrically opposed notches 15 therein for a purpose which will be later described in detail. The flat surface 13 is also provided with four angularly spaced slots 16 therein, the purpose of which will also be presently described.

As indicated in Figure 2 of the drawings, the knob body is rolled into a pan-shaped form and the edges of the body opposite the flat plate 13 are rolled to extend inwardly as indicated at 17. The edges of the inwardly rolled portion 17 form an aperture 19 which provides access to the interior of the body 12.

In order to enhance the appearance and to simplify the rolling of the body, the body 12 is made of a relatively soft material such as aluminum or an aluminum alloy which is exteriorally polished to provide an attractive appearance. If desired, the surface may be annodized in any desired color.

The reinforcing plate 20 may be formed of any desired material but this plate is preferably formed of material which is harder than that of the body 12. The reinforcing plate 20 includes a circular flat inner portion 21 surrounded by a bead 22 which is channel-shaped in cross section. The reinforcing plate 20 is preferably formed by a punching operation and the outer edge of the channel-shaped bead 22 is provided with a series of angularly spaced projecting ears 23 which are similar in number and which are similarly spaced to the slot 16 of the flat

end portion 13 of the knob body. The reinforcing plate 20 is provided with a central aperture 24 which is provided with diametrically opposed notches 25 communicating therewith, the aperture and notches being similar in form to the aperture 14 and notches 15 so as to register therewith. The ears 23 are of proper dimensions to extend through the slot 16.

An interior reinforcing plate 26 is also provided to lie inwardly of the flat end 13 of the knob body 12. The reinforcing plate 26 is generally circular in form and is provided with angularly spaced notches 27 which are similar in number and which are similarly located to the slots 16 in the end plate 13. Accordingly, when the reinforcing plate 26 is in place, the ears 23 of the reinforcing plate 20 may extend through the slots 16 and through the notches 27 and may be bent over to lie inwardly of the reinforcing plate 26.

The plate 26 is provided with a central aperture 29 having diametrically opposite notches 30. The aperture 29 and notches 30 are designed to register with the apertures 24 and 14 and the notches 25 and 15. The purpose of this arrangement will be presently described.

The inner connecting sleeve shown in Figures 6 and 7 forms a connection between the door knob body and the escutcheon plate. This sleeve 31 is preferably rolled from a sheet of flat sheet metal and is formed into tubular form after it has been stamped to the desired form. When completed, the inner sleeve 31 includes a tubular body 32 having ears 33 projecting from one end thereof in diametrically opposed relation and ears 34 projecting from the opposite end thereof. If the sleeve is formed as described, a longitudinal split 35 is arranged to extend through one of the ears 33 and through one of the aligned ears 34. Thus, in effect, one of each of these ears in reality comprises a pair of side-by-side ears forming a single unit.

An anchoring plate 36 is secured to one end of the tubular body 32 by means of the ears 33. The plate 36 is provided with a multi-sided aperture 37 extending therethrough axially of the tubular body portion 32. The plate 36 is provided with opposed notches 39 into which the ears 33 extend. These ears are then bent over the surface of the plate to firmly attach the plate to the tubular member 32. The plate 36 extends on a plane normal to the axis of the tubular body and the ends of the plate are rounded as indicated at 40 so that the plate will fit within a circular portion of the escutcheon plate reinforcing member as will be later described.

The escutcheon plate may next be assembled. The escutcheon plate reinforcing member 41 includes a pair of end portions 42 and 43 arranged on a common plane and a central circular offset portion 44 connected to the end portions 41 by a tapered connecting sleeve 45. The reinforcing plate 41 is generally oval in outline in the particular design of escutcheon plate employed herein.

A pair of apertures 46 extend through the end portions 42 and 43 of the reinforcing member 41 and tubular internally threaded sleeves 47 extend through these openings 46. The sleeves 47 are provided with enlarged heads 49 which permit the sleeves to extend through the reinforcing member to a predetermined distance. These sleeves are preferably forced through the openings 46 so that they tend to remain in right angular relation with the end portions 42 and 43 of the reinforcing member 41.

The escutcheon plate comprises a thin shell of light weight material such as aluminum and is generally oval in outline in the particular arrangement illustrated. The escutcheon plate is provided with an inturned marginal edge 50 which is designed to encircle the reinforcing plate 41 and to hold the two parts from relative pivotal movement. The escutcheon plate is shaped to overlie the offset portion 44 of the reinforcing plate 41 and is provided with an axial aperture 51 which is in registry with the aperture 52 in the reinforcing plate 41.

A spacing sleeve 53 is provided with a reduced diameter end portion 54 which extends through the apertures 51 and 52. The end of the sleeve may be rolled outwardly so as to rivet the extremity of this sleeve over the reinforcing plate 41. The inner sleeve 31 may then be inserted to the spacing sleeve 53 so that the bearing plate 36 is rotatably supported within the circular offset portion 44 of the reinforcing plate. When in this position, the structure appears as indicated in Figure 3 of the drawings with the bearing plate riding against the under surface of the reinforcing plate. As the reinforcing plate is entirely concealed in the mounted position of the lock, this plate may be made of harder material such as sheet steel although this is not normally necessary due to the fact that the stamped shape of this piece gives it very considerable strength.

The door knob may then be completed by inserting the ears 34 of the inner sleeve 31 through the aligned notches 15, 25 and 27 in the knob body end 13, the reinforcing plate 20, and the reinforcing plate 26. As is indicated in Figure 4 of the drawings, the ends of these ears 34 are then bent downwardly over the reinforcing plate 26 and the entire construction is assembled. The final operation in completing the door knob is to insert the closure plate 55 into the aperture 19 forming a part of the door knob body 12. This plate 55 is preferably concavo-convex so as to follow the general contour of the body 12.

While there are numerous parts in the door knob assembly, all of the parts are relatively simple and inexpensive to form and for the most part these elements may be formed in punch press operation. The parts such as the reinforcing and decorating plate 20 are formed of relatively thin metal which may be blanked out when in flat form and then bent in a punch press operation to form the channel-shaped bead about the periphery of the plate. The inner sleeve 31 is also preferably punched out to proper form when flat and then bent into the tubular form illustrated. The manner in which the other parts may be formed is believed obvious.

An elongated multi-sided shank 56 acts to connect the lock C and its handle 10 with the knob A, the shank 56 usually being formed integrally or as a part of the lock. In the particular form illustrated, bolts 57 extend through the casing of the lock C and into the internally threaded sleeves 47 to anchor these two parts together. This arrangement is desirable as in attaching the lock it is only necessary to drill three spaced holes through the door, the center hole being for the shank 56 and the other holes being for the sleeves 47. As the bolts 57 pass through the lock casing and into the sleeves 47, the proper alignment of the lock and knob is insured.

In accordance with the patent statutes, I have described the principles of construction and operation of my Door Knob Construction and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A door knob including a hollow door knob body having a flat end portion, reinforcing plates on opposite sides of said flat end portion, said end portion having angularly spaced slots therein, and ears on one of said reinforcing plates extending through said slots and bent to overlie the other reinforcing plate to reinforce the flat end of the knob body.

2. The construction described in claim 1 and in which the said one of said reinforcing plates is provided with a channel-shaped peripheral rim from which said ears project.

3. In a door knob assembly, an escutcheon plate having a circular apertured center portion, a reinforcing plate within said escutcheon plate and having an apertured center portion in registry with the apertured portion of said escutcheon plate, anchoring portions on said reinforcing

plate offset from said central circular apertured portion thereof, a flange on said escutcheon plate and extending marginally thereabout to enclose the edges of said reinforcing plate, a spacing sleeve having a reduced diameter end portion extending through the apertures in said escutcheon plate and reinforcing plate, and an inner sleeve rotatably supported within said spacing sleeve, a bearing plate mounted on the end of said inner sleeve, said bearing plate extending inwardly of the circular center portion of said reinforcing plate and a door knob body connected to said inner sleeve to rotate therewith.

4. The construction of claim 3 and including means on said inner sleeve holding said door knob body against said spacing sleeve.

5. The construction described in claim 3 and including internally threaded sleeves extending through the mounting portions of said reinforcing plate within said escutcheon plate, said sleeves having heads thereon between said reinforcing plate and said escutcheon plate to hold said sleeves in place.

6. The construction described in claim 3 and in which the bearing plate has a central multi-sided aperture extending therethrough, and a lock shank extending through said aperture in said bearing plate and rotatable therewith.

7. A door knob construction including an escutcheon plate assembly having an aperture extending therethrough, a bearing sleeve having a reduced diameter end extending into said aperture, an inner sleeve having a central tubular portion and projecting ears at opposite ends thereof, a bearing plate anchored to one end of said tubular sleeve by said ears, and a door knob assembly having aperture means therethrough through which the remaining ears of said inner sleeve may extend to anchor said inner sleeve to said door knob body.

8. The construction described in claim 7 and in which said inner sleeve holds said door knob body against said spacer sleeve.

9. The construction described in claim 7 and in which said door knob body has an aperture therethrough in the end thereof opposite the end connected to said inner sleeve, and a convex disc normally closing said last named aperture.

10. The construction described in claim 7 and in which said bearing plate has a multi-sided aperture extending therethrough.

No references cited.