Jan. 10, 1961 H. W. FALK 2,967,728

DOOR HANDLE CONSTRUCTION

Filed Feb. 14, 1958

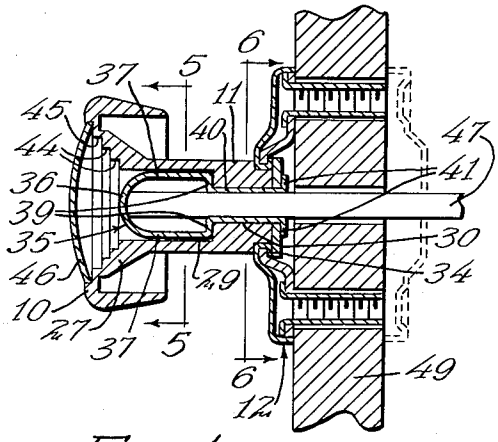


FIG. 1

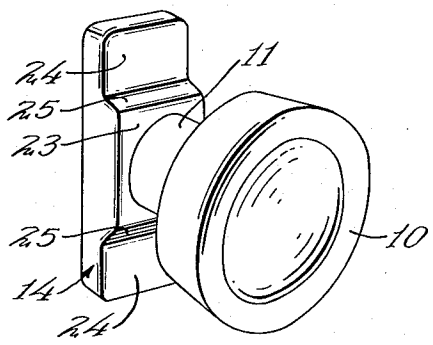


FIG. 2

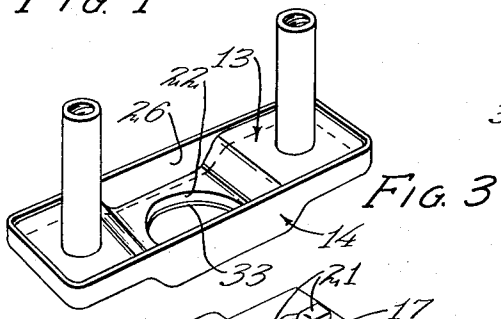


FIG. 3

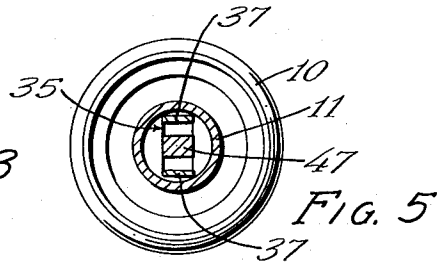


FIG. 5

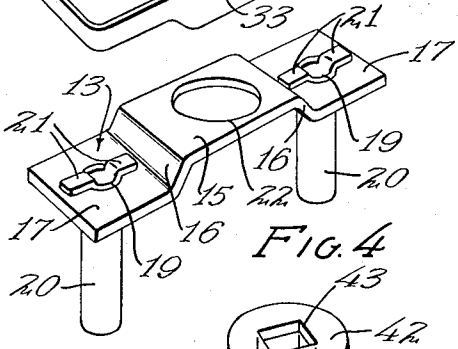


FIG. 4

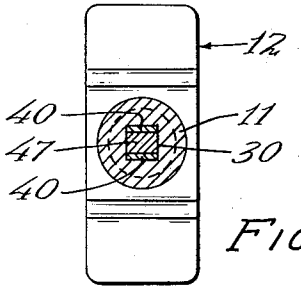


FIG. 6

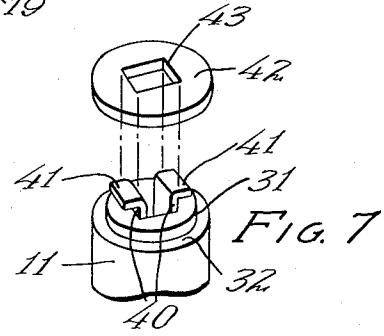


FIG. 7

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DOOR HANDLE CONSTRUCTION

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This invention relates to an improvement in door handle construction and deals particularly with a simple and effective door handle construction which can be produced at low cost and economically assembled.

A considerable proportion of the cost of many hardware items at present on the market is the cost of the labor involved in manufacturing and assembling the hardware. For example, door locks which include a door handle pivotally secured to an escutcheon plate structure require not only a means of pivotally connecting the knob to the escutcheon plate but also require some means of anchoring the escutcheon plate to the surface of the door. Because of the high cost of labor and due to the present trend toward home owners doing their own work, a simple means of mounting the latch upon the door is of importance. It is an object of the present invention to provide a door knob and escutcheon plate assembly which is easy to form and assemble and which may be mounted upon the door by drilling three spaced small diameter holes through the door.

A feature of the present invention resides in the provision of a novel and effective means of pivotally attaching the shank of the knob to the escutcheon plate structure. The knob is provided with a relatively large diameter socket in its outer end communicating with an axial passage through the shank designed to accommodate the square shaft connecting the knob to the lock mechanism. A generally U-shaped spring is provided having a pair of parallel arms designed to extend through the passage and to define two of the walls thereof. These arms are provided with outturned extremities capable of extending through an axial aperture in a washer to hold the washer assembled to the shank of the knob. The knob shank is provided with a small diameter portion designed to extend through the escutcheon plate assembly. By attaching the washer to the knob shank by means of the spring, the knob and escutcheon plate assembly are completely assembled.

A further feature of the present invention resides in the fact that the knob may if desired be detached from the escutcheon plate for repair or replacement of one of the parts. One of the difficulties with inexpensive latch structures of the type in question lies in the fact that the pivotal mountings are usually accomplished by spinning or riveting the ends of the door knob shank to the escutcheon plate assembly. If this action is improperly assembled, the shank of the knob may be attached to the escutcheon plate assembly so firmly that relative rotation is difficult. In other instances, if the spinning operation is not properly done, the two parts may readily fall apart when a pull is exerted upon the knob. Difficulty is experienced in providing a uniform joint by the spinning or riveting method. With the present construction, the joints between the knob and the escutcheon plate assembly are all identical and uniform and if desired, the arms of the spring may be flexed to permit the retaining washer to be removed thereby permitting the parts to be disassembled.

A further feature of the present invention resides in the fact that the knob is provided with a disc or cover plate which frictionally engages in the outer end of the knob to overlie the socket and to form a closure therefor. This disc fits into position and is held in place by

friction so that if desired it may be driven from place from the interior of the socket in the event replacement of the spring is necessary.

A further feature of the present invention resides in a novel manner of supporting a pair of internally threaded parallel sleeves to the escutcheon plate structure, the sleeves being designed to extend through the door and to accommodate attaching bolts inserted into the door from the other side to hold the escutcheon plate in place. These internally threaded sleeves are completely hidden in finished form of the construction so that the locking mechanism cannot be removed from the outside of the door.

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 a cross sectional view through the door knob and escutcheon plate assembly showing the arrangement of parts therein.

Figure 2 is a perspective view of the assembly in completed form.

Figure 3 is a perspective view of the inner surface of the escutcheon plate assembly.

Figure 4 is a perspective view of the mounting plate which forms a part of the escutcheon plate assembly.

Figure 5 is a cross sectional view through the knob shank, the position of the section being indicated by the line 5—5 of Figure 1.

Figure 6 is a sectional view through the knob shank, the position of the section being indicated by the line 6—6 of Figure 1.

Figure 7 is an exploded view of the handle knob shank and retaining washer before assembly thereof.

The door knob assembly includes a knob body **10** having an axial shank **11** projecting from the rear surface thereof. The knob shank **11** is designed for pivotal attachment with the escutcheon plate assembly **12** which includes the mounting plate which is illustrated in general by the numeral **13** and the covering shell which is indicated in general by the numeral **14**. The mounting plate **13** is formed of heavy material relative to the shell **14** in order to provide an effective support for the door knob **10**. The mounting plate **13** is a simple stamping and may be easily formed of thick metal in a single stamping operation. The plate **13** includes a central portion **15** which is connected by angularly bent connecting portions **16** to the end portions **17**. The end portions **17** are on a common plane parallel to the central portion **15** but offset therefrom. The end portions **17** are provided with apertures **19** extending therethrough.

A pair of internally threaded sleeves **20** are provided with projecting ears **21** at one end thereof. These ears extend through notches on opposite sides of the opening **19** and are bent outwardly in outwardly opposed relation so as to secure the sleeves **20** to the ends **17** of the mounting plate **13**. The center portion **15** of the mounting plate is provided with a central aperture **22** which is designed to extend the end of the knob shank **11** in a manner which will be later described. The entire mounting plate **13** is concealed within the covering shell **14** which is normally made of relatively light weight metal as the stamping is much more complicated and serves to decorate the escutcheon plate assembly.

As is indicated in the drawings, the outer shell **14** follows the same general contour as the mounting plate **13** including a central portion **23** and end portions **24** connected to the central portion by connecting walls **25**. A peripheral flange **26** encircles the structure, the flange **26** being generally rectangular in shape and forming a hollow shell which encloses the sides as well as the

outer surface of the mounting plate. The flange 26 confines the mounting plate 13 and encloses the same.

The knob 10 is in general a hollow circular shell connected at one end to a hollow generally conical supporting portion 27. The shank 11 is axially connected to the conical connecting portion 27 to act as a support for the knob. A cylindrical socket 29 is provided in the outer surface of the knob accessible through the inner surface of the hollow conical connection portion 27. The socket 29 communicates with a generally rectangular passage 30 extending the remainder of the way through the handle shank.

As is evident from Figure 7 of the drawings, the shank 11 includes a small diameter end portion 31 connected to the remainder of the shank along a shoulder 32. The small diameter portion 31 is of proper diameter to fit through the central aperture 22 of the mounting plate 13 and also through an aperture 33 in the shell 14. If desired, a flange 34 may encircle the aperture 33 and may extend through the aperture 22 of the mounting plate to be spun over the inner surface of the mounting plate thereby connecting the mounting plate and shell together.

The handle shank 11 is prevented from axial movement relative to the escutcheon plate assembly by the shoulder 32. In order to prevent axial movement in the opposite direction, a spring 35 is provided extending through the handle shank. The spring 35 includes a rounded end 36 which connects spaced parallel arms 37. The arms 37 include a pair of inwardly turned offsets 39 which support the arm ends 40. The arm ends 40 are provided with outwardly turned extremities 41 which are perhaps best illustrated in Figure 7 of the drawings.

A bearing washer 42 is provided having a rectangular recess 43 extending therethrough. When the ends 40 of the spring 35 are flexed together, the spring extremities 41 are close enough together to pass through the aperture 43 in the washer 42. The arms of the spring are of just sufficient length to hold the washer 42 securely against the end of the handle shank 11. In assembling the parts, the spring 35 may be inserted in place with the ends 40 extending through the handle shank. The small diameter portion 31 of the handle shank may then be inserted through the apertures 33 and 22 of the escutcheon plate assembly. The extremities of the arms are then flexed together and the washer 42 is slipped over these extremities so that when the arms of the spring spread apart they hold the washer 42 firmly against the end of the handle shank. This portion of the structure is then completely assembled.

It will be noted that the hollow conical portion 27 of the knob is provided with a series of concentric shoulders 44. A disc 46 which is preferably convex may be inserted within any of the shoulders 45 and frictionally engaged in place. By changing the shape of the disc 46 and the size thereof, the contour of the handle may be materially changed so as to provide a different appearance without materially changing the construction.

Thus it will be seen that the assembly may be readily put together at low cost and that the handle structure is simple and inexpensive to produce. When the rectangular shaft 47 which connects the handle to the lock mechanism on the opposite side of the door 49 is inserted between the ends 40 of the spring 35, the arms of the spring may no longer flex together and the lock cannot accidentally become disassembled.

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

I claim:

1. A door handle assembly including a hollow escutcheon plate assembly having a pivot aperture therein, a door knob having a shank projecting therefrom, said shank including an end projecting through said pivot aperture and supported by said escutcheon plate assembly, a shoulder on said shank engageable against the outer surface of said escutcheon plate assembly, an axial shaft socket in said shank, a generally V-shaped spring mounted within said socket and projecting from said shank end, a washer inwardly of said escutcheon plate assembly and engaging the inner surface of the same about said aperture, and outwardly turned end portions on said spring engaging said washer and holding the same against the end of said shank, said end portions being of a length to permit said washer to pass thereover when said spring ends are flexed together.

2. The structure described in claim 1 and including an operating shaft engaged in said socket, said shaft holding said spring in washer engaging position.

3. A door handle assembly including a hollow escutcheon plate assembly having a pivot aperture therein, a door knob having a shank projecting therefrom, said shank including an end projecting through said pivot aperture, said shank and knob being supported by said escutcheon plate assembly, a shoulder on said shank engaging the outer surface of said escutcheon plate assembly to limit axial movement of said shank in one direction, an axial shaft socket in said shank, a generally U-shaped spring mounted in said socket and projecting from said shank end, a washer having a central aperture positioned inwardly of the escutcheon plate assembly and engaging the inner surface of the same, and means on the ends of said U-shaped spring engaging said washer on opposite sides of the aperture therein and holding said washer in fixed relation to the end of said shank, said last-mentioned means being of a size to pass through said washer aperture when the ends of said spring are flexed together.

4. The construction described in claim 3 and including an operating shaft extending into said socket between the ends of said U-shaped spring, said shaft holding the ends of said spring in engagement with said washer.

5. The structure described in claim 3 and including cooperable means on said shank and on said spring holding said spring from movement through the end of said shank.

6. The construction described in claim 3 and in which said escutcheon plate assembly includes a mounting plate, and a covering member enclosing said mounting plate, and including a pair of parallel internally threaded sleeves secured to said mounting plate and extending substantially parallel to the axis of said shank.

7. The construction described in claim 3 and in which said socket includes an enlarged diameter portion spaced from the end of said shank, and in which said spring includes a pair of arms each having shoulder means engageable against the end of said large diameter socket portion to hold said spring from movement through the end of said shank.

8. The construction described in claim 7 and in which the large diameter socket portion extends through said knob, and including a covering disc extending over the outer end of said large diameter socket portion.

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