July 8, 1958 V. MUTTART 2,842,389

KNOB MOUNTING CONSTRUCTION

Filed Nov. 29, 1956

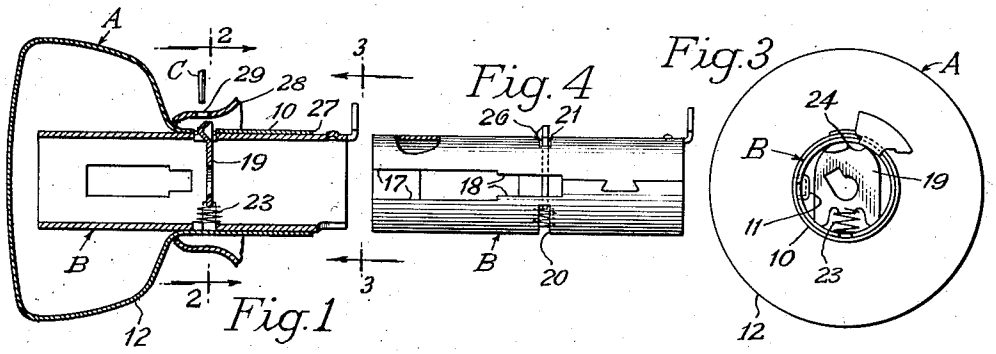



Fig. 1 Fig. 4 Fig. 3

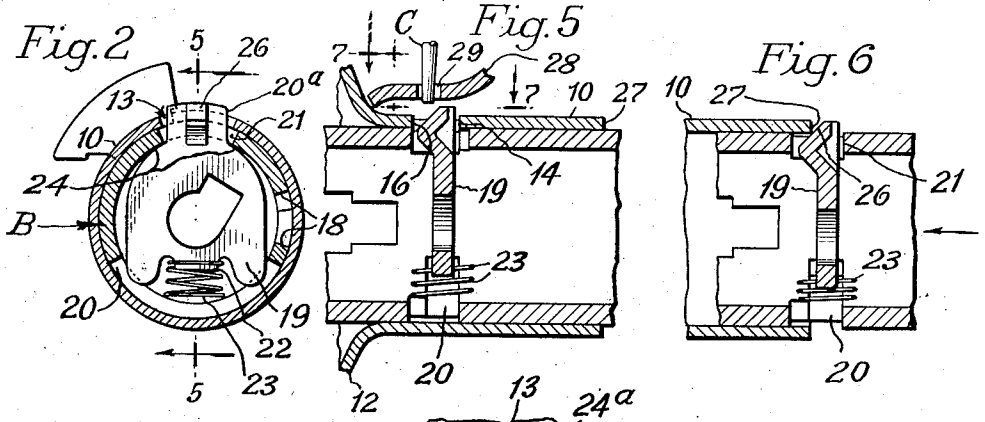



Fig. 2 Fig. 5 Fig. 6

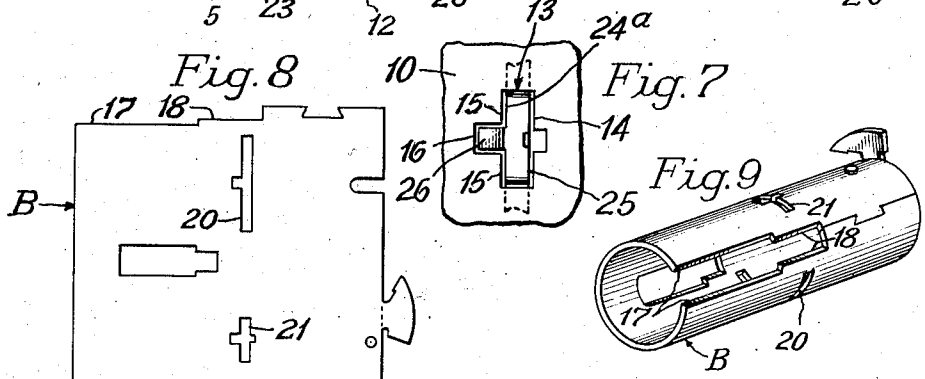



Fig. 8 Fig. 7 Fig. 9

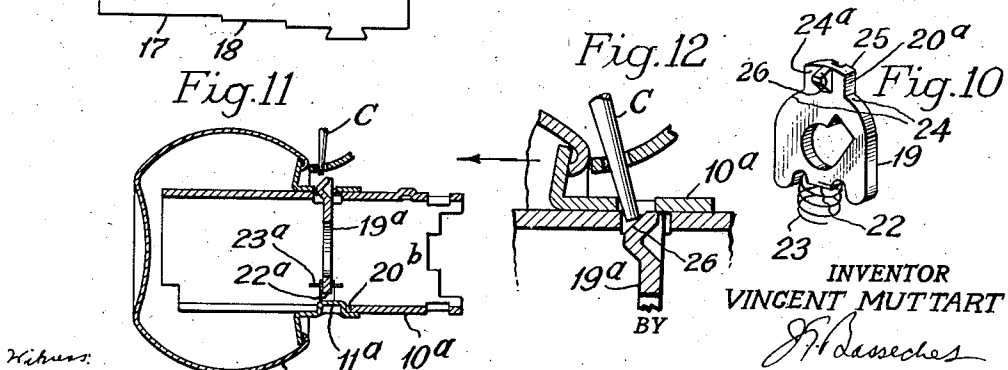



Fig. 11 Fig. 12 Fig. 10

Witness:
Mark Bassecheas

INVENTOR
VINCENT MUTTART
BY
J. Bassecheas
ATTORNEY

United States Patent Office

2,842,389

Patented July 8, 1958



2,842,389

# KNOB MOUNTING CONSTRUCTION

Vincent Muttart, Downey, Calif., assignor to Independent Lock Company, Fitchburg, Mass., a corporation of Massachusetts

Application November 29, 1956, Serial No. 625,056

3 Claims. (Cl. 292—352)

This invention relates to a novel demountable knob and spindle assembly of the cylinder lock type, in which the knob and a tubular shank extending from the knob are demountably fastened to a door latch operating spindle.

In the conventional demountable knob and spindle assembly, the process of remounting a demounted knob or of demounting an assembled knob, especially in changing "hand" and pin tumbler assembly, is tedious to perform, requires the use of a special tool, and often results in marring the fine surface fininsh of the knob shank, or even in burring the shank at portions where, during normal operation, it must contact the inside sleeve of the knob bearing.

Accordingly, it is an object of my invention to provide a demountable knob and spindle assembly wherein the remounting of a demounted knob may be performed without the use of a tool. A further object of my invention is to provide a demountable knob and spindle assembly in which the mounting and demounting of a knob is easily accomplished and danger of marring the knob shank or the door escutcheon or rose plate is minimized, and whereby key changes of the tumbler mounted on the knob or changing the "hand" thereof may be effected quickly and efficiently.

Still a further object of my invention is to provide a demountable door knob and spindle assembly in which the process of mounting or demounting the knob to the spindle is transformed from a difficult operation to one which may be performed easily, with one hand and without special tools.

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

Figure 1 is a central, longitudinal section through the knob and spindle assembly, separated from an entire lock assembly for clarity, with a latch actuating tool in position;

Figure 2 is a section taken on the line 2—2 of Figure 1;

Figure 3 is an end elevation taken in the direction of the lines 3—3 of Figure 1;

Figure 4 is a side elevational view of the spindle with portions broken away to show details;

Figure 5 is a fragmentary magnified, longitudinal cross-section showing in detail the latching mechanism in the finally seated position with a fragment of an unlatching tool in position;

Figure 6 is a magnified fragmentary, longitudinal cross-section of the knob shank and spindle in the initial sleeving position;

Figure 7 is a fragmentary plan view taken in the direction of the lines 7—7 of Figure 5;



Figure 8 is a plan view of a blank of which the spindle is formed;

Figure 9 is a perspective view of the spindle formed from the blank shown in Figure 8;

Figure 10 is a perspective view of the latch member employed in the embodiments shown in Figures 1 to 7;

Figure 11 is a cross-sectional view of a knob and spindle assembly of another embodiment, showing the latch mechanism in locked position, with a depressing tool in position;

Figure 12 is a fragmentary, magnified cross-sectional view of the assembly shown in Figure 11, with the latch in unlocked position prior to removal of the knob from the spindle, with the latch depressing tool in position.

Referring to the drawings in detail, the knob A is joined to spindle B by a latching mechanism which will now be more fully described.

The knob A has a tubular shank portion 10 formed at an end thereof, on which is provided an inwardly protruding detent 11 (see Figure 3) located near the junction of the shank 10 and the knob handle 12, normally but not necessarily of spun metal. The knob shank 10 has a T-shaped slot 13 outlined through the wall, which slot provides a forward shoulder 14, spaced rear shoulders 15—15, and a central branch shoulder 16.

The spindle B is tubular in cross-section and is adapted to slide initimately within the knob shank 10. A longitudinally extended finder slot 17 is cut or otherwise formed through a side wall of the spindle B, which slot narrows to the smaller seating slot 18.

A latch plate 19 is diametrically positioned and slidably guided between the tail slot 20 and the T-shaped slot 21. The latch plate 19 has a T-shaped head 20*a*, guided in said slot 21. A coil spring 23 is compressed between a side wall of the spindle B and the spring receiver lug 22 formed in the latch plate 19. The plate 19 is radially slidable within the spindle B, the spring 23 in the normal position of the latch plate 19 acting to bias the latch plate shoulders 24 against the inner face of the wall of the spindle B. The head portion 20*a*, in the biased position of the latch plate 19, protrudes through the slot 21 in the spindle B, and exposes the forward shoulder 24*a*, the rear shoulder 25 and the cam face 26 beyond the outer periphery of the spindle B.

Knob A and the spindle B are assembled as follows: Spindle B is axially inserted into the knob shank 10 (see Figure 6), and knob A is rotated until the detent 11 is positioned within the finder slot 17 and later within the seating slot 18, in spindle B, thereby aligning the T-shaped keeper slot 13 with the head portion 20*a* of the latch plate 19. Upon further axial insertion of the spindle B into knob shank 10, the cam portion 26 of the latch plate 19 contacts the edge portion 27 of the knob shank 10, depressing the latch plate 19 downward against the pressure of the coil spring 23.

The latch plate 19 is retained in downwardly displaced position by contact with the inner surface of the shank 10 until the T-shaped slot 21 on the spindle B registers with the keeper slot 13. Upon registration, the latch plate 19 is projected upward by the spring 23, forcing the head portion 20*a* through the keeper slot 13. In the projected position, the latch shoulder 25, which is sharp-edged, abuts the keeper shoulder 14, preventing separation of the knob A and the spindle B and the forward, sharp-edged shoulders 24*a* abut the keeper shoulders 15, limiting further movement of the knob A and the spindle

B toward each other. Cam **26**, in the projected position of the latch plate **19**, lies adjacent the central shoulder **16** of the keeper slot **13**.

In an "on the door" installation known to me, an escutcheon plate or rosette, having a tool receiving opening, is positioned over the knob and spindle assembly. In order to remove the knob from the spindle, the knob handle is rotated until the keeper slot and the head portion of the latch are accessible beneath the tool-receiving hole in the escutcheon or rosette. With the keeper slot thus positioned, a pointed tool is inserted through the hole into contact with the head portion of the latch plate, and the latter is depressed by the tool into the unlatching position. The knob may then be removed with the tool still positioned through the hole, to retain the latch plate in the escutcheon in depressed position.

Removal of the knob with the tool in latch depressing position often results in scarring the shank **10** of the knob by the pointed portion of the tool. This scarring aside from defacing the shank **10**, may even cause burrs to form and deface the slot to enlarge it.

Contrasted with the foregoing known knob installation just described, by my invention the pointed tool C is inserted through the hole **29** of the escutcheon **28**, with the knob A rotated so that the keeper slot **13** is exposed beneath the escutcheon opening **29**. The pointed tool C is positioned between the cam surface **26** and the shoulder **16** defining the rearmost branch of the keeper slot **13**, and is then forced radially inward. The motion thus imparted forces the latch plate **19** downward into unlatching position against the coil spring **23**, and at the same time moves the knob A axially outward from the spindle B due to the sideward wedging force imparted through the pointed tool C to the knob A as the tool C rides over the cammed surface **26**. When the latch plate **19** is fully depressed, the knob A will have slid sufficiently outward from the spindle B that, upon subsequent removal of the pointed tool C, the shoulder **25** lies against the inner periphery of the knob shank **10***a*, retaining the latch plate in the unlocking position (see Figure 12). With the tool C removed, the knob A may then be demounted by axially pulling it off the spindle B, and no scarring action will result.

I have found that for ease of operation a high pitch cam of about 45° to 60° is preferable, but it will be understood that I do not limit the application of my invention to the use of such high pitches.

While I have illustrated the use of a coil spring **23**, as shown in Figures 1 to 10, to project the latch plate **19**, I may project the latch plate by other spring biasing means, such as leaf springs, and for this purpose I refer to Figures 11 and 12 wherein a latch **19***a* has its tail portion **22***a* affixed to a chordally extended leaf spring **23***a* adjacent to and at one side of the guide slot **20***b*. The location of the detent **11***a* to engage with the slot **20***b* permits accessibility for a ready positioning of the latch **19***a* and spring **23***a* in the spindle.

In my invention, the operation of inserting a door knob into latched position on the spindle, as previously described, is accomplished without the necessity of using a latch depressing tool. It should be noted that in other lock assemblies known to me, the use of such latch depressing tool is required. In mounting the knob of such other assembly, the knob shank must first be sleeved over the spindle, with the keeper slot aligned with the latch plate. When the latch plate abuts the edge portion of the knob shank, a tool must be inserted against the latch plate, forcing it to the depressed position, thereby allowing the shank to be sleeved over the latching plate and the knob slot slid into engagement with the latching member.

The process of depressing the latch plate with an elongated tool is a difficult one, and is further complicated in those installations where an escutcheon or rosette is employed since such an escutcheon or rosette renders the latch plate even less accessible.



In my construction, the edge portion **27** of the knob shank **10**, upon axial sleeving of said knob shank **10** over the spindle B, contacts the cam face **26**, forcing it downward against the spring **23** or **23***a*, at which position the knob A and spindle B may be further inserted to locking position.

The same knob mounting procedure may be followed with the embodiment shown in Figure 11, in which case the axial insertion of the knob shank **10***a* over the spindle B depresses the latching plate **19***a* against the leaf spring **23***a*.

It will be readily recognized that the ease of mounting and demounting knobs made in accordance with my construction will greatly enhance the speed with which such operations as substituting knobs of one type for knobs of another type, changing the "hand" of a door lock, or repairing the inner mechanism of the door latch may be accomplished.

Furthermore, while I have illustrated my invention as used with a simple or inside knob, it will be understood that the same construction may be used with knobs carrying push button assemblies, pin tumbler assemblies for key operation, and the like, and, in fact, any knob assembly where quick demountability is a desired factor.

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

1. In a demountable door knob and spindle assembly wherein a tubular shank member is removably locked to a tubular spindle member by the engagement of a spring biased latch radially extending from one of said members into a slot forming a keeper on another of the members, cam means forming a leading edge for said latch in sliding said knob member on said spindle member, said cam means cooperating upon the axial coupling of the knob shank member over the spindle member to engage an edge of one member with the cam of the other member, thereby to depress said latch member to the shank releasing position thereof, said keeper having a rearwardly disposed branch slot through which said cam means extends in the knob locking position of said latch member said keeper being defined by transverse shoulders which form, in the knob locking position of said latch member, positive stops abutting the forward and rearward faces of the projected latch member and the shoulder defining the rearward extremity of said branch slot lies in non-abutting relation to said cam means.

2. In a demountable door knob and spindle assembly wherein a tubular shank member is removably locked to a tubular spindle member by the engagement of a spring biased latch radially extending from one of said members into a slot forming a keeper on another of the members, cam means forming a leading edge for said latch in sliding said knob member on said spindle member, said cam means cooperating upon the axial coupling of the knob shank member over the spindle member to engage an edge of one member with the cam of the other member, thereby to depress said latch member to the shank releasing position thereof, said keeper having a rearwardly disposed branch slot through which said cam means extends in the knob locking position of said latch member said transverse slot and said branch slot forming a T, and said cam means comprises a leading lip located medially of said latch.

3. In a demountable door knob and spindle assembly wherein a tubular shank member is removably locked to a tubular spindle member by the engagement of a spring biased latch radially extending from one of said members into a slot forming a keeper on another of the members, cam means forming a leading edge for said latch in sliding said knob member on said spindle member, said cam means cooperating upon the axial coupling of

the knob shank member over the spindle member to engage an edge of one member with the cam of the other member, thereby to depress said latch member to the shank releasing position thereof, said keeper having a rearwardly disposed branch slot through which said cam means extends in the knob locking position of said latch member said shank member and said spindle member having detent means and axial recess means, respectively, said detent and recess means cooperating to align said keeper and said latch upon axial insertion of said spindle into said shank.



**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,800,818 | Devereaux | Apr. 14, 1931 |
| 2,059,319 | De Vries | Nov. 3, 1936 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 102,395 | Australia | Nov. 11, 1937 |