March 7, 1967 I. V. SINERVO 3,307,384

DOOR CYLINDER LOCKS AND METHODS OF ASSEMBLY THEREOF

Filed April 13, 1965 2 Sheets-Sheet 1

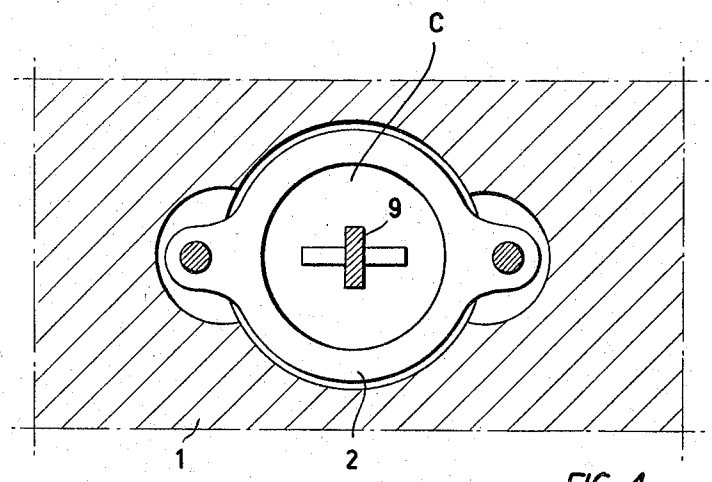


FIG. 1

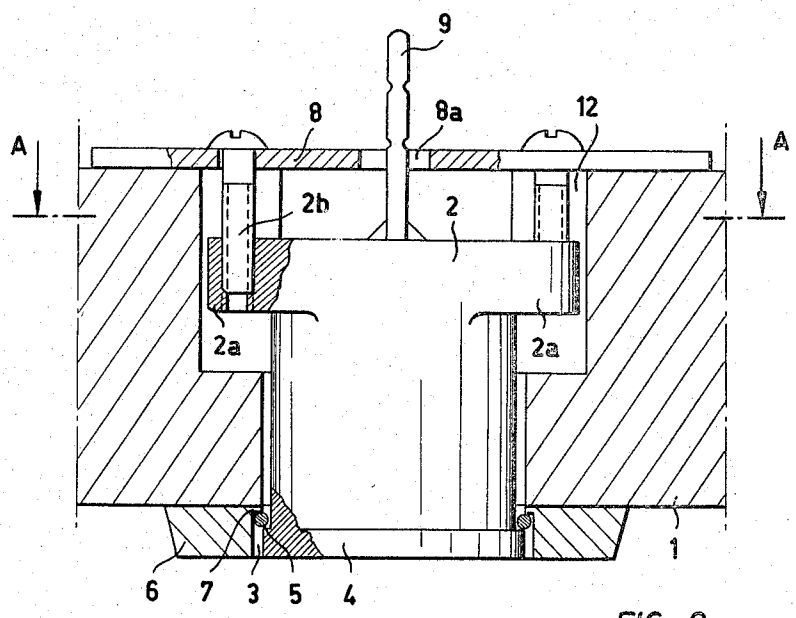


FIG. 2

DOOR CYLINDER LOCKS AND METHODS OF ASSEMBLY THEREOF

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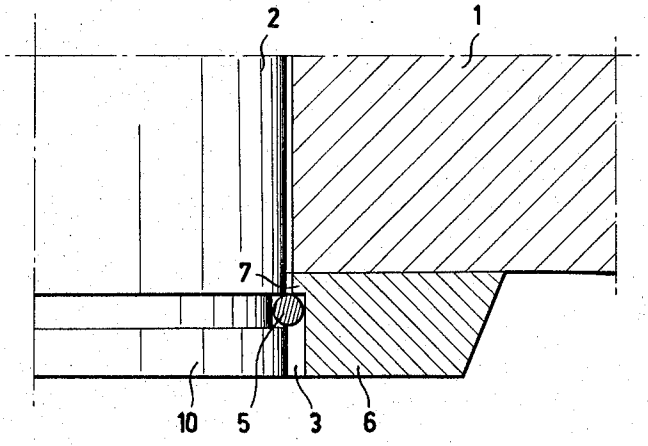


FIG. 3

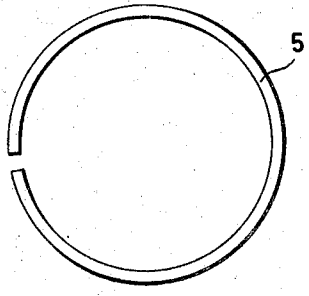


FIG. 4

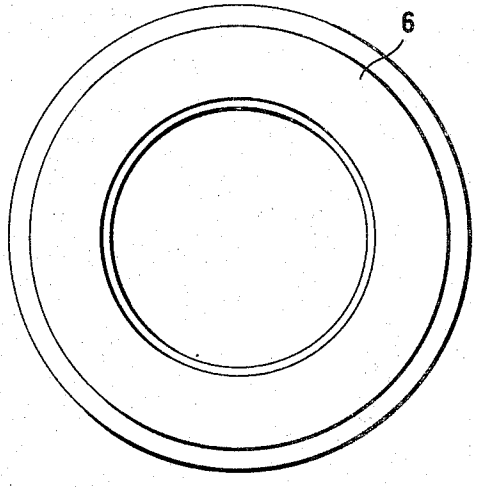


FIG. 5

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DOOR CYLINDER LOCKS AND METHODS OF ASSEMBLY THEREOF

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Claims priority, application Finland, Jan. 9, 1963, 36/63
9 Claims. (Cl. 70—370)

This is a continuation-in-part of application Serial No. 253,095, filed January 22, 1963, and now abandoned.

The invention relates to a cylinder lock for a door and in particular to a safety lock for an outer door and to methods of assembly and disassembly of such locks to the door. In general, the invention is directed to the class of locks which comprise a cylinder housing and a surrounding protecting ring or rose. More specifically the invention is directed to an improved fastening of the protecting ring or rose to the cylinder housing. The rose generally abuts the outside surface of the door and engages the cylinder housing so as to prevent the housing from being able to be pushed into the aperture in the door in which the cylinder lock is supported. The invention relates particularly to such an arrangement in which the cylinder is introduced from the inside of the door into the aperture. The cylinder housing is provided with ears having threaded holes for bolts, by which the housing is attached to a coverplate covering the aperture on the inside surface of the door. This plate is provided with a central circular hole for the passage of the lock part transmitting the turning movement of the cylinder to the latch element of the lock.

In known cylinder locks the outer end of the cylinder housing is provided with a flange intended to rest against the outside surface of the door. The inner end of the cylinder housing is provided with threaded holes for the mounting screws, which pass through the coverplate resting against the inside door surface and covering the aperture in the door for accommodating the lock. In these locks the cylinder housing in inserted from the outside of the door into the aperture and the coverplate is held in place against the inside door surface. The mounting screws are applied through said coverplate into screw holes in the cylinder housing and tightened up, the flange at the outer end of the housing pressing against the outside surface of the door. The housing is thus supported between the door surfaces. The construction has, however, the disadvantage that the lock is not a safety lock and burglar-proof in that a pipewrench can be employed to get a good grip on the cylinder housing flange and break the housing loose from the coverplate and remove the lock. To eliminate this disadvantage the housing flange in later designs has been reduced to a shoulder of sufficient dimensions to provide engagement with a separate rose or protecting ring surrounding the outer end of the housing and resting against the outside surface of the door. This rose or protecting ring can be turned without breaking the mounting screws. In order to make it more difficult to engage the rose with a pipewrench, the rim of the rose has been given a conical shape.

In previous known designs of the last mentioned type the rose had to be slipped over the ears adapted for engaging the mounting screws at the inner end of the cylinder housing. The housing with the rose is then inserted into the aperture in the door from its outside surface. A disadvantage of this manner of assembling the rose and the cylinder housing is that the rose and the aperture in the door must be comparatively large. The rose consequently acquires a considerable amount of material.

In other known designs the rose is attached to the cylinder housing by means of a split retaining ring accommodated in annular grooves opposite each other in the rose and the housing respectively. This arrangement

makes it difficult to separate the rose and the housing in case of repair, particularly if the cylinder housing is mounted or has to be dismounted from the inside of the door.

There are also known arrangements, where the rose and cylinder housing are fixedly joined by a wedge shaped ring of a non-metallic material. This ring is driven in between the end of the housing and the rose. A part of the wedge shaped ring, protrudes above the rose and can be removed by a pointed tool. A joint of this type is not suitable for safety locks also for that reason that with a pipewrench one can get a good hold of the housing end and damage it, after the rose has been removed.

Still other known earlier arrangements provide for a compressible rose construction. The rose is mounted between the outer surface of the door and an outward protruding flange at the end of the cylinder housing, which is screwed into the latch casing. This type of rose is also not suitable for safety locks. It is easy to compress the rose and get a good grip with a pipewrench on the outer end of the cylinder housing and screw it loose from the latch casing.

Still another known arrangement for joining two parts is known, in which a split retaining ring is seated on a conical surface of one part and is slidable on this surface between two shoulders. This arrangement is not without considerable disadvantage applicable to safety locks, because it requires that the cylinder housing be screwed into the latch housing from the outside which leaves the retaining ring partly exposed and the housing end protruding above the surface of the rose inviting unlawful removal of the cylinder housing.

It is an object of the present invention to eliminate all the aforementioned disadvantages and to create a joint between a cylinder housing and a rose making the mounting and dismounting easier, the manufacturing cheaper and reducing the cost of material while yet maintaining the advantageous features making the lock virtually tamper-free.

The accompanying drawings show two embodiments showing fastening of the rose to the cylinder housing according to the invention.

In the drawing:

FIGURE 1 is a vertical section taken along lines A—A in FIG. 2 showing the cylinder lock mounted;

FIGURE 2 is a horizontal section through a door with a cylinder lock mounted therein, the cylinder housing being cut away at one of the ears at the inner end, and at a shoulder at the outer end;

FIGURE 3 is a section on enlarged scale of a second embodiment of the invention at the outer end of the cylinder housing;

FIGURE 4 is a plan view of a split ring with a circular cross-section; and

FIGURE 5 is a plan view of a rose or protecting ring as seen from the outside of the door.

Reference numeral **1** designates a door, to which the lock is fastened. The cylinder housing **2** is provided with ears **2***a* with threaded holes for accommodating mounting screws **2***b*, which attach the cylinder housing to a coverplate **8** which is applied against the inside surface of the door. This coverplate covers the aperture **12** in the door which accommodates the cylinder housing **2**, and the coverplate **8** is provided with a hole **8***a* for the passage of bar **9** having a rectangular cross-section. The bar **9** transfers the revolving movement of the cylinder C in the housing to the latch mechanism (not shown). In FIG. 2, the outer end of the cylinder housing is provided with a flange or shoulder **4**, behind which a split retaining ring **5** of spring steel is seated. A rose or protecting ring **6**

is provided with a central circular opening 3. In the rose 6 is a peripheral radially inward annular protruding flange 7. The inner diameter of the flange 7 is large enough to permit the flange 4 of the cylinder housing to freely pass through the rose. The retaining ring 5 is of such dimensions that it cannot pass over the flange 7 of the protecting ring 6, when the latter is fitted in position around the cylinder housing 2. The protecting ring 6 is pushed from the outside over the end of the cylinder housing 2 against the surface of the door when assembling the lock. As soon as the flange 7 of the protecting ring or rose 6 has passed the flange 4 of the cylinder housing 2 the retaining ring 5 is fitted in position whereby said ring prevents the protecting ring 6 from sliding back over the end of the cylinder housing 2.

According to a modified embodiment of the invention a peripheral groove 10 is formed in the cylinder housing, as shown in FIG. 3, where the flange 4 has been omitted in the outer end of the cylinder housing.

The mounting of a cylinder lock according to the invention is performed in the following way. After the aperture in the door has been made, the cylinder housing 2 is inserted from the inside of the door into the aperture sufficiently far, such that the outer flanged end 4 protrudes beyond the outside door surface to enable the split retaining ring 5 to be applied behind the housing flange 4 after the rose 6 has been slipped over the protruding housing end. Thereafter, the cylinder housing 2 is pushed inwards and the coverplate 8 is applied onto the inside surface and attached by the mounting screws 2*b* to the ears 2*a* of the cylinder housing 2. When the mounting screws 26 have been tightened, the rose 6 and the coverplate 8 are strongly pressed respectively against the outer and inner surfaces of the door, thus clamping the cylinder housing 2 in the door. The retaining ring 5 as shown in FIG. 4 is a split ring in order to allow the ring to be slipped over the shoulder or flange 4 at the outer end of the cylinder housing 2. The ring 5 is preferably made of spring steel with a circular cross-section, but it is also possible to use a ring with a square or rectangular cross-section. If the flange 4 is omitted, as shown in FIG. 3 which allows a decrease of the diametral dimensions of the rose, this adds to the saving of material. The location of the groove 10 at the outer end of the cylinder housing 2 is determined by the thickness of the inwardly protruding flange 7 of the rose.

What is claimed is:

1. A cylinder lock adapted for being mounted in an aperture in a door, said lock comprising a cylinder housing having opposite ends, said housing being adapted for accommodation in said aperture with a portion at one of said ends projecting beyond the door, means to receive a fastener at the other of the ends of the housing for connecting the housing to the door, a protecting ring encircling the portion of the housing which projects beyond the door, and retaining ring means between the latter said portion of the housing and the protecting ring to cause the same to be secured in engagement in which relative axial movement in one direction only between the housing and the protecting ring is resisted while relative movement in the opposite direction is permitted.

2. A lock as claimed in claim 1 wherein said protecting ring and said projecting portion of the housing have radially projecting shoulders facing one another between which is interposed said retaining ring means.

3. A lock as claimed in claim 2 wherein said ring means is a split ring.

4. A lock as claimed in claim 3 wherein said ring means is constituted of spring steel.

5. A lock as claimed in claim 1 wherein said housing has a substantially uniform diameter and is provided with an annular groove in which the retaining ring means is accommodated, said retaining ring means projecting radially outwards of the housing to engage the protecting ring.

6. A lock as claimed in claim 3 wherein said retaining ring means has a circular cross-section.

7. A lock as claimed in claim 1 wherein said protecting ring includes an inwardly directed radial flange and the projecting portion includes an outwardly directed radial flange, said flanges facing one another and engaging the retaining ring means therebetween.

8. A cylinder lock adapted for mounting in the aperture of a door which has an inner and an outer surface, said lock comprising a cylinder housing adapted for extending through said aperture and beyond the outer surface of the door, means to receive a fastener at one end of the housing for detachably connecting the housing to the inner door surface, a protecting ring encircling the housing and adapted for abutting against the outer door surface, said ring being connected with the outer end of the cylinder housing which extends beyond the outer surface of the door, said ring comprising a radially inwardly projecting flange having an inside diameter which is sufficiently large to allow the outer cylinder housing end to pass therethrough, said outer end of the cylinder housing having a radially outwardly projecting flange, and a retaining ring interposed between the flange of the protecting ring and the flange of the cylinder housing, said ring being radially resilient and being dimensioned to prevent the protecting ring from passing over the cylinder housing end to thereby constitute a locking device coupling the housing and protecting ring together but being removable by detaching the cylinder housing from the inner door surface and pushing the cylinder housing in a direction from the inner door surface out of the aperture at the outer surface of the door and through the protecting ring whereby the retaining ring may be removed.

9. A method of assembling a lock assembly in an aperture in a door, said method comprising inserting a cylinder housing of the lock into the aperture from one side of the door, the housing being inserted to a depth sufficient to allow an end portion of the housing to project beyond the other side of the door, axially passing an outer protecting ring over the projecting end portion of the housing, and applying a resilient metal ring on the projecting end portion of the housing, the end portion of the housing and the protecting ring being formed so as to secure the resilient ring in interposed relation therebetween when the housing is secured to said one side of the door, drawing said end portion of the housing up tightly towards said other side of the door such that the protecting ring is prevented from being withdrawn from the end portion of the housing, the housing being separable from the protecting ring by being disconnected from said door and then axially displaced away from the other side of the door to expose the resilient ring which can be removed from the housing to enable withdrawal of the protecting ring.

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