United States Patent

Keller-Volper

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[54] **AN INSERTABLE CYLINDER FOR A DOOR LOCK**

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[51] **Int. Cl.** **E05b 17/04**

[58] **Field of Search** .70/379 R, 379 A, 380, DIG. 60, 70/DIG. 35, DIG. 42, DIG. 62

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[57] **ABSTRACT**

A cylinder for a door lock is comprised of a casing insertable into the lock and provided with two spaced portions separated by a slot and each carrying a rotatable drum. The spaced portions are integral with a solid, depending limb which is provided with a threaded opening for securing the cylinder in the lock. A rotatable actuator disk with a radially projecting cam is supported in the slot and is driven in rotation by a carrier disk in the form of a circular segment.

6 Claims, 6 Drawing Figures

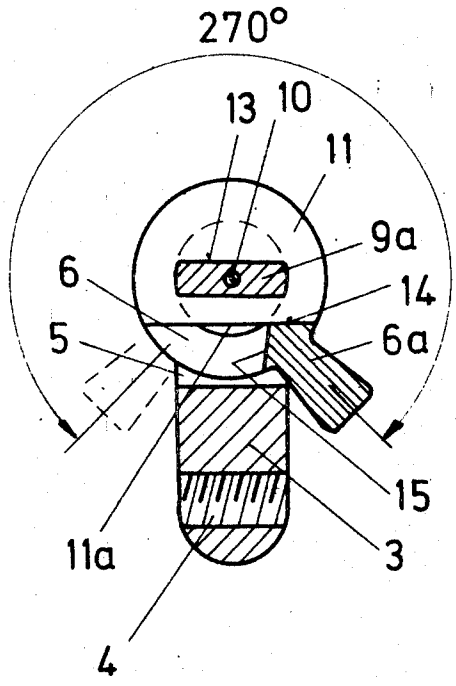
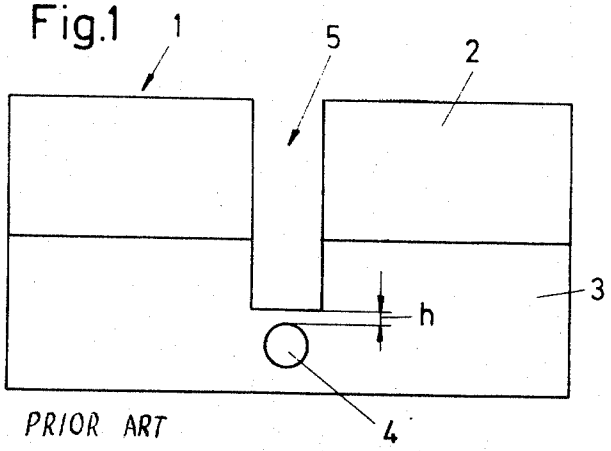
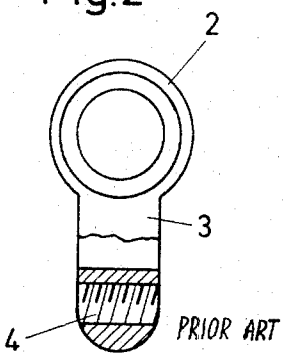


Fig.1



PRIOR ART

Fig.2



PRIOR ART

Fig.3

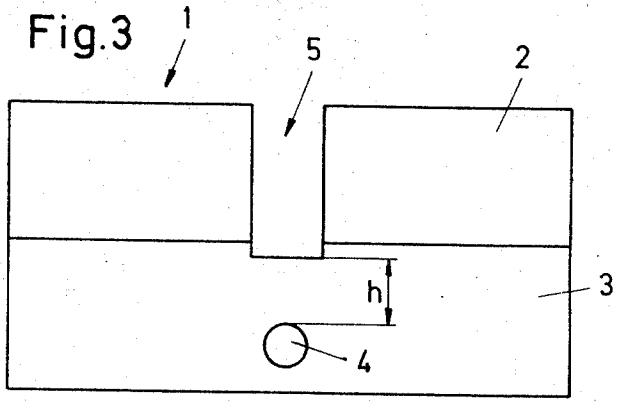
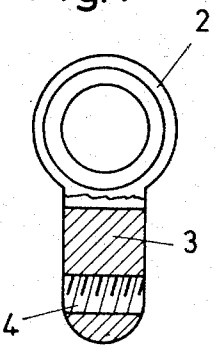


Fig.4



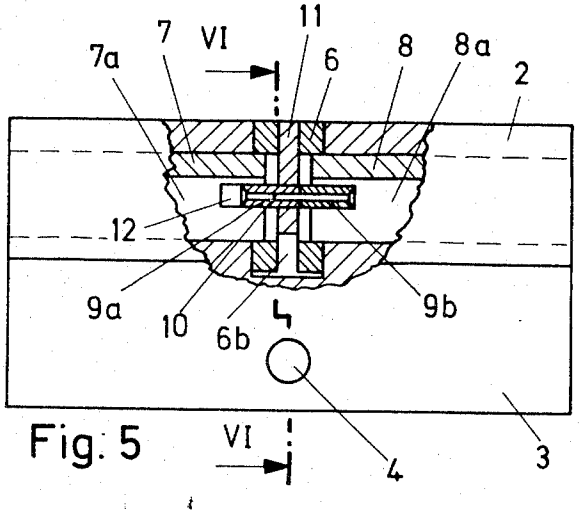


Fig. 5

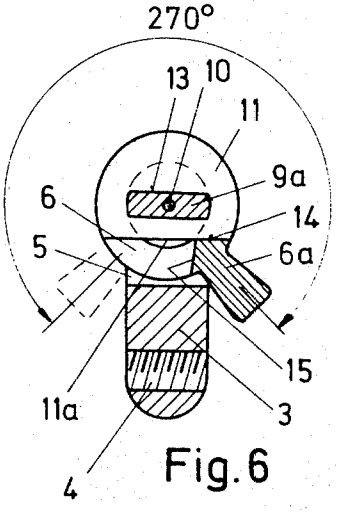


Fig.6

INSERTABLE CYLINDER FOR A DOOR LOCK

BRIEF SUMMARY OF THE INVENTION

The invention relates to cylinders for door locks and particularly to a cylinder with two cylinder drums arranged in a common casing, wherein the drums actuate a common closing tongue by means of a coupling plate assembly.

Cylinders of the above type are well-known and are inserted in a mortise door lock. The cylinder casing has two sections, i.e. one for each drum and each cross-section is true and has the same exact diameter as the other. The length of the cylinder casing is at least 60 mm, for reasons of security.

In case such cylinders and their door locks are installed in very thin doors, for instance metal doors, the front ends of the double cylinder protrude considerably beyond the door surfaces on both sides of the door.

The known cylinders are provided with a slot between the drum for the carrying cam of the closing tongue. Moreover, a threaded bore is provided under the slot for the securing screw which fastens the cylinder in the door lock. Hence, the cylinder casing has at this section a considerably weakened cross-section. Thus, unauthorized entry can be gained by clamping the protruding end of the double cylinder in a suitable tool and turning it until the cylinder breaks at the weakened section whereby the lock can now be opened.

An object of the invention is to provide a cylinder which removes the above drawback and has a cross-sectional area at its weakest point which is considerably greater than conventional double cylinders.

According to the invention, the cylindrical part of the closing tongue is provided with a slot, in which a carrier disk is inserted which is in driven connection with the carrier plates, and the carrier plate is positively connected with the closing tongue to provide lost motion therebetween such that the closing tongue rotates by an angle smaller than 360° during the complete rotation of one of the cylinder drums.

The carrier disk is advantageously constructed as a circular segment with a chordal surface which cooperates with abutting surfaces of the closing tongue in such a manner that during the rotation of the carrying disk by 360° the closing tongue rotates by only approximately 270°.

For this reason the carrying cam of the closing tongue need not pass through the slot between the drum sections of the casing and the slot can be a minimum size. Hence the cross-section of the cylinder casing at its weakest section can be made a maximum.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an elevational view of a casing of a conventional double cylinder;

FIG. 2 is a front view, partially in cross-section, of the casing of FIG. 1;

FIG. 3 is an elevational view of a casing of a double cylinder according to the invention;

FIG. 4 is a front view, partially in cross-section, of the casing of FIG. 3;

FIG. 5 is an elevational view, partially in longitudinal section, of the double cylinder according to the invention; and

FIG. 6 is a cross-sectional view taken along the line VI—VI of FIG. 5.

DETAILED DESCRIPTION

Referring to FIGS. 1–4, therein are shown cylinders which are insertable into a mortise lock. FIG. 1 shows a casing 1 with two aligned portions 2 for respective cylinder drums or barrels, the portions 2 being connected with an integral solid, depending portion or limb 3 having a threaded bore 4 by which the cylinder is secured in the lock.

The aligned portions 2 are separated by a central slot 5 for an actuating member for operating the latch of the door.

The only difference between the casing according to FIGS. 1 and 2 when compared with the casing according to FIGS. 3 and 4 is that the slot 5 protrudes deeply into the portion 3 in the casing according to FIGS. 1 and 2. The distance h between the bottom of slot 5 and the top of threaded bore 4 in the casing according to FIGS. 1 and 2 is considerably smaller when compared to the casing of FIGS. 3 and 4, so that the conventional casing is considerably weakened at this section and is capable of being more easily broken at this section.

A complete, assembled, cylinder is shown in FIGS. 5 and 6. Therein can be seen two cylinder drums 7, 8 rotatably arranged in the hollow portions 2 of the casing. These drums are retained in their positions in a known manner by means of tumblers which are not shown, and are rigidly connected with the casing. If a key is inserted in a key slot 7*a* or 8*a*, the tumblers are released and the associated cylinder drum can be rotated by the key through an angle of 360°. An actuator 6 is provided in the slot 5 and includes a cam 6*a*. The cam 6*a* is excluded from entering the recess 5, by limiting the rotation of actuator 6 through an angle of approximately 270° as shown in FIG. 6. The positive coupling between the cylinder drums 7, 8 and the actuator 6 must, therefore, be provided with an idle rotational angle of approximately 90°. As a consequence of restricting the travel of the cam 6a in slot 5, the depth of the slot can be reduced and the strength of the cylinder increased at the slot.

In order to effect idle rotation between the drums and actuator, the rotation of the cylinder drums 7, 8 is transmitted to a carrying disk 11 by means of an assembly of two coupling plates 9*a*, 9*b*. The plates 9*a* and 9*b* of the assembly are interconnected by means of a peg or pin 10 such that they can be rotated in relation to each other about the pin but are axially secured together. The coupling plates are axially displaceable as a unit in slots 12 in both the cylinder drums. In accordance with their axial position, either the plate 9*a* or the plate 9*b* extends into a corresponding slot 13 in the carrying disk 11 so as to transmit rotation thereto.

The carrying disk is in the form of a circular segment and is provided with a rectilinear chordal surface 11*a*. The carrier disk 11 is disposed within a slot 6b in the actuator 6. The chordal surface 11a cooperates with abutment surfaces 14 and 15 of the actuator 6 to rotate the same.

In operation, if a key is inserted, for instance, in the key slot 7*a*, the plates 9*a* and 9*b* of the coupling assembly are shifted by the key to the position shown in FIG. 5. During the rotation of the key in a counterclockwise direction the cylinder drum 7 is rotated, carrying with it the plate 9*a* and the disk 11. The disk 11 rotates freely at first, until its chordal surface 11*a* contacts the abutment surface 14, and then the actuator 6

is rotated to the position shown in broken lines in FIG. 6, whereby the cam 6*a* on the periphery of the actuator 6 actuates, in a known manner, the latch of the door lock (not shown).

Thus the construction of the actuator 6 and the disk 11 serves as a means by which travel of the cam 6*a* is limited to a region outside the slot 5. This is achieved by the idle rotation of the disk 11 before it abuts and carries the actuator 6 in rotation therewith. This idle rotation is a lost motion of 90° to exclude travel of the cam 6a in slot 5 and consequently the slot need not be made large to accommodate this travel. Hence the strength of the section through the slot 5 and bore 4 can be increased as compared to the section in FIG. 1.

What is claimed is:

1. A cylinder for a door lock comprising a casing with aligned portions separated by a slot, first and second separate drums individually rotatable in each said portion by a key inserted thereinto, rotatable actuator means in said slot for opening a latch, said actuator means including a projecting actuator cam, and means coupling said drums and said actuator means to rotate said cam through a restricted angle less than 360° and exclude passage of the cam through said recess for a complete rotation of either drum, said rotatable actuator means comprising a rotatable actuator disk with said cam extending radially at the periphery thereof, said disk having a pair of abutment surfaces, said means coupling the drum and actuator means comprising a rotatable carrier disk adjacent the actuator disk and constituted as a circular segment with a chordal surface facing said abutment surfaces for contact therewith to rotate said actuator disk.

2. A cylinder as claimed in claim 1 wherein said means coupling the drums and the actuator means comprises a lost motion connection to provide 90° of idle movement before the cam is rotated whereby the cam undergoes 270° rotation for a complete rotation of either drum.

3. A cylinder as claimed in claim 1 wherein said actuator disk has a slot in which said carrier disk is received for relative rotation.

4. A cylinder as claimed in claim 3 wherein the coupling means further comprises a coupling plate assembly engaged slidably in respective slots provided in said drums and displaceable by insertion of a key into a particular drum to permit selective rotation of said drum and the carrier disk therewith.

5. A cylinder as claimed in claim 1 wherein said casing includes a solid, depending portion with a threaded opening for attachment purposes.

6. A cylinder as claimed in claim 5 wherein said slot between the aligned portions is centrally located in said casing and is aligned with said threaded opening.

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