June 1, 1965 J. SCHWARTZ 3,186,199

LOCK CONSTRUCTION

Filed April 19, 1963 2 Sheets-Sheet 1

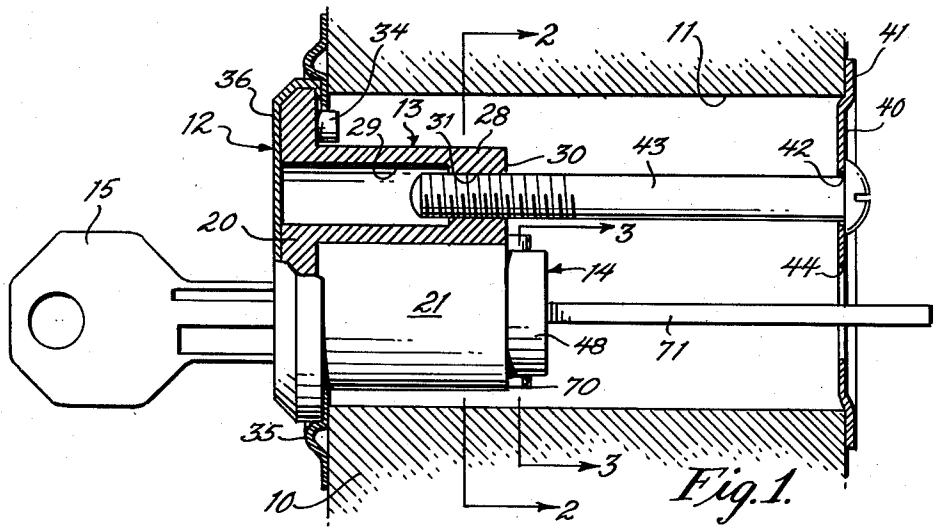


Fig. 1.

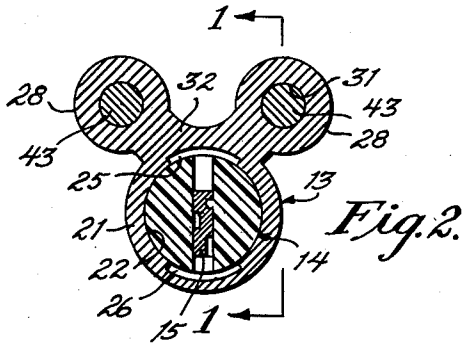


Fig. 2.

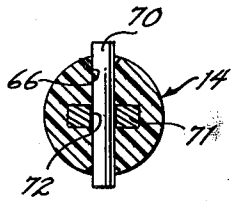
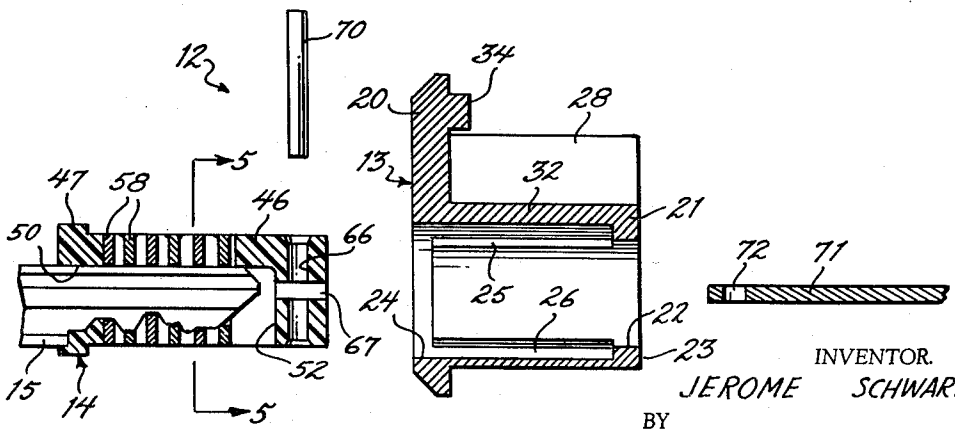


Fig. 3.

Fig. 4.



INVENTOR.
JEROME SCHWARTZ
BY
Robert K. Youtie
ATTORNEY.

June 1, 1965 J. SCHWARTZ 3,186,199

LOCK CONSTRUCTION

Filed April 19, 1963 2 Sheets-Sheet 2

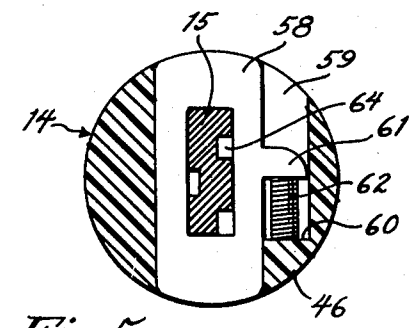


Fig. 5.

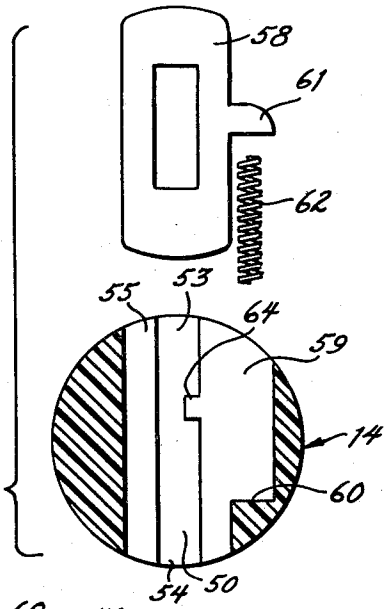


Fig. 6.

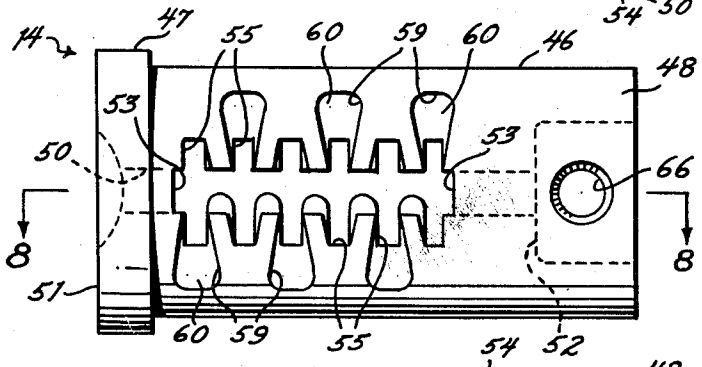


Fig. 7.

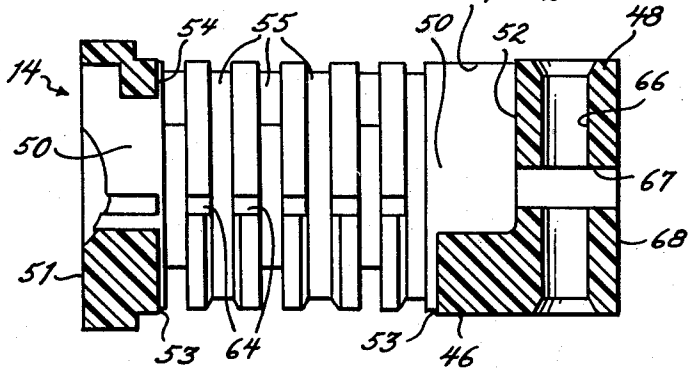


Fig. 8.

INVENTOR.
JEROME SCHWARTZ
BY Robert K. Voutie
ATTORNEY.

United States Patent Office 3,186,199
Patented June 1, 1965

3,186,199

LOCK CONSTRUCTION

Jerome Schwartz, Philadelphia, Pa., assignor to Taylor Lock Company, Philadelphia, Pa., a corporation of Pennsylvania

Filed Apr. 19, 1963, Ser. No. 274,147
6 Claims. (Cl. 70—370)

This invention relates generally to locks, and is especially concerned with improvements in cylinder locks.

It is one object of the present invention to provide unique improvements in the construction of cylinder locks which effect substantial economies in manufacture, both in manufacture of the components and in assembly thereof.

It is another object of the present invention to provide a cylinder-lock construction which is extremely simple and of enhanced durability to insure reliable operation throughout a longer useful life, even under severe conditions of use, including adverse weather conditions and corrosive atmospheres.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

FIGURE 1 is a longitudinal sectional view showing the assembled lock of the instant invention in a door;

FIGURE 2 is a sectional view taken generally along the line 2—2 of FIGURE 1;

FIGURE 3 is a sectional view taken generally along the line 3—3 of FIGURE 1;

FIGURE 4 is a longitudinal sectional view showing major components of the instant lock construction in exploded condition;

FIGURE 5 is a sectional view taken generally along the line 5—5 of FIGURE 4;

FIGURE 6 is a view similar to FIGURE 5 showing the parts thereof in exploded condition;

FIGURE 7 is a top plan view of the plug of the instant invention apart from other elements thereof; and

FIGURE 8 is a longitudinal sectional view taken generally along the line 8—8 of FIGURE 7.

Referring now more particularly to the drawings, and specifically to FIGURE 1 thereof, a door is there generally designated 10 and provided with a through opening 11 in which is located a lock cylinder, generally designated 12.

The lock cylinder includes a housing 13 located in the door opening 11 and rotatably carrying a cylindrical plug 14 into which is insertable a key 15 in the usual manner.

The housing 13 is advantageously integrally fabricated, say by die-casting, of suitable material, such as zinc alloy, or otherwise as desired. The integral housing 13 is composed of a generally flat, substantially circular plate portion 20 extending generally across the door opening 11 at one side of the door, the left side as seen in FIGURE 1. Extending inward or rightward, as seen in FIGURE 1, from the inner face of plate portion 20 is an open-ended cylindrical portion or cylinder 21. The cylinder 21 may be located in a lower central region of the plate 20, spaced above the lower edge of the plate, and is formed with a generally cylindrical bore 22 opening inward through the inner end 23 of the cylinder, and opening outward through the outer or left-hand face of the plate portion 20. The outer end region of bore 22 is enlarged,

as at 24, and a pair of upper and lower longitudinally extending recesses or slots 25 and 26 are formed internally in the bore 22 extending longitudinally inward from the enlarged portion 24 and terminating short of the inner cylinder end 23.

Also part of the integral housing 13 may be a pair of laterally spaced tubes 28 extending integrally from the inner or rightward face of the plate portion 20 above and on opposite sides of the cylinder 21. The tubes 28 are located in the upper region of plate portion 20, adjacent to and spaced inward from the bounding edge of the plate portion. The tubes 28 may be substantially identical, the interior of one being shown in FIGURE 1 as having a through bore 29, opening inward through the inner tube end 30, and outward or leftward through the outer face of plate portion 20. Further, the rightward or inner region of each tube 28 is of reduced internal diameter, and internally threaded, as at 31.

The cylinder 21 and tubes 28 thus project inward, generally normal to the plate portion 20, the cylinder bore 22 and tube bores 29 being substantially parallel to and spaced from each other; and, the tubes 28 may be integrally connected to the cylinder 21, as by a connecting formation 32, best seen in FIGURE 2.

Also provided on the inner or rightward face of the plate portion 20 may be one or more locating lugs 34, which may facilitate in properly locating the housing 13 in the door opening 11, or in an annular member or seating ring 35.

Secured across the leftward or outer face of the plate portion 20 is a cover or sheet 36, which may be fabricated of any suitable material, such as stainless steel or otherwise. The covering sheet 36 extends across and closes the bores 29 of the tubes 28 and is provided with a suitable opening in registry with the bore of cylinder 21 for insertion of the plug 14. The covering sheet 36 may be secured in its covering relation with the plate portion 20 by turning or rolling in of the sheet about the periphery of the plate portion, onto the inner side thereof. The periphery or bounding region of plate portion 20, together with the adjacent portion of sheet 36 thus combine to define a retaining flange engageable with the centering ring 35 or the door 10 to locate the housing 13 in the door opening 11 and retain the housing in position against rightward movement into the door opening.

Across the door opening 11, at the inner side of the door 10 may extend a back plate 40 having its central portion recessed or upset for locating engagement in the door opening 11 and formed with a peripheral flange 41 for seating engagement with the inner or rightward side of the door 10. The backing member or retaining plate 40 is formed with a pair of through holes 42 located for respective alignment with tubes 28, and each receiving an elongate threaded tie member or screw 43 threadedly engaged in the threaded reduced bore region 31 of a respective tube. The tie members or screws 43 thus serve to maintain the housing 13 and retaining or back plate 40 in position against opposite faces of the door 10.

An additional opening 44 is formed in the back plate 40 in substantial alignment with the cylinder 21, for a purpose appearing presently.

As thus far described, it will be appreciated that the housing 13 is admirably well suited for simple and inexpensive manufacture, say by die-casting, there being no requirement for lateral openings, cores, or other expensive requirements. Both the tubes 28 and the cylinder 21 are provided with through openings capable of formation by relatively simple die-casting procedures. Further, the through holes 29 of the tubes 28 permit of quick and easy threading or tapping of their reduced regions 31, while access to the tie members 43 is positively

obstructed by the covering relation of the sheet 36 with the tube openings 29.

The plug 14 is advantageously integrally formed, say by molding, of plastic material having slight resilient deformability, such as nylon, or the like. The structure of plug 14 is best seen in FIGURES 5–8 as including a body 46 of generally cylindrical external configuration and formed at one end with a peripherally extending shoulder or annular enlargement 47. The plug body 46 is rotatably insertable into the bore 22 of cylinder 21 with the shoulder 47 engaging in the enlarged bore region 24, see FIGURE 4. When the plug 14 is fully engaged in the cylinder 21, the rightward plug end portion 48 projects inward through and beyond the inner end of the cylinder 21.

Referring again to FIGURES 7 and 8, the plug 14 is formed with a longitudinal key-receiving slot 50 extending longitudinally inward through the outer plug end 51 and terminating in an end wall 52 proximate to and short of the plug end region 48. In addition, medially of its ends, the slot 50 opens radially outward through opposite sides of the plug, as at 53 and 54 in FIGURES 7 and 8. The plug body 46, in the region of longitudinal slot openings 53 and 54, is further formed with a series of generally parallel, spaced slots 55 extending transversely through the plug body. The several transverse slots 55 intersect with the longitudinal slot 50, communicating with the side openings 53 and 54 of the longitudinal slot, and in addition, each slot 55 extends laterally beyond opposite sides of the longitudinal slot.

The several transverse slots 55 are thereby respectively adapted to receive generally flat, open tumblers 58, as in FIGURES 4–6. The tumblers 58 may each be of generally rectangular, open configuration and respectively received in a transverse slot 55 and slidable therein between a locking position projecting beyond the plug and into one of the cylinder recesses 25, 26 and a retracted position entirely within the plug.

The plug 46 is further formed with a series of recesses 59, each extending chordally into the plug body, terminating therein at an end wall or bottom 60 and opening laterally through an adjacent side edge of a respective slot 55. As best seen in FIGURE 7, the slots 55 are each provided with a respective recess 59 adjacent to and opening through alternately opposite side edges of successive slots.

Each tumbler 58 is provided with a generally coplanar projection or arm 61 which extends into and moves along the adjacent recess 59 upon movement of the associated tumbler. Further, a coil compression spring 62, or other suitable resilient means, may be interposed between each arm 61 and the adjacent recess bottom wall 60 to urge the associated tumbler 58 in one direction out of its receiving slot 55.

In addition to the above internal plug structure, the keyway or slot 50 may be provided with internal projections, such as 64, for guiding engagement with a key.

With the tumblers 58 and springs 62 assembled in the plug body 46, and a key inserted into the slot 50 to retract the tumblers into the plug, the assembly may be inserted into the bore 22 of cylinder 21 to project the plug end portion 48 beyond the cylinder. The projecting end portion 48 of the plug is formed with a transverse through bore or hole 66 disposed just beyond the inner end of cylinder 21; and, a slot or opening 67 extends longitudinally inward through the inner plug end 68 and intersects with the hole 66. The hole 66 may be disposed diametrically of the plug body 46, and the slot or opening 67 may be disposed normal to the hole 66. The slot or opening 67 may communicate through the end wall 52 with key slot 50.

In order to retain the plug assembly 14 in position within the cylinder 21, a pin 70 is forcibly engaged through the hole 66 of the plug end portion 48, being of a length to extend radially beyond the plug body for retaining engagement with the inner end 23 of cylinder 21. By the slight resilient distention or deformation of the plug end portion 48 caused by insertion of the pin 70 in the hole 66, the pin is effectively retained therein without further securement.

Also secured to the plug end portion 48 is an elongate connecting member or bar 71. The bar 71 has one end provided with a through hole 72 and is engaged in the slot or opening 67 before insertion of the pin 70. Upon pin insertion, the pin passes through the bar opening 72 and positively secures the connecting member or bar to the plug assembly 14 for rotation therewith. The remote end of the connecting member or bar 71 is adapted for connection to conventional lock means, such as a knob, dead lock night latch, or the like, which is omitted from the drawing for clarity.

From the foregoing, it is seen that the present invention provides a lock-cylinder construction which fully accomplishes its intended objects and is well adapted to meet practical conditions of manufacture and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. In a lock-cylinder construction for installation in a door, the combination comprising a housing having a longitudinally extending cylindrical through bore and at least one longitudinally extending through hole generally parallel to and spaced from said bore and of a length substantially equal to that of said bore, said housing being adapted for location in a door with one housing end adjacent to one side of the door, flange means on said one housing end for retaining relation with said one door side, a rotary plug inserted in said bore through said one housing end and having a portion projecting beyond the other housing end, said plug being fabricated of resiliently distensible material, a pin of constant cross section force fit in said projecting plug portion to resiliently distend the latter and retain said plug in said bore, and threaded tie means in retaining relation with the other door side and extending into threaded engagement within said housing hole, whereby a single length of tie means is usable with a maximum range of door thicknesses.

2. A lock-cylinder construction according to claim 1, said housing hole having an internally threaded region of reduced internal diameter adjacent to said other housing end, for ease of tapping said hole.

3. A lock-cylinder construction according to claim 2, in combination with a cover secured on said one housing end in closing relation with said housing hole to prevent access to said tie means from said one door side.

4. A lock-cylinder construction according to claim 1, said projecting plug portion having a transverse hole snugly receiving said pin and an opening extending longitudinally into said projecting plug portion intersecting said transverse hole, and a connecting member extending longitudinally into said projecting plug portion received in said opening and receiving said pin for securement to said plug and axial rotation therewith.

5. A lock-cylinder construction according to claim 1, said housing comprising a generally flat plate portion at said one housing end and having its peripheral region defining said flange means, a cylinder extending from one face of said plate portion and having a longitudinal through passageway opening through the other face of said plate portion to define said cylindrical through bore, and a tube extending from said one face of said plate portion substantially coextensive with said cylinder and having a longitudinal through passageway opening through said other face of said plate portion to define said through hole, said through hole having its region remote from said

plate portion internally threaded and of reduced internal diameter for threaded reception of said tie means.

6. A lock-cylinder construction according to claim 5, in combination with a cover secured on said other face of said plate portion in closing relation with said through hole to close access to said tie means from said one door side.

References Cited by the Examiner

UNITED STATES PATENTS

1,002,098	8/11	Voight	70—373
1,518,996	12/24	Maunder	70—370
1,814,302	7/31	Falk	70—379 X
2,048,507	7/36	Keil	70—372
2,135,322	11/38	Brantingson	70—379
2,207,878	7/40	Schlage	70—370
2,795,445	6/57	Beil	292—140
2,841,974	7/58	Hensel	70—134
3,112,944	12/63	Adler	292—169

ALBERT H. KAMPE, *Primary Examiner.*