Nov. 25, 1952 A. TONNESSEN 2,618,957

CYLINDER TYPE LOCK WITH PLURAL TUMBLER SETS

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Fig. 1.

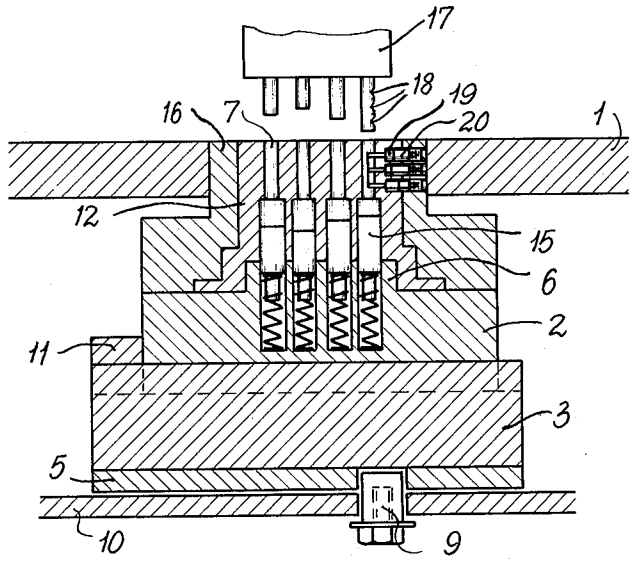
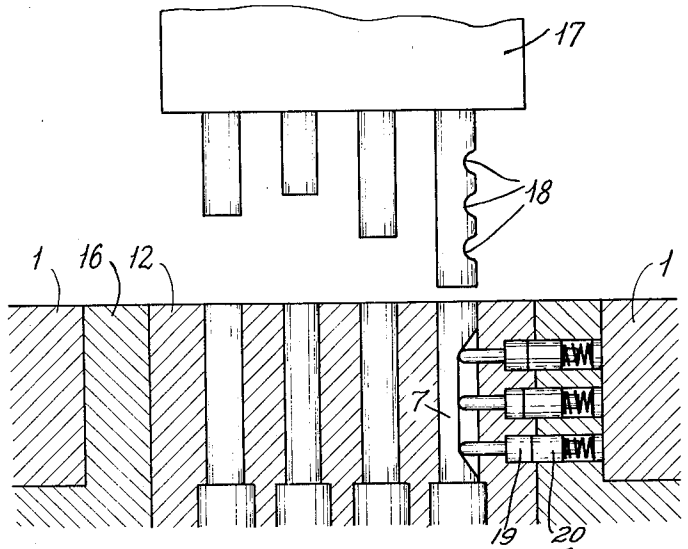


Fig. 6.



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CYLINDER TYPE LOCK WITH PLURAL TUMBLER SETS

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Fig. 2.

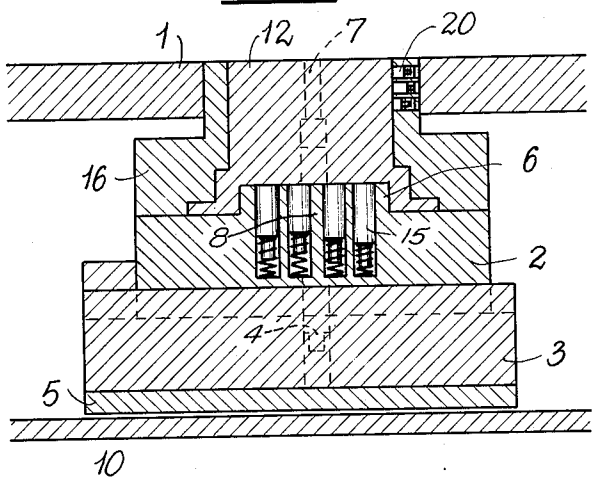
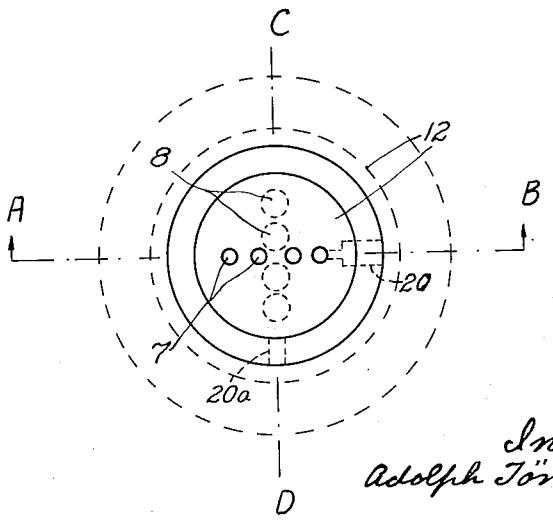


Fig. 3.



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Fig. 4.

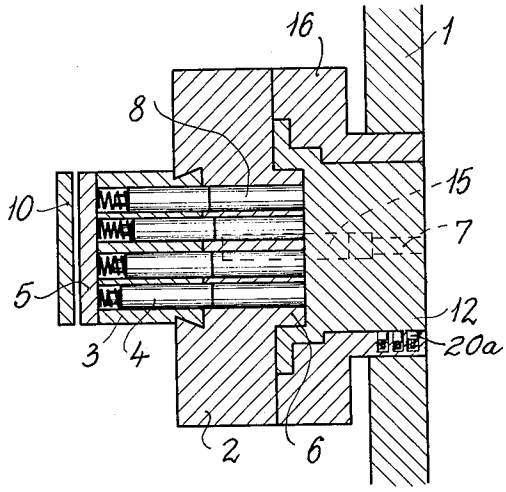
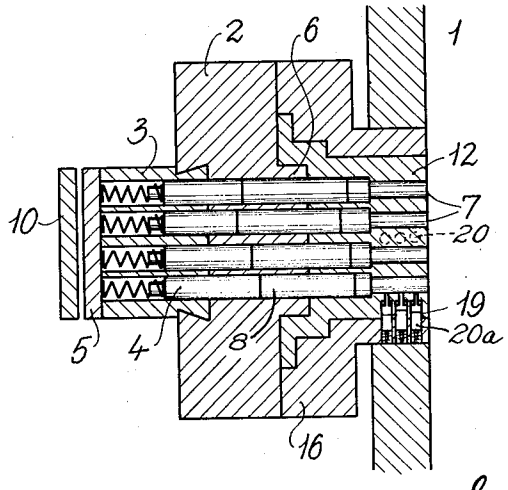


Fig. 5.



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Patented Nov. 25, 1952 2,618,957

UNITED STATES PATENT OFFICE

2,618,957

CYLINDER TYPE LOCK WITH PLURAL TUMBLER SETS

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Application September 29, 1947, Serial No. 776,700
In Norway May 18, 1942

Section 1, Public Law 690, August 8, 1946
Patent expires May 18, 1962

1 Claim. (Cl. 70—358)

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This invention relates to locking devices, and particularly to devices which are especially adapted for association with safe doors or the like. The general object of the invention is to provide a device of this class which is simple in construction and highly efficient in operation to prevent opening of the safe-door and access to the contents of the safe or other closure by unauthorized persons. A lock of this type is described in the U. S. Patent No. 1,854,080 and wherein a bolt carrier which is slidable in a stationary guide is provided with a first set of springpressed pin tumblers which, when in locking position, project into holes in the guide and engage pins, arranged in the holes. Positioned before the above-named pin tumblers a turnable barrel is arranged so as to surround a cylindrical projection, the said barrel being provided with a row of holes, and being locked to the guide by means of a second set of pin tumblers arranged angularly displaced relatively to the first set of pin tumblers of the main lock. The said barrel when in locking position prevents access to the pins of the main lock which may be actuated through the hole row of the barrel only when the barrel has been unlocked and rotated through an angle, as the pins of the main lock may then be pushed into the row of holes of the barrel.

According to the present invention the barrel is locked also by a third set of pin tumblers which are located substantially perpendicularly to the other pin tumblers and project into a row of holes in the side wall of the barrel and into a recess in one of the second set of pin tumblers of the barrel. The said third set of pin tumblers prevents rotation of the barrel, even if pin tumblers of the latter have been pushed inwards to a suitable degree by means of an ordinary pin key, the said third set of pin tumblers being brought out of locking position to free the barrel by one of the key pins being provided with notches, the bottoms of which said pin tumblers engage, when the key is pushed into the row of holes of the barrel, and are thereby so slid that the barrel may be rotated about its projection.

In the drawing the inventive arrangement is illustrated by way of an example, Fig. 3 showing the lock seen from outside. Figs. 1 and 2 show a section A—B of Fig. 3 before and after

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the barrel has been unlocked and rotated through 90°, whereas Figs. 4 and 5 show in the same manner a section C—D of Fig. 3. Fig. 6 is an enlarged sectional view showing particularly the third set of tumbler pins according to the invention.

In the drawings numeral 1 denotes a safe-door or other such member with which the device is adapted to be associated. The main lock or device comprises a lock body composed of members 2 and 6 which are attached to the door by any suitable fastening means, such as bolts running through the body members. The lock body slidably carries a bolt carrier 3 which is preferably dovetailed into member 2, as shown clearly in Figs. 4 and 5. Carrier 3 is provided with a suitable set of recesses which are adapted to carry a first set of pin tumblers 4.

These tumblers are preferably shaped as shown having their inner ends restricted in diameter and surrounded by coil springs whose function is to normally press the tumblers outward to lock the carrier 3 to the lock body 2. As shown clearly in Figs. 4 and 5 the restricted and portions of these tumblers are of such length as to extend at least half way through the coil springs, for a purpose which will be explained hereinafter.

Carrier 3 has mounted on its rear surface, by means of suitable fastening screws, or the like, a bar 5. This bar is provided with a recess into which a detent 9 carried by the locking bolt 10 extends. The locking bolt is provided with suitable actuating means of any conventional type (not shown). It will be apparent that the locking means comprising detent 9 and the recess in bar 5 maintains the bolt in fixed relation with respect to carrier 3, and that when the carrier is locked to the body by means of its pin tumblers 4, the bolt is likewise rendered immovable. In order to limit the movement of the bolt and its carrier, a stop 11 is provided on the carrier which abuts against member 2. The lock body 2 is provided with a set of apertures extending through the members thereof which carry slidable pin tumblers 8. These tumblers are adapted to actuate tumblers 4 carried by carrier 3 when the device is operated to unlock the same. Member 6 of the lock body is shaped at its front end to provide a cylindrical projection or por-

tion upon which a key barrel 12 is rotatably mounted.

The key barrel 12 is provided with an inner peripheral flange having slots therein through which screws extend as shown in the said Patent 1,854,080. These screws are attached to member 6 and function not only to attach the key barrel to the lock body, but also as stops to limit the rotation of the key barrel. In the present instance, the barrel is adapted to be rotated through 90°, as will appear more clearly hereinafter, but it is obvious that any desired angle may be used.

The lock body is also provided with a set of recesses which carry a second set of pin tumblers 15 and which are disposed at right angles to the apertures carrying tumblers 8, as shown clearly in Fig. 3. Pin tumblers 15 are shaped similar to tumblers 4, and are also actuated by coil springs disposed at the bottom of the recesses and surrounding the restricted inner portions of the tumblers. The key barrel is provided with a set of apertures extending through the central portion thereof and carrying pin tumblers 7. These tumblers have the greater part of their length of restricted diameter, while their inner ends are of substantially the same diameter as the recesses carrying tumblers 15. The apertures in the key barrel are shaped to conform with and accommodate pin tumblers 7, as will be clearly apparent from Figs. 1 and 5.

The purpose of pin tumblers 15 is to lock the key barrel in a certain position with respect to the lock body when the device is in locked condition. They are shown in this position in Fig. 1 and it is apparent from Fig. 4 that in such instance, access to tumblers 8 to unlock the device is prevented by the key barrel.

In other words, it is necessary that the key barrel be rotated through 90° to bring its apertures and tumblers 7 in alignment with the apertures and tumblers 8 in the lock body to unlock the device. Tumblers 7 are of varying length so that it requires a key having suitable prongs to move these tumblers and actuate tumblers 15 until their outer ends lie in the plane of contact of the key barrel and the lock body. At such time, tumblers 15 will, of course, be moved from the recesses in the key barrel and the barrel may be rotated through the necessary angle to align its apertures, and tumblers 7 with tumblers 8. This condition of the various parts is shown in Fig. 5. Obviously, in order to unlock the bolt carrier from the lock body and thereby release the bolt so that it may be actuated to unlock the door, it is necessary that the contacting surfaces of the tumblers 4 and 8 be brought into the plane of contact between carrier 3 and member 2. A different key will be required to force tumblers 8, and, therefore, tumblers 4, rearwardly until the desired unlocking positions of the parts are obtained. The necessary keys for the device are shown adjacent the devices of Fig. 1.

After the barrel 12 has been unlocked and rotated through 90° as described and the pin tumblers 8 have been pushed into the barrel hole row, the pins 4, 8 by means of an ordinary pin key are pressed inwards until their contacting faces are flush with the slide surface between the guide 2 and the bolt carrier 3, whereby the bolt carrier is freed and the door may be opened by sliding the locking bolt to the left by means of its handle.

When then the door is to be locked again, the locking bolt is again slid to the right until the bolt carrier in the position shown in the drawing is stopped by the stop 11. The pin tumblers 4 then again fall into the hole row in the guide 2 and lock the bolt carrier to the same. The barrel 12 is then rotated by means of the main lock key backwards through 90° to the left, whereupon the pins 15 project into the barrel hole row and lock the barrel to the guide.

Now, according to the invention the barrel 12 is locked fast also by means of a third set of pin tumblers 19, 20 which are located preferably perpendicularly to the other pin tumblers 4, 8, 7, 15, the said third set of pin tumblers preventing rotation of the barrel 12, even if its pins 15, by means of an ordinary pin key, have been pressed correctly back as described. The pins 20 which are pressed in against the barrel 12 by means of springs, are located in a row of holes in a stationary member 16 gripping around the barrel 12 and project in locking position into a corresponding row of holes in the side wall of the barrel as clearly shown in Fig. 6, and here engage the pins 19 which project into a recess in one of the pins 7. Even if now the pin tumblers 7, 15 of the barrel are pushed back by an ordinary pin key, the barrel cannot be rotated about the projection 6 owing to the pins 19, 20.

One of the pins in the key 17 is therefore provided with three notches 18, the bottoms of which are engaged by the pins 19, when the key pins are pushed into the barrel holes, for pressing the pins 7, 15 back. By means of said notched key pin the pins 19, 20 are pushed outwards, until their contacting surfaces are flush with the face between the barrel 12 and the member 16, and the barrel can in ordinary manner be rotated through 90°. The pins 19 are then rotated with the barrel and upon such rotation the pins 19 may co-operate with other pins 20*a* in spring holes in the barrel similar to the pins 20 and their spring holes shown in Fig. 1, and as indicated at 20*a* in Fig. 3. When the key is then withdrawn, the pins 19, 20*a* will lock the barrel against return rotation in such rotated position. The recess in the pin 7 for the pins 19 may have inclined ends, so that the pins 19 are pushed outwards when the key presses the pins 7 inwards.

The arrangement may be so made that the key will be suitable for unlocking the barrel 12 as well as unlocking the main lock.

What is claimed is:

A lock for safe-doors or the like, comprising a non-rotatable lock body adapted to be mounted on a door, a bolt carrier slidably carried by said body, a key barrel rotatably carried by said body and surrounded by a portion of the body and adapted to be rotated between a first and a second predetermined position, key operable means comprising a first set of spring-pressed pin tumblers carried by the barrel and by the body so as to be movable longitudinally in axial direction of the barrel, one of said operating pins being provided with a recess, key operable means comprising a second set of longitudinally movable spring-pressed pin tumblers carried by said body portion and said barrel and located substantially perpendicularly to the first set of pin tumblers, and operating pins projecting with one end by spring-action into said recess when not pressed in so as to allow also the second set of pins tumblers to lock the barrel against rotation in its first predetermined position but when pressed in so as to leave the recess by key operation, simultaneously with the first set of operating pins and pin tumblers being also set to allow the second

set of pin tumblers to release the barrel for rotation with respect to the body to its said second predetermined position by means of the inserted key.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,854,080	Tonnessen	Apr. 12, 1932
2,298,698	Hofmann	Oct. 13, 1942

FOREIGN PATENTS

Number	Country	Date
176,577	Switzerland	Apr. 30, 1935