Dec. 9, 1930. R. G. M. HOMOLLE 1,784,444

CYLINDER LOCK

Filed Aug. 18, 1927

Fig 1

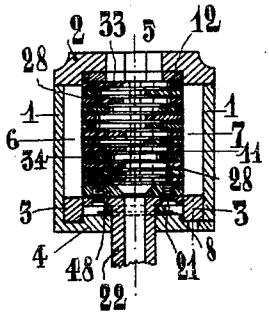


Fig. 2.

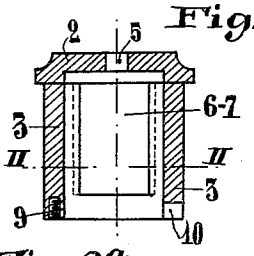
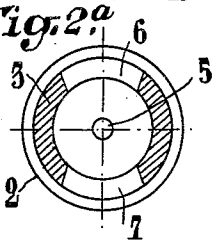


Fig. 2a



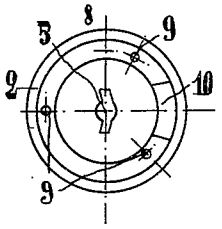


Fig. 2b

Fig. 3

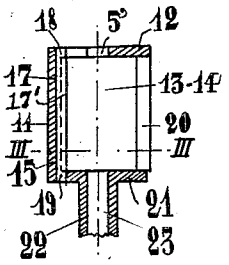


Fig. 3a

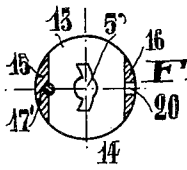


Fig. 3b

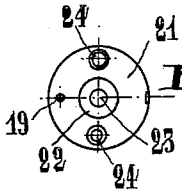
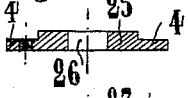


Fig. 4a



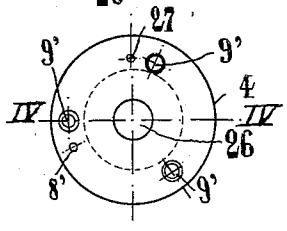


Fig. 4

Fig. 5

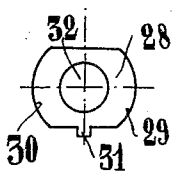


Fig. 5a

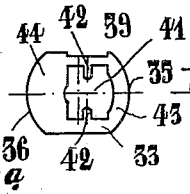


Fig. 5b

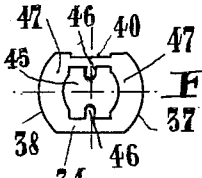


Fig. 6a

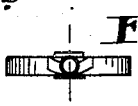


Fig. 6b

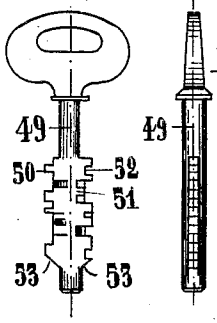


Fig. 6

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UNITED STATES PATENT OFFICE

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CYLINDER LOCK

Application filed August 18, 1927, Serial No. 213,909, and in France September 6, 1926.

The object of the invention is to provide a small-key operated cylinder lock adjustable to a master-key and mountable by well known means on any kind of locks, padlocks, etc.

The displacement of the tumblers in a lock to either the right or left is well known in the art, but in all the prior devices the displacement of the tumblers varies according to the depth of the notch in the corresponding keys. Such keys differ from each other in the depth of the notches. On the contrary the device here disclosed presents a lock operated by a key having notches and bits of equal depth. The different combinations for the various locks are obtained by variation in axial location of the key bits and corresponding tumblers, such a construction being particularly advantageous in the manufacture of a set of locks which may be operated by a master and individual keys.

The characteristic of said cylinder lock resides in the fact that the plate tumblers with which it is provided are adapted to be moved either right or left or to be unaffected by the turning of the key. Said plate tumblers, the number of which is predetermined and variable according to different requirements, are driven by the key so that any key except the proper one would only close said plate tumblers tighter.

In order to make the invention more clearly understood, I have illustrated, as an example, an embodiment thereof in and by drawings appended hereto and wherein:

Figure 1 shows in vertical section a completely assembled device.

Figure 2 illustrates a vertical section of cap 2 and circular member 3.

Figure 2*a* is a transverse section on the line II—II of Figure 2.

Figure 2*b* is a bottom view of Figure 2.

Figure 3 is a vertical section of circular member 11.

Figure 3*a* is a transverse section on the line III—III of Figure 3 and Figure 3*b* is a bottom view thereof.

Figure 4 is a bottom view of member 4 and Figure 4*a* is a vertical section on line IV—IV of Figure 4.

Figures 5, 5*a* and 5*b* are plan views of the washers 28, plate tumblers 33 and 34, respectively.

Figures 6, 6*a* and 6*b* are front, top and side views, respectively, of the key.

The cylinder lock is composed of a circular shell 1 (Figure 1) clamped between the cap 2 of member 3 (Figure 2) and member 4 (Figure 4) forming a closure.

The circular member 3 (Figure 2) has its cap 2 provided with an aperture 5 affording a passage for the key; said member has two openings 6 and 7 which are covered by shell 1, thus leaving a clearance of exactly the same depth as said member's thickness, which clearance is required to permit the plate tumblers to be shifted as will be hereinafter explained. At its lower end, said member 3 is provided with a tenon 8 and three threaded holes 9 for screws, as well as a cut-away part 10.

The circular member 11 (Figure 3) which encloses the plate tumblers, has through its top 12, an aperture to afford a passage or way for the key; its lateral faces provided with apertures 13 and 14, leave as solid portions walls 15 and 16 the inner faces of which are parallel. Apertures 13 and 14 register with openings 6 and 7 in member 3 so as to permit shifting of the plate tumblers. Wall 15 has on its inner face a circular notch 17 extending along its whole height in order to offer a way for a pin 17′ which pin is adapted to limit the travel of the plate tumblers. Said notch communicates at its upper end with a hole 18 and at its lower end with a hole 19 serving for the pin 17′ to pass through. Wall 16 is provided with a slot 20.

The bottom 21 of member 11 has a pipe 22 bored at 23 to provide a way for the tip of the key; and said bottom has threaded holes 24 for screws.

Closure of the cylinder lock is effected by member 4 (Figure 4) which has at its upper part a raised portion 25. Said member 4 is provided on the one hand with an opening 26 in which pipe 22 is adapted to fit, and, on the other hand, with a hole 27 for the pin. At 9′ are provided threaded holes for screws in order to permit said closing member 4 to be

secured to member 3 forming the body of the cylinder lock; at 8′ is provided a hole for affording a passage to tenon 8 of member 3.

The plate tumblers which are positioned within member 11 are spaced from one another by very thin disks or washers 28 (Figure 5). Said washers have their circular portions 29 and 30 registering with the apertures 13 and 14 of member 11 and carry on one of their straight faces a spur 31 adapted to register with slot 20 of said member 11. Said disks are also provided with an aperture 32 affording a way for the key.

The plate tumblers 33 and 34 are made of a certain thickness which may vary according to the particular case, and their curved surfaces 35—36 and 37—38 register with the apertures 13 and 14 of member 11 (Figure 3*a*). Said plate tumblers have a recessed groove 39, 40 permitting the pin 17′ to pass at 17.

The plate tumblers 33 are provided with a key receiving aperture 41 offering projections 42, the dimensions of said aperture 41 permitting the key to pass and ensuring sufficient play in order that the bits or projections of the key will, on said key being turned, shift to the right or left the plate tumbler 33 by means of the force exerted by the bits of the key on projections 42. For this purpose, said tumbler 33 has its aperture offset to one side of its axis in order to offer a solid portion 43 narrower than its other solid portion 44, an arrangement designed to permit the plate tumblers 33 to be positioned with their portion 43 either registering with aperture 13 or aperture 14 of member 11, according to the combination adopted.

Plate tumblers 34 have a key receiving aperture 45 hollowed out with projections 46 permitting the key to pass through the middle thereof; their solid portions 47 being, therefore, equal. They are positioned at the proper places according to the combination adopted in the clearance of member 11 with tumblers 33 always having their portions 47 corresponding to apertures 13 and 14 of member 11.

Owing to the arrangement of plate tumblers 33 and 34, the bits of the key, through their action on the projections 42 and 46 of plate tumblers 33 and 34 will cause said tumblers to be moved laterally either to the right or left according to the manner in which they are positioned, which motion will take place in clearances 6 and 7 of member 3 and, besides, will be limited by the pin 17′ located at 17 in accordance with the length of the outer grooves 39 and 40 of plate tumblers 33 and 34.

All the plate tumblers are properly kept in place, while the play required to permit them to move is allowed, by a member 48 of suitable thickness, the aperture of which is cone shaped so as to receive tip 53 of the key.

The shank 49 of the key has projections or bits 50, 51 and indents 52 whereby the plate tumblers of the lock can be moved or not according to the combinations desired to be obtained, and the set of bits or of indents is completed by a conical portion 53 adapted to fit into the corresponding conical aperture of member 48.

The cylinder lock can be suited for all and any combinations of special keys and master-keys by one or several tumblers per lock being made inoperative, said inoperativeness being distributed according to any combinations desired to be obtained. For instance, the key of a lock, the combination of which lacks a slit for shifting leftwards, will be unable to withdraw a bolt the proper key for which is slit at the same place with a leftward shifting combination. Similarly the key for a bolt which has a right slit combination at another place will not be able to operate a lock which has not this slit combination at the same place, while a master-key having both arrangements of slits will be able to operate both the lock and the bolt.

Having now particularly ascertained and described the nature of my said invention as well as the manner in which the same is to be performed, I declare that what I claim is:

1. A cylinder lock having a plurality of plate tumblers characterized by offset key receiving apertures in some of said plate tumblers, symmetrically placed key receiving apertures in the remaining plate tumblers and projections symmetrically and oppositely positioned in said key receiving apertures so that a key inserted through said key receiving apertures will actuate said plate tumblers upon rotary movement of said key.

2. A cylinder lock having a plurality of plate tumblers characterized by offset key receiving apertures in some of said plate tumblers, symmetrically placed key receiving apertures in the remaining plate tumblers and projections symmetrically and oppositely positioned in said key receiving apertures so that a key inserted through said key receiving apertures having key bits integral therewith and in spaced relation thereon will engage said projections to move corresponding plate tumblers upon rotary movement of said key.

3. A cylinder lock having a plurality of plate tumblers according to claim 2 and having recessed grooves in said plate tumblers and a pin mounted in said lock engaging said recessed grooves to limit the transverse movement of said plate tumblers.

In testimony whereof I affix my signature.

ROBERT GEORGES MARIE HOMOLLE.