Dec. 10, 1935. L. E. DEUTSCH 2,024,030

LOCK

Filed Jan. 19, 1935

Fig. 1.

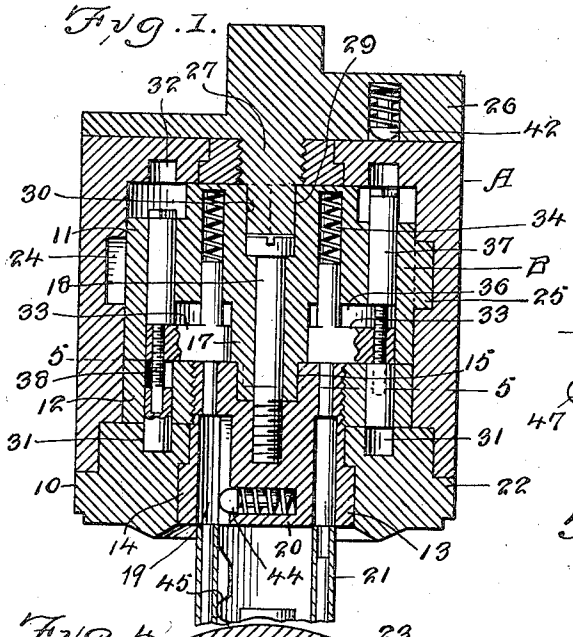


Fig. 2.

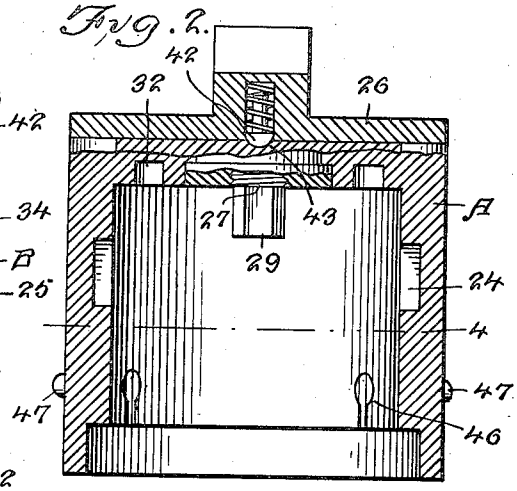


Fig. 3.

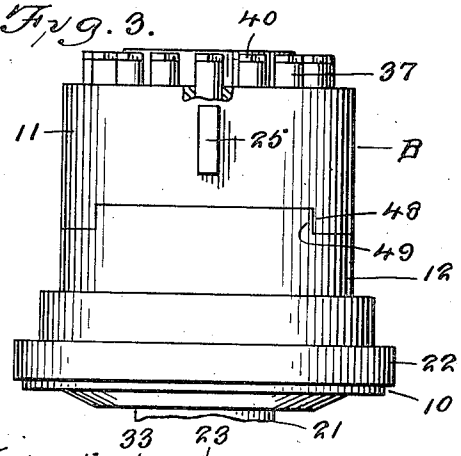


Fig. 4.

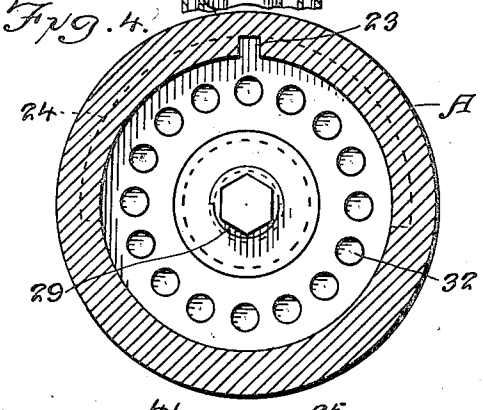


Fig. 5.

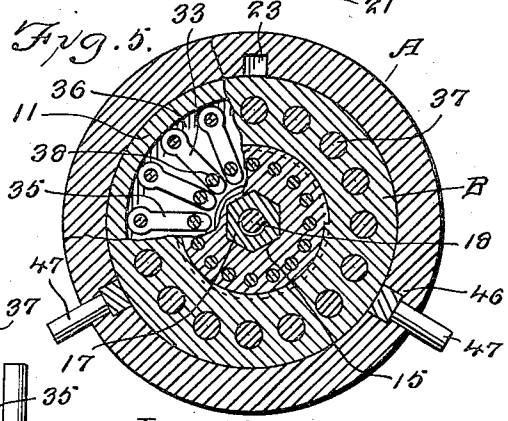


Fig. 6.

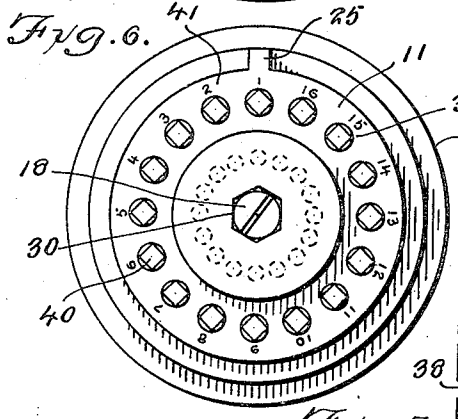
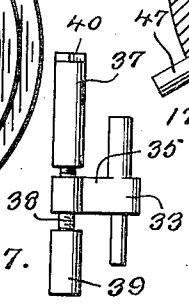


Fig. 7.



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2,024,030

LOCK

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Application January 19, 1935, Serial No. 2,577

17 Claims. (Cl. 70—93)

The invention relates to locks and more especially to key operated tumbler locks.

The primary object of the invention is the provision of a lock of this character, wherein the tumblers carried within the key receiving plug or cylinder are adjustable when said plug or cylinder is removed from the lock casing without extracting the tumblers from said plug or cylinder and thus a changed key of special design when adjusted for operating the tumblers will permit unlocking action of the lock and in this way a single key is useable for a great number of locks of this kind, thus relieving a person from carrying the number of keys corresponding to the number of locks used.

In previous locks of this class used on the doors of offices and residences or apartments or other places which from time to time require use by others than the original user, it has been a relatively easy matter for unscrupulous persons before releasing the key or keys operating the locks to have a duplicate key or keys made which will later afford them free entrance or the easy unlocking of such lock or locks for such entry. Thus it will be seen that it is highly desirable, not only for the reasons stated above, but for other reasons as well to provide a cylinder lock which can quickly and easily be converted into what practically amounts to a new lock and which can not be unlocked by any outstanding previously used key or keys in the hands of persons who may have had possession of such keys.

The present cylinder lock has been designed particularly with the idea in view of overcoming the objections pointed out above, which are being raised against cylinder locks of the rotary plug type now in use. The design of the lock including the key is compact, the lock itself simple, and practical in construction, affording assurance against picking thereof, is not likely to get out of order, and is inaccessible as to its mechanism except to the rightful possessor thereof and therefore can not be tampered with when once assembled.

The design of lock embodying the present invention is susceptible of an extremely wide range of combination and these are met by a single key which likewise has the same range of adjustment of combination. Thus but a single key is necessary for the operation of a large number of this design of lock.

Other objects will be in part obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described in detail, illustrated in the accompanying drawing which discloses a preferred embodiment of the invention and pointed out in the claims hereunto appended.

In the accompanying drawing:

Figure 1 is a longitudinal sectional view through a lock constructed in accordance with the invention and showing fragmentarily the introduction of a key therein, this key being of a special type.

Figure 2 is a sectional view taken irregularly through the lock casing.

Figure 3 is a plan view of the key receiving plug or cylinder.

Figure 4 is a sectional view on the line 4—4 of Figure 2.

Figure 5 is a sectional view on the line 5—5 of Figure 1.

Figure 6 is an inner end elevation of the key receiving plug or cylinder.

Figure 7 is an elevation of one of the tumblers and actuator members therefor.

Similar reference characters indicate corresponding parts throughout the several view in the drawing.

Referring to the drawing in detail, the lock comprises a casing or housing A, preferably of cylindrical form, open at its front end and closed at its rear end while rotatably fitted within this casing or housing is a key operated plug or cylinder B which is of cylindrical form. This plug or cylinder B includes an outer face ring 10, an inner end body section 11 and an intermediate coupling collar 12 threaded upon a key guide 13 coupled with the ring 10. The ring 10 and the guide 13 being formed with abutting shoulders 14 for the interlocking of the same. Centrally therein is a flat faced socket 15 for accommodating the corresponding end 16 of a tubular stem extension 17 centrally formed on the body section 11 and accommodating a releasable tie screw 18 which is threaded in the guide 13. This stem extension 17 spaces the collar 12 and the guide 13. The guide 13 is formed with a key hole in the order of a circular key-way 19 concentrically of a centering stud 20 formed at the center of the guide 13 and projecting outwardly from the rear end thereof. The key hole 19 is adapted to accommodate a changed key of special design and having a cylinder bit a portion thereof being indicated at 21. This special design of changed key constitutes the subject matter of an application for United States Letters Patents filed concurrently with this application.

The ring 10 is formed with a peripheral flange 22 which over-rides the outer front edge of the casing A when the plug or cylinder B is fitted in the latter and the outer edge of this flange lies flush with the outer face of the said casing. The casing A at a determined point interiorly thereof is formed with a longitudinal channel or groove 23 which opens through the front open end of said casing and is provided in the inner wall thereof to meet an annular channel or groove provided in the inner face of said casing and located intermediate of its ends while the plug or cylinder B on the inner end body section 11 has formed therewith a locking fin or lug 25 which is adapted to traverse in the groove or channel 23 for entrance in the groove 24 when the plug or cylinder is inserted in the casing for rotatably interlocking these parts together, yet in the mounting of the lock it is understood, of course, that the casing A is stationarily held while the plug or cylinder B is rotatable therein.

At the inner end of the casing A is a bolt throw member 26 which is adapted for connection with a locking bolt or the equivalent (not shown) and is rotatable for actuating the same. This throw member has a center post 27 with which is threaded a coupling collar rotatably fitted with the inner closed end of the casing A, the post 27 being formed with a flattened end 29 fitting a correspondingly shaped seat or socket 30 therefor provided in the inner end body section 11 so that when the plug or cylinder B is rotated the throw member 26 will correspondingly turn therewith. This seat or socket 30 accommodates the head of the tie screw 18 as will be apparent in Figure 1 of the drawing.

The inner face of the ring has provided therein a circular series of spaced round notches 31 these being concentrically disposed with respect to the guide 13 while the inner closed end of the casing A has formed in its inner face a circular series of spaced round notches 32, these notches and the said notches 31 constituting seats for tumblers hereinafter fully described.

Slidably fitted in the body section 11 and in the guide 13 concentrically with respect to the stem extension 17 is a series of actuator members 33 which are urged by springs 34 outwardly in the direction of the key hole and are provided with lateral arms 35 movable in a clearance space 36 as provided between the collar 12 and the body section 11 about the stem extension 17.

Mounted on the arms 35 are adjustable tumblers 37 each having the reduced threaded shank 38 for adjustably engaging its companion arm 35 and these tumblers under a selected combination are set so that designated ones in the combination will engage in their companion notches 31 for the locking of the plug or cylinder B against rotation, the other or remaining tumblers of the series being entirely free from the notches 32 at this time. Now should the key for the lock set for the combination thereof be inserted therein, these tumblers 37 engaged in the notches 31 will be driven therefrom so that the plug or cylinder B will be free for rotation in the casing *a* and thus permitting the actuation of the throw member 26 to control the locking bolt or the equivalent for its operation. Should a key not set to the combination of the lock be inserted therein those tumblers 37 out of engagement with the notches 32 will be driven into the same, either all or a part of such tumblers and the tumblers either all or a part thereof as engaged in the notches 31 will remain so engaged so that the plug or cylinder B will be held against turning movement within the casing A or, in other words, this cylinder or plug B will be maintained locked within the casing. It is, of course, understood that the ring 10 at all times is stationary within the casing A and the same may be held in this fixed relation in any desirable manner. The actuators 33 are for the purpose of operating the tumblers 37 according to the set thereof in the combination selected for the lock.

The tumblers 37 include in addition to the shanks 38 separable front parts 39, these permitting the assembling and disassembling of the tumblers with the arms 35.

The tumblers 37 at the innermost ends are exposed through the body section 11 and are provided with wrench gripping tips 40 so that when the plug or cylinder B has been removed from the casing A by the use of a wrench the said tumblers 37 can be adjusted. By adjustment of the tumblers the combination of the lock can be altered for the control thereof.

The face of the body section 11 adjacent to the tips 40 has indicated thereon digits or numerals 41 for identifying the series of tumblers 37 numerically and thus assisting in memorizing the adjustment of selected tumblers for altering the combination of the lock.

The throw member 26 has fitted therewith a latching detent 42 adapted for engagement with a seat 43 provided in the closed inner end of the casing A to latch the plug or cylinder B in a position for aligning the fin 25 with the longitudinal groove 23 so that when the tumblers release this plug or cylinder it can be readily withdrawn from the casing A to permit adjustment of the tumblers 37 carried therein. The latching detent 42 before referred to functions to hold the flattened portion 29 in a determined position, in case the cylinder is removed for setting the combination, so that upon the return of the cylinder into the casing, the correspondingly shaped socket 43 for this detent will enable the reengagement of the latter therein and also the reengagement of the portion 29 in the same relation as before had on the removal of the cylinder from the casing.

In the centering stud 20 is a latching detent 44 which is adapted to engage a seat 45 in the bit 21 of the key to latch it in the key hole 19 when the said key is inserted in the lock to avoid the accidental throwing out of the key under the urging action of the springs 34 with respect to the actuator members 33.

It will be readily understood that when the key has its bit 21 inserted in the key hole 19 the actuator members 33 will be disturbed so that these will be shifted to a releasing position provided the key is of the proper combination to the set combination of the lock and thus the plug or cylinder B can be readily turned in the casing A for unlocking of the lock.

Provided in the casing A at determined points are suitable clearances 46 for anchoring pins 47 which stationarily hold the casing in its mounting and these pins 47 can not be released for the freeing of the casing A in its mounting until the plug or cylinder B is extracted from said casing and this will be obvious from Figures 2 and 5 of the drawing. The lock hereinbefore described and disclosed in the drawing constituting a part of this application is an improvement over the subject matter of an application serially numbered 732,344 and filed June

25, 1934, which application was formerly allowed December 31, 1934.

The end body section 11 and the coupling collar 12 at confronting faces are formed with the interfitting portions 48 and 49, respectively, so as to eliminate displacement relative to each other and the proper spacing of one from the other to avoid any possibility of the binding of the tumblers to assure free working thereof.

What is claimed is:

1. A lock of the kind described comprising a casing open at its front and closed at its back, a throw member rotatably fitted in the back, a tumbler cylinder rotatably fitted within said casing and insertable through the open front thereof, means for interlocking the cylinder and casing with each other, a key guide fitted in the cylinder and adjustable key controlled locking mechanism within the cylinder to lock the same against rotation and disposed concentrically with respect to the longitudinal axis of the latter and having a screw threaded mounting for adjustment upon removal of the cylinder from the casing.

2. A lock of the kind described comprising a casing open at its front and closed at its back, a throw member rotatably fitted in the back, a tumbler cylinder rotatably fitted within said casing and insertable through the open front thereof, means for interlocking the cylinder and casing with each other, a key guide fitted in the cylinder, adjustable key controlled locking mechanism within the cylinder to lock the same against rotation and disposed concentrically with respect to the longitudinal axis of the latter and having a screw threaded mounting for adjustment upon removal of the cylinder from the casing and means in the key guide for frictionally latching a key when inserted therein.

3. A lock of the kind described comprising a casing open at its front and closed at its back, a throw member rotatably fitted in the back, a tumbler cylinder rotatably fitted within said casing and insertable through the open front thereof, means for interlocking the cylinder and casing with each other, a key guide fitted in the cylinder, adjustable key controlled locking mechanism within the cylinder to lock the same against rotation and disposed concentrically with respect to the longitudinal axis of the latter and having a screw threaded mounting for adjustment upon removal of the cylinder from the casing, means in the key guide for frictionally latching a key when inserted therein and means carried by the throw member and engageable with the casing to frictionally hold the cylinder in a determined position.

4. A lock of the kind described comprising a casing open at its front and closed at its back, a throw member rotatably fitted in the back, a tumbler cylinder rotatably fitted within said casing and insertable through the open front thereof, means for interlocking the cylinder and casing with each other, a key guide fitted in the cylinder, adjustable key controlled locking mechanism within the cylinder to lock the same against rotation and disposed concentrically with respect to the longitudinal axis of the latter and having a screw threaded mounting for adjustment upon removal of the cylinder from the casing, means in the key guide for frictionally latching a key when inserted therein, means carried by the throw member and engageable with the casing to frictionally hold the cylinder in a predetermined position and a coupling post on the throw member and releasably fitted in the cylinder.

5. A lock of the kind described comprising a casing open at its front and closed at its back, a throw member rotatably fitted in the back, a tumbler cylinder rotatably fitted within said casing and insertable through the open front thereof, means for interlocking the cylinder and casing with each other, a key guide fitted in the cylinder, adjustable key controlled locking mechanism within the cylinder to lock the same against rotation and disposed concentrically with respect to the longitudinal axis of the latter and having a screw threaded mounting for adjustment upon removal of the cylinder from the casing, means in the key guide for frictionally latching a key when inserted therein, means carried by the throw member and engageable with the casing to frictionally hold the cylinder in a predetermined position, a coupling post on the throw member and releasably fitted in the cylinder, the cylinder being formed of a plurality of separable sections and means detachably connecting the sections of said cylinder together.

6. A lock of the character described comprising a casing, a key receiving cylinder rotatably fitted within the casing, a plurality of adjustable tumblers carried in the cylinder, disposed concentrically with respect to the longitudinal axis of the latter, and slidable for locking engagement with the casing, a key guide fitted in the cylinder, means having adjustable threaded connection with the tumblers and projected into the key guide for actuation by a key when inserted therein, the said tumblers being accessible only on removal of the cylinder from the casing and adapted for adjustment manually without disassembling the said tumblers from the cylinder, and a throw member rotatably connected with the casing and detachably coupled with the cylinder.

7. A lock of the character described comprising a casing, a key receiving cylinder rotatably fitted within the casing, a plurality of adjustable tumblers carried in the cylinder, disposed concentrically with respect to the longitudinal axis of the latter and slidable for locking engagement with the casing, a key guide fitted in the cylinder, means having adjustable threaded connection with the tumblers and projected into the key guide for actuation by a key when inserted therein, the said tumblers being accessible only on removal of the cylinder from the casing and adapted for adjustment manually without disassembling the said tumblers from the cylinder, a throw member rotatably connected with the casing and detachably coupled with the cylinder and friction means for latching a key in the key guide.

8. A lock of the character described comprising a casing, a key receiving cylinder rotatably fitted within the casing, a plurality of tumblers carried in the cylinder and slidable for locking engagement with the casing, a key guide fitted in the cylinder, means adjustably connected with the tumblers and projected into the key guide for actuation by a key when inserted therein, a throw member rotatably connected with the casing and detachably coupled with the cylinder, friction means for latching a key in the key guide and means on the tumblers and exposed rearwardly of the cylinder for permitting adjustment of said tumblers.

9. A lock of the character described comprising a casing, a key receiving cylinder rotatably

fitted within the casing, a plurality of tumblers carried in the cylinder and slidable for locking engagement with the casing, a key guide fitted in the cylinder, means adjustably connected with the tumblers and projected into the key guide for actuation by a key when inserted therein, a throw member rotatably connected with the casing and detachably coupled with the cylinder, friction means for latching a key in the key guide, means on the tumblers and exposed rearwardly of the cylinder for permitting adjustment of said tumblers and means for detachably locking the cylinder in the casing.

10. In a lock of the kind described, a casing and a removable cylinder interfitted for rotation of the latter within said casing, and a group of tumblers carried within the cylinder for slidable locking action with the casing and each mounted for independent varying set within said cylinder and adjustable only on separation of the casing and cylinder and accessible through the inner end of the cylinder when removed from the casing.

11. In a lock of the kind described, a casing and a removable cylinder interfitted for rotation of the latter within said casing, a group of tumblers carried within the cylinder for slidable locking action with the casing and each mounted for independent varying set within said cylinder and adjustable only on separation of the casing and cylinder and accessible through the inner end of the cylinder when removed from the casing and key actuated members adjustably supporting the said tumblers.

12. In a lock of the kind described, a casing and a removable cylinder interfitted for rotation of the latter within said casing, a group of tumblers carried within the cylinder for slidable locking action with the casing and each mounted for independent varying set within said cylinder and adjustable only on separation of the casing and cylinder and accessible through the inner end of the cylinder when removed from the casing, key actuated members adjustably supporting the said tumblers and separable assembled sections constituting the cylinder.

13. In a lock of the kind described, a casing and a removable cylinder interfitted for rotation of the latter within said casing, a group of tumblers carried within the cylinder for slidable locking action with the casing and each mounted for independent varying set within said cylinder and adjustable only on separation of the casing and cylinder and accessible through the inner end of the cylinder when removed from the casing, key actuated members adjustably supporting the said tumblers, separable assembled sections constituting the cylinder and means accessible only on removal of the cylinder from the casing and locked thereby when within the casing for the holding of the latter fixed.

14. In a lock of the kind described, a casing and a removable cylinder interfitted for rotation of the latter within said casing, a group of tumblers carried within the cylinder for slidable locking action with the casing and each mounted for independent varying set within said cylinder and adjustable only on separation of the casing and cylinder and accessible through the inner end of the cylinder when removed from the casing, key actuated members adjustably supporting the said tumblers, separable assembled sections constituting the cylinder, means accessible only on removal of the cylinder from the casing and locked thereby when within the casing for the holding of the latter fixed and a bolt throw means rotatably fitted in the casing and separably coupled with the cylinder at the innermost end thereof.

15. In a lock of the kind described, a casing, and a removable cylinder interfitted for rotation of the latter within said casing, a group of tumblers carried within the cylinder for slidable locking action with the casing and each mounted for independent varying set within said cylinder and adjustable only on separation of the casing and cylinder and accessible through the inner end of the cylinder when removed from the casing, key actuated members adjustably supporting the said tumblers, separable assembled sections constituting the cylinder, means accessible only on removal of the cylinder from the casing and locked thereby when within the casing for the holding of the latter fixed, a bolt throw means rotatably fitted in the casing and separably coupled with the cylinder at the innermost end thereof and means for latching a key in the cylinder on alignment thereof with said members.

16. In a lock of the kind described, a casing and a removable cylinder interfitted for rotation of the latter within said casing, a group of tumblers carried within the cylinder for slidable locking action with the casing and each mounted for independent varying set within said cylinder and adjustable only on separation of the casing and cylinder and accessible through the inner end of the cylinder when removed from the casing, key actuated members adjustably supporting the said tumblers, separable assembled sections constituting the cylinder, means accessible only on removal of the cylinder from the casing and locked thereby when within the casing for the holding of the latter fixed, a belt throw means rotatably fitted in the casing and separably coupled with the cylinder at the innermost end thereof, means for latching a key in the cylinder on alignment thereof with said members and means for maintaining the members under tension within said cylinder.

17. In a lock of the kind described, a casing and a removable cylinder interfitted for rotation of the latter within said casing, a group of tumblers carried within the cylinder for slidable locking action with the casing and each mounted for independent varying set within said cylinder and adjustable only on separation of the casing and cylinder and accessible through the inner end of the cylinder when removed from the casing, key actuated members adjustably supporting the said tumblers, separable assembled sections constituting the cylinder, means accessible only on removal of the cylinder from the casing and locked thereby when within the casing for the holding of the latter fixed, a bolt throw means rotatably fitted in the casing and separably coupled with the cylinder at the innermost end thereof, means for latching a key in the cylinder on alignment thereof with said members and means for maintaining the members under tension within said cylinder, the casing having seats for the tumblers at opposite ends thereof and in axial alignment therewith.

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