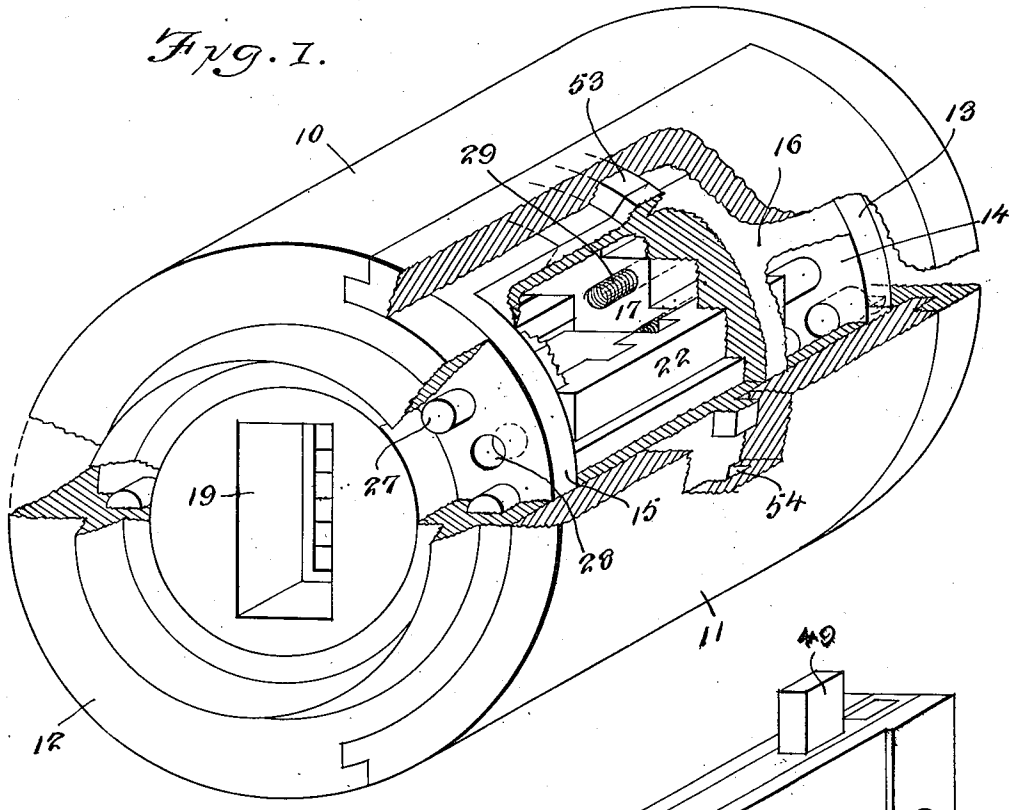
Oct. 29, 1935. L. E. DEUTSCH 2,019,399

KEY OPERABLE LOCK

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Fig. 1.



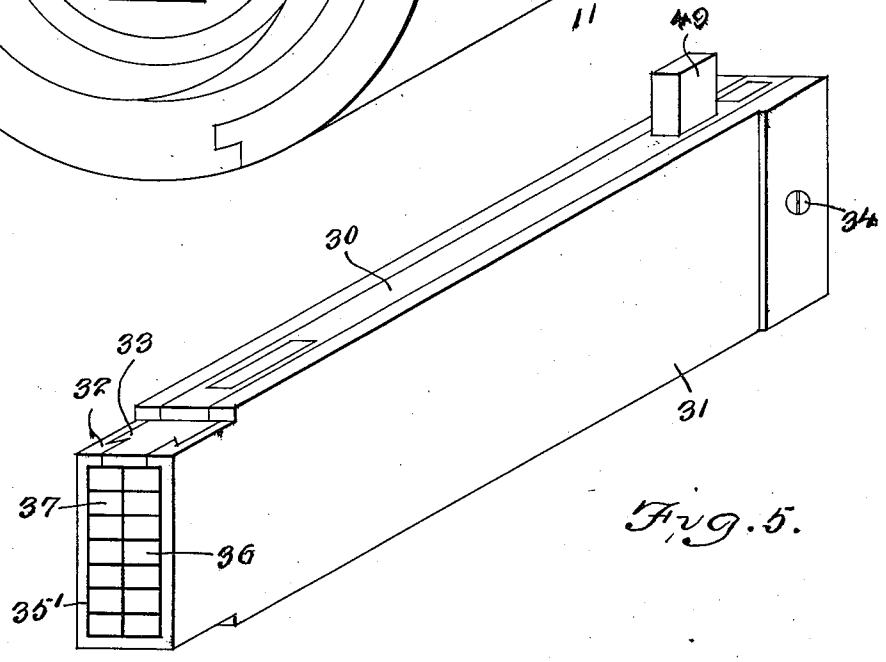


Fig. 5.

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Fig. 2.

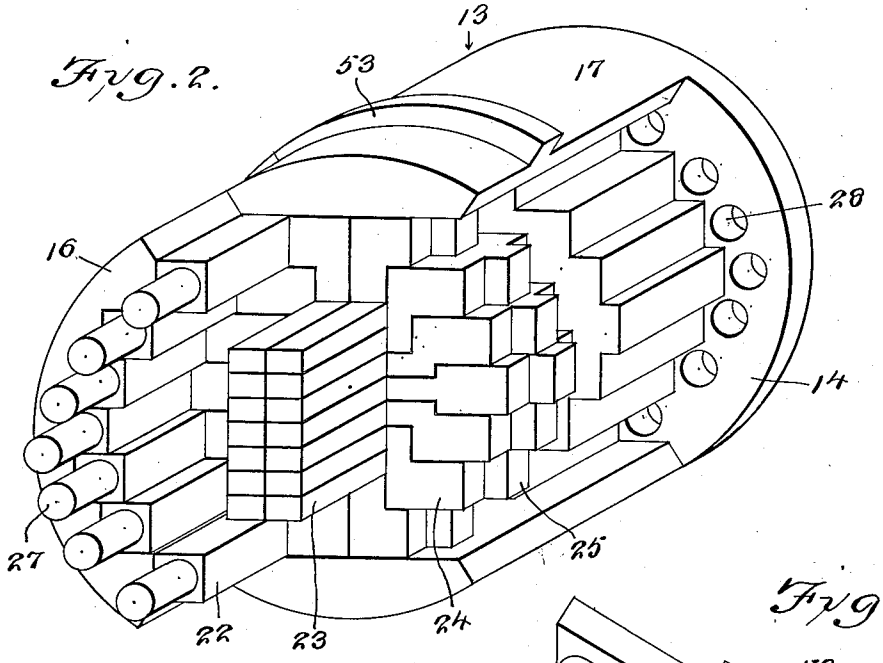


Fig. 4.

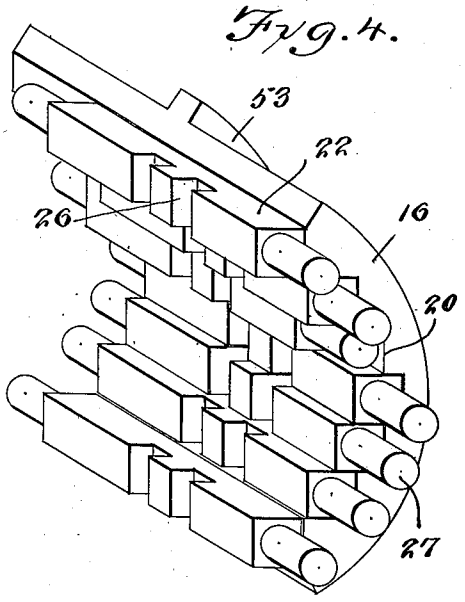
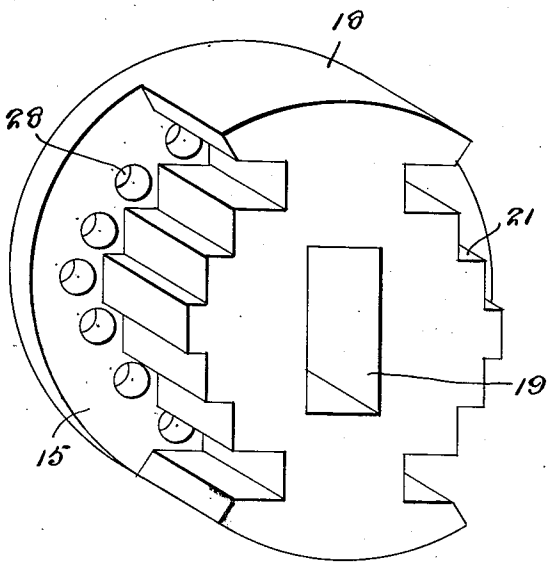


Fig. 3.



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Fig. 6.

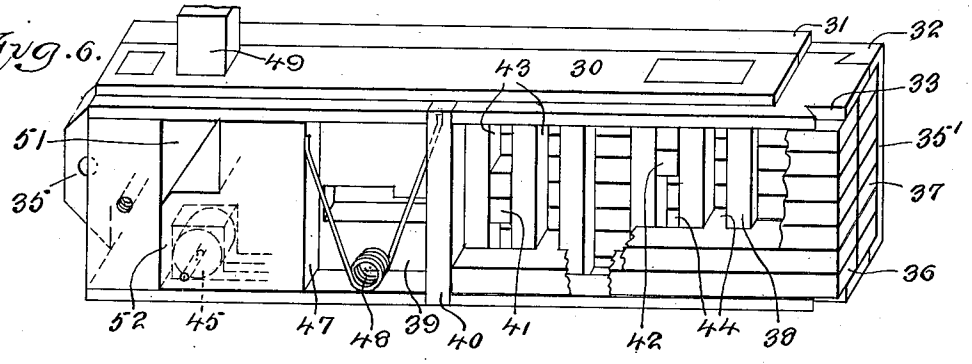


Fig. 7.

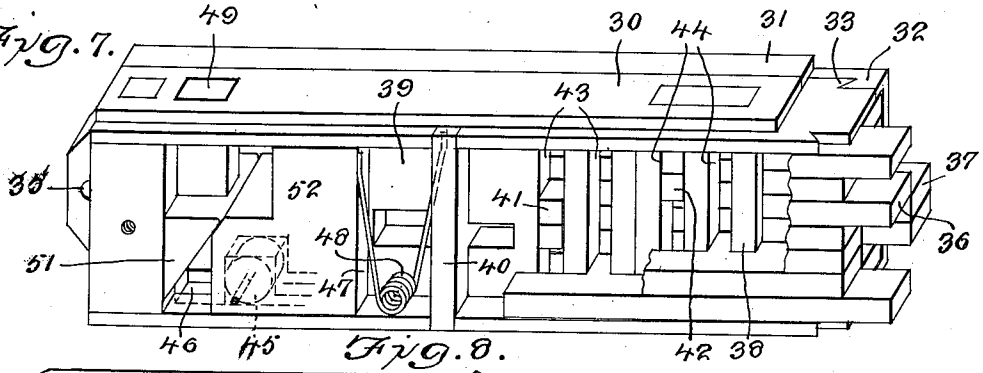
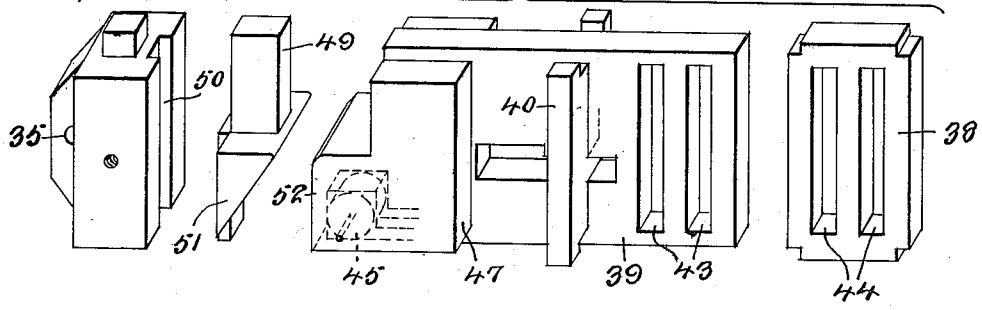


Fig. 8.



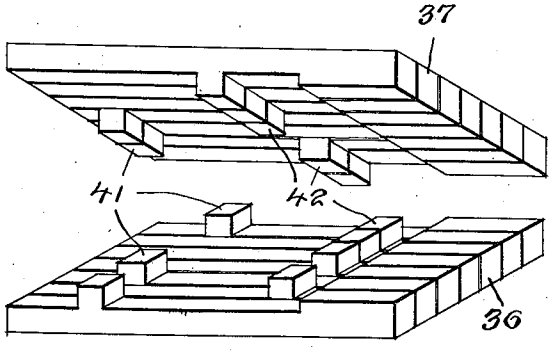


Fig. 9.

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UNITED STATES PATENT OFFICE

2,019,399

KEY OPERABLE LOCK

Leo E. Deutsch, Hammond, Ind., assignor to Marshall William Deutsch, Hammond, Ind.

Application April 4, 1934, Serial No. 719,013

7 Claims. (Cl. 70—70)

The invention relates to a lock and more especially to tumbler locks.

The primary object of the invention is the provision of a lock of this character, wherein the lock mechanism has arranged therein permutation means so that it is required, to operate the locking mechanism, that the key be set to a combination identical with the combination of the lock mechanism before such lock can be turned for its operation, thus it being apparent that the lock cannot be operated except by one possessing the key having the proper combination for so doing.

Another object of the invention is the provision of a lock of this character, wherein the locking action is had by tumblers, these being susceptible of various combinations for the control of the lock and operated through a key of a type having tumblers interchangeable for the setting of the key to operate the lock.

A further object of the invention is the provision of a lock of this character, wherein its mechanism is of novel form, the tumbler mechanism of the lock being accessible to change the tumbler thereof.

A still further object of the invention is the provision of a lock of this character which is comparatively simple in its construction, thoroughly reliable and efficacious in its purpose, safe, strong, durable, and inexpensive to manufacture and install.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described in detail, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention, and pointed out in the claims hereunto appended.

In the accompanying drawings:

Figure 1 is a perspective view, partly broken away, of a lock constructed in accordance with the invention.

Figure 2 is a perspective view of the turning plug or tumbler barrel of the lock, the said plug or barrel being partly assembled.

Figure 3 is a perspective view of the front end head of the plug or barrel.

Figure 4 is a perspective view of the removable body section thereof.

Figure 5 is a perspective view of the key for use with the lock.

Figure 6 is a perspective view of the key with one side plate removed and the tumblers of the key in normal position.

Figure 7 is a perspective view of the key with one side plate removed and showing the tumblers adjusted under the trigger control therefor.

Figure 8 is a perspective exploded view of adjuncts of the key.

Figure 9 is a perspective exploded view of the tumblers of the key in their assembled relation to each other.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail, particularly Figures 1 to 4 inclusive, the lock comprises an outer cylindrical casing 10 having slidably fitted longitudinally therewith a separable body section 11 to give access to the interior of said casing, for a purpose hereinafter described. This casing 10 has formed at each end an end rim 12 providing a circular opening at the longitudinal center of said casing and within the latter is received the turning barrel or plug 13, it being preferable that the casing 10 be longitudinally divided into two half-portions to enable the turning barrel or plug 13 to be introduced thereinto and these portions thereafter are welded or otherwise permanently joined with each other. The barrel or plug 13 is of cylindrical formation and has a permanent rear circular end head 14 and a removable front circular end head 15, respectively, as well as segment-shaped removable or separable body sections 16. The heads 14 and 15 are formed with permanent sector-shaped body portions 17 and 18, respectively, they being matched with each other and adapted to abut one with the other. These body portions 17 and 18 are formed centrally with a key slot or way 19 for accommodating a key hereinafter fully described.

The body sections 16 and body portions 17 and 18 are formed with steps 20 and 21, respectively, for the adjustable tumbler mechanism contained within the barrel or plug. The adjustable tumbler mechanism includes series of tumblers 22, these arranged with the steps 20 in the sections 16 and at opposite sides of the body portions 17 and 18, in the steps 21 therein and coacting with said tumblers is a series of actuator bars 23 which are formed with the intermediate extensions 24 carrying lugs 25, these selectively fitting in notches 26 in the tumblers 22, and in this manner the combination of the lock is altered. The tumblers 22 at opposite ends are formed with bolt extensions 27, these being adapted for engagement in keeper holes or openings 28 formed in the heads 14 and 15 and in the inner face of the

end rims 12 of the casing 10 to lock the barrel or plug 13 against actuation. The actuator bars 23 are urged into locking position by coiled expansion springs 29, they being suitably seated in the body portion 17.

It should be apparent that after the actuator bars 23 are engaged with the tumblers 22 under a particular combination selected by the user of the lock, it is necessary, through the instrumentality of a key, to displace the bars 23 and in so doing the tumblers 22 will be released from the casing 10 and the barrel or plug 13 turned for the operation of the lock. The removable body section 11 of the casing 10 permits convenient access to be had to the barrel or plug 13 and the tumbler mechanism within the latter is accessible by removing either body section or both of the same, whereupon the actuator bars 23 and tumblers can be selectively interfitted according to the combination selected for the operation of the lock.

In Figures 5 to 9 of the drawings there is shown a key for use with the lock hereinbefore described, the key being an adjustable tumbler type and comprising a rectangular elongated hollow body 30 having the removable side plates 31, each formed at one end with a dovetail-shaped tongue 32 for fitting a dovetail-shaped notch 33 in the body 30 and thus in this manner the plates 31 at one end of the body are interlocked therewith, while at the other end the plates are made secure to the body by a transverse bolt 34, this last-mentioned end of the key being closed and carrying an eye 35, so that the key can be attached to a key chain or the like, while the opposite end of the key is open, as at 35', for the projecting of series of tumblers 36 and 37, respectively, which are fitted within the body 30. The series of tumblers 36 and 37 are arranged within the body 30 at opposite sides of a longitudinally disposed partition 38 stationarily located at the longitudinal center and close to the open end of the key. Arranged between the closed end of the key and the partition 38 and within the body 30 in alignment with said partition 38 is a slide 39 which is slidably hung intermediate of its ends upon a transverse partition 40 interfitted therewith and made secure in the body 30. The tumblers 36 and 37 are formed with lugs 41 and 42, respectively. The lugs 41 are selectively engageable with slots 43 in the slide 39 to a particular combination corresponding to the combination of the lock, while the lugs 42 are engageable with the slots 44 in the partition 38 to hold certain of the tumblers 36 and 37 immovable by the slide 39, it being understood, of course, that the lugs 41 are on certain of the tumblers and the lugs 42 on other of the tumblers 36 and 37.

The slide has fitted therein an anti-friction roller 45 which traverses in a track 46 in the bottom side of the body 30 of the key so as to guide and make free the action of the slide 39. Fitted within the body 30 against the partition 40 and active against shoulders 47 on the slide 39 are tensioning springs 48, these being adapted to normally retract the slide to maintain the tumblers 36 and 37 from protruding through the open end 35' of the key.

Fitted within the body 30 and operating at right angles to the slide 39 is a trigger or a push wedge 49, the same operating in a guide slot 50 formed in the closed end of the key and having a wedge or beveled head 51 operating against the abutment 52 at the inner end of the slide 39 so as to shift the latter when the trigger 49 is manually depressed for the extending of the tumblers 36 and 37 according to the combination set thereof for the projecting of these tumblers through the open end 35' of the key. When the tumblers 36 and 37 are projected through the open end of the key 35', they being held thus by the trigger 49 when depressed, the said key is inserted in the key slot or way 19 in the barrel or plug 13 and the projected tumblers 36 and 37 coact with the actuator bars 23 to move these to displace the tumblers 22 locking the barrel or plug 13 in the casing 10 for the freeing of said barrel or plug so that it can be turned by the key, it being understood, of course, that the barrel or plug 13 cooperates with the part to be locked or unlocked.

It should be apparent that both the lock and key are of the adjustable tumbler types.

The tumblers 36 and 37 are readily accessible in the key by removing the side plates 31 from the body 30 thereof and such tumblers are projected through the open end of the key by manually depressing the trigger 49, whereby their combination will coact with the actuator bars 23 consistent with the combination set of the same for actuating the tumblers of the lock 22 to free the barrel or plug 13 for the turning of the same for locking and unlocking purposes.

Formed on the sections 16 and portions 17 of the barrel or plug 13 exteriorly thereof is an annular rim 53, the same being adapted to fit a companion groove or channel 54 interiorly of the casing 10, so that said barrel or plug 13 will be interfitted with the casing to prevent longitudinal movement of the barrel or plug within said casing or its removal from the latter in that direction, yet the barrel or plug is free for rotary movement when unlatched.

What is claimed is:

1. The combination with a lock having a casing and a barrel rotatable therein, of tumbler mechanism within the barrel and operable longitudinally thereof for engaging the casing, and key operated means changeably connected with and controlling the tumbler mechanism.

2. The combination with a lock having a casing and a barrel rotatable therein, of tumbler mechanism within the barrel and operable longitudinally thereof for engaging the casing, and key operated actuator bars within the barrel parallel with and selectively engaging the tumblers for moving the latter.

3. The combination with a lock having a casing and a barrel rotatable therein, of tumbler mechanism within the barrel and operable longitudinally thereof for engaging the casing, key operated actuator bars within the barrel parallel with and selectively engaging the tumblers for moving the latter, and a releasable section in the barrel for access to the tumblers to permit selective changing of the relation of the tumblers to the actuator bars.

4. In a lock of the kind described, a casing, a rotatable barrel held therein and having a central keyway longitudinally disposed therein, actuator bars slidably fitting in the keyway, and a series of changeable tumblers in the barrel concentrically of its longitudinal axis and parallel with and adjustably connected to the actuator bars and movable thereby for engaging the casing.

5. In a lock of the kind described, a casing, a rotatable barrel held therein and having a central keyway longitudinally disposed therein, actuator bars slidably fitting in the keyway, and a series of changeable tumblers in the barrel concentrically of its longitudinal axis and parallel with and adjustably connected to the actuator bars and

movable thereby for engaging the casing, the ends of the barrel being of disk formations and having perforations forming clearances for the tumblers.

6. In a lock of the kind described, a casing, a rotatable barrel held therein and having a central keyway longitudinally disposed therein, actuator bars slidably fitting in the keyway, a series of changeable tumblers in the barrel concentrically of its longitudinal axis and parallel with and adjustably connected to the actuator bars and movable thereby for engaging the casing, the ends of the barrel being of disk formations and having perforations forming clearances for the tumblers, the casing at opposite ends having keeper notches for the tumblers.

7. In a lock of the kind described, a casing, a rotatable barrel held therein and having a central keyway longitudinally disposed therein, actuator bars slidably fitting in the keyway, a series of changeable tumblers in the barrel concentrically of its longitudinal axis and parallel with and adjustably connected to the actuator bars and movable thereby for engaging the casing, the ends of the barrel being of disk formations and having perforations forming clearances for the tumblers, the casing at opposite ends having keeper notches for the tumblers, and a removable section carried by the barrel for permitting changing of the tumblers with relation to the actuator bars.

LEO E. DEUTSCH.