March 22, 1932. F. K. HEYER 1,850,586

LOCK

Filed July 30, 1927

Fig. 1

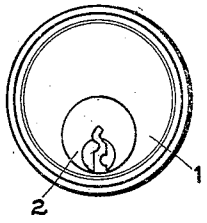


Fig. 2

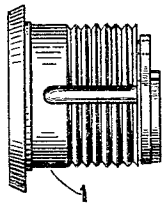


Fig. 3

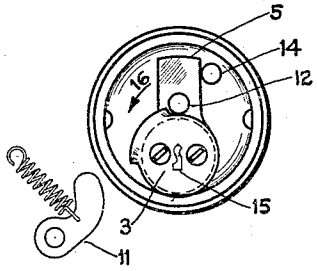


Fig. 4

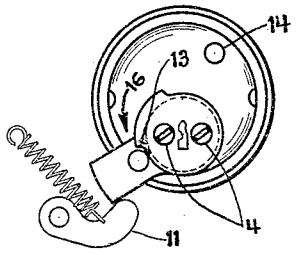


Fig. 5

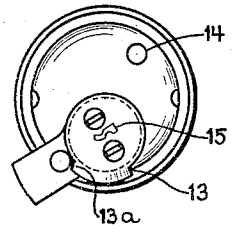


Fig. 6

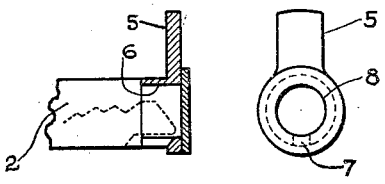


Fig. 7

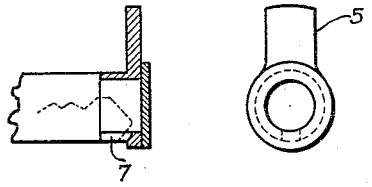


Fig. 8

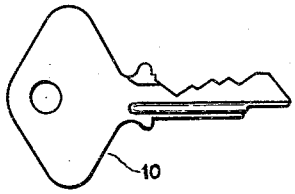
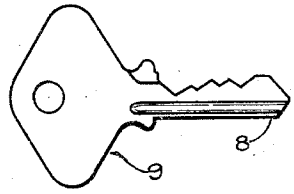


Fig. 9



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UNITED STATES PATENT OFFICE

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LOCK

Application filed July 30, 1927. Serial No. 209,567.

The object of this invention is to provide a cylinder lock, which, when actuated by certain keys, later termed higher order keys, will operate to retract a latch and hold the same in retracted position while permitting the keys to be withdrawn. This is especially useful in schoolhouse locks or other public building locks where it is desired to give free egress and ingress during certain hours.

A further object is to so arrange the lock that certain other keys, later termed lower order keys, will operate to retract the latch, but will be inoperative to hold the same retracted while the key is withdrawn.

A further object is to so arrange the lock that when the latch is held withdrawn after being positioned by the first named or higher order keys, it cannot be disturbed by the keys of lower order.

My invention is fully described in the following drawings wherein Fig. 1 is a front view of my cylinder; Fig. 2, is a side view thereof; Fig. 3 is a rear view thereof showing the cylinder rollback and cam in initial position and showing an arm of the lock adapted to be actuated by the rollback to retract the latch; Fig. 4 shows the position of the cylinder cam rollback and latch lever when moved to latch operating position by the higher order key; Fig. 5 is a similar view showing operation by the lower order key with the latch lever omitted; Figs. 6 and 7 are views of the cylinder plug showing the rollback in section and the relation of the higher and lower keys respectively to the rollback; Fig. 8 is a view of the higher order key and Fig. 9 is a similar view of the lower order key.

Reference numeral 1, represents a cylinder lock having the usual pin-tumbler mechanism (not shown) and the key operated plug 2. This plug has fixed to one end thereof the cam 3 which is held by the screws 4. One end of the plug 2 is machined to form a bearing surface 6 for the rollback 5, which is mounted for free movement relative to the plug and is held from endwise movement by the cam 3 and the shoulder of the bearing surface.

This rollback has a slot 7 cut in its bearing surface 8, this slot 7 being of such size that the end 8 of the lower order key 9 will fit into the same as shown in Fig. 7. Thus, when the cylinder is operated by the key 9, the plug and rollback will rotate together. On the other hand, the higher order key 10 has a notch cut at its end to avoid the slot 7 so that when the lock is operated thereby the plug will move free of the rollback 5. While it is possible under this condition that the rollback may move with the plug to a slight extent due to any frictional contact, it is easily seen that this contact will be insufficient to cause the rollback to operate to retract the latch operating arm 11 shown in Figures 3 and 4.

In order to operate the rollback 5 by the higher order key 10, a pin 12 is mounted on the rollback and this pin cooperates with the cut away portions 13 and 13A of the cam 3. The pin 14 mounted on the cylinder is adapted to limit the rollback movement and hold it in its initial position when the key is withdrawn.

The operation is as follows: Fig. 3 shows the initial positon of the mechanism with the arm 11 in its latch bolt extending position, and the keyway 15 in its vertical initial position. In this positon it will be noted that the rollback 5 is held rigid by means of pins 12 and 14 and the cam 3 so that either of keys 9 or 10 may be inserted, it being understood that key 9 cannot be inserted when the rollback 5 is moved even slightly from the position of Figure 3 since such movement would remove notch 7 from the plane of the keyway.

When the higher order key 10 is inserted and the plug is moved in the direction of the arrow 16 it is easily seen that the plug 2 and cam 3 are moved independently of the rollback (outside of the slight frictional drag previously mentioned) until the portion 13 of the cam 3 abuts the pin 12 as shown in Fig. 4 and forces the rollback to operate the latch retracting lever 11. When this operation is completed it will be observed that the keyway 15 is once more in the vertical and the usual position with the pin chambers alined as in the initial position so the key may then be withdrawn leaving the latch retracted. When the lock is left in this position by the withdrawal of key 10, the key 9 cannot be used, since the notch 7 of cam 5 will be out

of the plane of the keyway having been removed from that plane by the lazy connection between cam 3 and pin 12.

When the lower order key 9 is used the rollback will be coupled to the key, and therefore the rollback, the plug, and the cam 3 will rotate together to the position of Fig. 5, when the latch will be retracted. However, in this position the keyway 15 is out of the vertical plane and the usual pin-tumbler chambers will not be alined so that the key cannot be withdrawn without a return movement which will act to release the latch.

I am aware that the above objects have been accomplished by other patentees, but the apparatus in use at the present time involves a complicated system of levers, etc. in the lock mechanism, whereas my invention accomplishes the result by an ingenious arrangement of the cylinder elements themselves. Of course, various modifications of my invention may occur to anyone skilled in the art, such as, a double pin chamber cylinder for permitting key withdrawal at less than a full plug revolution. Thus, where my claims specify a, "full rotation of the plug to permit withdrawal of the key," the word "full" may be construed to mean predetermined, since by having several sets of pin chambers, the key may be withdrawn at several positions. The same is of course true with sliding tumblers as well as pin tumblers.

A further use of my device is to use the slot of the rollback as a shut-out feature, whereby any type of mechanism which in operation would displace the slot relatively to the plug keyway would act to shut out keys not cut away to avoid the rollback periphery. It should also be understood that while I use my invention to hold a latch, the same may be used in connection with any desired type of locking elements.

I claim:

1. In a cylinder lock of the class described, a key plug and a latch retracting rollback freely mounted thereon, said rollback having means meshing with a lower order key whereby a direct operation is possible between the rollback and the key, said key requiring but a partial revolution to move the rollback to latch retracting position whereby withdrawal of the key is prevented when the latch is retracted, a pin on said rollback, a cam carried by the cylinder plug and having a lazy connection with said rollback through the pin, said rollback being adapted to be operated through said lazy connection by a higher order key, said higher order key requiring a full revolution to move the rollback to latch retracting position thus permitting removal of the key when the latch is held retracted.

2. In a cylinder lock of the class described, a key plug, a latch retracting rollback freely mounted on said plug, a slot in said rollback whereby a lower order key having an extension coacting with said slot will make direct operation possible between the key and rollback, said key requiring only a partial revolution to move the rollback to latch retracting position whereby withdrawal of the key is prevented when the latch is retracted, said lock being operable by a higher order key cut away to avoid said slot, means carried by said plug for operating the rollback when actuated by said higher order key, such latter operation requiring a full revolution of the key to move the rollback to latch retracting position thus permitting removal of the key when the latch is held retracted.

3. In a cylinder lock of the class described, a key plug and a latch retracting rollback freely mounted thereon, said key plug being operable by a lower order key having means coacting with a part of said rollback whereby direct operation is possible between the key and rollback, said key requiring but a partial revolution to move the rollback to latch retracting position whereby withdrawal of the key is prevented when the latch is retracted. Said lock being operated also by a higher order key, means carried by the plug for operating the rollback when actuated by the higher order key, such latter operation requiring a full revolution of the key to move the rollback to latch retracting position thus permitting removal of the key when the latch is held retracted.

4. In a tumbler cylinder lock of the class described, the combination of a key plug, a latch retracting rollback operable by a lower order key cooperating therewith and moving thru less than a revolution to operate the same whereby retraction of said key is impossible when the latch is held retracted, said lock being actuable by a higher order key adapted to operate the rollback indirectly by means including the key plug, such latter operation requiring a full revolution of the key plug so as to permit withdrawal of the higher order key while the latch is held retracted.

5. In a tumbler cylinder lock of the class described, the combination of a key plug and a rollback freely mounted thereon, said key plug and lock being operable by a key of lower order adapted to move the rollback to operative position coincidental with a partial rotation of the key plug whereby the key cannot be withdrawn in such position, said lock and key plug being operable by a key of higher order adapted to move the rollback to operative position after a full revolution of the key plug whereby said latter key may be withdrawn in such position.

6. In the combination of claim 5, means on the rollback adapted to be positioned to shut out the lower order key when said roll-

back is left in latch retracting position by the higher order key.

7. In the combination of claim 5, means on the rollback adapted to obstruct the entrance of said lower order key into the key plug, said means being initially in inoperative relation to the key plug, the operation of the lock by the higher order key being adapted to change the relation of said obstructing means and the plug so as to exclude the lower order key when the latch is left in retracted position by the higher order key.

8. In the combination of claim 3, an obstruction carried by the rollback adapted to be moved into position by the higher order key operation to obstruct the entrance of the lower order key by cooperating with the rollback coacting means of said latter key.

9. A cylinder lock having a rollback provided with means whereby it is adapted to be moved to operating position by direct operation of one key and indirect operation by a second key, said second key being so positioned when the rollback is in operative position that it may be withdrawn from the lock, said rollback having means whereby when left in such position by said second key it cannot be operated by said first mentioned key.

10. A cylinder lock having a key plug and a latch retracting roll back, said key plug and lock being operable by a lower order key to retract the latch, a protuberance on said key, a depression on said roll back cooperating with the protuberance to permit entrance into the lock of the key when the roll back is in a certain angular position relatively to the key plug, said lock being operable by a higher order key, and a driving connection between the roll back and plug operable by said higher order key adapted to displace the roll back and its depression from said certain position relatively to the plug while retracting the latch so as to prevent entrance of the lower order key into the lock to release the latch when left in its retracted position by the higher order key.

11. A cylinder lock having a key plug and a latch retracting roll back, said lock being operable by a lower order key for operating said roll back to retract the latch, means on the roll back to shut-out said key, said means being positioned initially to permit entrance of the key when the roll back is at a certain angular position relatively to the key plug, said lock being operable by a higher order key adapted to enter the lock regardless of the roll back position and means operable by said higher order key to move the roll back from said predetermined position relatively to the key plug to shut out the lower order key.

12. A cylinder lock having a key plug and a latch retracting roll back, key shut out means carried by said roll back, said lock being operable by a lower order key adapted to operate the lock when said roll back and shut out means are in a predetermined position relatively to the key plug, said lock being operable by a higher order key, and means actuated by said higher order key operation to remove the roll back from said predetermined position so as to shut out the lower order key.

13. A cylinder lock having a key plug and a latch retracting roll back, said lock being operable by lower and higher order keys, shut out means for the lower order keys carried by the roll back, said higher order keys being adapted to position said means to shut out the lower order keys while moving the roll back to latch retracting position.

14. A cylinder lock having a key plug and a latch retracting roll back adapted to be moved relatively thereto, key shut out means carried by said roll back being inoperative when said roll back is in a predetermined position relatively to said key plug, said lock being operable by a lower order key adapted to operate said key plug synchronously with said roll back so as not to disturb said relative position, said lock being operable by a higher order key, means actuated by said higher order key operation to operate the roll back so as to disturb said predetermined position to render the shut-out means operative to prevent operation by said lower order key.

15. A cylinder lock having a key plug and a latch retracting roll back, said lock being operable by higher and lower order keys shut-out means for the lower order keys within said lock normally held inoperative, the operation by the lower order keys, being adapted to leave the shut-out means in their inoperative condition, means operated by the higher order keys to move the shut-out means to operative position while actuating the latch retracting roll back so as to shut-out the lower order keys.

16. A cylinder lock having a roll back mounted for free movement relatively to the cylinder, a depression in said roll back said lock being operable by said key having a portion fitting into a depression in the roll back for driving the same, said lock being operable also by a second key adapted to rotate the roll back by indirect contact.

17. A cylinder lock having a roll back, said lock being operable by a lower order key, an obstructing portion for said lower order key carried by said roll back, said lock being operable by a higher order key adapted to operate the roll back and to position the obstructing portion so as to prevent operation by said lower order key.

18. In a cylinder lock, a key plug, a cam fixed thereto, a roll back mounted to rotate freely on said plug, a slot in said roll back, said lock being operable by a lower order

key having an extension fitting in the slot to drive the roll back, a pin on said roll back and an extension on the cam cooperating with said pin, said lock being operable by a higher order key cut away to avoid the roll back slot, said higher order key being adapted to drive the roll back by means of the cam extension and roll back pin.

19. A cylinder having a roll back provided with means whereby it is moved to operating position by one key and independent means whereby it is moved to operating position by a second key, said second key operated means requiring a rotation whereby said key is so positioned when the roll back is in operative position that it may be withdrawn from the lock, said first mentioned means being constructed to prevent operation by said first mentioned key when the roll back is left in operative position by said second key.

Signed at Stamford in the county of Fairfield and State of Connecticut, this 28th day of July, A. D. 1927.

FREDERIC K. HEYER.