Feb. 13, 1934. F. E. THOMPSON 1,946,722

KEY EJECTING MEANS FOR CYLINDER LOCKS

Filed May 27, 1927

Fig. 1.

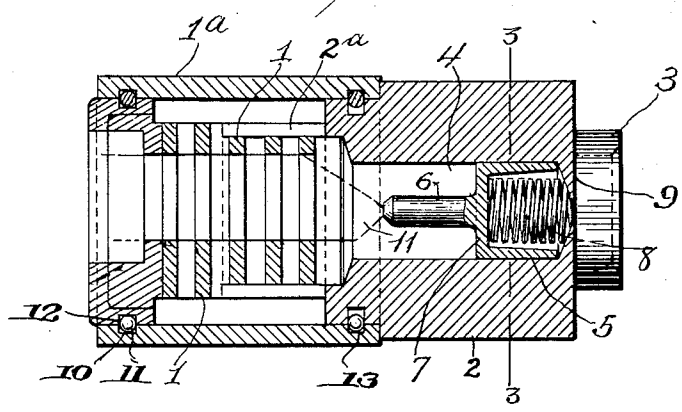


Fig. 2.

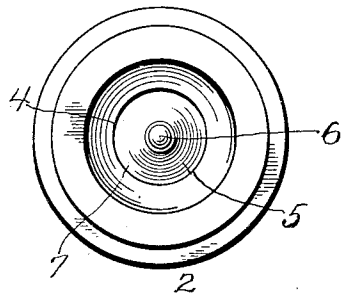
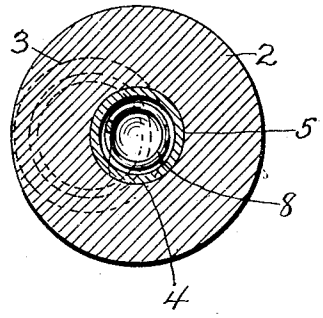


Fig. 3.



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KEY EJECTING MEANS FOR CYLINDER LOCKS

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12 Claims. (Cl. 70—46)

This invention relates to improvements in locks and more particularly to key ejecting means therefor,—one object of the invention being to provide simple and efficient means adaptable to the plug structure of a cylinder lock, for ejecting the key when it shall have been released by the user, and thus prevent the key being inadvertently left in the lock.

More particularly, it is an object of my invention to devise a cylinder lock having a key operated plug structure, and a cam mechanism to be rotated by the plug structure, the entire arrangement being in the form of a unitary assembly and having mounted therein a key ejecting mechanism.

With this and other objects in view, the invention consists in certain novel features of construction and combinations of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawing,—

Figure 1 is an enlarged longitudinal sectional view of a pin tumbler lock showing an embodiment of my invention.

Fig. 2 is an end view of the plug member containing the ejector, and showing the ejector in its relation to the plug member, but with the arms 2*a* fixed to the rear plug member for embracing the front plug member omitted.

Figure 3 is a transverse sectional view on the line 3—3 of Figure 1.

In the drawing, I have illustrated my improvements as embodied in a cylindrical lock structure in which the plug portion comprises a die-cast or skeleton tumbler-carrying member 1, and a cam member 2 having relatively greater strength than that of the die-cast or skeleton member 1 and adapted to partially embrace the latter,—such two part plug being mounted in the lock cylinder 1*a*, substantially as shown and described in application for patent filed by Joseph A. Horne, on the 19th day of February, 1927, and designated by Serial No. 169,519. While the plug could be designed of one piece, by making it in two pieces, greater security is obtained.

The plug structure comprises a main plug portion 1, which carries the various tumblers in a manner well known in the art. It also comprises a second plug portion designated by the reference numeral 2 which has arms 2*a* projecting therefrom and embracing the plug 1 so as to be operable thereby. For retaining the plug portion 1 in the cylinder 1*a*, I utilize the spring ring 10 which fits in corresponding grooves 11 and 12 in the casing and cylinder respectively. For securing the plug portion 2 to the cylinder, I utilize a similar type of spring ring 13 arranged in related grooves in the plug and cylinder structures. The plug portion 2 has a bore 4 extending longitudinally through the same and partially into the cam portion 3, this bore being utilized for the mounting of the key ejector, as will be explained presently.

The key ejector comprises a hollow plunger 5 provided at one end with a forwardly projecting stem 6 and said ejector is limited in its forward movement by engagement of the shoulder 7 formed by the forward end of the plunger 5, with the rear end of the plug member 1. A spring 8 is placed in the chamber of the plunger, and bears at one end against the seat 9, which latter also forms a limiting stop for the ejector plunger. The inner wall of the plunger 5 is made somewhat tapering so that the spring chamber shall afford adequate play for the spring during the compression and expansion movements of the latter.

When a key, represented in outline at 11, Figure 1, is inserted into the plug structure of the lock, its end will engage the forwardly projecting stem 6 of the plunger and force the latter rearwardly against the resistance of the spring 8, thus compressing the latter so that the parts will assume the positions shown in Figure 1, with the spring of the ejector structure under compression. It is apparent that if the user should now release his hold upon the key, the spring-actuated ejector will at once force the key outwardly and thus eject the same to any desired distance out of the plug and avoid the inadvertent leaving of the key in the lock. The distance which the key may be ejected may be regulated by the length of the stem 6 or by the tension of the spring 8 or in any other desired manner.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination with the plug of a cylinder lock and a cam portion therefor, said cam portion having a bore in line with the key-way of the plug, of a spring-actuated plunger movable in said bore and cooperable with a key to eject the latter.

2. The combination with the plug of a cylinder lock and a cam portion therefor, said cam portion having a bore in line with the key-way of the plug, of a plunger movable in said bore and having a stem to be engaged by a key inserted into the plug, and a spring operable to force the plunger forwardly to eject the key.

3. The combination with the plug of a cylinder lock, said plug having a bore in line with the key-

way of the plug, of a hollow plunger movable in said bore and provided with a stem to be engaged by a key inserted into the key-way of the plug, a spring housed in said hollow plunger, and an inwardly projecting flange at the rear end of the plug constituting an abutment for one end of said spring and limiting means for the plunger.

4. The combination of a plug for a cylinder lock, said plug comprising two cooperating members, one of which forms an elongated cam portion for the plug and the other provided with a key-way, said cam portion of the plug having a longitudinal bore in line with said key-way, and a spring actuated key ejector mounted entirely within said plug and movable in the bore of the elongated cam member of the plug.

5. A sliding tumbler cylinder lock, including a plug structure, said plug structure having an elongated cam portion, said elongated cam portion having a bore and a key ejecting plunger mounted in said bore and housed completely within the plug structure.

6. A sliding tumbler cylinder lock having a plug structure, provided with a key-way, said plug structure having an elongated cam portion provided with a bore in line with the plug key-way, and a spring pressed key ejecting plunger movable in said bore and disposed entirely within the plug structure, said plunger being provided with a portion to be engaged by a key inserted into the key-way of the plug.

7. A sliding tumbler cylinder lock including a plug structure, having a key-way, said plug structure having an elongated cam bearing portion provided with a bore in line with the plug key-way, and a spring pressed key ejecting plunger movable in said bore and disposed entirely within the plug structure, said plunger being provided with a portion to be engaged by a key inserted into the key-way of the plug structure.

8. A cylinder lock comprising a plug, said plug having a tumbler bearing portion and a cam bearing portion, said tumbler bearing portion having a key-way and the cam bearing portion having a bore in line with the key-way, and a spring pressed key ejecting plunger mounted in said bore entirely within said cam and tumbler bearing portions and having a portion adapted to be engaged by a key inserted into the key-way.

9. In a sliding tumbler cylinder lock, the combination with the plug having a keyway and having a bore at the rear of the keyway and axially alined and in communication therewith, the rear end of the bore being closed, of a hollow plunger mounted in said bore and having a stem extending toward the keyway to be engaged by an inserted key, and an expansion spring housed in the plunger and bearing between the head of the same and the rear closed end of the bore.

10. In a lock device including a cylinder mounting head, a cylinder rotatable within the head having a key receiving opening, a tail piece connected with the cylinder for rotation therewith and having a central bore, a member guided in the bore of the tail piece, an extension carried by said member and adapted to project into the key opening of the cylinder from the rear, and spring means within the bore of the tail piece and yieldably urging the member guided therein to position its extension into the key receiving opening, said extension being engaged by the inner end of a key inserted in the cylinder opening and moved into the tail piece against its spring to free the cylinder for rotation from its locked position, said member moving into the key opening as the cylinder is returned to its locked position to eject the key from the cylinder opening.

11. In a lock device including a casing, a cylinder rotatable within the casing and having a key receiving opening, a tail piece having a flange to be received in the casing, a spring ring engageable in a groove in the flange to secure the tail piece within the casing, on operative connection between the tail piece and cylinder, and a key ejector guided in the tail piece to extend into the cylinder key receiving opening whereby the insertion of a key in the cylinder is at all times yieldably resisted.

12. In a lock device including a cylinder mounting head, a cylinder rotatable within the head having a key receiving opening, a tail piece mounted within said mounting head, means connecting the tail piece with the cylinder, cooperating means between the mounting head and the tail piece for securing the same together and the cylinder against detachment within the mounting head, and a key ejector longitudinally movable in the tail piece and having a part normally yieldably urged into the key receiving opening of the cylinder.

FRANK E. THOMPSON.