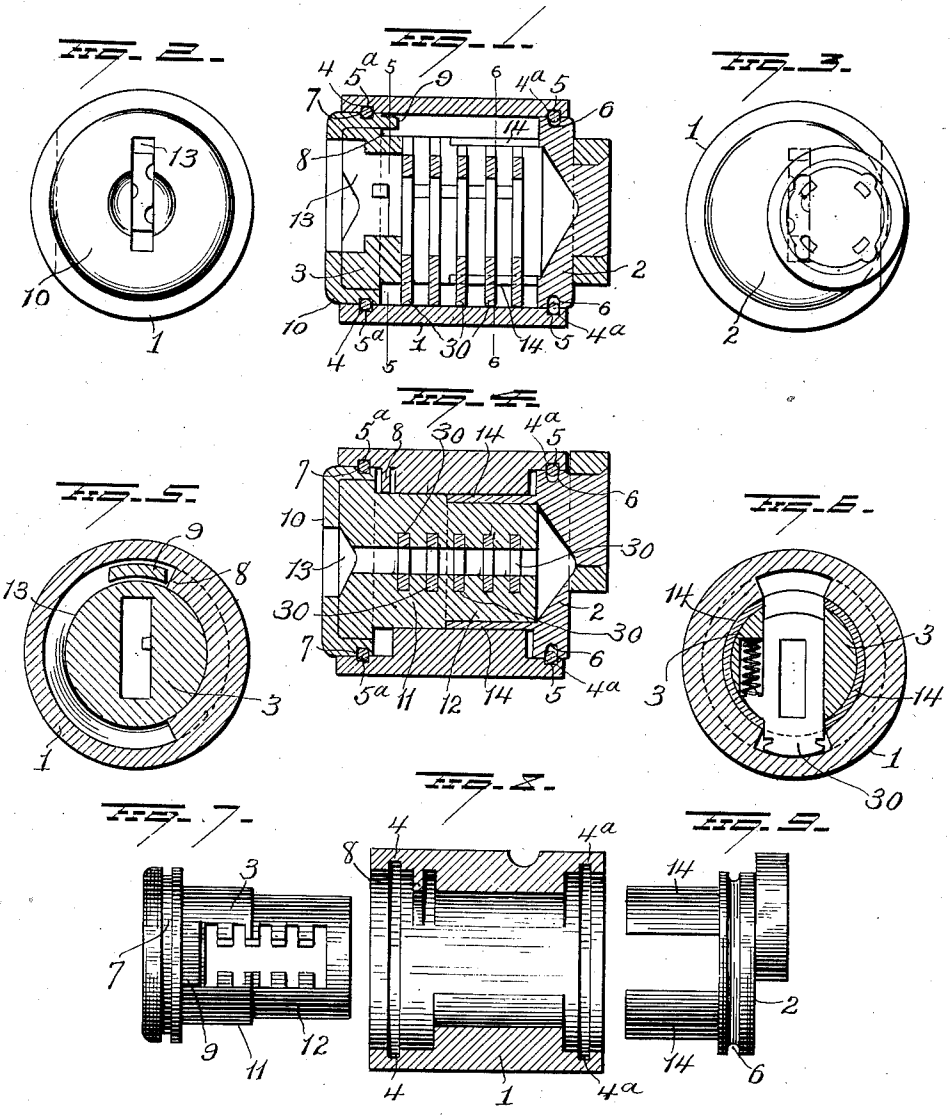
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LOCK

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Inventor

J. A. Horne

By Seymour & Bright

Attorneys

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LOCK

Joseph A. Horne, Stamford, Conn., assignor to The Yale & Towne Manufacturing Company, Stamford, Conn.

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16 Claims. (Cl. 70—46)

This invention relates to improvements in locks and more particularly to those of the "cylinder" type, the improvements being especially valuable with a die cast plug which is brittle and easily broken.

The object of the present invention is to provide a cylinder lock which cannot be surreptitiously operated, and, more specifically, to provide a construction of lock whereby an attempt to open the lock by the use of an instrument, other than the key provided therefor, will render the lock inoperative without retracting the bolt. A further object of the invention is to provide a cylinder and tumbler lock in which the plug will be fractured and no movement imparted to the bolt-throwing cam when an attempt is made to operate the lock by the use of a screwdriver or similar implement. A structure embodying the invention is illustrated in the accompanying drawing and will be hereinafter fully described, the invention residing in certain novel features which will be particularly pointed out in the appended claims.

In the drawing, Figure 1 is a longitudinal section of so much of a cylinder lock as is necessary to an understanding of the invention,

Figure 2 is an elevation of the outer end of the lock,

Figure 3 is a similar view of the inner end of the lock,

Figure 4 is a longitudinal section in a plane at a right angle to the plane of Figure 1,

Figures 5 and 6 are transverse sections on the lines 5—5 and 6—6, respectively, of Figure 1,

Figure 7 is a plan view of the plug,

Figure 8 is a longitudinal section of the cylinder free of the plug and the cam,

Figure 9 is a plan view of the cam.

The cylinder 1 receives the cam 2 in its inner end and the plug 3 in its outer end. The cylinder is provided adjacent its ends with internal annular grooves 4 4^a, the latter receiving a snap ring 5 which seats in a mating groove 6, in the cam. A groove 7 in the plug mates with the groove 4, and a locking wire 5^a inserted through a tangential hole in the cylinder wall, occupies the mating grooves 4—7 to lock the plug against longitudinal movement, as disclosed in pending application filed by Maxwell C. Maxwell and designated by Serial No. 126,556. The cylinder is also provided with a stop flange 8 near its outer end which is engaged by a lug 9 on the plug head 10 to limit the rotary movement of the plug.

According to the present invention, the die cast plug 3 is of differential formation, the outer portion 11 being of greater diameter than the inner portion 12, as clearly shown in Figures 4 and 7. The plug is formed with the usual keyway 13 and tumblers 30 are mounted in the plug and engaged with the cylinder in the usual manner, three tumblers being carried by the inner weaker portion 12 and two tumblers being carried by the outer relatively stronger portion 11. The cam is formed with the spaced arms 14 projecting from its head, and these arms are of such length and produced on such a radius that they fit closely over the inner reduced portion 12 of the plug, at the sides of the keyway and the tumblers therein, but do not extend over the portion 11 thereof, the three tumblers carried in the inner smaller portion of the plug serving to actuate the cam when the lock is operated by the key.

Under normal operation of the lock, no strain is put on the plug as all the strain of operating the cam is borne by the key and the tumblers. Should a flat blade, such as a screwdriver, be inserted in the plug and an attempt be made to rotate the plug, the effort to effect rotation will be resisted by the tumblers and the plug will be fractured at the juncture of its larger and smaller portions. Application of the rotative force will also shear the two tumblers carried by the outer stronger portion of the plug which will then rotate independently of the inner weaker portion, the latter and its tumblers retaining the cam in locked position.

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

1. A plug for cylinder locks having its outer portion relatively strong and an inner relatively weak portion whereby said outer portion may be broken from the inner portion under rotative force and tumblers carried by both of said portions.

2. A die cast plug for cylinder locks having relatively weak and strong portions, tumblers carried by each of said portions, the juncture of said portions being denoted by an abrupt structural change, whereby breakage at said juncture will be facilitated when said plug is subjected to strain.

3. A plug for cylinder locks having its inner portion of less diameter than its outer portion whereby the plug may be fractured under abnormal strain and locking tumblers mounted in each of said portions.

4. A sliding tumbler lock comprising a plug having relatively strong and weak portions, tumblers carried in each of said portions, a sleeve carrying

a cam and mounted on the weak portion of the plug and adapted to be actuated by the tumblers carried in said weak portion.

5. A lock comprising a plug having relatively strong and weak sections, cam mechanism carried by the weak section, tumblers carried by each of said sections, the tumblers of the weak section being adapted to actuate the cam mechanism carried by said weaker section.

6. The combination of a cylinder lock plug, and a cam having spaced arms projecting over the inner end of the plug.

7. The combination of a plug having an inner end portion of less diameter than its outer end portion, and a cam having spaced arms engaging about the smaller end portion of the plug.

8. The combination of a lock cylinder, a frangible plug rotatably held in one end of the cylinder, and a cam rotatably held in the other end of the cylinder and engaging around the inner end of the plug.

9. The combination of a lock cylinder, a plug rotatably mounted in one end of the cylinder, tumblers mounted in the plug and normally engaging the cylinder, and a cam rotatably mounted in the opposite end of the cylinder and having elements fitting about the plug at the sides of some of the tumblers.

10. The combination of a lock cylinder, a plug rotatably mounted in said cylinder and having its inner end of less diameter than its outer end, tumblers mounted in the forward end of the plug and normally engaging the cylinder, and a cam rotatably mounted in the cylinder and having elements fitting between the cylinder and the smaller end of the plug at the sides of the tumblers therein whereby effort to rotate the plug without releasing the tumblers from the cylinder will fracture the plug between its ends and shear the tumblers in its outer end.

11. A lock comprising a plug, and a group of tumblers carried thereby, a sleeve carrying a cam mounted on said plug, but freely rotatable relatively thereto, certain of said group of tumblers being adapted to actuate the cam sleeve when the lock is operated.

12. In a cylinder lock, a plug, and a bolt-throwing cam having plug engaging arms, said cam being loosely mounted on the plug.

13. In a lock device including a casing, a cylinder rotatable within the casing and having a key receiving opening and tumblers carried by the cylinder to normally lock the same in the casing against rotation, said tumblers being operable by the insertion of a proper key in the cylinder opening to permit rotation of the cylinder, a tail piece having a flange to be received in the casing from the rear, a spring ring engageable in a groove in the casing and in a groove of said tail piece flange to secure the same within the casing, and an operative connection between the tail piece and cylinder.

14. A plug for cylinder locks having a head portion, a relatively strong portion and a relatively weak portion, tumblers carried by said weak and strong portions, said strong and weak portions being arranged so that the plug may be easily ruptured at the juncture of said portions upon attempted rotation with a tool other than its own key.

15. A plug for cylinder locks having forward and rearward tumbler carrying portions, said portions being defined from each other by a distinct structural change, tumblers in each of said portions to resist turning movement of said plug in a cylinder except when said tumblers are properly positioned by a key, the tumblers in said forward portion being more readily severable than the rearward portion tumblers when stress is placed on the forward portion of said plug to rotate the same without proper positioning of the tumblers, whereby said forward portion and its tumblers will readily be severed from said rearward portion by such surreptitious operation.

16. A plug for cylinder locks having forward and rearward tumbler carrying portions, said portions being defined from each other by a distinct structural change, tumblers in each of said portions to resist turning movement of said plug in a cylinder except when said tumblers are properly positioned by a key, the tumblers in said forward position being fewer in number than those in the rearward position so as to be more readily severable than the rearward portion tumblers when stress is placed on the forward portion of said plug to rotate the same without proper positioning of the tumblers, whereby said forward portion and its tumblers will readily be severed from said rearward portion by such surreptitious operation.

JOSEPH A. HORNE.