Aug. 25, 1942. O. C. LARSON 2,294,308

CYLINDER LOCK

Filed Oct. 16, 1940

Fig. 1.

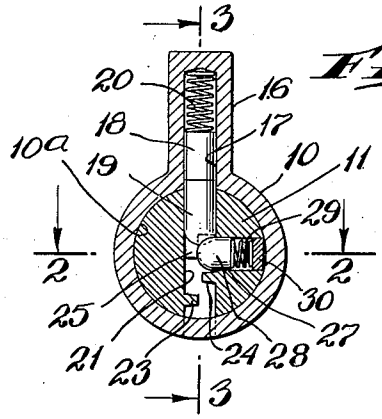


Fig. 2.

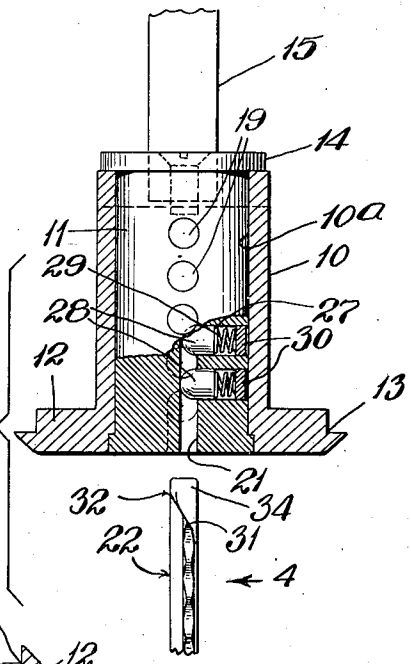


Fig. 3.

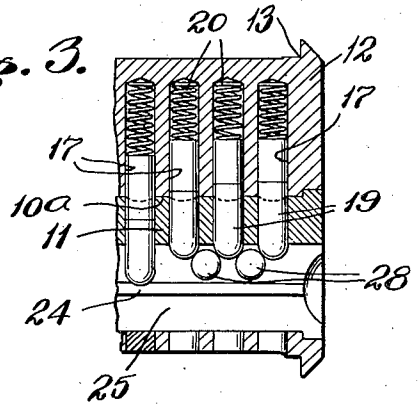
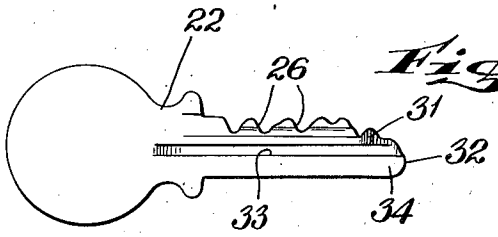


Fig. 4.



INVENTOR
OTTO C. LARSON
BY
ATTORNEY

Patented Aug. 25, 1942

2,294,308

UNITED STATES PATENT OFFICE

2,294,308

CYLINDER LOCK

Otto C. Larson, Brooklyn, N. Y.

Application October 16, 1940, Serial No. 361,403

3 Claims. (Cl. 70—421)

This invention relates to cylinder locks employing a plurality of tumblers actuated by a key to bring the same into proper alinement to provide rotation of the cylinder in opening or closing a lock mechanism; and the object of the present invention is to provide a lock structure of the character described having a series of key blocking elements associated with the respective tumblers of the lock to prevent insertion of a normal key into the lock and further to render the picking of the lock more difficult; the invention further consists in the provision of a key device associated with the lock having means moving the blocking pins or elements into inoperative position to permit insertion of the key into the lock to actuate the tumblers thereof in the operation of rotating the cylinder; and with these and other objects in view, the invention consists in a lock structure of the class and for the purpose specified, which is simple in construction and which is constructed as more fully hereinafter described and as defined in the appended claims.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a cross sectional view through a cylinder lock showing the general relationship of the tumblers and the locking pins employed.

Fig. 2 is a section on the line 2—2 of Fig. 1 and also showing a vertical edge view of part of the key for insertion into the lock.

Fig. 3 is a section substantially on the line 3—3 of Fig. 1 showing only a part of the lock structure; and

Fig. 4 is a side view of a key looking in the direction of the arrow 4 of Fig. 2.

In the drawing 10 represents the casing in which the cylinder 11 of the lock is arranged. The casing has an enlarged disc or flange portion 12 at its outer end, grooved as seen at 13 for mounting in any suitable lock casing or in an opening formed in a door or other support. The cylinder 11 has a retaining plate 14 at its inner end which retains the cylinder against longitudinal displacement in the casing 10 and to this plate is pivoted the usual spindle 15.

The casing 10 has an upwardly extending web portion 16 having a series of bores or passages 17 in which the backings 18 of the tumblers 19 are arranged, as well as the springs 20, normally urging the tumblers downwardly into the key channel 21 of the cylinder. This channel is of irregular cross sectional contour, depending upon the particular type and kind of key 22 employed. In the present structure, however, the container has on opposed walls, two inwardly extending ribs 23 and 24, and above the rib 23 is an inwardly set portion 25. The key 22 has on its upper edge the usual grooves or notches 26 which cooperate with the tumblers 19 in properly alining these tumblers in the cylinder 11 so as to provide rotation of the cylinder when the key is properly inserted in position. This construction is substantially conventional with locks that are well known on the market.

In carrying my invention into effect, I provide the cylinder 11 with a series of bores or passages 27 preferably arranged intermediate the passages 17. In these bores or passages are arranged key blocking pins 28 normally held in extended position into the key channel 21 by springs 29; the outer ends of which seat on retaining plugs 30 which simply guard the springs from scratching or otherwise defacing the bore 10a of the casing 10 in which the cylinder 11 rotates. The blocking pins 28 are preferably arranged intermediate the tumblers 19 and may in fact be regarded as supplemental tumblers.

A lock of this construction will require the use of a specially constructed key; that is to say, a conventional key which would otherwise fit the lock to operate the tumblers 19 will be blocked against insertion into the key channel 21 by the pins 28. I therefore provide on the inner end of the key 22 a beveled surface 31, note Fig. 2 of the drawing, so that upon inserting the pointed or beveled end 32 of the key into the channel 21, the beveled surface 31 will operate to move the blocking pins or supplemental tumblers 28 to the right as viewed in Fig. 2 of the drawing, to allow the key to pass into the cylinder beneath the tumblers 19. When the key is in fully inserted position, the notches 26 will properly aline the tumblers 19 in the cylinder 11, allowing said cylinder to be rotated to actuate the spindle 15 in operating a lock mechanism as in other locks of this type and kind.

It will of course be apparent that the blocking pins 28 also form stops limiting the downward movement of the tumblers 19, and by changing the position or arrangement of the pins 28 in the lock, different effects may be produced in the entire lock structure.

With a cylinder lock constructed according to my invention, it will appear that the picking of a lock will be rendered more difficult by rea-

son of the necessity of having to care for displacement of each of the series of stopping or blocking pins employed while manipulating the respective tumblers.

In the present construction, which is shown to illustrate one adaptation of my invention, it will appear that the position of the blocking pins or supplemental tumblers **28** is arranged above the flange **24** which extends into the groove **33** formed in the key **22**, and it is only that part of the key above the groove **33** which is beveled at the end **32** as shown at **31**. The lower portion **34** has the usual blunt end, as will also appear in Fig. 2 of the drawing. It will appear, however, that the particular beveling can be arranged at any desired position on the key to register with the particular location of the blocking pins or cylinder. It will also be apparent that any number of these pins may be employed, and it is not absolutely essential that the pins be arranged intermediate each of the tumblers of the lock. It will of course be apparent that the inner ends of the pins **28** are slightly rounded or beveled as are the inner ends of the tumblers to provide the outward camming of the pins **28** by engagement with the beveled surface **31**.

It will be apparent that in locating the apertures **27** intermediate the apertures **17**, there is no possibility of the plugs **30** interfering with free rotation of the cylinder **11** in the casing.

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

1. A cylinder lock of the class described havlongitudinally spaced tumblers operatively engaging one characterized edge of a key inserted into the lock, another series of supplemental tumblers arranged angularly to the first named tumblers and operatively engaging one side surface of a key inserted into the lock, said supplemental tumblers normally extending transversely across the key into the lock, means at an end portion and along said side surface of the key in alinement with the supplemental tumblers for displacing the latter in the insertion of the key into the lock, said supplemental tumblers being arranged intermediate the first named tumblers, and each of said supplemental tumblers contacting two of said first named tumblers to support the same in raised position.

2. The combination with a cylinder lock employing tumblers and a key for alinement of the tumblers, of a series of supplemental tumblers at one side of the cylinder and operatively extending across the key passage of said lock between and operatively engaging pairs of said first named tumblers, and means on said supplemental tumblers cooperating with special end and side surfaces of a key to provide for insertion of the key and operation of the lock.

3. The combination with the cylinder of a lock employing tumblers spaced longitudinally of the cylinder and entering the key channel of said cylinder, of a pair of supplemental tumblers arranged in the cylinder angularly to the first named tumblers at one side thereof and extending into the key channel, and each of said supplemental tumblers being arranged intermediate and operatively engaging two of the first named tumblers.

OTTO C. LARSON.