Oct. 9, 1928.

E. N. JACOBI

1,686,665

LOCK

Filed Dec. 18, 1926

Fig. 1.

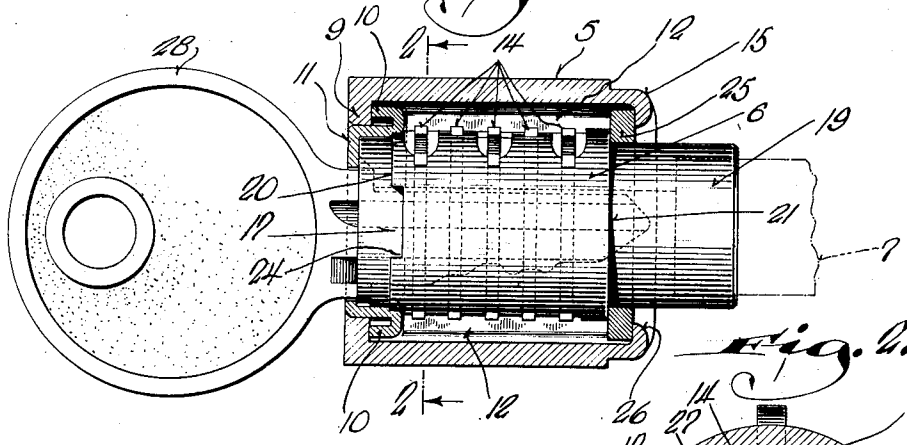


Fig. 2.

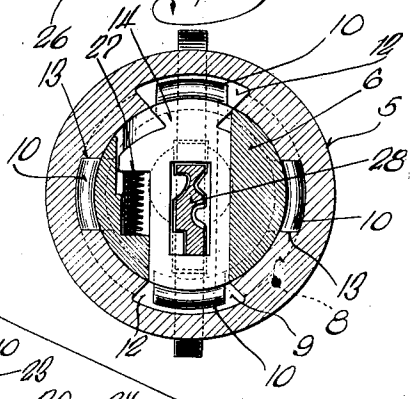
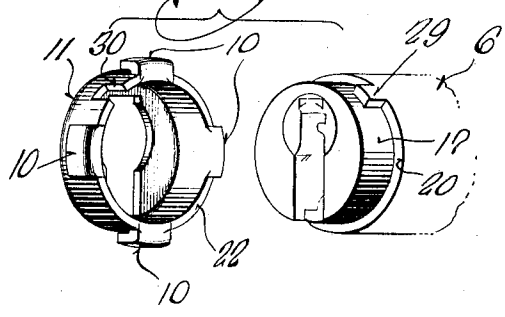


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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LOCK.

Application filed December 18, 1926. Serial No. 155,627.

It is an object of this invention to provide a new and useful lock of the cylinder type which is so designed as to frustrate attempts to forcibly rotate the plug or cylinder.

Another object of this invention resides in the provision of an improved lock of the character described having a cap fitted over the exposed end of the lock plug or cylinder fitted within the lock shell whereby chiselling of the shell to free the cap and expose the outer end of the lock plug or cylinder will not permit the ready rotation of the plug or cylinder.

And a further object of this invention resides in the provision of a cylinder type lock which is so designed as to afford maximum protection against unauthorized operation and which is capable of ready economical manufacture.

With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawings, I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view, partly in section and partly in side elevation, of a lock embodying my invention;

Figure 2 is a transverse sectional view taken through Figure 1 on the plane of the line 2—2;

Figure 3 is a perspective view of the lock with parts disassembled and the shell and cylinder broken away and partly in section, and

Figure 4 is a perspective view of a steel end cap and the outer end portion of a lock cylinder illustrating a slightly modified construction.

Referring now more particularly to the accompanying drawings, in which like numerals designate like parts throughout the several views, the numeral 5 designates the shell, housing or locking barrel mounting head of a lock proper, which may be die cast or machined of brass or other material and in which a key actuated plug or cylinder 6 is rotatably secured, the cylinder being connected with the mechanism to be locked by a member 7 of conventional construction. The shell 5 is centrally bored and has an annular recess or channel 8 spaced slightly inwardly of its outer end to provide an annular flange 9 against which the forward ends of a plurality of ears or lugs 10 of a steel cap 11, to be later described, abut. The wall of the shell bore is slotted, as at 12 and 13, the slots being spaced apart ninety degrees and connecting with the channel 8, the grooves or slots 12 cooperating with the tumblers 14 of the cylinder 6 to prevent rotation of the cylinder except by a proper key 28. The groove 13, being narrower than the tumblers, prevent interference with the rotation of the cylinder by making it impossible to withdraw the key when the cylinder is in an intermediate position with the tumblers aligned with the grooves 13.

The outside diameter of the shell rear end portion is reduced, as at 15, and the inside of the corresponding end portion thereof is counterbored, as at 16. The cylinder 6 has a medial portion of a diameter to be rotatably received between the lugs 18 on the inner wall of the shell and defined by the channels 8 and grooves 12 and 13, the outer and rearward ends 17 and 18, respectively, of the cylinder being of reduced diameter to form shoulders 20 and 21.

The cap 11 fits over the reduced end 17 of the cylinder and is preferably stamped from sheet steel having its ears 10 formed by tongues formed at the time of stamping and folded over the annular flange portion 22 thereof. The rear ends of the tongues protrude rearwardly of the flange 22, as at 23, to engage corresponding notches or recesses 24 in the shoulder 20 at the forward end of the cylinder and the forward ends of the lugs or ears abut the shell flange 9. The cylinder is secured in the shell with the lugs 10 against the flange 9 by a steel washer 25 fitted over the reduced rear end portion 19 thereof and abutting the shoulder 21 and behind which the reduced portion 15 of the shell is spun or clinched, as at 26.

The plug is assembled by inserting the cylinder with the cap thereon in the shell from the rear, the lugs 10 sliding through

the grooves 12 and 13. The washer 25 is then inserted in place and the reduced portion 15 of the shell spun or clinched thereover, as illustrated in Figure 1, the grooves 13 permitting two of the lugs 10 to pass therethrough and the grooves 12 permitting two of the lugs 10 to pass therethrough and also receiving the locking ends of the tumblers 14 which are normally engaged therein by springs 27. When the proper key 28 is inserted in the cylinder, the tumblers are drawn into the same against the springs 27 and the cylinder may be readily rotated, the lugs 10 moving in the channel 8. Two of the lugs 10 being directly in line with the end of the tumblers prevent their being drilled by persons seeking authorized access to the lock and further attempts to forcibly rotate the cylinder by a tool are frustrated and in general a well protected lock is obtained.

In Figure 4 a slightly modified structure is illustrated wherein the lugs 10, instead of projecting rearwardly of the flange 22 of the cap, are flush with the rear end thereof and the cap and cylinder held against rotation with respect to each other by a tit or projection 29 extended from the shoulder 20 and engageable in a recess or notch 30 in the cap flange 22.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art to which an invention of the character described appertains that I provide a novel and improved lock which is so designed that the necessity of careful and accurate machining of the parts to insure their snug fitting is eliminated, thus permitting economy in manufacture, and that ample protection against unauthorized operating of the lock is afforded.

What I claim as my invention is:

1. A device of the character described, comprising a shell having a longitudinal bore therein, a flange at the outer end portion of the shell extending into its bore, the inner wall of the shell having longitudinal grooves therein communicating with an annular counterbore adjacent the flange, a tumbler cylinder adapted to be inserted in the shell from the rear end thereof, lugs carried by the outer end portion of the cylinder and spaced apart to correspond with the intervals between the shell grooves, the lugs passing through the grooves when the cylinder is placed in the shell and rotating in the annular counterbore, said lugs and flange preventing outward movement of the cylinder in the shell, and means preventing rearward movement of the cylinder in the shell.

2. In a device of the character described, a shell, a cylinder rotatable in the shell, tumblers carried by the cylinder and normally locking the same in the shell against rotation, a cap fitted over the forward end of the shell, a flange at the outer end of the shell, means carried by the cap and cooperating with the shell flange to prevent outward longitudinal movement of the cylinder with respect to the shell, means preventing rearward longitudinal movement of the cylinder with respect to the shell, said cylinder and cap having registered key receiving openings, and cooperating means between the cap and cylinder to prevent their rotation with respect to each other and the consequent disalignment of the key receiving openings.

3. In a device of the character described, a shell, a key cylinder, tumblers carried by the cylinder and normally locking the same in the shell, a cap fitted over the forward end of the cylinder to rotate therewith, said cap and cylinder being inserted in the shell from the rear, a flange at the outer end of the shell preventing movement therebeyond of the cap and cylinder, and a flange formed in the rear end of the shell to prevent the movement of the cylinder therebeyond.

4. In a device of the character described, a shell, a cylinder, tumblers carried by the cylinders and normally locking the same against rotation therein, a cap fitted over the forward end of the cylinder to rotate therewith, said cap and cylinder being inserted in the shell from the rear, a flange at the outer end of the shell preventing movement therebeyond of the cap and cylinder, a washer fitted over the rear end portion of the shell, and shell carried means engaged behind the washer to prevent the dislodgment of the cylinder from the shell.

5. In a device of the character described, a centrally bored shell, a tumbler cylinder fitted in the shell to rotate therein, tumblers carried by the cylinder and adapted to be key actuated, means normally urging the tumblers to locking engagement with the shell to prevent rotation of the cylinder therein, a cap member fitted over the outer end of the cylinder to rotate therewith and exposed at the outer end of the shell, cooperating means carried by the cap and the shell to prevent outward longitudinal movement of the cylinder in the shell, and means adjacent the rear portion of the cylinder to prevent the rearward longitudinal movement of the cylinder in the shell.

6. A device of the character described, comprising a shell having a longitudinal bore therein, a flange at the outer end portion of the shell extending into its bore, the inner wall of the shell having longitudinal grooves therein communicating with the annular counterbore adjacent the flange, a tumbler cylinder adapted to be inserted in the shell from the rear end thereof, lugs carried by the outer end portion of the cyl-

inder and spaced apart to correspond with the intervals between the shell grooves, the lugs passing through the slots when the cylinder is placed in the shell and rotating in the annular counterbore, said lugs and flange preventing outward movement of the cylinder in the shell, and cooperating means between the rear end portion of the cylinder and shell for preventing rearward movement of the cylinder in the shell.

7. A device of the character described, comprising a shell having a longitudinal bore therein, a flange at the outer end portion of the shell extending into its bore, the inner wall of the shell having longitudinal grooves therein communicating with an annular counterbore adjacent the flange, a tumbler cylinder adapted to be inserted in the shell from the rear thereof, lugs carried by the outer end portion of the cylinder and spaced apart to correspond with the intervals between the shell grooves, the lugs passing through the grooves when the cylinder is placed in the shell and rotating in the annular counterbore, said lugs and flange preventing outward movement of the cylinder in the shell, the inner end of the cylinder being reduced in diameter to form a shoulder on the cylinder spaced inwardly of the rear end of the shell, a washer fitted on the reduced end portion of the cylinder and abutting said shoulder, and a flange on the rear end of the shell and formed behind the washer after the cylinder has been inserted in the shell to prevent rearward movement of the cylinder with respect to the shell.

8. A device of the character described, comprising a shell having a longitudinal bore therein, a flange at the outer end portion of the shell extending into its bore, the inner wall of the shell having longitudinal grooves therein communicating with an annular counterbore adjacent the flange, a tumbler cylinder adapted to be inserted in the shell from the rear end thereof, a cap member fitted over the outer end of the cylinder, lugs carried by the cap member and spaced apart to correspond with the intervals between the shell grooves, the lugs passing through the grooves when the cylinder is placed in the shell and rotating in the annular counterbore, said lugs and flange preventing outward movement of the cylinder in the shell, the inner end of the cylinder being reduced in diameter to form a shoulder on the cylinder spaced inwardly of the rear end of the shell, a washer fitted on the reduced end portion of the cylinder and abutting said shoulder, and a flange on the rear end of the shell and formed behind said washer after the cylinder has been inserted in the shell to prevent rearward movement of the cylinder with respect to the shell.

9. A device of the character described, comprising a shell having a longitudinal bore therein, a flange at the outer end portion of the shell extending into its bore, the inner wall of the shell having longitudinal grooves therein communicating with an annular counterbore adjacent the flange, a tumbler cylinder adapted to be inserted in the shell from the rear end thereof, a cap member fitted over the outer end of the cylinder and having a key opening registering with a key opening in the cylinder, means preventing rotational movement between the cap member and the cylinder, lugs carried by the cap member and spaced apart to correspond with the intervals between the shell grooves, the lugs passing through the grooves when the cylinder is placed in the shell and rotating in the annular counterbore, said lugs and flange preventing outward movement of the cylinder in the shell, the inner end of the cylinder being reduced in diameter to form a shoulder on the cylinder spaced inwardly of the rear end of the shell, a washer fitted on the reduced end portion of the cylinder and abutting said shoulder, and a flange on the rear end of the shell and formed behind said washer after the cylinder has been inserted in the shell to prevent rearward movement of the cylinder with respect to the shell.

In testimony whereof, I hereunto affix my signature.

EDWARD N. JACOBI.