Oct. 8, 1935. E. N. JACOBI 2,016,602

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Fig. 1.

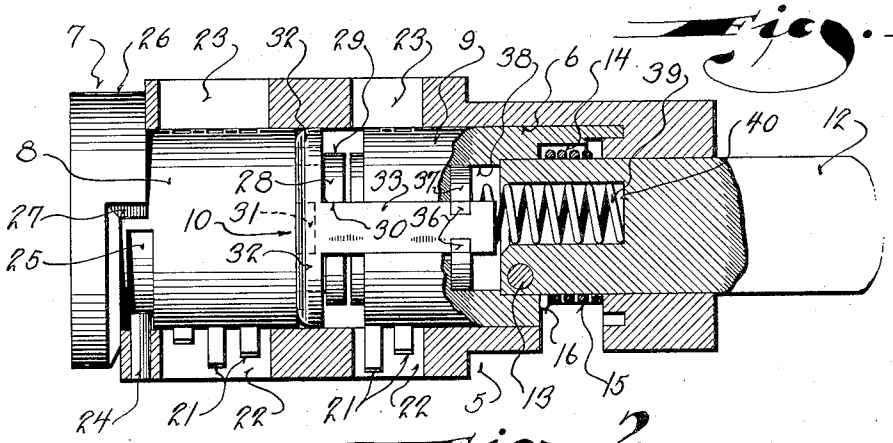


Fig. 2.

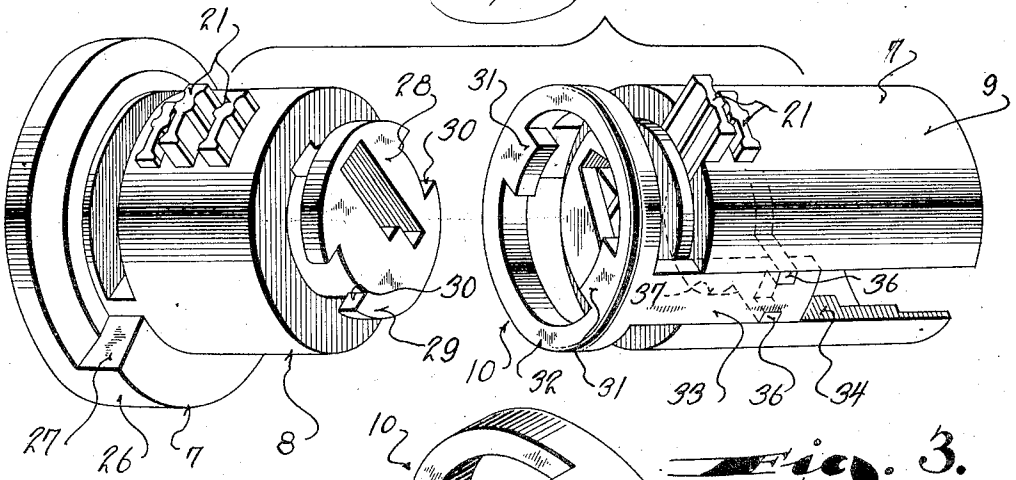
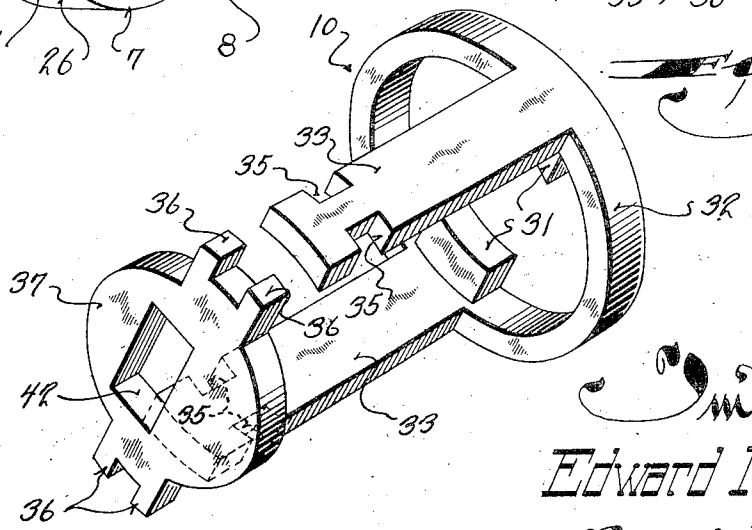


Fig. 3.



Inventor:
Edward N. Jacobi
By Lea Smith & Jones
Attorneys

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Fig. 4.

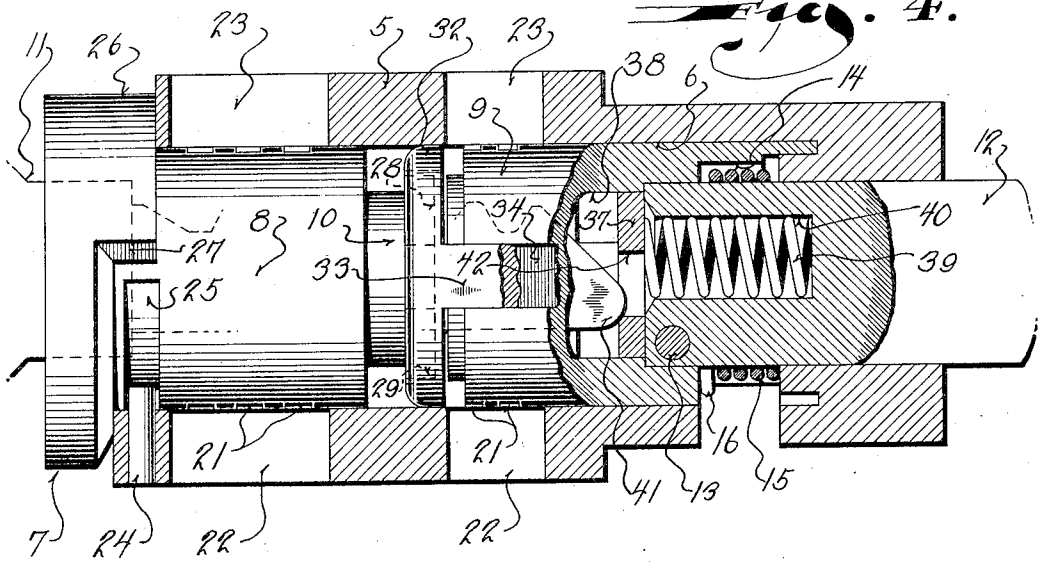


Fig. 5.

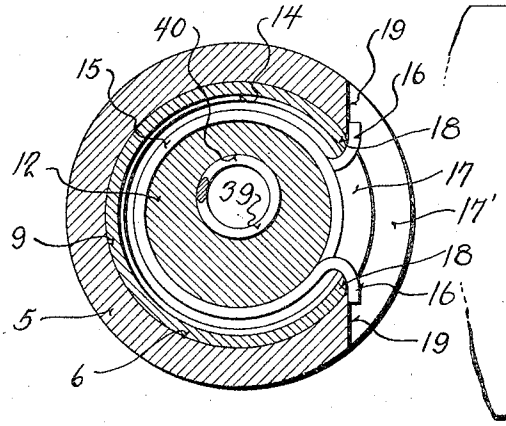
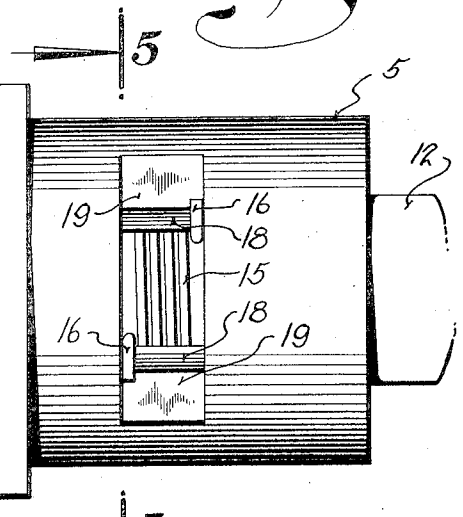


Fig. 6.



Inventor:
Edward N. Jacobi
By Dashiell Hammett Jones
Attorney

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UNITED STATES PATENT OFFICE

2,016,602

LOCK

Edward N. Jacobi, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis., a corporation of Delaware

Application June 11, 1934, Serial No. 730,077

16 Claims. (Cl. 70—46)

This invention relates to improvements in cylinder locks and has as a general object to provide a lock having added security against picking.

More specifically, it is an object of this invention to provide a lock having a two part cylinder so asociated that torsional stress cannot be applied to the inner cylinder part except through the use of a proper key.

Another object of this invention is to provide a novel clutch mechanism for drivingly connecting the two cylinder parts.

Another object of this invention is to provide novel means to yieldably maintain the lock cylinder in a normal locked position of rotation from which it may be turned in either direction.

With the above and other objects in view which will appear as the description proceeds, this 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.

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

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

Figure 2 is a perspective view of the two cylinder parts and their clutch mechanism;

Figure 3 is a perspective view of the clutch mechanism to connect the cylinder parts;

Figure 4 is an enlarged view similar to Figure 1, but showing the key in position, and the clutch connecting the cylinder parts;

Figure 5 is a cross sectional view taken on the plane of the line 5—5; and

Figure 6 is a detail view in elevation showing the spring construction to yieldably hold the cylinder in its normal position of rotation.

Referring now more particularly to the accompanying drawings in which like numerals indicate like parts throughout the several views, the numeral 5 designates the shell or sleeve of the lock which is positionable in a mounting structure with which the lock is employed. The shell or sleeve 5 is bored as at 6 to rotatably receive the cylinder indicated generally by the numeral 7.

The cylinder 7 is composed of a front part or section 8 and a rear part or section 9, normally disconnected and free to turn with respect to each other, but connectible through a clutch mechanism 10 upon the insertion of a proper key 11, into the aligned keyways in the two cylinder parts.

The rear end of the cylinder part or section 9 is bored to receive a shaft 12, which is fixed thereto in any suitable manner as by a cross pin 13. The shaft 12 projects through the rear end of the shell or sleeve 5 to connect the cylinder with mechanism to be actuated (not shown).

Encircling the shaft 12 and disposed in a counterbore 14, in the rear end of the cylinder part 9 is a torsion spring 15. The outturned ends 16 of the spring project through aligned openings 17 and 17' in the wall of the counterbore 14 and the wall of the sleeve to engage the side edges 18 and 19 of the openings 17 and 17' respectively. Hence, the spring yieldably holds the cylinder in a predetermined position of rotation from which it is rotatable in either direction.

The cylinder parts 8 and 9 are normally positively held against rotation from said predetermined position by tumblers 21 carried by the cylinder parts and projectable into tumbler receiving recesses 22 in the sleeve. In the present instance, the front cylinder part 8 has three tumblers and the rear cylinder part has two.

All of these tumblers are retractable within the periphery of the cylinder by the key 11 in the customary manner, the sleeve 5 being provided with auxiliary recesses 23 diametrically opposite the recesses 22 to receive the projected ends of the tumblers during insertion and removal of the key.

A pin 24, carried by the sleeve at its front end engages in an arcuate groove 25 in the adjacent portion of the cylinder to hold the same in place, said portion of the cylinder being provided with an enlarged flange 26, part of which is cut away to define shoulders 27, which through engagement with a lug on the sleeve, serves to limit the rotation of the cylinder.

As illustrated, the cylinder parts 8 and 9 are spaced from each other and in this space, the clutch mechanism 10 is mounted. The clutch mechanism comprises a circular boss 28 projected rearwardly from the front of the cylinder part 8, which boss is equipped with an annular flange 29 cut away at diametrically opposite points to define two recesses 30. Engageable in these recesses are tongues 31 directed inwardly from a clutch ring 32 slidably but non-rotatably mounted on the rear cylinder part 9.

To so mount the clutch ring on the rear cylinder part 9, two parallel arms 33 extend rearwardly from the clutch ring to be slidably received in

grooves 34 cut in the cylindrical surface of said cylinder part. The arms 33 are flush with the cylindrical surface of the cylinder part.

The ends of the arms 33 are notched as at 35 to have an interengaging connection with oppositely extending lugs 36 on a plate 37, which is slidably disposed in a bore 38 in the cylinder part 9.

The assembly of the arms 33 with the clutch plate is effected by spreading the arms sufficiently to engage their extremities with the lugs 36 and then returning them to their proper positions flush with the cylindrical surface of the cylinder part. In this manner, the structure comprising the clutch ring, its arms 33 and the clutch plate 37, form one unitary assembly which is non-rotatably but slidably mounted on the rear cylinder part 9, the permitted longitudinal motion being limited by the bottom of the bore 38, and the adjacent end of the shaft 12.

A spring 39 confined between the clutch plate and the bottom of a spring recess 40 in the shaft 12, at all times yieldably urges the clutch assembly toward the front of the lock in which position the tongues 31 are out of transverse alignment with the recesses 30, permitting free relative rotation between the two cylinder parts. Upon inward shifting of the clutch assembly, the tongues 31 engage in the recesses 30 and effect a driving connection between the two cylinder parts securely holding the same against relative rotation.

To so shift the clutch assembly, the key 11 is of such size that its point 41 engages an edge of an opening 42 in the clutch plate and moves the same inwardly its proper distance to engage the tongues 31 in the recesses 30 when the key has been inserted its proper distance (see Figure 4). The key thus not only serves to retract the tumblers but also affords a driving connection between the two cylinder parts, and as the key engages an edge of an opening rather than directly against the flat surface of the plate only a key of exactly the proper length and shape will afford the desired movement.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art to which this invention appertains, that this invention provides novel means for rendering the picking of a cylinder lock difficult. It is readily apparent that unless the clutch is actuated to drivingly connect the two cylinder parts, it is impossible to apply torsional force on the inner or rear cylinder part in the manner in which it is generally done during picking, and if a tool is inserted down the keyway, to actuate the clutch, the space left within the keyway is insufficient to permit the operation of a tumbler picking tool.

What I claim as my invention is:

1. In a lock, a cylinder composed of two axially aligned parts normally free for relative rotation, and key controlled means to drivingly connect said cylinder parts.

2. In a lock of the character described, a cylinder having axially aligned sections each provided with a keyway, clutch means to non-rotatably connect the cylinder sections, and said clutch means including a part accessible from the keyway in one of the sections engageable by a key therein, whereby the normal insertion of the proper key actuates the clutch means to drivingly connect the cylinder sections.

3. In a lock of the character described, a cylinder having relatively rotatable axially aligned parts, key operable tumblers in each of said cylinder parts, and means for drivingly connecting the cylinder parts, said means being operable by the same key which retracts the tumblers.

4. In a lock of the character described, a cylinder having axially aligned parts free to turn with respect to each other, key operable tumblers carried by each of said parts, clutch means to drivingly connect the cylinder parts, and a spring to yieldably maintain the clutch means in an inoperative position from which said clutch means is movable to drivingly connect the cylinder parts by a proper key.

5. In a lock, a two part cylinder in said sleeve, said cylinder parts being free to turn with respect to each other, key operable tumblers in each of said cylinder parts to engage the sleeve and secure said cylinder parts against rotation in the sleeve entirely independently of each other, and means operable by the key provided to retract the tumblers to drivingly connect the cylinder parts.

6. In a lock of the character described, a two part cylinder, key operable locking tumblers in each cylinder part to secure the cylinder parts against rotation independently of each other, said cylinder parts being relatively rotatable, and clutch means longitudinally slidable but non-rotatable on one of the cylinder parts and arranged to have an interlocking engagement with the other cylinder part upon longitudinal movement to a predetermined position.

7. In a lock of the character described, a two part cylinder, key operable locking tumblers in each cylinder part to secure the cylinder parts against rotation independently of each other, said cylinder parts being relatively rotatable, clutch means longitudinally slidable but non-rotatable on one of the cylinder parts and arranged to have an interlocking engagement with the other cylinder part upon longitudinal movement to a predetermined position, a spring to yieldably urge said clutch means to an inoperative position, and means connected with the clutch means and engageable by a key inserted into the keyways of the cylinder parts to move the clutch means to its operative position.

8. In a lock of the character described, a cylinder composed of two axially aligned sections free to turn with respect to each other, locking tumblers in each of the sections to secure the sections against rotation independently of each other, a boss projecting from one section toward the other, said boss having a recess, a clutch member slidably but non-rotatably mounted on the other section and having a part engageable in said recess to afford a driving connection between the cylinder sections, and a spring to yieldably hold the clutch member in an inoperative position disengaged from said recess and from which position it is movable to its operative interlocking position by a proper key.

9. In a lock of the character described, a cylinder composed of two axially aligned relatively rotatable sections, a boss projecting from one section and provided with a recess, a clutch member slidably but non-rotatably mounted on the other section, a tongue on said clutch member engageable in said recess to effect a driving connection between the sections, and spring means normally holding the clutch member in an inoperative position with its tongue disengaged from said recess.

10. In a lock of the character described, a cylinder composed of front and rear sections in axial alignment, a recessed boss projected from the front section toward the rear section, a clutch

member slidably but non-rotatably mounted on the rear section, a tongue on said clutch member engageable in the recess of the boss to drivingly connect the cylinder sections, spring means yieldably urging the clutch member toward the front section to a position at which its tongue is disengaged from the recess, and means associated with said clutch member and engageable by a key inserted into the cylinder from the front end thereof to move said clutch member to its operative position engaging its tongue in the recess.

11. In a lock of the character described, a cylinder composed of front and rear axially aligned sections, a boss projecting rearwardly from the front section and provided with diametrically opposed recesses, a clutch ring having means to engage in said recesses, means to slidably but non-rotatably mount the clutch ring on the rear cylinder section for movement to and from an operative position engaging said recesses and drivingly connecting the cylinder sections, spring means yieldably urging the clutch ring toward the front of the lock and to an inoperative position, and means associated with the clutch ring and engageable by a proper implement inserted into the cylinder from the front end thereof to move the clutch ring to its operative position.

12. In a lock of the character described, a cylinder having two relatively rotatable axially aligned parts, clutch means to drivingly connect said cylinder parts comprising a ring, longitudinal arms carried by the ring slidably received in grooves in one of the cylinder parts to slidably but non-rotatably mount the ring thereon, means on said ring to have an interlocking engagement with the other cylinder part upon movement to an operative position, and spring means yieldably urging the ring to an inoperative position.

13. In a lock of the character described, a cylinder composed of two axially aligned relatively rotatable sections, and clutch means to drivingly connect said sections comprising a boss on one section, a clutch ring adapted for non-rotatable connection with the boss, longitudinal arms on the clutch ring slidably disposed in grooves in the other cylinder section to slidably but non-rotatably mount the clutch ring thereon, a plate connecting said arms and disposed within said cylinder section, and spring means engaging said plate to yieldably hold the clutch ring in an inoperative position, and said plate being engageable by a key inserted into the cylinder to move the clutch ring to its operative position.

14. In a lock of the character described, a cylinder having two axially aligned sections, locking tumblers in each of said sections to secure the same against rotation independently of each other, said tumblers being retractable to free the cylinder sections for rotation by a proper key inserted into aligned keyways in the cylinder sections, and clutch means to drivingly connect said cylinder sections comprising, a boss on one section, a clutch ring adapted for interlocking engagement with the boss, arms connected with the clutch ring and slidably disposed in longitudinal grooves in the other cylinder section to slidably but non-rotatably mount said clutch ring thereon, a plate disposed within said last mentioned cylinder section and connected to said arms, said plate having a part lying across the inner end of the keyway to be engageable by the key during insertion thereof to retract the tumblers, whereby said key moves the plate and the clutch ring to an operative position interengaged with the boss, and spring means to oppose such movement and normally hold the clutch ring in an inoperative position.

15. In a lock of the character described, a lock cylinder, a sleeve in which the cylinder is rotatably mounted, and means to yieldably maintain the cylinder in a predetermined position of rotation from which it is rotatable in either direction comprising, a torsion spring having its ends engaged over adjacent edges of recesses formed in the cylinder and the sleeve.

16. In a lock of the character described, a cylinder having a counterbored end and a shaft projecting from said counterbored end, a sleeve bored to receive the cylinder and said shaft, key operable locking tumblers to releasably secure the cylinder in a predetermined position of rotation, and means to yieldably maintain said cylinder in said predetermined position comprising, a spring coiled about said shaft with its ends hooked over adjacent edges of aligned recesses formed in the sleeve and the counterbored portion of the cylinder.

EDWARD N. JACOBI.