Apr. 24, 1923. 1,452,812

E. O. MURMANN

LOCK

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Fig. 1.

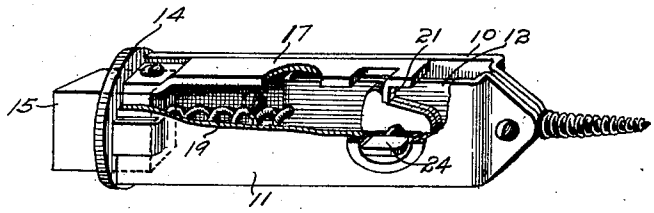


Fig. 2.

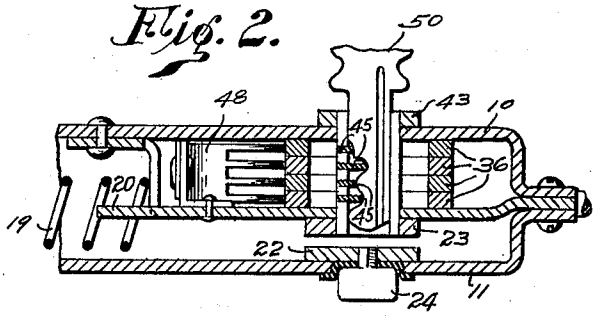


Fig. 3.

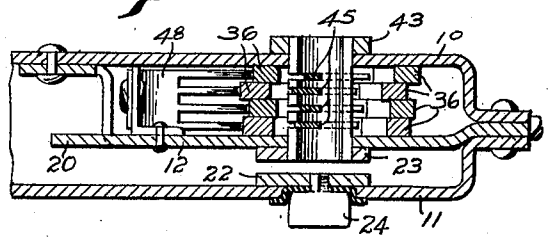
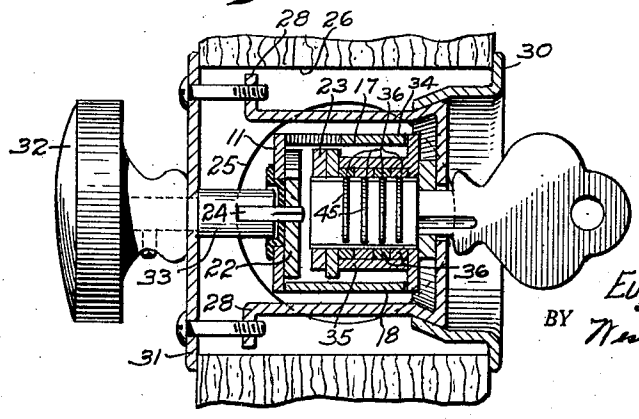


Fig. 4.



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Fig. 5.

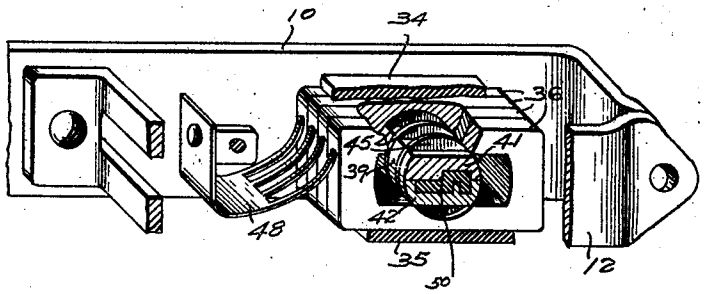


Fig. 6.

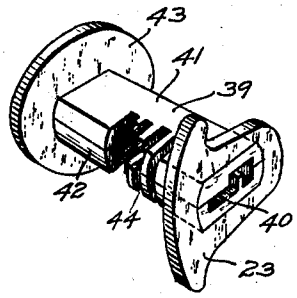


Fig. 7.

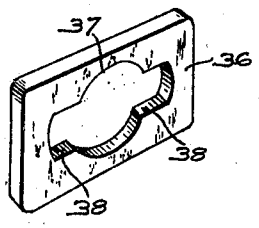


Fig. 8

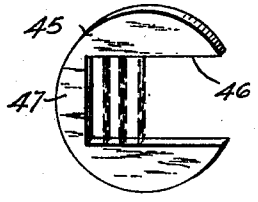
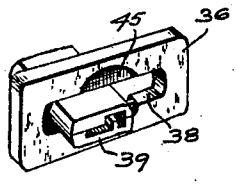


Fig. 9.



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Patented Apr. 24, 1923. 1,452,812

UNITED STATES PATENT OFFICE.

EUGENE O. MURMANN, OF GLENDALE, CALIFORNIA.

LOCK.

Application filed May 2, 1922. Serial No. 557,946.

To all whom it may concern:

Be it known that I, EUGENE O. MURMANN, a citizen of the United States, and resident of Glendale, in the county of Los Angeles and State of California, have invented new and useful Improvements in a Lock, of which the following is a specification.

This invention relates to a cylinder lock and pertains especially to a lock having a plug rotatable within a plurality of transversely movable plate tumblers. It is the primary object of this invention to provide a construction of the class described which may be made compact, is simple, durable, and easily assembled. In addition to the broader objects of this invention, there are several novel features of construction hereinafter set forth and corresponding accomplishments secured thereby.

The invention is illustrated, by way of example, in the accompanying drawings, in which:

Fig. 1 is a perspective view of a complete lock housed within a casing, a portion of the casing being broken away to better show the parts; Fig. 2 is an enlarged fragmental section showing the key in position; Fig. 3 is a section similar to Fig. 2 showing the key removed; Fig. 4 is a section through the lock and casing and a fragment of a door, the key being shown in position with the bolt drawn back; Fig. 5 is a perspective view of a fragment of the lock with the casing partially broken away and parts is shown in section; Fig. 6 is a perspective view of the plug; Fig. 7 is a perspective view of one of the tumbler plates; Fig. 8 is a perspective view of one of the alignment washers; and Fig. 9 is a perspective view of the plug, a tumbler plate and its aligning washer, with the parts in locking position.

In the drawing, the lock is shown housed within a casing adapted to be inserted in a cylindrical recess in a door. Foundation plates 10 and 11 are bent at their ends, and clamped therebetween is a center plate 12. At the outer ends, the foundation plates are secured to a selvage plate 14. Mounted in a latch opening in the selvage is a latch 15. The latch has secured thereto aprons 17 and 18. These aprons serve to complete the housing for a spring 19 extending over a tongue 20 on the center plate 12. A tongue 21 is cut from the apron 17 and bent downwardly. A similar tongue in a corresponding position is provided on the plate 18 for engagement by rock levers 22 and 23. A projection 24 for engagement by the shank of a knob is connected to rock lever 22.

In installing the lock, a cylindrical recess 25, see Fig. 4, is bored into the door from the edge and is met by a bore 26 extending through the door from one side to the other. The bore 26 is positioned in the door at the point at which a key would be inserted. A circular plate 27 has legs 28 straddling the casing. The plate has a bevelled edge as indicated by 29 and rests within a flanged collar 30 which completes the cover for one end of the bore 26. Plate 27 has a key hole. The feet of legs 28 are bored and threaded to receive screws which pass through a cover plate 31. Cover plate 31 carries a knob 32 mounted on a shank 33. The shank has a kerf to receive projection 24. It is obvious that by tightening the screws, the parts may be securely held in position. Turning knob 32 will cause lever 22 to be rocked, the latter engaging a tongue, as indicated by 21 and moving aprons 17 and 18 inwardly against the action of spring 19 so as to retract the latch bolt 15. The same movement may be accomplished by rocking lever 23 which is operated by means of a key.

The lock mechanism is mounted between center plate 12 and foundation plate 10. Extending from plate 10 are guides 34 and 35. Slidably mounted between the guides 34 are tumbler plates. In this case four tumbles plates are shown. These tumbler plates are identical, being rectangular and having an opening comprising a circle 37 intersected by a rectangle so as to form oppositely disposed wing recesses 38, see Fig. 7. A plug 39 has opposite arcuate faces corresponding to the circle 37 in the tumbler plates and of such dimensions that when the plug is aligned at the centers of the tumbler plates it may be rotated. The plug is also provided with opposite flat faces so that it may slide in the wings 38 as indicated in Fig. 9. A key hole 40 is formed in the plug and the latter is preferably constructed of two sections 41 and 42 which are milled on opposite faces to form a keyhole when brought together. The sections are held in position by the lever 33 and a washer 43. Thus, in manufacturing the lock, long bars may be milled out and then cut into plug lengths. Transverse kerfs 44, see Fig. 6, of the same depths are cut into the plug to intersect the keyhole. These are arranged to receive

alignment washers 45. These washers are circular and of the same size as the circular openings 37 in the tumbler plates so that when properly aligned they may be rotated therein. They have a plug opening of rectangular form indicated by 46 in Fig. 8. The depth of the chordal part 47 of the washer is made to differ for different washers. The washers are slipped into position in the kerfs 44 so as to ride for a limited distance back and forth. It is obvious that when in position with the chordal parts extending into the kerfs 44 of the plug, that the peripheries of the alignment washers will not be in the surface of a single cylinder. Each tumbler plate is positioned over a washer, and if the washer is not in position to form a cylinder with the arcuate surfaces of the block, the tumbler plates will be moved so that the plug is disposed in one of the wings as shown in Fig. 9. In this position the plug could not be rotated. A multiple finger spring 48 is positioned so as to press against each one of the tumbler plates and to maintain them in the position such that the chordal parts of the washers 45 are moved into their kerfs 44 in the plug as far as they will go. This results in the tumbler plates being positioned with their circular recesses 37 out of line and the plug 39 resting in the wings. In this position the plug cannot be turned. If a key is inserted in the keyhole and engaged with the chordal portions of the washer 45 to move the latter into position so that they align and the plug and washer are in the surface of a cylinder, then the tumbler plates will be moved to a position such that the circular recesses 37 are in line permitting the plug to be rotated. In Fig. 3 the tumbler plates are thrown out of alignment. In Fig. 2 a key 50 is shown in the keyhole. The edge of the key is of such configuration that when fully inserted, it will align the washers and the recesses in the tumbler plates so that the plugs may be turned. In Fig. 4 the plug is shown turned into position so that the latch bolt is drawn back. Just as soon as the key is removed, the tumbler plates are moved to locked position.

What I claim is:

1. In a lock, the combination of a casing, a movable plate-tumbler having an opening comprising a circle intersected by a rectangle, a plug rotatable when centered in the circular part of said opening and non-rotatable when disposed in the rectangular part and eccentric to the circular part of said opening, key operated means for moving said tumbler to align the circular part of said opening to permit rotation of said plug, and means tending to move said tumbler out of alignment.

2. In a lock, the combination of a casing, a plurality of independently movable plate-tumblers each having an opening comprising a circle intersected by a rectangle, a plug rotatable when centered in the circular parts of said openings and non-rotatable when disposed in the rectangular parts and eccentric to the circular parts of said openings, key operated means for moving said tumblers to align the circular parts of said openings and permit rotation of said plug, and means tending to move said tumblers out of alignment.

3. In a lock, the combination of a casing, a movable plate-tumbler having an opening comprising a circle intersected by a rectangle, a plug rotatable when centered in the circular part of said opening and non-rotatable when disposed in the rectangular part and eccentric to the circular part of said opening, an alignment washer having a circular periphery fitting within the circular part of said opening and slidably mounted on said plug, and key operated means for moving said washer and said tumbler so as to center the latter within the opening in said tumbler and permit rotation, and means tending to move said tumbler out of alignment.

4. In a lock, the combination of a casing, a plurality of independently movable plate-tumblers each having an opening comprising a circle intersected by a rectangle, a plug rotatable when centered in the circular parts of said openings and non-rotatable when disposed in the rectangular parts and eccentric to the circular parts of said openings, alignment washers having circular peripheries fitting within the circular parts of said openings and riding on said plug, key operated means for moving said tumblers to align the circular parts of said openings and permit rotation of said plug, and means tending to move said tumblers out of alignment.

5. In a lock, the combination of a casing, a movable plate-tumbler having an opening comprising a circle intersected by a rectangle, a plug rotatable when centered in the circular part of said opening and non-rotatable when disposed in the rectangular part and eccentric to the circular part of said opening, said plug having a keyhole and a kerf intersecting said hole in line with said tumbler, an alignment washer having a circular periphery fitting within the circular part of said opening and riding in said kerf, said washers having a chordal part abutting said plug, and means tending to move said tumbler transversely.

6. In a lock, the combination of a casing, a plurality of independently movable plate-tumblers, each having an opening comprising a circle intersected by a rectangle, a plug rotatable when centered in the circular parts of said openings and non-rotatable when disposed in the rectangular

parts and eccentric to the circular parts of said openings, said plug having a keyhole and kerfs intersecting said keyhole in line with said tumblers, alignment washers having circular peripheries fitting within the circular parts of said openings and riding in said kerfs, said washers having chordal parts of varying depths, and means tending to move said tumblers transversely.

In witness that I claim the foregoing I have hereunto subscribed my name this 24th day of April, 1922.

EUGENE O. MURMANN.