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E. P. HURD

2,021,185

LOCK

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Fig. 1.

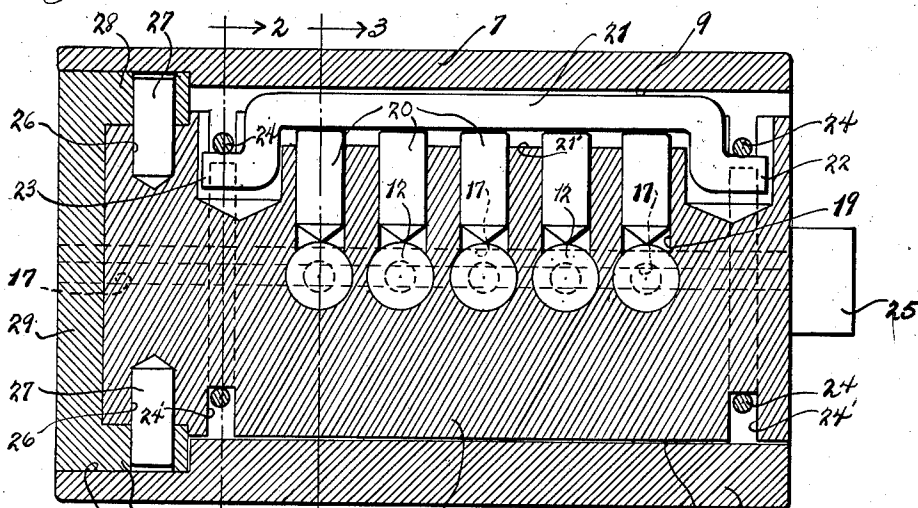


Fig. 2.

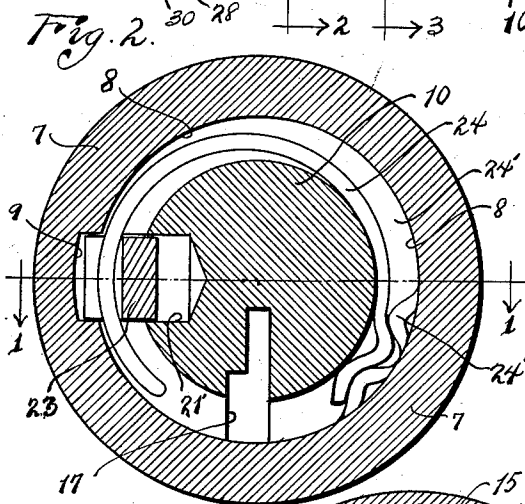


Fig. 3.

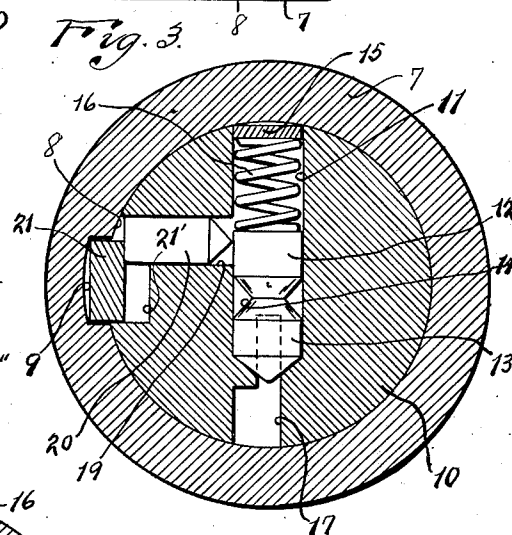
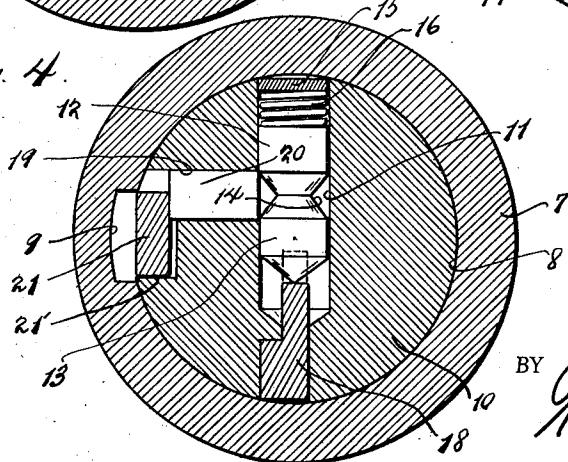


Fig. 4.



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LOCK

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4 Claims. (Cl. 70-47)

My invention relates to a new and useful improvement in a lock and has for its object the provision of a locking mechanism having movable tumblers for controlling the movement of the mechanism and so arranged and constructed that the tumblers may be simultaneously moved to releasing position by means of a suitable key, and the movement of the tumblers to releasing position, separately by means of a pick, is rendered practically impossible.

Another object of the invention is the provision of a locking mechanism so arranged and constructed that a plurality of tumblers must be brought to predetermined varied positions in order to effect a release of the mechanism with the full operative effect of the locking mechanism in position for functioning until all of the tumblers have been so moved.

Another object of the invention is the provision of a radially movable member for locking a rotatable part against rotation and normally held, when in locking position, by a plurality of movable tumblers, all of which must be moved to a predetermined position before releasing the locking bar.

Another object of the invention is the provision of a tumbler lock of this class which may be mounted in a suitable supporting body and which does not require a special casing for the rotatable part.

Other objects will appear hereinafter.

The invention consists in the combination and arrangement of parts hereinafter described and claimed.

The invention will be best understood by a reference to the accompanying drawing which forms a part of this specification, and in which, Fig. 1 is a longitudinal, central sectional view, taken on line 1-1 of Fig. 2,

Fig. 2 is a transverse sectional view taken on line 2-2 of Fig. 1,

Fig. 3 is a sectional view taken on line 3-3 of Fig. 1, and

Fig. 4 is a view similar to Fig. 3, showing the parts in different positions.

In this type of locking mechanism, the rotatable part, which may be termed the key plug, may be mounted in a suitable casing if desired, but it is a feature of the present invention that no casing is required with this type of mechanism. The key plug may be mounted in a suitable opening formed in the door or other similar supporting body with which it is intended to use the lock.

In the drawing, I have illustrated the inven-

tion used with a supporting body 7 in which is formed the bore or passage 8. Formed on the inner surface of the body 7 so as to communicate with the bore 8 is an axially directed groove 9.

Rotatably mounted in the bore or passage 8 is the plug 10 in which are formed a plurality of spaced, diametrically directed chambers 11. Positioned in each of these chambers 11 is a tumbler pin or plate embodying the end portions 12 and 13, separated by the peripheral notch or recess 14. This notch or recess 14 is formed in each of the pins intermediate the ends thereof, but the distance from the ends varies in the different tumbler pins, which are all preferably of the same length. One end of the chambers is closed by a suitable cap or plug 15, against which engages one end of a spring 16, the other end thereof engaging one end of the tumbler pin. Extending inwardly from one end of the plug 10 is a key slot 17 in which may be inserted the key 18. This key slot 17 projects through each of the chambers 11 adjacent one end thereof, and the key 18 when projected therein is adapted for engaging the ends of each of the tumbler pins.

Formed in the plug 10 so as to extend into each of the chambers 11 are the chordally directed passages 19 in each of which is slidably positioned a thrust pin 20.

An axially extending groove 21' is formed in the periphery of the plug 10, intersecting all of the chambers 19. Engaging in this groove 21' is a locking bar 21 having the angularly turned ends 22 and 23 embraced by the spring clips 24 which lie in the grooves 24' formed in the plug 10. This groove 24' is peened over the spring clip 24 as at 24'' in order to prevent dislodgement of the clip 24.

The bar 21 is movable radially of the plug 10 but the spring clips 24 serve to normally retain this bar in the groove 21' so as to clear the periphery of the plug and allow it to rotate in the supporting body 7 in which it fits snugly.

When the key 18 is inserted in the plug 10 so as to raise all of the tumblers to the position at which the notch or recess 14 of each of the pins registers with the chordally directed passages 19, the spring clips 24 will function to bring the bar 21 inwardly, and thus move the pins 20 into the position shown in Fig. 4, so that they engage at their inner ends in the recess or notch 14. It will be noted that when the parts are in this relative position the spring 16 is under compression. While the parts are in this position, the plug 10 which carries the locking finger 25 may be freely rotated in the bore 8. When the plug 10 is ro-

tated so that the grooves 21 and 9 register and then the key 18 removed, the spring 16 will function to force the tumbler pins downwardly into the position shown in Fig. 3. This is due to the fact that the springs 16 are of greater strength than the clips 24. When the tumblers are forced downwardly, the thrust pins 20 will be forced outwardly so as to force the bar 21 to move into the groove 9, thus locking the plug 10 against rotation in the body 7.

It has been found that a lock constructed in this manner is one which is very difficult, if not impossible, to pick.

A cover cap is mounted at the front or key entrance end of the lock and comprises the disk 29 having the flange 28 which engages in the cut away portion 30 of the body 7. Pins 27 extend through openings formed in the flange 28 and enter sockets 25 formed in the plug 10. This construction is preferable but the plug 10 may obviously be formed solid with head larger or smaller than receiving bore.

While I have illustrated and described the preferred form of construction of my invention, I do not wish to limit myself to the precise details of structure shown, but desire to avail myself of such variations and modifications as may come within the scope of the appended claims.

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

1. A locking mechanism of the class described adapted for use with a supporting body having a bore formed therein and provided with an axially directed groove opening into said bore; comprising a plug rotatably mounted in said bore; a radially movable locking bar carried by said plug and movable into said groove; means for resisting movement of said bar into said groove; means

for thrusting said bar into said groove; and movable tumbler pins for controlling the movement of said thrust means.

2. A locking mechanism of the class described adapted for use with a supporting body having a bore formed therein and provided with an axially directed groove opening into said bore, comprising: a plug rotatably mounted in said bore; means carried by said plug for engaging in said groove and preventing the rotation of said plug in said bore; means for resisting movement of said preventing means into said groove; means for thrusting said preventing means into said groove; and tumblers in said plug for actuating said thrusting means.

3. A locking mechanism of the class described adapted for use with a supporting body having a bore formed therein and provided with a slot opening into said bore, comprising: a plug rotatably mounted in said bore; means carried by said plug for engagement in said groove; means for resisting movement of said preventing means into said groove; means for thrusting said preventing means into said groove; a plurality of tumbler pins for actuating said thrusting means; and spring means for moving said tumbler pins into actuating position.

4. A locking mechanism of the class described comprising a plug; a radially movable bar carried by said plug; means for resisting outward radial movement of said bar; a plurality of tumbler pins carried by said plug and movable radially therein at an angle to the direction of movement of said bar; spring means for resisting movement of said tumbler pins in one direction; and means engageable with said pins and said bar for moving said bar radially outwardly of said plug.

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