April 21, 1931. F. B. ASHTON 1,801,299

AUTOMATIC COMBINATION LOCK

Original Filed Nov. 17, 1927

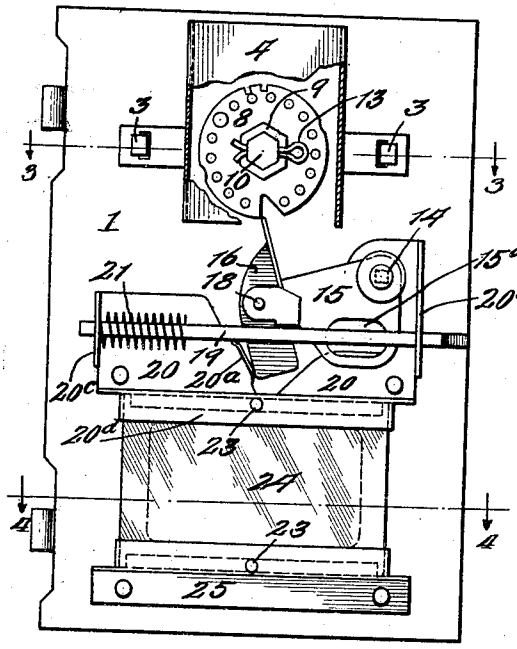


Fig. 1.

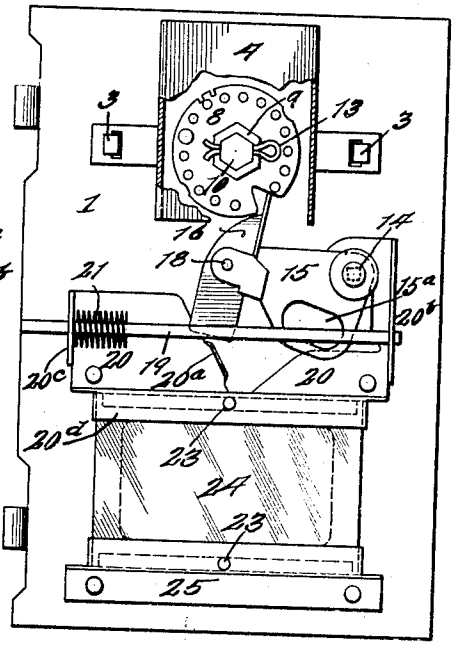


Fig. 2.

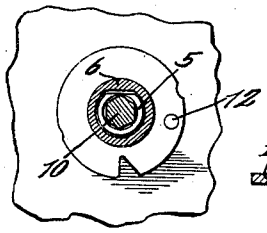


Fig. 7.

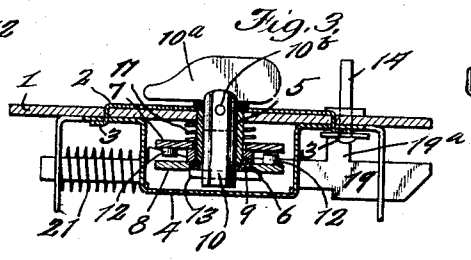


Fig. 3.

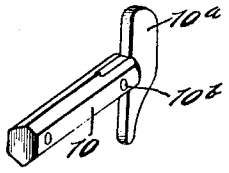


Fig. 6.

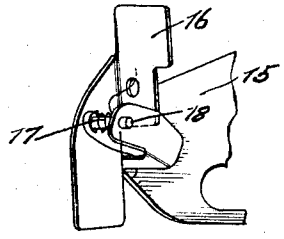


Fig. 5.

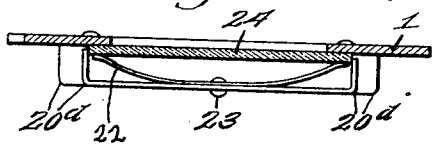


Fig. 4.

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Inventor

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UNITED STATES PATENT OFFICE

FRED B. ASHTON, OF ST. LOUIS, MISSOURI

AUTOMATIC COMBINATION LOCK

Application filed November 17, 1927, Serial No. 233,936. Renewed September 10, 1930.

My invention mainly relates to an improved means by which a door to which it is attached is locked when the door is closed by the mechanism in and attached to said lock, whether or not the operator wills it, and without the operator throwing off the combination by the revolution of the tumblers or otherwise, so that persons who have not the combination cannot obtain access to the receptacle closed with said lock.

Another object attained is a reduction in cost of construction, because of the possibility of attachment to a sheet metal door as well as one that has been cast.

I attain these objects by the mechanism illustrated in the accompanying drawing in which—

Fig. 1 is a rear view of a post office box door, on which the lock is used in this illustration, showing the mechanism set on the combination, that is, ready for the bolt to be retracted; Fig. 2 is a similar view, but showing the bolt retracted, in which operation the tumblers were rotated to some extent, so that when the bolt resumes its normal position, returning also to their normal positions the lever and dog which displaced the tumblers, the nose of said dog will not stand opposite the gates in the tumblers, thus preventing the retraction of the bolt the second time without again setting the combination; Fig. 3 is a sectional view on line 3—3 of Fig. 1 showing tumbler arrangement etc.; Fig. 4 is a sectional view on line 4—4 of Figure 1, showing the glass holding device; Fig. 5 is a view in perspective (enlarged) showing the construction of the dog and lever hereinafter described; Fig. 6 is an enlarged perspective of the indicator and indicator shaft showing its construction; Fig. 7 is a view showing a bushing through which the indicator shaft extends, a partially completed tumbler, and a nonrotatable washer mounted on said bushing, which prevents one disk tumbler from rotating by friction with the other, except when pins inserted in each tumbler come in contact with each other.

Similar numbers refer to the same parts throughout the several views.

The indicator dial 2 (Fig. 3) is not integral with door 1, but is a separate piece of sheet metal on which numbers or other marks are stamped for setting the combination. This dial has two lugs 3 (one on each side) formed so that they project through slots in the door 1, and through slots in lock cover 4 to be clamped or riveted on the inside and holding these three parts firmly together.

Extending through a hole in the door 1 and dial 2, and projecting on the inside is a bushing 5. This bushing has one side flat except where it is attached to the door and dial, as shown in Figure 7, which permits the mounting of a nonrotatable washer 6 between the disk tumblers 7 and 8. Disk tumbler 7 is rotatably mounted on bushing 5. Disk tumbler 8 has a hexagonal opening in the center, in which a hexagonal washer 9 loosely fits to facilitate the changing of combinations. This hexagonal washer 9 also has a hexagonal opening in its center, for mounting on indicator shaft 10 which is hexagonal in shape. This hexagonal washer 9 operates at the inside end of bushing 5.

Also mounted on and around bushing 5 is a coiled spring 11 which forces tumbler 7 against washer 6 and this washer against tumbler 8, keeping the latter in engagement with hexagonal washer 9 so that this tumbler 8 may be actuated by rotation of the indicator shaft 10, and which in turn will actuate tumbler 7 through contact of pins 12 in both tumblers.

Another function of this coiled spring 11 is to keep the entire assembly tight against the cotter pin 13 through the end of indicator shaft 10 to prevent easy rotation by accident, and to prevent the return of the tumblers to the opening point by dog 16 as it resumes its normal position after displacing the tumblers, and as it drags against the edge of the tumblers.

Mounted on the inner end of knob 14 is a lever 15. This lever 15 has an opening 15—*a* below where knob 14 enters it, for the reception of an extension 19—*a* from bolt 19, so that when the knob 14 is turned the outer end of lever 15 moves upward, and bolt 19 is retracted to permit the opening of the door.

Mounted on the outer end of lever 15 by

pivot pin 18, is a dog 16. When tumblers 7 and 8 are set for opening, with their gates opposite the end of dog 16, knob 14 may be turned, the outer end of lever 15 moves upward, retracting the bolt 19, the nose of dog 16 entering the gates in the tumblers and then pushing them around to the point as indicated in Fig. 2.

Housed in the formed end of lever 15, around pivot pin 18 is a combination compression and torsion spring 17, the function of which is to keep the dog 16 flat against the inner side of lever 15, and to return the dog 16 to its normal position when lever 15 is also returned to normal position after pressure on knob 14 is removed. The return of these parts as well as bolt 19 is effected by coiled compression spring 21 around the rear end of bolt 19.

In the return of dog 16 to normal position, the lower end slides over lug 20—*a*, formed from bracket 20, and becomes locked behind this lug, so that bolt 19 cannot be retracted until combination is again set for opening.

Bracket 20, which is attached by rivet or otherwise to door plate 1 is made of sheet metal formed at each end 20—*b* and 20—*c* and slotted in said formed portions for the slidable operation of bolt 19. It also has a formed lug 20—*a* behind which the lower end of dog 16 locks when in normal position, as shown above.

Also fastened to door plate 1, at the lower end, is a small bracket 25 formed from sheet metal to receive glass 24 and spring 22, which is held in place by rivet 23, as shown by Fig. 4.

Fig. 6 illustrates in detail indicator shaft 10 and indicator 10—*a*, which is constructed of a hexagonal shaped rod rounded and slotted at one end to receive stamped sheet metal indicator 10—*a*, both being held together by rivet 10—*b*.

In the construction of this lock it may be necessary for me to depart to some extent from the descriptions and illustrations herein, hence I desire that it be understood that I may not confine myself strictly thereto, although remaining within the scope and spirit of my invention.

Having described my invention, what I claim as new and wish to protect by Letters Patent is:

1. In an automatic combination lock, the combination with a bolt, a knob, tumblers, indicator and indicator shaft, of a dial having two formed lugs adapted to project through slots in a door and lock cover for holding them firmly in place, substantially as specified.

2. In an automatic combination lock, the combination with a bolt, knob, tumblers, indicator and indicator shaft, and a dial, of a bushing fastened at one end in the dial and door, projecting inward from the door and having mounted thereon for rotation the tumblers, and having a portion of one side flat for mounting a nonrotatable washer, substantially as specified.

3. In an automatic combination lock, the combination with a bolt, a knob, tumblers, indicator and indicator shaft, and a dial, of a bushing on which tumblers rotate, a washer of hexagonal shape inside and outside mounted on a hexagonal shaped indicator shaft adapted for the actuation of a tumbler substantially as specified.

4. In an automatic combination lock, the combination with a bolt, a knob, tumblers, indicator and indicator shaft, a dial, and a bushing upon which tumblers rotate, of a coiled compression spring mounted on said bushing adapted to holding tumblers and washers mounted on the bushing in proper contact and to the prevention of accidental rotation of tumblers when not desired, substantially as specified.

5. In an automatic combination lock, the combination with a bolt, a knob, tumblers, indicator and indicator shaft, a dial, and a bushing on which tumblers rotate, of an indicator shaft hexagonal in shape, with one end rounded and slotted and adapted to receive an indicator stamped from sheet metal, substantially as specified.

6. In an automatic combination lock, the combination with a bolt, a knob, tumblers, indicator and indicator shaft, a dial, washers and a lever actuated at one end by a knob and carrying a dog on its other end, of a dog as indicated, pivotally mounted at one end of the lever, with its upper end adapted to enter gates in the tumblers and its other end adapted for sliding over and behind a lug which locks it in place, substantially as specified.

7. In an automatic combination lock, the combination with a bolt, a knob, tumblers, indicator and indicator shaft, a dial, washers, a lever mounted on the knob at one end and the other end carrying a dog adapted to the rotation of tumblers, of a combination compression and torsion spring assembled with the dog and adapted for forcing it to slide over and behind a lug for locking and holding it in normal position, substantially as specified.

8. In an automatic combination lock, the combination with a bolt, a knob, tumblers, indicator and indicator shaft, a dial, washers, a lever mounted on the knob carrying on its other end a dog for rotation of tumblers, of a bolt made from sheet metal with a projection adapted for engagement with a lever for actuation, and slidably mounted on brackets, substantially as specified.

9. In an automatic combination lock, the combination with a bolt, a knob, tumblers, indicator and indicator shaft, a dial, washers, a lever, and a dog, of a bracket adapted

for fastening to the door to which the lock is attached, having its two ends formed and slotted for the slidable mounting of a flat bolt, and having a formed lug for locking the dog to prevent operation of the bolt again without setting the combination, substantially as specified.

In witness whereof I have hereunto affixed my signature.

FRED B. ASHTON.