Oct. 20, 1925.

1,558,080

J. L. FOUTS

COMBINATION LOCK

Filed Sept. 25, 1924

2 Sheets-Sheet 1

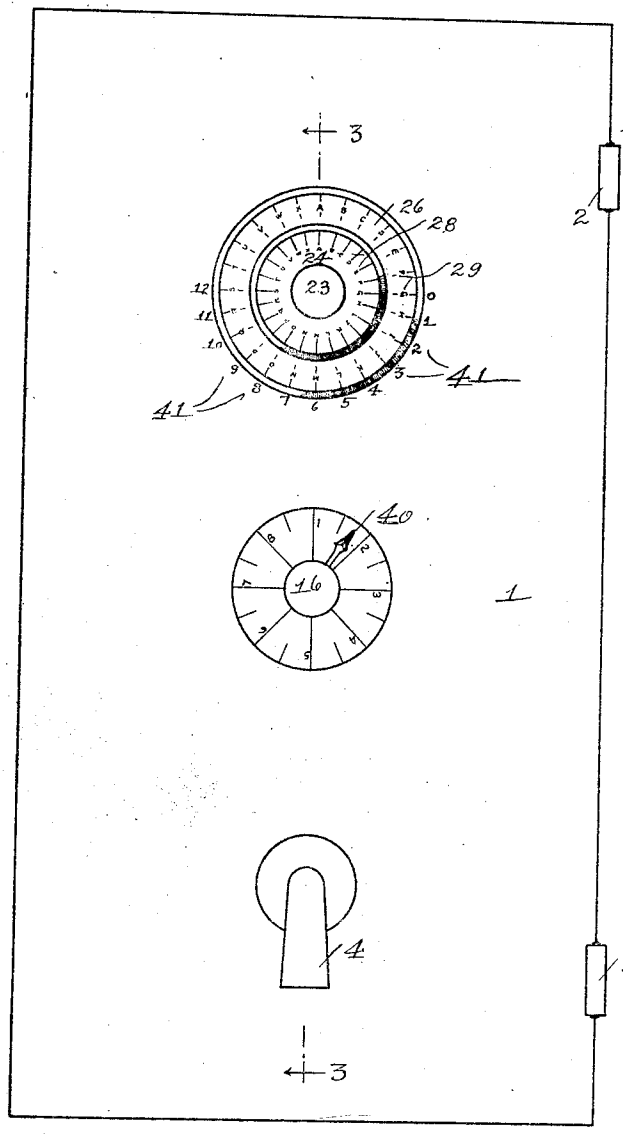


Fig. 1.

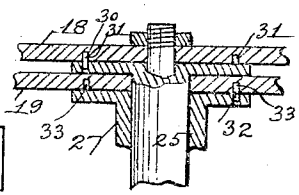


Fig. 4.

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Witness:

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Oct. 20, 1925.

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2 Sheets-Sheet 2

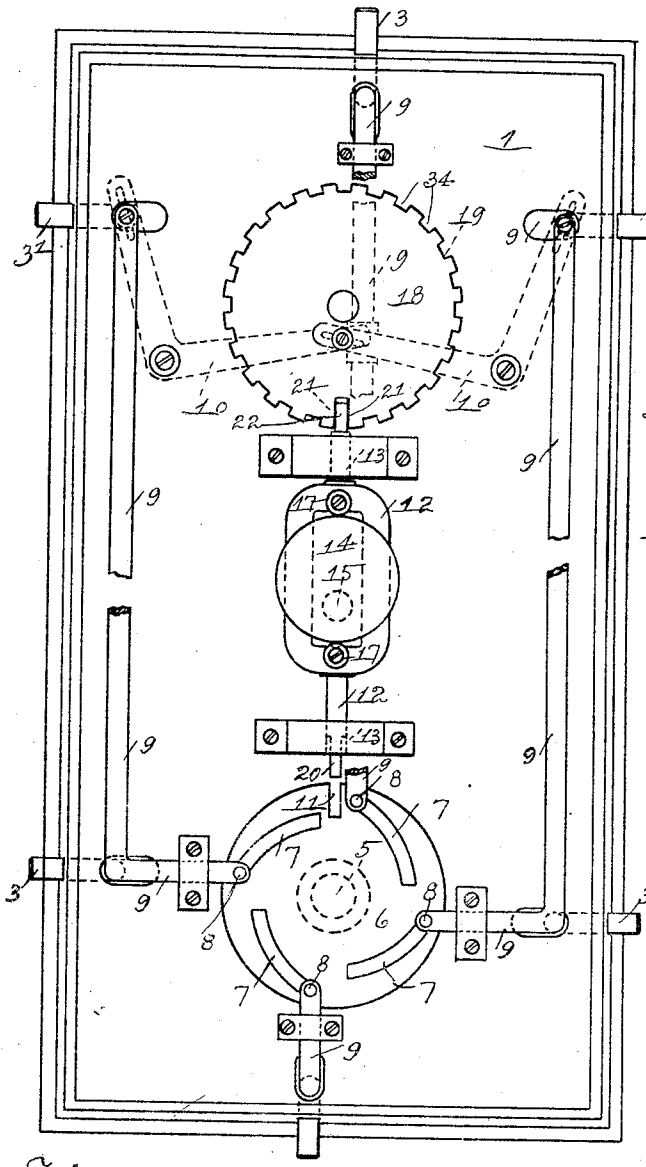


Fig. 2.

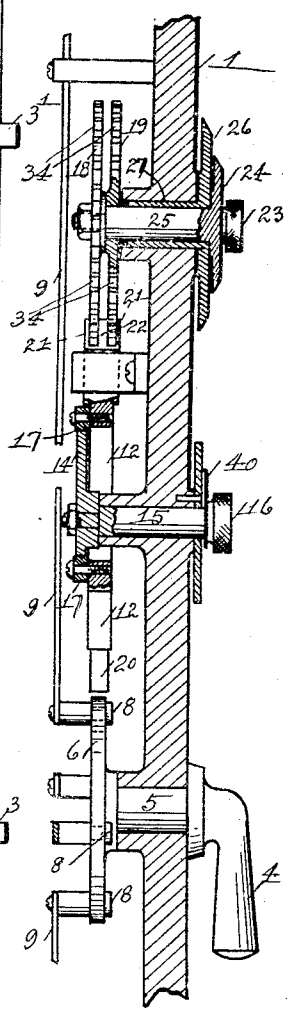


Fig. 3.

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Patented Oct. 20, 1925. 1,558,080

UNITED STATES PATENT OFFICE.

JAMES L. FOUTS, OF MUSKEGON, MICHIGAN.

COMBINATION LOCK.

Application filed September 25, 1924. Serial No. 739,791.

To all whom it may concern:

Be it known that I, JAMES L. FOUTS, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented new and useful Improvements in Combination Locks, of which the following is a specification.

The present invention relates to combination locks; and its object is to provide such a lock improved in various respects hereinafter appearing; and, more particularly, to provide in such a lock means for readily changing the combination; and further, to provide in such a lock means whereby the operative movement of the parts into opening combination with each other cannot be detected by sound or touch.

These and any other objects hereinafter appearing are attained by, and the invention finds preferable embodiment in, the structure hereinafter particularly described and illustrated by the accompanying drawings, in which:—

Figure 1 is a face view of a safe or vault door to which my lock is applied;

Figure 2 is an inner side view of the same;

Figure 3 is a vertical sectional view of said door taken on line 3—3 of Figure 1 and showing the parts of the lock, some of which are shown in section; and

Figure 4 is an axially-sectional view of certain parts of the lock.

The door 1 hingedly mounted at 2 carries on its inner side the concealed parts of the lock, whose manually operated means and indicators are carried on the outer side or face of the door. A plurality—six in the lock illustrated in Figure 2—of locking bars 3 are slid into and out of holding engagement with keepers in the jamb of the door by any suitable means, as by the handle 4 whose shaft 5 carries, inside the door, the circular plate 6 having cam-grooves 7 in which slide the pins 8 of connecting rods 9 carried by the locking bars, bell-crank levers for sliding the locking bars 3′ being indicated in dotted lines at 10.

The plate 6 has a recess 11 adapted to receive the lower end 20 of the locking bolt 12 when the plate 6 is turned to the position seen in Figure 2, the bolt thus received into the recess 11 locking the plate 6 against being turned by the handle 4 to open the door. This locking bolt 12 is slidably movable in bearings 13, into and out of said engagement with the recess 11 of the plate 6, by an eccentric cam member 14 whose turnable shaft 15 carries the knob 16 outside the door, this cam member's periphery bearing on the locking bolt's anti-friction rolls 17 to slide said bolt. When this locking bolt 12 engages in said recess 11, it is held in such locking position by the periphery of the disks 18, 19 except when these disks are rotated to the positions seen in Figure 2, in which positions their interrelatively registering recesses 21 are in position to receive the upper end 22 of the locking bolt when moved upwardly into unlocking position as shown in said view, in which position of the locking bolt its lower end 20 is withdrawn from the recess 11 of the plate 6 thus allowing the bars 3 to be slid inwardly to permit the door to open.

The disk 18 may be manually rotated from outside the door by the knob 23 or by the circular indicator 24 on the shaft 25 whose inner end carries the said disk; and the disk 19 may be rotated from outside the door by the circular indicator 26 on its hollow shaft 27 whose inner end carries said disk, this hollow shaft containing the shaft 25 of the other disk 18. These circular indicators 24 and 26 are provided with suitable symbols, as the letters indicated at 28 and 29 respectively, for indicating the rotated positions of the respective disks.

In order to "change the combination" of the lock when desired, these disks are adjustable to different angular positions on their respective shafts and are secured in such positions by suitable means.

In the construction seen in Figure 4, such means comprises a pin or projection 30 carried by the radially-extended end of the inner shaft 25 adapted to engage in any one of a circularly arranged series of holes 31 in the disk 18, a similar provision being made for the other disk 19, its shaft's radially-extended end carrying a pin or projection 32 adapted to engage in any one of the circularly disposed series of holes 33 in the disk 19.

In order to confuse one who tampers with the lock and attempts to detect by sound or touch when the recesses 21 of the disks 18 and 19 are in the position in which the upper end 22 of the locking bolt may be received thereinto, the peripheries of these

disks are provided with notches 34 adapted to receive the end 22 of the locking bolt when moved toward unlocking position; but these notches are so shallow that they do not permit the locking bolt when slid thereinto to be withdrawn far enough to disengage from the recess 11 of plate 6.

The cam member 14 may be adjustably held in different angular positions on the inner end of its shaft 15, by suitable means, as by means identical with those shown in Figure 4 for thus securing the disks 18, 19 to their respective shafts; and the cam member's shaft 15 may carry means, as the indicator pointer 40 for indicating its rotated position. This provision serves to further confuse one who tampers with the lock.

A plurality of fixed points, as indicated by numbers or symbols at 41 on the face of the door, may be provided, so that any one of said points may be selected as the point relatively to which the disks 18, 19 are adjusted to provide the opening combination.

The invention being intended to be pointed out in the claims, is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings or hereinbefore described.

I claim:

1. In a lock: a locking bar movable into and out of locking position; a rotatable member having a spirally-formed cam and a recess; means engaging the cam for moving the locking bar; a locking bolt movable into and out of engagement with said recess to hold said member against rotation.

2. In a combination lock: a slidably movable locking bolt; a rotatable shaft; a disk carried by said shaft and having a peripheral recess adapted to receive one end of the bolt moved into unlocking position; a rotatable member having a peripheral recess adapted to receive the other end of the locking bolt when moved into locking position; a second rotatable shaft carrying a cam member engaging the locking bolt intermediate its ends to slidably move the same.

In testimony whereof I have hereunto set my hand at Grand Rapids, Michigan, this 22nd day of September, 1924.

JAMES L. FOUTS.