C. E. BREDE.

LOCK.

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1,009,891. Patented Nov. 28, 1911.

Fig. 2.

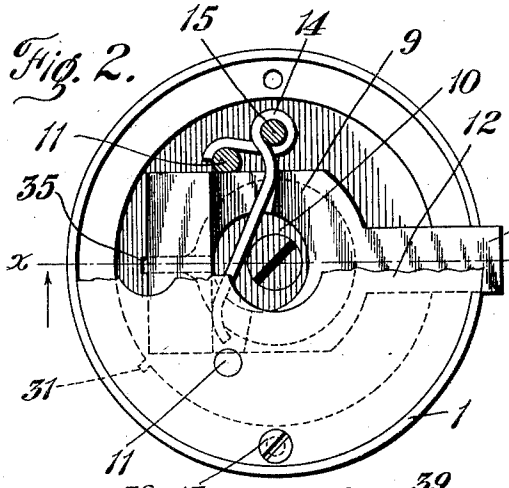


Fig. 1.

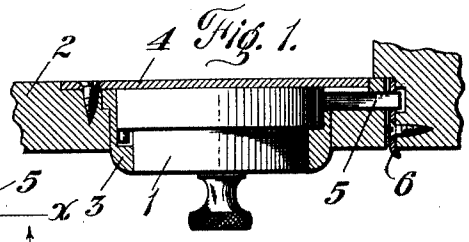


Fig. 3.

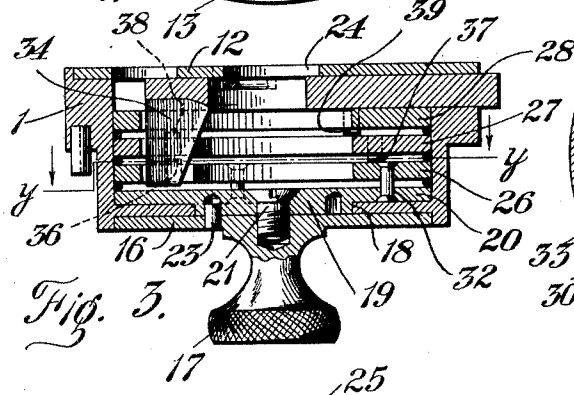


Fig. 4.

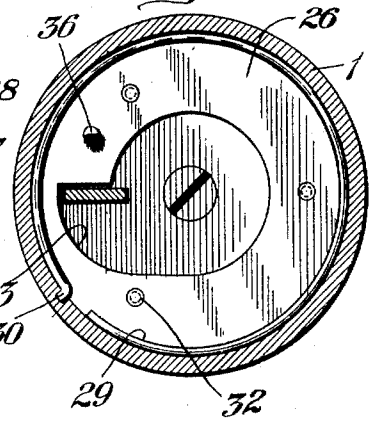


Fig. 5.

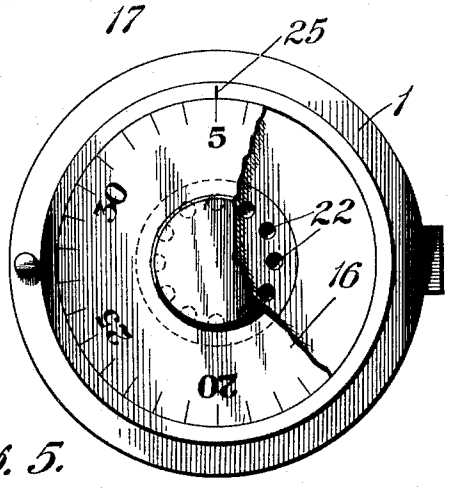
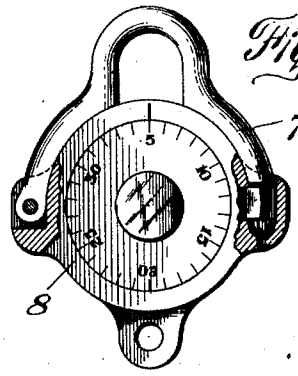


Fig. 6.



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LOCK.

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To all whom it may concern:

Be it known that I, CARL E. BREDE, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Locks, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in permutation or keyless locks and its object is to provide a very compact construction which is cheap to manufacture and efficient in its operation.

To this end the invention consists in the matters hereinafter set forth and more particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is an edge elevation of a lock embodying the invention and showing the same as arranged for locking a door; Fig. 2 is an enlarged rear elevation of the lock detached with parts broken away to show the construction; Fig. 3 is a transverse section on the line x—x of Fig. 2; Fig. 4 is a vertical section on the line y—y of Fig. 3; Fig. 5 is a front elevation of the same with parts broken away to show the construction; and Fig. 6 is a modified construction showing the lock constructed as a padlock.

The lock proper consists of a suitable cylindrically shaped casing 1 which when the lock is applied to a door 2 shown in Fig. 1, may be inserted within an outer casing 3 of any suitable form having an inside closing plate 4 secured to the inner face of the door over the inner side of the casing 1 of the lock. Within the casing 1 is a reciprocable bolt 5 adapted to be projected through an opening in the side of the casing into engagement with a striker plate 6 as shown in Fig. 1, or into engagement with a notch in one end of a shackle 7 which is pivotally attached at its opposite end to the other side of a suitable outer casing 8 within which the lock proper is secured, and forms a padlock as shown in Fig. 6. The bolt 5 is formed with an enlarged inner end 9 having a center opening 10 and is guided and supported within the casing between studs 11 on a back plate 12 which closes the inner end of the casing 1 and is secured thereto by screws 13 or other suitable means. The bolt is retracted by a spring 14 coiled about a stud 15 on the plate 12 with one end engaging a shoulder on the bolt.

The outer end of the casing 1 is formed with a recess to receive the plate or disk 16 which is provided or otherwise formed with a knob or handle 17 for turning the disk and the outer end of the casing is also formed with an axial opening 18 to receive a projecting hub portion 19 of a disk or plate 20 upon the inside of the casing, said disk 20 being secured to the disk 16 on the outside of the end wall of the casing, by an axial screw 21. By taking out this screw the plate 16 may be removed or adjusted relative to the plate 20 which plate is provided with a concentric row of holes 22 in its hub 19 to receive a pin 23 carried by the plate 16. When the screw 20 is removed by means of a screw driver inserted through an axial opening 24 in the plate 12, the plate 16 may be moved to disengage the pin from one of the holes in the plate 20 and the plate then turned to engage its pin with one of the other holes, the outer or dial plate being readily adjusted relative to the plate 20 and to a suitable line or mark 25 on the edge of the casing 1 which is adapted to register with suitable scale or division markings on the dial plate 16.

Fitting loosely within the casing 1 to turn freely therein are three rings 26, 27 and 28, spaced apart by spring wire rings 29 each formed of a length of wire with one end 30 turned outward to engage a notch 31 in the wall of the casing and with its opposite end free and spaced from the out-turned end so that the ring will expand and lie closely against the inner face of the wall of the casing. The ring 26 is attached to the disk 20 to turn therewith by pins or rivets 32 and extending laterally from its center opening is a cam slot 33 to receive a lug 34 extending forwardly from the rear end of the bolt 5, the rings 27 and 28 being also formed with slots 35 extending laterally from their center opening to receive said lug.

When the parts are in the position shown and the ring 26 is turned, the bolt 5 will be projected by the engagement of the curved side of the cam slot 33 with the lug 34 on the bolt and said lug will thus be moved out of engagement with the slots 35 of the rings 27 and 28. Further turning of the ring 26 will bring the concentric inner edge of the ring into engagement with the lug

and the bolt will thus be held projected. On the ring 26 is a pin 36 projecting laterally therefrom toward the ring 27 which is provided with a similar pin 37 projecting laterally into the path of the pin 36, said pin 37 being located diametrically opposite the pin 36. A pin 38 on the ring 27 extends laterally therefrom toward the ring 28 which is provided with a pin 39 located in the path of said pin 38. Continued turning of the ring 26 will bring its pin 36 into engagement with the pin 37 on the ring 27 and said rings will then turn together, and the turning of the ring 27 will bring its pin 38 into engagement with the pin 39 on the ring 28 and the latter ring will be turned with the others thus moving the slots 35 in the rings 27 and 28 out of alinement with the lug 34 of the bolt which will be held projected thereby.

The retraction of the bolt is accomplished by turning the dial plate in accordance with the markings thereon, the operator knowing what number will register with the line 25 when the slot 35 in the ring 28 is in position to permit the bolt to be retracted. The ring 27 is next brought into position by the turning of the ring 26 in an opposite direction, the operator being guided in such turning by the markings on the dial plate, and then the ring 26 is finally turned to aline its slot with the slots 35, the motion being again reversed, when the spring 14 will retract the bolt. The combination of the lock may be quickly and easily changed, as before described, by adjusting the dial plate 16 relative to the plate 20 and by constructing the computing mechanism of a series of rings, easy access may be had to the screw controlling the change of the combination, through the axial opening 24 in the plate 12. The ring construction also facilitates the assembling of the devices as said rings are simply slipped into the casing with the spacing wires between and a very compact construction is secured as the lug operating the bolt passes through the axial opening of the rings.

What I claim is:

1. In a permutation lock the combination of a casing, permutation mechanism within the casing comprising a plurality of rings having a peripheral bearing within the casing, spacing members between the rings expansible into engagement with the inner face of the wall of the casing to space the rings apart, means on each ring for turning an adjacent ring, a bolt, and means on the bolt projecting through and engaging the rings.

2. In a permutation lock the combination of a casing closed at its front end, permutation mechanism in the casing comprising a plurality of rings, a dial outside the front wall of the casing operatively connected to the rings, and means operable from within the casing through said rings for adjusting said dial and rings relatively.

3. In a permutation lock the combination of a casing having a closed front end, a dial outside of said end, a member within the casing rotatable with the dial, means for adjustably attaching said member to the dial operable from within the casing, permutation mechanism comprising a plurality of rings rotatable within the casing, a bolt operated by the turning of said rings, means for turning the dial, and means on each of the rings for turning an adjacent ring.

4. In a permutation lock the combination of a cylindrical casing having a closed outer end, a dial plate outside of the end wall of the casing, a plate within the casing having a hub portion extending through an opening in the end wall of the casing and adjustably attached to the dial, means removable from within the casing for securing the plate and dial together, permutation mechanism comprising a plurality of rings fitting loosely within the casing and rotatable therein and each provided with a slot extending radially from its axial opening, means on each ring for engaging and turning an adjacent ring, a longitudinally movable bolt within the casing adjacent to one side of the rings, a lug on the bolt extending through said rings and adapted to engage the slots thereof, the slot of one ring being formed with a cam side to engage the lug and project the bolt, a spring to retract the bolt, and means for actuating the permutation mechanism.

5. In a permutation lock, the combination of a cylindrical casing, permutation mechanism comprising a plurality of rings loosely fitting within the casing and provided with slots extending outward from their inner edges, the slot of one of said rings being formed with a cam side, a dial outside the end wall of the casing, a plate within the casing adjustably connected to the dial and attached to one of said rings to turn therewith, means for spacing the rings apart, a member on each ring adapted to engage a member on its adjacent ring and turn said ring, a bolt within the casing reciprocable transversely of said rings, a lug on the bolt extending through said rings and adapted to engage the slots therein, said bolt being adapted to be projected by the engagement of the cam slot with said lug, and a spring for retracting the bolt.

In testimony whereof I affix my signature in presence of two witnesses.

CARL E. BREDE.

Witnesses:
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ANNA C. RAVILER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."