

W. ERHARDT.  
 PERMUTATION LOCK.  
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931,287.

Patented Aug. 17, 1909.

FIG. 1.

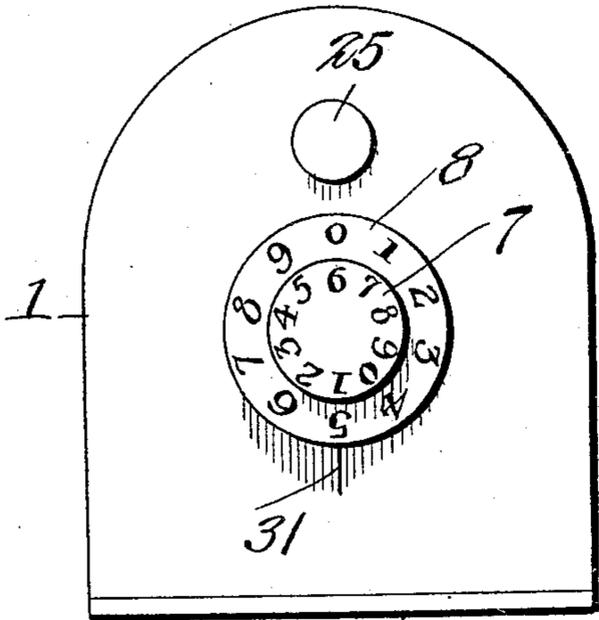


FIG. 2.

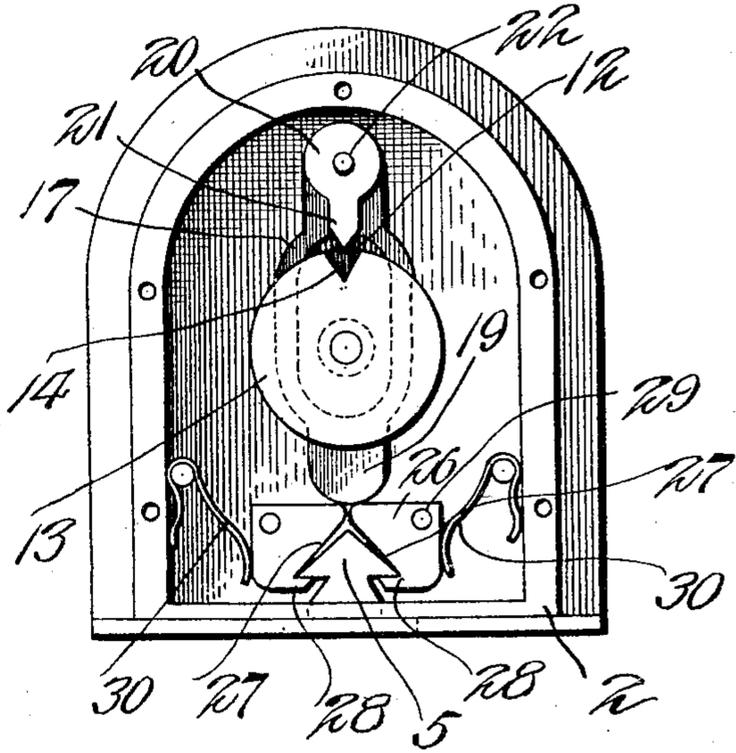


FIG. 3.

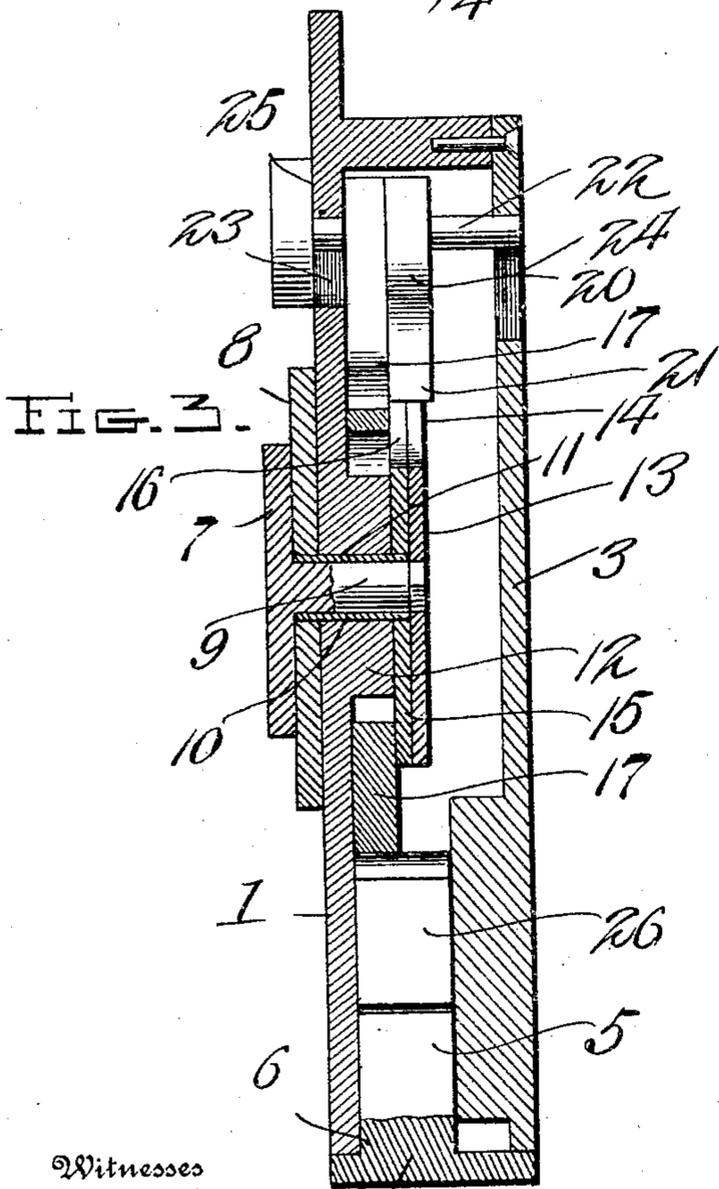
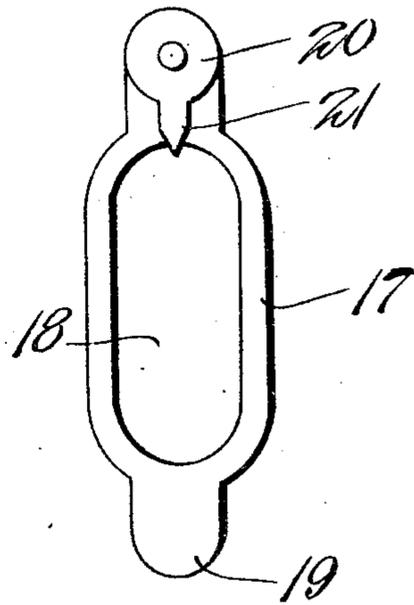


FIG. 4.



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# UNITED STATES PATENT OFFICE.

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## PERMUTATION-LOCK.

No. 931,287.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed September 18, 1908. Serial No. 453,617.

*To all whom it may concern:*

Be it known that I, WILLIAM ERHARDT, a citizen of the United States, residing at Astoria, Long Island City, in the county of Queens and State of New York, have invented new and useful Improvements in Permutation-Locks, of which the following is a specification.

This invention relates to combination or permutation locks, the object of the invention being to provide a simple, inexpensive and reliable lock for chests, trunks, suitcases, writing desks, etc., which may be interlocked with the keeper irrespective of the condition of the permutation mechanism and conveniently unlocked by a person acquainted with the combination.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawing, in which:—

Figure 1 is a face view of a permutation lock embodying my invention showing the same interlocked with the keeper. Fig. 2 is a back view of the same with the cover plate removed. Fig. 3 is a central longitudinal section through the lock on an enlarged scale. Fig. 4 is a detail view of the slotted slide or retractor bar.

Referring to the drawing, 1 designates the lock casing which may be of any suitable form to inclose the operating parts, and which is provided with a flat side or abutting face 2 to bear against the keeper and is open at its rear, which is closed by a cover plate 3, secured in position in any preferred manner. The keeper 4 employed in conjunction with the locking mechanism of the casing comprises an oblong flat plate carrying on its outer face an arrow-shaped locking head 5 which is adapted for insertion into the lock casing and withdrawal therefrom through a slot 6 of suitable dimensions in the face 2.

At the front of the lock casing are arranged indicating dials or disks 7 and 8, the dial 7 being of smaller diameter than the dial 8 and arranged to bear against the outer face thereof, the rear face of said dial 8 bearing against the front or face plate of the casing. Each of these dials is provided with a series of numerals or indicating marks, which correspond with each other and are arranged progressively in a circle around the faces of said dials.

The dial 7 is mounted upon the outer end of a stem or shaft 9, while the dial 8 is mounted upon the outer end of a hollow shaft or sleeve 10 which incloses the shaft 9 and in which the latter is adapted to turn. These shafts extend inwardly into the lock casing through an opening 11 formed in the front plate of the casing and in a bearing boss 12 formed on the inner side of said front plate. The inner end of the shaft or stem 9 projects beyond the corresponding end of the shaft or sleeve 10 and has suitably fixed thereto a locking tumbler or disk 13 provided at one point in its periphery with a V-shaped notch or recess 14. A similar locking disk or tumbler 15 is mounted upon the inner end of the shaft or sleeve 10 and is provided at one point in its periphery with a V-shaped notch or recess 16. These locking disks correspond in diameter and lie in abutting contact, with the front face of the disk 13 bearing against the rear face of the disk 15 and the front face of the latter bearing against the boss 12.

A retractor bar or plate 17 is arranged to slide longitudinally of the casing between the front plate and disk 15 and is provided with a longitudinal slot 18 receiving the boss 12, the side edges of which bear against the side walls of the slot 18, so that the boss forms a guide to insure movement of the bar or plate in a determined path. The boss corresponds in contour with the slot 18 and is of the same width but of less length than said slot, to permit the bar or plate to have a determined range of sliding movement. One end of the bar, for convenience termed the lower end, is provided with a contact portion 19, while the other or upper end thereof is formed with a boss 20 carrying a V-pointed projection 21 adapted to engage and ride upon the peripheries of the disks 13 and 15 to hold said bar from operating movement and to move into the recesses 14 and 16 of said disks to permit the bar to have a determined range of operating movement when said recesses 14 and 16 are in registering relation. A stem 22 projects across the upper portion of the casing from front to rear and passes through the boss 20 and is movable at its ends in guide slots 23 and 24 formed in the front and cover plates of the casing. To the forward end of this stem is connected a knob or finger piece 25 or other suitable form of operating device by which the slide may be operated. The notches 14 and 16 in the

respective disks 13 and 15 may be arranged in alinement with any of the indicating numerals or marks on the setting or indicating dials 7 and 8. For convenience of description, it may be assumed that the notch 14 is arranged in alinement with the numeral 6 on the dial 7 and the notch 16 in alinement with the cipher on the dial 8.

The contact portion 19 of the operating slide lies in contact with the flat inner faces of a pair of locking dogs 26 adapted to engage the locking head 5 of the keeper plate 4. These dogs are provided with beveled faces 27 to engage the corresponding faces of the head 5 and are formed on their outer faces with inwardly projecting hooks 28 to engage the shoulders of said locking head, as shown in Fig. 2, to hold said head against withdrawal through the slot 6. At their inner corner portions the dogs are pivotally mounted upon pins or studs 29 projecting from the front plate of the lock casing, so that when the slide is moved forwardly said dogs will be swung on their pivots to cause the locking hooks 28 to move outwardly in opposite directions from engagement with the shoulders of the locking head. Springs 30 are suitably supported within the casing to bear against the outer sides of the dogs in advance of their pivot points to normally hold the dogs in alinement with their locking hooks projected and their inner faces in contact with the portion 19 of the slide, and serve to return the dogs to such position after they have been swung open by the action of the slide to release the locking head and to return the slide to normal position upon the release of the knob or finger piece 25. The hooks 28 are provided with beveled ends which are adapted to be engaged by the beveled faces of the head 5, so that upon the inward movement of the head the hooks will be spread apart by an outward swinging movement of the dogs under the pressure of the head, thus providing for an automatic locking engagement between the head and dogs independent of the action of the slide at all times when said slide is in normal (retracted) position.

It will be understood from the foregoing description that the keeper and lock casing may be brought into locking engagement at any time whether or not the permutation mechanism is arranged to permit movement of the slide, so that, if desired, the closure to which the lock is applied may be fastened so that it can not be opened except by one acquainted with the combination of the permutation mechanism, or so that the closure may be opened freely at any time by a simple movement of the operating knob 25. Assuming that the locking head is engaged with the dogs and that it is desired to set the lock so that it can not be opened to release the keeper except by one acquainted with the combination, the setting or indi-

cating dials 7 and 8 are adjusted to move their proper indicating numerals out of registering relation with each other and with the cooperating indicating mark 31 on the face of the casing with which said numerals are brought into alinement in order to set the recesses 14 and 16 in registering relation. Any attempt to operate the lock will then be frustrated by contact of the projection 21 with the peripheries of the disks 13 and 15, which will prevent the slide from being moved forward to force the dogs open. When the disks 7 and 8 are adjusted, however, to set the proper indicating numerals thereon, in alinement with the mark 31, the recesses in the disks 13 and 15 will be brought in alinement beneath the projection 21, which may thus move into said recesses and allow the slide to be operated to open the dogs for the release of the locking head of the keeper.

From the foregoing description, taken in connection with the drawing, the construction and mode of operation of my improved permutation lock will be readily understood, and it will be seen that a simple, inexpensive and reliable type of lock is provided. Of course, any suitable number of setting and locking disks may be employed to render the operation of the lock more or less complex.

Having thus fully described the invention, what is claimed as new is:—

1. In a lock, a keeper having an arrow-shaped locking head, a casing provided with a slot for the insertion and withdrawal of said locking head, spring actuated dogs pivotally mounted within the casing and provided with beveled inner faces and having inwardly projecting locking hooks at the outer ends thereof to engage said locking head, said hooks being also formed with beveled faces, a slide adapted to engage the inner ends of said dogs to swing them to open position, the said dogs being adapted when the slide is retracted to be independently opened by pressure of the locking head upon the beveled faces of the hooks, and permutation mechanism controlling said slide.

2. A lock comprising a casing, spring actuated dogs pivotally mounted therein, a slide independent of connection with the dogs and provided with an engaging member at one end and a bearing portion at its opposite end, said bearing portion being adapted to engage and swing the dogs to open position upon the operating movement of the slide, coaxially mounted disks having peripheral notches adapted to receive the projection on the slide, and means for setting said disks.

3. A lock comprising a casing, a pair of pivotally mounted spring actuated dogs therein, a guide portion upon the casing, a slide having a longitudinal slot receiving

5 said guide portion, said slide being provided at one end with a projection and having its opposite end arranged to engage the dogs and to swing the same to open position upon the operation of said slide, and permutation mechanism including notched locking disks adapted to cooperate with said projection to control the operation of the slide.

10 4. A lock comprising a casing, spring-actuated locking dogs therein, a slotted slide for moving the dogs to retracted position, said slide having a bearing portion at one end to engage the dogs and a projection at its opposite end, guiding means on the casing projecting into the slot of the slide, ro-

tary disks coaxially mounted and arranged to lie in the path of said projection, said disks being provided with recesses adapted to be brought into register to receive said projection and to permit movement of the slide, means for operating the slide when released for movement, and permutation setting disks for adjusting the first-named disks. 20

In testimony whereof I affix my signature in presence of two witnesses. 25

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Witnesses:

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