M. HALEY.

COMBINATION LOCK.

APPLICATION FILED AUG. 4, 1915.

1,212,767.

Patented Jan. 16, 1917.

2 SHEETS—SHEET 1.

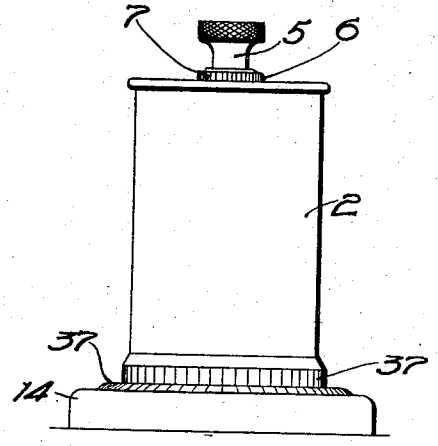


FIG. 1.

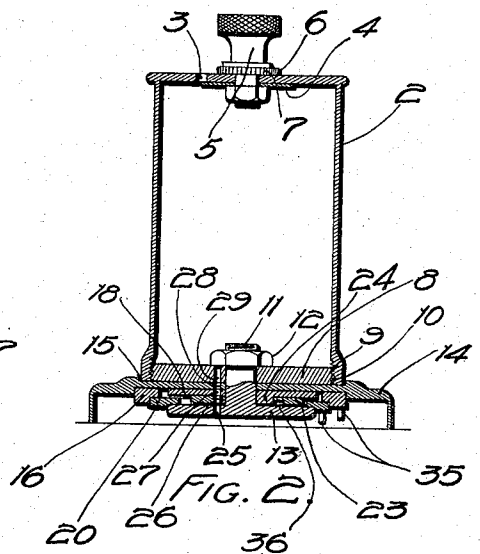


FIG. 2.

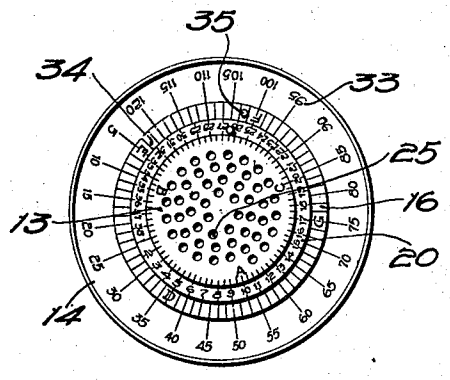


FIG. 3.

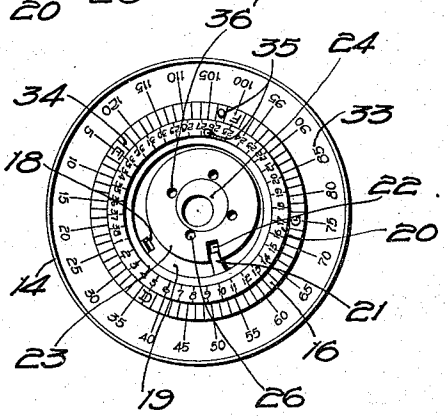


FIG. 4.

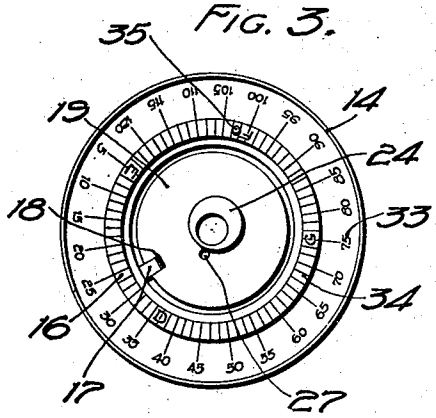


FIG. 5.

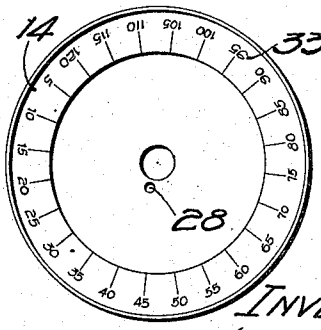


FIG. 6.

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2 SHEETS—SHEET 2.

FIG. 7.

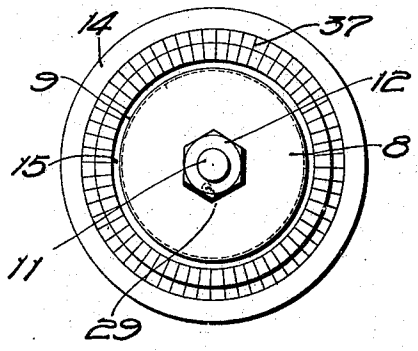


FIG. 8.

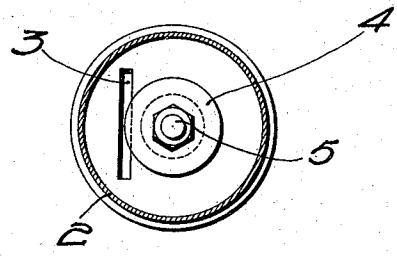
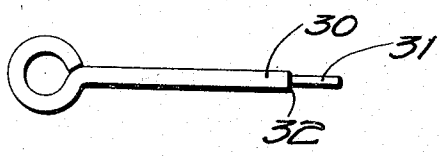


FIG. 9.



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UNITED STATES PATENT OFFICE.

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COMBINATION-LOCK.

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Application filed August 4, 1915. Serial No. 43,606.

To all whom it may concern:

Be it known that I, MICHAEL HALEY, a citizen of the United States, residing at Newburyport, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Combination-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to combination locks, and more particularly to a combination lock for receptacles wherein valuables may be stored, such as savings banks.

The primary object of the invention is to provide a combination lock which will prevent the removal of the contents of the receptacle unless the combination is known.

In accordance with this object a feature of the invention contemplates the provision of a substantial, compact and efficient combination lock whereby, when the combination is known, access to the interior of the receptacle may readily be had at any time for the removal of its contents.

To the accomplishment of this object, and such others as may hereinafter appear, as will readily be understood by those skilled in the art, the invention comprises the features and combination of parts hereinafter described and particularly pointed out in the appended claims.

The preferred form of the invention is illustrated in the accompanying drawings, where it is shown as applied to a portable savings bank, and in which:—

Figure 1 is a side elevation; Fig. 2 is a central vertical section through the bank shown in Fig. 1 with the members of the combination lock adjusted in the position for unlocking; Fig. 3 is a bottom plan of the bank with the parts illustrated in unlocking position; Fig. 4 is a bottom plan with the key-hole plate removed; Fig. 5 is a bottom plan with the key-hole plate and lower combination set of the illustrated embodiment removed; Fig. 6 is a bottom plan of the bank showing the base with both combination sets of the illustrated embodiment removed; Fig. 7 is a top plan of the lower structure of the bank with the body removed; Fig. 8 is a plan of the inside of the top of the body showing the body in section; and Fig. 9 is a plan view of the key for operating the lock.

In the embodiment of the invention illustrated in the drawings, the body or coin holding portion 2 of the bank comprises a hollow receptacle of suitable proportions which may be of any desired cross-section and configuration, such, for instance, as cylindrical, octagonal, etc. The upper portion of the body 2 is closed and is provided with a coin slot 3 (Figs. 2 and 8) secured beneath which is a suitable guard 4, the purpose of which is to prevent the withdrawal of coins through the slot 3. In the present instance the guard 4 is shown as comprising a flexible disk (Figs. 2 and 8) of metal, held close to the under side of the closed upper end of the body portion, of such diameter as to project partly across the slot 3. Under pressure on its upper side the disk will flex to allow the insertion of a coin and will then spring back into its slot closing position to prevent withdrawal of the coin through the slot. The guard 4 may be held against the under side of the top of the body 2 by any suitable means such here being indicated as a thumb screw and nut 5 which may be freely rotatable for the purpose of increasing the difficulties to be encountered in opening the bank. To this end the screw 5 may have a portion 6 graduated as at 7 (Figs. 1 and 2), the graduations being indicative of having some predetermined relation and locking coincidence to the bank. The lower, open end of the bank body 2 is provided with a closure 8 secured to the body by any suitable means of attachment requiring a relative rotative movement for detachment. The closure 8 here comprises a disk or plate (see Fig. 7) with peripheral threads 9 engageable with complemental internal threads 10 at the lower end of the bank body. The closure 8 is centrally perforated to loosely receive a threaded stud or spindle 11 on the upper or inner end of

which is mounted a nut 12, the lower or outer end of the spindle 11 being secured to or formed with a head or key-hole plate 13 forming one member of the combination lock. Rotatably mounted upon the stud or spindle 11 of the key-hole plate 13 is a flanged base or cover 14 which covers the closure 8 and extends across the opening of the bank body so that the closure is entirely concealed. The cover 14 may be recessed at 15 to receive the lower end of the bank body, and in this recess the bank body 2 and its closure 8 are freely movable. It will be noted that when the parts of the bank, thus far described, are assembled the closure 8 is inaccessible from the outside to one attempting to open the bank. Obviously, with the construction described, the body 2 can be detached from the closure 8 and removed from the base 14, only by holding one of the two parts stationary while the other is turned. Preferably, the combination lock now to be described is utilized to provide for an engagement of the inaccessible closure 8 and thus permit a relative detaching movement between the bank body and its closure.

Interposed between the upper side of the key-hole plate 13 and the lower face of the base 14 are one or more sets of combination devices forming parts of the lock. The upper set comprises a ring 16 (Fig. 5) having an inwardly projecting lug or tongue 17 which engages in a notch 18 of a plate 19. The plate 19 and the ring 16 are in the same general plane, and the plate 19 is rotatable freely about and mounted upon the spindle 11. The ring 16 fits snugly into a recess in the lower face of the base 14. The lower combination set comprises a ring 20 which is seated against and rotatable in a rabbet at the inner circumference of the ring 16 and has an inwardly projecting lug or tongue 21 which engages in a notch 22 formed in a plate 23. This plate is mounted to turn freely about a bearing or hub portion 24, projecting from the lower face of the plate 19, whose perimeter is eccentric to the axis of the spindle 11. The ring 20 is rabbeted at its inner circumference to receive the flange or key-hole plate 13. It will be seen, therefore, that the parts when assembled are maintained in position by the head 13 and its locking nut 12. When the bank is in an upright position, as in Figs. 1 and 2, the lowermost combination set rests upon the key-hole plate 13 and the ring 16 with its correlated plate 19 bears on the ring 20 and is supported thereby against the lower side of the flanged annular base or cover 14. Thus the combination lock members are interposed between the key-hole plate 13 and the closure 8 upon which latter member the body 2 of the bank is securely screwed. With this construction the several combination lock members, including the key-hole plate 13, the ring 20, the ring 16, the base 14, and the body 2, are relatively freely rotatable. It will further be observed that the body 2 cannot be unscrewed from the closure 8 unless the closure is held from rotation relative to the combination lock members. The means providing for holding the closure 8 in fixed relation to the base 14 so that the body 2 may be unscrewed therefrom comprises the novel construction of the several combination members 13, 20, 16 and 14, with their associated plates and parts.

The key-hole plate 13 is provided with a single, unlocking, or master key-hole 25 being a given one of an arbitrary group, here shown as spirally arranged over the face of the plate. The eccentrically mounted plate 23 is provided with a key-hole 26, the intermediate plate 19 with a key-hole 27, the base 14 with a key-hole 28, and the threaded bank closure 8 with a key-hole 29, which holes are adapted to be brought into axial alinement for the insertion of a key 30 of suitable design, such, for instance, as is shown in Fig. 9. This key may have a reduced stem 31 at one end to form a shoulder 32, the stem 31 being insertible through all the key-holes of the parts of the combination lock when they have been properly alined as shown in Fig. 2. Obviously the key may be pivotally mounted on the bank if so desired having provision for entering any of the holes in the key-hole plate 13. When the key has been so inserted it locks all of the parts, including the closure 8, against relative rotative movement on the spindle 11, and then the body 2 may be unscrewed from the closure 8 thereby allowing access to the interior of the bank.

It will be understood that the body 2 of the bank is secured to the closure 8 by screwing these parts together while the key 30 is in the alined key-holes, the operator thus preventing a relative rotation of the closure 8 while the bank body is being attached. What the key, and key-hole members, really amount to are means, within the knowledge of the initiated only, for inserting an eccentric stop or wrist pin in the closure 8, which forms the closure for the bank body 2, and which may be used to hold the closure from relative movement, permitting the attachment or detachment of the coin holding member.

For aiding the operator, who has a knowledge of the necessary index combination, to quickly bring the several key-holes of the lock component parts into bank opening position, the base 14 is provided with a set of index numerals and lines 33, and the upper ring 16 is provided with a set of reference or index marks 34 and when a given letter as "E" on the ring 16 is brought into radial juxtaposition with a given index

number as "5" on the base, the apertures or key-holes 27 and 28 of the plate 19 and the base 14 are brought into alinement; the plate 19 being actuated or turned about the bearing spindle 11 through the medium of its ring 16. The actuating ring 20 is provided with a series of numerals and when a given numeral as "5" thereon is brought into juxtaposition to the letter "D" on the ring 16, the key-hole 26 of the plate 23 is brought into alinement with the key-hole in the plate 19. Since the eccentric hub 24 is formed on the plate 19 it will be seen that this plate must be brought to a given position and the eccentrically mounted plate 23 be swung around by its ring 20 before the aperture 26 will be alined to receive the key. Owing to the eccentric mounting of the plate 23 a very slight movement of the plate 19 with its eccentric hub 24 will quickly and effectually destroy the alinement of the key holes. The rings 16 and 19, which have small projections or pins 35 forming handles by which they may be rotated, are then held against rotative movement while the operator rotates the key-hole plate 13, which may be accomplished by inserting the key 30 in any one of the holes of the plate, until a given index letter as "A" is moved into position adjacent the index numeral "10" on the ring 20, thus bringing the master key-hole 25 into alinement with those in the upper lock members, whereupon the key may be inserted in the hole 25 and its stem 31 passed through the alined apertures. The body of the bank and its closure 8 are now rotated until the inserted key slips into the key-hole 29 in the closure 8. With the several combination members thus locked by the key against rotation on the spindle 11, the body 2 of the bank may be unscrewed from its closure 8 allowing access to its interior. The key-hole plate 13, as shown in Fig. 3, is provided with a multiplicity of apertures only one of which is alinable with the coordinate combination apertures of the other lock members and a knowledge of the proper aperture (the master key-hole) in the key-hole plate 13 is essential to a rapid opening of the bank.

For the purpose of further baffling the uninitiated in unlocking the bank, the plate 23 may be provided with a number of depressions 36 which do not allow the key to pass through but which serve as blinds. These depressions will receive the key stem but will intercept further entrance of the key except when the latter is inserted in the proper key-hole plate aperture as 25.

For further complicating the apparent combinations of the bank the base 14 and the lower portion of the body 2 may have peripheral false graduation marks 37, these members as stated being relatively movable to each other, and these marks having no actual relation, in the present adaptation, to the combination of the lock.

In the preferred construction hereinbefore described it will be seen that the cover 14, rings 16 and 20, plates 19 and 23 and the key-hole plate 13 all form a part of the combination lock. However in the construction of different types of locks one or more of these members, for example the cover 14, ring 16 or plate 19, might be omitted and the remaining parts will still form an effective lock. Further, the cover 14 does not need to be extended to form a hand piece for removing the closure 8 from the opening as the key itself, or any other means for engaging the key-hole plate 13, will serve as a handle or crank by which the closure may be rotated. It will be noted also that the rings 16 and 20 are of sufficient diameter to form a cover which conceals the closure 8.

From the foregoing description, those familiar with the construction of coin banks will recognize that the main essential is a construction in which two connected parts have a free relative rotative movement which is ineffective to procure the opening of the bank unless the two parts be keyed or otherwise held in fixed relation to each other preferably through the intermediary of a combination lock. It is believed that the present invention is the first to devise a structure of this general character and while one specific form for carrying out the invention is illustrated it must be understood that the invention is not limited to the details of construction and operation of the illustrated embodiment, nor to the conjoint use of all its features or parts, but may be embodied in other forms within the terms and spirit of the following claims.

What is claimed as new, is:—

1. A combination lock for a closure for an opening, having, in combination, a receptacle having an opening, a closure constructed to be secured in said opening by a relative rotary movement of the receptacle and closure, a cover mounted on said closure to have a free rotary movement relatively to said closure, and means whereby the closure may be keyed to the cover to lock the cover to the closure so that the cover and receptacle may be relatively rotated to remove the closure.

2. A combination lock comprising a closure constructed to be rotatively secured in the opening of a receptacle to be locked; a member pivotally secured to the closure and covering it so as to render it inaccessible, and means for locking the closure and said member together against relative rotation so that by the rotation of said member the closure may be rotated and released from the receptacle.

3. A combination lock comprising a closure having peripheral threads adapted to be

screwed into threads of an opening of a receptacle to be locked, a cover for concealing the closure which is loosely pivoted to the closure, and means for locking the cover to the closure whereby a movement may be imparted to the cover to screw the closure out of the opening.

4. A combination lock comprising a closure provided with a key-hole and constructed to be rotatably secured in an opening of a receptacle to be locked, a cover held against said closure for rotary movement relatively to the closure and provided with a key-hole adapted to be axially alined with the closure key-hole, and means by which the key-holes may be alined to receive a key to lock the cover to the closure and permit the closure to be removed from the receptacle.

5. A combination lock comprising a closure constructed to be rotatably secured in an opening of a receptacle to be locked, a cover pivoted to said closure, a key-hole plate pivoted to said closure, said closure, cover and key-hole plate being provided with key-holes, and means by which the key-holes in said cover, key-hole plate and closure may be alined to receive a key to lock them together.

6. A combination lock comprising a closure constructed to be rotatably secured in an opening of a receptacle to be locked, a cover and a key-hole plate both pivotally secured to the closure and one or more additional pivotally mounted parts between the key-hole plate and cover, all of said parts having a key-hole and all of said key-holes being adapted to be axially alined to receive a key to lock them together.

7. A combination lock comprising a closure adapted to be secured in an opening of a receptacle to be locked, a combination lock device attached to said closure which has a free relative rotative movement to the closure, and means coöperating with said device and closure to hold said parts in fixed relation to each other and permit the attachment and detachment of the closure in the opening of the receptacle.

8. A combination lock comprising a closure having peripheral threads constructed to be screwed into a threaded opening of a receptacle to be locked, means adapted to be eccentrically attached to the closure by which the closure may be moved to be threaded out of the opening and a locking device pivoted to said closure having a series of plates provided with key-holes which are adjustable on the closure to aline the apertures in position so that the eccentric means may be secured to the closure.

9. A combination lock comprising a closure having peripheral threads constructed to be screwed into a threaded opening of a receptacle to be locked, a key engageable with the closure whereby the latter may be rotated to be screwed out of the receptacle opening and a combination lock mechanism for preventing an insertion of the key save when the members of the mechanism have a predetermined relative position.

10. A combination lock comprising a closure constructed to be detachably mounted in an opening of a receptacle to be locked, and a combination lock device movably mounted on the closure, a key coöperating with the locking device and closure to lock them together, said device comprising a plate with a master key-hole pivoted on the closure, a plurality of rotatable indexed rings superposed on the key-hole plate, and a plurality of key-holed inner plates each coöperating with the respective ring and rotatable thereby, and means for alining a key-hole in said plates for the insertion of the key.

11. A combination lock comprising a closure constructed to be detachably mounted in an opening of a receptacle to be locked, a combination locking device rotatably mounted on said closure, means for locking the closure to the device for attaching and detaching the closure in the opening of the receptacle, said locking device comprising a plate with a master key-hole, a plurality of turnable indexed rings superposed on key-holed inner plates each engaged and turnable by its respective ring, and a key engageable with said closure when the key-holes in all of the plates are alined, one of the inner plates having an eccentric boss on and about which another plate turns.

12. A combination lock comprising a closure for an opening for a receptacle to be locked, a cover to conceal the closure, a plurality of apertured plates movably mounted on said closure, apertures in the closure and cover and indices on the plates and cover by which an aperture may be made to register through the cover, closure and plates for the reception of a key.

13. A combination lock comprising a closure for an opening of a receptacle to be locked, a key-hole in said closure, a cover to conceal said closure loosely rotatable upon said closure, a key-hole in said cover to register with the closure key-hole, and a plurality of locking plates having a loose pivotal mounting on said cover and provided with key-holes, one of said plates being eccentrically mounted to the other plates and having a plurality of apertures, and means by which the plates may be adjusted to aline an aperture in the plates, cover and closure for the insertion of a key.

14. A combination lock for a closure for an opening, having, in combination, a receptacle having an opening, a closure movable to cover or uncover said opening, and locking devices comprising a plurality of combination plates relatively eccentric and rota-

table to each other, and means for locking said plates and a closure together to permit the withdrawal or insertion of said closure.

15. A combination lock comprising a closure constructed and arranged to be secured in an opening of a receptacle to be locked, a locking device mounted on the closure to conceal and render it inaccessible, and means for connecting the closure with the locking device so that the closure may be manipulated through the medium of the locking device to remove it from the opening.

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