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COMBINATION KEYLESS LOCK.

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Fig. 1

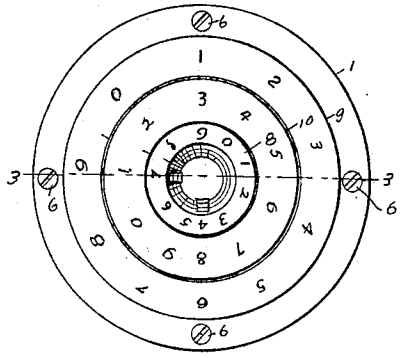


Fig. 4

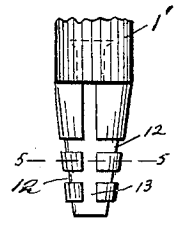
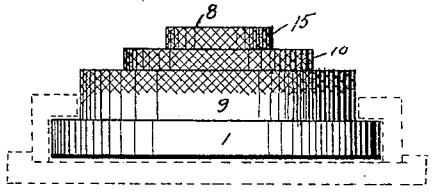


Fig. 5

Fig. 2



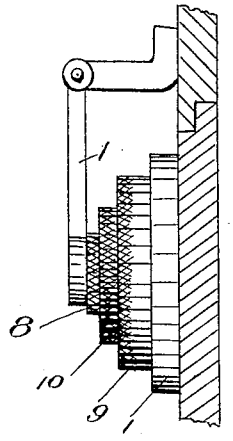
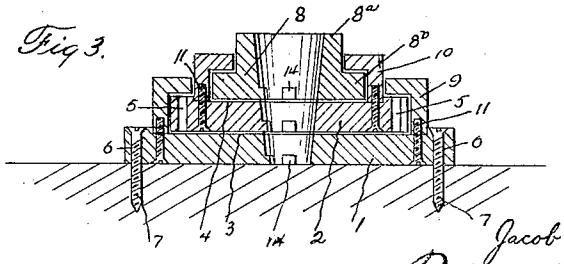


Fig. 6

Fig. 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

JACOB WILLIAM WACHTER AND BERNARD HENRY PRENDERGAST, OF LANSDOWNE, MARYLAND, ASSIGNORS OF ONE-THIRD TO FRANCIS E. RICHARDS, OF WASHINGTON, DISTRICT OF COLUMBIA.

## COMBINATION KEYLESS LOCK.

No. 813,992. Specification of Letters Patent. Patented Feb. 27, 1906.

Application filed October 29, 1904. Serial No. 230,512.

*To all whom it may concern:*

Be it known that we, JACOB WILLIAM WACHTER and BERNARD HENRY PRENDERGAST, citizens of the United States of America, residing at Lansdowne, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Combination Keyless Locks, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to certain new and useful improvements in combination keyless locks, and has more particular reference to that type in which a plurality of tumblers coact with a shackle, which together with the tumblers are provided with interlocking parts adapted for coöperation, so that upon proper manipulation of the tumblers said interlocking parts will be either engaged or disengaged, as will be more fully described hereinafter.

The invention has for a further object to provide tumblers which are counterparts in construction and are interfittingly superposed one upon the other, whereby the number of tumblers can be readily increased or decreased, so as to vary the complexity of the operation, it being obvious that when the lock is designed to safeguard matters of importance the tumblers are increased, so as to obviate the proper manipulation of the tumblers by unauthorized parties.

A further object of our invention is the provision of means whereby the tumblers are retained in their relatively superimposed positions and prevented from displacement by means of removable elements which overlap the tumblers, so as to rotatably embrace the same.

Further, our invention consists in concealing the fastening means of all removable parts, so that it is absolutely impossible for unscrupulous parties to maliciously tamper with the working parts of the lock.

Further objects and advantages will be set forth in the following description and those features of construction upon which we base our claim for patent protection defined in the appended claims.

In the accompanying drawings, in which like numerals of reference indicate like parts throughout the several views, Figure 1 is a view in top plan of a lock embodying our improvements. Fig. 2 is a view in side elevation thereof. Fig. 3 is a section taken on line 3 3, Fig. 1. Fig. 4 is a fragmentary detail view of the shackle. Fig. 5 is a cross-sectional view taken on line 5 5 of Fig. 4, and Fig. 6 is a side elevation of our invention attached to an article shown in section.

In carrying out our invention a plurality of superimposed tumblers are provided, as has been heretofore intimated, and of these in the present embodiment but one is stationary. This is the inner or larger of the several tumblers, and in addition to its serving this function it also performs the function of a base or securing plate. This plate is indicated by the reference-numeral 1, and at points adjacent its edge it is provided with a plurality of openings adapted to receive suitable securing means whereby the lock is secured in position.

2 indicates the next tumbler, which in general configuration is a counterpart of the tumbler 1. Both of these tumblers have their outer faces cut out to form recesses or seats 3 and 4, respectively, the tumbler 2 seating snugly in the seat 3 and thereby having any tendency of a lateral movement on its part resisted.

By constructing the tumblers in this manner any number can be applied, although it will be apparent that in order to bear a stepped relation the same must necessarily be of an increased diameter when proceeding rearwardly from the outer tumbler. Further, it will be observed that the tumbler 2 is also provided at points adjacent its edge with openings 5, corresponding with the openings 6 of the plate 1, so that if it is desired to employ but two tumblers the tumbler 1 can be dispensed with and the securing means 7 thereof then passed through the openings 5 of the tumbler 2. Tumbler 2 would then become stationary and but one movable tumbler, which is hereinafter referred to, would be employed.

In the present illustration we have shown ordinary screws for securing our lock in position. This is a simple form of illustration; but it will be obvious that any other means could be employed without departing from the spirit of our invention.

The outer tumbler 8 fits snugly in the recess 4 of the tumbler 2 as the latter tumbler

rests in its specific relation to the tumbler 1; but the construction thereof is different in that it is increased in thickness to provide a projecting part $8^a$ and a flange $8^b$ at the inner end thereof.

The securing means for the tumblers 2 and 8 consist of flanged rings, and as the several rings are counterparts of one another a description of one will suffice. We will therefore describe the ring 9, which is the inner, the same encircling the tumbler 2 and having its inner end disposed in the seat 3 of the tumbler 1. At its outer edge the ring is provided with an inturned flange, which overlaps the outer face of the tumbler 2. The ring 10 bears against the inner edge of the flange of said ring 9, so as to form a neat joint, and its flange overlaps the flange $8^b$ of the tumbler 8. These rings are all secured in position by suitable means, such as screws 11, which are passed through the tumblers from their inner faces. The means are thus concealed, and when all the parts are assembled it will be impossible to remove any of the component parts without first removing the entire lock from its support.

Each tumbler is provided with an opening, the opening of one tumbler alining with those of the others, so as to form a continuous opening or bore for the reception of the shackle, which in the present illustration is tapered, and consequently the several openings of the tumblers are tapered in order to insure a proper adjustment.

The shackle 1′, the end of which is tapered, is formed with circumferential grooves 12 and longitudinal grooves 13, which intersect the former at right angles, thereby forming a plurality of series of projections or teeth, which are adapted to pass and interlock with lugs 14, arranged at the proper points in the openings of the tumblers.

In our invention as now illustrated we form one of the grooves 13 of greater width than the other, (see Fig. 5,) and the lugs 14 in the series registering with that slot are correspondingly increased in width. This, however, is not an essential feature of our invention, as the number of slots, grooves, and interlocking lugs 14 can be altered with respect to number and size without making material changes.

In order to more fully present the idea of the manner in which the inner tumblers interfit in one another in their stepped relation, so as to facilitate the addition of interfitting tumblers of larger size to increase the complexity of the arrangement, we have shown in dotted lines in Fig. 2 an additional tumbler, the same being secured by an extra ring to the tumbler 1, and thereby serving as the base-plate in lieu thereof.

In operation the tumblers 2 and 8 are rotated, so as to bring their lugs in alinement with the lugs of the stationary tumbler 1, and the shackle is then moved into the several openings in the tumblers, whereupon the latter are rotated to any desired position so as to move the lugs 14 out of alinement or registry with the grooves 13, and thereby prevent removal of the shackle.

To facilitate the operation of the tumblers, we preferably mill the outer portions of the outer faces thereof, as at 15, so that a firmer grip can be obtained by the operator.

Of course, as in ordinary combination keyless locks, we provide rotatable tumblers with suitable characters of indication, so that with the proper combination in mind the operator can move the tumblers with certainty to their proper positions when the unlocking operation is begun.

Our lock is adapted for use in connection with any type of fastening means in which a movable shackle is employed, such as swinging hasps, padlocks, &c., and while we have herein shown a construction capable of carrying out the several functions assigned thereto, yet we reserve the right to make such alterations and changes in the details of construction as fall within the scope of the appended claims.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. A lock comprising a plurality of tumblers, means carried by the tumblers for locking engagement with a shackle, one of said tumblers being formed with openings arranged in annular series adapted to receive a securing means for securing the lock in position.

2. A lock comprising a fixed tumbler and a plurality of movable superimposed tumblers, the fixed tumbler being formed with openings adapted to receive the securing means for securing the lock in position, means carried by all of the tumblers for locking engagement with a shackle, the inner movable tumblers being counterparts of said fixed tumbler.

3. A lock embodying a plurality of superimposed tumblers, said tumblers carrying locking means for engagement with a shackle, said tumblers formed with central openings successively increasing in diameter, a flange overlying the outer portion of each of the said tumblers, and rings carrying said flanges and being secured to the adjacent tumbler in the rear of the respective tumblers which each flange overlies.

4. A lock comprising a fixed tumbler adapted to receive means for securing the lock in position, a movable tumbler mounted thereon and being a counterpart thereof, said tumblers being formed with central openings successively increasing in diameter, locking means carried by the tumblers for engagement with a shackle, and means for securing the tumblers together.

5. A lock comprising fixed and movable

tumblers superimposed, each tumbler fitting into the other, said tumblers being formed with central openings successively increasing in diameter, locking means carried by the several tumblers for engagement with a shackle, and means carried by each tumbler for removably securing the succeeding tumblers thereto.

6. A lock comprising fixed and movable tumblers, fitting one into the other, each of said tumblers being formed with a tapered opening, said openings being of successively-increasing diameter in the several tumblers, a ring secured to the fixed tumbler and having a flange overlying the next movable tumbler, a ring secured to said movable tumbler and having a flange overlying the next movable tumbler, locking means carried by the several tumblers for engagement with a shackle, and a projection carried by the outer tumbler projecting beyond the outer ring.

7. A lock comprising a fixed tumbler formed with openings adapted to receive a securing means and a plurality of movable tumblers, each of said tumblers being formed with a tapered opening, said openings being of successively-increasing diameter in the several tumblers, said movable and fixed tumblers fitting one into the other, the inner movable tumblers being counterparts of the fixed tumbler, rings carried by the fixed and inner movable tumblers and being provided with flanges overlying the next outer tumbler, all of said tumblers being formed with openings and having locking-lugs projecting thereinto, the outer tumblers having a portion projecting beyond the outer ring, and securing means passing through the said fixed and inner movable tumblers from their inner faces and engaging said rings for securing same in position.

In testimony whereof we affix our signatures in the presence of two witnesses.

JACOB WILLIAM WACHTER.
BERNARD HENRY PRENDERGAST.

Witnesses:
MOSES KAUFMAN,
ABE KAUFMAN.