A. MERCER.

LOCK.

APPLICATION FILED DEC. 30, 1907.

898,767.

Patented Sept. 15, 1908.

Fig. 1.

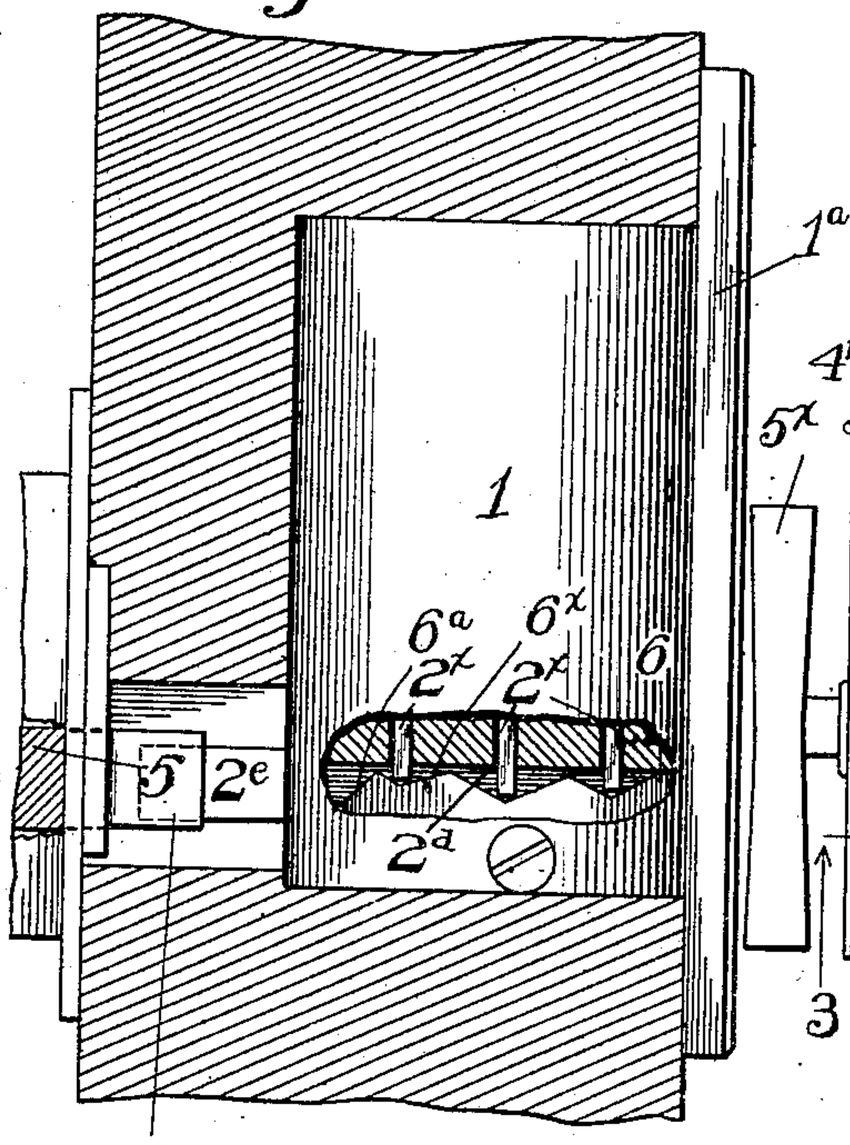


Fig. 2.

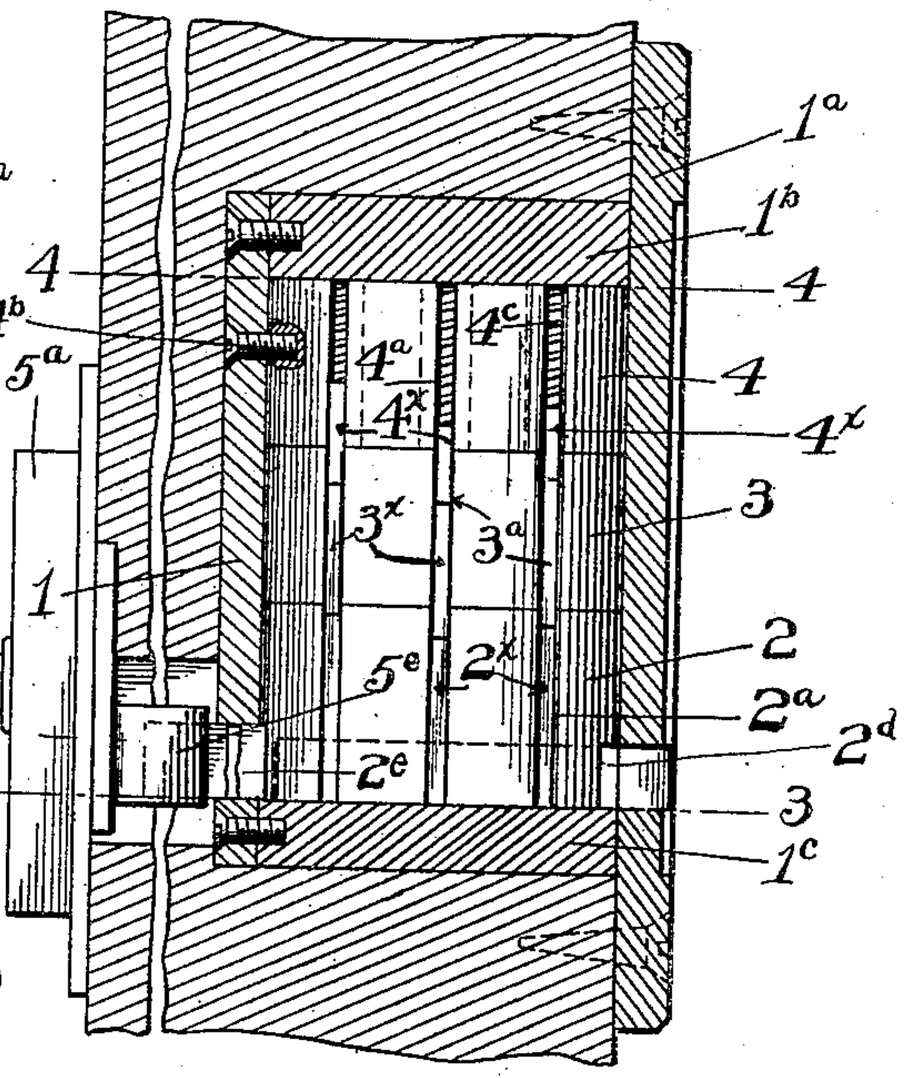


Fig. 3.

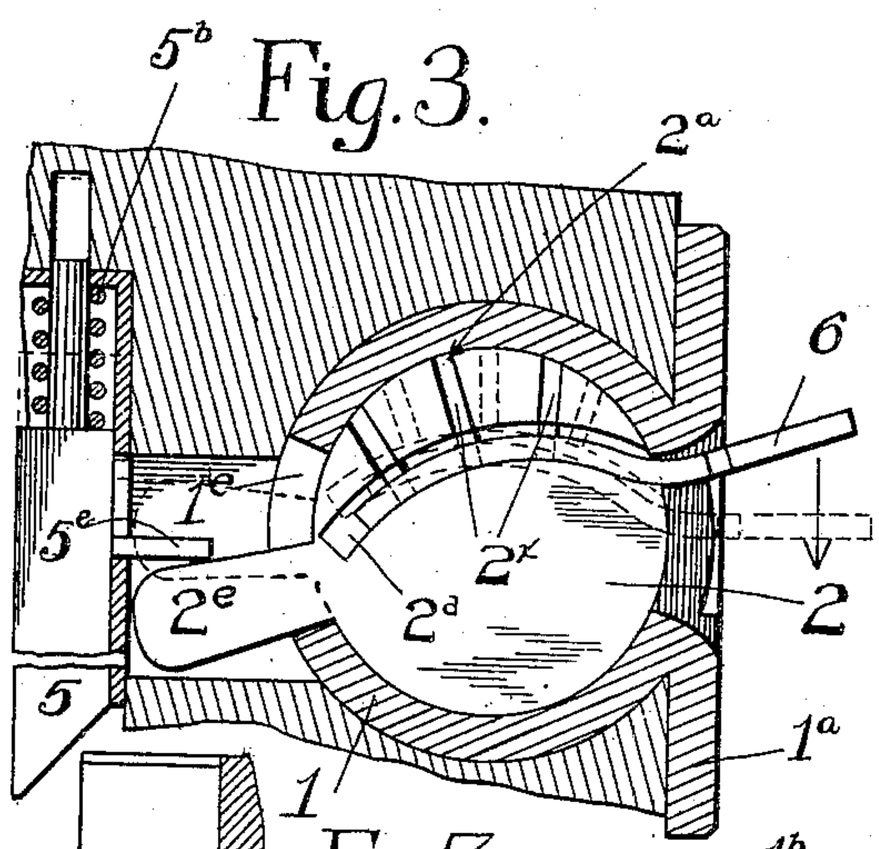
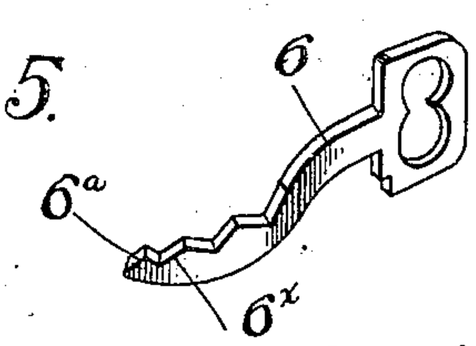


Fig. 5.



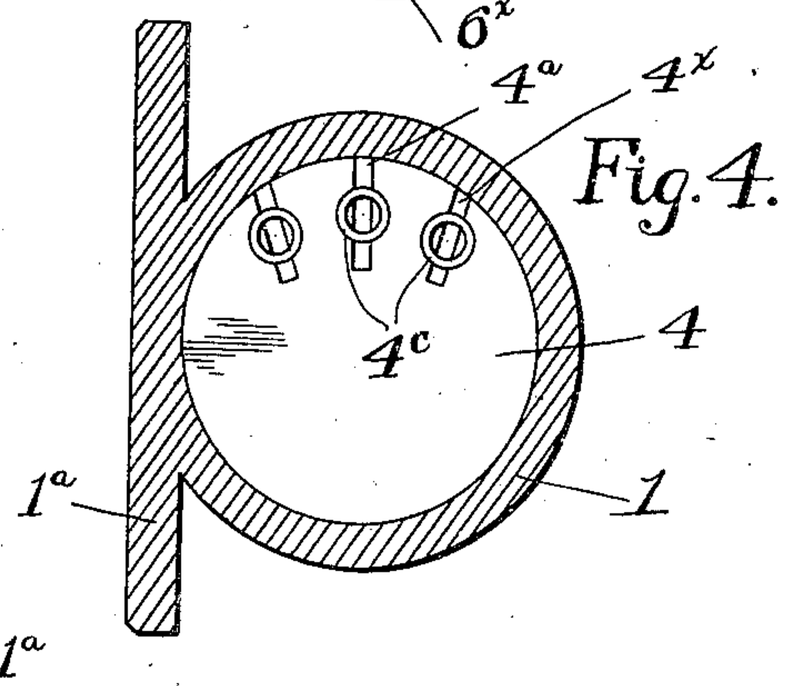


Fig. 4.

Fig. 7.

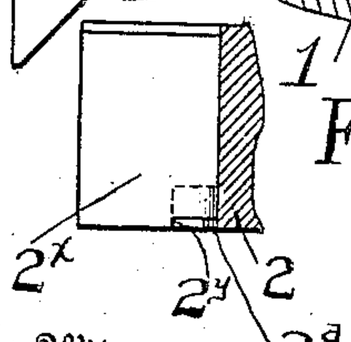
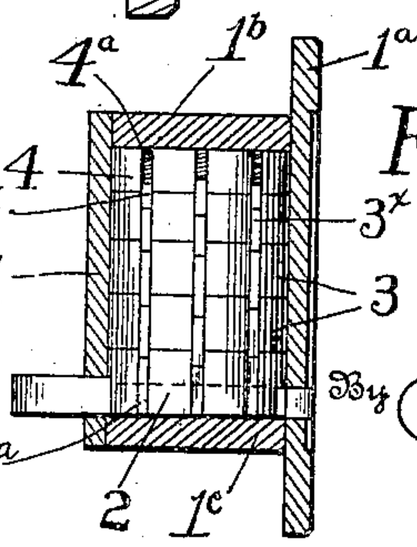


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

ALFONSO MERCER, OF NORFOLK, VIRGINIA, ASSIGNOR OF ONE-FOURTH TO HERBERT E. PAGE AND ONE-FOURTH TO WILLIAM R. BUTCHER, OF NORFOLK, VIRGINIA.

LOCK.

No. 898,767. Specification of Letters Patent. Patented Sept. 15, 1908.

Application filed December 30, 1907. Serial No. 408,691.

To all whom it may concern:

Be it known that I, ALFONSO MERCER, of Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Locks; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in locks and its object is to provide a multiple tumbler lock of such construction that a number of similar locks can be easily arranged so that each lock may be locked only by a particular or individual key, but all of them can be opened by a master-key if desired,—such locks being particularly useful in hotels, apartment houses, safe deposit vaults, and the like, where a number of locks are employed to secure the property of different tenants or individuals each of whom has a key which will only open his individual lock,—while the proprietor may have a master-key which will open any one of such locks.

The object of the invention is to provide a simple but efficient construction whereby by simply rearranging or changing the tumblers, or length of tumblers, a great variety of individual key locks can be formed, each of which can be controlled by a master-key,—and the invention further provides a lock which can be operated by a lateral thrust of the key instead of a twisting motion of the key, thereby lessening the liability of injury to the key and to the hand of the operator and further enabling the key-way to be so constructed that picking of the lock will be rendered more difficult.

The invention consists in the novel construction and combinations of parts hereinafter described and claimed, and illustrated in the accompanying drawings in which—

Figure 1 is an external view of the lock as applied to a door. Fig. 2 is a view similar to Fig. 1 with the casing broken away to show the internal arrangement of the cylinders and tumblers. Fig. 3 is a sectional view looking upward on line 3—3, Fig. 2. Fig. 4 is a sectional view looking downward on line 4—4, Fig. 2. Fig. 5 is a perspective view of a key. Fig. 6 is a view with the casing removed showing a slight amplification of the lock. Fig. 7 is a detail.

I will describe the lock as illustrated in the drawings which will impart a clear understanding of the essential features of the invention but it should be understood that the invention is not restricted to the specific form shown in the drawings as the shape of the casing, and the size and proportion of parts and the number of disks and of tumblers employed can be varied to suit the wishes of the maker and the purposes for which the locks are intended, and the number of individual locks of like pattern which it is desired to control by one master-key.

The lock casing comprises a cylinder 1 attached to a face-plate 1^a which can be secured to the door frame in any suitable manner. This cylinder may have its ends closed by removable heads 1^b, 1^c. Within said cylinder are arranged a plurality of rotatable disks 2 and 3 and a non-rotatable disk 4, the disk 2 being at bottom, and disk 4 at top as shown in Fig. 2. Only one disk 3 is shown in Fig. 2, but if desired a number of similar disks 3 may be interposed between the disks 2 and 4 as indicated in Fig. 3.

The disk 2 has a plurality of radially disposed vertical slots 2^a in its edges, see Figs. 2 and 3, only three slots being shown in the drawings, but their number may be increased if desired. The disk 3 has a similar number of slots 3^a; and disk 4 a like number of slots 4^a. Normally the said slots in the several disks register.

The disk 4 is fastened in the cylinder by any suitable means, so that it cannot rotate, a screw 4^b being shown in the drawings tapped through the wall of the cylinder. The disks 2 and 3 can be rotated, unless locked, as hereinafter described.

Within the slots 2^a of cylinder 2 are placed removable tumblers 2^x which are preferably of different lengths; within the slots 3^a in disk 3 are placed tumblers 3^x; and within the slots in disk 4 are placed tumblers 4^x. The tumblers 3^x are preferably of different lengths, so are tumblers 4^x.

When the slots register as in Fig. 2 the tumblers all drop downward by gravity. To facilitate and quicken the gravital action, springs 4^c may be placed in slots 4^a above the tumblers 4^x, as indicated in the drawings. When in the lowermost position the tumblers 3^x will project into the upper ends of slots 2^a,

and the tumblers 4^x will project into the upper ends of slots 3^a; consequently the disks 2 and 3 will be interlocked, and cannot be rotated when the tumblers are in such position.

In the lower end of disk 2 is formed a key-way 2^d, which is preferably curved and intersects the lower ends of the tumbler slots 2^a, see Fig. 3, so that the lower ends of the tumblers 2^x, when in normal lowermost position, will obstruct the key-way 2^d. The tumblers 2^x are preferably notched as shown at 2^y, Fig. 7, so that they will not entirely close the key-way, but will allow the pointed end of a key 6 to be slipped thereunder so as to lift the tumblers in the slots when the key is inserted in the key-way.

The lower disk 2 may also be provided with devices to actuate the fastening bolt. As shown it has a laterally projecting arm or pin 2^e which extends out through a slot 1^e in the casing and is adapted to actuate the bolt 5 on the inner side of the door. This bolt may be of any suitable construction and may be spring projected. As shown the bolt 5 is contained in a casing 5^a attached to the inner side of the door and may be retracted in the usual manner by means of an ordinary handle 5^x; to this bolt 5 is attached a finger 5^e which projects into the path of the arm 2^e, so if the disk 2 is rocked in the proper direction by means of key 6, see Fig. 3, the bolt will be retracted. A spring 5^b may be suitably arranged to project the bolt 5 when the disk 2 is released, and said spring will therefore tend to return disk 2 to its normal, locked, position. Of course disk 2 cannot be turned by the key 6 so long as disks 2, 3, 4, are locked by the tumblers.

The individual key 6 for the lock is formed as shown in Fig. 5 and is curved laterally to conform to the key-way 2^d into which it can be entered. The key is pointed on its end as shown at 6^a so that it can successively pass under and raise the tumblers 2^x, and the key is notched on its upper edge, as shown at 6^x, to engage the tumblers 2^x, respectively, and the projections between the notches are so formed that when the proper key is fully inserted the series of tumblers will be raised to the positions necessary to allow the disk 2, or disks 2 and 3, to be rotated in the casing. For instance one key 6 may be so formed that when fully inserted it will raise all the tumblers until the upper ends of the several tumblers 2^x are flush with the upper surface of disk 2; this will of course free disk 2 from disk 3 (although the latter may remain locked to disk 4), then disk 2 can be turned, by a lateral push on the key 6, and in turning disk 2 will of course retract bolt 5 and unlock the door. Again the lock can be arranged to be operated by another form of key so notched that when inserted in the key-way it will raise the tumblers until the upper edges of tumblers 3^x are all flush with the upper edge of disk 3. Then although disks 2 and 3 may remain locked together they can be rotated under disk 4, and the latch operated as described. Any other key (except the master-key) which will not thus bring the tumblers 2^x (or 3^x) to the stated positions will not unlock the door. By interchanging the tumblers in the slots it is obvious that a multiplicity of individual key locks may be formed without any change in the number or relation of the disks. By increasing the number of slots in each disk the complexity of the lock and permutation changes thereof are correspondingly increased. Also by increasing the number of the disks 3 as indicated in Fig. 6, a still greater variety of individual key locks can be made.

Of course each different arrangement of tumblers requires a different notching of the individual keys, but these may all be controlled by a master-key whose form is determined at the factory. By the arrangement described I am able in a very simple manner to produce a great variety of individual key locks, at very little expense.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a lock, the combination of a casing, a set of disks therein provided with coincident slots, one of said disks being fast, tumblers in said slots normally locking the several disks together, a bolt, and means on the movable disk for operating said bolt; with a key adapted to engage said movable disk and move the tumblers into position to free the disk from the fixed disk, whereupon said movable disk can be rotated to actuate the bolt.

2. In a lock, the combination of a casing, a plurality of axially alined disks therein, having coincident slots, one end disk being fixed, and the other end disk rotatable and having a bolt actuating device and provided with a key-way intersecting the slots; with a series of tumblers in said slots normally interlocking the disks, and a key adapted to enter said key-way and move the tumblers until they free the movable disk from the fixed disk.

3. In a lock, the combination of a cylindric casing, a set of superposed disks therein provided with vertical coincident slots, tumblers in said slots, one of said disks being fast and the others movable, the tumblers however normally locking the several disks together, and bolt actuating devices on one of the movable disks; with a key adapted to engage the lowermost movable disk and raise the tumblers into position to free said movable disk from the fixed disk whereupon said movable disk can be rotated to actuate the bolt.

4. In a lock, the combination of a cylin-

dric casing, a plurality of disks therein having radially disposed coincident slots, said disks being arranged one above the other, one end disk being fixed, the other disks being rotatable, and the outermost movable disk having a bolt actuating finger, and a curved key-way intersecting the slots; with a series of tumblers in said slots normally interlocking the several disks, and a key adapted to enter said key-way and raise the tumblers to free the movable disks from the fixed disk.

5. The herein described lock comprising a cylindric casing attached to a face-plate, a series of disks fitted in said casing, one above the other, the uppermost disk being fixed and the other disks rotatable, the lowermost disk having a bolt actuating device, and a key-way communicating with a key opening in the face-plate, each of said disks having a plurality of radially disposed slots registering when the disks are in normal position, a series of tumblers of different lengths in said slots, said tumblers normally interlocking the said disks and preventing rotation thereof; with a bolt engaged by the finger on the movable disk, and a key adapted to enter the key-way and raise the tumblers until the movable disk is freed from the fixed disk, whereupon the movable disk can be rotated by lateral thrust on the key.

6. The herein described lock, comprising a cylindric casing attached to a face-plate, a series of disks fitted in said casing, one above the other, the uppermost disk being fixed and the other disks rotatable, the lowermost disk having a curved key-way in its lower face communicating with the key opening in the face-plate, and each of said disks having a plurality of vertical radially disposed slots registering when the disks are in normal position; a series of tumblers in said slots, said tumblers normally interlocking the said disk and preventing rotation thereof, springs to project the tumblers in the fixed disk; with a bolt engaged by the movable disk, and a key adapted to enter the curved key-way and raise the tumblers until the movable disk is freed from the fixed disk whereupon the movable disk can be rotated by lateral thrust on the key.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

ALFONSO MERCER.

Witnesses:

JOHN L. FLETCHER,

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