No. 671,326. Patented Apr. 2, 1901.

F. SOLEY.

SAFE DEPOSIT LOCK.

(Application filed June 28, 1898.)

(No Model.)

Fig. 1.

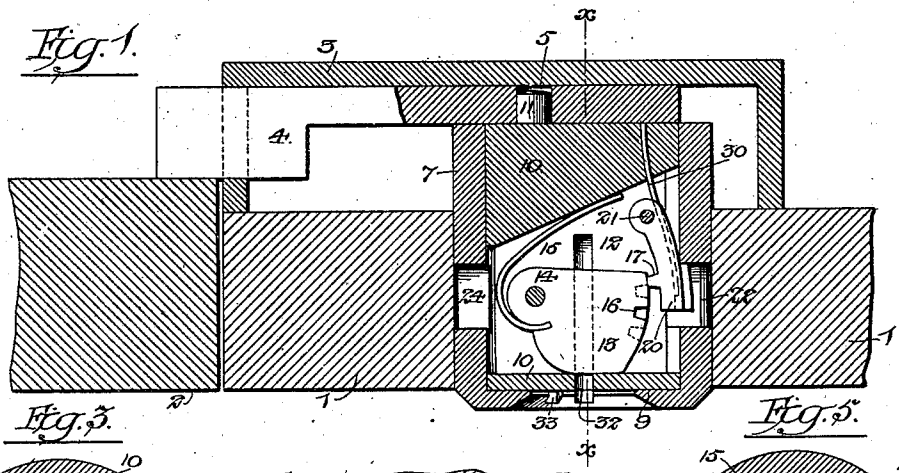


Fig. 3.

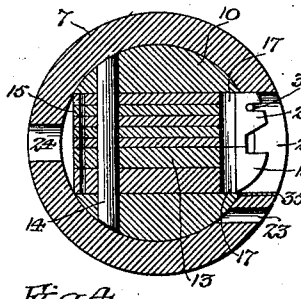


Fig. 2.

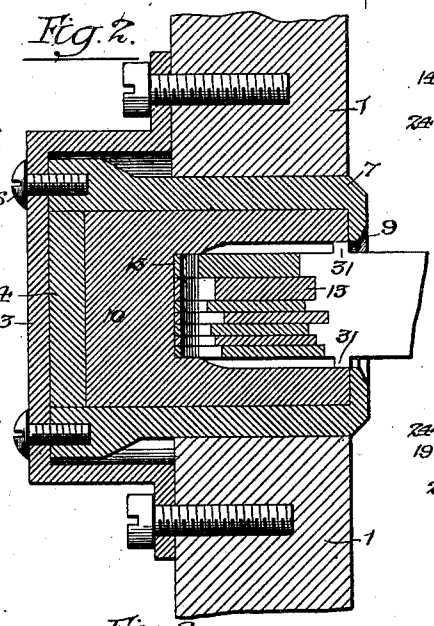


Fig. 5.

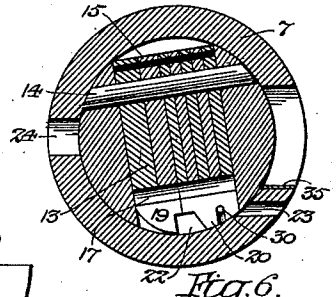


Fig. 4.

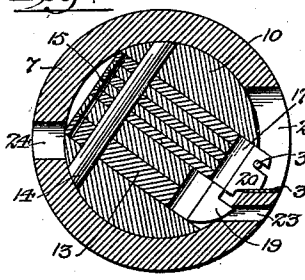


Fig. 6.

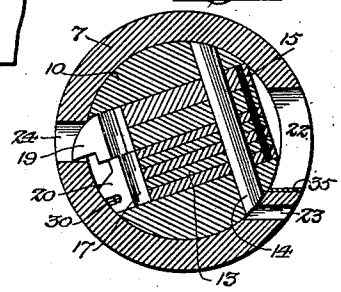


Fig. 7.

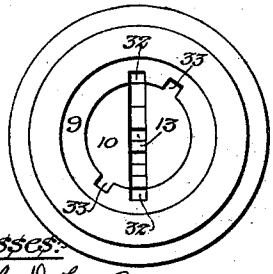


Fig. 8.

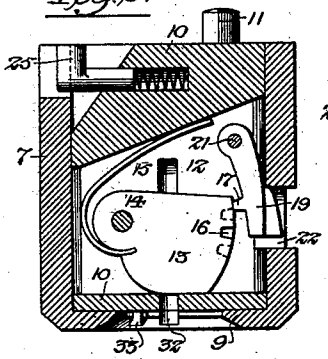
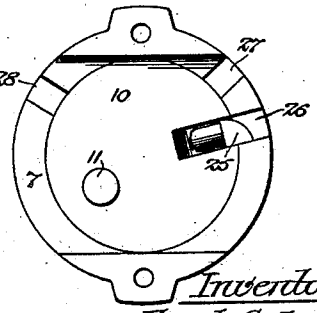


Fig. 9.



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UNITED STATES PATENT OFFICE.

FRANK SOLEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE MILLER LOCK COMPANY, OF SAME PLACE.

SAFE-DEPOSIT LOCK.

SPECIFICATION forming part of Letters Patent No. 671,326, dated April 2, 1901.

Application filed June 28, 1898. Serial No. 684,674. (No model.)

To all whom it may concern:

Be it known that I, FRANK SOLEY, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented a certain Improvement in Safe-Deposit Locks, of which the following is a specification.

My invention relates to that class of locks known as "safe-deposit" locks, which require the use of both the custodian's key and the renter's key before they can be opened, the object of my invention being to construct a simple and secure form of such lock in which the retraction and subsequent projection of the bolt is effected by a single forward rotation of the cylinder, which single rotation is effected partly by the action of the custodian's key and partly by the action of the renter's key, the movement imparted by the custodian's key having no effect upon the unlocking movement of the bolt, the projection of the bolt by backward movement of the cylinder being prevented by the action of certain stops and the renter's key being incapable of removal until the complete rotation of the cylinder has been effected and the locking-bolt projected.

In the accompanying drawings, Figure 1 is a sectional plan or top view of a lock constructed in accordance with my invention. Fig. 2 is a vertical section on the line *x x*, Fig. 1. Figs. 3, 4, 5, and 6 are transverse sections showing the working parts of the lock in different positions. Fig. 7 is a front view of the lock, and Figs. 8 and 9 are views illustrating another embodiment of my invention.

1 represents part of the door, and 2 part of the fixed frame, of a safe-deposit structure, the door having on the inside of the same a casing 3, containing a sliding locking-bolt 4, with slot 5 therein, said bolt being adapted to be projected so as to engage with the fixed frame, as shown in Fig. 1, or retracted, so as to be free from engagement with said frame in order to permit of the opening of the door.

Secured to the casing 3, by means of screws 6 or other equivalent fastenings, is a tubular casing 7, which projects forwardly through an opening in the door 1 and has at its forward end an inwardly-projecting annular flange 9, between which and the bolt 4 is longitudinally confined a cylinder 10, having a projecting crank-pin 11, which engages with the slot 5 in the bolt 4, so that by rotation of said cylinder 10 the bolt 4 can be projected and retracted. This is a common means of effecting reciprocating movement of a locking-bolt by rotating movement of a cylinder, and hence forms no part of my invention; nor is my invention limited thereto, as any desired means may be employed for causing rotating movement of the cylinder 10 to effect back-and-forth reciprocation of the locking-bolt.

In the cylinder 10 is formed a transverse recess 12 for the reception of a series of pivoted tumblers 13, which are hung to a pin 14, each of said tumblers being acted upon by a spring 15, tending to maintain it in contact with the cylinder at the front end of the recess 12, as shown in Figs. 1 and 2, the tumblers having segmental peripheries concentric with the pin 14 and provided with notches for the reception of lugs 17 upon a pair of dogs 19 and 20, which are located side by side in the recess 12 and are hung to a pin 21 extending across said recess.

Normally—that is to say, when the lock is closed—the parts are in the position shown in Figs. 1, 2, and 3, both of the dogs projecting into a slot 22 in the tubular casing 7, so that the dog 19 engages with the forward wall of said slot and the dog 20 engages with the rear wall of the same, whereby both forward and backward movement of the cylinder 10 are prevented. When the custodian's key is inserted, however, it effects such adjustment of the tumblers lying beneath the lug 17 of the dog 19 as to bring the notches 16 of said tumblers into line with said lug. Hence said dog 19 is at liberty to swing inwardly when the cylinder is turned forwardly, such inward movement being caused by the action of the forward wall of the slot 22 upon the beveled face of the dog 19. This movement continues until the forward face of the dog 20 comes into contact with the forward wall of the slot 22, as shown in Fig. 4, further forward movement of the cylinder by the use of the custodian's key being thus prevented and backward movement being also now prevented owing to the fact that the dog 19 has entered a slot 23 in the tumbler-casing 7, so as to pre-

vent such backward movement. The custodian's key being now withdrawn the renter's key is inserted, and this effects such adjustment of the tumblers beneath the dog 20 as to bring the notches of said tumblers into line with the lug 17 of said dog 20, thereby permitting inward movement of said dog under the influence of a suitable spring 30, Fig. 1, so that the dog no longer engages with the forward wall of the slot 22. Hence further forward movement of the cylinder 10 is permitted, as shown in Fig. 5. The movement of the cylinder by the action of the renter's key continues until the bolt has been fully retracted. Before the bolt has been retracted far enough to permit opening of the door, however, the dog 19 has entered a slot 24 in the tubular casing 7, as shown in Fig. 6. Hence the bolt cannot now be projected by a backward movement of the cylinder 10, the dog 20 on the continued forward movement of the cylinder also engaging with the slot 24 in order to prevent such backward movement. Hence in order to effect the projection of the bolt and the relocking of the door continued forward motion of the cylinder 10 must be resorted to until the parts finally again reach the normal position. (Shown in Fig. 3.)

It should be understood that each key is provided with one or more lugs 31, which when the key is inserted into the lock, so as to effect adjustment of the tumblers, and the cylinder is turned will engage with the inwardly-projecting flange 9 of the casing 7 as soon as said cylinder begins to turn, so that neither key can be withdrawn until the movement of the cylinder intended to be effected by that key has been completed, suitable notches 32 and 33 in the flange 9 providing for the insertion and withdrawal of the keys at the proper time. Thus the custodian's key is inserted through the notches 32 and withdrawn through the notches 33, and the renter's key is inserted through the latter notches and withdrawn through the notches 32. Hence after the renter has inserted his key and has commenced to turn the cylinder 10 he cannot withdraw the key until he has completed the movement of said cylinder sufficient to withdraw and again project the locking-bolt 4. It will thus be seen that in my improved lock the desired movements of the locking-bolt are effected by turning the keys always in the same direction—that is, forwardly or to the right. Efficient stops are provided for limiting the forward movement of the custodian's key and for preventing back movement of the same, and the operation of the bolt by backward movement of the renter's key is also prevented, and as the removal of said renter's key from the lock is rendered impossible until the bolt has first been withdrawn and then again projected the door must be closed and locked by the renter before he can leave it. Hence the door cannot be left in the unlocked position because of carelessness or forgetfulness on the part of the renter.

In the modification of my invention shown in Figs. 8 and 9 the slots 23 and 24 in the tubular casing 7 for the entrance of the dogs 19 and 20 are dispensed with and a special spring-dog 25 is mounted in the rear end of the cylinder 10, this dog engaging with notches 26, 27, and 28 in the casing 7, so as to prevent backward movement of the cylinder from either of the positions shown in Figs. 4, 5, or 6. This same construction of dog may be applied with advantage to a cylinder containing two sets of tumblers of a character similar to those of the well-known "Yale" lock, one set to be adjusted by the custodian's key and the other set to be adjusted by the renter's key, the dog serving the same purpose of preventing back movement of the cylinder after it has been moved forward to a certain extent.

It will be noted on reference to Figs. 3, 4, 5, and 6 that the forward wall of the slot 22 in the casing 7 of the lock is composed of a plate 35, which is suitably secured in position in said casing and is composed of steel or other hard metal, so that its inner corner will not become worn by the pressure and friction of the dogs upon it to such an extent as to permit a portion of the dog 19 to pass beneath it. Hence no such pressure can be brought to bear upon said dog 19 as would cause its lug to enter, even so little, the notch of a tumbler moved beneath the dog until all of the tumblers are properly adjusted for the entrance of said lug, thereby preventing the location of the notches on the part of any one attempting to pick the lock.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. A safe-deposit lock having a rotatable carrier with tumblers and dog mechanism, and a casing with stops for said dog mechanism, which stops prevent backward movement of the tumbler-carrier after the same has been moved so as to retract the bolt, whereby the retraction and projection of said bolt are effected by a single forward rotation of the tumbler-carrier, substantially as specified.

2. The combination in a safe-deposit lock of the tumbler-cylinder having two sets of tumblers, and two locking-dogs, with stops therefor, one dog operating in conjunction with one set of tumblers, and the other dog operating in conjunction with the other set of tumblers, substantially as specified.

3. The combination in a safe-deposit lock of the tumbler-carrier and its tumblers, and a pair of dogs and stops therefor, one dog being released from its stop on one adjustment of the tumblers, and the other dog being released from its stop on another adjustment of the tumblers, substantially as specified.

4. The combination in a safe-deposit lock, of a cylinder having two sets of notched tumblers disposed side by side and a pair of locking-dogs likewise disposed side by side, one

of said dogs being adapted to engage with the notches of one set of the tumblers, and the other dog being adapted to engage with the notches of the other set of tumblers.

5. A safe-deposit lock in which are combined a single cylinder and two sets of tumblers contained therein, one set adapted to be adjusted by one key, and the other set by another and different key, and mechanism whereby both sets of tumblers must be adjusted before the lock can be opened.

6. A safe-deposit lock in which are combined a rotatable cylinder having tumblers, a casing having a notch or recess therein, and a spring-dog independent of the tumblers but carried by the cylinder for engagement with said notch when the cylinder has been partly turned so as to prevent backward movement of the cylinder.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK SOLEY.

Witnesses:

GEORGE L. BATTERSBY,

WM. L. LEO.