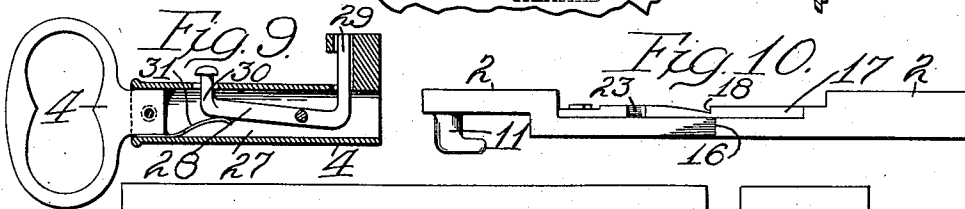
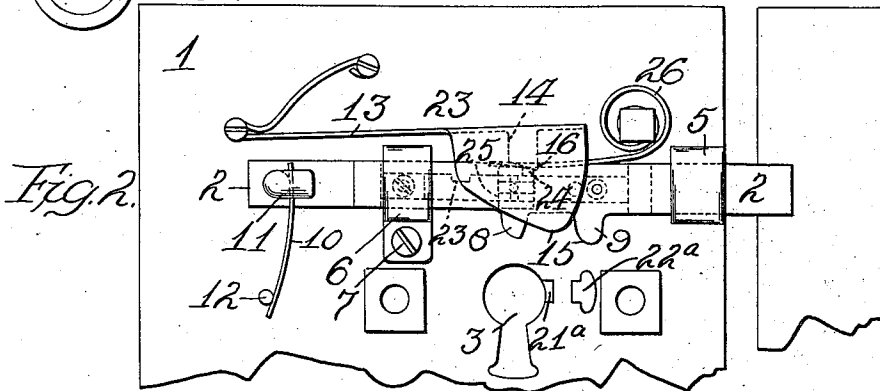
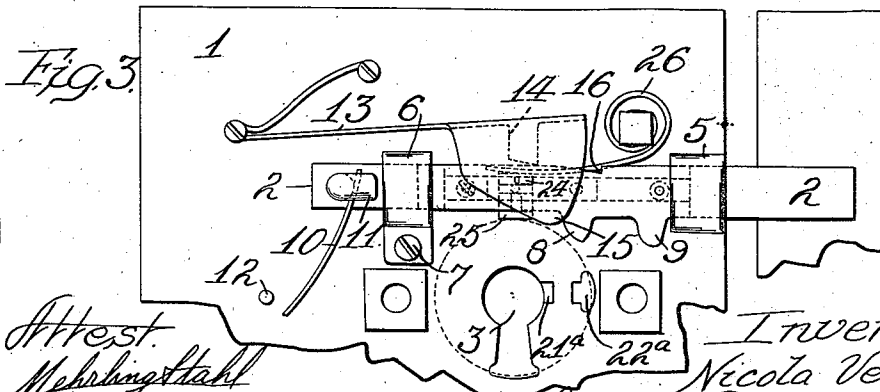


APPLICATION FILED JAN. 6, 1914.

Patented May 26, 1914.



Attest.
Mehringstahl
Arthur Middleton

Inventor:
Nicola Ventrice.

By Spear, Middlebrook, Dumas and Spear
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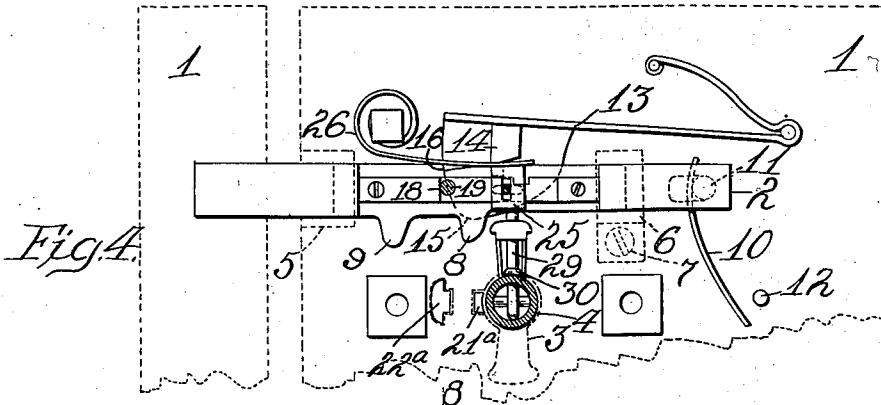
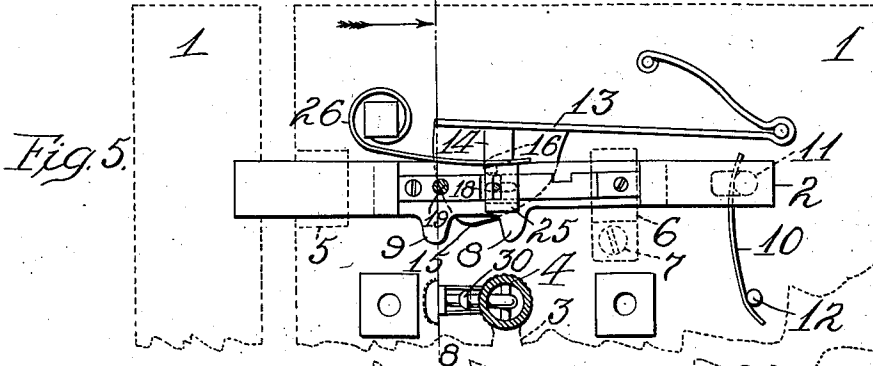
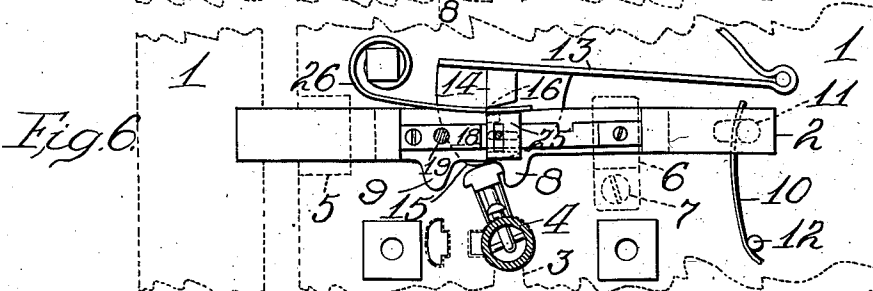
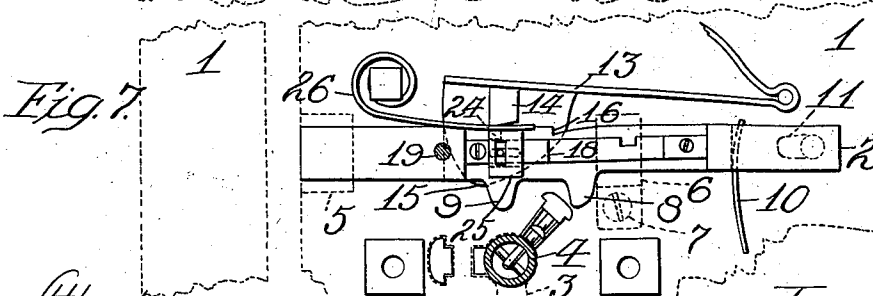
N. VENTRICE.
PERMUTATION LOCK.

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2 SHEETS—SHEET 2.

1,098,068.



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UNITED STATES PATENT OFFICE.

NICOLA VENTRICE, OF COLLINSVILLE, CALIFORNIA.

PERMUTATION-LOCK.

1,098,068.

Specification of Letters Patent.

Patented May 26, 1914.

Application filed January 6, 1914. Serial No. 810,668.

To all whom it may concern:

Be it known that I, NICOLA VENTRICE, citizen of the United States, residing at Collinsville, Solano county, California, have invented certain new and useful Improvements in Permutation-Locks, of which the following is a specification.

This invention relates to permutation locks that are operated by a double movement of the key, and has for its object the production of a lock wherein it will be impossible for unauthorized persons to unlock the same without knowing the manner of operation thereof.

Another object of the invention is to provide a simple and efficient lock wherein after it is once locked, the key may be rotated in either direction in the lock by an unauthorized person but the bolt of the lock can not be withdrawn unless the operator is acquainted with the specific manner of making the key operative.

With these and other objects in view, the invention includes the features of construction and arrangement and construction of parts hereinafter described and more particularly pointed out in the claims, it being understood that I do not intend to limit myself with regards to the details of the different parts of my invention.

I have illustrated my invention in the accompanying drawings, in which:

Figure 1 is a rear elevation of the lock in its open position; Fig. 2 is a similar view of the lock after one closing revolution of the key; Fig. 3 is a similar view of the lock in its closed position or after two closing revolutions of the key; Fig. 4 is a front elevation with the face plate removed showing the completion of the first opening operation; Fig. 5 is a similar view showing the completion of the second opening operation; Fig. 6 is a similar view of the completion of the third opening operation; Fig. 7 is a similar view showing the completion of the fourth opening and final opening operation; Fig. 8 shows a section on the line 8—8 of Fig. 5 looking in the direction of the arrow; and Fig. 9 shows a longitudinal section of the key; Fig. 10 is a top plan view of the bolt.

In the drawings, the ordinal 1 indicates the face-plate of the lock, 2 the bolt, 3 the key hole, 4 the key whose particular construction is more particularly hereinafter described. The bolt 2 is slidably secured to the face plate 1 by guides 5 and 6 which may

be removably secured to the face plate as by the screw 7. On the under side of the bolt 2 are cam shaped projections 8 and 9 upon which the key operates to shoot the bolt. A spring 10 is provided to exert an opening pressure upon the bolt through a bent pin 11 thereon. 12 indicates a limiting stop for this spring. A spring tumbler member 13 is also provided having a tooth 14 adapted to bear against the upper edge of the bolt and a cam shaped lateral extension 15 adapted to be raised by the key when in certain positions. In the top of the bolt is a notch 16 adapted to receive the tooth 14 of the tumbler member 13 when the parts take the position shown in Fig. 2. The bolt is of a shape substantially as that shown in Fig. 10. Inserted in the cutaway portion of the bolt is a plate 17 having a notch 18 therein adapted to engage a pin 19 when the parts are in the position shown in Fig. 4. This pin 19 (Fig. 8) projects inwardly from a spring plate 20 secured to the outside of the face plate adjoining the key hole and between the key hole and the side of the lock from which the bolt shoots. Parts of the face plate are cut away at 21 and 22 and are of a shape to correspond with the key and into which fit and project projections 21^a and 22^a on the spring plate 20 for a purpose hereinafter described. In the top of the inserted plate 17 is a notch 23 which is adapted to engage a square pin 24 on a vertically moving member 25 slidably secured to the face plate and having a spring 26 exerting a downward pressure thereon. Fig. 3 shows these parts in engagement.

The key 4 is peculiarly constructed as shown in Fig. 9 wherein 27 is a hollow barrel thereof having pivoted therein a lever 28 with bent ends 29 and 30. A spring 31 is provided to normally maintain the end 29 withdrawn into the key and the end 30 extended therefrom.

The operation of my lock is as follows: In the open position the parts are as shown in Fig. 1. Then the key is inserted and during one revolution of it to close the lock, it engages the projection 9 of the bolt and thereby moves the bolt into the partially locked position shown in Fig. 2. In this position, the tooth 14 of the spring tumbler member 13 falls into the notch 16 in the bolt and prevents the spring 10 from causing the withdrawal of the bolt. During the second closing revolution of the key, it engages

the projection 10 of the bolt and thereby moves the bolt to its completely locked position, Fig. 3. While the key is causing the bolt to move, it engages and lifts the cam shaped extension 15 of the tumbler 13 which, being integral with the tooth 14, lifts it out of engagement from the notch 16 and allows the bolt to be more readily shot. When the bolt is completely locked or shot as far as it will go, the vertically moving member 25 falls, due to the pressure of the spring 26 thereon, until its square pin 24 engages the notch 23 and prevents any retraction of the bolt. This fall allows a portion of this member 25 to project below the bolt as will be seen by comparing its positions in Figs. 2 and 3. When the parts are completely locked as in Fig. 3, the key may be turned in either direction without any effect upon the parts as is illustrated by the circle in dotted lines which is to show the reach of the key. Now, to unlock the bolt it is first necessary to place the key in the position shown in Fig. 4. Then the pin 30 extending from the barrel of the key is depressed, which causes the extension of the end 29 of the lever, as shown in Fig. 4. As this end 29 emerges from the key, it raises the member 25 against the pressure of the spring 26 and unseats the square pin 24 from its notch 23. This leaves the spring 10 free to retract the bolt until its movement is stopped by the notch 18 engaging the pin 19 of the spring plate 20 (see Figs. 4 and 10). The key is next given a three-quarter turn until it is over the openings 21 and 22 and the projections of the spring plate therein (Fig. 5). The key is then given a pull toward the operator when a portion of the bit enters the openings 21 and 22 and forces the projections 21^a and 22^a therefrom which causes the spring plate 20 to bend outwardly from the face plate (Fig. 8) thereby disengaging the pin 19 from the notch 18 and allowing the spring again to operate to retract the bolt until the notch 16 in the top of the bolt engages the tooth 14 of the tumbler member 13 (Fig. 5). The key is then given an unlocking turn (Fig. 6) wherein it engages and lifts the cam-shaped extension 15 of the spring tumbler member, which disengages the tooth 14 from the notch 16, thereby enabling the bolt to be unshot by the key moving the bolt through the projection 8 thereon.

I claim as my invention:—

1. In combination in a lock, a bolt, a key, projections on said bolt arranged to be engaged by said key consecutively in its several locking revolutions, means for partially retracting said bolt, means in said key for directly causing said partially retracting

means to operate, and means for locking said bolt when partially retracted, said key operating on one of said projections to complete the retraction of the bolt.

2. In combination in a lock, a bolt, a key, projections on said bolt arranged to be engaged by said key consecutively in its several locking revolutions, spring retracting means for said bolt, automatic arresting means in the path of said bolt, means in said key for releasing said arresting means, said key operating on one of said projections to complete the retraction of the bolt.

3. In combination in a lock, a bolt, a key, lugs on said bolt arranged to be engaged by said key consecutively in its several locking revolutions, a spring exerting a retracting pressure upon said bolt, projections in the path of said bolt, notches in said bolt automatically engaged by said projections, means in said key for disengaging said projections from said notches, said key operating on one of said lugs to complete the retraction of the bolt.

4. In combination in a lock, a bolt, a key, lugs on said bolt arranged to be engaged by said key consecutively in its several locking revolutions, a spring exerting a retracting pressure upon said bolt, a spring plate on the exterior face of the lock, a pin carried thereby projecting into the path of said bolt, tumblers, projections carried thereby also extending into the path of said bolt, notches in said bolt automatically engaged by said pin and projections, means in said key for disengaging said pin and projections from said notches, said key operating on one of said lugs to complete the retraction of the bolt.

5. In combination in a lock, a bolt, a key having a bit, lugs on said bolt arranged to be engaged by said key consecutively in its several locking revolutions, spring retracting means for said bolt, a plurality of automatic arresting means in the path of said bolt, a pivoted lever longitudinal of said key having one projection through the bit of said key, and another through the barrel thereof, the manipulation of said lever operating to release one of said arresting means when the key is in a certain position and the bit of the key operating to release another of said arresting means when the key is in a certain position and pulled toward the operator, said key operating on one of said lugs to complete the retraction of the bolt.

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

NICOLA VENTRICE.

Witnesses:

JOSEPH ANTONIUS,
EMIL EMMINGTON.