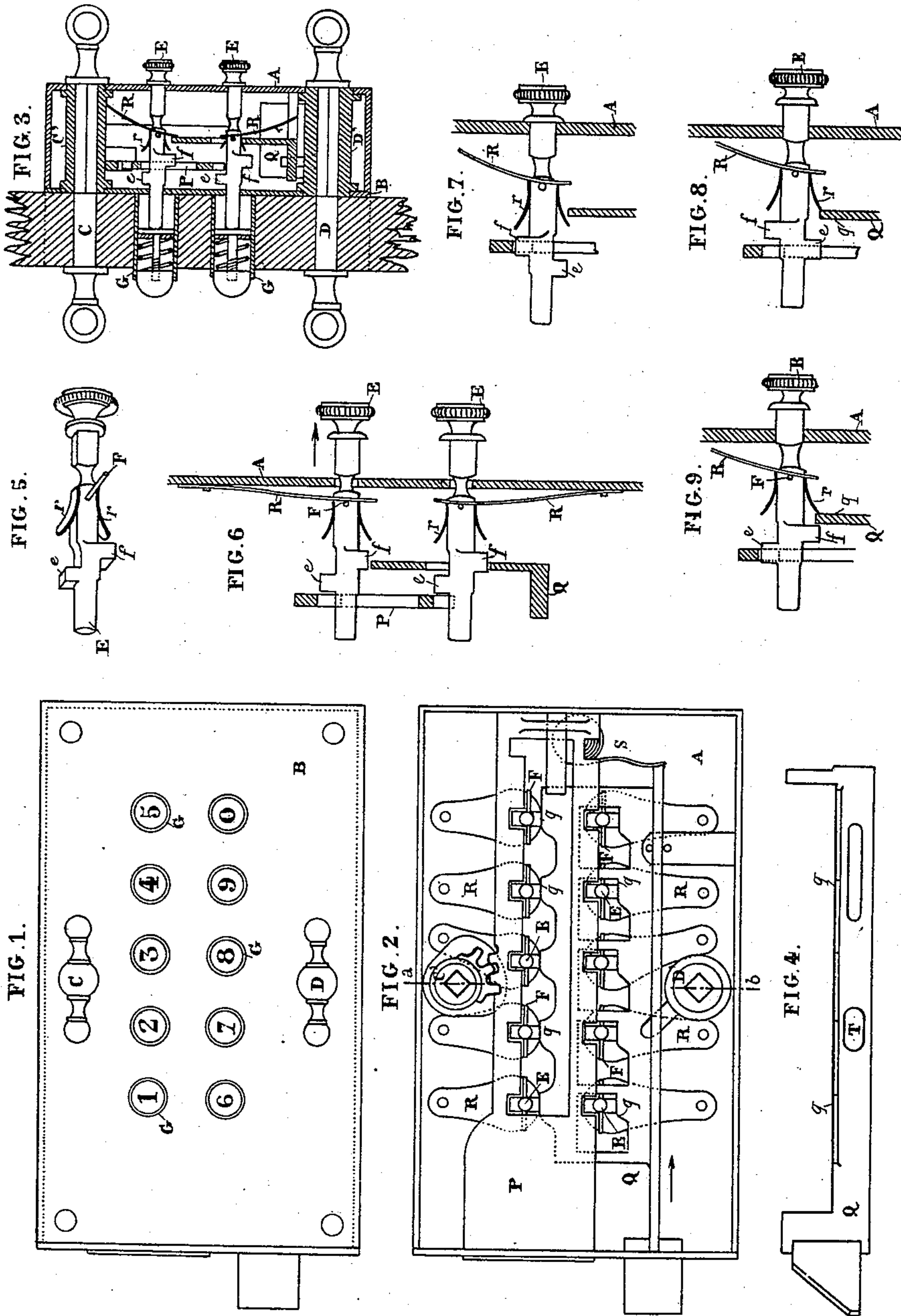


(No Model.)

E. FÉRET.
PERMUTATION LOCK.

No. 472,868.

Patented Apr. 12, 1892.



Witnesses:
Thomas Durant.

E. B. Smith

Inventor:
Ernest Féret,
by Church & Church
his Attys

UNITED STATES PATENT OFFICE.

ERNEST FÉRET, OF PARIS, FRANCE.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 472,868, dated April 12, 1892.

Application filed July 5, 1889. Serial No. 316,616. (No model.) Patented in France October 26, 1888, No. 193,741, and in England June 4, 1889, No. 9,268.

To all whom it may concern:

Be it known that I, ERNEST FÉRET, a citizen of the Republic of France, residing at Paris, in France, have invented certain new and useful Improvements in Permutation-Locks, (for which I have obtained Letters Patent in Great Britain, No. 9,268, dated June 4, 1889, and in France, No. 193,741, dated October 26, 1888,) of which the following is a specification.

The present invention relates to an improved keyless lock—i. e., a lock which is opened by means of ordinary handles bearing figures or letters or the like, by means of which different combinations can be formed.

In the accompanying drawings, Figure 1 represents the outer part of the lock. Fig. 2 represents a view of the interior, the covering being removed. Fig. 3 is a transverse section on line *a b* of Fig. 2. Fig. 4 is a plan of the small bolt. Fig. 5 is a perspective view of one of the rods for forming the combinations. Fig. 6 represents the position of two of the said rods, which are drawn from the inner side of the door to form a combination. Fig. 7 is one of the rods in position to be pushed from the outside for opening the door. Fig. 8 represents the same rod pushed back. Fig. 9 represents a wrong rod pushed back in error and preventing the door from opening.

This lock, which may also be applied to safes and all kinds of furniture as well as to doors of any kind, consists of a box or case A, which contains the whole of the mechanism and is closed by a plate B. Through the whole pass two rods or spindles C D of square section and provided at both ends with handles or knobs for the purpose of opening the door from the inside or outside. The upper spindle C passes through a square socket C', provided on its outer side with a toothed sector-gearing with a few teeth formed in the upper edge of the large bolt P of the lock. By turning the spindle C the large bolt is therefore moved laterally to open or lock the door. The lower spindle D passes through a square socket D', provided with a nose or single tooth, which engages in a slot T, formed in the small bolt Q of the lock, in such a manner that by turning this lower spindle D the small bolt is

moved laterally. The said spindles C and D may be dispensed with and the socket-pieces C' D' turned by means of a key having the same shape as the opening in the socket.

Through the lock pass a series of short rods E, ten being represented in the drawings. These rods, represented in perspective in Fig. 5, are of square section for very nearly their whole length and are provided with two noses *e f*. They are further provided with two springs *r* and a transversely-projecting pin F. Each of the said rods passes through an opening formed in a spring-blade R, fixed to the case. This spring bears against the above-named pin F and tends to push the rod outward. Each rod passes through the cover-plate B and enters a socket G, at the end of which is a spring-button, by pushing which with the finger the rod is pushed inward. These buttons are numbered as represented in Fig. 1 and are visible from the outside of the door. Instead of figures, they may be marked with letters or other signs. The body of the large bolt P is of a flat form and is formed with openings and at the upper and lower part with a series of notches, in which the noses of the short rods E are adapted to engage. The body of the small bolt Q has the section of an angle-iron, Fig. 6. The vertical part is formed with openings, through which pass the lower row of the short rods E, and the upper and lower parts are provided with projections *q*.

The operation of the lock is as follows: The short rods E being in the position indicated in Fig. 3—i. e., leaving the bolts P Q perfectly free—the latter can be moved by simply turning the handles of the spindles C D. If it is desired to prevent any one from opening the door, any desired combination of the numbered buttons is made—for instance, "2849." The rod bearing the number "2" is now drawn inward from the inside of the door, Fig. 6, and given a half-turn, so that the nose *e* of the rod which was at the top is now at the bottom. The rod is then released and is returned into its former position by the action of the above-named spring R. The same operation is performed with the rods bearing the numbers "8," "4," and "9." The noses *f* of the

short rods E, numbered as above, which were at the bottom before, are at the top now and engage in the notches formed in the body of the large bolt, so that they must be displaced first from these notches before the large bolt can be moved. To open the door, it suffices to press successively the outer buttons 2, 8, 4, and 9. By depressing the buttons the short rods E are pushed in and one of the small springs *r*, slipping over one of the projections of the small bolt, retains the rod, and thus keeps its nose *f* disengaged from the notch in the large bolt, Fig. 8. The latter is now free and can be moved by simply turning its handle.

To open the door definitely, the small bolt is moved by turning its handle, and in doing so the projections *q* of the small bolt are also moved aside, releasing the small springs *r* of the above-named rods 2 8 4 9, which are now returned into their former position. If any stranger tries to open the door and presses one of the buttons which is not in the combination, one of the small springs *r* will always slip over one of the projections of the small bolt and retain the short rod E; but one of the noses of this rod will now engage with one of the notches of the large bolt, Fig. 9, and prevent this latter from being moved even after the right buttons have been depressed afterward. To open the door, only the buttons in combination ought therefore to be depressed.

To lock the door, the buttons of the combination are depressed first. The large bolt is then shot into its socket by turning its handle. The handle of the small bolt is then turned to move this latter to liberate the rods of the combination and permit them to return to their former position. The small bolt is returned by means of a spring S and the door is locked. As many of the rods as desired may be included in the combination; but it is desirable not to include more than half of them. To increase the safety, an electric contact may be attached to each rod not in the combination and arranged to ring an electric bell directly a stranger depresses one of the buttons not in the combination.

I claim—

1. In a keyless lock, the combination, with the bolt, of the series of independent spring-projected rods having projections co-operating with the bolt to lock the same against longitudinal movement, with independent finger-pieces for the rods projecting beyond the lock-casing, substantially as described.

2. In a keyless lock, the combination, with the bolt having a series of recesses therein, of the series of independent reversible spring-pressed longitudinally-movable rods having projections on each side, adapted to enter the

recesses in the bolt, whereby the bolt is locked, substantially as described.

3. In a keyless lock, the combination, with the bolt having a series of recesses therein, of the series of independent movable rods having projections adapted to enter the respective recesses in the bolt and the catches for holding the rods pressed inward, substantially as described.

4. In a keyless lock, the combination, with the bolt having a series of recesses therein and the series of independent movable rods having projections adapted to enter the recesses in the bolt, of the catches and the movable bolt with which said catches engage to hold the rods retracted, substantially as described.

5. In a keyless lock, the combination, with the bolt having a series of recesses therein and the series of independent spring-pressed movable rods having projections adapted to enter the recesses in the bolt, of the spring-catches, the movable bolt having the projections with which the catches engage to hold the rods retracted, and means for moving said bolts, substantially as described.

6. In a keyless lock, the combination, with the bolt having a series of recesses therein and the series of independent reversible spring-pressed longitudinally-movable rods having projections on opposite sides adapted to enter the recesses in the bolt to lock the latter, of the spring-catches and the second bolt co-operating with said catches to release the rods, substantially as described.

7. In a keyless lock, the combination, with the two locking-bolts, one having a series of recesses therein, of the spring-pressed rods having the projections entering said recesses and the spring-catches for the rods released by the bolt not having the recesses therein, substantially as described.

8. In a keyless lock, the combination, with the locking-bolt and series of independent spring-projected rods co-operating therewith to lock the same, one end of said rods extending outside of the casing, of the series of independent finger-pieces bearing against the opposite ends of the rods, substantially as described.

9. In a keyless lock, the combination, with the locking-bolt, of the series of independently-rotatable rods co-operating therewith to lock the same, each having the irregularly-shaped body with a reduced portion to permit of their reversal, substantially as described.

In testimony whereof I have hereto set my hand in the presence of the two subscribing witnesses.

ERNEST FÉRET.

Witnesses:

ACHILLE MARILLIER,
R. J. PRESTON.