

O. M. FARRAND.
COMBINATION OR KEYLESS LOCK.
APPLICATION FILED AUG. 16, 1911.

1,028,868.

Patented June 11, 1912.

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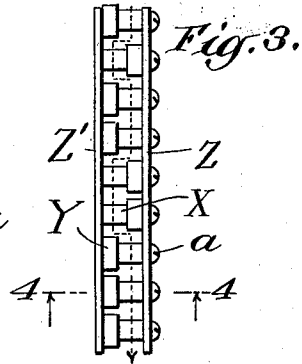
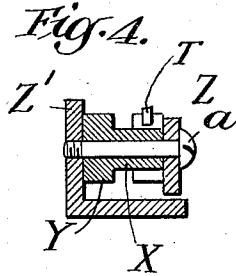
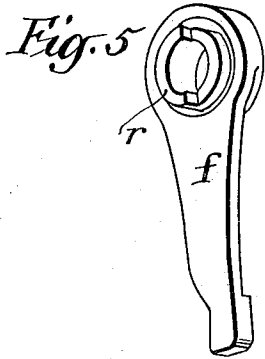
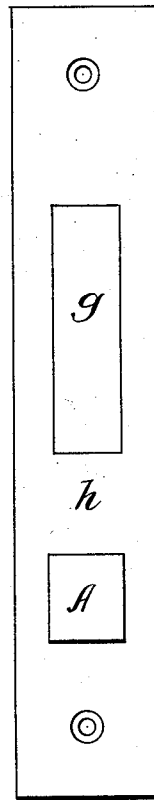
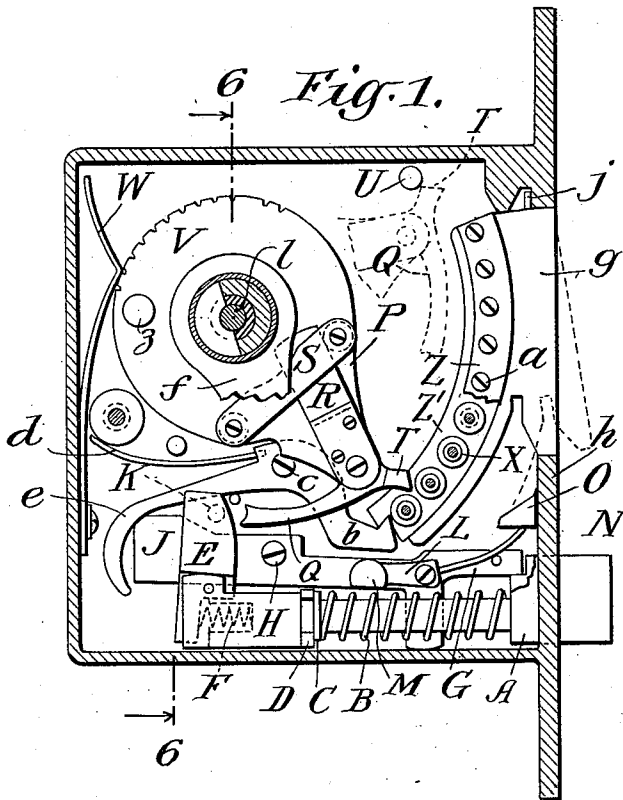


Fig. 2.



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2 SHEETS-SHEET 2.

Fig. 7.

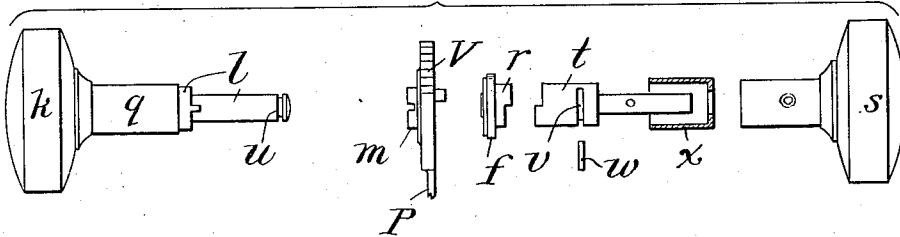


Fig. 6.

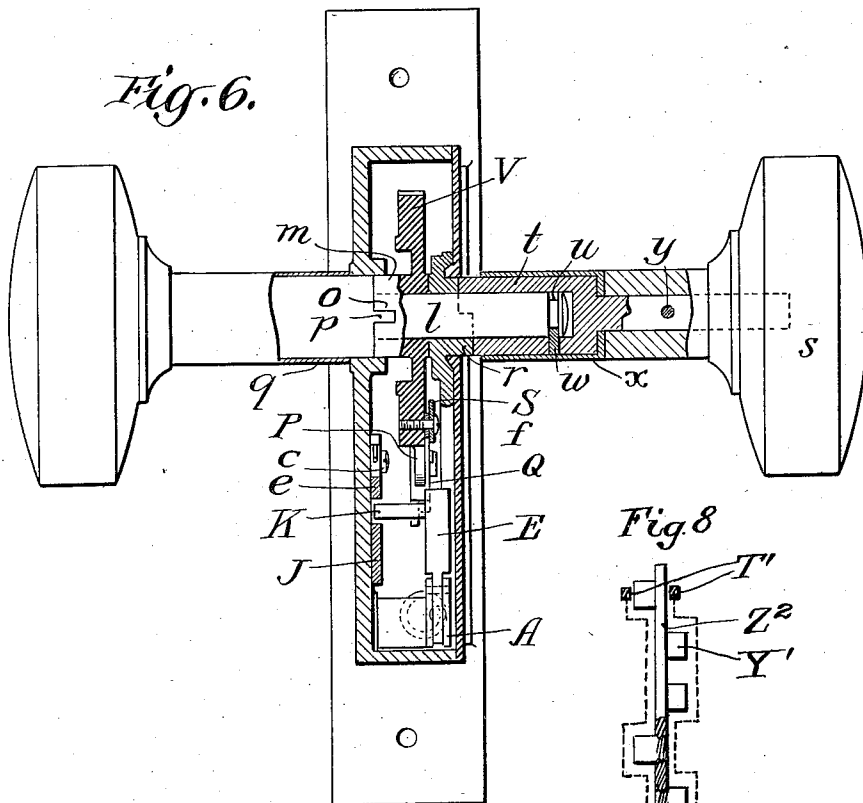
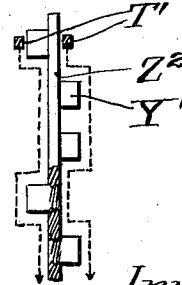


Fig. 8.



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COMBINATION OR KEYLESS LOCK.

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Specification of Letters Patent.

Patented June 11, 1912.

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To all whom it may concern:

Be it known that I, OLIVER M. FARRAND, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Combination or Keyless Locks, of which the following is a specification.

This invention aims to provide certain improvements in keyless or combination locks adapted for use in any situation but especially for house doors or front doors of apartments or the like, and adapted to be operated by the sense of touch, the means for counting the numbers constituting the combination being invisible, so that it may be operated by a deaf or a blind person and equally well at night or in day light. The construction is extremely simple and reliable in operation. The combination can be changed easily. A dead latch is provided to prevent the bolt from being forced back without operating the knobs.

Various other features of advantage are referred to hereinafter.

The accompanying drawings illustrate an embodiment of the invention.

Figure 1, is an elevation from the inside, with the inside plate of the casing removed, parts being cut away for greater clearness. Fig. 2, is an elevation of the outer edge plate. Fig. 3, is a development in plan of the combination member. Fig. 4, is a section of Fig. 3 on the line 4—4. Fig. 5, is a perspective view of the free arm which in Fig. 1 is partly cut away. Fig. 6, is a section of Fig. 1 on the line 6—6. Fig. 7, is a group of details showing the connections of the knobs to each other and to their respective arms within the lock. Fig. 8 is a view, similar to Fig. 3, of a variant thereof.

Referring to the embodiment of the invention illustrated the usual or any suitable bolt A is pressed outward by means of a spring B bearing, through a washer C, upon a guide D fixed upon the outer plate of the casing. The bolt extends beyond the guide D and is provided at its inner end with a pivoted member E pressed forward by a spring F in a recess of the rear end of the bolt and capable of limited pivotal motion, after which further inward movement of the member E carries the bolt with it.

The pivotal movement of the member E is used for releasing a dead latch consisting of a member G pivoted at H and having at

its rear end a cam or projecting portion J which is in the path of the rearward motion of the pin K on the releasing member E. When the dead latch is in operative position, as in Fig. 1, its forward end lies in the path of a shoulder on the bolt A to prevent inward movement of the latter. When the releasing member E is swung backward the cam J is pressed downward and the forward end of the dead latch G is lifted out of the path of the bolt and the further rearward movement of the releasing member E carries the bolt with it to draw the latter inward. Pivoted on the forward part of the dead latch G is a restoring member L having a projection M which lies in the path of the free arm hereinafter referred to so that when said arm is given an extreme backward movement the member L is pressed downward and a spring N connected thereto bears upward against a projection O fixed on the outer plate of the casing and forces down the dead latch.

A combination arm P is connected with the outer knob so as to be rocked thereby and carries means for striking the pin K, when the arm is moved properly according to the combination, and drawing the bolt. For this purpose the arm P carries pivotally mounted on the end of the arm a member Q having a notch at the end for engaging the pin K. This member is connected with an extension R which is a spring bearing frictionally against the arm P to hold the member Q in any position to which it is moved. The spring R is held against the arm P by means of a bar S fastened by pins at its ends which also serve as stops to limit the movement of the spring R and member Q in opposite directions. The member Q is provided also with a tail T which when the arm is swung back to its upper position strikes the fixed pin U and throws the member Q to the operative position shown. The starting position is shown in dotted lines in Fig. 1. From this position as the arm swings down the tail T has to pass over a line of stops constituting the combination and the arm has to be so manipulated that the tail will not strike any of the stops. If the tail T strikes any one of the stops it is pushed inward and the member Q is forced outward to such a position that at the completion of the movement of the arm the member Q will pass under the pin K and the bolt will not be withdrawn.

The arm P is formed with a circular extension V which is provided with notches for engagement with a light V-shaped spring W, the spacing of the notches corresponding with the spacing of the stops in the combination member. As the arm is turned therefore the notches in the part V ride over the spring W and produce a succession of clicks or shocks by which the operator determines the position of the tail T relatively to the stops.

The combination member consists of a succession of identical hollow pins X having shoulders Y, the pins being held in place between parallel plates Z, Z' by means of screws *a*. The plates Z, Z' are curved as shown in Fig. 1 and located so that the shoulders Y, constituting the stops of the combination, lie within a radius less than that of the arc through which the tail T should move; but the reduced portions of the pins X lie within an arc greater than that of the tail T. Therefore, supposing the pins arranged as in Fig. 3, then the tail T must be so moved as to advance one step, shift axially, advance one step, shift again, advance two, shift again, advance two and shift again, and advance three; that is to say, the combination is represented by the numbers 1, 1, 2, 2, 3. The axial movement is secured by first pulling the outer or combination knob, and with it the arm B and parts carried thereby first inward and then outward, shifting it axially at the end of each step in the combination. Fig. 6 shows that the spindle is adapted to be shifted in this way between shoulders formed as hereinafter described. The construction of the combination member permits of readily changing the combination by withdrawing one of the screws A and its pin X and reversing the position of the latter so that its shoulder will be shifted from right to left or the opposite.

For changing the combination the entire combination member has to be removed from the casing, and this can be done without opening the casing. The plate Z' is hook-shaped at its lower end and is normally engaged by a hook *b* pivoted at *c* and pressed upward by a spring *d*. The hook is provided with a tail *e* lying in the path of the pin K. When the latter is pressed backward sufficiently to withdraw the bolt the hook *b* is forced down so as to release the combination member. The free arm *f* is then swung forward and strikes the lower end of the plate Z and gives the entire combination member a slight push out. The plate Z' of the combination member is provided with an extension *g* entering a recess in the edge plate *h* of the casing and having its face flush therewith (Fig. 2) so that after receiving a slight push to the position shown in dotted lines in Fig. 1 the part G can be seized

from the outside and the entire combination member withdrawn. A pin *j* engaging a recess in the casing holds the upper end of the part *g* in place until the lower part thereof has been seized and pulled downward to free the pin *j*. After changing the combination the combination member may be reinserted by first introducing the curved plate portion and then the pin *j* and pushing the whole in until the end of the plate Z' is forced over the hook *b* and caught thereby.

Because of the necessity of using the free arm to give the combination member its initial outward push the holding of the hook *b* down must be effected through the combination arm pressing backward against the pin K. That is to say, the combination must be worked correctly and the bolt must be drawn and held so by the combination arm and at the same time the free arm must be turned backward to its extreme position to push out the combination member. This arrangement provides against the changing of the combination by persons not familiar with the existing combination.

The outside or combination knob *k* is on a spindle *l* which passes through both sides of the casing and upon which the arm P and circular plate V are mounted, these parts having a hub *m* journaled in the outer plate of the casing and provided with notches *o* engaged by projections *p* on an enlarged part of the spindle *l* so that the rotation of the outer knob effects a similar movement of the combination arm. A sleeve *q* is carried on the spindle of the outer knob to limit the inward movement of the latter in an axial direction. The free or non-combination arm *f* is provided with a hub *r* journaled in the inside plate of the casing and free to rotate on the spindle *l*. The inside knob *s* is provided with a hollow shaft *t* fitting over the end of the spindle *l* and having a shouldered engagement with the hub *r* (see Fig. 7) so as to turn the latter. The spindle *l* is provided near its end with a circumferential groove *u* and the hollow shaft *t* is provided with a slot *v* of substantially the same width. A key *w* may be passed through the slot and fits loosely therein and in the groove *u*. It is then held in place by a sleeve *x* which is passed about the hollow shaft *t* and held in place by the shank of the knob when the knob is fastened upon the outer end of the shaft by the usual screw *y*. The sleeve *x* forms, at its inner end, a shoulder adapted to strike the inside plate of the casing so as to limit the distance to which the outer knob *k* can be pulled in an axial direction.

The inside or free arm *f* is located in the plane of the pivoted releasing member E and the restoring member M of the dead latch. It is only necessary to turn the in-

side knob and the free member in the proper direction to release the dead latch and draw the bolt, or to restore the dead latch. When the combination knob is operated the free arm remains idle, except that upon restoration of the combination arm a pin z mounted thereon strikes the free arm f and turns the same backward to the limit of its movement to cause it to restore the dead latch.

Supposing the combination to have been properly worked, the pin K , in its original position, lies in the arc described by the end of the member Q . As the knob is further turned and the bolt withdrawn the pin K moves on a line which carries it farther from the center of rotation of the combination arm. This movement of the pin K carries the end of the member Q outward from the center of the spindle. As soon as the pressure on the outer knob is released and the combination arm turned backward ever so slightly the pin K will ride over the arm Q and the bolt cannot be again withdrawn except by moving the arm backward to its starting point and repeating the combination.

Fig. 8 shows a variant of the combination device of Fig. 3 in which the screws Y' constituting the stops are mounted in transverse positions on opposite faces of a central plate Z^2 . The yielding detent T of the previous figures must be replaced in this case with a two-armed detent T' which must follow the path indicated by the double dotted lines in Fig. 8 in order to escape the stops. The screws Y' in this case constitute pins, the heads of which are shoulders acting in the manner of the shoulders Y in Fig. 3. The screws or pins are held in line by the central plate Z^2 . By unscrewing one of the pins

and shifting it to the other side of the plate and screwing it in again it can be reversed with the same effect as the pins of Fig. 3.

What I claim is—

1. A lock of the class described having a combination device comprising a set of pins with shoulders and means for holding said pins in line, the pins being reversible end for end to shift the positions of the shoulders and effect a change in the combination.

2. A lock of the class described having a combination device comprising a set of pins X with shoulders Y , plates Z, Z' and means for detachably fastening each of said pins separately between the plates.

3. A lock of the class described having a combination arm and an outside knob for operating the same, a spindle of said knob projecting through to the inner side of the lock and provided with a circumferential groove near its inner end, a free arm pivotally mounted on said spindle, an inside knob having a hollow shaft rotatably mounted on the inner end of said spindle and engaging said free arm to rotate the latter, said hollow shaft having a slot in line with said circumferential groove, a key fitting loosely in said groove and slot to permit rotary movement between the spindle and the hollow shaft and a sleeve overlying said hollow shaft and key to hold the latter in place, said sleeve being held in place by the knob on said shaft.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

OLIVER M. FARRAND.

Witnesses:

D. ANTHONY USINA,
LILLIAN KELLER.