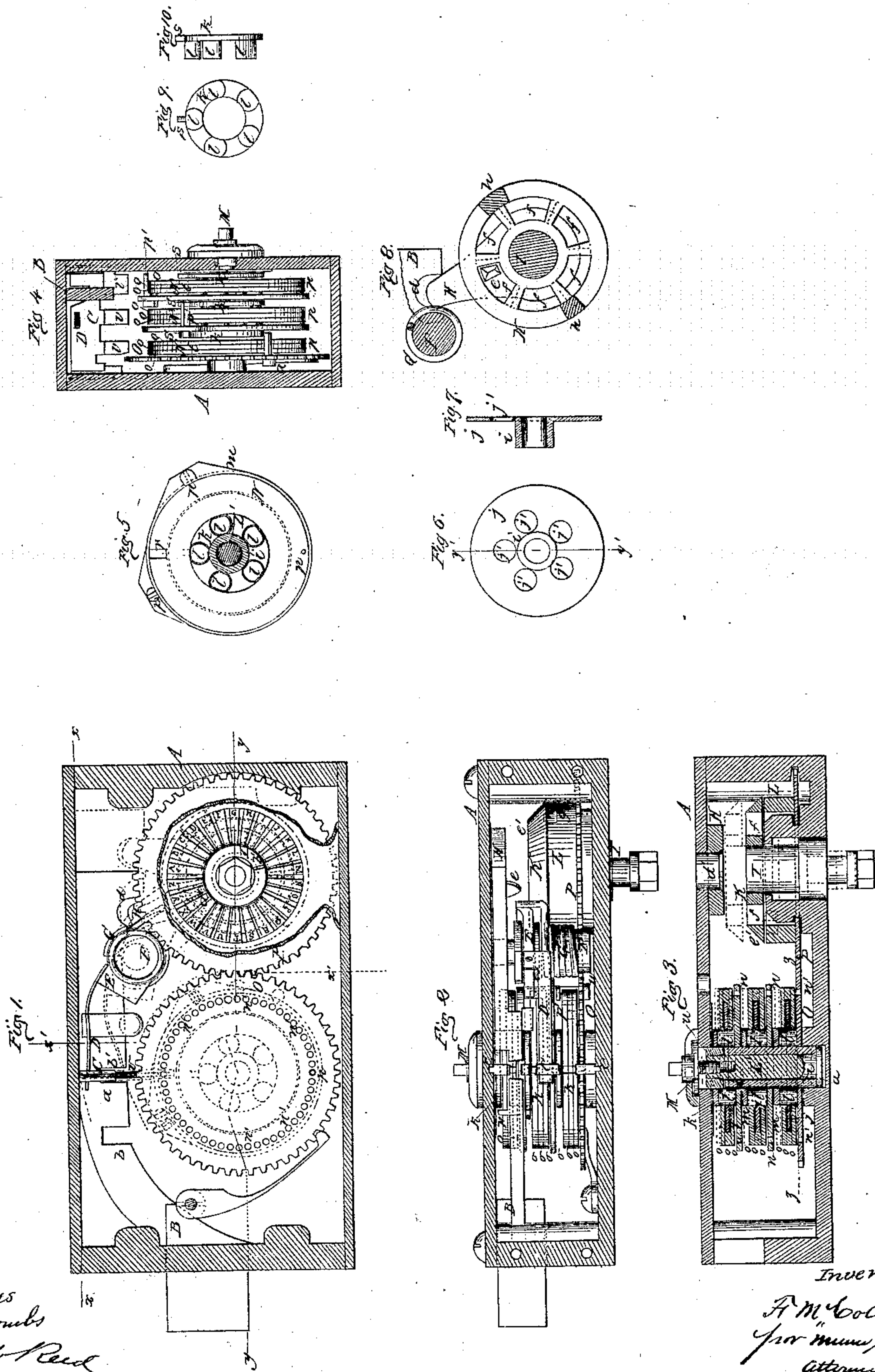


F. Mc Collum,
Permutation Lock,

No 41,518,

Patented Feb. 9, 1864.



UNITED STATES PATENT OFFICE.

F. McCOLLUM, OF ROCKVILLE, CONNECTICUT.

IMPROVEMENT IN LOCKS.

Specification forming part of Letters Patent No. 41,518, dated February 9, 1864.

To all whom it may concern:

Be it known that I, F. McCOLLUM, of Rockville, in the county of Tolland and State of Connecticut, have invented a new and Improved Burglar-Proof Lock; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an internal view of my invention, the side of the lock-case nearest the eye being removed in order to expose the interior; Fig. 2, a plan or top view of the same, the top of the lock-case being removed, as indicated by the line *x x*, Fig. 1; Fig. 3, a horizontal section of the same, taken in the line *y y*, Fig. 1; Fig. 4, a transverse vertical section of the same, taken in the line *z z*, Fig. 3; Fig. 5, a detached section of a portion pertaining to the same, taken in the line *x' x'*, Fig. 3; Fig. 6, a detached side view of one of the circular plates or disks pertaining to the same; Fig. 7, a section of Fig. 6 taken in the line *y' y'*; Fig. 8, a detached side view of the mechanism of the bolt-operating device; Fig. 9, a detached side view of an annular studed plate pertaining to the invention; Fig. 10, an edge view of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to a new and improved burglar-proof lock of that class in which the tumblers are adjusted in proper position to admit of the moving of the bolt through the medium of letters, figures, or other marks on the outer side of the lock-case to serve as guides or indices.

The object of the invention is to obtain a burglar-proof lock of the class specified, which will admit of the tumblers being adjusted in different positions to effect "changes," as it is commonly termed, so as not to admit of the lock being opened at all times by one and the same movement and adjustment of the bolt-arbor, and at the same time obtain a simple and efficient means for effecting this result, which will be hereinafter fully shown and described.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents the lock-case, which is of rectangular form, and B is the bolt, which is fit-

ted therein in such a manner that it may, when not retained or held, slide freely in the case. The portion of this bolt B which does not enter the nosing when the lock is in a locked state, is of curved form, as shown at *a* in Fig. 1, and said part *a* has two vertical slots, *b b'*, made in it at its under edge, both of which are shown in Fig. 1. These slots *b b'* are for the purpose of receiving a bar, C, which is fitted transversely in the case A, its ends sliding in grooves *c*; and this plate is connected with a spring, D, which is attached to an arm, E, fitted loosely on a shaft, F, in the lock-case, said arm having a spiral spring, G, which is on the shaft F, bearing upon it, which spring has a tendency to keep the bar C elevated and within either of the slots *b b'* in the bolt B. When the lock is in a locked state, the bolt being shoved outward, as shown in Figs. 1 and 2, the bar C is in the back slot, *b'*, and when the lock is in an unlocked state the bar C is in the front slot, *b*. The bolt B, at its inner end, has a notch, *d*, made in its under edge to receive the end of a bar, H, which is fitted loosely on a pin or stud, *d'*, in the case, and is provided with a projection, *e*. (Shown in Figs. 2 and 8.)

I is the bolt-arbor, which has a knob or key attached to its outer end, and has a circular plate, K, attached to its inner end within the lock-case. This circular plate K has its periphery *e'* of beveled form, as shown in Figs. 2 and 3, and it is perforated with a series of holes, *f*, which are shown clearly in Fig. 8.

On the bolt-arbor I there is placed loosely a circular disk, L, having two recesses, *g*, made in it to receive two projections, *h h*, at the inner side of the plate K, when said plate is drawn backward, which may be done on account of the bolt-arbor I being allowed a certain degree of longitudinal play or movement in the lock-case A.

The operation of sliding the bolt B so as to lock and unlock the lock is as follows: By shoving the knob-arbor I inward the beveled edge or periphery *e'* of the plate K will come in contact with the end of the arm E and raise it, thereby throwing down the bar C, if there be nothing to prevent it, so that said bar will be free from the slot *b* or *b'* in the bolt B, and when the plate K reaches the extent of this movement the projection *e* on the bar H will be in one of the holes *f* of the plate K, and by

turning the knob-arbor I the bar H will also be turned, and the bolt B moved back and forth, the periphery of the plate K, in consequence of the arm E being upon it, keeping the bar C down free from the bolt B.

From the above description it will be seen that in order to lock and unlock the bolt it is necessary that the bar C be shoved down free from the bolt B; and in order to prevent said bar being thus operated illegitimately the following means are employed: In the lock-case A a shaft, L', is placed transversely, which has a certain degree of longitudinal play or movement allowed it. This shaft is moved by a screw, M. (Shown clearly in Fig. 3.)

On the shaft L' there are placed tightly three collars, *i*, each of which has a circular plate, *j*, at one end, as shown clearly in Fig. 7, said plates *j* having openings *j'* made in them; and on the collars *i* there are fitted or placed three annular plates, *k*, which have each a series of studs, *l*, attached to or cast at one side of them, (see Figs. 3, 5, 9, and 10,) and on the collars *i* there are also fitted two circular plates, *m m*, which are perforated near their edges with holes *n*.

N N N represent circular tumblers, which are each formed of three plates, *o o o*, secured permanently together, the central plate *o* being simply a narrow rim, so as to leave a space within each tumbler to receive a plate, *j*, of a collar, *i*, the inner edges of the outer plates *o o* of each tumbler being fitted on the studs *l* of a plate, *k*. (See Fig. 5.) Each tumbler N has a pin, *p*, projecting from it near its edge, and these pins are in line with the holes *n* in the plates *m*. Each plate *m* has a pin, *p'*, passing through it near its edge, as shown in Fig. 5. The annular plates *k* have each a pin, *s*, projecting from their peripheries, said pins *s* being opposite to slots *t* in the tumblers N, which slots are designated by dotted lines. (See Fig. 4.) The collars *i* are fitted tightly on the shaft L', so that they may not turn thereon, and are allowed to move longitudinally with it in consequence of being between shoulders *u u*, as shown in Fig. 3; and hence whenever the shaft L' is thus moved or adjusted the tumblers N will be moved accordingly, and by this movement are connected to or detached from the plates *m m*.

The bar C, which prevents the movement of the bolt B, as previously described, has three pendent projections, *v v v*, which prevent the bar C from being pressed down, in consequence of coming in contact with the peripheries of the tumblers N; and in order to admit of the bar C being pressed down free from the bolt B, the tumblers N must be so adjusted that the slots *r* will be in line with each other and directly under the bar C, so that the pendants *v* may enter said slots.

O is a toothed wheel placed loosely on one of the collars *i*, and said wheel has a pin, *w*, passing through it near its edge, the pin *w* being similar to the pins *p'* of the plates *m m*. The wheel O is also perforated with holes *n'*

like the plates *m m*. The wheel O gears into a wheel, P, which is attached to the circular disk L in the bolt-arbor I.

In the outer side of the lock-case A, and concentric with the knob-arbor I, there is a circle in which are made a series of radial grooves, *a'*, the spaces between which are lettered from A to Z, (see Fig. 1,) and the outer end of the bolt-arbor I has a groove, *b'*, made in it. These lettered spaces on the lock-case and the groove *b'* in the knob-arbor serve as indices or guides in adjusting the tumblers N, as will be presently described.

The operation is as follows: The tumblers N are adjusted or turned so as to bring their slots *r* in line with each other by drawing back the knob-arbor I so that the projections *h h* on the plate K will engage with or fit into the recesses *g* in the disk L. The knob-arbor I is then turned from left to right, and the wheel O will be rotated by the wheel P attached to the disk L. The wheel O rotates the tumbler N adjoining it in consequence of the pin *p* of said tumbler fitting in a hole, *n'*, of the wheel O, and motion is communicated from the wheel O to the plate *m* nearest to it in consequence of the pin *w* of said wheel coming in contact with the pin *p'* of said plate, which, as it rotates, communicates motion to the tumbler N which is connected with it in the same way as the tumbler first mentioned is connected to the wheel O, and motion is communicated to the other plate *m* and tumbler N adjoining it in consequence of the pins *p'* of said plates coming in contact.

Suppose, for instance, that the tumblers N and plates *m* be so adjusted or set that the lock can be unlocked to the word "Wol." The operator first draws the arbor I back to connect the plate K with the disk L, and then turns the arbor I to the left two revolutions at least, in order that the tumbler N nearest the back of the lock-case may be operated by the pins *p'*, which, after two revolutions of the arbor I, will all be brought in contact, and the groove *b'* is stopped in line with the space W on the outer side of the lock-case, and the slot *r* of the tumbler N at the back part of the lock-case will be in line with the back pendant *v* of the bar C. The next letter is O, to which the groove *b'* is to be brought in line with, and the arbor I is turned to the right (a reverse direction) one entire revolution, so that the pin *w* of the wheel O may be brought in contact with the opposite side of the pin *p'* of the middle or intervening tumbler N; and the arbor, when said pins are in contact, is further turned to the right until the groove *b'* comes in line with O, when the slot *r* of the middle tumbler will be in line with that of the tumbler first turned. The arbor I is then turned to the left until the groove *b'* comes in line with the letter L, and the slots *r* of the three tumblers will be in line and the bar C allowed to be forced down. The arbor I is then shoved inward to operate upon the bolt B, as previously described.

In order to make the changes—that is to say, change the relative position of the plates *m* and tumblers *N*, so that the lock may be unlocked to different words—the shaft *L'* is moved by turning the screw *M* so that the tumblers *N* will be disconnected from the plates *m m*, and the tumbler which adjoins the wheel *O* also disconnected from it. In this adjustment of the tumblers the latter slide on the studs *l* and plates *k*, and the pins *s* on the latter fit in the recesses *t* in the tumblers. The plates *m m*, when the tumblers are disconnected from them, are turned independently of the former, and are set by means of the groove *b'*, and letters on front of the lock-case to any word desired, and the tumblers *N* are then connected with the plates *m m* by moving the shaft *L'* back to its original position.

I do not claim, broadly, the employment or use of rotary tumblers, for they have been previously used; but,

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

1. The arrangement and combination of the tumblers *N*, provided with the pins *p*, plates *m m*, perforated and provided with the pins *p'*, annular plates *k*, provided with the studs *l*, and the collars *i*, having perforations *j'*

made in them, and fitted within the tumblers *N*, all arranged in connection with the shaft *L'*, and perforated wheel *O*, provided with the pin *w*, to operate as and for the purpose specified.

2. The sliding arbor *I*, having a plate, *K*, attached to it provided with projections *h h*, in connection with the disk *L*, provided with recesses *g*, and having the wheel *P* attached to it, all arranged as shown, in connection with the wheel *O*, for communicating motion to the tumblers *N* and plates *m m*.

3. The bar *C*, provided with the pendent projections *v v v*, and attached to the arm *E* on shaft *F*, in connection with the spring *G*, and plate *K* on the arbor *I*, provided with the beveled edge *e'*, substantially as and for the purpose specified.

4. The bar *H*, provided with the projection *e*, and fitted on the pin or stud *d'*, and connected with the bolt *B*, as shown, in combination with the perforated plate *K* on the sliding arbor *I*, all arranged as shown, for admitting of the arbor being connected with and disconnected from the bolt, as set forth.

F. McCOLLUM.

Witnesses:

A. W. TRACY,

BENEZET H. BILL.