

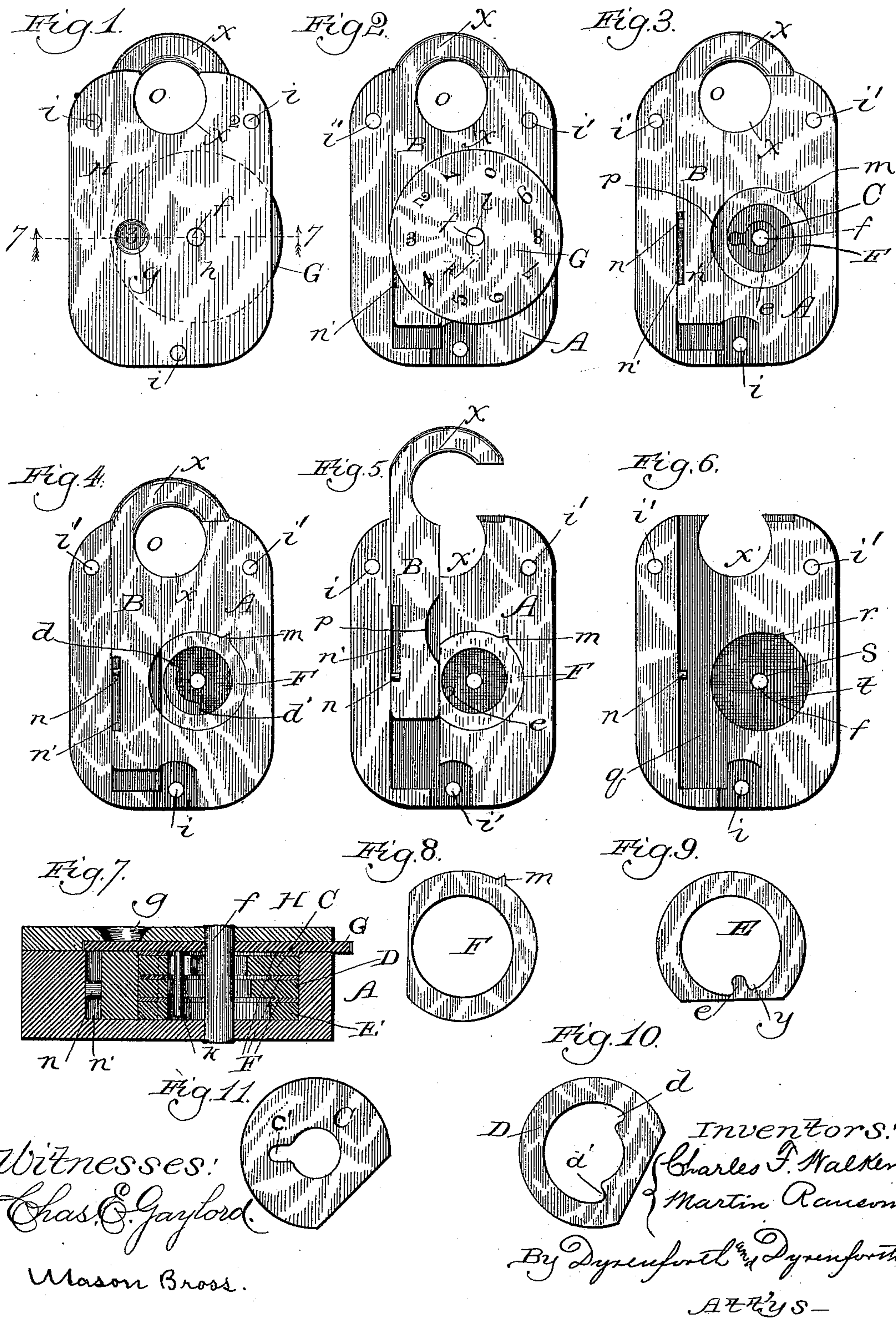
(No Model.)

C. F. WALKER & M. RANSOM.

PERMUTATION PADLOCK.

No. 330,647.

Patented Nov. 17, 1885.



UNITED STATES PATENT OFFICE.

CHARLES F. WALKER, OF OAK PARK, AND MARTIN RANSOM, OF CHICAGO,
ILLINOIS; SAID RANSOM ASSIGNOR TO SAID WALKER.

PERMUTATION-PADLOCK.

SPECIFICATION forming part of Letters Patent No. 330,647, dated November 17, 1885.

Application filed March 2, 1885. Serial No. 157,505. (No model.)

To all whom it may concern:

Be it known that we, CHARLES F. WALKER, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, and MARTIN RANSOM, a subject of the Queen of Great Britain, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and Improved Combination-Lock; and we hereby declare the following to be a full, clear, and exact description of the same.

It is our object to provide a combination or permutation lock suitable for all the purposes to which such locks are applicable, which shall be accurate in its operation and of comparatively simple construction; and to this end our invention consists, first, in effecting the locking of the bolt by means of tumblers or disks of peculiar construction arranged to be turned independently of each other about a common center; second, in providing disks having each a segment removed from its periphery, whereby when the straight portions of the disks shall be in line with each other and adjacent to the bolt the latter shall be unlocked, and locked when the disks shall be in any other position with relation to each other or to the bolt, and, third, in providing a key for operating the disks or tumblers, and which display the numbers to indicate the combinations to lie within the receptacle containing the locking mechanism.

Our invention further consists in certain details of construction and combinations of parts, all as hereinafter particularly set forth.

Referring to the drawings, Figure 1 is a front elevation of our invention applied in the form of a padlock; Fig. 2, a similar view having the covering-plate removed to display details; Fig. 3, a similar view having the covering-plate and the combined dial and key removed to display other details, and showing the bolt locked; Fig. 4, a similar view having the covering-plate, combined dial and key, and first tumbler removed to display the remaining tumblers; Fig. 5, a similar view having the covering-plate, combined dial and key, and first and second tumblers removed to show the lowest tumbler in position; Fig. 6, a plan view showing the interior of the shell of the padlock for containing the operat-

ing mechanism; Fig. 7, a sectional view taken on the line 7 7 of Fig. 1, and viewed in the direction of the arrows; and Figs. 8, 9, 10, and 11 plan views of details.

Although to illustrate our invention we have chosen to show its application in the form of a padlock, such choice has no special significance, since any other form of lock, whether for a drawer, a door, or the like might have been selected without affording or avoiding additional advantages of display. Because, therefore, a padlock is used to illustrate our invention, it is not intended to imply that this is the only form of lock to which it may be applied, or even that it is the form in which the best results are obtained from its use, since it is equally useful for all the purposes to which combination-locks are adapted.

A is the bed-plate, comprising a solid piece of metal of the form shown in the drawings, or of any other desired form, and of suitable thickness. Toward the center of one of its sides the plate A is hollowed out to form a cylindrical well, *t*, having a central opening, *s*, in its bottom, and a longitudinal notch, *r*, in one side, and opening on its inner side into a longitudinal recess, *q*, preferably of the same depth as the well.

B is the bolt, which slides, when unlocked, within the recess *q*, and is recessed or concaved, as represented at *p*, Fig. 5, on its inner edge to form, when locked, as shown in Figs. 3 and 4, the inner side of the cylinder composing the well. In the form of a padlock, as illustrated, the bolt B is bent toward its rear extremity, as shown at *x*, to form, when locked with the rear end of the bed-plate A, a ring, *o*, to surround the object to be secured, to which the device is attached for the purpose, and the longitudinal play of the bolt B, when unlocked, is controlled by a pin, *n*, forming a stop, within a recess, *n'*, formed on the rear edge of the bolt.

C, D, and E are annular disks or tumblers the peripheries of which correspond in shape with the form of the well *t* without the concavity *p* in the bolt—that is to say, a segment is cut of the same dimensions from each disk to produce upon it a straight edge to extend across and coincide transversely with the lat-

eral opening of the well *t*. The opening in the tumbler C is circular, with a lateral recess, *c'*. The opening in the tumbler D is partly circular, with stops *d* and *d'* formed in one side; and that in the tumbler E is circular, with a lip or stop, *e*, extending toward the center.

F is an annular washer, of which three are provided, each having its periphery formed to correspond in shape with the peripheries of the tumblers, and provided with a peripheral projection, *m*, to fit within the notch *r* of the well *t* when the tumblers are adjusted in the manner hereinafter described.

G is a dial-plate having an opening, *l*, in its center, and a pin, K, projecting from its under side to one side of the central opening, *l*.

H is the covering-plate, provided with a concavity, *x*², to coincide, when adjusted, with the concaved portion *x'* of the bed-plate A, and having rivet-holes *i*, to receive rivets *i'*, which project from the bed-plate, and an opening, *h*, to coincide, when the plate is adjusted, with the opening *s* in the bottom of the well, and, also, an opening, *g*, below which pass the figures on the dial-plate G in revolving the latter about its axis in the form of a pin, *f*, extending centrally through the plate H and well *t*. The under side of the plate H is recessed to form a circular receptacle for the dial-plate G, which projects beyond the edge of the shell, and is milled around its periphery.

When the device is employed as a combination-lock for drawers, doors, and the like, in which application a suitable handle may be properly connected with the key G *k*, to turn it, milling of the edge may be omitted, and the dial-plate need not project beyond the edge of the shell.

In the following explanation of the manner of adjusting the operative parts of the mechanism hereinbefore described, to produce the desired results one combination is described, the attainment of which will unlock the device. It is obvious, however, that the combination is subject to numerous changes, even with the number and form of disks or tumblers employed, by changing the order of their insertion or inverting them, or both, though more than three tumblers of proper construction may be used, when, of course, the number of possible combinations for unlocking will be increased. Another and well-known means of changing the combination is by changing the relative positions of the dial.

The tumbler E is inserted into the well *t* first, with its flattened edge coincident with the opening in the side of the well. By adjusting the key G *k* in a manner to cause the pin *k* to abut laterally against the side *y* of the lip *e*, a certain number will appear at the opening *g*—say the number 3. A metallic washer, F, is then adjusted upon the inserted tumbler to coincide with the latter and to cause its projection *m* to enter the notch *r* in the well, and thereby render the washer

stationary. The tumbler D is then adjusted upon the washer covering the tumbler E in a manner to coincide with the latter as to its periphery, and the pin *k* is caused to abut laterally against the stop *d*, when a certain other number will appear at the opening *g*—say the number 6. A metallic washer is then adjusted upon the tumbler D in the manner already described of the tumbler E. The tumbler C is then imposed upon the washer last adjusted in a manner to cause its straight edge to coincide with the straight edges of the adjusted tumblers E and D. When in this position, by inserting the pin *k* into the recess *c'* the number directly in line with the pin *k* will appear upon the dial at the opening *g*, which number in the present combination is zero, since the pin *k* is secured to the under side of the dial-plate G on a line extending from the zero-sign diametrically across the surface of the plate. A washer, F, is imposed upon the tumbler C in the manner hereinbefore described of the other tumblers. With the tumblers in the positions just described the bolt B may be moved back and forth, its movement being limited only by the stop *n*. The plate H is adjusted to cover the internal mechanism, and is fastened in place by means of the rivets *i'*, which fit into the holes *i*, and the pin or shaft *f*, which extends through the opening *s* in the well *t* and through the opening *h* in the covering-plate. By moving the bolt inward to the position shown in Figs. 2, 3, and 4 of the drawings the tumblers may be turned without impediment by operating the pin *k*, through the medium of the dial-plate, which is turned by manipulating its milled edge. When thus turned, the combination will have been disturbed, and the curved edges of the tumblers, or the curved edge of one tumbler, if only one is turned, will fit into the recess *p* of the bolt B and afford a stop to its withdrawal, whereby it will be locked. To unlock it, the straight edges of the tumbler must, to restore the combination, be presented to the concave portion *p* of the bolt, which is accomplished by turning the key G *k* to the left until, with the combination hereinbefore suggested, the figure 3 shall appear at the opening *g*, then to the right until the figure 6 shall be seen, and again to the left until the figure 0 shall be presented to view at the opening *g*, whereby impediment to the sliding of the bolt will be removed.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a combination-lock, the combination, with a bolt recessed on one side, of one or more tumblers, each comprising a disk having a segment removed from its edge, and means, substantially as described, for turning the tumbler or tumblers.

2. In a combination-lock, the combination, with the covered receptacle A, of a bolt, B, concaved on one edge, a well, *t*, opening laterally into the concaved portion of the said bolt and rendered thereby cylindrical, and

provided laterally with a longitudinal notch, *r*, independently-movable tumblers within the said well, comprising annular disks provided with suitable stops and having each a segment removed from its edge, stationary washers *F*, interposed between the said tumblers, and means, substantially as described, within the receptacle *A*, for turning the said tumblers.

10 3. A combination-lock comprising, in combination, a bed-plate, *A*, having a well, *t*, a recess, *q*, into which the said well opens laterally, a sliding bolt, *B*, within the recess *q*, and concaved on one edge to complete, when
15 inserted, the necessary distance within the said recess, the cylindrical cavity forming the said well, tumblers *C D E* within the said well, comprising annular disks having each a segment removed from its edge and producing a
20 straight portion upon the said edge to permit, when such straight portions are in vertical line adjacent to the said bolt, movement of the latter, the said tumblers operating to prevent such movement when one or more of the
25 straight portions shall be turned from such vertical line, a suitable covering for the said parts, and means, substantially as described, for turning the said tumblers.

4. A combination-lock comprising, in combination, a bed-plate, *A*, provided with a well, *t*, and a recess, *q*, into which the said well opens laterally, a sliding bolt, *B*, within the recess *q* and concaved on its inner edge to complete, when inserted, the necessary distance within
35 the said recess, the cylindrical cavity forming the said well, independently-movable tumblers *C D E* within the said well, comprising annular disks having each a segment removed from its edge to permit movement of the bolt
40 when the straight edges are in vertical line adjacent to the said bolt, the said tumblers operating to prevent such movement when one or more of the straight edges shall be turned from such vertical line, a key comprising a dial-plate, *G*, and pin *K*, extending
45 from the under side of the said dial-plate

through the said annular disks and operating to move the said annular disks by abutment against stops provided therein, and a suitable cover for the entire operative mechanism, substantially as described. 50

5. A combination-lock comprising, in combination, the following elements: a bed-plate, *A*, having a well, *t*, a longitudinal recess, *q*, into which the said well opens laterally, a
55 sliding bolt, *B*, within the recess *q* and concaved on its inner edge to complete, when inserted, the necessary distance within the said recess, the cylindrical cavity forming the said well, and provided with a recess, *n'*, on its opposite edge abutting against a suitable stop, *n*, and bent at one extremity to form a ring with the concave portion of the plate *A*, tumblers within the said well, comprising an annular disk, *C*, having a recess, *c'*, leading from its
65 central opening and forming a stop, an annular disk, *D*, having stops *d* and *d'* formed within its central opening, and an annular disk, *E*, having a projection, *e*, extending inward from its central opening and forming a stop, each
70 annular disk having a segment removed from its edge, a key comprising a dial-plate, *G*, and a pin, *K*, extending from the under side of the said dial-plate through the said annular disks and operating to move the said disks by abutment against the said stops therein, a covering-plate, *H*, secured upon the said bed-plate *A*, and concaved at one end, and recessed on its under side to receive the dial-plate *G*, and
75 provided with an opening, *g*, underneath which the numbers on the said dial-plate shall pass in moving the same, and a shaft, *f*, passing centrally through the said well and secured at opposite extremities to the said bed-plate *A* and covering-plate *H*, the whole being constructed and arranged to operate substantially
85 as described.

CHARLES F. WALKER.
MARTIN RANSOM.

In presence of—
MASON BROSS,
EDWARD THORPE.