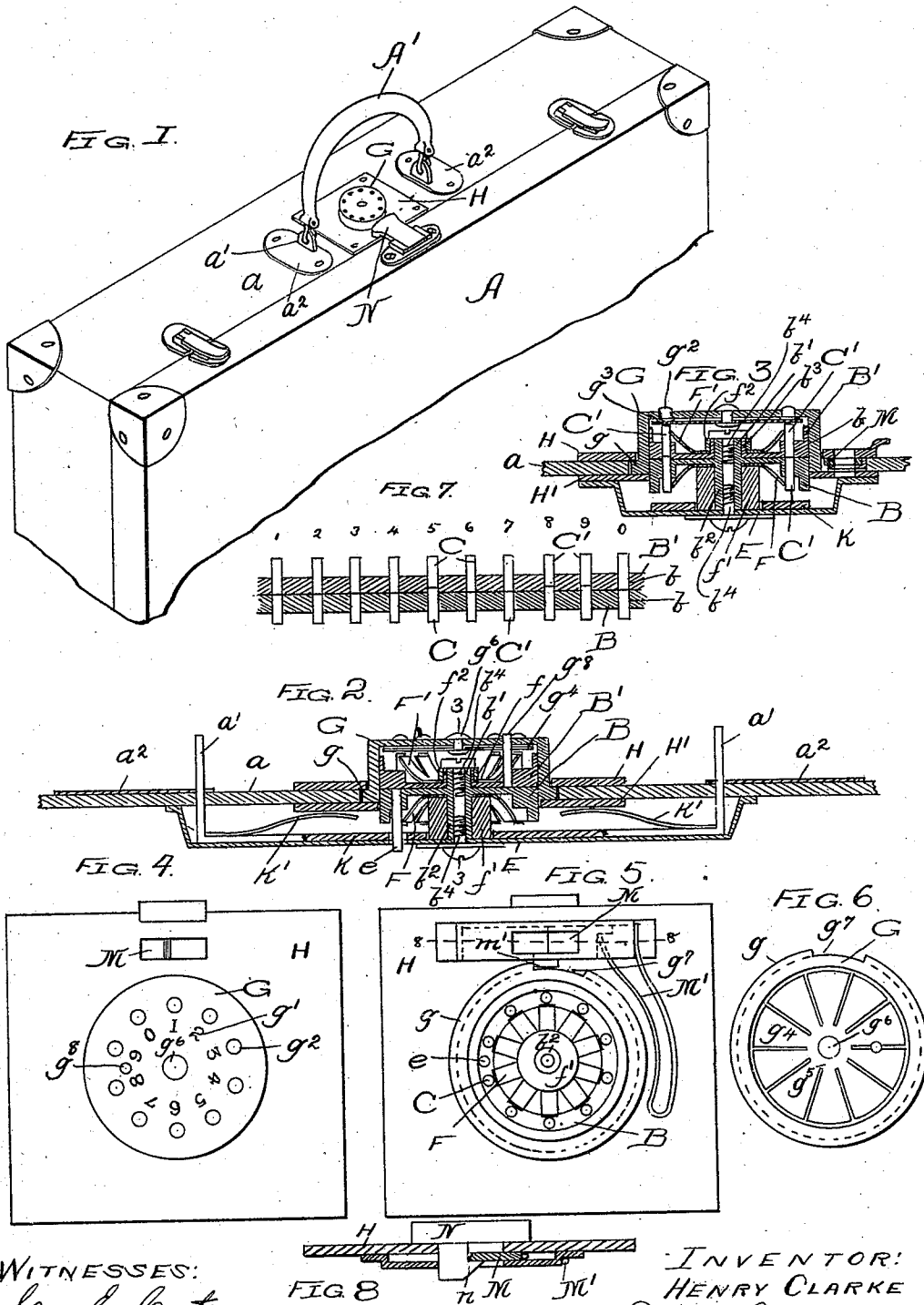


(No Model.)

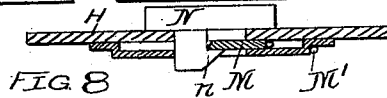
H. CLARKE.
PERMUTATION LOCK.

No. 577,380.

Patented Feb. 16, 1897.



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PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 577,380, dated February 16, 1897.

Application filed June 12, 1896. Serial No. 595,342. (No model.)

To all whom it may concern:

Be it known that I, HENRY CLARKE, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Combination-Locks for Traveling-Bags and other Articles, of which the following is a specification.

My invention relates to improvements in the construction of combination-locks.

The object of my invention is to provide a combination-lock of a strong, simple, durable, and efficient construction that may be light and small and also cheaply manufactured and adapted to be used as a lock for traveling-bags and other articles where a comparatively inexpensive lock is essential.

To this end my invention consists, primarily, in a combination-lock comprising two adjacent lock-disks, one adapted to turn in respect to the other on their common axis, each furnished with a series of holes for receiving a series of lock-pins, and two series of lock-pins, the pins of the one series being longer than those of the other, all the pins of the one or the short series (excepting those constituting the particular combination in use) being mounted in one of the lock-disks and all the pins of the other or long series (excepting those constituting the particular combination) being mounted in the other disk, so that by depressing the pins of the combination the two disks are left free to turn the one in respect to the other.

It further consists, in connection with these parts, as follows: in friction-springs or equivalent devices for retaining or holding the lock-pins in proper position in respect to their disks, in a setting plate or device for returning the lock-pins to position, in a movable dial or cover plate furnished with keys or push-pins for operating the lock-pins, and in a suitable device or connecting mechanism for operating the catch or locking plate of the lock by the movement of the movable lock-disk or of the dial or cover plate; and it further consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown and described, and more particularly specified in the claims.

In the accompanying drawings, forming a part of this specification, and in which similar letters of reference indicate like parts in all the views, Figure 1 is a perspective view of a device embodying my invention. Fig. 2 is an enlarged central vertical longitudinal section. Fig. 3 is a cross-section on the line 3 3 of Fig. 2. Fig. 4 is a detailed top or plan view showing the hasp removed. Fig. 5 is a detailed bottom view of the lower disk and the front or face plate. Fig. 6 is a detailed bottom view of the dial or cover plate. Fig. 7 is a sectional diagrammatic view showing the upper and lower lock-disks and the two series of lock-pins unrolled or extended in a straight line for the purpose of illustrating the operation, and Fig. 8 is a detailed sectional view taken on the line 8 8 of Fig. 5.

In the drawings, A represents a traveling-case or other article to which my invention may be applied or in connection with which it may be used, and A' is the handle thereof.

B and B' are the lower and upper lock-disks, mounted adjacently and about a common axis in respect to each other, and each furnished with a series of lock-pin holes *b*, preferably ten in number and extending in a circle around the axis.

C and C' are the lock-pins, the series of long pins being lettered C and the series of short pins C'.

As illustrated in Fig. 7, the lock is set for the combination "5, 8, 9," and it will be observed that all the short pins C are mounted in the lower disk B, excepting the three pins constituting the combination "5, 8, 9," which three short pins are in the upper disk B', and that correspondingly all the long pins C are mounted in the upper lock-disk B', excepting the three in the combination "5, 8, 9;" and it will also be readily understood from Fig. 7 that when the three short pins of the combination "5, 8, 9" are depressed so that the corresponding long pins do not project into the upper disk B' the two lock-disks B B' will be free to turn one in respect to the other, and thus enable the catch or locking plate to be moved out of engagement with the hasp.

The lower lock-disk B is provided with a central hub *b'*, extending through the upper lock-disk B', and upon which the upper disk

turns. It also has a similar hub b^2 projecting from its lower face to serve as a convenient means for securing it to the frame-plate or bail E, by which the lock may be attached to the traveling-bag or other article to which it is to be applied. The upper lock-disk B' is preferably furnished with a similar hub b^3 , surrounding the hub b' , to give a longer and better bearing for the upper disk on the hub of the lower disk. The lock-disks B B' are each further provided with a series of springs or frictional devices F F', one bearing against each of the locking-pins to hold the same in whatever position it may be pushed. All of the springs F are preferably formed in one piece by simply slitting a circular disk of metal f , which disk is furnished with a central hole adapted to fit over the hub b^2 . The spring-disk f is secured in place by a collar f^1 , surrounding the hub b^2 , which collar is interposed between the disk B and the frame-plate E. A screw b^4 , threaded into the hub b^2 , secures the lock-disk B to the plate E and at the same time fixes the spring-plate f in place. The springs F' are similar in construction to the springs F and are secured in place by a collar f^2 , surrounding the hub b^3 . A screw b^4 , threaded into the hub b' , serves to bind the parts together.

G is the dial or cover plate, in which the lock-disks B B' are mounted. It is secured to the traveling-bag or other article by the face-plate H in connection with the bottom plate H', which together embrace a flange g on the dial or cover plate G, as well as the top a of the traveling-bag. The dial or cover plate G is furnished with a series of index-figures g' , corresponding to the number of lock-pins in each series, and with a series of keys or push-pins g^2 , corresponding to and registering with the lock-pins C C'. These keys or pins g^2 are each furnished with a head g^3 at their lower end, and they are held in position and returned to position, each independently, by springs g^4 , interposed between the dial or cover plate G and the lock-pins. The springs g^4 are preferably, like the springs F F', all formed in a single piece by simply slitting or cutting into separate radial tongues a circular disk or plate g^5 , which is secured by a rivet g^6 to the dial or cover plate G.

K is a movable setting-plate by which the pins are returned to their normal position. This setting-plate K is preferably formed integral with the ears $a' a'$, to which the handle A' of the traveling-bag is attached, so that the setting-plate will be given its necessary movement by simply lifting on the handle, the movement thus imparted being in the direction of the locking-pins. If preferred, the setting-plate may be moved by any other suitable means or in any other suitable manner to return the locking-pins to their position. Springs K' K' hold the setting-plate in its retracted position. The ears $a' a'$ extend through slots in the ear-plates $a^2 a^2$.

The catch or locking plate M may prefer-

ably have a simple sliding movement to engage the hook n of the hasp N; and this movement may be imparted to the catch or locking plate M by the movement of the lock-disk B' or of the dial or cover plate G by any suitable means, but preferably by providing the catch or locking plate M with a finger or projection m' , that fits against a notch or projection g^7 on the dial or cover plate G. The dial or cover plate G is secured to and caused to turn with the upper lock-disk B' by a pin g^8 , connecting them. The lower lock-disk B is likewise connected to the plate E by a similar pin e . A spring M' serves to return the catch or locking plate M.

In operation, to unlock the device, the setting-plate is first moved, and then the keys or push-pins corresponding to the combination are simply pushed upon or depressed, thus pushing the lock-pins corresponding to the combination into such position that the division between the upper and lower pins of the combination is flush with the meeting faces of the two lock-disks B B', so that the upper lock-disk B' and the dial-plate G can be turned and thus withdraw the catch or locking plate M from engagement with the hasp. In case any mistake is made or keys pressed upon other than those constituting the combination the setting-plate must be moved to restore all the locking-pins to position. It will of course be understood that the movement of the setting-plate likewise locks the combination, this being done, as before stated, by simply lifting on the handle of the bag. The two lock-disks may be locked together and prevented from turning by depressing any of the keys other than those of the combination; and before the lock can be unlocked it is of course necessary to return such keys to position for unlocking by moving the setting-plate. Before attempting to unlock, therefore, the setting-plate should be first moved and then the keys of the combination depressed. The false or additional locking-pins thus afford a means of locking the lock-disks from turning, as well as the particular pins of the combination.

In cases where my improved lock is applied to articles other than traveling-bags or those having handles the setting-plate may be moved by any suitable means or in any suitable direction to restore the lock-pins to position.

I claim—

1. In a combination-lock, the combination with two adjacent lock-disks, one adapted to turn in respect to the other on a common axis, and each furnished with a series of lock-pin holes, of two series of lock-pins mounted in said disks, the pins of the one series being longer than those of the other, and part of each series of pins being in each disk, and means for holding the lock-pins in the positions to which they may be individually pushed to set the combination for unlocking, substantially as specified.

2. In a combination-lock, the combination with two adjacent lock-disks, one adapted to turn in respect to the other on a common axis, and each furnished with a series of lock-pin holes, of two series of lock-pins mounted in said disks, the pins of the one series being longer than those of the other, and part of each series of pins being in each disk, and means for holding said locking-pins in position as they are separately and individually moved into position for unlocking, substantially as specified.

3. In a combination-lock, the combination with two adjacent lock-disks, one adapted to turn in respect to the other on a common axis, and each furnished with a series of lock-pin holes, of two series of lock-pins mounted in said disks, the pins of the one series being longer than those of the other, and part of each series of pins being in each disk, and a series of independently-movable push-pins or keys for independently moving the lock-pins into position for unlocking, substantially as specified.

4. In a combination-lock, the combination with two adjacent lock-disks, one adapted to turn in respect to the other on a common axis, and each furnished with a series of lock-pin holes, of two series of lock-pins mounted in said disks, the pins of the one series being longer than those of the other, and part of each series of pins being in each disk, and a movable setting plate or device for returning the lock-pins to position, substantially as specified.

5. The combination of two adjacent lock-disks one adapted to turn in respect to the other, and having each a series of holes extending through the same parallel to its axis to receive the lock-pins, of two series of lock-pins mounted in said disks the pins of the one series being longer than those of the other, springs for holding said pins in position, a dial or cover plate, a series of keys or push-pins mounted on said dial or cover plate to operate said locking-pins and a setting-plate for returning said locking-pins to position, the short pins being uppermost under the keys of the combination and the long pins uppermost under the other keys so that a depression of any key other than those of the combination will lock the disks from turning, until all the lock-pins are restored by movement of the setting-plate to position for unlocking by depressing the keys of the combination, substantially as specified.

6. The combination of two adjacent lock-disks one adapted to turn in respect to the other, and having each a series of holes extending through the same parallel to its axis to receive the lock-pins, of two series of lock-pins mounted in said disks the pins of the one series being longer than those of the other, springs for holding said pins in position, a dial or cover plate, keys or push-pins to operate said locking-pins, a setting-plate for returning said locking-pins to position, and

springs interposed between said keys or push-pins and said lock-pins, substantially as specified.

7. In a combination-lock, the combination with two adjacent lock-disks one adapted to turn in respect to the other on a common axis, and each furnished with a series of lock-pin holes, of two series of lock-pins mounted in said disks, the pins of the one series being longer than those of the other, part of each series of pins being in each disk, and a dial or cover plate inclosing said disks and provided with a series of keys or push-pins, substantially as specified.

8. In a combination-lock, the combination with two adjacent lock-disks one adapted to turn in respect to the other on a common axis, and each furnished with a series of lock-pin holes, of two series of lock-pins mounted in said disks, the pins of the one series being longer than those of the other, part of each series of pins being in each disk, a dial or cover plate inclosing said disks and provided with a series of keys or push-pins, and springs interposed between said keys or push-pins and the lock-pins, substantially as specified.

9. In a combination-lock, the combination with two adjacent lock-disks, one adapted to turn in respect to the other on a common axis, and each furnished with a series of lock-pin holes, of two series of lock-pins mounted in said disks, the pins of the one series being longer than those of the other, a movable setting plate or device for returning the lock-pins to position, and a handle secured to said setting-plate, substantially as specified.

10. The combination of a traveling bag or case, having hasp and catch or locking plate, of a combination-lock comprising two lock-disks, one adapted to turn in respect to the other, having each a series of holes to receive lock-pins, two series of lock-pins mounted in said disks, the pins of the one series being longer than those of the other, a series of keys or push-pins, a setting-plate, and the handle of the bag attached to said setting-plate, substantially as specified.

11. The combination with the dial or cover plate G, the two lock-disks and two series of lock-pins, of a series of push-pins g^2 having heads g^3 mounted in said plate G, and a spring-disk g^5 divided radially into a series of spring-tongues g^4 , substantially as specified.

12. The combination with lock-disks B B', of lock-pins C C', and index or dial plate G, keys or push-pins g^2 , spring disk or plate g^5 , springs F F' for holding the lock-pins in position, movable setting-plate K, catch or locking plate M having a finger or projection m' , said dial-plate G having a notch or projection g^7 engaging said finger or projection m' on the catch or locking plate, substantially as specified.

13. The combination with a lock-disk B', of an adjacent lock-disk B, having a hub b' projecting through said lock-disk B', and a hub b^2 projecting in the opposite direction, two

series of locking-pins C C', two spring-disks having radial spring-tongues bearing against said locking-pins and fitting over the hubs of said lock-disk B, substantially as specified.

5 14. The combination with a lock-disk B', of a lock-disk B, having hub b' projecting through said lock-disk B', and a hub b^2 projecting in the opposite direction, two series of locking-pins C C', two spring-disks having
10 radial spring-tongues bearing against said locking-pins and fitting over the hubs of said lock-disk B, and collars $f' f^2$ surrounding said hubs and bearing against said spring-disks, substantially as specified.

15 15. The combination with a traveling-bag having a handle, of a combination-lock having a pair of lock-disks and two series of lock-pins and a setting-plate attached to the handle of said bag, substantially as specified.

20 16. The combination with a pair of lock-disks and two series of lock-pins mounted therein, a dial or cover disk rotatable with one of said lock-disks and having a notch or projection for operating a catch or locking
25 plate, substantially as specified.

17. The combination with a pair of lock-

disks and two series of lock-pins mounted therein, a dial or cover disk rotatable with one of said lock-disks and having a notch or projection for operating a catch or locking
30 plate, a catch or locking plate and a hasp, substantially as specified.

18. The combination with a pair of lock-disks and two series of lock-pins mounted therein, a dial or cover disk rotatable with
35 one of said lock-disks and having a notch or projection for operating a catch or locking plate, a series of keys or push-pins, and a setting-plate, substantially as specified.

19. In a combination-lock, the combination
40 with a dial or cover plate G, of a series of keys or push-pins g^2 , having heads g^3 at their lower ends, and a spring plate or disk secured near its center to said dial-plate and bearing near its periphery against the heads of said
45 keys or push-pins to hold them in position, substantially as specified.

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Witnesses:

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S. E. CURTIS.