(No Model.) 2 Sheets—Sheet 1.

# C. TREGONING.

## PERMUTATION LOCK.

No. 301,646. Patented July 8, 1884.

Fig. 1

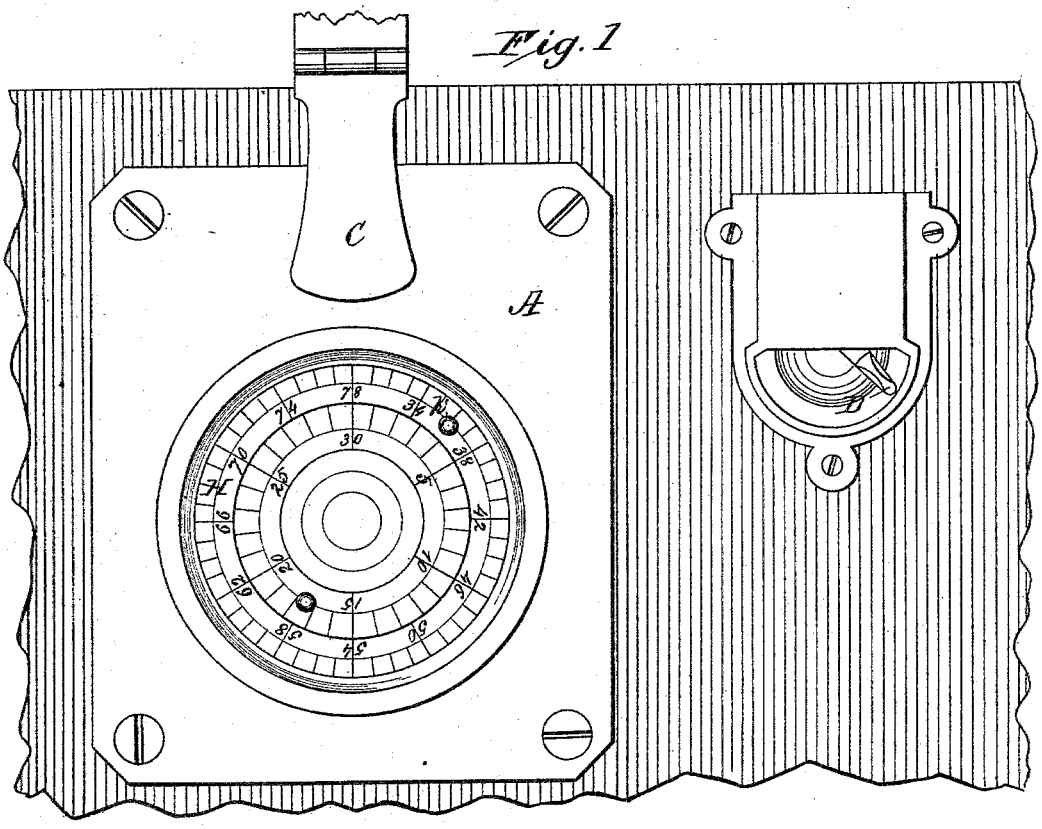
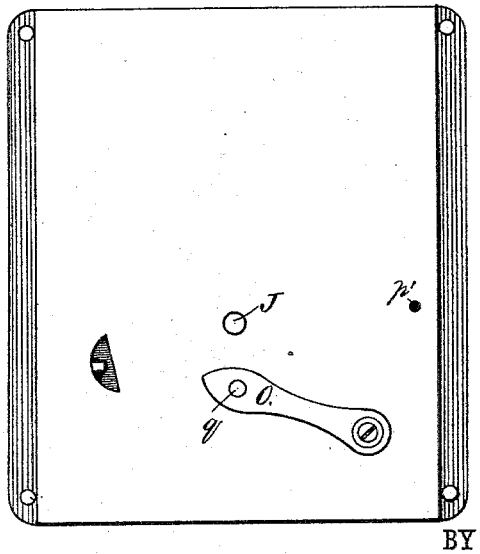



Fig. 2.




WITNESSES:

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W. X. Stevens

INVENTOR:

Chas. Tregoning

BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

# C. TREGONING.

## PERMUTATION LOCK.

No. 301,646. Patented July 8, 1884.

Fig. 3.

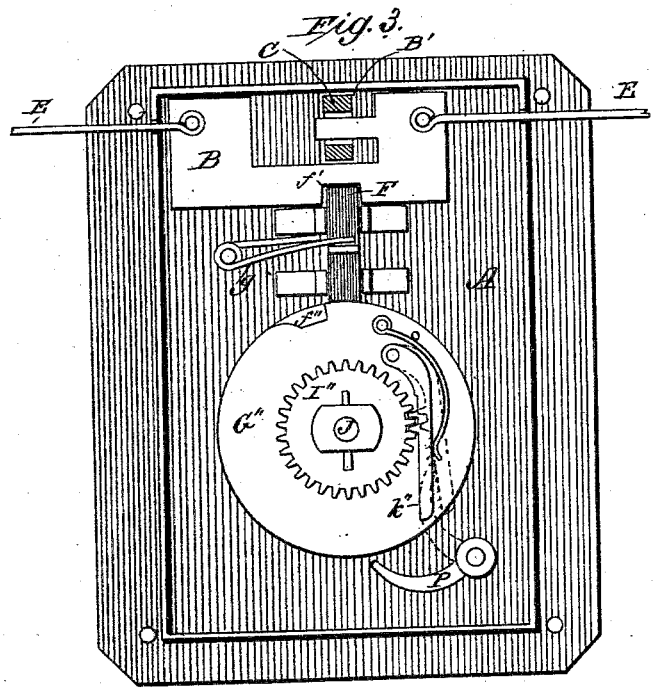



Fig. 4.

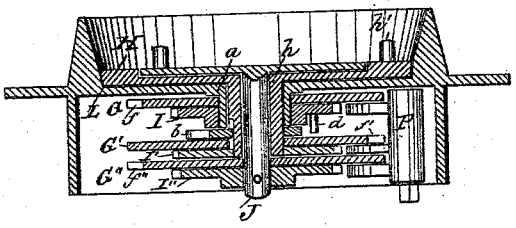



Fig. 5.

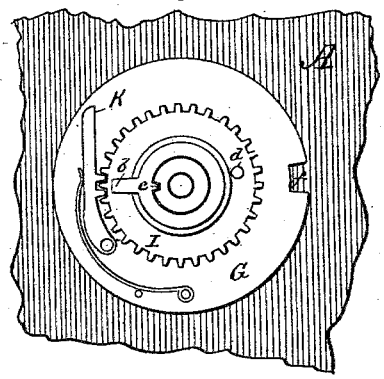
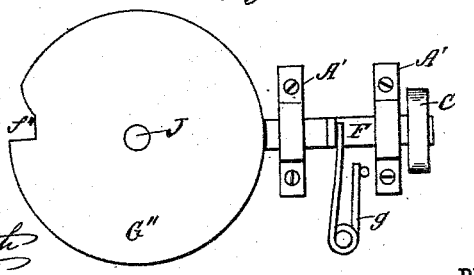



Fig. 6.




WITNESSES:

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INVENTOR:

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# UNITED STATES PATENT OFFICE.

CHARLES TREGONING, OF LEAD CITY, DAKOTA TERRITORY.

## PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 301,646, dated July 8, 1884.

Application filed February 8, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES TREGONING, of Lead City, in the county of Lawrence and Territory of Dakota, have invented a new and useful Improvement in Combination-Locks, of which the following is a full, clear, and exact description.

This invention relates to that class of locks in which a series of concealed disks are operated by turning graduated visible dials to coincide with certain prearranged figures to liberate the bolt of the lock; and it has for its object to provide means whereby two disks may be operated by one visible dial, and means whereby a series of dials may all be liberated at once to be set relatively to each other.

To this end my invention consists in the construction and combination of parts forming a lock, hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of my lock and a portion of a trunk to which it is attached. Fig. 2 is a rear view of a portion of the same. Fig. 3 is an interior rear view in elevation. Fig. 4 is a transverse vertical section. Fig. 5 is a rear view of the interior of the lock with some of the disks removed, and Fig. 6 shows a modification of the bolt.

A represents the body of the lock, which may be made in any form adapted to the purpose for which it is to be used. It is here shown as a trunk-lock.

B represents the bolt which slides across the opening B′, to hold the hasp C, as usual. The bolt is slid to and fro by means of latches D and connecting-rods E. The latches D are shaped with finger-spots or lever ends, by which they may be swung to and fro to work the rods E.

To prevent the bolt B from being slid to unlock it, I provide another bolt, F, which is mounted in a groove between rigid posts A′ of the lock-frame, to slide in a direction at right angles to the bolt B, to enter a notch, *f′*, therein.

G G′ G″ represent a series of disks whose circular edges touch against the rear end of bolt F when it is extended, and any one of the disks will hold the bolt F so extended; but each disk is provided with a notch, *f*, into which the cross-bolt F may slide when the disks are properly set, thereby leaving the main bolt B free to be slid.

*g* is a spring which acts continually against the cross-bolt to retract it, so that when all the notches *f* come opposite to said bolt it will be sprung back. The disks are provided with means for changing the position of their respective notches relatively to each other around their common spindle J, and with means for indicating on the exterior of the lock said position, as follows: The lock-plate A has a hollow stud, *a*, upon which the first disk, G, and its toothed wheel I are journaled to revolve freely. The stud *a* is just as high as the united thickness of disk G and wheel I.

H is a circularly-graduated and figured dial fitted into a circular ledge, L, of plate A, and provided with a hollow shaft, *h*, which fits to revolve within the stud *a*, and provided with a knob, *h′*, by means of which it may be turned.

*b* is a hand secured upon shaft *h* by means of a slot in the shaft and a spline, *c*, in the ring of the hand.

*d* is a stud or pin standing from the face of the toothed wheel I in the path of the hand *b*.

K is a spring-operated pawl hung upon the disk G, to engage the teeth of the wheel I, thereby connecting the disk and wheel to revolve together, but rendering them adjustable, so that the pin *d* may be set in any relation to the notch *f*. When the dial H is revolved, it carries with it the hand *b*, and this hand may revolve either way nearly a whole circle before it strikes the pin *d*, and carries the toothed wheel I and disk G.

G′ is another disk provided with a toothed wheel, I′, and spring-pawl K. The disk G′ may revolve upon the hollow shaft *h* when its pawl is disconnected from the toothed wheel I′; but said wheel I′ is splined to said shaft *h*, to revolve therewith.

H′ is another dial within the first, provided with a spindle or solid shaft, J, which is journaled in the hollow shaft *h*.

G″ is a disk mounted to revolve, when at liberty, on shaft J. Toothed wheel I″ is pinned to shaft J, to revolve therewith, and is connected with disk G″ by a spring-pawl, *k″*. The disk G″ is wedge-shaped at one edge of the notch *f″*, whereby the cross-bolt F may be driven out of the disks by turning dial H′.

The dials may have any style of circular gradations and figures to indicate their relative positions.

It will be seen that each pawl *k* extends forward from its pivot beyond its teeth; and I provide a series of hooks, P, to engage these forward ends of the pawls, and the hooks, having one common hub, are operated by one handle, O, located on the exterior of the lock within the trunk, to disengage all the pawls at once from their toothed wheels, thereby leaving the said wheels free to revolve with their dials, while the disks stand still. The disks will be held still by the cross-bolt F when retracted into the disk-notches *f*. Lever O is provided with a stud, *q*, to project into holes *p p'* in the rear lock-plate. The hooks P are in service when the stud *q* is in the hole *p'*, and they will retain all the pawls, so that all the dials may be set. When the stud *q* is in the hole *p*, the hooks are out of the path of the pawls, leaving the latter free to engage their respective toothed wheels.

The operation of setting a combination is as follows: Suppose the O mark on the ring to be the point of registry, that the first disk, G, is to be set by turning to the right to 70, the disk G' at 50, and the disk G'' at 5. First, unlock the bolt; second, set lever O at *p'*, thus disengaging the disks from the dials; third, turn dial H once around to the right to make sure that the hand *b* has engaged the pin *d*, then continue to turn forward until 70 on dial H registers with O line on the ring; fourth, turn dial H back to the left until 50 on the same dial registers with the same O line; when turning to the right, both dials G and G' were being turned; but the instant the turning to the left began the hand *b* left the pin *d* and the disk G standing still; fifth, turn dial H' either way until 5 thereon registers with the O line; sixth, withdraw lever O to hole *p* to release the pawls K, and be sure that each pawl has engaged its toothed wheel. Now, the combination is set and the lock is ready for use. To lock it, place the hasp C in the hole B', slide the bolt B, then turn dial H', thereby forcing the cross-bolt F to secure bolt B. This cross-bolt is necessary to prevent any one from feeling the position of the notches in the disks. If the rear end of the main bolt rested directly upon the disks, or if it rested thereon by means of a lever which would be pushed into the notches by the act of withdrawing the said bolt, then a person might press continually on the main bolt to withdraw it and feel the notches as he revolved the separate disks. My cross-bolt, acting at right angles to the main bolt, not only prevents this, but it will not be withdrawn by the light spring *g* if it is pressed sidewise by the main bolt, the friction caused thereby being too great to be overcome by the said spring.

The object of arranging two disks to be registered by one dial is to prevent any one seeing the combination while the lock is unlocked, for in the combination above stated the dial H will stand at 50 when unlocked, while the number 70 of disk G, which it has once registered, has now been moved, and is thereby concealed. By having but one holder to withdraw the pawls of the three disks all at once I simplify both the construction and operation of the lock. With three disks and fifty teeth to each it would take more than a million years for any person to try all the combinations that might be made with this lock; so it may be considered to be tolerably safe. It is evident that the bolt F goes through all the movements necessary to serve as a main lock-bolt, so that there may be places where I would dispense with bolt B and use bolt F as the locking-bolt.

As a series of disks connected with toothed wheels by spring-pawls and a series of separate hooks for holding the said pawls disengaged from their respective wheels are the subject of a former patent of my own, I do not here claim the same.

What I claim as my invention, and wish to secure by Letters Patent, is—

1. The combination, with a series of notched lock-disks, a series of graduated dials, a toothed wheel connected with each dial, and a spring-pawl upon each of the said disks connecting it with a toothed wheel, of a series of hooks adapted to engage the said pawls, and a single handle whereby all of said hooks are separated at once, as shown and described.

2. The combination, with a lock-case, A, having the hollow stud *a*, projecting inward from its front face, the notched disk G, and the toothed wheel I, journaled on said stud, the spring-pawl K upon the disk, and a stud-pin, *d*, upon the wheel I, of a graduated dial, H, having a shaft, *h*, journaled in and extending through the stud *a*, a disk, G', journaled on the shaft *h*, a toothed wheel, I', and a hand, *b*, secured to shaft *h* at the opposite end of the stud *a* from the dial H, and a spring-pawl connecting the disk G' with the wheel I, as and for the purpose specified.

CHARLES TREGONING.

Witnesses:
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SOLON C. KEMON.