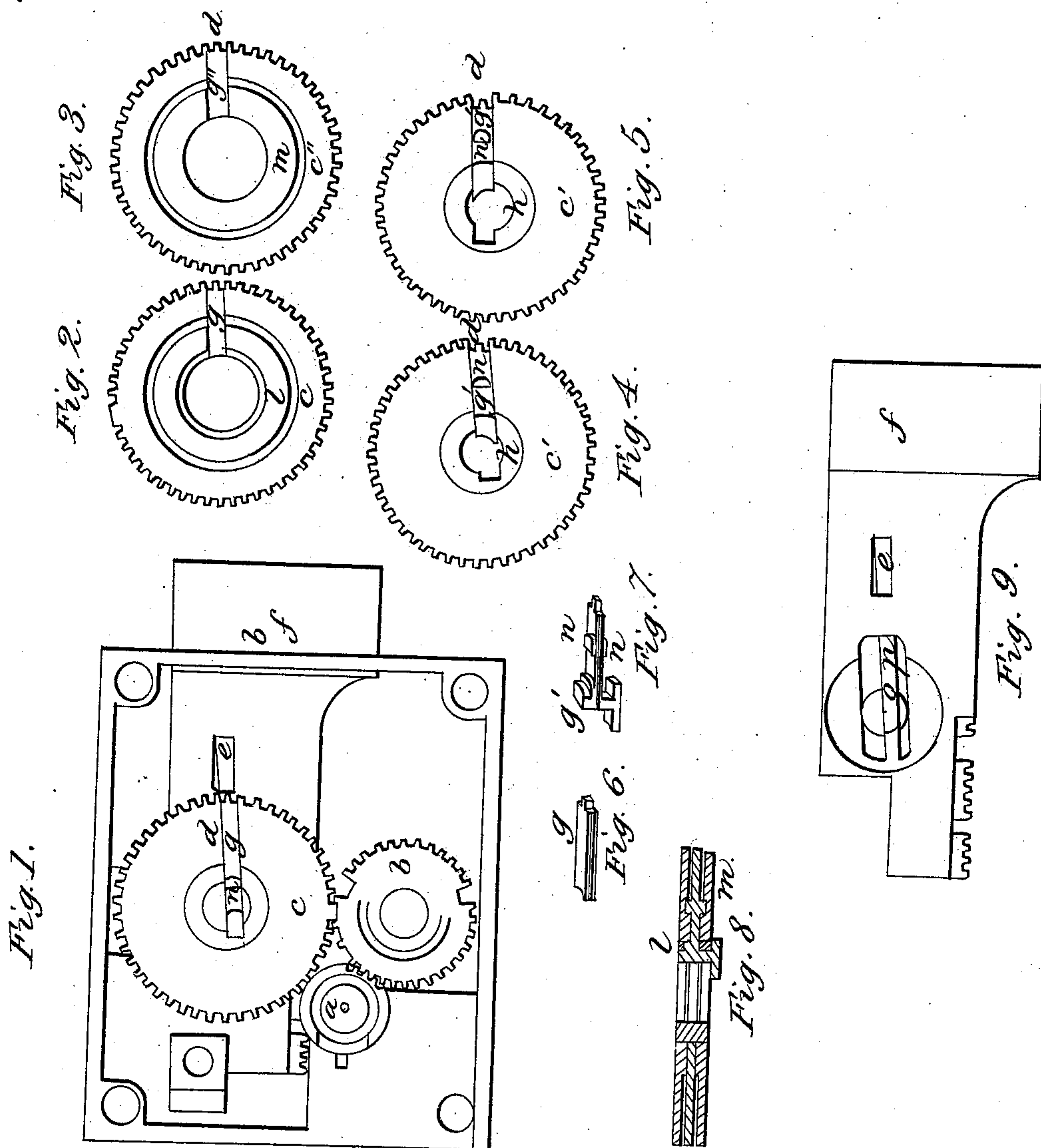


*W. F. Ensign,*  
*Permutation Lock.*

*N<sup>o</sup> 83,144.*

*Patented Oct. 20, 1868.*



*Witnesses:*

*Charles D. Kellum*  
*Marcus P. Norton.*

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# United States Patent Office.

WILLIAM F. ENSIGN, OF TROY, NEW YORK.

Letters Patent No. 83,144, dated October 20, 1868.

## IMPROVEMENT IN PERMUTATION-LOCKS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM F. ENSIGN, of the city of Troy, in the State of New York, have invented a certain new and useful Improvement on Locks; and I do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, and to the letters and marks thereon, which said drawings form part of this specification, and exhibit a lock and certain parts thereof, with my invention connected therewith, under these views, viz:

Figure 1, a view of the interior of the lock, with the cap and plate removed, the bolt being thrown nearly out or locked;

Figure 2, a view of the upper of the interlocking-tumblers or wheels, the view being of the inner or bottom side;

Figure 3, a top view of the lower or inner of said wheels or tumblers;

Figure 4, a view of the upper or outer side of the middle one of said tumblers or wheels; and

Figure 5, a view of the under or inner side of said middle wheel or tumbler.

Figure 6 is a view of the slide of the upper wheel or tumbler.

Figure 7, a view of the slide of the middle wheel or tumbler.

Figure 8, a view, by section, of the three tumblers.

Figure 9, a view of the bolt detached from the lock, with the stump or swivel-lever and guide-block of the bolt.

In each of these figures where like parts are shown, like marks and letters are used to indicate the parts.

My invention has reference to that class of locks called "combination"-locks, where toothed wheels or disk-tumblers are so arranged in relation to each other, or to sets thereof, that certain slots in a part thereof must be in line, to allow of the bolt being moved in or unlocked, the position of the slots being one dependent upon an arrangement of certain other slotted disks or plates, the position of which can be changed or varied at pleasure, and other combinations formed.

In the lock here represented, within the cylinder embracing the key are certain toothed disks, the slots or slits of which must be in line, to allow the key to be moved in or out, so as to be brought in contact with the bolt, or to be removed from the bolt—an arrangement of parts and an operation common to like locks, and unnecessary to be here described to understand my invention. In connection with the key-cylinder *a* are also other toothed disks or plates, *b*, that are well known, as also certain other toothed disks or tumblers, *c*, when slotted. It is to this last-named set of disks or tumblers that my invention has bearing.

My invention consists in what I call interlocking-tumblers, and they are constructed as follows: The tumblers or wheels *c*, when disarranged, or the combination mixed,

are so constructed that the slot or gate-way *d*, into which the lever, swivel-stump *e*, micrometer proof-latch, or whatever other device there may be to prevent the bolt *f* from being withdrawn or unlocked, is closed or locked by a slide, *g*, working in the slot or gate-way of the tumblers, and is held by the tumbler or wheel next in the pack, so that some other one of the tumblers or wheels securely locks the slide in the gate-way or slot.

In the lock here shown, there is a pack of three tumblers, *c c' c''*. The middle one, *c'*, of the pack has an inner ring, *h*, which extends on both its sides, and is the arbor upon which the other wheels, *c c''*, rotate. In the slot of the middle wheel, *c'*, is fitted the slide *g'*. The other two wheels have a slide, *g* and *g''*. Each of the tumbler-wheels, *c* and *c''*, has a plain periphery-projection, *l* and *m*, which the studs *n* on the sides of the slide of the tumbler-wheel *c'* may come in contact with, and thus one wheel is made to lock the slot or gate-way in the next wheel of the pack.

When these wheels or tumblers are all set in their proper position, or on the combination, the swivel-stump *e* in the bolt carries the slides into the centre of the wheels a sufficient distance to allow the bolt to be unlocked, and when locked, the piece *o*, on the bolt-strip *p*, will carry the slides out, so that the periphery of the wheels will present an unbroken circle, with no slot or gate-way.

If an attempt be made to pick this lock with the "micrometer," there being no variation or unevenness of the outer surface of the wheels, no indication would be given as to whether the slot or gate-way was in a high or low place in the wheel. The slot or gate-way being closed, a low place on the wheels or tumbler, or a greater movement of the bolt of the lock, would not indicate the correct number of the combination, for the reason that the slot might be on the high or larger side of the wheel, and the slide would operate to throw up the swivel-stump, the same as the solid tooth on either side of the slot or gate-way. If the slide of the gate-way were not there, it would show a low point of the wheel, and thus indicate the right combination upon which the lock was set.

The slides might be thrown out, so as to lock the gate-way or slot in the tumblers, by means of springs or eccentrics, instead of the piece *o* on the bolt-strip.

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

In combination, the interlocking of the wheels or tumblers, and closing of the gate-way in the wheels by the slides, as shown and described.

In testimony whereof, I have hereunto set my hand, this 4th day of December, A. D. 1866.

WM. F. ENSIGN.

Witnesses:

CHARLES D. KELLUM,  
MARCUS P. NORTON.