C. Flesch,

Permutation Lock.

No. 110,560. Patented Dec. 27, 1870.

FIG. I.

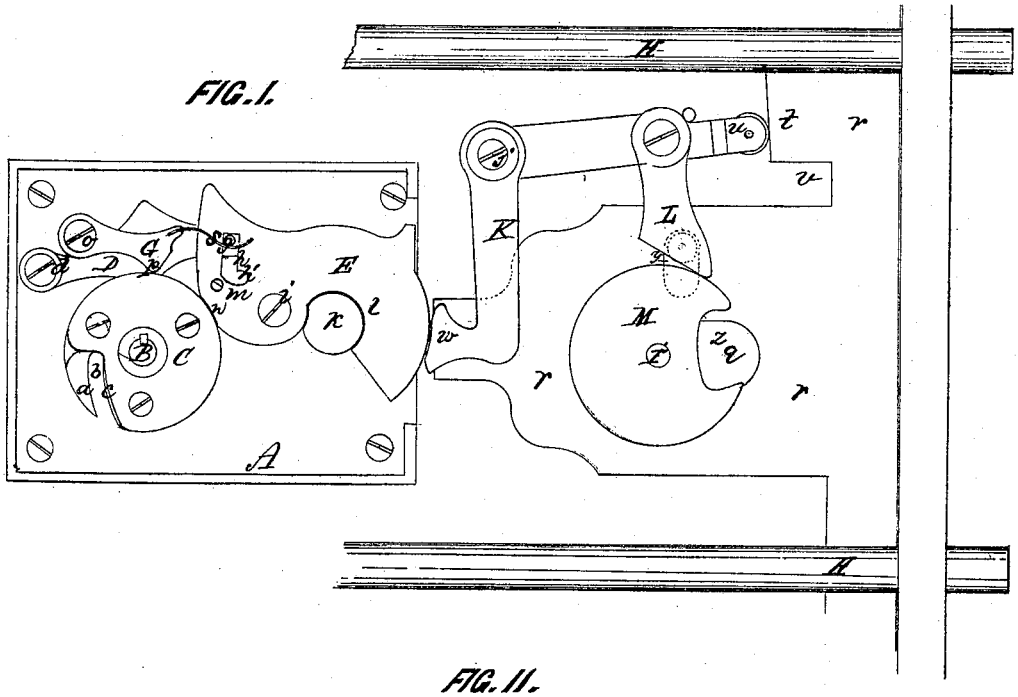


FIG. II.

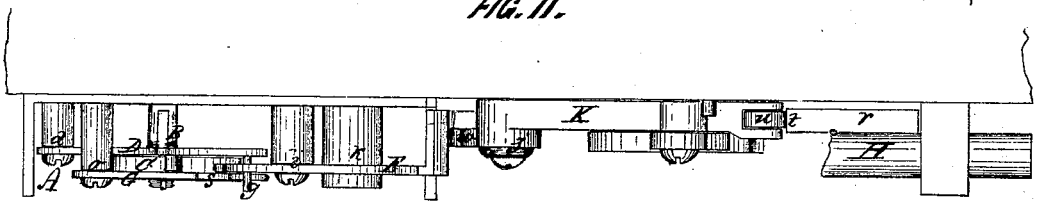


FIG. III.

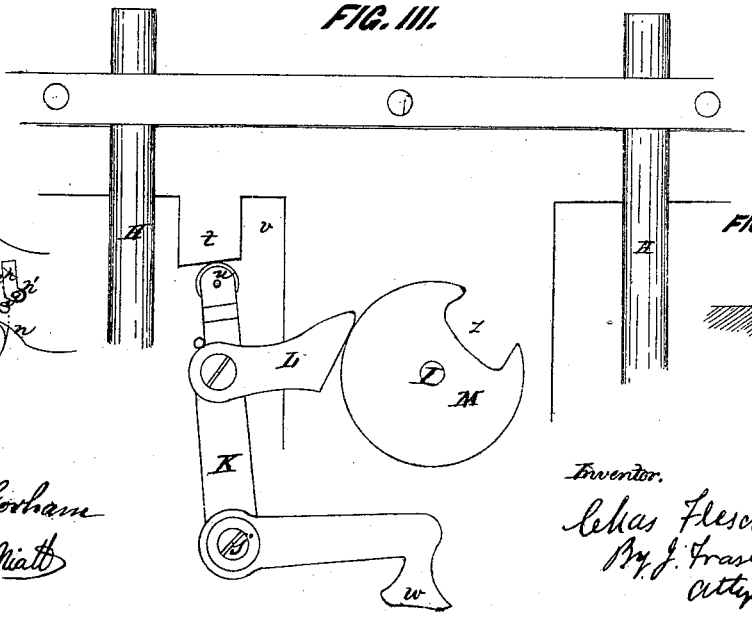


FIG. IV.

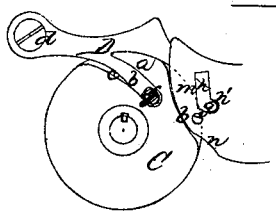


FIG. V.

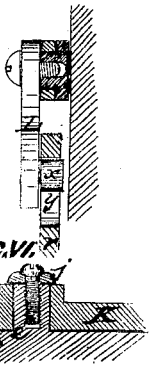

FIG. VI.




Witnesses.
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# United States Patent Office.

CHARLES FLESCH, OF ROCHESTER, NEW YORK.

Letters Patent No. 110,560, dated December 27, 1870.

## 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, CHARLES FLESCH, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Combination-Locks and Bolt-Work, of which the following is a specification.

### *Nature of the Invention.*

This invention consists in an improved construction of the lock and of the bolt-work, as hereinafter described.

### *General Description.*

In the drawing—

Figure 1 is an elevation of my improvement, showing the arrangement locked.

Figure 2, a plan of the same.

Figure 3, a diagram, showing the bolt-work arrangement at right angles to its usual position, to illustrate the action when the safe is turned on one side.

Figures 4, 5, and 6, detail views.

A represents the lock-case.

B is the spindle, having situated thereon the usual tumblers or wheels, and at the inner end the cam C.

This cam is of special construction, being provided with a hook, *a*, formed by cutting a curved slot into its periphery, for the purpose of drawing down the lever, as hereinafter described, and having also a curved recess, *b*, which receives the end of the bolt, which will also be presently explained.

This curved recess is made in the periphery, but with flanges on either side, which hold the bolt in place laterally.

The side *c* of the hook-slot forms the cam for throwing up the lever.

D represents the lever, which is pivoted at *d*. It has a pin, *f*, which operates in connection with the hook *a* and cam-face *c*, as before described.

It also has a pin, *g*, which rests in a slot, *h*, of the bolt.

This pin, when the lever is drawn down by the hook, elevates the front end of the bolt, and, when the lever is thrown up by the cam-face, it rises in the slot, whose length is adapted to the purpose.

The lower end of the slot is made rounded, as shown at *h'*, to allow the free working of the parts.

E represents the bolt of the lock proper which is pivoted at *i*. It is in the form of a hook, the front end *l* striking over the stud *k*, which is fixed to the lock-case, while the rear end *m* is rounded of such shape as to strike into recess *b* of the cam when depressed, as before described.

This end of the bolt has also a slight concave, *n*, which fits the circle of the cam; the object being to give a steady bearing and close jointure of the parts. Any strain applied to the front end of the bolt will be expended upon the fixed stud *k*, and will not extend to the working parts of the lock, neither will it affect the pivot *i*.

G represents an arm pivoted at *o*, and having a bearing, *p*, which rests upon the periphery of the cam.

It also has a spring, *s*, which projects forward and rests under the pin *g*, which rests in the slot of the bolt.

As the arm rides on top of the cam the spring holds up the pin *g*, and, consequently, its lever D a little higher, which elevates the dog of the lever that falls into the notches of the tumblers so far above the tumblers that it cannot come in contact therewith.

It also gives a degree of elasticity to the lever D, and, as the bearing *p* wears away, its elasticity provides a compensation by still holding the lever up from contact with the wheels.

H H represents the bolt-work of the safe or door, which has a stem or bearing, *r*, that strikes the bolt E when locked.

It has a slot, *q*, which slides freely over the spindle I as the bolt-work is thrown.

At the top also it has a shoulder, *t*, which strikes stop *u*, and below this a notch or slot, *v*, which allows said stop to enter when it falls.

K represents a stiff arm or elbow which is pivoted at *j* upon a fixed stud, *e*, of the door. It is made obtuse angled, as shown, the front end carrying the friction-roller *u*, which forms the stop before spoken of, while the rear end, which is depressed, is formed into a bearing, *w*, which rests against the lock-bolt.

The upper part has pivoted thereto a swinging latch, L. Said latch has a pin, *x*, which rests in a slot, *y*, of the stem *r*.

The lower end of the latch falls into a socket, *z*, of the cam M, by which, when in proper position, the bolt-work is thrown forward and backward. At the extent of throw outward the cam clears the latch, which then simply rides upon its surface.

It will also be noticed that the pressure of the bolt-work will come upon the stop *u*, and, as the arm that carries the stop stands angularly upward, the force will be expended upon the stud *e* of the door, and not the stud *k* of the lock-case. By this means the strain is isolated or cut off from any connection with the mechanism of the lock-work. Should the stop *u* fail, it would then strike the end of bolt E, but, even in that case, the strain would be received by the fixed stud *k*, and no harm could then come to the lock-work even if the safe were tipped on one side, as is sometimes done, thereby bringing the lock-work in position shown in fig. 3; still no strain could come on the lock-bolt, as the obtuse-angular form of the arm K would keep the latter in position to receive the stock or stud *e*.

I am aware that a rack-bar has been connected with

a gear-wheel in place of cam M, which throws out of and into gear; but such is not the equivalent of my arrangement. Such a device would not answer the purpose of mine if the safe were turned on one side, as above described.

*Claims.*

What I claim, and desire to secure by Letters Patnet, is—

1. The construction of the cam C, with the hook *a*, cam-face *c*, and peripheral recess *b*, the whole arranged as described, and operating in the manner and for the purpose specified.

2. The combination, with the lever D and bolt E, of the arm G, provided with the spring *s*, which projects forward and bears under the pin *g*, the effect being to always hold said pin elevated in its slot, and thereby secure the stiff connection of the lever and bolt, as described.

3. In combination with the lock-bolt E and bolt-stem *r*, the single obtuse-angled elbow K, having its upper end armed with a roller, or equivalent stop *u*, which takes the strain from the lock-bolt, and provided with the depending latch L, which engages with the cam of the spindle I', as herein specified.

4. The combination and arrangement of the cam C, hook-bolt E, lever D, spring arm G, and obtuse-angled elbow K, operating in the manner and for the purposes set forth.

CHARLES FLESCH.

Witnesses:
R. F. OSGOOD,
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