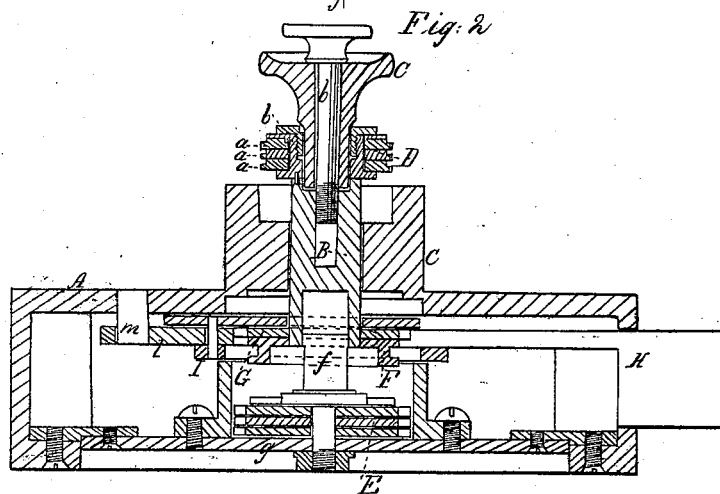
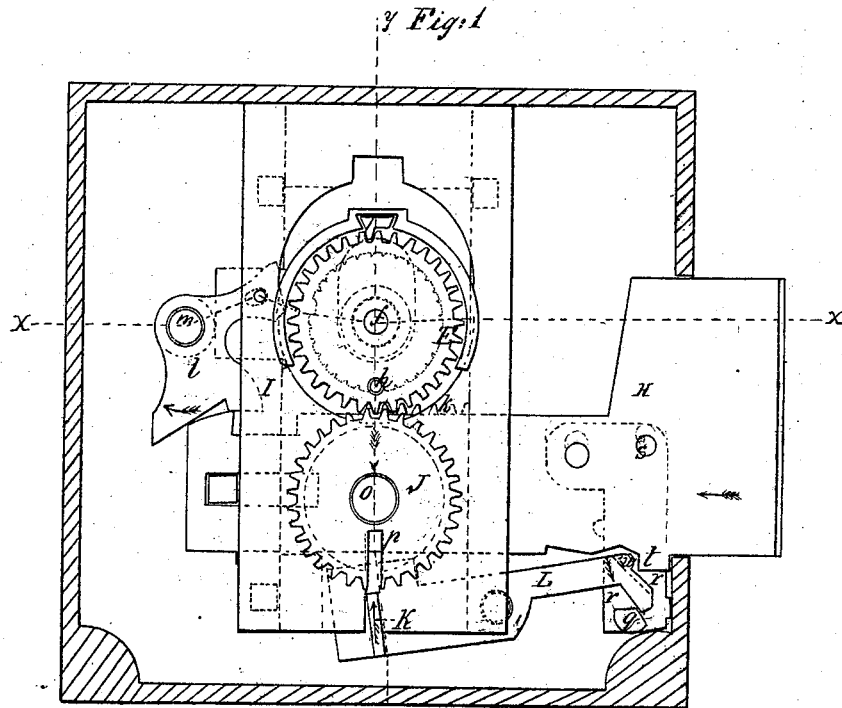


Lock & Bayer. Perm. Lock.

No 52864.

Patented Feb. 27. 1866.



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Perm. Lock.

No. 52.864.

Patented Feb. 27. 1866.

Fig: 3

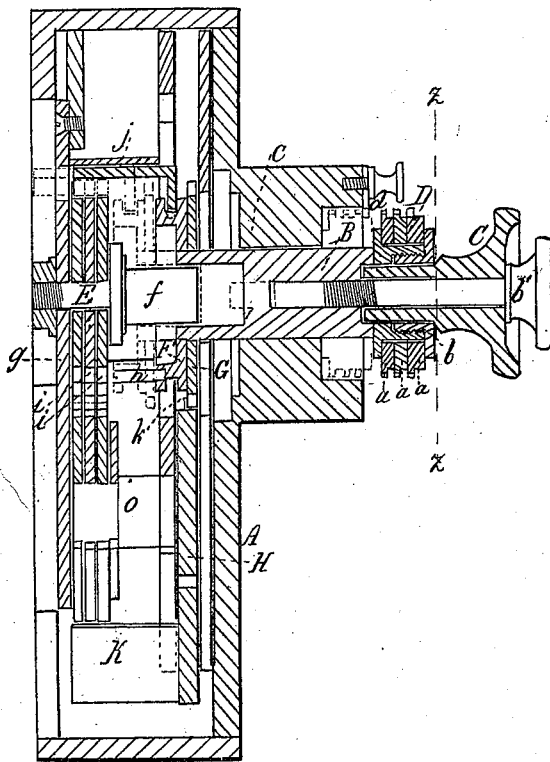


Fig: 4

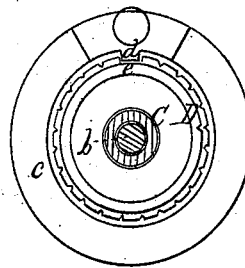
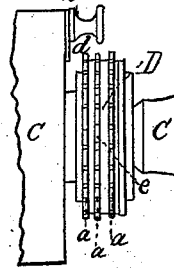


Fig: 5



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UNITED STATES PATENT OFFICE.

JOSEPH LOCH AND GEORGE BAYER, OF NEW YORK, N. Y.

LOCK.

Specification forming part of Letters Patent No. **52,864**, dated February 27, 1866; antedated February 19, 1866.

To all whom it may concern:

Be it known that we, JOSEPH LOCH and GEORGE BAYER, of No. 191 Third street, in the city, county, and State of New York, have invented a new and Improved Permutation-Lock; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents an inside view of the principal working parts of the lock. Fig. 2 is a longitudinal section of the same, taken in the plane indicated by the line *x x*, Fig. 1. Fig. 3 is a transverse section of the same, the line *yy*, Fig. 1, indicating the plane of section. Fig. 4 is a transverse section of the key or handle, the plane of section being indicated by the line *z z*, Fig. 3. Fig. 5 is a side elevation of the same.

Similar letters of reference indicate like parts.

This invention relates to a lock the key of which is composed of a series of notched plates or disks secured to a common handle, and operating, in combination with a stationary lip and with a series of tumblers, notched wheels, rising and falling slide, and knife attached to an oscillating lever, in such a manner that by the combination of said notched disks a key is produced which admits of a very large number of changes, and which, when removed from the lock, leaves no hole through which powder can be introduced. When the door is locked and the notched wheels turned to such a position that their notches do not register, and consequently they cannot be brought by turning them simultaneously in such a position in which the knife will pass into the notches, it is next to impossible to pick the lock or to open it except with the proper key. The oscillating lever to which the knife is attached forms a latch which rests upon an arm hinged to the bolt. If an attempt is made to force the bolt back before the notched wheels are brought in the proper position to admit the knife, said latch rises and catches behind a shoulder on the bolt, thereby relieving said notched wheels from all pressure and preventing the possibility of feeling for the notches. Said notched wheels are secured to a rising and falling slide,

to which motion is imparted by a dog which is acted upon by the shank of the bolt.

A represents the case of our lock, which is made in the ordinary manner of cast-iron or any other suitable material. This case forms the bearings for the longitudinally-sliding shaft B, which is rotated by a suitable handle, C.

D is the key, which is secured to the handle C, and which is composed of a series of notched disks, *a*, secured to a tubular stem, *b*, as shown in Figs. 1, 2, 3, and 5 of the drawings. Each of the disks *a* is provided on its circumference with a series of notches, which may be numbered or lettered, so that the proprietor of the key is enabled to set said disks according to a certain number or word.

The handle C is secured to the shaft B by a set-screw, *b'*, and said shaft is guided by a socket, *c*, bored through a boss, which is secured to the outside of the case. This boss is bored out to receive the key D, and it is provided with a lip, *d*, projecting over its inner edge and made to fit notches *e* in the peripheries of the disks *a*. One such notch is made in each disk, and said disks are so arranged that when the notch *e* of the first disk is brought opposite the lip *d* the key D and shaft B can be forced in until said lip strikes the second disk; then the key has to be turned until the notch of the second disk comes opposite the lip and allows the shaft B to recede another step, and so on according to the number of disks.

The inner end of the shaft B is bored out to fit over a stud, *f*, which is firmly secured in a cross-bar, *g*, and forms the bearings for the tumblers E. These tumblers are flat round disks with cogs in their peripheries, and equal in thickness to the notched disks *a* composing the key, and motion is imparted to them by a pin, *h*, projecting from the inner surface of a pulley, F, which is mounted on the shaft B. If the shaft is drawn out to the position shown in Figs. 2 and 3 of the drawings, the pin *h* is clear of the tumblers; but if the first disk of the key has entered the socket the pin *h* passes into a hole, *i*, in the first tumbler and causes the same to rotate with the handle, and when the notch in the first disk comes opposite the lip a hole, *i'*, in the second tumbler is opposite the hole *i* in the first tumbler, and as the second disk of the key passes into the socket the

pin *h* drops into the hole *i'* and the second and first tumblers rotate with the handle, and so on until the pin *h* passes through holes in all the tumblers, causing them all to revolve with the handle.

In order to cause the holes *i'*, &c., in the tumblers to register one with the other, a sliding catch, *j*, is applied to the pulley *F*, being provided with a segmental lip, which drops into a groove turned in the periphery of the pulley, so that said catch is not compelled to rotate with the pulley, but it must partake of a longitudinal motion of the same toward and from the tumblers. Said catch passes in between the teeth on the circumference of the tumblers, and it is so adjusted that it catches into the teeth of each tumbler as the key enters the socket and retains said tumblers in the proper position to allow the pin *h* to pass in the holes *i'*, &c.

When the key is drawn out a cog-wheel, *G*, mounted on the shaft *B*, gears in a toothed rack, *k*, secured to the bolt *H*, and by turning the handle the bolt is thrown in or out, according to the direction in which the handle moves. The tail of the bolt acts on a dog, *l*, which swivels on a pivot, *m*, and is mounted to a rising and falling slide, *I*, to which the notched wheels *J* are attached. These wheels rotate loosely on a pin, *o*, projecting from the slide *I*, and they are provided with cogs which, when the slide is raised, gear in the cogs of the tumblers, the number and thickness of said wheels being equal to that of the tumblers.

When the bolt is thrown forward the slide *I* rises and the wheels are thrown in gear with the tumblers, and when the bolt is drawn in the slide sinks down.

Each of the wheels *J* is provided with a radiating slot, *p*, and the slide *I* is not allowed to descend until all these slots register one with the other to allow the knife *K* to enter into them. This knife is secured to an oscillating lever, *L*, the front end of which is curved down and made to rest upon a cam, *q*, projecting from an arm, *r*, which is attached to the bolt by a rivet, *s*.

When the bolt is thrown forward the cam

q strikes the angular front end of the lever *L*, causing the same to rise, and the knife is depressed.

A shoulder, *u*, near the front end of the lever *L* stands opposite the shoulder *t* of the bolt. This lever, together with the arm *r* and cam *q*, is intended to prevent the picking of the lock by feeling out the notches, for if the bolt is thrown out the wheels *J* may be turned indiscriminately by reinserting the key and turning the same in either direction, and if the key is then taken out by unscrewing the handle, and an attempt is made to pick the lock by pressing the bolt back for the purpose of feeling for the notches in the wheels *J*, the arm *r* and cam *q*, together with the notch or shoulder on the bolt, cause the forward end of the lever *L* to rise and to lower the knife clear of the wheels *J*, so as to effectually prevent the discovering of the locality of said notches by feeling.

This lock is comparatively simple in its construction. It is proof against powder and against being picked, and its key admits of an innumerable number of changes.

We claim as new and desire to secure by Letters Patent—

1. A key composed of a series of notched disks, *a*, and operating in combination with the handle *C*, the lip *d* or its equivalent, the sliding shaft *B*, cog-wheel *G*, bolt *H*, pulley *F*, tumblers *E*, and notched cog-wheels *J*, substantially in the manner and for the purpose set forth.

2. The dog *l*, in combination with the rising and falling slide *I* and bolt *H*, constructed and operating substantially as and for the purpose described.

3. The cam *q* on the arm *r*, in combination with the stop-lever *L*, knife *K*, and ratchet-wheels *J*, constructed and operating substantially as and for the purpose specified.

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Witnesses:

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