JOHN MOFFET.

Improvement in Combination Locks.

No. 125,475 Patented April 9, 1872.

Fig: 1

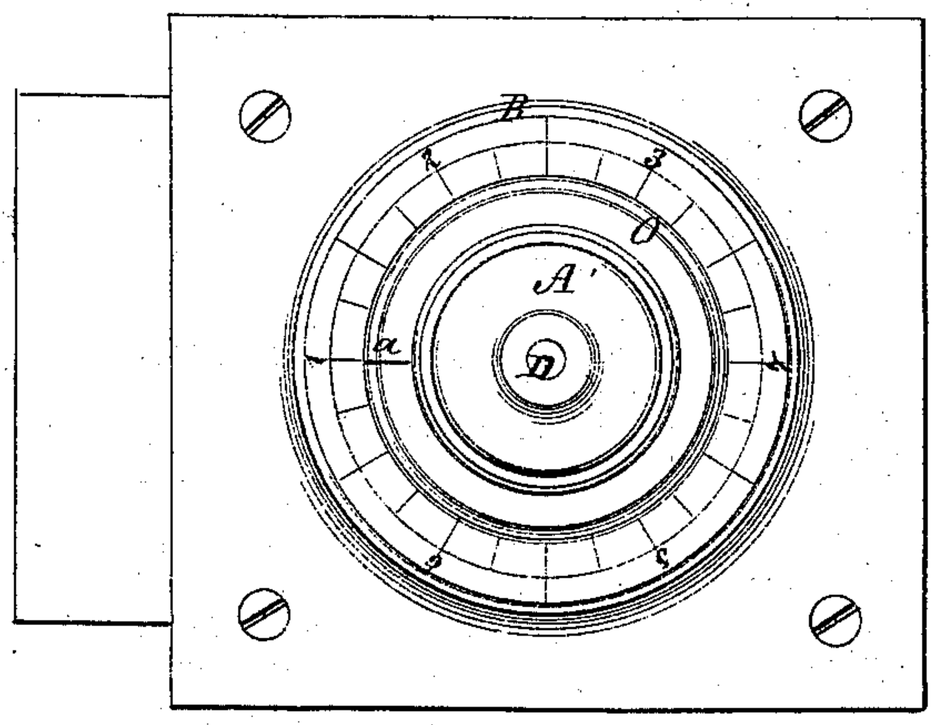


Fig: 3

Fig: 2

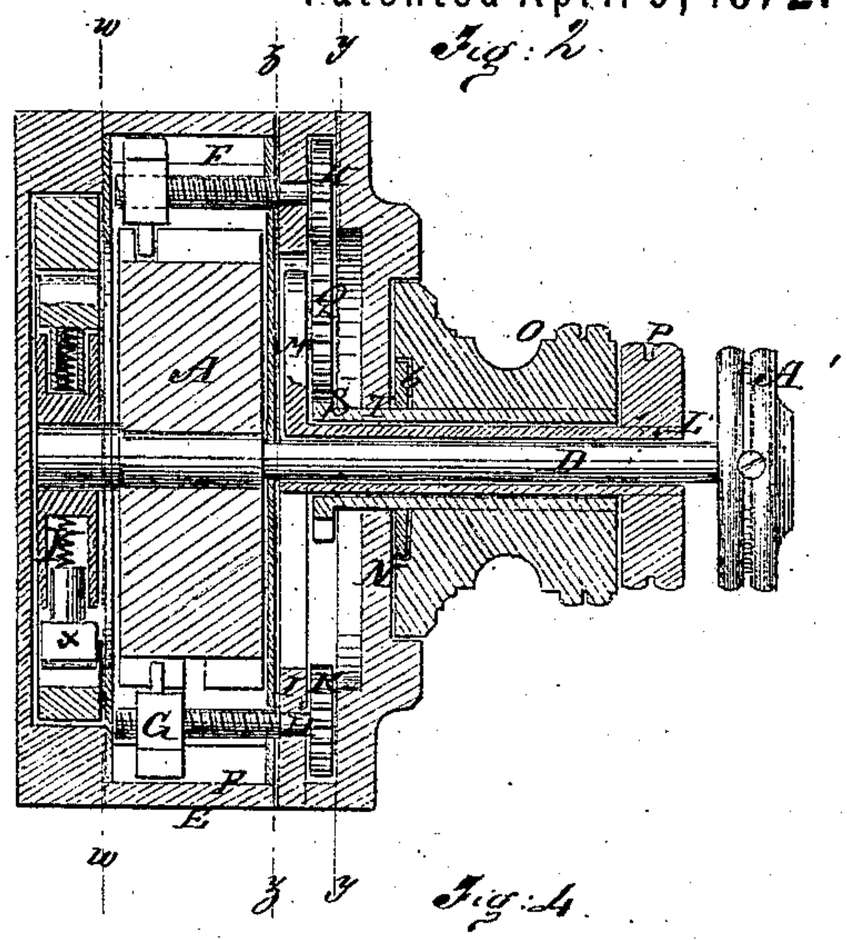


Fig: 4

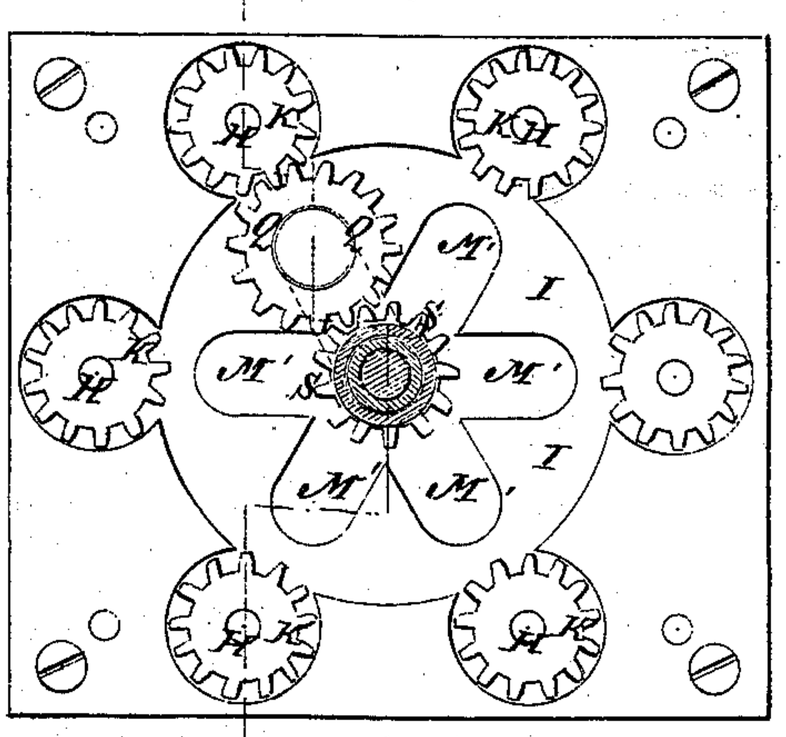


Fig: 5

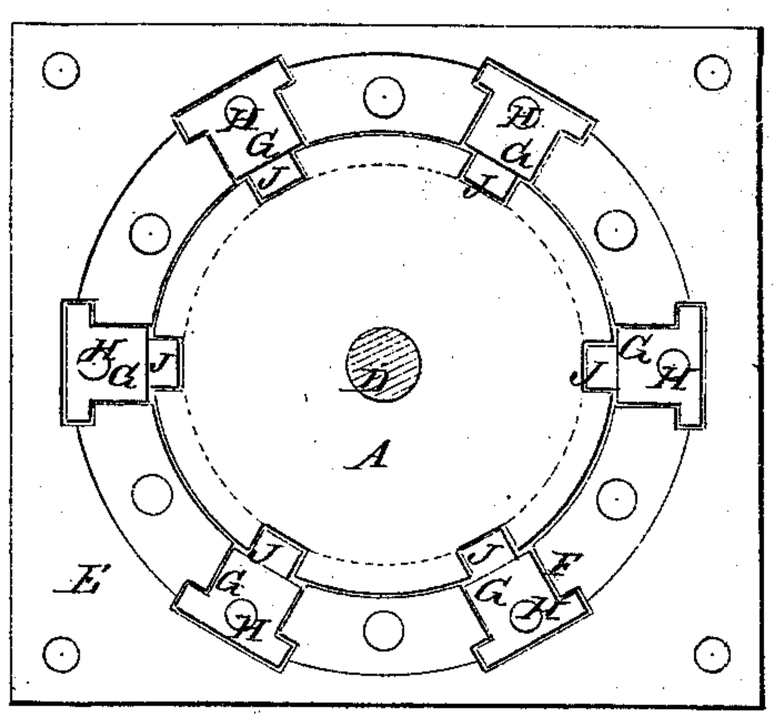
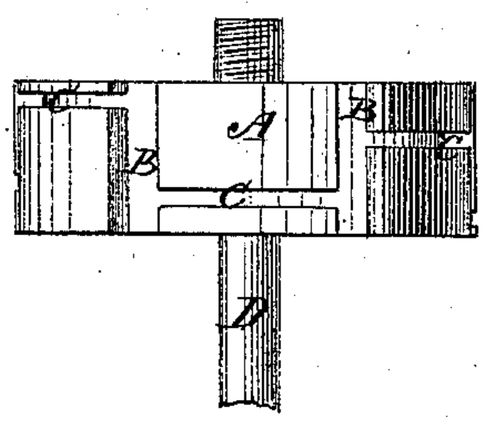


Fig: 6



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125,475

UNITED STATES PATENT OFFICE.

JOHN MOFFET, OF NEW YORK, N. Y.

IMPROVEMENT IN COMBINATION LOCKS.

Specification forming part of Letters Patent No. 125,475, dated April 9, 1872.

Specification describing a new and Improved Combination Lock, invented by JOHN MOFFET, of the city, county, and State of New York.

In this improved lock a disk with a wide edge, having six (more or less) large grooves across said edge at equal distances apart, and with a deep and narrow circumferential groove between the transverse grooves, all in different planes, is mounted on a spindle which carries the bolt-operating wheel, and as many blocks are provided in corresponding transverse grooves in a case surrounding the disk as the number of transverse grooves in the latter, with an adjusting-screw for each block, which has also a tongue projecting into a transverse groove of the disk, all of which tongues must be adjusted by the screws to the circumferential grooves before the bolt can be thrown, and these adjustments are made according to a record kept, showing how many turns each screw must make to bring the tongue of its block to the right position. The screws, which are confined within the case, have each a toothed wheel with which a wheel on an arm revolving around the axis of the knob-spindle is brought in contact for effecting the necessary adjustments, by turning a sleeve on the said spindle. The arrangement is such that even a quarter turn of one of the screws out of the true position will prevent the opening of the lock. As many changes can be made as there are transverse notches and shifting tongues, and with each change a different combination table of revolutions for the turning of the screws is required. The construction is such that a perfectly tight packing is maintained around the spindle, so that the introduction of powder or other explosive material is prevented. A novel arrangement of a tappet-wheel is introduced for throwing the bolt, which is adapted to throw the bolt with the spindle set in any one of the six positions to which it may be adjusted in making the changes.

Figure 1 is a front elevation of my improved lock. Fig. 2 is a transverse section on the line *x x* of Fig. 3. Fig. 3 is a section on the line *y y* of Fig. 2. Fig. 4 is a section on the line *z z*. Fig. 5 is a section on the line *w w;* and Fig. 6 is an edge view of the disk with a part of the spindle.

Similar letters of reference indicate corresponding parts.

A is the aforesaid disk; B, the transverse grooves; and C, the circumferential grooves in the edge. The former are wide and arranged at equal distances apart, and the latter are narrow and all arranged in different planes without regard to regularity. In this example there are six of each of these grooves; but there may be more or less, according to choice and circumstances. This disk is mounted on the knob-spindle D, which throws the bolt, also, and said disk is fitted within a large circular hole in a square or other shaped plate, E, as thick as the disk, and having the same number of transverse grooves F in its inner wall that there are in the disk, said grooves being "under-cut," or in any way arranged to hold the blocks G, fitted in them to slide back and forth, said blocks being worked by the screws H, having bearings in the plate I, so that they cannot move endwise, and each having a gear-wheel, K, on the end projecting through said plate. These blocks have tongues J projecting into the transverse grooves B of the disk, and capable of passing from one groove B to another through the circumferential grooves C, or allowing the disk to be turned when they are adjusted to coincide with the grooves C. L is a sleeve, fitted on the knob-spindle, with a radial arm, M, in the space inside of the front plate N, and projecting outward through said plate, also through the principal knob O, and having a disk, P, on the outer end for turning it, said disk being capable of both turning and sliding on the spindle. When it slides backward, the arm drops into a radial groove, M′, of which there is one in the axial line of each wheel K. This arm carries an idle wheel, Q, on a stud-pin near the outer end, so adjusted that it can be brought into gear with any one of the pinions K, which is done by sliding sleeve L forward to bring the idle wheel out of the plane of said pinions, and turning it around until said idle wheel is brought to the radial line of the knob-spindle, cutting the axis of the pinion it is designed to have said idle wheel gear with, which is indicated when a notch or mark of any kind on the knob P, coinciding with the radial line of the arm M, comes to the number on the dial R of the pinion to be geared,

and then pushing said sleeve backward, which brings the said arm into the groove M′, which holds said arm against being turned, by the resistance of the screws. This idle wheel also gears with a pinion, S, on a sleeve, T, of knob O, fitted on sleeve L, and is turned by the rotation of said knob O, and turns the pinions K and the screws H, to adjust the tongue J to the grooves C, so that the disk A may be turned by its knob A′, and spindle D, to throw the bolt U, which it does through the medium of the tappet-wheel V, when moved one-sixth of a revolution. The knob O has a mark, *a*, by which to indicate the revolutions as it passes the number of the screw it is turning on the dial R. In order that the tappets of this wheel may escape the notch W of the bolt and allow the disk A to be shifted for a new combination, they are fitted in radial holes of the disk *v*, so as to slide out and in, and a spring, *y*, is provided with each, to keep them extended for working the bolt, and an incline or a spring, Z, is arranged on the bolt, and the notch W is arranged in such manner that when the bolt is drawn back—that is, when the lock is unlocked—the tappets coming around toward the notch in turning in the same direction the disk does to move the bolt back, the said tappets will be pressed back into the disk so as to pass over into the notch, and the notch will be so far to the right, as seen in Fig. 5, beyond the vertical axis of the disk as to allow the tappets to escape, although extended as much as they are when throwing the bolt. A washer of flexible packing, *b*, is arranged with the sleeve T, plate N, and knob O, as shown in Fig. 2, in such manner as to prevent the introduction of powder for exploding the lock.

When a change for a new combination is to be made, the disk is shifted or turned as far to the left, or in the direction in which it moves to withdraw the bolt, as it will go. The blocks are then all screwed up against one of the side-plates from which the calculations for turning the screws are taken—say the one on the side fronting the operator—and then screwed back according to the number of turns kept in the record for that combination, which will bring the blades all to the right position to allow the disk to be turned another stage to the left, then a movement of it to the right will throw out the bolt, after which any one of the screws being turned a half turn or more, will so displace the tongue operated by it that the bolt cannot be driven back until it is readjusted, for which a special temporary record of the number of turns of the screws thus made after locking is kept; but this record, unlike the other, gives the number of turns by which the tongues are moved from the grooves C, and it must also show in which direction, as they may be moved in either direction, or some one way and some the other way.

The adjusting-screws may be turned with other apparatus—for instance, a key for each—and I do not limit myself to the arrangement of devices here shown for turning them, although I prefer the said arrangement.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the transversely and circumferentially grooved disk A, shifting-blocks G, and tongues J, and the adjusting-screws H, substantially as specified.

2. The combination of the sleeves L T, arm M, idle wheel Q, and toothed wheel S, with the knob-spindle and the adjusting-screws, substantially as specified.

3. The combination, with the shifting-disk A, knob-spindle, and the bolt U, of the tappet-disk V, and radially-shifting tappets substantially as specified.

4. The combination of the radially-grooved plate I with the arm M and idle wheel Q, substantially as specified.

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