Bentley & Mee,

Permutation Lock.

No. 100,714. Patented Mar. 15. 1870.

Figure 2—

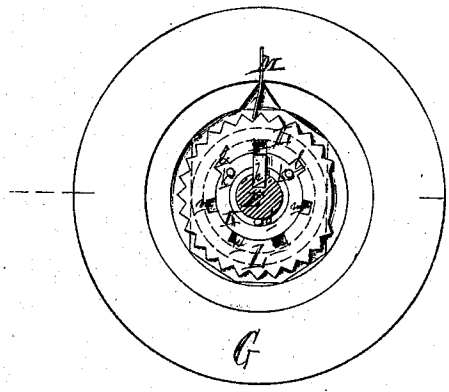


Figure 4—

Figure 8—

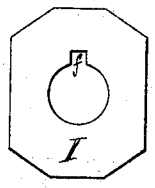


Figure 5—

Figure 6—

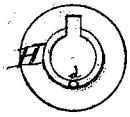


Figure 9—

Figure 7—

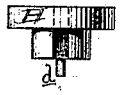


Figure 10—

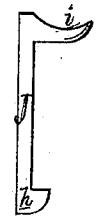
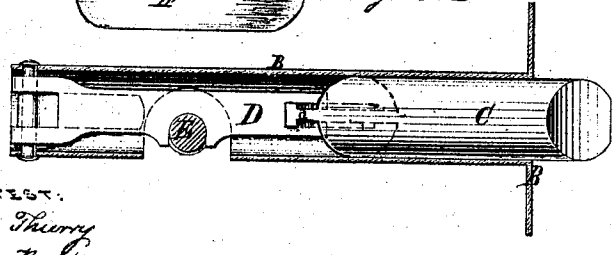


Figure 1—

Figure 3—



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SPENCER BENTLEY AND CHARLES MEE, OF DETROIT, MICHIGAN.

Letters Patent No. 100,714, *dated March* 15, 1870.

IMPROVED COMBINATION LOCK.

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

To whom it may concern:

Be it known that we, SPENCER BENTLEY and CHARLES MEE, of Detroit, in the county of Wayne, and State of Michigan, have invented a new and useful Improvement in Combination Locks; and we do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon and being a part of this specification, in which—

Figure 1 is a horizontal section of a door, showing a plan of our lock and latch in position;

Figure 2 is an elevation of the interior of the lock-case, showing the various parts in position;

Figure 3 is a vertical longitudinal section of the latch-tube, showing the latch and its lever in position;

Figure 4 is an edge view of the change-wheel;

Figure 5 is a plan of the same;

Figure 6 is a plan of the tumbler;

Figure 7 is an edge view of the same;

Figure 8 is a plan of the scutcheon and washer covering the tumbler;

Figure 9 is an edge view of the same; and

Figure 10 is a plan of the sliding key.

Like letters refer to like parts in each figure.

The nature of this invention relates to an improvement in the construction of permutation locks, and consists in the combination with such locks of a spring latch, so arranged as to be operated by pressing in the knob-shaft, serving as a simple door-latch, and, by a peculiar arrangement of its parts, the latch may be instantly disconnected from the shaft, and be locked, requiring a knowledge of the proper combination in order to open it; also, in the management of its various parts, as hereinafter more fully shown and set forth.

In the drawings—

A represents a section of a door, in which is mortised the latch-tube B, by simply boring a hole of the proper diameter therein, and inserting the tube.

Within the tube is a cylindrical latch-bolt, C, having its outer end beveled, as shown.

The inner end of the latch-bolt is flattened, and has a transverse recess or groove, *a*, formed on each side of the reduced end, and which groove is at an angle of about forty-five degrees to the knob-shaft.

D is a lever, pivoted in the far end of the tube, recessed to allow the knob-shaft E to pass under it and through the tube, and terminates in a bifurcation with inward-projecting studs, which engage with the groove *a* in the end of the latch-bolt.

A spring, *b*, pivoted about the lever, compels its outward movement.

The knob-shaft has a rotary motion in its rose or bearing, but, at the point of contact with the lever, it is reduced in diameter to form a shoulder, which abuts against the latter. By pressing in the knob-shaft, the lever is carried with it, and the studs on its end working in the grooves of the latch-bolt, (which grooves act as inclined planes,) draws the latch-bolt within the tube, and allows the door to be opened. When the knob is released the spring *b* forces it outward, and the latch-bolt C forward.

F is the outer knob of the shaft E, and F′ the indoor knob, secured to the shaft by a screw, *c*.

G is the lock-case, in the form of an enlarged rose, secured on the inner side of the door, and is recessed for the reception of the various tumblers, change-wheels, and washers, as shown in fig. 1.

In the bottom of the case is placed a tumbler, H, in the form of a circular washer, having an inward-pro-projecting tube, slotted, as shown, for the passage of the key-stub.

On the inner end of the tube is a pin or stud, *d*, opposite the slot.

Surrounding the base of the tumbler is a rubber ring or holder, *e*, to prevent it from being rotated, except motion is communicated to it by the key-stub coming in contact with its pin *d*.

Over the tumbler is placed a washer, I, to keep the former in place, and is provided with a slot, *f*, at the top of the opening, through which the knob-shaft passes to admit the key-stub, and thus serves as a scutcheon to properly guide the key.

Through the tube of the tumbler H, and through the lock-case, is passed the reduced portion of the knob-shaft, which has a groove or key-way, *g*, extending its length.

In this groove the key J is placed, having on its inner end a stub, *h*, and on its outer a thumb-piece, *i*.

K is a change-wheel, sleeved on the tumbler-tube over the washer I, and is slotted at *j* for the passage of the key-stub; it is provided with two pins, *k*, and opposite them with two studs, *l*.

This wheel may be cylindrical or heptagonal in its outer periphery, and the studs *l* may engage with any two of the seven slots, *m*, of the combination wheel L sleeved on it. This wheel L is provided on its outer periphery with notches or teeth, except for a short distance in one place.

M is a spring, rigidly secured in a slot in the upper part of the lock-case, its free end projecting down between the teeth of the combination wheel, so that, when the latter is rotated, it will give an audible click when passing from one notch into the next, and when released by the last tooth into the open space, its vibrations will emit a marked and prolonged musical sound.

Over the whole is placed a washer, N, when the lock-case may be secured to the door, care being taken to place the key J in position to enter the key-way *g*

of the knob-shaft before securing the lock-case on the door.

The shank of the knob F' is hollow, to receive the end of the shaft E, and is also slotted to receive the key J.

O is a spring sleeve, nearly surrounding the shank of the knob F', to which it is secured by the screw *c*; it has also a thumb-piece, *o*, on its free end, by which its stop, *p*, may be withdrawn from the key-way of the knob-shank.

When the lock is to be used as a day-latch, place thumb on the piece *o*, and spring the stops *p* away from the key-way, then push forward the key J until its thumb-piece *i* is opposite the space between the stops *p*, then release the spring sleeve, whose stops will embrace the key, when it will be seen that its stub, *h*, is beyond and out of the engagement with the studs *k* and *d* of the tumbler and change-wheel; the knob-shaft may then be rotated without affecting the positions of the former.

The reverse of this operation brings the key-stub into engagement again with the combination wheel and tumbler.

Suppose the combination to be set on the numbers 19 and 11, and it is desired to open the door from the outside—turn the knob F slowly to the right or left; as each tooth of the combination wheel passes under the spring M it will cause the latter to give a sharp, audible click; turn until the space where there are no teeth is reached, when the spring, being free to vibrate, will give out a prolonged musical sound; then turn to the right until the spring has given 19 clicks; then turn to the left until 11 more are given; turn the knob a little to the right to bring the key-stub opposite the slot in the change-wheel, when the other slots will be found to be on a line with it, and the knob-shaft may be pressed inward to open the door, the key-stub *h* retiring into the slots.

It will clearly be seen that the present invention may be used in the night or in darkness, as well as in day-light, as there are no letters or numbers to find on a dial, the combination being picked up by sound or touch, enabling it to be employed where such locks would be useless.

To change the combination—withdraw the combination wheel L from the change-wheel K, and bring two other slots, *m*, into engagement with the studs *k* of the combination wheel, counting the notches or clicks each way, to bring the slots of these wheels on a line with the slot *f* of the scutcheon I.

Two or more combination wheels and tumblers may be employed in a lock of this description, to complicate the difficulty of picking it.

Care should be taken in locking that the thumb-piece *i* of the key is vertical, pointing up toward a guide-notch in the top of the case, (not shown in the drawings,) otherwise the lock may be set on a new combination.

We do not claim as our invention the combination of a latch-bolt provided with a transverse groove, with a lever and spring; but

What we do claim as our invention, and desire to secure by Letters Patent, is—

1. The arrangement of the latch-bolt C, provided with the transverse groove *a*, the lever D actuated by the spring *b* and the knob-shaft E, when constructed to operate as and for the purpose set forth.

The construction of a combination lock, wherein the latch-tube B, latch-bolt C, lever D, knob-shaft E, knobs F F', lock-case G, tumbler H, washer I, key J, change-wheel K, combination wheel L, spring M, washer N, and spring-sleeve O, with their various appurtenances, as hereinbefore described, are constructed, arranged, and operated substantially as and for the purposes specified.

S. BENTLEY.
CHARLES MEE.

Witnesses:
THOS. S. SPRAGUE,
H. S. SPRAGUE.