(No Model.)

J. BOIS.

PERMUTATION LOCK.

No. 516,467. Patented Mar. 13, 1894.

FIG. 1

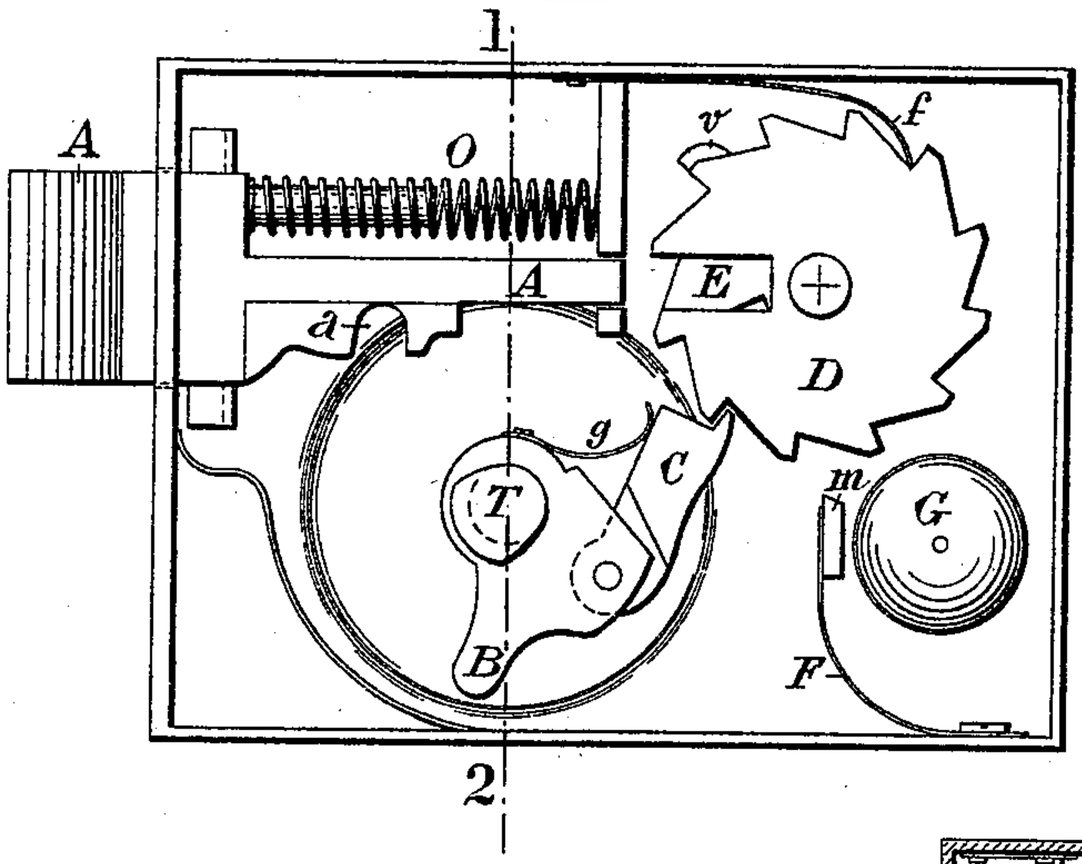


FIG. 2

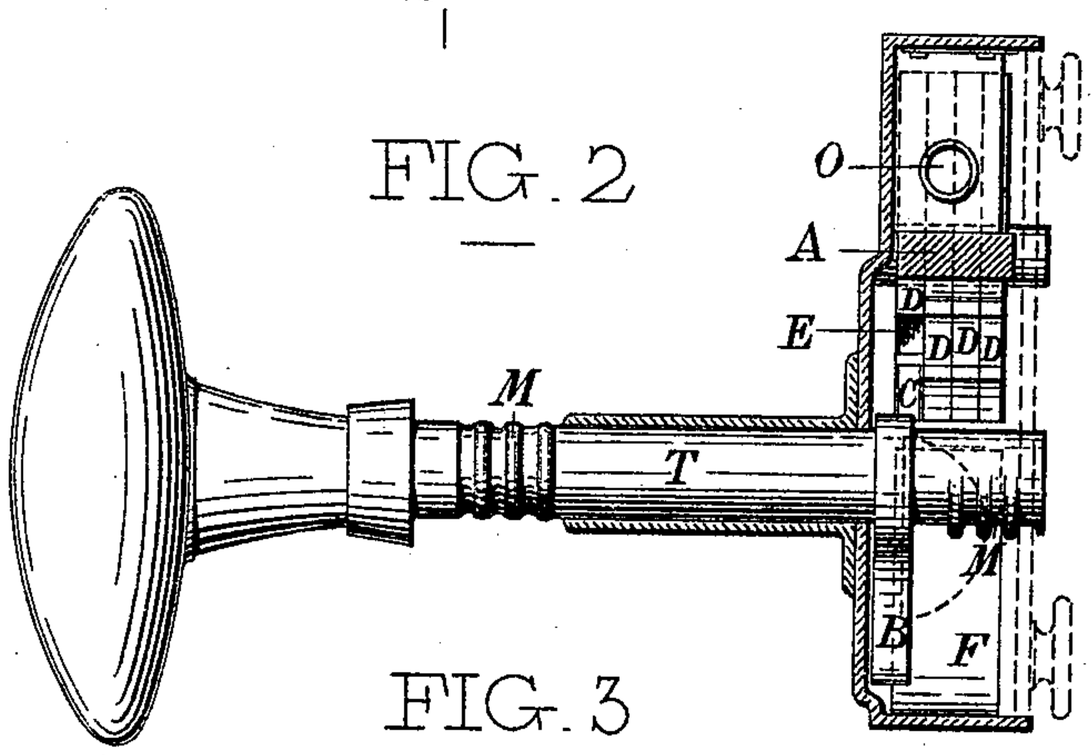
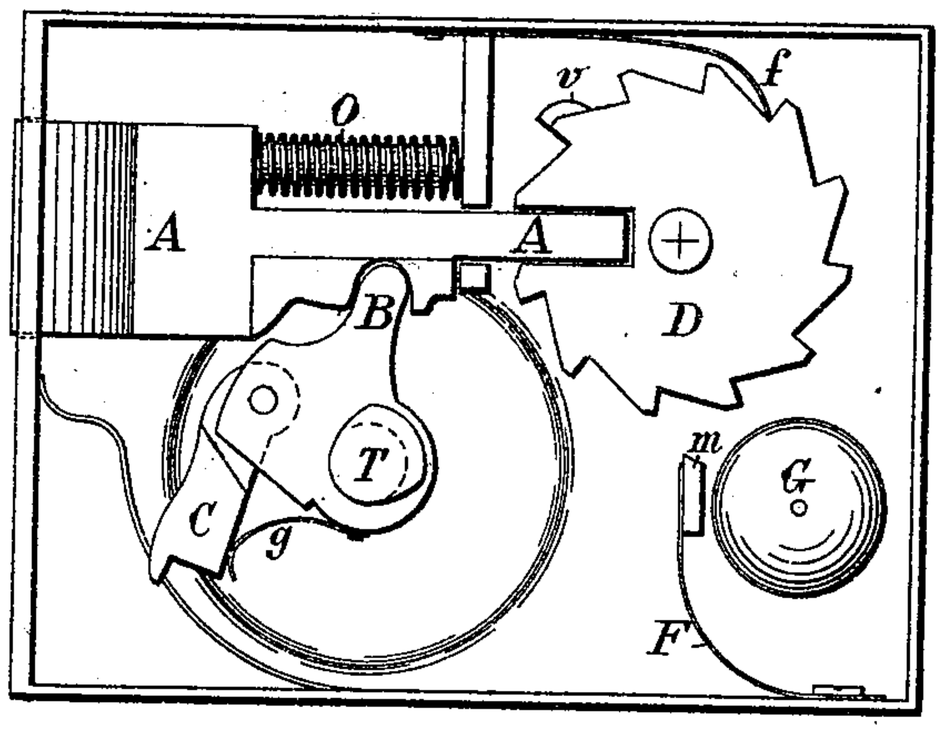


FIG. 3



Witnesses

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UNITED STATES PATENT OFFICE.

JULES BOIS, OF LYONS, FRANCE, ASSIGNOR TO LA SOCIÉTÉ ANONYME DE LA SERRURE SANS CLEF, OF SAME PLACE.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 516,467, dated March 13, 1894.

Application filed May 7, 1892. Serial No. 432,140. (No model.)

To all whom it may concern:

Be it known that I, JULES BOIS, a citizen of the Republic of France, residing at Lyons, Department of Rhone, Republic of France, have invented certain new and useful Improvements in Keyless Safety-Locks, of which the following is a specification.

My invention relates to certain improvements in that class of combination locks wherein no key is employed and the object of my invention is to provide a lock of this character of a simple and inexpensive construction which shall at the same time be susceptible of a great number of combinations all as will be hereinafter fully set forth.

The novel features of my invention will be carefully defined in the claims.

In order that my invention may be better understood, I have illustrated in the accompanying drawings a lock provided with my improvements, in which—

Figure 1 is a front elevation of the lock with the front plate removed in order to better show the inclosed parts. Fig. 2 is a transverse section taken along the line 1—2 in Fig. 1. Fig. 3 is a view similar to Fig. 1, but showing the bolt shot or withdrawn in such a manner as to permit of opening the lock.

In the drawings X represents the casing of any desired form in which is arranged the longitudinally movable bolt A, adapted to be shot or protruded by means of a coil spring O, as clearly seen in Fig. 1. The bolt A is provided with a notch *a*, with which engages a finger B arranged on the inner end of the knob spindle T as clearly seen. The knob-spindle is further provided inside the casing with a spring pawl C adapted to engage as said spindle is turned, with one or the other of a series of tumblers D, each of which is provided about its periphery with a series of teeth and which tumblers are prevented from backward rotation by leaf springs *f*, as seen in Fig. 1. Of the tumblers D any desired number may be employed according as it is desired to give the lock a greater or less number of combinations, but in the drawings I have shown but four.

It will be seen by inspection of Figs. 1 and 3, that the inner end of the spindle is of such a form that it may not be entirely rotated, but is only capable of partial revolution, and at each of such partial revolutions of said spindle it will also be seen that the pawl C will engage and partially rotate one of the tumblers D, being held distended by its spring *g*, out into the path of said tumblers.

The spindle T is provided either at its inner or outer end, or at both as seen in Fig. 2, with a series of peripheral grooves or notches, M, each of a width substantially equal to the thickness of one of the tumblers D, by means of which notches the said spindle may be set in a position either more or less far into the casing, whereby the pawl C is caused to move in the plane of either of such tumblers, as will be readily understood.

V is an adjustable block or toe adapted to be secured to either of the teeth of either of the tumblers D, and in the rotation of the tumbler to which it is secured, said block strikes against the spring actuated hammer *m* whereby as said block passes said hammer, the gong G is struck, giving warning to the operator of the position of the parts of the lock. Each of the tumblers D is further provided with an opening E, which openings in the several tumblers are adapted to co-incide whereby a recess is formed for the entry of the tail of the bolt A, as seen in Fig. 3.

The lock is provided with a removable cover, as seen in dotted lines in Fig. 2, said cover being so constructed that it may only be removed when the lock is in its opened position as seen in Fig. 3, and that when the bolt is shot as in Fig. 1, said cover is securely locked in place and cannot be removed. By this arrangement, it will be understood that it is possible to gain access to the interior of the lock in order to shift the position of the block *v*, for changing the combination, the manner of performing which I will now explain. The lock being opened, the face plate of the casing is removed, and the block *v* is removed from the tooth of the tumbler on which it was previously set and placed upon another, for example the second tooth above the opening E of the tumbler D next the removable cover plate. The cover is then applied to the casing and the bolt shot, and the spindle T is given a few turns back and forth so as to set the combination.

When it is again desired to open the lock, the spindle T is given a number of movements such number corresponding to the position in which the block *v* has been set upon the tumbler D. By these movements of the knob spindle it will be seen that the tumbler D is rotated tooth after tooth, until the block *v* comes in contact with the spring hammer *m*, when the same is vibrated and the warning given by the gong of the position of the parts. After this stroke of the gong G, the handle or spindle T is moved back and forth four times as the combination is set in Fig. 1, when the opening E will assume a position directly in the rear of the bolt A as seen in said figure. When it is desired to set more than one of the tumblers so as to arrange a combination having several numbers, each of such tumblers should be provided with a tripper or block similar to the block *v* and adapted to engage the hammer *m*. The grooves or notches M on the inner or outer end of the spindle T serve to indicate to the operator the tumbler on which the said spindle is in position to act. For if the spindle is withdrawn until its innermost notch appears outside the casing which is as seen in Fig. 2, provided with a tubular socket, it will be evident that said spindle is in position to engage the outermost tumbler D, and if said spindle is pushed in to its fullest extent it is also evident that it is in position to engage the innermost tumbler D. Thus several tumblers may be provided with trippers set about various points of their peripheries and said tumblers may be caused one after another to present their openings E in line behind the bolt, whereby, when the combination is complete, the bolt may be withdrawn from its socket by a proper movement of the spindle, and the lock thereby opened.

Having thus described my invention, I claim—

1. The combination with the casing, of a longitudinally movable bolt arranged therein and provided with a notch, a tumbler rotatively mounted in said casing behind said bolt, said tumbler having a toothed periphery and an opening adapted to receive the tail of the bolt, and the knob-spindle rotatively mounted in said casing, said spindle having a finger adapted to engage the notch in the bolt and being also provided with a pawl adapted to engage the teeth of said tumbler, substantially as set forth.

2. The combination with a casing, of a longitudinally movable bolt arranged therein and provided with a notch, a tumbler, rotatively mounted in said casing behind said bolt, said tumbler having a series of peripheral teeth and being further provided with an opening adapted to receive the tail of the bolt, a spindle rotatively mounted in the casing, a finger mounted on the spindle and adapted to engage the notch in the bolt, and a spring pawl mounted on said spindle and adapted to engage the teeth of said tumbler, substantially as set forth.

3. The combination with a casing, of a longitudinally movable bolt arranged therein and provided with a notch, a tumbler rotatively mounted in said casing behind said bolt, said tumbler having a toothed periphery and an opening to receive the tail of the bolt, a spindle rotatively mounted in the casing, a finger mounted on said spindle and adapted to engage the notch in the bolt, and a pawl mounted on said spindle and adapted to engage the teeth of said tumbler, a tripper mounted on said tumbler, a gong, and a hammer adapted to sound said gong, said hammer being arranged in the path of said tripper on the tumbler, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JULES BOIS.

Witnesses:
XAVIER JANICOT,
JEAN GERMAIN.