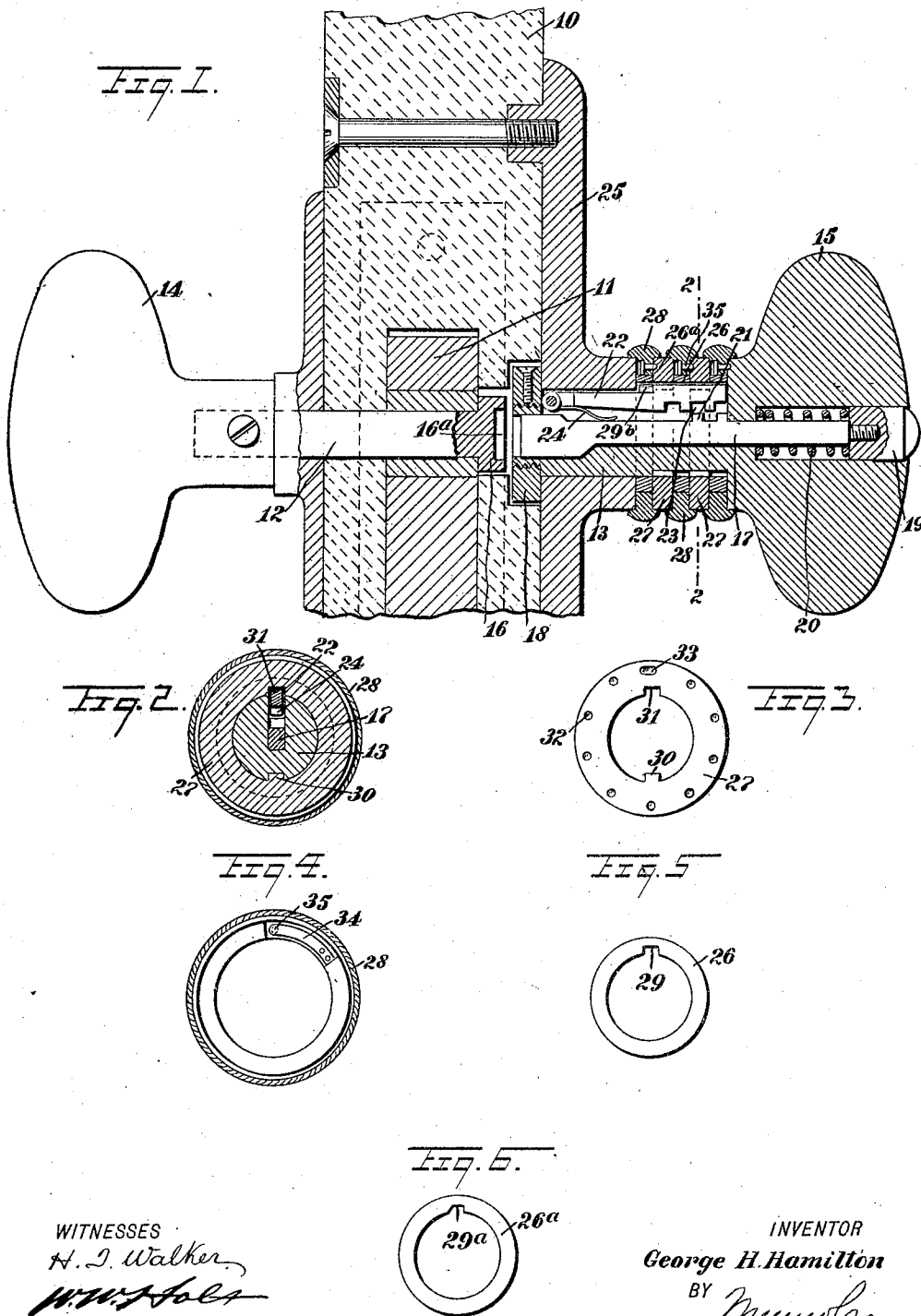


G. H. HAMILTON.
 PERMUTATION LOCK.
 APPLICATION FILED MAY 25, 1909.

942,553.

Patented Dec. 7, 1909.



UNITED STATES PATENT OFFICE.

GEORGE H. HAMILTON, OF PORTLAND, OREGON.

PERMUTATION-LOCK.

942,553.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE H. HAMILTON, a citizen of the United States, and a resident of Portland, in the county of Multnomah and State of Oregon, have invented a new and Improved Permutation-Lock, of which the following is a full, clear, and exact description.

The invention is an improvement in permutation locks such as are provided in connection with latching spindles of ordinary locks, and has in view a construction embodying a latch spindle, the spindle having the customary knob and revoluble independently of the latch operating mechanism, the spindle being provided with a push bar to lock it to said mechanism, and also having a spring pawl to lock the push-bar in its innermost and retracted positions, controlled by a permutation mechanism mounted on the spindle at the outside of and adjacent to the outer door knob.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a central vertical section through a lock embodying my invention; Fig. 2 is a cross-section of the same on the line 2—2 of Fig. 1; Fig. 3 is an inner face view of one of the fixed index rings of the permutation mechanism; Fig. 4 is a similar view in section, of one of the operating rings of the permutation mechanism; Fig. 5 is a similar view of one of the tumbler rings of said mechanism; and Fig. 6 is a similar view of the innermost tumbler ring.

In the embodiment of my invention shown, the door or other closure 10 is provided with a lock 11 of conventional form, except that it is provided with a divided latch spindle comprising an inner section 12 and an outer section 13, the sections having the customary door knobs 14 and 15 respectively. The inner end portion of the section 12 of the spindle has an expanded head 16 which prevents the withdrawal of this portion of the spindle from the lock, the said head having a socket 16^a arranged in alinement with and adapted to be engaged by a push-bar 17 slidable in the spindle section 13. The spindle section 13 has a nut or other enlargement 18 secured to its in-

ner end, and is longitudinally slotted to receive the push-bar 17, as shown in Figs. 1 and 2, the push-bar extending into a counterbored recess formed in the knob, where it is provided with a push-button 19 and normally forced to a retracted position by a spring 20, the latter being located about the bar within the recess and bearing on the push-button and the inner wall of the knob. The push-bar is provided with a number of teeth 21 on its upper face, the outer tooth of which contacts with the inner face of the knob when the push-bar is fully retracted.

Within the longitudinal slot of the spindle section 13, is pivoted at the inner end a pawl 22 having teeth 23 opposed to the teeth 21 and adapted to mesh therewith when the push-bar is in its retracted and projected positions. The pawl 22 is normally forced from the push-bar to disengage the teeth, by a spring 24 arranged near its pivot and bearing on the upper face of the push-bar. The spindle section 13 is journaled in a knob-plate 25, which is provided with an outwardly-projecting boss, the same being separated a substantial distance from a similar inwardly-projecting portion on the knob, and in this space, on the spindle section 13, I provide a permutation mechanism for controlling the position of the pawl 22.

The permutation mechanism consists in general of tumbler rings 26 and 26^a, shown in detail in Figs. 5 and 6, respectively, index rings 27, alternating with the tumbler rings, and operating rings 28, as shown in detail in Figs. 2 and 4, arranged at the outside and covering the tumbler rings. Each tumbler ring 26 has an inner notch 29, into which the back of the pawl 22 is adapted to pass, and is freely revoluble on the spindle section 13. The notch 29^a in the innermost tumbler ring 26^a is beveled at one side to register with a correspondingly-beveled portion 29^b at the edge of the pawl 22. The intermediate index rings have gibbs 30 keying them to the spindle section 13, and notches 31 in register with the slot of this section of the spindle and designed to receive the back or outer portion of the pawl 22. The inner projecting portion of the knob 15 forms one of these rings, which, as also those index rings separate from the spindle, have a number of equi-distant depressions 32 and one

elongated depression 33. The operating rings 28 are counterbored at opposite sides to fit over the index rings 27. The inner or side face of the counterbored portion at one side of the rings is recessed to receive a spring 34, one end of the spring being suitably fixed, and the other end carrying a pin 35 which passes through an aperture to the opposite side of the ring and normally projects sufficiently, as shown in Fig. 1, to engage the recesses 32 and 33 of the adjacent index ring. The recess containing the spring 34 is sufficiently deep to permit of the pin moving inwardly out of engagement with the recesses 32 and 33 when the operating ring 28 is revolved. The tumbler rings 26 are sufficiently tight in the operating rings 28 to move therewith when the rings 28 are revolved, but the rings 28 may be turned on the tumbler rings when the latter are held against rotation. As the operating rings 28 are revolved, the pins successively snap into the recesses of the index rings and it can be easily detected when the pins pass into the elongated slots 33, which are shown to be located in radial alinement with the notches 31, which, as before stated, are in register with the longitudinal slot of the spindle section 13. When the operating rings have been moved to break the combination, the tumbler rings press the pawl 22 inwardly against the tension of its spring and engage the teeth of the pawl with the teeth of the push-bar. The tumbler rings are brought to a position to release the pawl from the push-bar by any one knowing the combination, by first moving the operating rings until the pins engage the elongated recesses of the fixed index rings, then counting the number of recesses from this point as each operating ring is turned in the proper direction. These recesses may be counted by noting the number of vibrations made by each pin in its successive engagements. When the last tumbler ring of the combination is set, the pawl 22 moves outwardly, under the influence of the spring, into the notches of the tumbler and index rings, at which time the push-button of the push-bar may be forced inwardly to engage the push-bar with the socket of the spindle section 12, and the knob 15 used to operate the latch spindle of the lock. The pawl 22 may be forced inwardly to lock the push-bar in either its projected or retracted positions by giving the operating ring 28, carrying the tumbler ring 26, a partial turn, the inclined edge of the notch 29 and the beveled portion of the tumbler ring and pawl respectively, admitting of this operation.

To change the combination, the combination is set to permit of the disengagement of the pawl and the push-bar, as shown in Fig. 1, whereupon the operating rings are forced around on the tumbler rings as many

notches or recesses as desired, the operator noting the change made for each operating ring.

It is obvious that when the invention is applied to a locker box or similar structure, the section 12 of the spindle would be entirely or partially dispensed with; thus, for example, only the portion fitting within the thimble or sleeve of the lock having the socket remaining, or the said sleeve made of a size to directly receive the push-bar, in which case the sleeve would constitute the inner section of the spindle.

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

1. In a lock, a latch spindle transversely divided into two separate sections, each section independently revoluble, with one of the sections having a push-bar to lock the two sections of the spindle together, slidable therein, a spring-pressed pawl to lock the push-bar in its retracted and projected positions, and a permutation mechanism to control the pawl, carried on that section of the spindle having the push-bar.

2. In a lock, a latch spindle transversely divided into two separate sections, a push-bar to lock the two sections of the spindle together, slidable in one of said sections, and means to lock the push-bar in its projected and retracted positions, including a permutation mechanism having index rings and operating rings, the said index rings and operating rings alternating with each other, with the index rings fixed to the spindle section having the push-bar and each provided with a number of recesses on its inner face, one of which is elongated, and the operating rings revoluble on the spindle and each having a spring-pressed pin adapted to successively engage the recesses of the adjacent index ring.

3. In a lock, a latch spindle having separate sections, one of said sections longitudinally slotted and provided with a knob having a counterbored recess, a push-bar to lock the two sections of the spindle together, slidable in said slot and extended into the counterbored portion of the knob, a push-button in said counterbored portion of the knob and attached to the push-bar, a spring bearing on the push-button and knob, forcing the push-bar outwardly, and means to lock the push-bar against inward movement, including a permutation mechanism revoluble on the slotted section of the spindle adjacent to and at the outside of the knob.

4. In a lock, a latch spindle in separate sections, one of the spindle sections having a knob provided with a recess, a push-bar to lock the two sections of the spindle together, slidable in one of the spindle sections and having a push-button arranged in

said recess, and means to lock the push-bar in its retracted position, including a permutation mechanism carried on the spindle at the outside of and adjacent to the knob.

5 5. In a lock, a latch spindle constructed of an inner and outer section, the outer section having a longitudinal slot, a push-bar to lock the two sections of the spindle together, slidably mounted in said slot, means normally forcing the push-bar in a direction to disengage it from the opposite spindle, a pawl to lock the push-bar in its retracted position, pivotally supported in said slot, and a permutation mechanism to control the
10 pawl, carried on the slotted spindle section and having index and operating rings alternating with each other, with the index rings secured to the spindle.

6. In a lock, a latch spindle in separate
20 sections, one of the sections having a longitudinal slot, a push-bar to lock the two sections of the spindle together, slidable in the said slot, a pawl to lock the push-bar in a retracted position, pivotally supported within the slot, and a permutation mechanism to control the pawl, carried on the slotted spindle section.

7. In a lock, a latch spindle transversely divided into an inner and outer section, the
30 outer section having a longitudinal slot and provided with a recessed knob, a push-bar to lock the two sections of the spindle together, slidable in said slot and having a push-button located in the recess of the knob, a spring arranged in the recess of the knob and bearing on the button, normally forcing the push-bar to its outermost position, a spring pawl to lock the push-bar in retracted and projected positions, pivoted in
40 said slot, a series of index rings fixed to the slotted spindle section and having internal notches registering with the said slot, adapted to receive the outer portion of the pawl, a series of revoluble tumbler rings alternating with the index rings and having corresponding internal notches, operating rings
45 surrounding the tumbler rings and frictionally binding thereon, and spring-pressed pins carried by the operating rings, each

adapted to successively engage with a number of recesses formed in the inner face of the adjacent index ring.

8. The combination of a lock having a latch spindle and a permutation mechanism to control the operation of the spindle, having a series of operating rings and index
55 rings, the said rings alternating with each other, with the index rings fixed to the spindle and having a number of recesses on one face, one of which is elongated, and the operating rings each provided with a spring-pressed pin adapted to successively engage
60 in the said recesses.

9. In a lock, a latch spindle of separate sections, a push-bar to secure the two
65 sections of the spindle together, slidable in one section of the spindle, a pawl to lock the push-bar in its retracted position, having a beveled shoulder, a series of index rings fixed to the spindle section about the pawl, having notches in which the outer portion
70 of the pawl is adapted to pass, tumbler rings revoluble on the spindle and alternating with the index rings, having corresponding notches, with the notch in one of the tumbler rings having a beveled edge to conform with the beveled shoulder of the
75 pawl, and operating rings carried on and engaged with the tumbler rings.

10. In a lock, a latch spindle divided into
80 an inner and outer section, a knob plate in which the outer section of the latch spindle is mounted, a knob in connection with the outer spindle section, spaced from the knob plate, a push-bar to lock the two sections of the spindle together, slidable in the outer
85 spindle section, and means to lock the push-bar in a retracted position, including a permutation mechanism, arranged on the spindle between the knob plate and knob.

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

GEORGE H. HAMILTON.

Witnesses:

J. FAY DOUGLASS,
W. L. HAMILTON.