

W. A. RATCLIFF.
LOCK.
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1,037,531.

Patented Sept. 3, 1912.

Fig. 1.

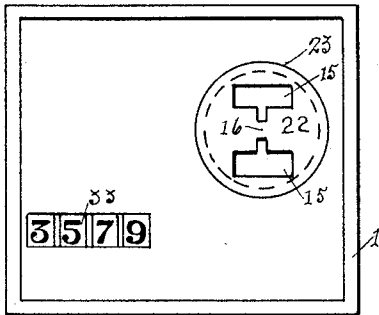


Fig. 2. x'

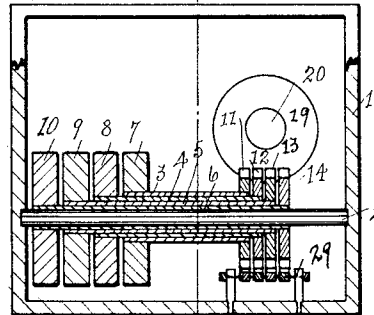


Fig. 3. x

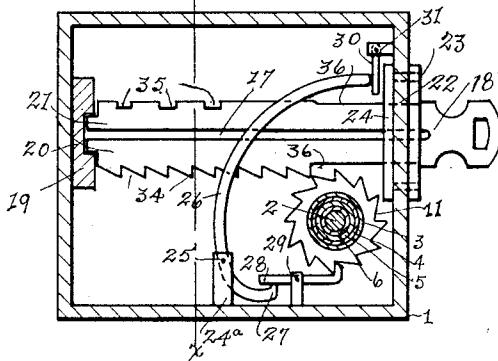


Fig. 5. x'

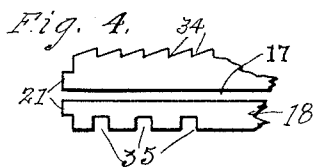
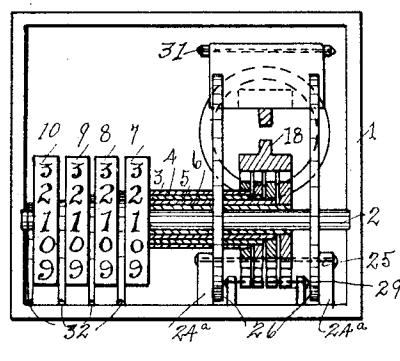
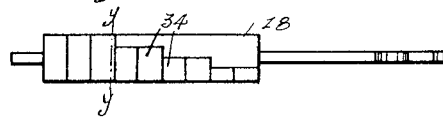


Fig. 7.



Fig. 6.



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LOCK.

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To all whom it may concern:

Be it known that I, WILLIAM A. RATCLIFF, a citizen of the United States, and a resident of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Locks, of which the following is a full, true, and exact specification.

The principal object of my invention is to provide a lock having a plurality of keys any one of which operates the lock proper, but in which each key differs from the others in that mechanism is actuated differently by each key to indicate the key last used to operate the lock.

Further objects of the invention will appear as the same is more fully disclosed in the following specification and accompanying drawings, in which—

Figure 1 is a plan view of the lock. Fig. 2 a similar view, partly in section, with the top or cover of the case removed, showing the construction of the registering mechanism, some of the other parts being omitted. Fig. 3 is a sectional view substantially upon the line $X^1 X^1$ of Fig. 2 (looking toward the right), showing the key in the lock and turned into position to operate the registering mechanism. Fig. 4 is a broken detached view of the key in position to enter the lock. Fig. 5 is a sectional view upon the line $x-x$ of Fig. 3 (looking toward the right). Fig. 6 an edgewise view of the key. Fig. 7 a cross section of the key upon the line $y-y$ of Fig. 6.

Reference numeral 1 designates the lock casing, 2 a shaft revolubly mounted within the casing and upon which shaft loosely telescope the sleeves 3, 4, 5 and 6, said sleeves having secured to their left hand ends the register wheels 7, 8, 9 and 10 respectively, and to their right hand ends the ratchet wheels 11, 12, 13 and 14, in the order named, the register wheels being each divided into ten equal spaces and numbered (in the spaces) from 0 to 9, as shown.

15 designates the keyhole, having the bridge 16, which bridge is adapted to enter the slot 17 in the key 18.

19 is a boss secured to the inner wall of the lock case, and having the circular opening 20 into which opening loosely fits the offset portion 21 of the key 18, forming a rear bearing therefor.

The keyhole 15 pierces a plug 22, which plug is revolubly mounted in an opening in

the top or cover of the case 1, and held in place laterally by the ring 23 upon one side (tightly fitting the plug), and the shoulder 24 upon the other side. From the bottom of the casing 1 upwardly extend the studs 24^a, which studs are pierced to receive the pin 25, upon which pin are pivoted the levers 26, the shorter ends 27 of the levers 26 contacting with the outer ends of the retaining pawls 28 which are pivoted at 29. The longer ends of the levers 26 contact with the inner surface of the flap 30, which flap is pivoted at 31 and normally projects slightly below the upper edge of the keyhole 15 so as to contact with the upper edge of the key when the same is thrust into the keyhole. Watch springs 32, each secured at one end to the inner surface of the case 1, extend outwardly and between the register wheels 7, 8, 9 and 10 and are pinned to the sleeves 3, 4, 5 and 6 respectively, and serve to return the register wheels to their normal positions, as shown in Fig. 5, when the retaining pawls 28 are out of engagement with the ratchet wheels 11, 12, 13 and 14.

The top or cover of the case 1 is provided with a sight aperture 33, through which the numbers or other symbols upon the register wheels are displayed.

Upon the lower edge of the key 18 are the teeth 34 which are stepped, as shown in Fig. 6 so as to form what might be considered parallel rows of teeth, the first row containing nine teeth, the second row seven, the third five, and the fourth row three, and each row when the key 18 is inserted in the keyhole 15, is in alinement with one of the ratchet wheels 11, 12, 13 and 14. The notches 35 at the edge of the key are the usual notches for operating the bolt or bolts of the lock proper, no part of which is here shown as any suitable form of lock may be used in connection with my improved mechanism, the lock constituting no part thereof.

To operate the device the key 18 is inserted in the keyhole 15, with the teeth 34 up, as shown in Fig. 4. The key in entering the keyhole contacts with the flap 30 which swings inwardly carrying the upper ends of the levers 26 with it, which causes the lower ends 27 of the levers 26 to rise and lift the inner ends of the retaining pawls 28, causing their opposite ends to descend out of engagement with the ratchet wheels 11, 12, 13 and 14, and allowing the register wheels 7, 8, 9, and 10 to simultaneously return to zero

under stress of the watch springs 32. After the key 18 is fully inserted, with the notches 35 down, as shown in Fig. 4, the offset portion 36 near the handle of the key, allows the flap 30 to return to its normal position, causing the levers 26, pawls 28, sleeves 3, 4, 5, and 6 together with their attached register wheels, to also return to their normal positions as shown in Fig. 5. The key 18 now being turned from the position shown in Fig. 4 to the position shown in Fig. 3, operates the bolt or bolts of the lock proper (not shown) in the usual manner, and in withdrawing the key from the lock it is clear that as the teeth 34 pass over the ratchet wheels 11, 12, 13 and 14 each of the latter will be caused to rotate a distance equal to the number of teeth 34 passing over its toothed face, which, through the sleeves 3, 4, 5, and 6 cause the register wheels 7, 8, 9, and 10 to rotate a corresponding distance, the pawls 28 holding the parts in their moved positions. For example, if a key be used having the teeth 34 arranged as shown in Fig. 6 the withdrawal of the key will cause the ratchet wheel 14 to rotate a distance equal to 3 teeth, and its register wheel 10 to rotate a corresponding distance, displaying the numeral 3 through the sight aperture 33; the next ratchet wheel will be caused to rotate a distance equal to 5 teeth and its register wheel 9 will display the numeral 5; the next ratchet wheel be caused to rotate a distance equal to 7 teeth and its register wheel display the numeral 7; the next ratchet wheel be caused to rotate a distance equal to 9 teeth and its register wheel display the numeral 9; the total result being the number 3579—displayed through the sight aperture, as shown in Fig. 1, which number corresponds to the number stamped upon the particular key used.

It will, of course, be understood that instead of stamping a numeral or numerals upon each key to correspond with a like character or characters upon the registering wheel, the letters of the alphabet may be used, or any other suitable symbols.

I am aware that many changes in the details of construction will readily suggest themselves to others skilled in the art, without departing from the spirit and scope of my invention, and I do not, therefore, desire to be limited to the exact form of embodiment herein shown and described.

Having described my invention, what I claim as new and desire to protect by Letters Patent of the United States, is—

1. In a lock, the combination with locking mechanism and a plurality of symbol bearing keys each of which has a different arrangement of teeth from any of the other keys, but each constructed to operate said locking mechanism, of a ratchet wheel having teeth adapted to engage the teeth upon one of said keys when the latter is being withdrawn from the lock, retaining means for said ratchet wheel, a registering wheel, connections between said registering wheel and said ratchet wheel whereby the latter is actuated to register the symbol or symbols corresponding to the symbol or symbols upon the key, and means for restoring said registering means to normal position.

2. In a lock the combination with locking mechanism and a plurality of symbol bearing keys each of which has a different arrangement of teeth from any of the other keys, but each constructed to operate said locking mechanism, of a ratchet wheel having its teeth adapted to engage certain teeth only of the teeth upon a key when the latter is inverted in the lock, retaining pawls for said ratchet wheel, a registering wheel and means for securing the same to said ratchet wheel and means operable by the entrance of a key into the lock whereby said registering wheel is disengaged from said retaining pawls, and means for returning the said ratchet wheel to its normal position.

3. In a lock the combination with locking mechanism and a plurality of symbol bearing keys each constructed to operate said locking mechanism and having teeth arranged substantially in parallel rows of different lengths, a ratchet wheel for each of said rows of teeth and adapted to be engaged thereby, retaining pawls for said ratchet wheels, tubular hubs for said ratchet wheels sleeving one over the other, a registering wheel secured to the end of each of said hubs and means operable by the entrance of a key into the lock whereby said ratchet wheels are disengaged from their retaining pawls, and means for returning said ratchet wheels to their normal positions.

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