

No. 681,838.

Patented Sept. 3, 1901.

W. H. TAYLOR.
COMBINATION LOCK.

(Application filed Apr. 22, 1897.)

(No Model.)

Fig. I.

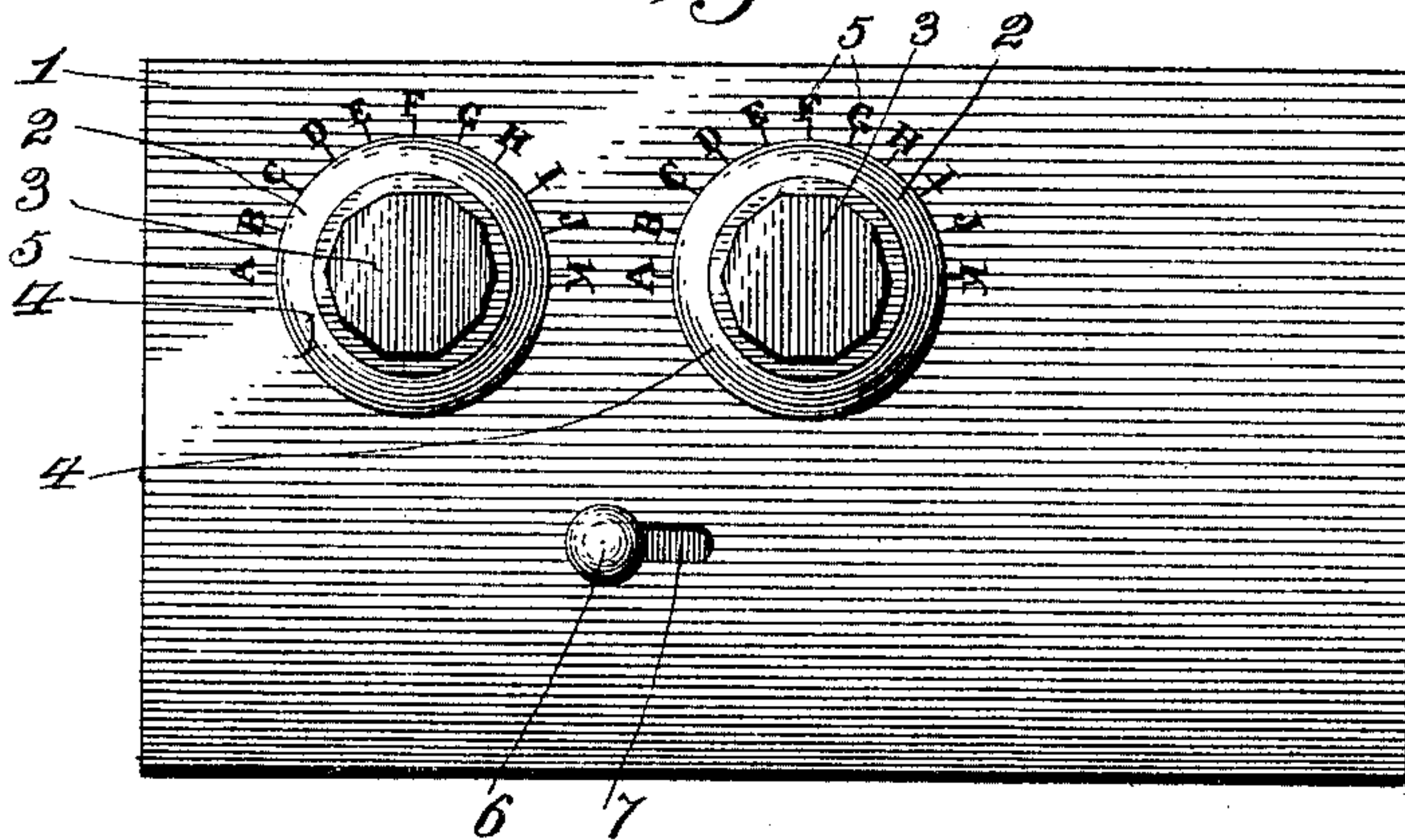


Fig. II.

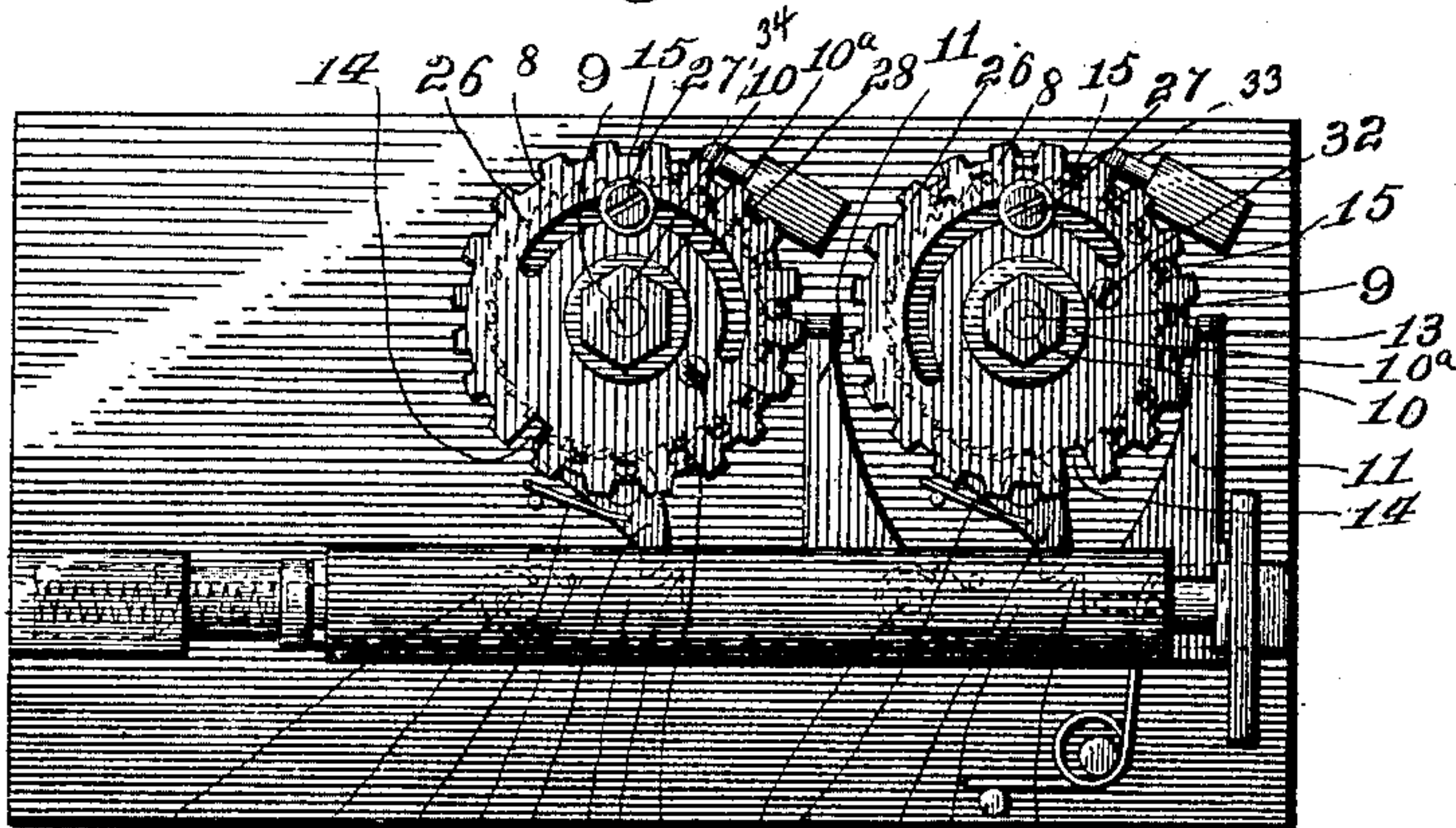


Fig. III.

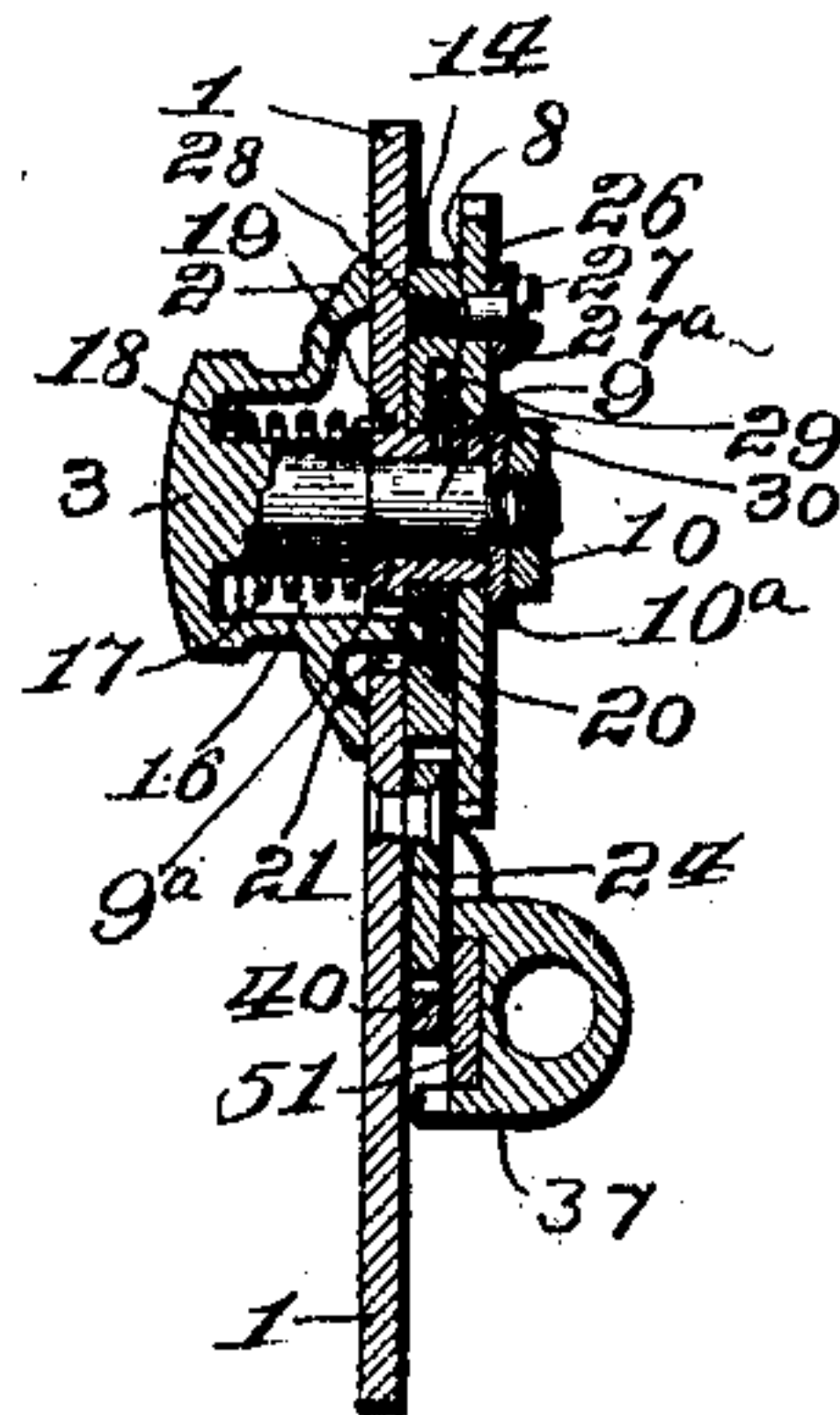


Fig. V^a.

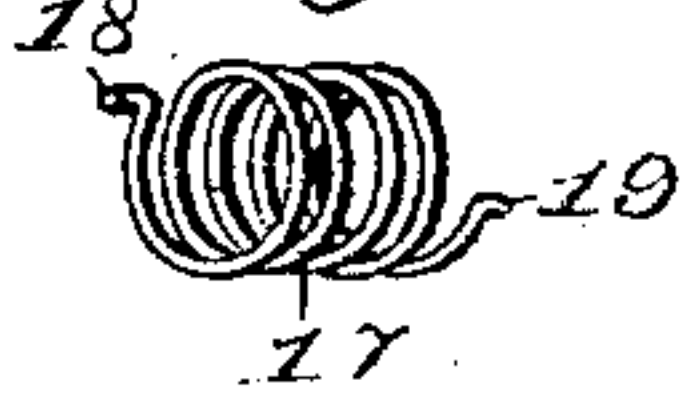


Fig. IV.

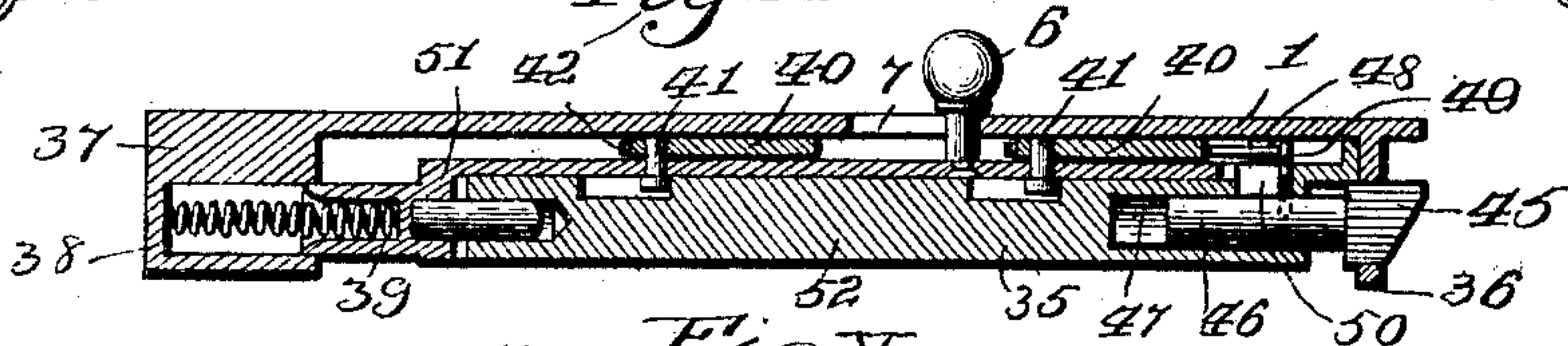
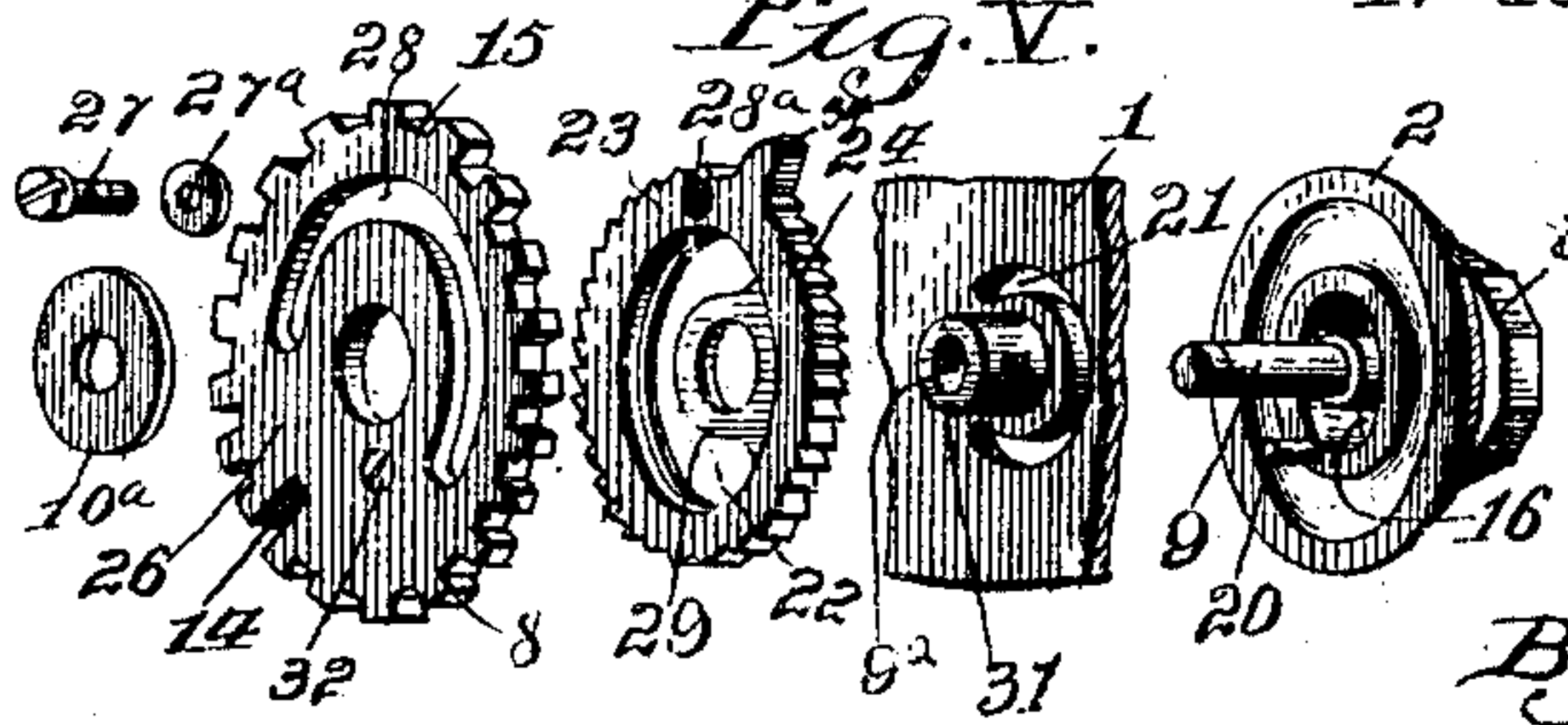


Fig. V.



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UNITED STATES PATENT OFFICE.

WARREN H. TAYLOR, OF FAIRFIELD, CONNECTICUT, ASSIGNOR TO THE
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COMBINATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 681,838, dated September 3, 1901.

Application filed April 22, 1897. Serial No. 633,320. (No model.)

To all whom it may concern:

Be it known that I, WARREN H. TAYLOR, a citizen of the United States, residing at Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Combination-Locks, of which the following is a specification.

My present invention relates to locks of that type wherein several tumblers are employed and each tumbler, with its controlling dial, is arranged apart from and operated independently of the others and has independent controlling connections with the lock-bolt. The dials are generally disposed horizontally, but this is immaterial to the operation of the lock, and any arrangement may be employed which might be more convenient under the peculiar conditions of the place of use.

Combination-locks have already been made so that the tumblers are automatically disconcerted with relation to the fence by the movement of the bolt. I accomplish this result and also I arrange such disconcerting mechanism so that it will be actuated whether the bolt be moved after the tumblers have been set, as in the authorized unlocking of the lock, or whether the bolt's movement is simply to a limited extent incident to tampering with the lock.

The device renders it impossible for any one through carelessness or oversight to leave the combination set when opening a receptacle to which the lock is applied—such, for instance, as a post-office box.

A further object is to employ in connection with such features a tumbler which has, in addition to the notches which permit sufficient movement of the fence to cause unlocking, additional false notches, which admit the stump of the fence at any point, and in addition to thus offering an obstacle to an unauthorized attempt at working the combination permit the aforesaid limited movement sufficient to cause the disconcerting movement.

A novelty in my construction is that the dials after being actuated so as to set the tumblers at once automatically return to the normal unlocked position, and the tumblers

also automatically return to the normal unlocked position immediately after the bolt has been moved for unlocking or for an attempt to unlock.

My invention consists in novel features of construction, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure I is an outside view of a door or other part to which my lock is applied. Fig. II is an inside view of the same. Figs. III and IV are sections taken, respectively, on a vertical line through one of the dial-spindles and on a horizontal line through the locking-bolt. Fig. V is a perspective view showing the parts of the tumbler and setting mechanisms, and Figs. V^a and V^b are perspectives of their springs.

1 represents the door or other part to which the lock is applied, and 2 represents dials, of which there may be any desired number, and each of which is adapted to be turned by a knob 3 to bring an index 4 into coincidence with any one of the designations 5 surrounding the dial on the door 1.

6 represents a knob working in a slot 7 and by means of which the bolt is moved.

Referring to Figs. II and III, 8 represents any desired number of tumblers, of which I have selected two for purposes of illustration and which are loosely confined upon spindles 9 of the dials 2 by nuts 10 and washers 10^a.

11 represents fences equal in number to the tumblers and all carried by and dogging the movement of the same bolt 12 by means of stumps 13, which enter the gates 14 when the latter have been previously set, and thus permit unlocking movement of said bolt, or else enter false notches 15 and permit a movement of the bolt insufficient to unlock the door, but sufficient to mislead one in the unauthorized attempt to work the combination and sufficient to actuate the disconcerting mechanism, presently to be described.

Each dial-spindle 9 has a surrounding box 16, containing a spring 17, fixed at one end 18 to the dial and at the other end 19 to the door 1. (See Figs. III and V.) By this means each dial is returned to and held normally in

unset position when the knob 3 is released. An eccentric projection 20 in the dial works through an arcuate slot 21 in the door and establishes turning connection in one direction only with the tumbler 8, an arcuate slot 22 running backward from the point of engagement of said projection, permitting the dial to be alone returned to normal position by its spring 17 after setting the tumbler. (See Fig. V.) Each tumbler is comprised of a ratchet-disk 23, Fig. V, having formed on its periphery a ratchet 24, into engagement with which a pawl 24 is pressed by a spring 25, Figs. II and III, for the purpose of holding the tumbler to any position to which it may be set, and a gate-disk 26, Figs. II, III, and V, formed on its periphery with the gate 14 and notches 15, hereinbefore referred to. These disks 23 and 26 are secured together adjustably, Figs. II, III, and V, by means of a screw 27, projecting through a slot 28 in the gate-disk with interposed washer 27^a and screwing at 28^a into the ratchet-disk, so that the relative positions of the two parts, and consequently the relative positions of the gate and dial, may be altered at will within the limits prescribed by the ends of the slot 28. The inner ratchet-disk 23 of the tumbler is formed with a spring-box 29, containing a convolute spring 30, the inner end of which makes connection with the boss 31, projecting from the spindle-bearing 9^a in door 1, while the outer end makes connection with the tumbler, and thereby serves to return the tumbler to disconcerted position whenever it is not engaged by the pawl 24. The connection between the outer end of the spring 30 and the tumbler is preferably made with the gate-disk 26 of the tumbler, so that tension may be put upon said spring by simply removing the set-screw 27 and rotating said gate-disk 26. A small screw 32 may be set into the gate-disk of the tumbler to enter a loop 32^a in the end of spring 30. 33 is a spring-buffer, and 34 is a projection on the tumbler for arresting the return movement of the tumbler without jar. These parts may also serve to limit rotation of the tumbler in the other direction. From so much of the description it will be seen that the tumbler may be set to any position through the medium of the dial-knob 3, and it will be held in such position by the pawl 24; also, that said dial and tumbler each contain means which enables them to automatically return to disconcerted positions. It therefore becomes simply necessary to provide for automatically releasing pawl 24 by movement of the bolt to accomplish the primary object of my invention. This is preferably done by causing the bolt to engage said pawl upon its return movement, and as the bolt is automatically projected immediately the knob 6 is released the combination will never remain set even long enough for possible observation while the door is open.

35 represents the bolt, which is guided at its outer or latch end by an upturned flange 36 and at its inner end by a box 37, in which is located a projecting spring 38, said bolt being provided with a reduced shank 39, which enters said box, and said shank being provided with a bore for accommodating a portion of the spring. To adapt the bolt to trip the pawls 24, said bolt is provided with dogs 40, pivoted at 41 and pressed by springs 42 normally against stops 43 and in position to engage the ends of pawls 24. As the bolt is withdrawn the beveled ends 44 of the dogs cause the latter to ride over the pawls; but on the shooting movement of the bolt said pawls 24 are tripped. In order that the bolt may snap freely on closing the door, it is provided with an independently-movable latch 45, having a stem 46 working in a socket 47 of the main portion of the bolt, and said latch is pressed normally outward by a spring 48, engaging a pin 49, which projects from said latch and has a limited movement in a slot 50 of the bolt. The spring 48 also serves to press the main portion of the bolt outward by first forcing the latch-pin to the end of the slot. In order to permit a sufficient independent movement of that portion of the bolt which carries the tripping-dogs, to permit tripping the pawls without withdrawing the latch, as in case of unauthorized attempt to work the combination, said bolt comprises a carriage 51, which is constructed, as heretofore explained, to receive the projecting pressure of spring 38 and the bolt proper, 52, which is channeled, as shown in Fig. III, to receive the carriage and has a bore 53 to receive a sliding pin 54, carried by the carriage. The bolt proper, 52, carries the fences 11 and has recesses 55 provided on its under side, in which stops project to limit the relative movement between it and the carriage. The heads of pivot-pins 41 conveniently serve as these stops, though stops may be specially provided for the purpose. By this construction of bolt the several functions may be independently performed with obvious advantages.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a combination-lock, the combination of a locking-bolt having a projecting spring, a tumbler controlling the withdrawal of said bolt, means for turning said tumbler to unlocking position, a spring for returning said tumbler, a pawl for holding said tumbler to its adjustment, and a dog carried by the bolt, tripping past the pawl in one direction but engaging said pawl and tripping it in the other direction; substantially as and for the purpose set forth.

2. In a combination-lock, the combination of locking mechanism, a tumbler controlling said locking mechanism and provided with a return-spring, a pawl for holding said tumbler to its adjustment, means for releasing said pawl, and means for turning the tumbler

consisting of a dial having an eccentric projection engaging in a slot in the tumbler, and a return-spring for said dial to return it to normal position after setting the tumbler; substantially as and for the purpose set forth.

3. In a combination-lock, the combination of a door or other part to which the lock is applied, formed with a spindle-bearing, and slot concentric with said bearing, a dial having a spindle turning in said slot, a spring-box formed in said dial, a spring in said box engaging at one end the dial, at the other end the door or fixed part, a tumbler having a return-spring, and mounted on the spindle, and formed with a curved slot in which the eccentric projection on the dial engages but which extends backward from the point of engagement to permit the dial to return to normal position independently, and means under control of the locking mechanism for holding the tumbler to its adjustment and for releasing it by the unlocking movement; substantially as and for the purpose set forth.

4. The combination of the tumbler of a combination-lock formed with a spring-box, a spring located within said box engaging at one end with the tumbler and at the other end with a fixed part, and a dial engaging the tumbler when rotating in one direction only, and having an independent spring returning it to normal position, substantially as and for the purpose set forth.

5. In combination with the locking mechanism of a combination-lock, a fence carried by the bolt thereof, a tumbler in the path of said fence, having a disconcerting-spring, and a pawl restraining said tumbler, released by a slight unlocking movement of the bolt, said tumbler having its periphery formed with notches in addition to the unlocking gate, to permit partial movement of the locking-bolt, to cause release of the pawl and disconcerting of the tumbler upon attempting to retract the bolt, substantially in the manner and for the purpose set forth.

6. In a combination-lock, the combination of the locking mechanism, a tumbler controlling said locking mechanism and having a return-spring, and a yielding buffer for arresting movement of the tumbler when re-

turned by the spring; substantially as explained.

7. In a combination-lock, the combination of the locking mechanism and an automatically returning or disconcerting tumbler controlling said locking mechanism, and comprising two parts, connected together by means of a slot-and-screw connection, and one of which is formed with a spring-box containing a spring; substantially as and for the purpose set forth.

8. In a dial-lock, the combination of a dial and a tumbler engaged by said dial only in the direction for setting, and an automatic returning means, independent of the tumbler, whereby the dial, after setting the tumbler, will at once automatically return to its normal position.

9. In a dial-lock, the combination of a dial having independent automatic returning means, and a tumbler engaged in one direction and set thereby, means for holding the position to which the tumbler may be moved by the dial, and means carried by the bolt that releases said holding means when the bolt is moved, whereupon said tumbler would automatically return to its normal position, substantially as described.

10. In a combination-lock, the combination of locking mechanism, an automatically-returning tumbler controlling said locking mechanism, means whereby said tumbler is released by the movement of the bolt, and an independently-movable latch carried by the bolt, substantially as and for the purpose set forth.

11. In a combination-lock, the combination of a self-returning tumbler, and locking mechanism controlled by said tumbler and adapted to release the same; said locking mechanism comprising a bolt proper carrying the latch and the fence and a carriage having a limited independent movement and carrying the means for releasing the tumbler; substantially as and for the purposes set forth.

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Witnesses:

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