

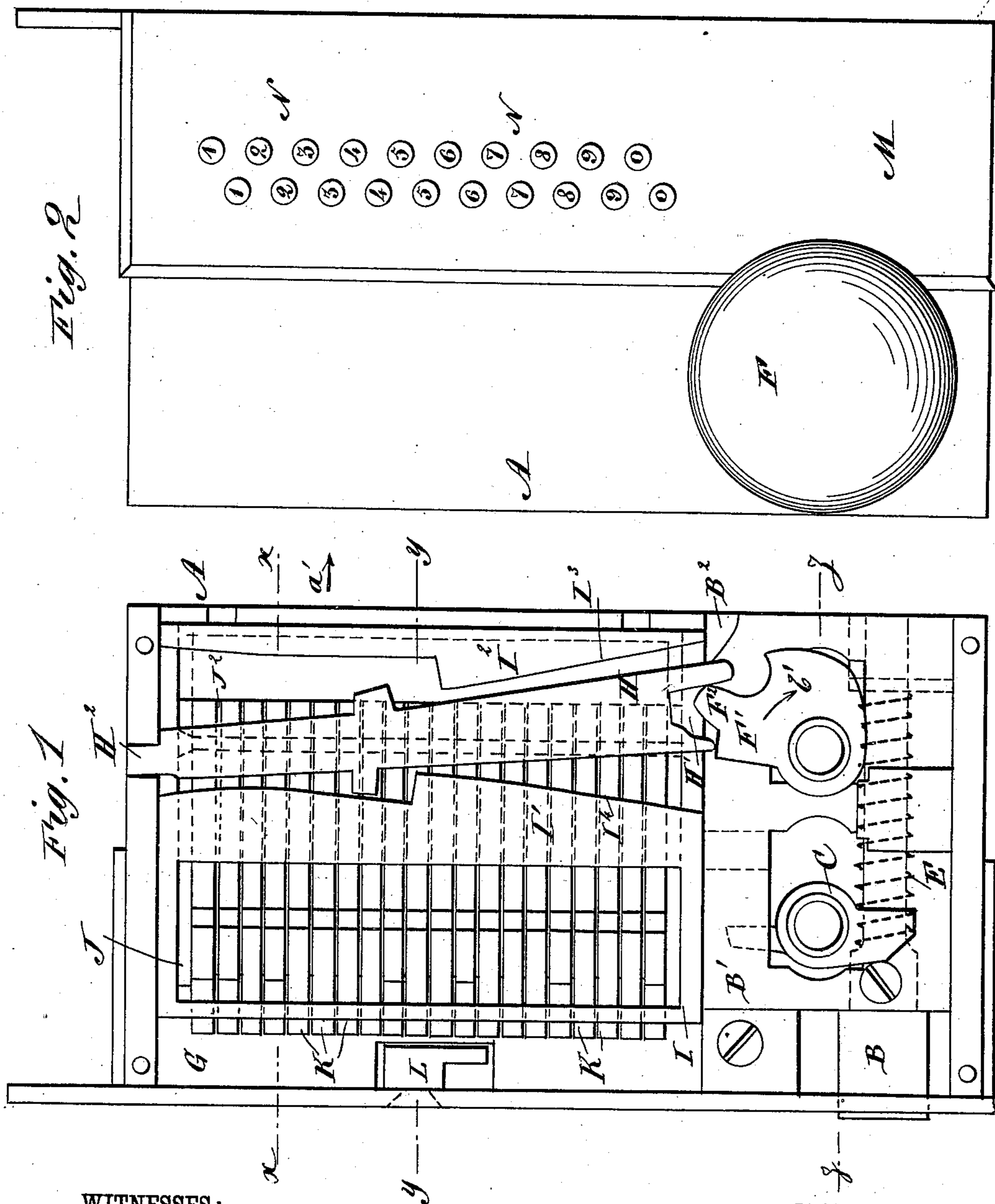
(Model.)

2 Sheets--Sheet 1.

J. G. O'NEILL.
COMBINATION LOCK.

No. 365,317.

Patented June 21, 1887.



WITNESSES:

C. Sevens

C. Sedgwick

INVENTOR:

J. G. O'Neill

BY

Munn & Co.

ATTORNEYS.

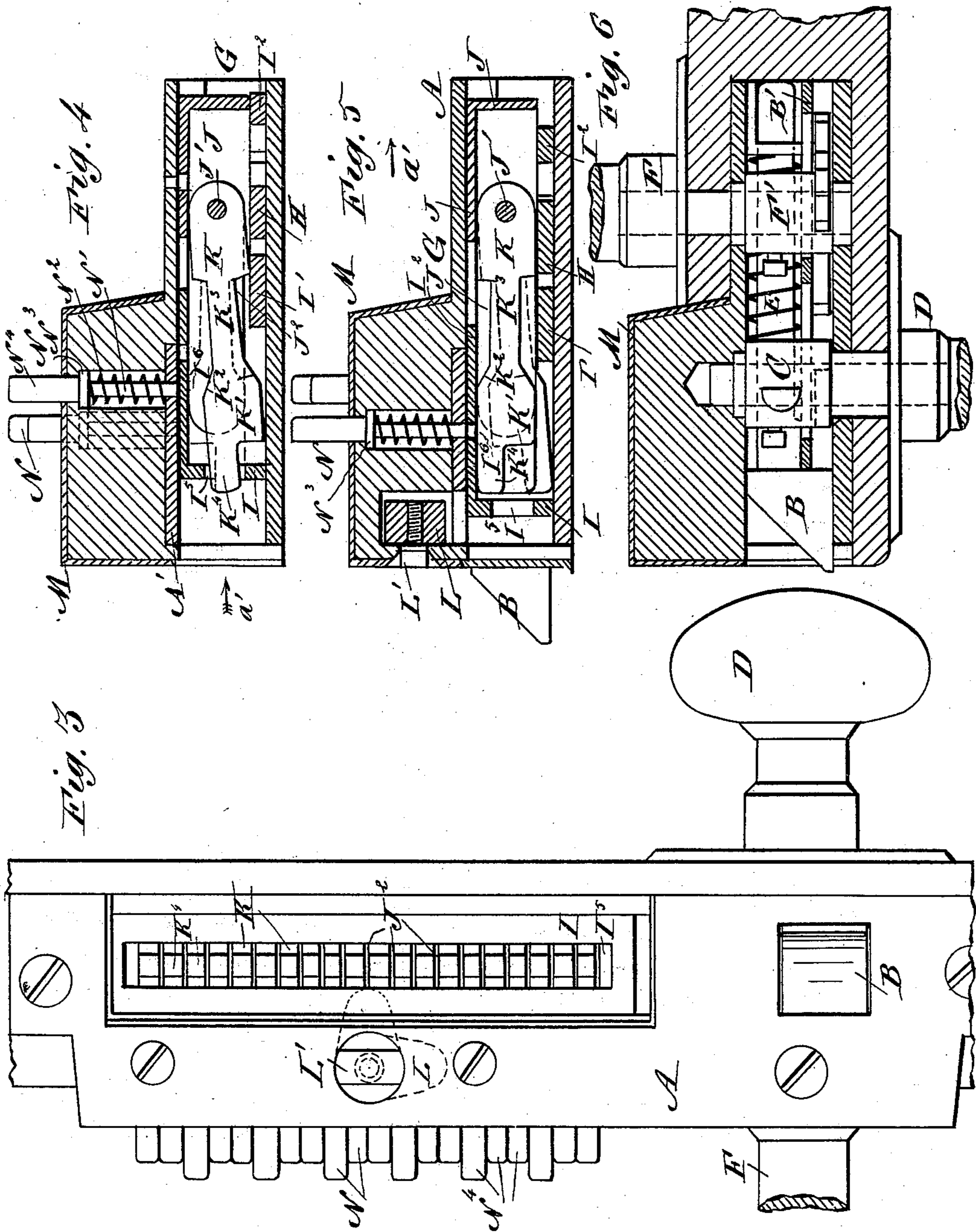
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UNITED STATES PATENT OFFICE.

JOSEPH G. O'NEILL, OF NEVADA CITY, CALIFORNIA.

COMBINATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 365,317, dated June 21, 1887.

Application filed October 20, 1886. Serial No 216,723. (Model.)

To all whom it may concern:

Be it known that I, JOSEPH G. O'NEILL, of Nevada City, in the county of Nevada and State of California, have invented a new and Improved Combination-Lock, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved combination-lock which is simple and durable in construction, safe and reliable in operation, and adapted to be changed to any desired combination for unlocking.

The invention consists of a sliding bolt-frame operated by a lever, of a locking-frame actuated by the outside knob and the said lever, and of pivoted tumblers operated by spring-keys.

The invention also consists of various parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

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

Figure 1 is a side elevation of my improved lock with the inner face-plate removed and showing the same in an unlocked position. Fig. 2 is an elevation of the lock-casing with the spring-keys, their casing, and the knob. Fig. 3 is a front edge view of the same with the front covering-plate removed. Fig. 4 is a sectional plan view of the same on the line $x x$ of Fig. 1, showing my lock in an unlocked position. Fig. 5 is a sectional plan view of the same on the line $y y$ of Fig. 1, showing my lock in a locked position; and Fig. 6 is a sectional plan view of the same on the line $z z$ of Fig. 1.

My improved combination-lock is mounted in the casing A, secured in the usual manner to a door and provided with the bolt B, secured to the frame B', sliding in suitable bearings in the said casing A, and operated from the inside of the door by the follower C, attached to the spindle of the inner door-knob, D. The spring E, acting on the frame B', has the tendency to hold the bolt B and its frame B' in an outer or closed position. The door-knob F on the outside of the door is connected by

its follower F', having the arm F², with the combination-lock mechanism G, by means of the lever H, having the forked end H', which engages with the said arm F², and having its other end, H², fulcrumed on the casing A. The lever H operates between two bars, I' and I², each provided with an inclined inner edge, I⁴ and I³, respectively, and both bars I' and I² are secured to the locking-frame I, which slides in the casing J, held in the casing A, and containing the tumblers K, which are all alike in shape, and are pivoted at their inner ends on a common pin or shaft, J', secured to the sides of the said casing J. The several tumblers K are separated from each other by the spring-plates, J², secured to the frame J. The outer end of each tumbler K is provided with a notch forming a shoulder, K', and with the inclines K², which connect the said outer end with the shank K³ of the tumbler at each edge.

The front end of the locking-frame I is provided with a rectangular opening, I⁵, which fits over the projecting ends K⁴ of the tumblers K, when the same are in the relative positions hereinafter more fully described. The locking-frame I can be locked in position on the tumblers K by means of the latch L, which is secured to the casing A, and is provided with the thumb-knob L', placed in a recess in the front edge of the lock. Two rows of spring-keys N are mounted in a separate casing, M, attached to the outside of the casing A. Each of the keys N consists of the shank N', which has a bearing on its inner end in an aperture in the plate A' of the casing A. On the shank N' is coiled the spring N², the inner end of which rests on the said plate A', while its outer end abuts against a collar, N³, secured to the said shank N'. The finger-piece N⁴ extends from the said collar N³ to the outside of the casing M, and is provided on its front with a numeral, as shown in Fig. 2. The numerals of each row of keys N are preferably successive, commencing with the numeral "1" at the top. The springs N² hold the key N in the outer position. Two rows of apertures, I⁶, corresponding in size and position to the shanks N' of the keys N, are provided in the inner plate of the locking-frame I, each aperture

being over the edge of one of the tumblers K, so that when the locking-frame I is in the position shown in Fig. 5 the inward movement of a key N brings the inner end of its shank N' into contact with the corresponding tumbler K. The tumblers K, which are placed to have their shoulders K' toward the keys N, have their outer ends, K⁴, in line with the opening I⁵ of the locking-frame I when they are in a normal position; but the tumblers which have their notches opposite the keys N have their outer ends, K⁴, in such a position as to prevent the frame I from sliding in the direction of the arrow a', as their outer ends, K⁴, would come in contact with the front edge of the said frame.

If it is desired to open the door from the outside by means of the knob F, it is necessary that the respective tumblers which have their notches opposite the keys N should be brought, by means of the respective keys N, into position to permit the frame I to slide inward in the direction of the arrow a', the said movement being accomplished by turning the knob F in the direction of the arrow b', so that the arm F² of the follower F' will act on the forked end of the lever H, which, swinging inward, presses against the bar I² and forces the frame I inward in the direction of the arrow a' until it reaches the position shown in Fig. 1. The forked end H', at the same time coming in contact with the lug B² of the bolt-frame B', slides the said frame inward and unlocks the door. As soon as the respective keys N are pressed inward and the pressure is relieved, the springs N² will return said keys to their normal positions, as shown in Figs. 4 and 5. It will be seen that the locking-frame I cannot be moved inward in the direction of the arrow a' by turning the knob F as long as the front ends, K⁴, of all the tumblers K are not in line with the aperture I⁵ of said frame I, as an inward movement of the latter cannot take place and the lever H cannot swing inward, but is held in place by the bar I² until all the outer ends, K⁴, of the tumblers K are in line with the said aperture I⁵. After the door is unlocked, the operator turns the knob F in the inverse direction of the arrow b', so that the arm F² of the follower F' forces the lever H to swing toward the front, whereby the frame I is slid in the inverse direction of the arrow a', and the tumblers K are forced to their normal positions by their inclines K², projecting beyond the spring-plates J², coming in contact with the edge of the bar I', so that the lock is again set, and the door cannot be opened by the knob F until the respective keys N, and none others, forming the combination are pressed inward so as to bring the outer ends, K⁴, of the reversed tumblers K again in line with the other tumblers, as above described. The sliding frame B' can always be moved by the knob D from the inside of the door. The frame I can be locked in position on the tumblers K, as shown in Fig. 1, by turning the latch L upward, so

that such frame I will not leave the front ends K⁴ of the tumblers K. The front end of the said frame then rests against the latch L, and is free to slide inward in the direction of the arrow a' when the knob F is turned. The division spring-plates J² hold the tumblers K in any desired position by pressing against the faces of the same.

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

1. In a combination-lock, the combination, with a sliding bolt-frame having a lug and an outside knob carrying a follower, of a lever operated by the said follower, and acting on the lug of the said sliding bolt-frame, and a locking-frame having two bars with inclined inner edges, against which operates the said lever and pivoted tumblers, substantially as shown and described.

2. In a combination-lock, the combination, with a pivoted lever operated by the outside door-knob, of the locking-frame I, having an aperture in the front edge thereof, and having two bars, I' and I², with inner inclined edges, tumblers K, pivoted in a stationary casing and each having a notched shoulder, K', forming the outer end, K⁴, which fits into the aperture in the said frame I, and spring-keys N, for actuating the said tumblers, substantially as shown and described.

3. In a combination-lock, the combination, with the pivoted lever H, operated by the outside door-knob, of a locking-frame, I, having an aperture in the front edge thereof, and having two bars, I' and I², each provided with inclined inner edges, tumblers K, pivoted in a stationary casing, in which slides the said frame I, said tumblers having notched shoulders K', forming the outer ends, K⁴, which fit into the aperture in the said casing or frame I, and the thumb-latch L, for locking said sliding frame I in position on the said tumblers K, substantially as shown and described.

4. In a combination-lock, the stationary casing J, the tumblers K, pivoted on the pin J', secured to the said casing J, and the locking-frame I, having an aperture, I⁵, in the front edge thereof, and having the bars I' and I² and the follower F' on the outside door-knob, and the lever H, engaging said follower and acting on the bars I' and I² of the said frame I, in combination with the spring-keys N, adapted to press the said tumblers K into position, so that their front ends, K⁴, fit into the aperture I⁵, substantially as shown and described.

5. In a combination-lock, the sliding bolt-frame B', having the lug B², the follower F', operated from the outside door-knob, F, the lever H, operated by the said follower, and the locking-frame I, operated by the said lever H, in combination with the stationary casing J, in which slides the said frame I, the tumblers K, having the shoulders K' and the inclines K², the spring-plates J² between the said tumblers,

and the spring-keys N, acting on the edges of the said tumblers, substantially as shown and described.

6. In a combination-lock, the stationary
5 casing J, the pivoted tumblers K, and the locking-frame I, having the bars I' and I², each provided with an inclined inner edge, in combination with the lever H, having the

forked end H', the follower F', having the arm F² and operated from the outside door-knob, 10 F, and the sliding bolt-frame B', having the lug B², substantially as shown and described.

JOSEPH G. O'NEILL.

Witnesses:

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GEORGE L. HUGHES.