No. 697,651.

Patented Apr. 15, 1902.

W. J. NEIDL.

COMBINATION LOCK.

(Application filed Aug. 26, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1

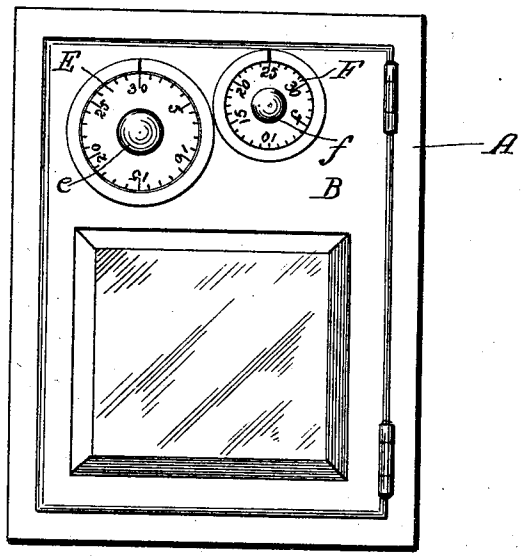
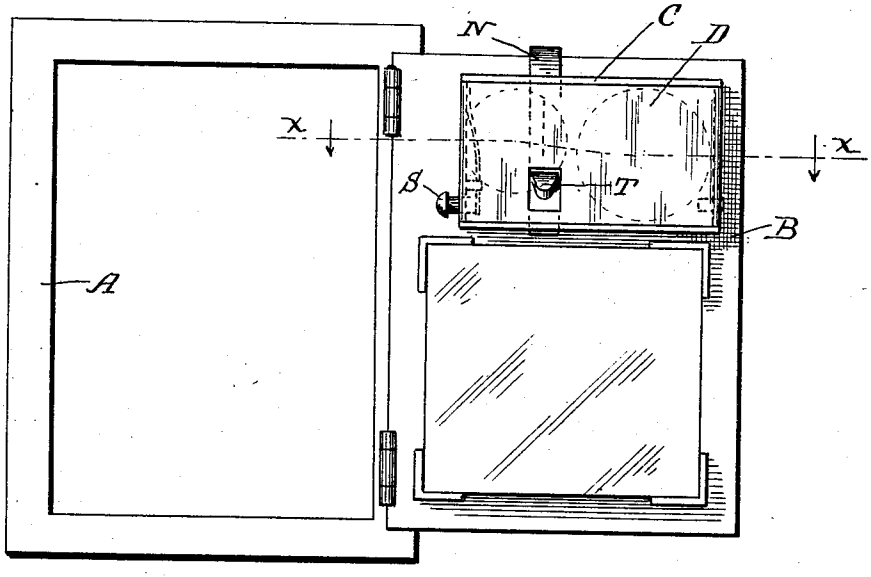


Fig. 2



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Fig. 3.

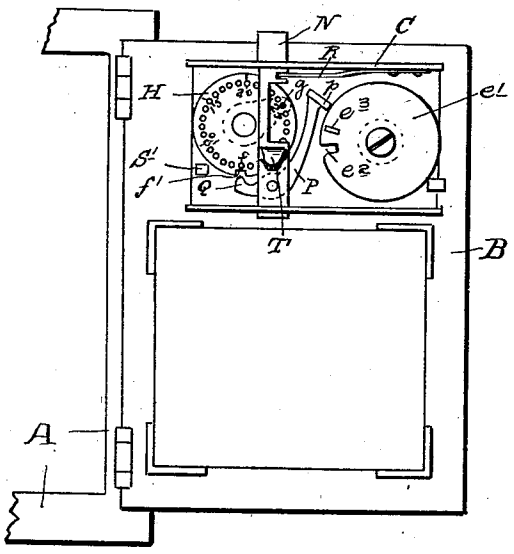


Fig. 4

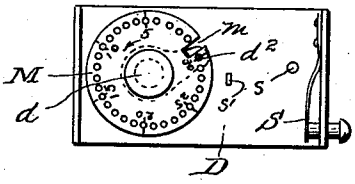
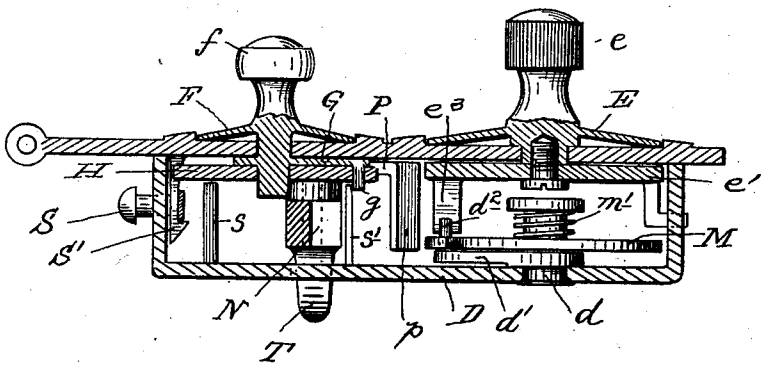


Fig. 5



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(Application filed Aug. 26, 1901.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 6.

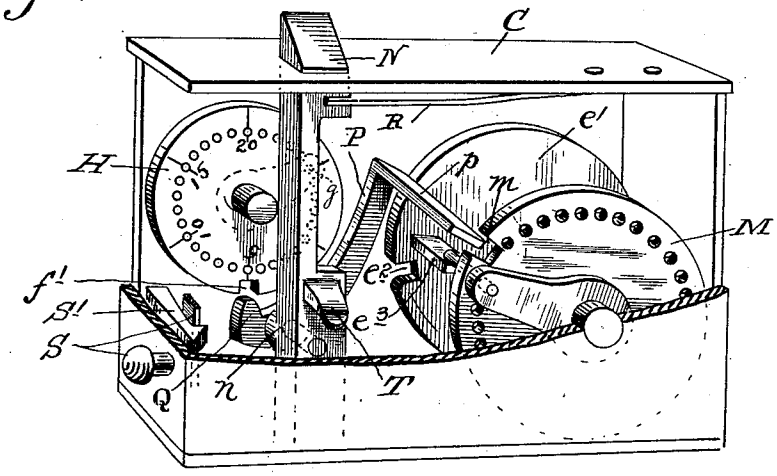


Fig. 7

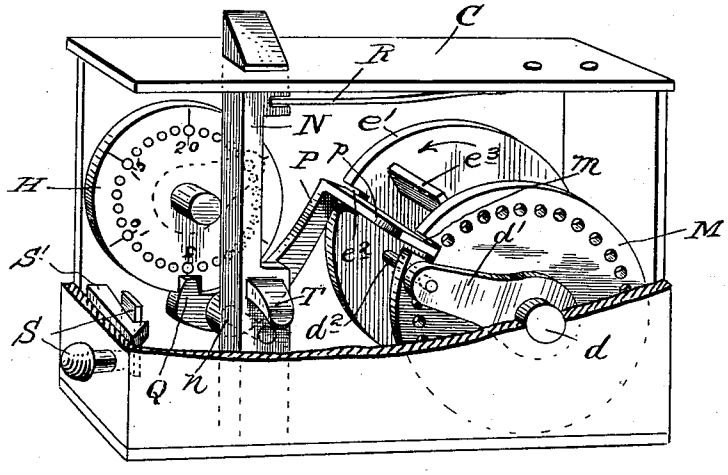
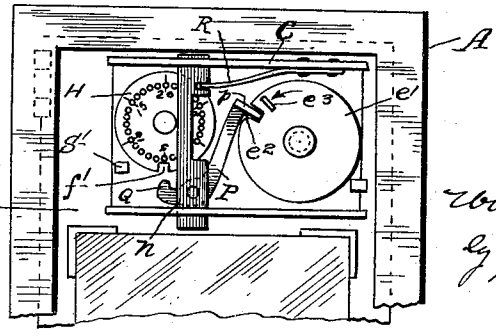


Fig. 8



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UNITED STATES PATENT OFFICE.

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COMBINATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 697,651, dated April 15, 1902.

Application filed August 26, 1901. Serial No. 73,294. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. NEIDL, a citizen of the United States, and a resident of New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Combination-Locks, of which the following is a full, clear, and exact description, whereby any one skilled in the art may make and use the same.

The object of my invention is to produce a lock of the kind described having features of novelty and advantage.

In the drawings I have shown my invention applied to a door of an ordinary post-office box.

Figure 1 denotes a front view of the box with the door closed. Fig. 2 denotes a front view of the box with the door open. Fig. 3 is a view similar to Fig. 2 with the casing of the lock removed. Fig. 4 is a view of the inside of the casing of the lock, showing the parts attached thereto. Fig. 5 is a detail section on enlarged scale on the lines $x\,x$ of Fig. 2. Fig. 6 is a view in perspective showing the parts of the lock in one position. Fig. 7 is a view in perspective showing the parts of the lock in their unlocked position. Fig. 8 is a detail view of the lock with the casing removed, showing the bolt retracted.

Referring to the drawings, A denotes the frame of the box, to which is hinged the door B. To this door B is secured a casing C, in which some of the parts of the lock are secured. The back D of this casing is removable and has other parts of the lock secured to it. In the front of the door are located two dial-plates E F, arranged in the usual manner and having the ordinary operating-handles $e\,f$. To the inner end of the stem on the dial F is secured an arm G, having at its outer end a pin g, which is adapted to enter holes formed in a tumbler H, which is mounted on the stem of the dial F. This tumbler is marked into divisions corresponding to the divisions on the dial F, and at each division is a hole for the pin g. The combination of the dial F may be changed by lifting the tumbler H until it is disengaged from the pin g and turning it around to a greater or less extent, settling it back into place with the pin g in another of the holes. Thus in Fig. 3 it is seen that the pin g is in the hole at the division 25, and this determines the combination of the dial F, as shown in Fig. 1. In the periphery of this tumbler H is the notch f', the use of which will be described hereinafter.

Secured to the stem of the dial E is the tumbler e', having a recess e^2 in its periphery and a rearwardly-projecting lug e^3.

Secured to the back of the casing D is a post d. On this post is revolubly mounted an arm d', having at its end a pin d^2. Directly above this arm there is revolubly mounted on the post d a tumbler M, marked off into divisions corresponding with the divisions on the dial E, there being a hole at each division to receive the pin d^2 on the arm d'. The combination of the dial E is changed in a manner similar to that of the dial F by locating the pin d^2 in different holes about the edge of the tumbler M. This tumbler M is held in position by the spring m' rising between it and the head of the post d. The pin d^2 is long enough to project slightly through the tumbler to be engaged by the projecting lug e^3 on the tumbler e'. The tumbler M has a recess m in its periphery. The lock-bolt N is slidingly mounted in operative relation to the parts of the lock and has projecting from its under side a lug n, the end of which rides in a slot in the front of the casing C to guide the rear end of the bolt. The front of the bolt is guided by the casing, as is clearly indicated in the drawings. To this lug n on the bolt is pivoted a lever P, having at one end a pawl p, extending rearwardly therefrom and of such a length that it bridges the two tumblers e' and M. The other end of this lever P, on the opposite side of the pivot from the pawl p, is formed into a tooth or projection Q, which projects toward the tumbler H.

The operation of the device is readily understood, it being first noticed that there is no connection whatever between the tumbler M and the plunger e' except through the lug e^3, carried by the punger e'. Assuming the parts to be in their locked positions, the dial F is first moved until the recess f in its periphery is in line with the tooth or projection Q on one end of the lever P. The dial E is now turned to the left. The lug e^3 on the tumbler e' engages the pin d^2, which is secured to the end of the arm d' and passes through a hole in the tumbler M, thus moving the

tumbler M until the recess m in its periphery is in its proper position, which is shown in Fig. 6. The dial E, with its attached plunger e', is now turned to the right until the recess e^2 in its periphery registers with the recess m in the periphery of the plunger M. The parts will now be in the position shown in Fig. 7, and the lever P by its own weight drops, the pawl p entering the recesses e^2 m and the tooth Q entering the recess f'. A further movement of the dial E to the right causes the bolt to be retracted into the position shown in Fig. 8 against the action of the spring R, which normally holds the bolt in its forward position. When the box is closed, either one of the dials E F or both of them may be moved slightly and the combination thrown out.

In Fig. 5 there will be seen two posts s s', which are secured to the removable back of the casing C and which are adapted to hold in place the tumbler H. There is also secured to the removable cover C a spring-catch S, which coöperates with a locking-dog S' to retain the removable part of the casing in place. On the side of the lock-bolt opposite the lug n is a projection T, which projects through a hole in the removable back D. By means of this projection the bolt may be retracted from the inside. This often is convenient when the box-owner has forgotten or cannot work the combination.

I have illustrated and described herein one of the simplest forms in which my lock may be embodied; but I do not care to limit myself to this particular construction. It is evident that by putting two or three or four tumblers on the post d the combination can be very much complicated. In fact, my lock is well adapted for use under any circumstances where a combination-lock is wanted.

I claim as my invention—

1. In a lock of the class specified a plurality of dials, tumblers operated by the dials, notches in the peripheries of the tumblers, the lock-bolt and an unbalanced lever connected with said bolt, the ends of said lever coöperating with the notches in the tumblers to retract the bolt by further movement of some of the tumblers, substantially as described.

2. In combination in a device of the class specified, dials, tumblers operated thereby, recesses in said dials, the lock-bolt and an unbalanced lever connected with said bolt, the ends of said lever coöperating with said recesses to operate the bolt by further movement of part of the tumblers, substantially as described.

3. In combination in a device of the class specified, the dials and their operating-handles held against lengthwise movement, tumblers secured to each dial, a tumbler mounted independent of the dials, a stationary lug on one of the first-mentioned tumblers adapted to engage a projection from the last-named tumbler, recesses in the peripheries of each of the tumblers, the lock-bolt and mechanism connected therewith and operated by further movement of part of said tumblers for retracting said bolt, substantially as described.

4. In a device of the class specified the dials, tumblers secured to each dial and a tumbler mounted independent of said dials, notches in the peripheries of said tumblers, the lock-bolt, an unbalanced lever connected with said lock-bolt, one end of said lever coöperating with the notches in the other dial-tumblers and in the independent tumblers, substantially as described and for the purposes set forth.

5. In a device of the class specified two or more dials, a notched tumbler operated by each of said dials, an independent tumbler mounted adjacent to one of said dial-tumblers, a notch in the periphery of said independent tumbler, the lock-bolt and the lever carried thereby, one end of said lever coöperating with a notch in one of the dial-tumblers, the opposite end of said lever being bent to coöperate with the notches in the other dial-tumbler and the adjacent independent tumbler, as and for the purposes specified.

6. In a device of the class specified, the dials mounted in the front of the door, tumblers on the inside of said door connected with said dials, recesses formed in the peripheries of said tumblers, a tumbler mounted on a removable support independent of the dial-tumblers, and recesses in the periphery of said independent tumbler, a lug on one of said dial-tumblers engaging a projection on the independent tumbler, the locking-bolt and a lever pivoted to said bolt, said lever having at one end a tooth adapted to enter the recess in one of the dial-tumblers, and at the other end a pawl adapted to enter the recesses in the other dial-tumbler and the independent tumbler, as and for the purposes specified.

7. In a device of the class specified the dials marked into divisions in the ordinary manner, an arm positively secured to one of said dials and carrying at its ends a pin, a tumbler having a series of holes corresponding to the divisions of the dial, said tumbler connected with said dial by said pin, a second tumbler mounted independently of the other dial and having a series of holes corresponding to the divisions on the dial, and connections between the second dial, and the independent tumbler.

8. In a device of the class specified the dials having the ordinary divisions marked thereon, an arm positively connected with one of said dials and having a pin at its outer end, a tumbler having a series of holes corresponding to the divisions on the dials connected therewith by said pin, and an arm mounted independently of the second dial and having at its end a pin, a second tumbler having a series of holes corresponding to the divisions on the second dial, said pin projecting through one of the holes in said tumbler, and a finger op-

erated by said second dial and adapted to engage said pin to operate the second tumbler, substantially as described.

9. In a device of the class specified the dials suitably divided, arms operated by said dials, pins located in the ends of said arms, tumblers having series of holes corresponding to the divisions of the dials, and pins in the ends of said arms being adapted to enter different holes in the dials to change the combination, said tumblers being held in position by a spring, substantially as described.

10. In a device of the class specified the dials mounted side by side, tumblers connected with and operated by said dials, a tumbler mounted independent thereof, recesses in the peripheries of said tumblers, a lock-bolt and an unbalanced lever pivoted thereto and means located at each end of said lever coöperating with said tumblers, as and for the purposes specified.

11. In combination in a device of the class specified the dial the tumblers H e' secured to and operated thereby, the notches f' e^3, the independent tumbler M, notch m on the periphery thereof, bolt T, unbalanced lever P pivoted thereon, tooth Q on one end of said lever and the pawl p at the opposite end thereof, all arranged and adapted to operate substantially as described.

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