No. 698,781. Patented Apr. 29, 1902.

J. & C. E. ARNER.

PERMUTATION LOCK.

(Application filed Apr. 9, 1901.)

(No Model.)

Fig. 1.

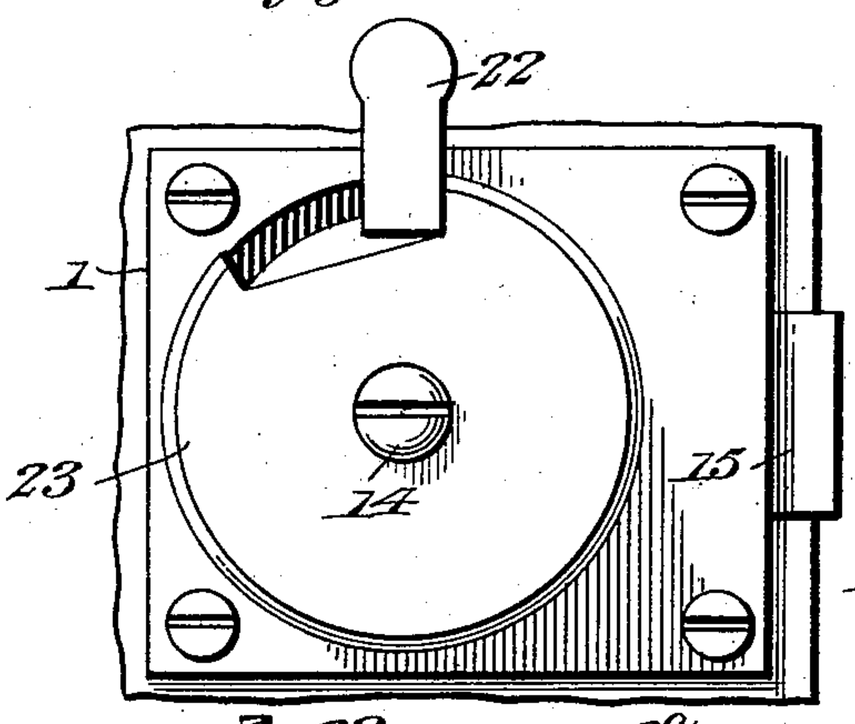


Fig. 2.

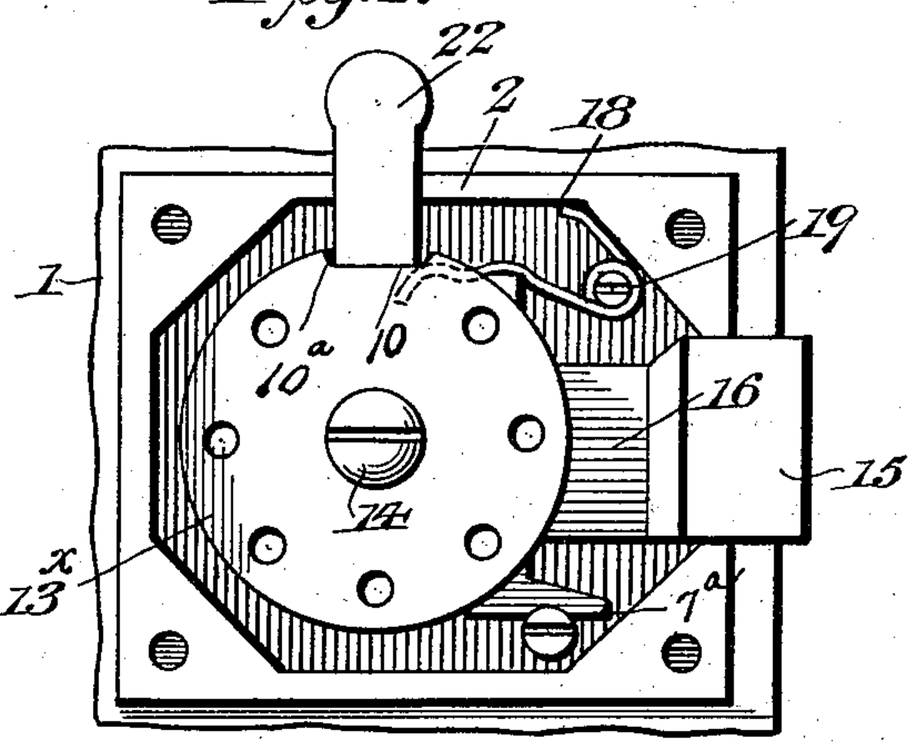


Fig. 3.

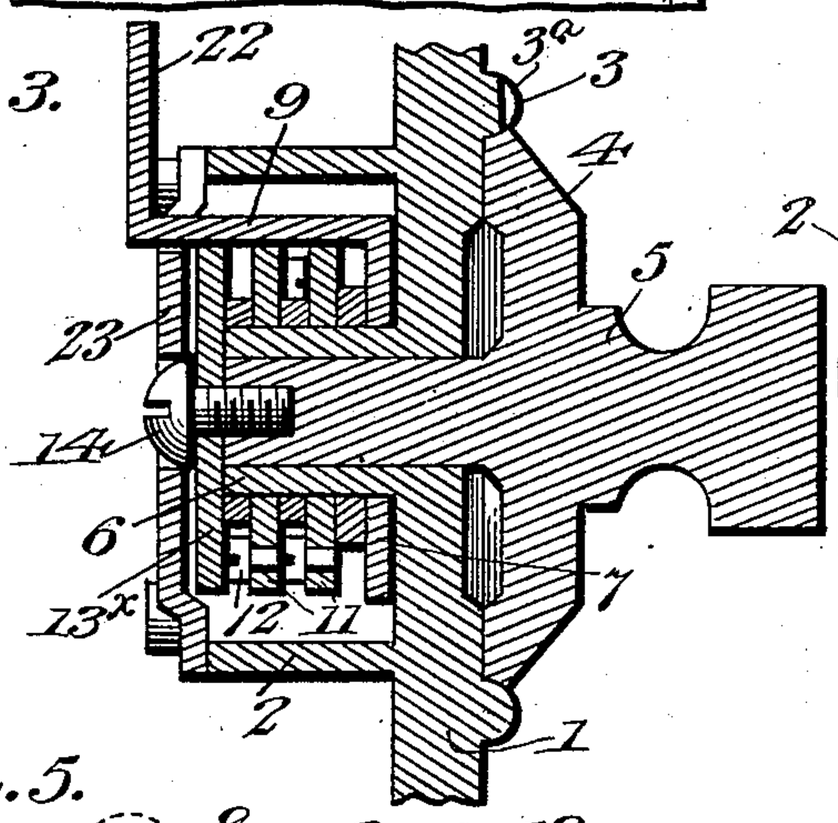


Fig. 4.

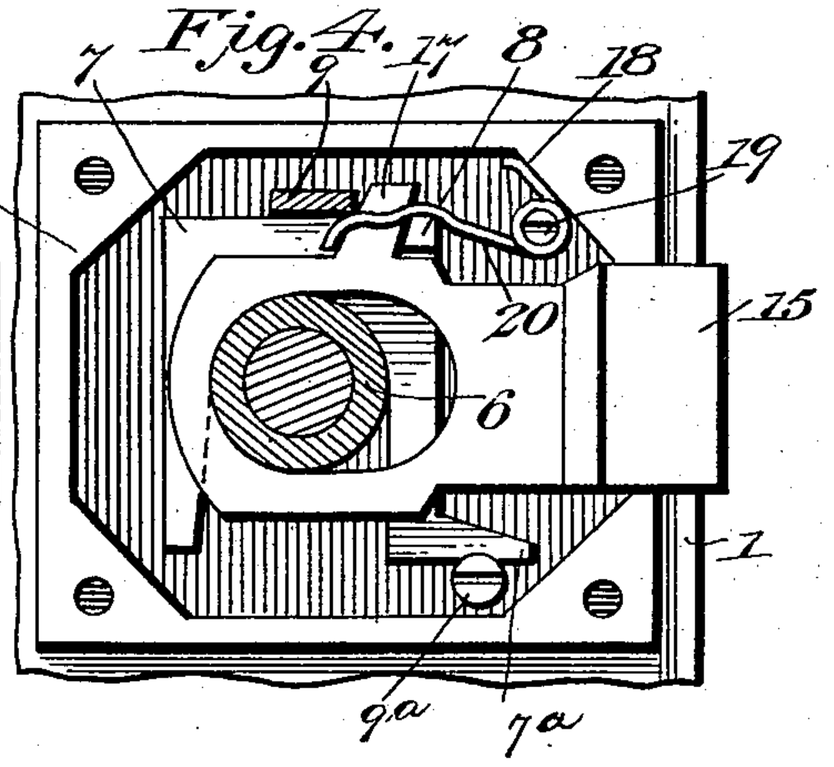


Fig. 5.

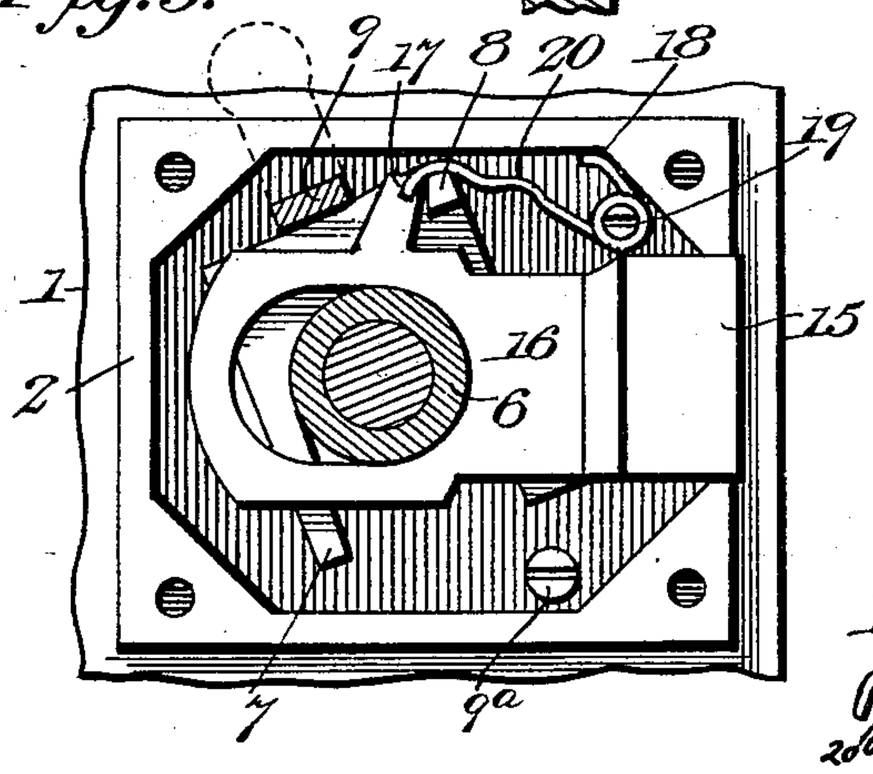


Fig. 6.

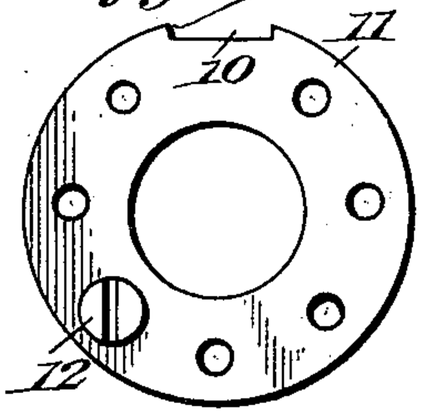


Fig. 7.

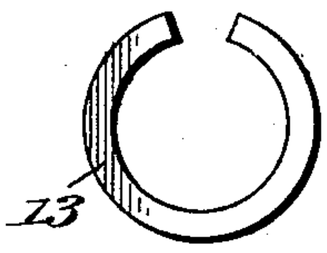
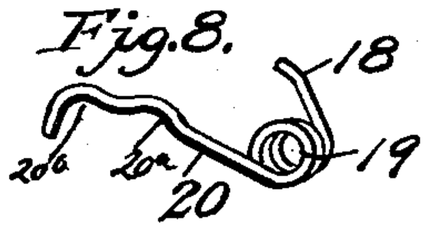


Fig. 8.



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By
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UNITED STATES PATENT OFFICE.

JOSEPH ARNER AND CALVIN E. ARNER, OF WEISSPORT, PENNSYLVANIA, ASSIGNORS TO THE KEYLESS LOCK COMPANY, OF LEHIGHTON, PENNSYLVANIA, A CORPORATION OF DELAWARE.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 698,781, dated April 29, 1902.

Application filed April 9, 1901. Serial No. 55,101. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH ARNER and CALVIN E. ARNER, citizens of the United States, residing at Weissport, in the county of Carbon and State of Pennsylvania, have invented new and useful Improvements in Permutation-Locks, of which the following is a specification.

This invention relates to new and useful improvements in permutation-locks especially adapted for use upon chests, mail-boxes, and other devices requiring a small lock.

The object of the invention is to provide a simple, durable, and efficient construction whereby the bolt of the lock will be withdrawn when the knob thereof has been turned to the proper combination.

The details of construction, as well as the novel arrangement of parts and the method of operation, will be fully disclosed in the following description, taken in connection with the drawings hereunto annexed, in which—

Figure 1 is a rear elevation of the preferred form of lock constructed in accordance with our invention. Fig. 2 is a similar view with the securing-plate removed. Fig. 3 is a vertical longitudinal section through the same. Fig. 4 is an elevation of the parts in position, the tumblers being removed. Fig. 5 is a similar view showing the bolt in a retracted position. Fig. 6 is a top plan view of one of the tumblers. Fig. 7 is a similar view of one of the intermediate washers, and Fig. 8 is a view of the spring detached.

Referring now to the drawings by reference-numerals, 1 designates a lock-case of suitable design and proportions, in the barrel 2 of which we provide the lock mechanism. On the outer face of the case is a rim 3, provided with a graduation or starting-point 3^a, and in this rim is a dial 4, containing graduations or characters, which are adapted to register with the graduation on the rim to form the combination. This dial is integral with the knob-spindle 5, working in a sleeve 6 in the case.

7 designates a bifurcated plate which straddles the sleeve 6 and carries on one corner thereof a lug or projection 8, the purpose of which will be explained hereinafter.

9 designates a fence projecting from one side of the plate, provided with an upwardly-extending lever 22 and adapted to engage recesses 10 in the tumblers 11. These tumblers are revolubly secured upon the sleeve 6 and carry one or more buttons or knobs 12, adapted to register to form the combination. These tumblers are spaced apart by split rings or washers 13. At the end of the spindle is secured a tumbler $13^\times$, rigidly fastened to the spindle by a suitable screw 14. The bolt 15, which is slidably secured within the lock-case, is provided at its inner end with a yoked leaf 16, which fits over the spindle and is provided with an upwardly-projecting finger 17, adapted to be engaged by the lug or projection 8 on the bifurcated plate 7, whereby the said bolt may be retracted.

18 designates a spring secured at 19 and having a laterally-extending arm 20, bearing upon the lug or projection 8, so as to force the bifurcated plate 7 downward, and thus bring the fence 9 in engagement with the notches in the disks when in alinement, thus making it possible to retract the bolt 15 through the medium of the knob-spindle and rigid tumbler $13^\times$. The spring-arm 20 is bent to form two curved seats 20^a and 20^b to receive the lug 8 of the plate 7. When the bolt is projected, the lug 8 is within the seat 20^a, and the tension of the spring holds the plate 7 in the position shown in Fig. 4, the downward movement of said plate 7 being limited by a foot 7^a, projecting from the plate and adapted to contact with a screw or pin 9^a, projecting from the casing. When the plate 7 is turned to the position shown in Fig. 5, its lug 8 enters the curved seat 20^b of the spring-arm 20, thus retaining said plate in position with the bolt retracted.

The operation of the mechanism is as follows: Assuming the bolt to be in its projected or locked position, as shown in Figs. 1, 2, and 4, the knob-spindle carrying the fixed tumbler $13^\times$ is manipulated to bring all of the notches 10 into alinement. The fence 9 normally bears upon the periphery of each of the tum-

blers under the tension of the spring-arm 20, the foot 7^a and pin 9^a serving as a fulcrum-point, and as soon as the notches in the tumblers are alined the spring-arm 20 forces the fence into the notches, including the notch in the tumbler $13^\times$, which is fixed on the spindle. By then turning the spindle the fence is moved inward, causing its lug 8 to engage the finger 17 and withdraw the bolt. This movement disengages the fence from the seat 20^a and moves it into the seat 20^b, as shown in Fig. 5, thus retaining the bolt in its retracted position. As soon as the spindle is again turned to lock the bolt the beveled wall 10^a of one of the notches lifts the fence upward, thus moving its lug 8 into the seat 20^a and holding the bolt projected. The plate 7 may be moved and the bolt projected or withdrawn at will without the aid of the tumblers from the rear by means of the lever 22.

The entire mechanism is housed within the barrel 2 by means of a lock-plate 23.

From the foregoing it will be seen that we have provided cheap, efficient, and durable means for operating the bolt by the spindle without the aid of secondary levers or other like devices—such as, for instance, employed in safes, vaults, and the like.

While we have described our invention as particularly applicable to mail-boxes, it is obvious that by increasing the proportions thereof this lock could be put to a multiplicity of uses, and while we have described in detail what appears to us at this time to be the very best means of accomplishing the desired result we do not limit ourselves to the exact construction shown, but reserve the right to make such slight changes and alterations as might suggest themselves from time to time and which would be apparent to those skilled in the art without departing from the spirit thereof.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a permutation-lock, the combination with a suitable lock-case; a spindle mounted therein; a reciprocating bolt provided with a yoke-shaped slot through which the spindle projects; a bifurcated plate straddling the spindle and adapted to engage the bolt; a fence on said plate, a foot projecting laterally from one arm of the plate to engage a projection of the casing, a plurality of notched disk-shaped tumblers on the spindle designed to engage the fence when the notches aline; and means carried by the spindle for retracting said bolt when the combination is solved.

2. In a permutation-lock, the combination with a case; of a spindle mounted therein; a plurality of notched tumblers mounted on said spindle and adapted to aline with each other; a sliding bolt in the case having a slot through which a spindle projects; a laterally-projecting arm on said bolt; a bifurcated plate straddling the spindle; a lug or projection on said plate for engagement with the arm; a fence carried by the plate and adapted to engage the notches in the tumblers whereby the bolt can be retracted by a partial rotation of said tumblers.

3. In a permutation-lock, the combination with a case; of a spindle mounted therein; a plurality of notched tumblers mounted on said spindle and adapted to aline with each other, a sliding bolt in the case having a slot through which a spindle projects; a laterally-projecting arm on said bolt; a bifurcated plate straddling the spindle; a lug or projection on said plate for engagement with the arm; a fence carried by the plate; and adapted to engage the notches in the tumblers whereby the bolt can be retracted by a partial rotation of said tumblers; and means for withdrawing said lever from engagement with the notches comprising a laterally-projecting foot on the plate and a pin projecting from the casing to engage said foot.

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH ARNER.
CALVIN E. ARNER.

Witnesses:
AUSTIN BOYER,
R. N. ANTHONY.