

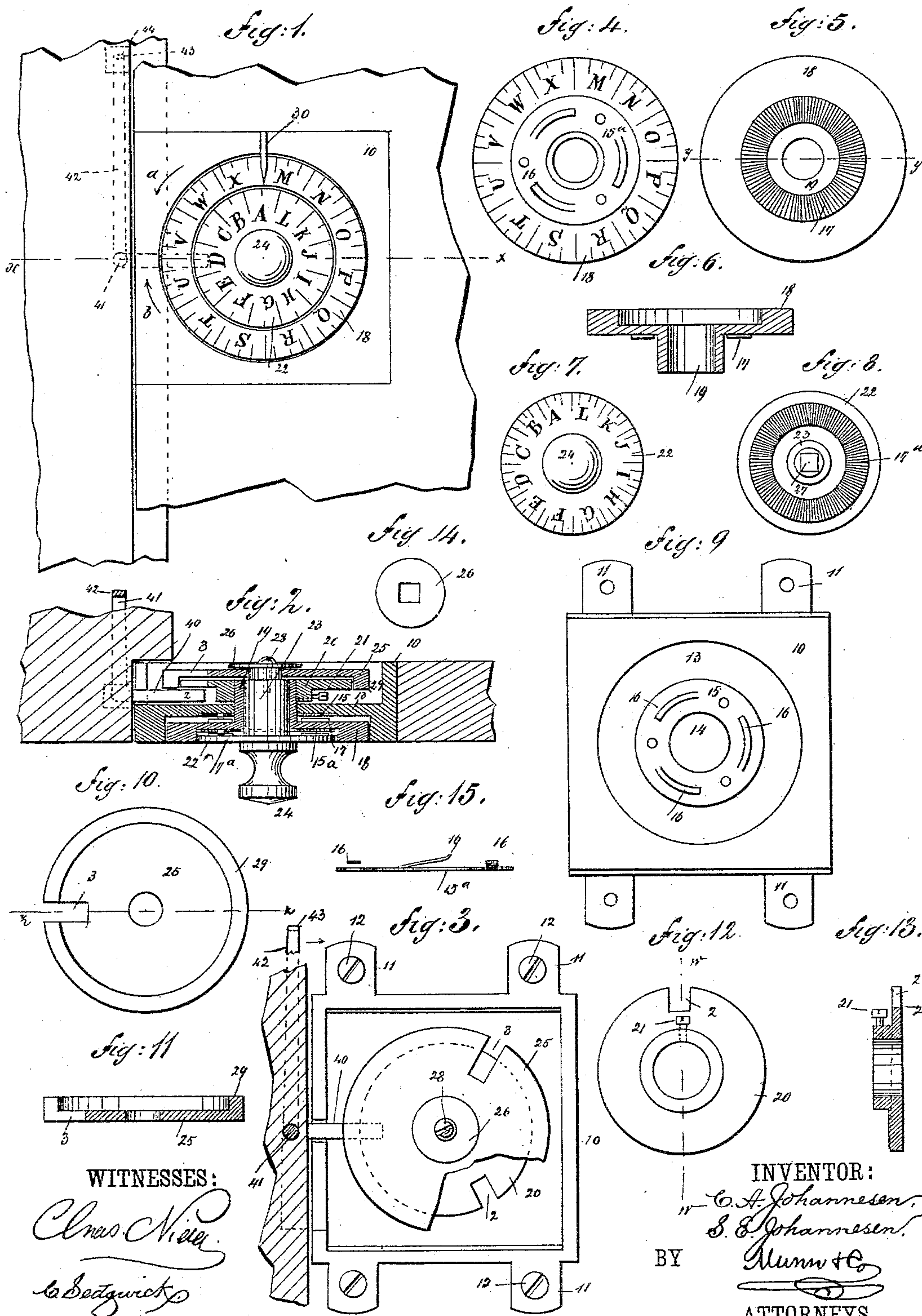
(Model.)

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PERMUTATION LOCK.

No. 387,789.

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UNITED STATES PATENT OFFICE.

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PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 387,789, dated August 14, 1888.

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To all whom it may concern:

Be it known that we, CONRAD ALBERT JOHANNESSEN and SVEND EMANUEL JOHANNESSEN, of Erie, in the county of Erie and State of Pennsylvania, have invented a new and Improved Permutation-Lock, of which the following is a full, clear, and exact description.

This invention relates to locks, the object of the invention being to provide a permutation-lock that shall be especially applicable for use as a lock for postoffice-boxes, although the lock might be used for many other purposes.

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

Figure 1 is a face view of our improved form of lock. Fig. 2 is a sectional plan view taken on line *x x* of Fig. 1. Fig. 3 is a view of the inner face of the lock, parts being broken away. Fig. 4 is a detail view representing the construction of the outer dial-plate, the spring-pawl plate carried by the dial-plate being shown in connection therewith. Fig. 5 is a detail view representing the inner face of the dial-plate shown in Fig. 4. Fig. 6 is a sectional view taken on line *y y* of Fig. 5. Fig. 7 is an outer face view of the knob and the dial-plate carried thereby. Fig. 8 is a view of the opposite side of the plate shown in Fig. 7. Fig. 9 is a face view of the lock-case with the dials removed, the spring-pawl plate carried by the lock-case being shown in connection therewith. Fig. 10 is a view of the forward face of the outer tumbler. Fig. 11 is a sectional view taken on line *z z* of Fig. 10. Fig. 12 is an outer face view of the inner tumbler. Fig. 13 is a sectional view taken on line *w w* of Fig. 12. Fig. 14 is a face view of the washer by which the tumblers are held to the spindle, and Fig. 15 is a cross-sectional view of one of the spring-pawl plates.

The lock illustrated in the drawings is carried by a frame or case, 10, that is arranged for connection with a door, preferably being formed with lugs 11, through which retaining-screws 12 are passed. This case or frame has a central web, 13, said web being formed with a central circular aperture, 14.

To the outer face of the web 13 there is se-

cured a spring-pawl plate, 15, said plate being formed with a number of upwardly-extending tongues or pawls, 16, as shown best in Fig. 9, which tongues engage a circular set of ratchet-teeth, 17, that are formed upon the under side of the outer dial-plate, 18, which dial-plate is provided with a sleeve, 19, which extends through the central opening, 14, of the case or frame 10, a tumbler, 20, being held to the sleeve 19 by a set-screw, 21, the tumbler being connected to the inner end of the sleeve, as best shown in Fig. 2. A second spring-pawl plate, 15^a, is secured to the outer face of the dial-plate 18 within a central recess that is formed in the plate, and the pawls or spring-arms of this plate 15^a engage with a circular ratchet, 17^a, that is formed upon the inner face of a dial, 22, which said dial is rigidly connected to the spindle 23 of a knob, 24, the spindle extending through the sleeve 19 and fitting closely therein, the extending portion of the spindle being cut away to receive the outer tumbler, 25, said tumbler being held to the spindle by a washer, 26, which fits upon a squared or irregularly-formed projection, 27, the washer portion being held to the spindle by a set-screw, 28, this construction being adopted in order that when the set-screw is tightened the position of the tumbler will not be affected.

The tumbler 25 is formed with a forwardly-extending ring or flange, 29, the face of which is flush or parallel with that of the face of the tumbler 20. The tumblers 20 and 25 are formed with slots 2 and 3, respectively, which slots extend inward from the peripheral edges of the tumblers. In connection with the dial-plates we arrange a pointer, 30.

In setting up the lock the spring-pawl plates 15 and 15^a and the circular ratchets 17 and 17^a are arranged in opposition, so that as the knob 24 is turned in one direction the dial-plate 18, and with it the inner tumbler, 20, will be advanced; but when the motion imparted to the knob is reversed said dial-plate and tumbler will be held in a fixed position and the outer tumbler, 25, and its dial 22 will move. In the construction illustrated in the drawings, if the knob 24 be turned in the direction of the arrow marked *a* the dial 18 and its tumbler

will be advanced; but if the knob be turned in the direction of the arrow marked *b* the dial 22 and its tumbler will be advanced. Consequently in numbering or lettering the graduations upon the dial 22 we arrange the numerals or letters so that they run from right to left instead of from left to right, as will be seen from an inspection of Fig. 1.

In connection with the lock above described we employ a latch which consists, essentially, of an outwardly-extending stud, 40, which, when the apertures 2 and 3 are brought into register opposite the point at which the stud is located, will pass through said recesses or apertures to a point between the flange 29 of the tumbler 25 and the web 13 of the case or frame 10, the point of the stud extending inward, so that it rests between the face of the tumbler 20 and the said web of the case or frame. Then, if the knob 24 be turned so as to throw the recesses or apertures 2 and 3 out of register the one with the other and with the stud 40, the door or cover to which the lock is connected will be held firmly within its casing and cannot be opened until the two recesses or apertures have been once again brought into register with the stud 40.

In order to bring the recesses into register with the stud 40, the combination being known, the knob 24 is turned in the direction of the arrow *a* until the dial 18 is moved to proper relative position with the pointer 30. Then the motion of the knob is reversed until its dial is brought into proper relative position with the pointer 30, as will be readily understood from an inspection of the drawings.

When our improved form of lock is employed in connection with postoffice-boxes, it is desirable that the postmaster should be able to open the box-doors at will, as it frequently happens that the box-owners forget their combinations, and to this end we prefer to connect the stud 40 to a shaft, 41, which extends at right angles to the stud, the shaft being mounted in proper bearings upon which it is free to turn. To the inner end of this shaft we connect a spring-arm, 42, at one end of which there is formed a catch, 43, which catch may be thrown into engagement with a keeper, 44, and when so placed the stud or arm 40 will extend outward, as illustrated in the drawings; but should the box-owner forget the combination the postmaster has only to throw the catch 43 from engagement with the keeper 44 and move the spring-arm

outward in the direction of the arrow shown in connection therewith in Fig. 3, which movement of the spring-arm will carry the stud 40 clear of the tumblers 20 and 25, thus providing for the opening of the box-door.

It will of course be understood that our improved form of lock might be used in connection with safe or other doors, or that it might be employed to lock drawers, caskets, jewel-boxes, or any receptacle that it is desired to protect from the intrusion of unauthorized parties.

In order that the tumblers when operated by unauthorized persons will be apt to slip by the stud 40 as their slots are brought near said stud, we prefer to make the flange of the outer tumbler and the body of the inner tumbler slightly thinner at and near the points where the slots are formed, for by so doing the frictional contact between the tumblers and the stud is decreased as the tumblers are turned so as to bring their slots in close proximity to the stud, and it is likely that the party will turn the tumblers so that their slots will be carried past the stud.

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

1. In a permutation-lock, the combination, with two dials and tumblers arranged in connection therewith, of a spring-plate and ratchet arranged between the lock-case and the outer dial, and an inversely-arranged spring-pawl plate and ratchet arranged between the dials, substantially as described.

2. In a permutation-lock, the combination, with a lock-case formed with a central web and carrying a spring-ratchet plate, 15, of a dial formed with a sleeve, 19, which passes through an aperture in the web-case and is provided with a ratchet upon its inner face, an inner tumbler fixed to the sleeve of the dial, an inner dial connected to the shank, an operating-rod the shank of which passes through the sleeve 19, an outer tumbler secured to the said shank, a spring-ratchet plate carried by the first-named dial, and a ratchet formed upon the inner face of the last-named dial, substantially as described.

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Witnesses:

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