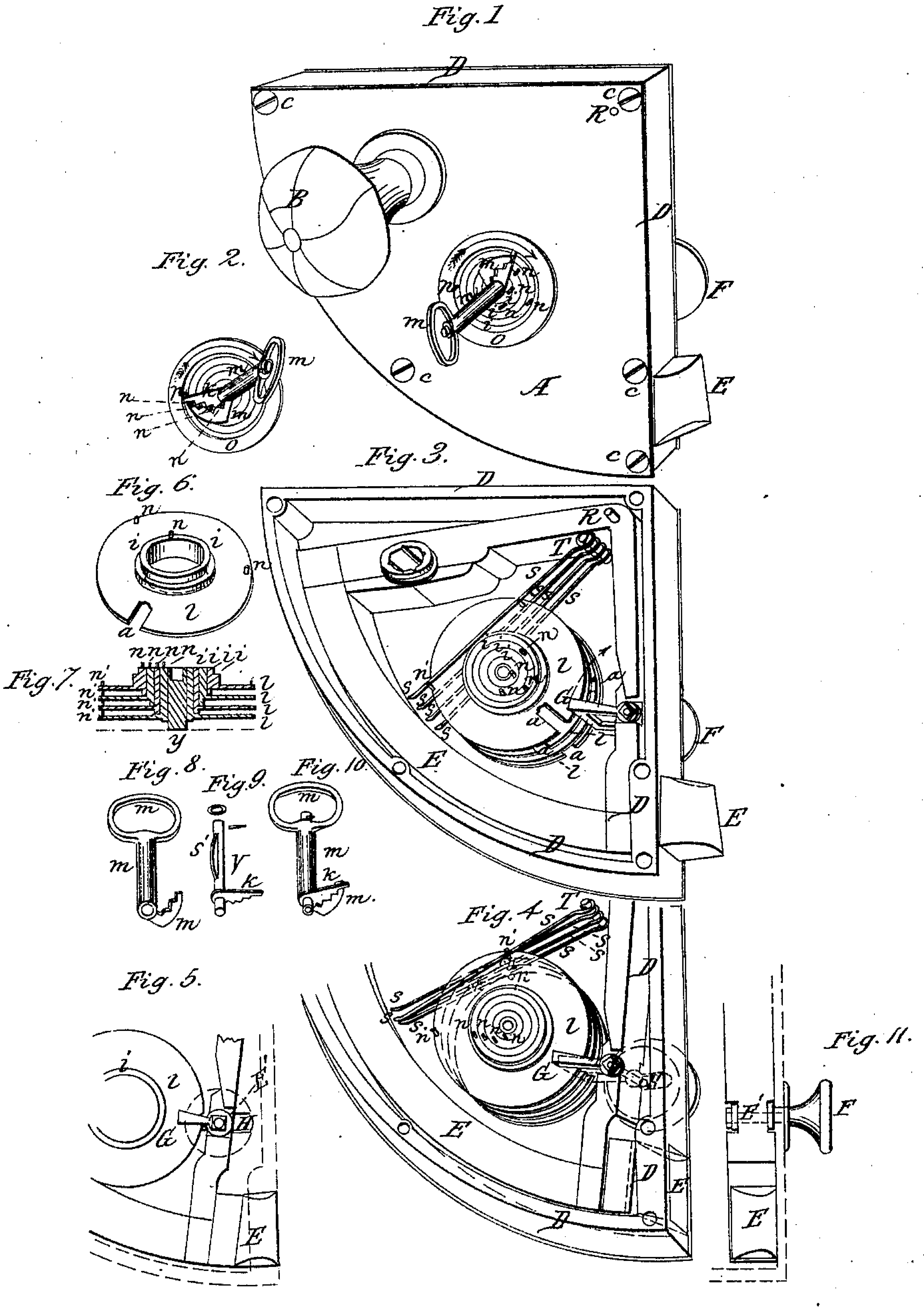
F. G. Johnson,

Latch,

No. 17,681, Patented June 30, 1857.



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UNITED STATES PATENT OFFICE.

FRANK G. JOHNSON, OF BROOKLYN, NEW YORK.

IMPROVED PERMUTATION-LOCK.

Specification forming part of Letters Patent No. **17,681**, dated June 30, 1857.

To all whom it may concern:

Be it known that I, FRANK G. JOHNSON, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Permutation-Locks; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the whole lock with the key applied thereto; Fig. 2, a perspective view of that part of the lock to which the key is applied, with the key applied thereto in the position it will assume when it has unlocked the lock. Fig. 3 is a perspective view of the interior of the lock, the face-plate and knob being removed and the tumblers being in the position they will assume when the lock is locked. Fig. 4 is a perspective view of a portion of the interior of the lock, and shows the position of the tumblers, springs, bolt, and locking-latch G when the lock is unlocked. Fig. 5 is a perspective view of a portion of the lock, showing the connection between the bolt E and the locking-latch G, showing the pin E′, upon which G is centered and by which it is operated, also showing the slot H, through which the exterior projection or thumb-piece F, Fig. 11, plays. Fig. 6 is a view of the upper tumbler of the lock detached from the others, and shows how the tumblers are formed and adjusted one upon the other. Fig. 7 is a geometrical section of all the tumblers and of the post Y, upon which they are adjusted. This post Y is riveted into the back plate of the lock-case and is bored out in the front or upper end to admit the bottom of the key and to support the same in turning. Figs. 8 and 9 are perspective views of the several parts of the keys; Fig. 10, a perspective view of the whole key closed together ready to be placed upon the lock; and Fig. 11 is a view of a portion of the lock, showing the position, construction, and adjustment of the thumb-piece F and pin E′, by which the locking-latch G, Figs. 3 and 4, is secured and operated.

The locking-latch G is constructed in the manner represented and is attached to the bolt of the lock. It may be turned down against the tumblers, as represented in Fig. 3, or by the thumb-piece F it may be turned up against the bolt, as indicated by the arrow, Fig. 3, so as to avoid the tumblers.

The same letters indicate like parts in all the figures.

In Fig. 1, A is the face-plate of the lock-case; B, the knob; *c c c c c*, the screws by which the plate A is attached to the frame D; E, the bolt; F, the thumb-piece of the locking-latch G, Figs. 3 and 4; *m*, the key; *i i i i*, the exterior hubs of the tumblers *l l l l*, Figs. 3, 4, 5, 6, and 7.

K is the set part of the key, Figs. 1, 2, 9, and 10.

m is the motor part of the key by which the tumblers are operated, Fig. 8, and into which K is fitted.

n n n n are exterior pins, one of which is fitted into each of the hubs of the tumblers *l l l l*, Figs. 3, 4, and 7.

o is a flat ring soldered to the plate A to protect the pins *n n n n*, and *p* is a pin fixed in the said plate to arrest the set part of the key K, against which the pins *n n n n* are brought around by the movable part of the key *m* and there held in the unlocking position, as represented in Fig. 2.

In Fig. 3 the construction and adjustment of the bolt E is shown. The bolt is in the form of a quadrant of a circle, and is suspended and adjusted upon the pin R in such a manner that when it is thrown back by turning the knob into the unlocking position it will on being released again fall back by the force of its non-gravity into the locking position, or when the locking-latch is moved away from the tumblers in the direction indicated by the arrow, Fig. 3, then the bolt E will act simply as a gravitating catch.

The springs *s s s s*, Figs. 3 and 4, are made of wire coiled and attached to the stud T, which is riveted in the back plate of the lock-case. These springs operate upon the tumblers *l l l l* by means of the pins *n′ n′ n′ n′*. The pins *n′ n′ n′ n′* may be one or several to each tumbler, and may be set thereon in any position desired. One of them, however, must be so set upon each tumbler that when the slots *a a a a* in the tumblers are brought by means of the key together in a line and into the unlocking position each spring will be at a tension, Fig. 4, so that when the key is re-

moved and the bolt falls out the tumblers will be thrown irregularly around and the slots confused, as in Fig. 3.

The construction of the tumblers and their adjustment together upon the stud or post Y is clearly shown in Figs. 6 and 7.

The key is composed of the main part represented in Fig. 8, the shank being made hollow to admit of the introduction of the stud V, Fig. 9, with the set K attached thereto. As V is to turn in *m*, the spring S′, Fig. 9, is applied, as represented, in order that the friction of turning may always be uniform and of requisite amount. V is secured in *m* by means of the washer and pin represented in Fig. 9. The complete key then presents the appearance represented in Fig. 10. The key may be variously constructed, its characteristics, however, remaining the same.

The combination of the tumblers and the bolt with the locking-latch may be variously modified and arranged—as, for example, the latch may be made permanent on the bolt and the bolt be operated with a spring in such a manner that when the tumblers are brought into the unlocking position by means of the key G will be forced into the slots *a a a a* of the tumblers and the lock be unlocked, thus remaining until the bolt is thrown forward by hand, (by a projecting piece on the front of the lock,) when, the tumblers being released, they will be acted upon by the springs *s s s s*, as before described, thus confusing the slots of the tumblers and preventing the bolt from going back again without the use of the key. By this latter arrangement the lock is unlocked by the key and locked by a simple movement of the hand only. The springs *s s s s*, which operate the tumblers, may be also variously modified and applied—as, for example, they may be wholly attached to the tumblers themselves between the flanges thereof and so arranged in various ways that the spring on one tumbler will act upon and operate another tumbler, and so on, each tumbler being free as now to turn in either direction, or all the tumblers being free to be turned together in either direction as now. The form of the lock may be also various.

I contemplate adapting and applying the essential principles of my invention to the various uses of house, bank, door, trunk, cabinet, and pad locks, as shall prove desirable.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination together of the tumblers *l l l l* (using two or more of said tumblers) with the exterior pins *n n n n* and the pins *n′ n′ n′ n′* with the springs *s s s s*, the bolt E, and locking-latch G, substantially as herein set forth.

FRANK G. JOHNSON.

Witnesses:

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J. A. STARTENBURGH.