

(Model.)

C. A. DORN.
PERMUTATION LOCK.

No. 470,110.

Patented Mar. 1, 1892.

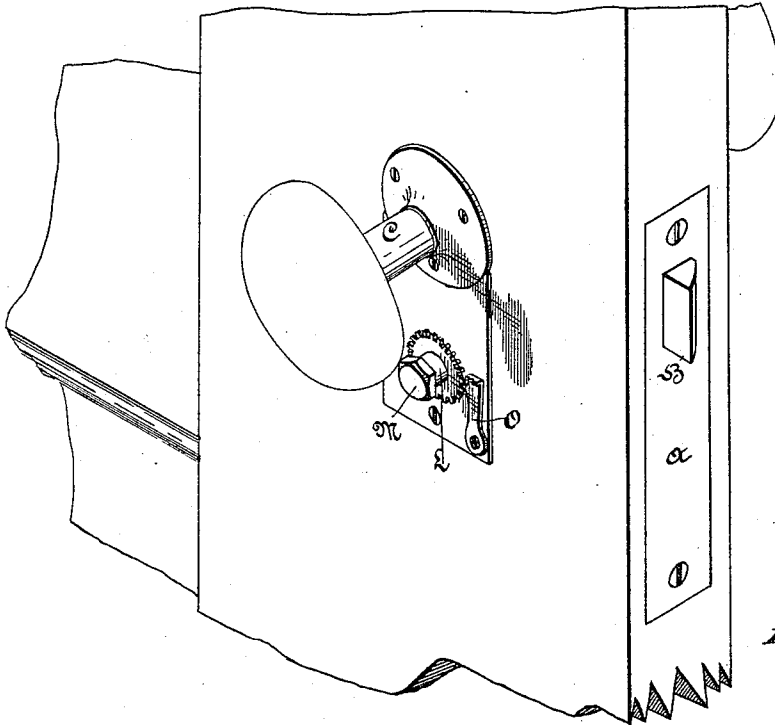


Fig. 1.

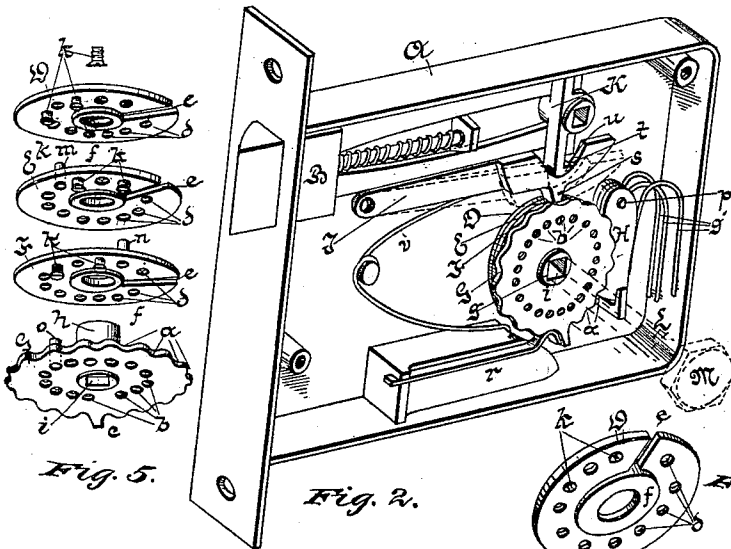


Fig. 2.

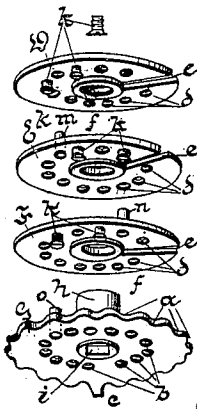


Fig. 5.

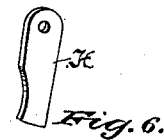


Fig. 6.

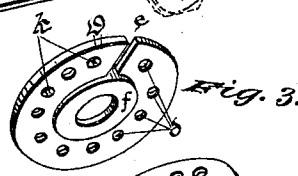


Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES A. DORN, OF CANTON, OHIO, ASSIGNOR OF ONE-HALF TO RUFUS BETZ, OF SAME PLACE.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 470,110, dated March 1, 1892.

Application filed March 27, 1891. Serial No. 386,626. (Model.)

To all whom it may concern:

Be it known that I, CHARLES A. DORN, a citizen of the United States, and a resident of Canton, county of Stark, State of Ohio, have invented a new and useful Improvement in Permutation-Locks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to improvements in commutation-locks; and it consists in certain features of construction and combination of parts, as will be hereinafter described and pointed out in the claims.

Figure 1 of the accompanying drawings is a view in perspective of the lock as seen on a door from the inside; Fig. 2, a similar view of the inside portion of the lock; Fig. 3, a similar view of the front side of a tumbler; Fig. 4, a similar view of the rear side of tumbler; Fig. 5, a similar view comprising the commutation-wheel and tumblers; Fig. 6, a similar view of a lock-shoe.

Similar letters of reference indicate corresponding parts in all of the figures of the drawings.

For the purposes of this application I have shown my invention as applied to a mortise-lock, the case A of the ordinary form having therein a latch-bolt B, adapted to be operated by a knob-spindle C in the usual way of operating similar latch-bolts. Below said spindle is provided a similar spindle, on which is provided a series of tumblers, which I will designate as D E F, and a commutation-wheel G, the latter having about its periphery a series of notches or scallops *a* to correspond with the perforations *b*, and interjacent its peripheral edges a series of perforations *b*, and projected from its edge a finger *c*, the tumblers D E F having a plane or smooth periphery broken only by a slot *e* extending from the periphery to the central portion, a series of perforations *d* to correspond with similar perforations in wheel G. The tumblers D, E, and F have a central hub portion *f* by which the wheels are spaced apart when placed upon the hollow stud *g*. The wheel G is provided with a sleeve *h*, adapted to enter and rotate in the hub *g*. The aperture *i* through said sleeve is rectangular to receive

the rectangular spindle L. (Shown by the dotted lines in Fig. 2.)

Calling attention to tumbler D, Fig. 5, it will be noticed that small screws, as *k*, are placed in the threaded perforations *d*, the head portion projected about equal to the space between the face of the hub *f* and the side of the tumbler. These screws are placed in the third and fifth apertures, to the left of the slot *e*. In the tumbler E similar screws are placed in the first and third perforations, to the left of the slot *e*, and in the fourth perforation is placed a screw or pin *m*, projecting through the disk rearwardly a distance to a point between the head of the screws *k* when said tumblers are placed upon the hollow stud *g*. In the tumbler F is placed in perforations 3 and 5 to the left of slot *e* screws, as *k*, with the heads projecting outwardly from the tumbler, as stated in describing tumbler E, and in the perforation next on the left to the slot *e* is placed a screw or pin *n*, projecting rearwardly through the tumbler to a point between the heads of the screws *k* in tumbler E when the tumbler F is placed on the hollow stud *g*, and in the wheel G is provided a screw or pin *o*, placed in the seventh perforation to the left of the finger *c* to extend through the disk rearwardly a distance to a point between the screws in the tumbler F when said tumblers are placed on the hollow stud *g*. (Shown in Fig. 2.)

To secure the tumblers D, E, and F against rotary movement, except when moved by the appliances provided for that purpose, a shoe, as H, is provided suspended on a pin *p*, said shoe having a circular edge portion adapted to the periphery of the tumblers, and to the back portion of the shoe is secured a spring *g'*, the free end to rest against the end of the lock-frame A, the energy of the spring exerted to hold the shoes against the edge of the tumbler.

To secure the commutation-wheel G against movement other than provided for, a spring *r* is provided, one end of which is secured to a portion of the frame, the free end bent as shown and adapted to rest in the scallops *a* and against the finger *c*. A bar, as J, is provided, which is pivotally secured to the frame A at one of its ends, the free end adapted to

be vibrated about said pivot, said end having a depending tooth *s* and on its upper side a depression *t*, the sides of which are graded upwardly and out.

5 On the latch-spindle *C* is placed a cross-bar *K*, the lower end portion *u* extended downwardly into the depression *t*. The object and operation will be explained farther on. A spring *v*, as shown, serves to hold the free end
10 of the bar *J* against the end portion of the arm *u*, the end in the depression *t*. A tumbler-actuating spindle *L* is passed through the sleeve *h* of the commutation-wheel *G*, on the ends of which are placed the knobs *M*, by
15 which the tumbler may be rotated to lock or unlock the arm *K* and thereby lock or unlock the bolt *B*.

The operation is as follows: The tumblers distributed, slots *e* on the right, as shown by
20 the dotted lines, the commutation-wheel *G* is turned to the left by the knob *M*. The finger *c*, resting against the spring *r*, turns to the right six notches, as indicated by the movement of the spring, the click of which can be heard by
25 the operator. Calling attention to Fig. 2, it will be seen that the tooth *s* of the arm *J* rests on the periphery of the tumblers *D*, *E*, and *F*, locking the end *u* of the arm *K* in the depression *t* in arm *J*, so that it cannot be operated to move
30 the latch-bolt. To release the latch-operating mechanism in this instance, as before stated, the commutation-wheel has been turned six points to the right, bringing the slot *e* of the tumbler *D* directly under the tooth *s* of the
35 arm *J*, then turn the knob *M* three points to the left to bring the slot *e* of tumbler *E* under the tooth *s*, and reverse the movement two points to move the slot *e* of tumbler *F* under the tooth *s*, in which position the tooth *s* will
40 be free to move down into the slot provided therefor, as before stated, when the latch-knob and spindle *C* are turned to vibrate the bar to move the latch. To secure the latch-bolt in a locking position, the knob *M* is turned to
45 distribute the combination, which for the purposes of this case is six points to the right, three to the left, and two to the right, as before stated; but it is so provided that by moving the screws *k* and pins *o* in the perforations
50 the combination may be varied to other desired combinations.

To lock the tumbler-spindle *L* against ro-

tation by the movement of the knob *M* on the outside of the door, there is provided a notched disk *N*, placed on the spindle *L* on the inside
55 of the door, and a pawl *O* to engage said notches, thus providing a further means of security when the lock is used on the door of a dwelling. The members all in, the lock may be set so as to prevent unlocking from the 60 outside.

Having thus fully described the nature and object of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with an inclosing case 65 *A*, of a latch-bolt, a spindle and bar to operate the latch-bolt, said bar having one of its ends adapted to engage a locking-depression in a vibrating locking-arm *J*, said arm having a tooth *s*, adapted to enter the slots *e* in
70 the tumblers *D*, *E*, and *F*, the commutation-wheel *G*, having finger *c*, the actuating-spindle *L*, and the spring *r* to be engaged by the finger *c* when combined and operated substantially as described, and for the purpose 75 set forth.

2. The combination, with the inclosing case *A*, of the commutation-wheel *G*, having about its periphery a series of depressions *a*, a finger *c*, a spring to engage said depressions, and
80 a series of perforations to carry a pin *o* to engage the screws *k* in the tumbler *F*, said tumbler, and the tumblers *E* and *D*, similar perforations engaging screws or pins and slots *e*, spring-actuated shoes to engage the periphery
85 of said tumblers, an arm *J*, pivotally secured at one of its ends to the case *A*, the other end provided with a tooth *s* to engage the tumbler, and a depression to engage the arm *K* to hold said arm against vibration to move the
90 latch-bolt, substantially as described, and for the purpose set forth.

3. The combination of the commutation-wheel *G*, having depressions or scallops about its periphery, a spring to engage said depressions, tumblers *D*, *E*, and *F*, arms *J* and *K*, and
95 the notched disk *N* and pawl *O*, substantially as described, and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 17th day of March, A. D. 1891. 100

CHARLES A. DORN.

Witnesses:

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CHAS. R. MILLER.