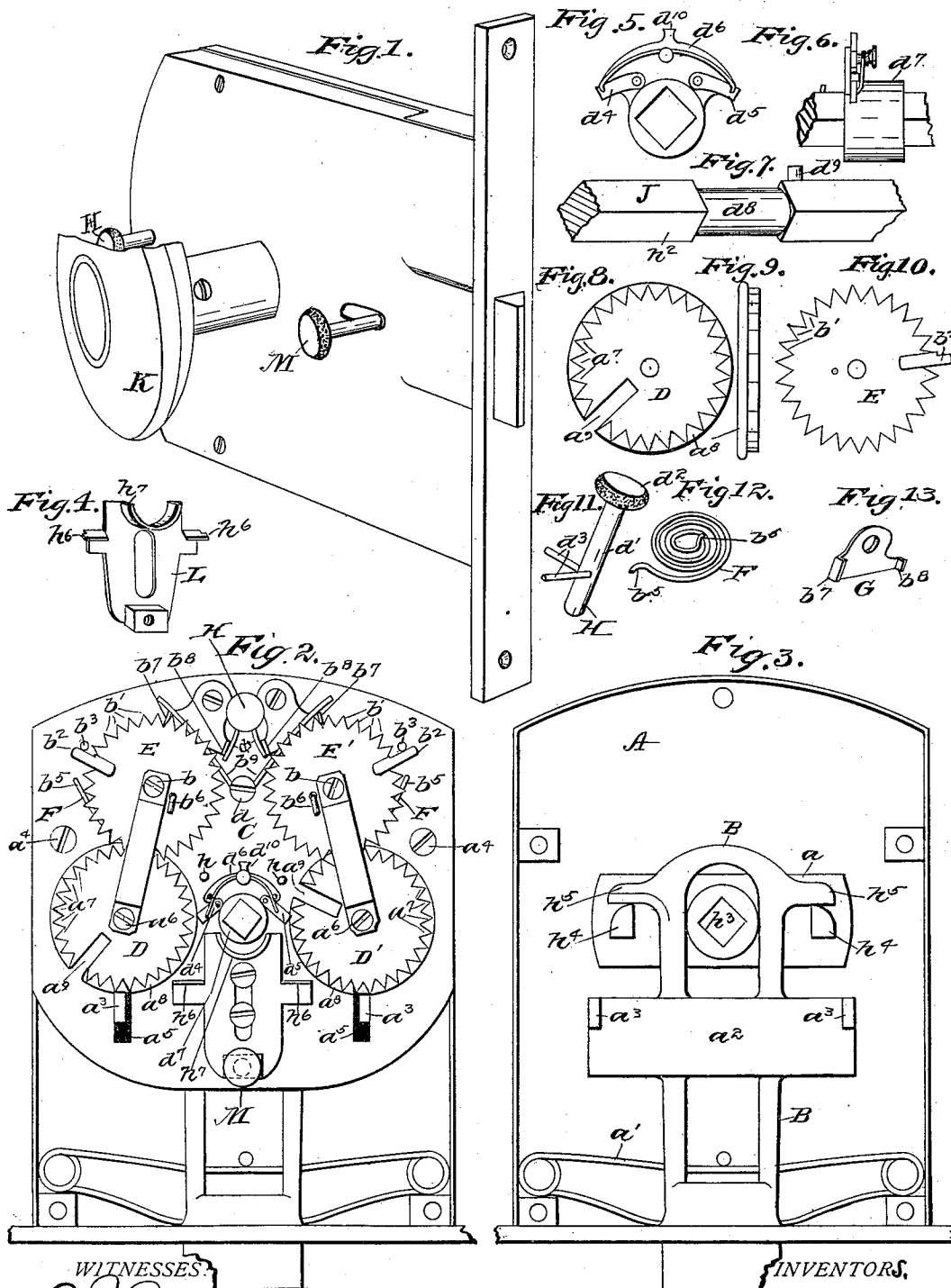


(Model.)

E. L. MILLER & J. J. ROSHONG.
PERMUTATION LOCK.

No. 463,685.

Patented Nov. 24, 1891.



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EDWARD L. MILLER AND JOHN J. ROSHONG, OF CANTON, OHIO.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 463,685, dated November 24, 1891.

Application filed January 5, 1891. Serial No. 376,775. (Model.)

To all whom it may concern:

Be it known that we, EDWARD L. MILLER and JOHN J. ROSHONG, citizens of the United States, and residents of Canton, county of Stark, State of Ohio, have invented a new and useful Improvement in Commutation-Locks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

This invention relates to an improvement in commutation-locks; and it consists of 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 perspective of the lock; Fig. 2, a plan view with cap of case removed, showing the interior mechanism of the lock; Fig. 3, a similar view showing the latch-bolt and operating mechanism; Fig. 4, a perspective of a latch by which the commutation-wheels are locked against rotation; Fig. 5, a plan view of the pawls by which the commutation-wheels are rotated and the hub and flange-support; Fig. 6, a side view of the same on a fragment of the spindle; Fig. 7, a perspective of the spindle; Fig. 8, a plan of commutation-wheels; Fig. 9, a side view of the same; Fig. 10, a plan view of a wheel to lock the commutation-wheels; Fig. 11, a perspective of key to release the lock-wheel to throw off or release the lock-wheels; Fig. 12, a spring to rotate a pawl to lock the wheels.

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

For the purpose of this application we have shown this invention as applied to a mortise-lock, Fig. 1 showing the inclosing case.

In the body A of the inclosing case is placed the locking latch-bolt B and latch-plate a and latch-spring a' . On the latch-bolt is provided a locking-bar a^2 , having at its end portions studs a^3 , which will be explained farther on. A gear-plate C, as shown in Fig. 2, is placed over the inner end portion of the latch-bolt and the bar a^2 and secured in position by the screws a^4 , said plate having elongated perforations a^5 , through which are passed the upper end portions of the studs a^3 . To the plate C

is attached all of the commutative parts, as shown in Fig. 2.

The commutative wheels D D' are similar, each of which is loosely secured to the plate C by a central stud-pin a^6 and is provided with a given number of teeth a^7 and an outwardly-projected flange portion a^8 and inwardly-projected slots a^9 , the flange a^8 to protect the teeth a^7 from being injured by the studs a^3 . The wheels E E', by which the commutation-wheels D D' are held in position, are loosely secured to the gear-plate C by central stud-pins b , said wheels having a corresponding number of teeth b' , similar to and to engage the teeth a^7 on the commutation-wheels D D'. The wheels E E' are also provided with a projecting finger b^2 to engage a stop-pin b^3 , by which the wheels are stopped and prevented making more than one revolution in either direction. A coil-spring F, as shown in Fig. 12, is placed about the stud b , the end b^5 secured to the gear-plate C, and the other end b^6 to the wheels E E'. A resisting or locking spring-pawl G, in form substantially as shown in Fig. 13, having turned-up lugs b^7 and b^8 , is pivotally secured to the gear-plate C, as shown in Fig. 2, the lugs b^7 to engage the teeth b' of the wheels E E'. To hold the pawl in engagement with the teeth b' of the wheels E E', a spring b^9 is provided, having its central portion secured to the gear-plate, as shown, by the screw d , the free ends resting on the lugs b^7 . The energy of the spring is exerted to hold the pawl in engagement with the teeth of the wheel.

To release the wheel E E' to throw off the commutation, a key H is provided, having a stem portion d' , a knob or head d^2 , and a ward or wards d^3 , that engage the lugs b^8 . By turning the key the wards to engage the lugs b^8 alternately will turn the pawl in its pivotal connection with the gear-plate, by which movement the lug b^8 will be raised out and from engagement with the tooth b' of the wheels E E'. To rotate the wheels D and D' to unlock the latch-bolt B, spring-actuated pawls d^4 and d^5 are provided, which are pivotally secured to a flange portion d^6 , projected from a hub d^7 , mounted on the knob-spindle J, as shown in Figs. 6 and 2. The middle portion of the spindle J is rounded, as shown at d^8 , to allow the spindle to be rotated with-

out moving the bolt B. There is also provided on the spindle J a pin or feather d^9 , adapted to pass through a keyway in the gear-plate under the flange d^6 , (not shown,) by which the spindle is guided in its longitudinal movement through the gear-plate. On the gear-plate is provided stopping-post h , that engages a projecting lug d^{10} on the flange d^6 , by which the distance of rotation of the spindle is determined.

When it is desired to move the latch-bolt B by the knob K, the square portion h^2 of the spindle is drawn into the aperture h^3 in the latch-plate a , said plate having studs h^4 , that engage the arms h^5 of the latch-bolt B.

To describe the operation we will call attention to Fig. 2 of the drawings, which illustrates the parts in position to lock the latch-bolt in the door-jamb, the studs a^3 resting against the flange portion a^8 of the commutation-wheels D D'. To unlock the latch-bolt B the spindle J is rocked or rotated to the right. The pawls d^5 , engaging the teeth a^7 of the wheel D', continue the operation until the slot a^9 is turned to a position in line with the stud a^3 . This wheel may be set in its engagement with the wheel E', so as to require any previously-determined number of movements of the spindle within the limits of the number of teeth in the wheel. Each movement of the wheel D' will move the wheel E' one tooth under the lug b^7 of the pawl G, which serves to hold the said wheel in a locked engagement with the wheel D'. The movement of the wheel E' about its spindle b will wind the spring F about said spindle. The finger b^2 , engaging the pin b^3 , will prevent the wheel E' making more than one revolution. The spindle J is now turned to the left, the pawl a^4 engaging the teeth a^7 of the wheel D, and by repeating the movement until the slot a^9 is brought in line with the stud a^3 the wheel E, pawl G, and spring F will be brought in position, as just described in connection with the wheels D' and E'. The spindle J is now drawn forward, the pin d^9 drawn to the front side of the gear-plate, and the square portion h^2 of the spindle J into the aperture h^3 of the latch-plate a . A rotary movement of the spindle will now move the locking latch-bolt B, the studs a^3 passing into the slots a^9 . To secure the parts in this position, a latch L is provided, having wings h^6 to engage the teeth a^7 of the wheels D D', by which said wheels are held against rotation, and a flanged portion h^7 to pass under the hub d^7 , by which the spindle is held against longitudinal movement. This slide is moved into and out of engagement with the parts just mentioned by the knob or handle M.

To distribute the combination to lock the latch-bolt, the key H is brought into action, the wards d^3 serve to raise the lugs b^7 out of the teeth, and the spring F will turn the wheel back until stopped by the finger b^2 engaging

the pin b^3 , the other side or set of wheels to be thrown off in the same manner, the parts taking the position shown in Fig. 2.

The commutation may be varied by removing the pin a^6 and changing the engagement of the wheels D D' with the wheels E E' by throwing them forward or back, so as to require three movements of the spindle to the left and two to the right to bring the slots a^9 of the wheels D D' in line with the studs a^3 or any other commutation desired.

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

1. The combination, in a commutation-lock, with the inclosing case and a locking latch-bolt having studs a^3 , of the commutation-wheels D D', having slots a^9 , adapted to receive the studs a^3 , wheels E E' to engage said wheels D D' to resist rotation and to throw off the commutation, and springs for rotating said wheels E E' in one direction.

2. The combination, with an inclosing case and a locking latch-bolt, of the studs a^3 , a gear-plate C, having elongated apertures a^5 , through which said studs pass to engage commutation-wheels D and D', locking-wheels E and E' to engage said commutation-wheels, springs F to rotate said locking-wheels in one direction, pawls G to resist the rotary movement of said wheels, and actuating-pawls d^4 and d^5 and spindle J, by which the commutation-wheels are rotated in opposite directions into position to release or unlock the latch-bolt, substantially as set forth.

3. The combination, in a door-lock, of an inclosing case, a locking latch-bolt, commutation-wheels D D', wheels E E' to engage the wheels D D' to resist rotation and to distribute or throw off the commutation, pawls G to engage and resist the rotation of the wheels E E', a key by which the pawls G are thrown out of engagement with said wheels, and springs F to reversely rotate said wheels to throw off or distribute the combination, substantially as described, and for the purpose set forth.

4. The combination, in a commutation-lock, with the inclosing case and a locking latch-bolt, of the commutation-wheels D D', wheels E E' to engage said wheels to resist rotation and to throw off the commutation, and the latch L to engage the commutation-wheels to hold or lock them against rotation, substantially as described, and for the purpose set forth.

In testimony whereof we have hereunto set our hands this 31st day of December, A. D. 1890.

EDWARD L. MILLER.
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Witnesses:

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