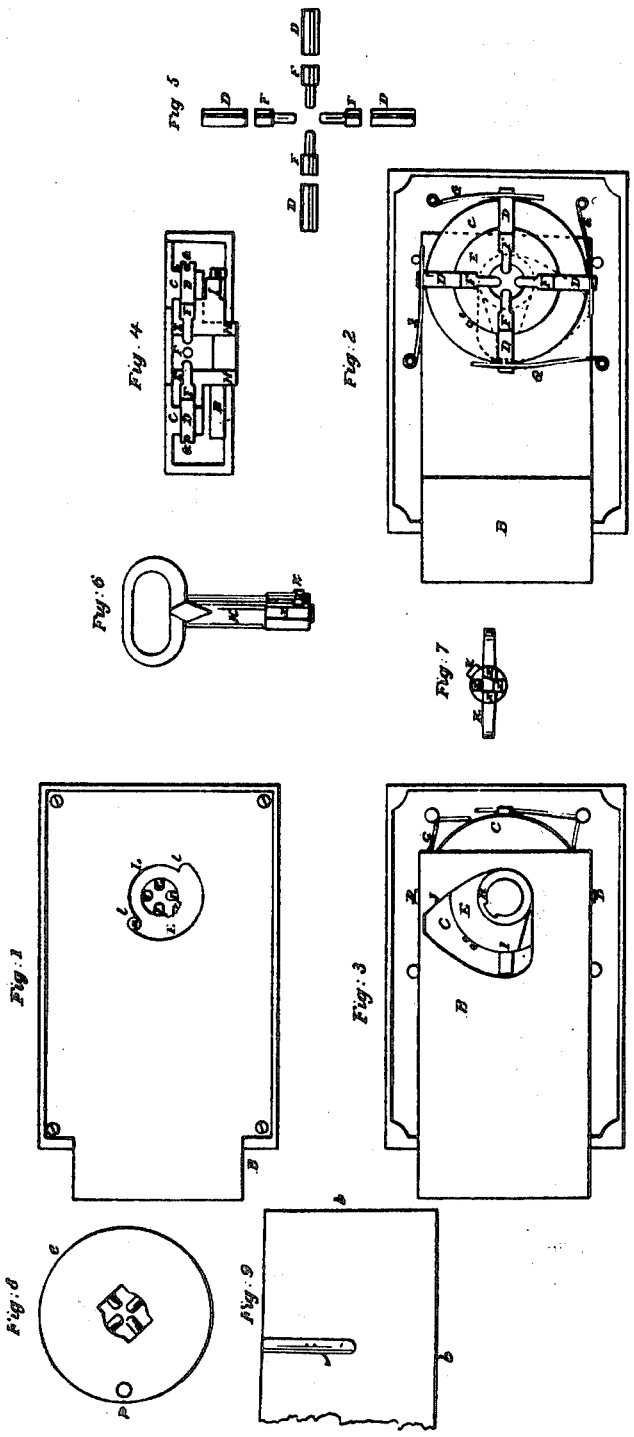
L. Yale,

Door Lock.

No. 3,630. Patented June 13, 1844.



UNITED STATES PATENT OFFICE.

LINUS YALE, OF SPRINGFIELD, MASSACHUSETTS.

DOOR-LOCK.

Specification of Letters Patent No.3,630, dated June 13, 1844.

To all whom it may concern:

Be it known that I, LINUS YALE, of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Door Locks, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a view of the front of the lock. Fig. 2 is a vertical longitudinal section. Fig. 3 is a plan of the interior of the lock the back plate being removed. Fig. 4 is a vertical transverse section. Fig. 5 is a plan of the pistons. Fig. 6 is a plan of the key. Fig. 7 is a section of same.

The box A and bolt B of this lock are made in the usual manner.

The improvement consists in having a cylinder or circular rim C on the inside of the front plate of the box fastened thereto in any convenient way, or cast therewith, forming a cylindrical socket, said cylinder or circular rim being pierced from the outer to the inner circumference with round apertures on lines radiating from the center to the periphery, in which apertures are placed cylindrical pistons D, which pass through said apertures and enter corresponding apertures in a revolving cylinder or tumbler E, (having a hub or arm) that turns in said cylindrical socket for locking the bolt as hereafter described, said pistons being kept pressed inward toward the center (against other pistons F hereafter described) by springs G attached to the front plate of the box.

The tumbler E is a simple cylinder of the same diameter as the aforesaid cylindrical socket in which it is placed and made to revolve, being pierced in its center with a cylindrical cavity to admit the key, and perforated around its periphery with the same number of radial apertures as there are in the before described circular rim and corresponding therewith when the cylinder or tumbler is turned so as to bring the several pairs of pistons in radial lines. In said apertures in the revolving cylinder are placed the other pistons F just mentioned used for driving the first named pistons D back out of the apertures in the tumbler till their ends are coincident with the outer periphery of the tumbler and inner periphery of the rim, in which position the tumbler can be turned for locking and unlocking the bolt. These pistons two-thirds their length are of the same diameter as the first named pistons, the remaining third is reduced in diameter where it passes into the center cavity of the tumbler, the radial apertures in the tumbler being made of corresponding shape. When the bolt is thrown out in a locked position and the key is withdrawn these pistons F are driven inward by the pistons D in the rim which are forced against them by the springs G aforesaid, their axes being all in straight radial lines, the pistons D of the rim C partly entering the apertures in the tumbler E and thus locking the tumbler to the rim. The pistons of the tumbler are of different lengths.

The tumbler E is provided with a round hub H in its center that enters a corresponding aperture in the back plate of the box forming a round box for it to turn in, and having an arm I extending from its periphery that enters the opening J on the bolt B for throwing it in or out of the box or case.

The key K used to lock and unlock this lock is a cylinder containing as many wedge shaped cavities or grooves *x* in its periphery as there are pistons—one for each piston—and corresponding therewith and extending lengthwise of the key from the inner end toward the middle of the spindle in inclined planes which terminate at the circumference thereof, said inclined planes being of various depths to correspond with the different lengths of the inner pistons F so as to cause their outer ends to reach the periphery of the cylindrical tumbler at the instant the key is pushed in as far as it is intended to be inserted. The key is likewise provided with a cog or ward *k* which enters a corresponding cavity or notch *n* made in the tumbler.

The inner plate is perforated with an aperture L for the insertion of the key and a segment aperture forming shoulders *l l* against which a pin M projecting from the end of the tumbler E strikes for preventing the tumbler turning too far either way.

The pistons are to be multiplied to any extent required in a single lock and as they are all of different lengths and required to be moved out by the key different distances the picking of the lock becomes very difficult. Some of the pistons of the tumbler are made to enter holes sunk in the body of the key when turned to produce this effect, rendering it still more difficult to open the lock without a knowledge of the construction of the key.

The planes or grooves *g* and the holes in the periphery of the key should be made as dissimilar as possible.

The pistons F should be fitted and adapted to the tumbler after the key is finished and inserted, which is effected by various trials.

In order to lock the bolt the key must be pushed in as far as it will go, the inclined planes of which come in contact with the pistons F of the tumbler and force them against the pistons D of the rim and cause them to recede, until their place of union or point of contact is coincident with the joint between the inner periphery of the rim C and the outer periphery of the tumbler E as at *c c* when the latter can be turned and not before—the tumbler is then turned and its arm I brought in contact with the bolt B which is then thrown either way. By withdrawing the key the springs G instantly throw the pistons into the apertures in the tumbler and again prevent it from turning. I likewise modify the construction of the tumbler and bolt of the lock in the manner represented in Figs. 8 and 9 so as to dispense with the cog *k* on the key for turning the tumbler and the arm I on the tumbler for throwing the bolt and the opening J in the bolt and in lieu thereof I insert a pin *p* in the face of the tumbler and make a vertical groove *j* in the bolt *b* as represented in Fig. 9 into which said pin *p* Fig. 8 enters and works for throwing the bolt horizontally back and forth as the tumbler is turned to the right or left, said pin *p* remaining always in said groove *j*, changing its position vertically as the bolt moves horizontally.

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

The method of throwing the bolt by means of the pin *p* Fig. 8 on the rotary tumbler working in a groove *j* in the bolt *b* Fig. 9 in combination with the arrangement of pistons in the rotating tumbler and circular rim as herein described.

LINUS YALE.

Witnesses:
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