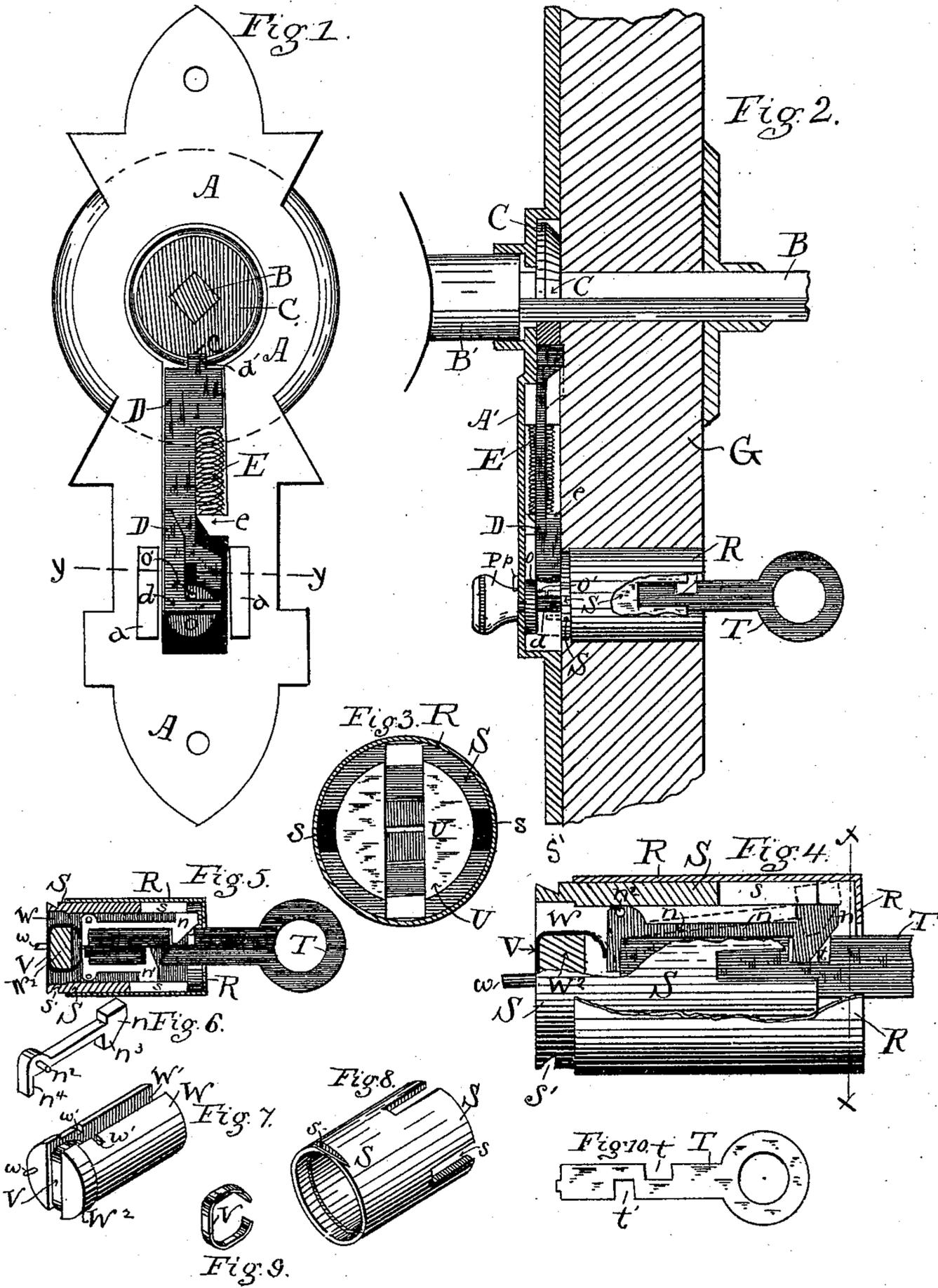


Z. T. FURBISH.

KNOB LOCK.

No. 355,311.

Patented Jan. 4, 1887.



Witnesses:

H. Spaulding
Wilbur F. Smith

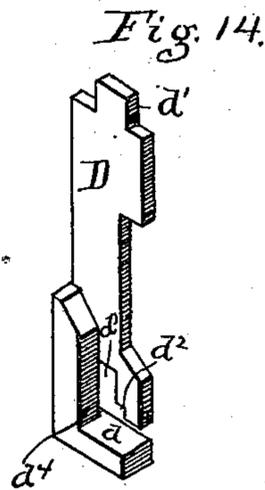
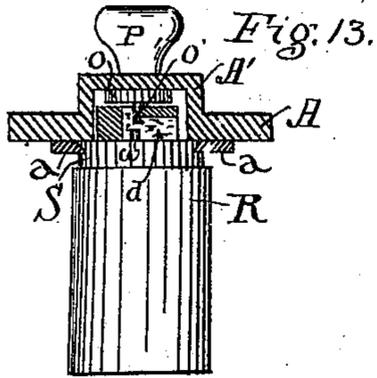
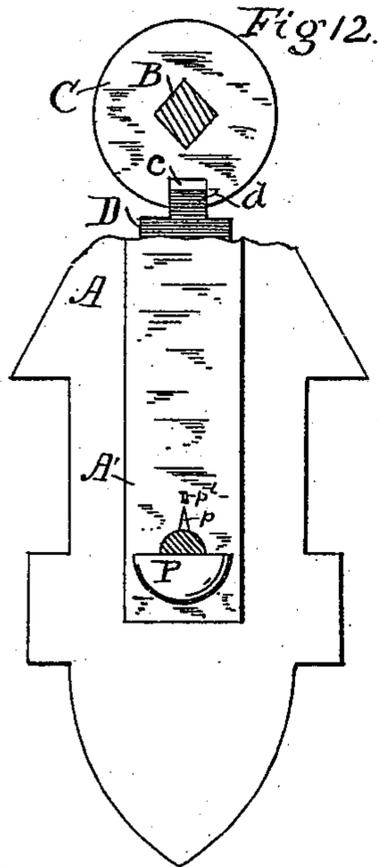
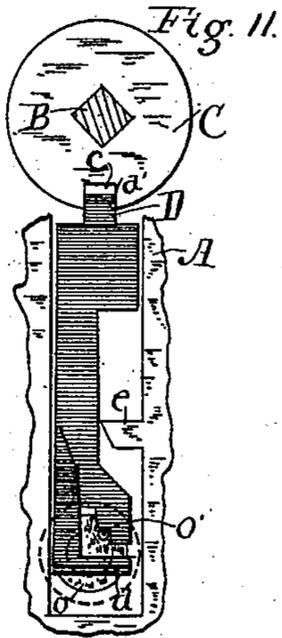
Inventor:

Zachary T. Furbish
by S. M. Bates
his atty.

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UNITED STATES PATENT OFFICE.

ZACHARY T. FURBISH, OF AUGUSTA, ASSIGNOR TO WILLIAM H. STEVENS,
OF PORTLAND, MAINE.

KNOB-LOCK.

SPECIFICATION forming part of Letters Patent No. 355,311, dated January 4, 1887.

Application filed October 20, 1886. Serial No. 216,692. (No model.)

To all whom it may concern:

Be it known that I, ZACHARY T. FURBISH, a citizen of the United States, and a resident of Augusta, in the county of Kennebec and State of Maine, have invented a new and useful Knob-Lock, of which the following is a specification, reference being had to the accompanying drawings, in which similar letters represent similar parts throughout the several views.

My invention relates to that class of door-locks wherein a locking device is employed to prevent the turning of the knob-spindle and the consequent movement of the latch, thus dispensing with the separate bolt used in ordinary locks.

My invention has for its object the construction of a locking device to be operated upon the knob-spindle, and which shall be capable of being used as an ordinary night-latch by the use of a button on the inside of the door and a latch-key on the outside, in addition to which it may be used from the outside as an ordinary door-lock, and it may be also set from the inside by a movement of the button in such a manner that it cannot be unlocked from the outside.

My invention consists of a spring-latch having a vertical bolt on the upper end of which is a tongue made to engage a notch in a circular disk hung on the knob-spindle, and having on its lower end a horizontal offset upon which operates a pin inserted in the face of a small disk or wheel, the latter being actuated or rotated by a button on the inside of the door, the rotation of said button acting to depress the bolt.

It further consists in the combination of this latching device with a cylindrical lock of peculiar construction, which will hereinafter be more particularly described and claimed.

In the drawings, Figure 1 is a face view of that part of the lock which comes next the door, as seen in looking away from the door. Fig. 2 is a section through the door with lock in part section. Fig. 3 is a section through $x x$ of Fig. 4, and shows an enlarged end view of cylindrical lock with key withdrawn. Fig. 4 is a part longitudinal section through the same, also enlarged. Fig. 5 is a central longitudinal section through the same. Figs. 6, 7, 8,

9, and 10 are details of lock and key. Fig. 11 is a portion of same view as Fig. 1, with parts in a different position. Fig. 12 is a view on outside with thumb wheel or button in same position as in Fig. 11. Fig. 13 is a horizontal section on line $y y$ of Fig. 1. Fig. 14 is a perspective view of bolt.

A is a casing or plate having a recess, A' , to receive the bolt D. B' is the door-knob, and C is a wheel or disk, through which passes the knob-spindle B. In the periphery of the wheel C is the square notch c , sufficiently large to receive the tongue d' on the upper end of the bolt D. A portion of the bolt D is cut away on one side to make room for the spiral spring E, which rests on the seat e and presses upward the bolt D. On the lower end of the bolt D is a horizontal offset, d , having a width somewhat greater than the thickness of the body of the bolt D. Above the offset d is the vertical notch d^3 , extending some distance up the bolt, and at the side of notch d^3 is a small downward-opening notch, d^2 . A vertical portion, d^4 , of the same thickness as offset d , extends upward, forming one side of the notch d^3 .

The button P on the inside of the door is connected with a small disk or plate, O, which lies immediately behind the bolt D, and in the face of disk O, and projecting out over the upper face of offset d is the pin o' . (See Fig. 13.)

The button P has next the casing A a small pointer, p , and just above and in the casing is a mark, p' . (See Fig. 12.) The position of the pointer p and the mark p' is such that when the button P is turned so that the pointer is opposite the mark the pin o' will be vertically under the notch d^2 in the bolt, as shown in Fig. 11. When the pin o' is in this position, the bolt D cannot be withdrawn wholly from the notch c , and hence the door cannot be unlocked from the outside.

The operation of that portion of my device thus far described is evident. When the button P is turned to the left, Fig. 1, the pin o' acts as a cam on the offset d and depresses it, thus withdrawing the bolt D from the notch c and unlocking the door. After the button P has turned one-half around, the pin o' will be directly under the center of disk O, or on a dead-center, and hence will not allow the bolt to rise by the action of the spring E until it is turned

backward. The surface d^t , against which the pin o' strikes, prevents it from passing beyond the dead-center. Thus in unlatching the door the bolt may be simply withdrawn by turning the button P less than one-half, and the knob turned, leaving the bolt to snap back when the door is closed; or by turning the button completely over, as explained, the lock can be disconnected, so that it will not operate at all.

I now proceed to describe the construction and operation of the special locking device by which I actuate the bolt from the outside of the door.

R is the outside cylindrical casing, and S is the inner casing, having at one end two dovetail notches, S' , and at the other end a series of longitudinal slots, ss , around the periphery of the cylinder. In this case I show four slots, situated at right angles to each other.

Secured to the casing A are two cleats, $a a$, one on each side of the recess A' , and near its edge, opposite the disk O. The inner edges of these cleats are recessed or dovetailed in such a manner that the dovetailed notches S' in the end of cylinder S slide in between said cleats and thus hold the cylinder and its contents firmly to the casing A.

Within the cylinder S is the core or central cylinder, W, having a longitudinal slot or opening, W' , which extends from one end nearly to the other, dividing the core into two parts, the two parts being connected by a solid portion, W^2 . The spring V partially encircles the solid portion W^2 , its two ends projecting into the space W' and pressing against the offsets n^4 of the two tumblers n and n' , placed opposite each other. These tumblers are hung by means of pivots in notches w' , cut in the edges of the opening W' , and they have at one end an offset or foot, n^4 , and at the other end a dog, n^3 . The tumblers $n n'$ are slightly narrower than the slots ss , so that the end containing the dog will pass freely through said slots. The dogs n^3 are formed to fit into the notches $t t'$ of the straight key T, and the inner end of said key is formed to fit the notched or straight faces of the foot-pieces n^4 . The pin w is inserted in the end of core W, so that it rests against the top surface of offset d of the bolt when said bolt is up. (See Fig. 13.)

The operation of my lock is as follows, viz: The key being inserted, its end rests against the foot n^4 of the tumblers n and n' . This forces the dogs n^3 into the notches of the key, allowing the core W to be turned so that the revolution of the pin w depresses the bolt D by bearing on the offset d . During this operation the key is pressed inward, to counteract the pressure of the spring V and to hold the dogs n^3 into the notches of the key. When the pressure is removed from the key, the springs V press against the feet n^4 of said tumblers and force outward the dogs n^3 , and when the core is turned so that said dogs come opposite the slots ss in the cylinder they enter said slots and prevent further rotation of the core, and at the same time, being forced from the notches

$t t'$ of the key, allow the latter to be withdrawn. The position of the pin w is such that when the key is vertical, as in Fig. 5, the pin is horizontally on a line with the center. If the key is turned a quarter-way around, or ninety degrees to the right, so that the tumblers come opposite the side slots, ss , in the cylinder S, the pin has depressed the bolt and is vertically under the center of the core, or on a "dead-center." It also impinges against the surface d^t , which prevents it from turning farther in that direction. If the key be now withdrawn, the device is unlocked and cannot be again locked, except by inserting the key and turning it backward. Operated in this manner, my lock performs the same functions as an ordinary door-lock, as distinguished from a spring-lock—namely, it does not close with a spring when the key is withdrawn. If it is desired to use it as an ordinary night-latch, the key is pressed in and turned around until the bolt is free. The door is unlatched in the usual way. The key is turned back to a vertical position and withdrawn.

It thus appears that by simply manipulating the button and the key the following operations may be performed, namely: First, the bolt may be simply unlatched by turning the button P to the left; or, second, it can be thrown out so that it will be entirely disconnected by turning button half around; or, third, it can be adjusted so that it cannot be unlocked from the outside. By the use of the key it can, fourth, be unlatched, as in ordinary night-latches; or, fifth, it can be locked and unlocked, as in ordinary doors, without making use of the spring.

The pin w of the cylindrical lock, instead of operating on the surface of the same offset, d , with the pin o' , may operate on a similar offset placed higher up on bolt D, and independent of pin o' , or it may play in a slot cut in the bolt D, into which it may project.

It is evident that many combinations may be made in my lock by varying the tumblers, the size and shape of the dogs, and the corresponding notches in the key, the end of the key, and the corresponding portions of the feet of the tumblers.

It is desirable to cut the notches half-way through the key, so that a piece of wire, or other similar device may not be inserted to operate the tumblers and pick the lock. When the dogs are made to extend at least half-way across the opening, any such article cannot be used to pick the lock, since the dogs will strike it before being released from the slots ss . Two tumblers may be used on each side, in place of one, as here shown, by having a thicker key with notches extending through one-half its thickness.

The cylindrical lock here shown may be used on any kind of a door to throw any bolt; and I do not wish to confine its use to spring door-locks.

I claim—

1. In a knob-lock, the combination of a bolt

having at one end means for engaging the knob-spindle to prevent it from turning and having an offset, a cam actuated by a button on the inside of the door and operating upon said offset to depress said bolt, a spring to press said bolt toward the knob-spindle, and a casing to contain said parts, substantially as shown.

2. In a knob-lock, the combination of a bolt having at one end means for engaging the knob-spindle to prevent it from turning and at the other end an offset, a cam actuated by a button on the inside of the door, said cam operating on said offset to depress said bolt, a downward-opening notch in the bolt to prevent the same from throwing when the pin is turned to be vertically under the notch, an indicator to show the position of said pin, a spring to press the bolt against the knob-spindle, and a lock adapted to depress said bolt and operated by a key from the outside of the door, substantially as shown.

3. In a knob-lock, a bolt having at one end means for engaging the knob-spindle to prevent it from turning and having an offset upon which operates a cam adapted to depress the bolt, said cam being controlled by a button on the inside of the door, a spring for forcing said

bolt toward the knob-spindle, combined with a lock adapted to throw said bolt and having a key to be inserted from the outside of the door, substantially as shown.

4. A knob-lock having a rotating cylindrical core with a longitudinal slit or opening extending from one end nearly through said core, tumblers pivoted in the edges of said opening, each of said tumblers having at its inner end a foot or offset projecting toward the center of said core and at the outer end an inwardly-projecting dog, a flat key with lateral notches to receive said dogs, the end of said key conforming to the form of the feet or offsets, a spring to press outward the dog end of said tumblers, a fixed cylindrical case inclosing said core and having in its periphery slits to allow said dogs to pass outward to free themselves from the notches of said key, a pin or projection in said core, and a locking-bolt operated by said pin, substantially as shown.

In testimony whereof I affix my signature in presence of two witnesses.

ZACHARY T. FURBISH.

Witnesses:

S. W. BATES,
LEWIS SELBING.