No. 655,605. Patented Aug. 7, 1900.

T. CHURCHILL.

LOCK.

(Application filed Mar. 28, 1900.)

(No Model.)

Fig. 1.

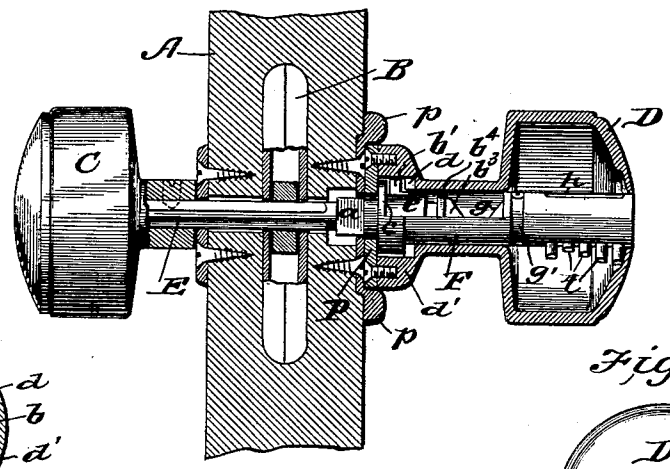


Fig. 4.

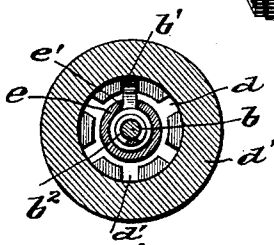


Fig. 5

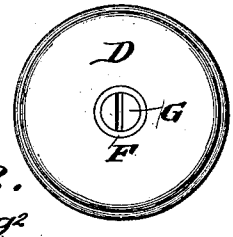


Fig. 3.

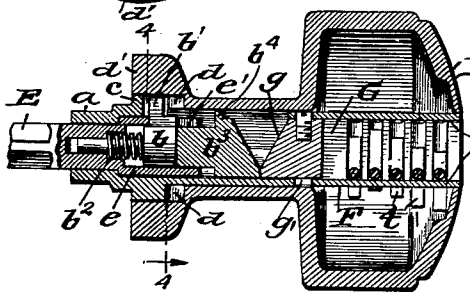


Fig. 2.

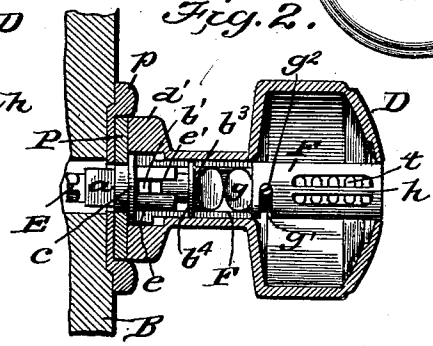


Fig. 6.

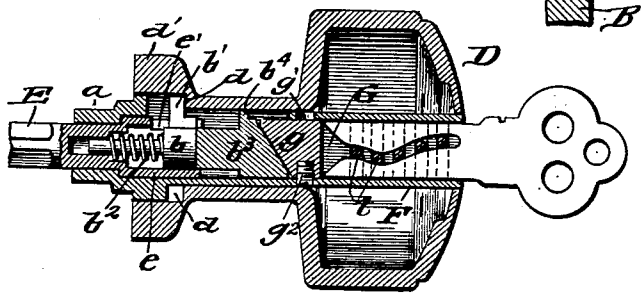


Fig. 7

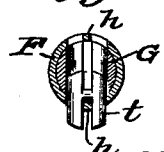


Fig. 8

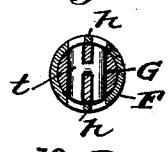
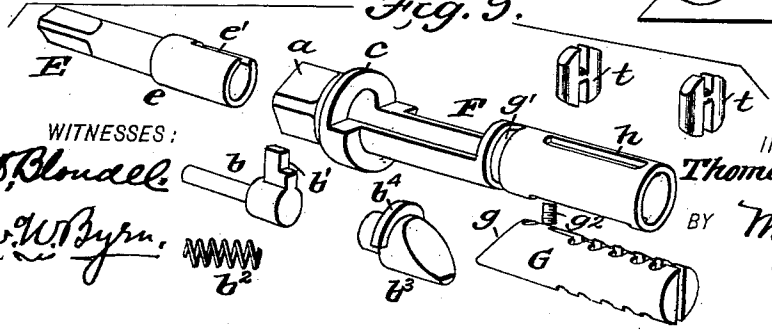


Fig. 10



Fig. 9.



WITNESSES:

M. S. Blondell.

Edw. W. Byrn.

INVENTOR

Thomas Churchill.

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS CHURCHILL, OF YORK COUNTY, VIRGINIA.

LOCK.

SPECIFICATION forming part of Letters Patent No. 655,605, dated August 7, 1900.

Application filed March 28, 1900. Serial No. 10,537. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CHURCHILL, of York county, in the State of Virginia, have invented a new and useful Improvement in Locks, of which the following is a specification.

My invention relates to that class of knob-locks in which the outer knob is made incapable of turning the spindle except when temporarily locked thereto by a key which is inserted concentrically through the knob and is made to act upon clutch devices which cause the knob to be coupled to the spindle. In my previous patent, No. 576,028, dated January 26, 1897, I have shown and described a lock of this class.

My present invention comprehends further developments and improvements in this form of lock which relate more especially to the locking or clutch mechanism which connect the knob to the spindle and which are applicable to any of the ordinary forms of locks having the usual squared spindle. It consists in the peculiar construction and arrangement of parts, which I will now proceed to describe with reference to the drawings, in which—

Figure 1 is a vertical sectional view taken through the knob-sleeves, the door, and lock. Fig. 2 is a horizontal section through the knob D. Fig. 3 is a vertical central longitudinal section through knob D on a somewhat-larger scale. Fig. 4 is a cross-section on line 4 4 of Fig. 3. Fig. 5 is a face view of knob D. Fig. 6 is a vertical central longitudinal section of knob D, showing key applied and showing position of parts for locking the knob D to the spindle. Figs. 7 and 8 are cross-sections of the tumbler-barrels and containing-sleeve, showing different positions of the tumblers. Fig. 9 represents perspective views showing details of detached parts, and Fig. 10 is a side view of the key.

In the drawings, A represents a door.

B is the lock, which is of the form known as a "mortise-lock," let into a mortise within the plane of the door, but which may just as well be an external or rim lock, if desired.

C is the knob on the inside of the door, and D the knob on the outside of the door. The inner knob C is rigidly connected to the spindle E by means of the usual screw and does not differ from the ordinary knob. The outer knob D, however, is of peculiar construction. In general principle it turns loosely in relation to the spindle ordinarily and is only locked thereto by a peculiar clutch mechanism within, which is adapted to be set into action by a key that passes centrally into the knob itself and rotates a barrel and operates a clutch in the manner hereinafter described.

On the outside of the door there is secured by screws a recessed escutcheon-plate p, which is rigidly fixed to the door and has a square opening in its center that receives the squared end a of a non-rotating sleeve F. Into this sleeve there protrudes the outer end e of the square spindle E, which end is made round and turns in a round bearing of the sleeve F and is also made with a hollow end having a longitudinal open slot e'. The middle part of the sleeve F is cut away to about one-half of its cylindrical surface, (see Fig. 9,) and in this portion there slides longitudinally a locking clutch-stem b', which at one end is provided with a radially-projecting lug b', that is guided in the slot e' of the hollow end e of the knob-shaft. Behind this clutch-stem there is a helical spring b^2, which tends always to force the clutch-stem and its lug b' outwardly. On the outer end of the clutch-stem there is an enlarged head b^3, which has a face inclined to its axis, and a half-collar b^4, which rides upon and is guided by the cut-away edges of the sleeve as the clutch-stem slides back and forth. As shown, this head is made as a separate piece from the clutch-stem for convenience in making the parts.

The outer end of the non-rotating sleeve F performs two principal functions—first, it affords an axial bearing upon which the shank of the outer knob D turns, and, secondly, it forms a containing case for a rotating barrel G, which latter contains tumblers for the key, and an inclined head g, that corresponds to the inclined head of the clutch-stem. When this barrel is rotated a half-revolution by the key, as hereinafter described, its inclined head g, by a cam action on the inclined head b^3, forces the clutch-stem inwardly, as shown in Figs. 2 and 3, and causes the lug b' to be forced in; but when the two cam-faces lie flat against each other, as in Fig. 6, this lug is in its outermost position, and in this posi-

tion it engages one of a series of notches d, Fig. 4, in the recessed flange d' of the outer knob. When the lug b' is forced inwardly toward the door, which is its normal position, said lug is disengaged from the notches d of the knob-flange and the knob and its flange rotate freely on the stationary sleeve F, without imparting any effect to the spindle and without acting on the knob-latch of the door-lock. When, however, a half-revolution is given to the barrel G and the lug b' passes outwardly and into the notches d of the outer knob, as in Fig. 6, the latter when turned acts upon the lug b', and this acting upon the slotted end e of the spindle E turns it and opens the door.

The barrel G within sleeve F is limited to a half-revolution by a screw g^2, Fig. 2, in the barrel playing in a transverse semicircular groove g' in the sleeve. This barrel has a series of H-shaped tumblers t, and the key is a flat key with a zigzag slot, as seen in Figs. 6 and 10. When the key is inserted, its slot straddles or embraces the cross-piece of the H-shaped tumblers, and these cross-pieces are arranged at different distances from the ends, corresponding to the incline of the zigzag slot, so that when the key is inserted the ends of all the H-shaped tumblers will be within the bore of the encompassing sleeve and the barrel may be turned; but when the key is withdrawn the bifurcated ends of the H-shaped tumblers drop to a straddling position on one or the other of two bars h h, Figs. 7 and 8, of the sleeve and lock the barrel thereto. These bars h are arranged at diametrically-opposite points of the sleeve and are formed by two parallel longitudinal slots.

When the outer knob and its shank and flange are in place inclosing the stationary sleeve F, the parts are held together by a disk-plate P, Figs. 1 and 2, which is fastened to the flange of the knob by screws and incloses the little collar c on the sleeve, about which it swings or turns.

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

1. In a knob-lock, the combination of the spindle having a hollow circular slotted end, a clutch-stem arranged therein with a spring behind it and having a lug protruding through the slot, a rotary barrel with cam-face adapted to operate on said clutch-stem, an encompassing fixed sleeve for the clutch-stem and barrel, and a knob with hollow shank and flange turning on the fixed sleeve and having locking-notches adapted to be engaged by the clutch-lug substantially as described.

2. In a knob-lock, the combination of the spindle having clutch devices adapted to engage it, a fixed sleeve containing in its middle portion said clutch devices and having at its outer end a rotating barrel to operate said clutch devices, said barrel carrying H-shaped tumblers, and said sleeve having at diametrically-opposite points longitudinal locking-bars for the tumblers, and a swiveling knob with shank and flange having locking-notches as described.

3. In a knob-lock, the combination of a swiveling knob having a hollow shank and clutch devices as described for locking the knob to the spindle; of a stationary axial sleeve slotted longitudinally at opposite sides and having double-acting tumblers within passing through either side, a rotating barrel carrying said tumblers and constructed and arranged as described to operate the clutch devices, and a key acting on said tumblers at a point between their outer ends substantially as set forth.

4. In a knob-lock, the combination of a spindle having a hollow circular slotted end, a clutch-stem arranged therein with a spring behind it having a lug protruding through the slot and a cam-face on the other end, a rotary barrel with corresponding cam-face and locking-tumblers, a stationary sleeve inclosing said clutch-stem and barrel, and a swiveling knob with shank and flange turning on said fixed sleeve and having locking-recesses adapted to be engaged by the lug of the clutch-stem substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS CHURCHILL.

Witnesses:
O. D. BATCHELOR,
W. W. WOODWARD.