(No Model.)

# G. THUMSHIRN.

## LOCK.

No. 306,976. Patented Oct. 21, 1884.

Fig. 1

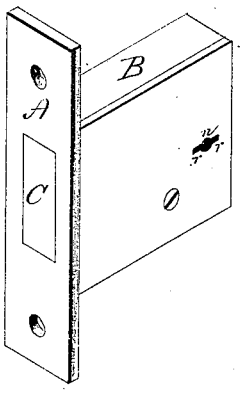



Fig. 2

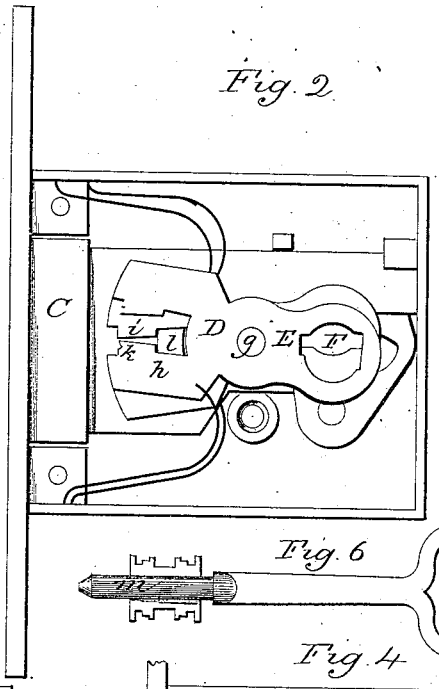



Fig. 3

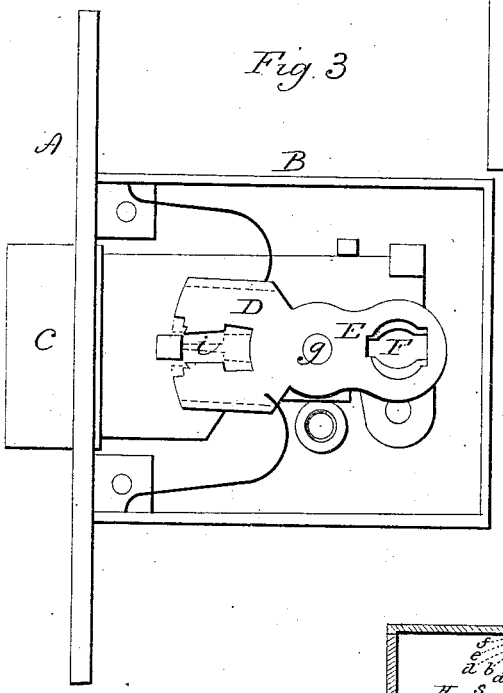



Fig. 6




Fig. 4

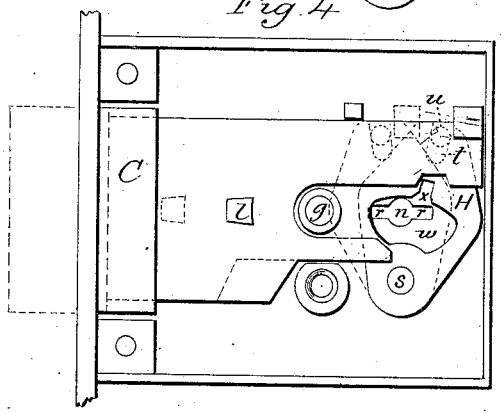



Fig. 5

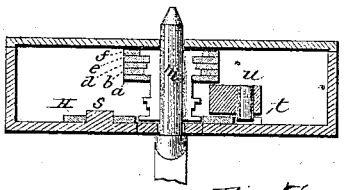
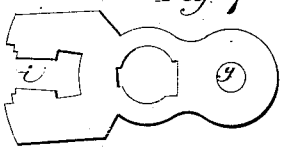



Fig. 7

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# UNITED STATES PATENT OFFICE.

GEORGE THUMSHIRN, OF BRANFORD, CONNECTICUT.

## LOCK.

SPECIFICATION forming part of Letters Patent No. 306,976, dated October 21, 1884.

Application filed May 12, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE THUMSHIRN, of Branford, in the county of New Haven and State of Connecticut, have invented a new Improvement in Locks; and I do hereby declare the following, when taken in connection with accompanying drawings, and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a perspective view; Fig. 2, a side view, the covering-plate removed, and showing the parts in the unlocked or drawn position; Fig. 3, a side view showing the tumblers turned, the bolt thrown; Fig. 4, a side view, the tumblers removed to show the lever upon which the key operates to throw the bolt; Fig. 5, a transverse section showing the key as having turned the tumblers into the position seen in Fig. 3; Fig. 6, the key; Fig. 7, a modification.

This invention relates to an improvement in that class of locks in which the tumblers are in the form of levers, which are turned from engagement with the bolt by the rotation of the key, the object of the invention being a greater security in a simple construction of lock; and the invention consists in the construction of the tumblers and the key, as more fully hereinafter described, and particularly recited in the claims.

A represents the face-plate; B, the case; C, the bolt, arranged therein in the usual manner, and so that when free the key will throw the bolt out or in, according to the direction in which the key is turned.

As represented in the illustration, five tumblers are employed, *a b d e f*. These are in the form of levers of the first order. They are hung upon a fulcrum, *g*, in the case, and lie in a plane parallel with the plane of the plate, each independent of the other, as such tumblers are usually arranged, and each provided with its own spring, as shown. One arm, D, of each tumbler is constructed with a notch, *h*, and from which notch is an opening, *i*, through which the stud *l* on the bolt may pass; but when the bolts are in their normal condition, as seen in Fig. 2, the notch of each tumbler engages the stud, so as to hold it in its down position; or when the bolt is thrown, as seen in Fig. 3, and after the stud has passed through the opening *i*, the tumblers will spring behind the stud, as indicated in broken lines, Fig. 3, and hold the bolt in that position.

The key designed for use in this lock is seen in Fig. 6. Its spindle *m* extends through the two plates of the case, so as to take a bearing therein to serve as a center or axis upon which the key is turned. The bit extends each side the spindle, making practically a double-bitted key, both sides alike. The key-hole has a central part, *n*, corresponding to the spindle, with a horizontal slot, *r*, extending to the right and left therefrom, corresponding substantially to the width and thickness of the two parts of the bit, and as seen in Fig. 4. The other arm, E, of the tumblers extends to the key-hole, and through that arm of each tumbler is an opening, F, which in length corresponds to the key-hole, and so that as the key is inserted it will pass through the openings in the several tumblers. The tumblers are arranged at one side of the case, as seen in Fig. 5, occupying no more than one-half the thickness of the case. The springs are applied to the tumblers, one upon one side, the next upon the opposite side, and so on, alternating. One or more tumblers are therefore lifted to engage the stud, and the others are forced downward. The openings F through the tumblers vary to some extent with relation to their respective notches. The shoulders on the bit of the key vary accordingly. When the key is inserted, the tumblers are in the position seen in Fig. 2. After the key is introduced, it may be turned, the bit bearing on the tumblers, those which lift acted upon by the bit upon one side, those which are to be depressed acted upon by the bit upon the opposite side of the spindle, as seen in Fig. 5, until they are brought into line, as seen in Fig. 3. In that condition the bit of the key strikes the bolt and throws it forward, as shown, and as the key turns to the opposite direction, the tumblers return behind the stud L, as indicated in broken lines, Fig. 3, and hold the bolt in its thrown condition. Then the key may be removed, or, being returned, will op-

erate the tumblers as before, and draw the bolt.

In order to insure the accurate working of the tumblers with relation to the stud on the bolt, the opening F in each of the tumblers is in height equal to the width across the two bits on the shoulder which corresponds to the respective tumblers, and as seen in Fig. 5, so that when the key stands in the vertical position, to bring the openings *i* in the tumblers in line with the stud L, each tumbler comes to a bearing on both the bits, as seen in Fig. 5. Both ends of the bit are alike, the shoulders at one end bearing upon the tumblers when the key is introduced from one side of the lock, and the shoulders at the other end when the key is introduced from the reverse side.

As a convenient and practical means of throwing the bolt, I hang a lever, H, below the key-hole upon a pivot, *s*. This extends up above the key-hole, as seen in Fig. 4, and engages with the bolt, the upper end of the lever being constructed with a slot, *t*, and the bolt provided with a corresponding stud, *u*. Through the lever is an opening, *w*, for the passage of the bits of the key, and in the upper side of the opening is a notch, *x*, with which the bit of the key will engage and turn that lever, and with it the bolt, as indicated in broken lines, Fig. 4. This construction of tumblers makes the lock simple and cheap, the key substantially flat and light, the key-hole small, yet complicates the lock so as to make it difficult to pick.

By making both bits of the key alike and arranging the tumblers at one side, so that one end of the bit operates from one side and the other from the opposite side, no care or attention is necessary in the introduction of the key, as it operates upon the tumblers the same irrespective of which bit is turned up or down.

While I prefer to hang the tumblers midway of their length, and so that the key operates at one end with a gate at the opposite end, the tumblers may be hung at one end, as at *g*, Fig. 7, the opening F between the pivot and the gate or shoulders at the opposite end.

I claim—

1. The combination of the bolt C, two or more tumblers hung midway of their length upon a pivot, *g*, to swing in a plane parallel with the plane of the bolt, one or more provided with a spring to turn them in one direction, and the others with like springs to turn them in the opposite direction, each of said tumblers constructed with an opening, F, on one arm at the key-hole, and into which the key may enter, the other arm constructed with shoulders *h k* and with a slot, *i*, opening between them, the bolt constructed with the stud *l* to work through said opening, and with which the shoulders *h* or *k* will engage, as the case may be, with a double-bitted key, the shoulders on one bit corresponding to the tumblers which turn in one direction, and the shoulders on the other bit to the shoulders which turn in the opposite direction, substantially as described.

2. The combination of the bolt C with two or more tumblers hung upon a pivot, *g*, each provided with a spring, the springs of a portion of the tumblers operating to turn those tumblers in one direction and the springs of the remainder to turn such remainder in the opposite direction, one arm, E, extending over the key-hole, and having an opening, F, therein for the passage of the key, the other arm, D, constructed with shoulders *h k* and with the opening *i* between them, the bolt constructed with the stud *l* to work through said opening *i* and engage either shoulder, as the case may be, the double-bitted key, the shoulders of the bit upon one side corresponding to the shoulders of the bit upon the opposite side, the height of the opening F in the tumblers corresponding to the respective shoulders of the two bits, substantially as described.

GEORGE THUMSHIRN.

Witnesses:
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