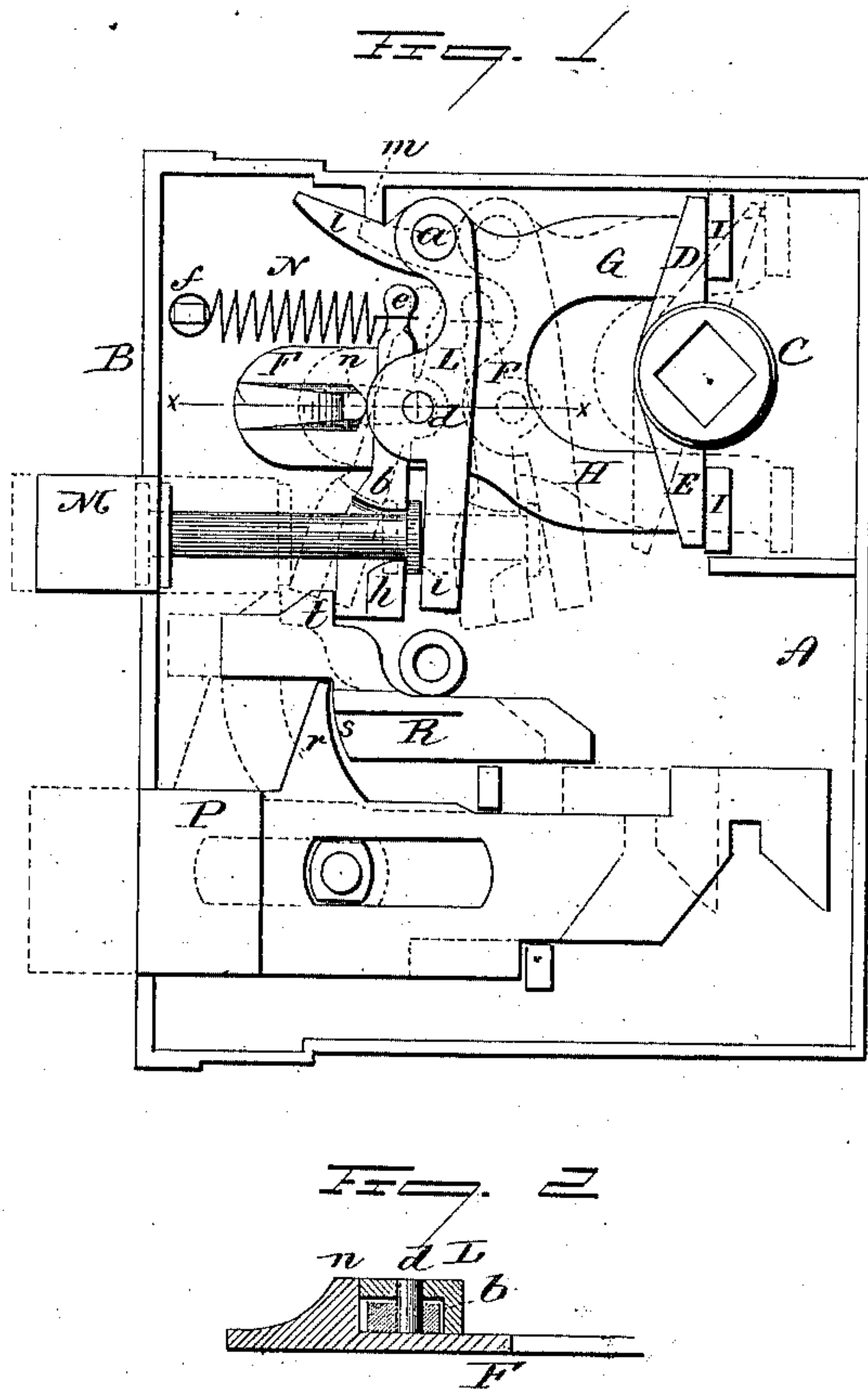


(No Model.)

W. E. SPARKS.  
REVERSIBLE LATCH.

No. 312,916.

Patented Feb. 24, 1885.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## REVERSIBLE LATCH.

SPECIFICATION forming part of Letters Patent No. 312,916, dated February 24, 1885.

Application filed November 24, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. SPARKS, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Knob-Latches; 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 side view, the covering-plate removed to show the latch and lock mechanism; Fig. 2, a transverse section on line *x x*, showing the connection between the levers L and *b*.

This invention relates to an improvement in knob-latches, particularly to that class in which the latch-bolt is made reversible, and also in which the latch-bolt is arranged for an easier inward movement against the keeper than under the action of the knob, and is an improvement upon the latch of my invention for which Letters Patent were granted to the assignees in this application, October 14, 1884, No. 306,545, the object of the invention being to increase the resistance upon drawing the latch under the action of the knobs to diminish the resistance to the movement of the bolt under its action upon its keeper, and to adapt the reversible mechanism to locks in which there is considerable space between the latch and lock mechanism; and the invention consists in the construction as hereinafter described, and more particularly recited in the claims.

A represents the case; B, the face-plate; C, the hub to receive the knob-spindle, and is constructed with the usual projecting arms, D E; F, the slide, one arm, G, of which extends rearward above the knob, the second arm, H, rearward below the knob, each of the arms provided with a lug, I, against which the respective arms of the hub will work in the usual manner.

Upon a pivot, *a*, on the slide a lever, L, is hung, which extends downward, its lower end in rear of the rear end of the spindle of the latch-bolt M. On the lever L a second lever, *b*, is hung upon a pivot, *d*. One arm, *e*, of this lever *b* extends upward above the pivot

*d*, and to that arm one end of a spring, N, is attached, the other end being attached to a fixed stud, *f*, in the lock-case, and so that the tendency of the spring is to draw the lever *b* forward, and, owing to the connection between the levers *b* and L, the same tendency applies to the lever L, and because the lever L is attached to the slide the same spring tends to draw the slide forward. The lower arm, *h*, of the lever *b* stands forward of a head, *i*, on the spindle of the latch-bolt, the head *i* being held between the lower arm, *h*, and the lower end of the lever L; but because the lever *b* is pivoted to the lever L, the latch-bolt may be pulled forward independent of the lever L, as indicated in broken lines, and so as to reverse the latch-bolt, the spring N yielding for such turning of the lever *b*.

The lever L, when the parts are in their normal condition, is prevented from turning forward by an arm, *l*, extending forward from its pivot end, and resting beneath a lug, *m*, on the case, so that as the latch-bolt is drawn forward in reversing no movement is imparted to the lever L. The bearing-surface of the arm *l* upon the lug *m* is inclined upward and forward, and so that when the slide is moved inward under the rotation of the knob the lever L will be moved with it, and because of the inclination of the upper surface of the arm *l* the lower end of the lever L will be moved backward faster than the slide—that is to say, the lever L will be forced to turn rearward as it is drawn backward under the action of the knob. Thus the movement of the slide to draw in the latch-bolt is considerably less than the actual movement of the bolt. The spring N being applied to the lever L through the lever *b*, it follows that the extension of the spring is proportionately greater than the movement of the slide, and to the extent that this extension of the spring is greater than the movement of the slide the resistance to the turning of the knob is increased. It is desirable that there shall be a considerable resistance to the turning of the knob in a knob-latch to draw in the bolt; but unless some provision be made to make the movement of the latch independent of the slide operated by the knob, then that resistance will be met when the latch-bolt strikes the keeper. To



make the resistance very light as the latch-bolt strikes the keeper, the lever L is provided. The lower end of the latch-bolt abuts against the lower end of this lever, and at a considerable distance below the pivot or fulcrum *a* the spring is applied near the pivot or fulcrum. As the lever L is permitted an inward movement independent of the slide, it follows that when the latch-bolt strikes the keeper the only resistance which the latch-bolt meets to its inward movement is the lever L, and because of the great leverage or power which this lever has over the spring N the resistance to the inward movement of the bolt is very slight, and when the bolt strikes the keeper it is easily moved inward, turning the lever L, as indicated in broken lines, Fig. 1. This advantage of easy movement of the bolt and the contact with the keeper may be attained without the employment of the inclined surface or cam-like action of the arm *l*. In that case a simple stop, *n*, on the slide forward of the lever L will be sufficient to combine the lever with the slide, so that in turning the knob the lever will move with it, but yet leave the lever L free for inward movement under the action of the bolt against the keeper; but in such construction the advantage of increased resistance due to the cam-like action of the arm *l* would be lost. In my previous patent an extension was made from the lock-bolt upward to stand in front of the lever with which the tail of the latch-bolt was engaged when the lock-bolt was drawn inward, but from which the lever was released when the lock-bolt was thrown outward, and so that when the lock-bolt was thrown out the latch-bolt could be reversed, but could not be reversed when the lock-bolt was drawn in. In the shorter class of locks and latches this extension of the lock-bolt accomplishes the object; but in longer or higher cases, as in some classes of rim-locks, and in which the latch bolt and lock-bolt are farther apart, such an extension of the lock-bolt would be an inconvenience. Again, as in the various classes or lengths of latches and locks the mechanism is the same, it would follow that if the lock-bolt were constructed to engage the lever a different construction of lock-bolt would be required for every variation in the length or height of the case.

To adapt the mechanism to various heights of case without changing this construction, I introduce a connecting device between the lock-bolt and the latch-lever.

P represents the lock-bolt, from which an arm or projection, *r*, extends upward, as in my previous patent; but this extension is not of sufficient length to reach the latch-bolt lever. Above the lock-bolt I arrange a slide, R, constructed with a shoulder, *s*, against which the arm *r* will abut when the lock-bolt is drawn in. Upon the upper side of the slide

is a second shoulder, *t*, which stands forward of the lever with which the latch-bolt is engaged, and which has the same relation to the said lever that the projection *r* would have were the lock-bolt higher up or nearer the latch-bolt, and when the lock-bolt is drawn in, as seen in Fig. 1, the shoulder *t* stands close in front of the latch-bolt lever, and so that drawing out of the latch-bolt is prevented; but when the lock-bolt is thrown, as seen in broken lines, then the slide R is free and the latch-bolt may be drawn outward. The lever striking the shoulder *t* will move the slide with it toward the arm *r* on the lock-bolt, and when the lock-bolt is returned then the slide will be returned with it. In various lengths or heights of latches, therefore, it is only necessary to make different slides R to correspond to the variations in length, the mechanism of the latch part and the lock part remaining the same. This part of the invention may be employed without the lever L, the latch-bolt lever being hung directly to the slide, as in my previous patent.

I have represented the spring N as a helical spring; but it will be understood that any known equivalent spring may be applied in lieu thereof.

I claim—

1. In a knob-latch, the combination of the slide F, the latch-bolt M, the lever L, hung to said slide, extending down in rear of the latch-bolt, a second lever, *b*, hung to said lever L between the tail of the latch-bolt and the fulcrum of the lever L, the latch-bolt engaged with one arm of said lever *b* below its pivot, and a spring applied to said lever *b*, substantially as described.

2. In a knob-latch, the combination of the slide F, the latch-bolt M, the lever L, hung on said slide and extending in rear of the latch-bolt, and constructed with an arm, *l*, extending forward, and with an upwardly-inclined bearing-surface, a lug, *m*, in the case, against which said inclined surface will strike, the lever *b*, hung to said lever L, the latch-bolt engaged with one arm of said lever *b*, and a spring applied to said lever *b*, substantially as described.

3. In a knob-latch, the combination of the slide F, latch-bolt M, a lever one arm of which extends into connection with the bolt forward of a shoulder on the bolt, and a spring in connection with said lever arranged to turn said arm rearward against the shoulder on the bolt, the lock-bolt P, constructed with a projection, *r*, and the slide R between the said projection on the lock-bolt and the lever to which the latch-bolt is hung, substantially as described.

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Witnesses:

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