UNITED STATES PATENT OFFICE.

AUGUST W. O. KLEINAU, OF HAMBURG, GERMANY.

IMPROVEMENT IN LOCK AND LATCH COMBINED.

Specification forming part of Letters Patent No. **184,874**, dated November 28, 1876; application filed November 24, 1875.

To all whom it may concern:

Be it known that I, AUGUST W. O. KLEINAU, of Hamburg, Germany, have invented Improvements in Locks, of which the following is a specification:

The nature of my invention consists in the novel construction and arrangement of a lock, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, which form a part of this specification, and which represent various forms of my lock, all embodying the same principle.

Figure 1 is an interior view of my lock, showing the bolt in position when used as a latch. Figs. 2 and 3 are sections of the same. Fig. 4 shows the bolt in the locked position. Fig. 5 is a section of Fig. 4. Fig. 6 represents the key.

A represents an ordinary lock-case; and B is the bolt, which also acts as a latch. C is a spiral spring, fastened to the lock-case at one end, and having its other end, *a*, straightened and passed through a projection, *b*, on the under side of the bolt, with a loop formed in the wire on the other side of said projection, to keep the bolt with a certain tension in the position shown in Fig. 1. The spring C is prevented from drawing out the bolt any farther by the tumbler D bearing against a shoulder, d^1, formed by cutting a recess, *d*, in the top of the bolt, as shown in Fig. 1. By means of the knobs on the sides of the door, the bolt may, however, be moved back, so that the door, having simply been latched may thereby be locking may be done from the inside by reversing the operation.

To lock the bolt from the outside, the tumbler D must be lifted by a key, G, consisting simply of a flat piece of iron, beveled at its forward end. This key is introduced through a suitable key-guide and key-hole with the beveled edge upward, so that the end of the key enters as a wedge under the tumbler and lifts the same. To facilitate this the edge of the tumbler is rounded. As soon as the tumbler is completely lifted by the key, the spring C shifts the bolt slightly forward, as much as the slot d^2 will permit, said slot being for that purpose made a little wider than the thickness of the key. The tumbler can then not drop back into the recess *d;* but after the key is withdrawn it rests on the top of the bolt, which can then be moved forward by the knob E until the tumbler drops into the recess *h* and locks the bolt.

To unlock the door, the key G is again inserted and the tumbler lifted; and the bolt must then be moved very little inward, so that when the key is withdrawn the tumbler will not fall back into the recess *h*. This is accomplished by means of a small rabbet, *k*, on the under side of the key, ending in a sloped shoulder, *i*. This shoulder presses against the back or right-hand side of the small recess *h'* in the bottom of the recess *h*, and thereby moves the bolt sufficiently for the purpose designed. A small slide, *m*, arranged in front of the key-hole is lifted by the key in the same manner as the tumbler.

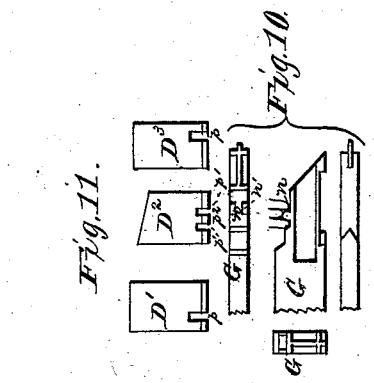
To prevent the tumbler from being lifted by other means than the proper key, there is a slot *n* cut in the lower edge of the tumbler,

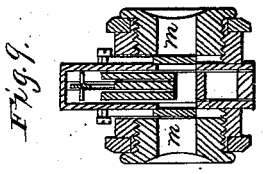
2 Sheets—Sheet 2.

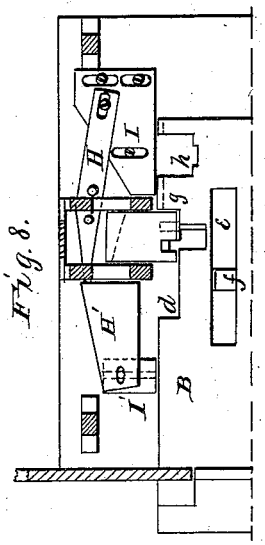
A. W. O. KLEINAU.

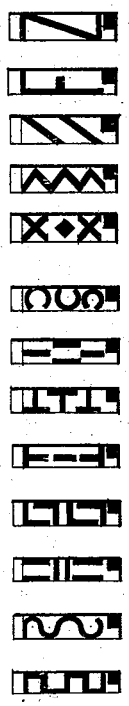
LOCKS AND LATCHES COMBINED.

No. 184,874. Patented Nov. 28, 1876.









WITNESSES

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Fr R Hauer

INVENTOR

August W. O. Kleinau

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Figure 1 is an interior view of my lock, showing the bolt in position when used as a latch. Figs. 2 and 3 are sections of the same. Fig. 4 shows the bolt in the locked position. Fig. 5 is a section of Fig. 4. Fig. 6 represents the key.

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To lock the door, it is necessary to raise the tumbler D out of the recess *d* and above the shoulder d^1. This can be done from the inside by means of a small knob, E′, when the bolt can be moved outward by the knob E as far as the slot *e* and stud *f* will permit. When the bolt has arrived at this point the tumbler will drop down into another recess, *h*, in the top of the bolt, and fasten the bolt. The unlocking may be done from the inside by reversing the operation.

To lock the bolt from the outside, the tumbler D must be lifted by a key, G, consisting simply of a flat piece of iron, beveled at its forward end. This key is introduced through a suitable key-guide and key-hole with the beveled edge upward, so that the end of the key enters as a wedge under the tumbler and lifts the same. To facilitate this the edge of the tumbler is rounded. As soon as the tumbler is completely lifted by the key, the spring C shifts the bolt slightly forward, as much as the slot d^2 will permit, said slot being for that purpose made a little wider than the thickness of the key. The tumbler can then not drop back into the recess *d;* but after the key is withdrawn it rests on the top of the bolt, which can then be moved forward by the knob E until the tumbler drops into the recess *h* and locks the bolt.

To unlock the door, the key G is again inserted and the tumbler lifted; and the bolt must then be moved very little inward, so that when the key is withdrawn the tumbler will not fall back into the recess *h*. This is accomplished by means of a small rabbet, *k*, on the under side of the key, ending in a sloped shoulder, *i*. This shoulder presses against the back or right-hand side of the small recess *h′* in the bottom of the recess *h*, and thereby moves the bolt sufficiently for the purpose designed. A small slide, *m*, arranged in front of the key-hole is lifted by the key in the same manner as the tumbler.

To prevent the tumbler from being lifted by other means than the proper key, there is a slot, *p*, cut in the lower edge of the tumbler, a trifle narrower than the key.

To increase the security of the lock, I have added several devices—as, for example, I show in Fig. 8 the same lock with three tumblers, D^1 D^2 D^3, which have to be lifted at different heights, the key being shaped accordingly, as shown in Fig. 10. The tumblers D^1 and D^3 have each the slot *p*, as above described, for the tumbler D, while the tumbler D^2 has two slots, p^1 p^1, the tongue p^2 remaining between the two, being the point on which the lower step of the key acts. The two small projections *n n′* of the key G pass through the slots

p^1, and then one of them lifts the tumbler D^3. As the second or center tumbler, D^2, remains in a lower position than the two others, a corresponding longitudinal slot is cut in the top of the bolt, as shown by dotted lines at *g*, Fig. 8; otherwise the bolt could not be moved. In case (when the bolt is fully locked) any one of the tumblers is lifted too high by a wrong key or other instrument, it acts at once upon a pivoted lever, H, above it, to move a slide, I, down behind the bolt, to prevent the latter from being pushed back. A weight, H′, at the other end of the lever H, keeps it in its non-acting position. To this weighted end is connected a slide, I′, to prevent the tumblers from being lifted, one by one, by means of a hook or other instrument, because in attempting to do this a certain pressure of the bolt on the tumblers is required to support them in an elevated position, and this slide I′ prevents such pressure from being brought to bear on the tumblers.

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

1. In a lock, the combination of the bolt B, provided with knobs E E′ and recesses *d* d^2 and *h* *h′*, the spring C, having its straight end *a* passed through a part of the bolt, and one or more tumblers, arranged to operate substantially as and for the purposes herein set forth.

2. In a lock having one or more tumblers, falling by gravity into recesses in the bolt, the key provided with an inclined shoulder, *i*, to operate on the bolt to move the same slightly when the tumblers are raised, so that they will be supported by the bolt, substantially as herein set forth.

3. The lever H and slides I I′, in combination with a recessed bolt and one or more tumblers, as and for the purposes herein set forth.

4. The combination of the bolt B, provided with recesses *d h* and slot *g*, the tumblers D^1 D^3, having slots *p*, the tumbler D^2, having slots p^1 p^1 and tongue p^2, and a suitable key, all substantially as and for the purposes herein set forth.

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

AUGUST W. O. KLEINAU.

Witnesses:
AUG. GEORG. HERRM. BEESK,
T. R. WEINER.

2