D. K. MILLER.

LATCH-LOCK.

No. 180,255. Patented July 25, 1876.

Fig 2

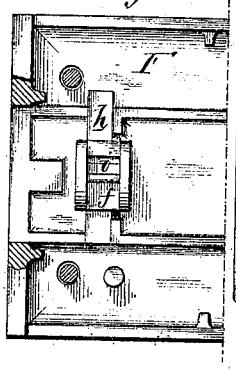


Fig 1

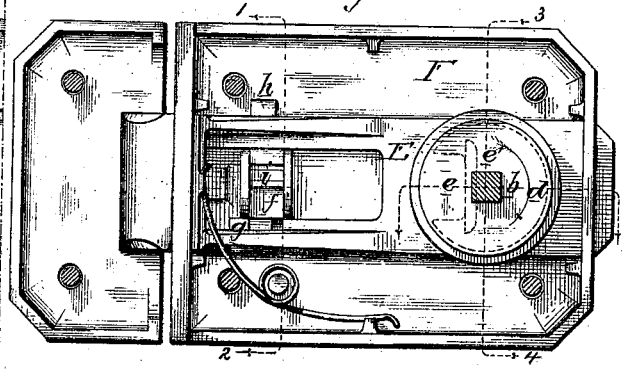


Fig 3

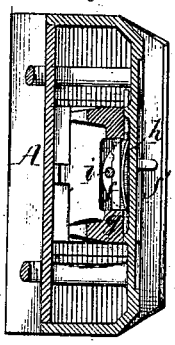


Fig 4

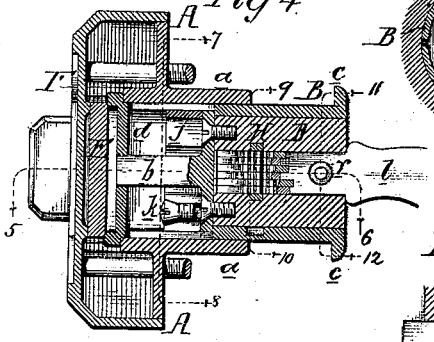


Fig 6

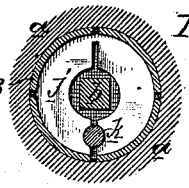


Fig 5.

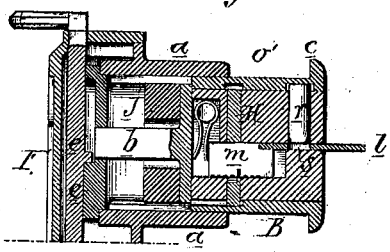


Fig 13

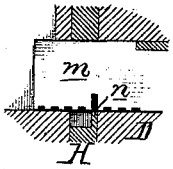


Fig 7

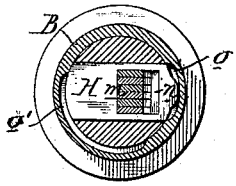


Fig 12

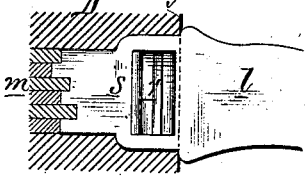


Fig 8

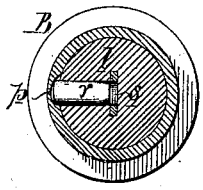


Fig 9.

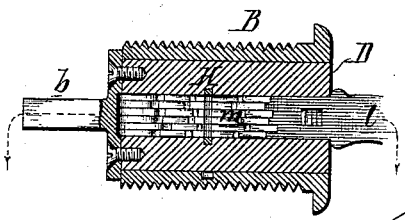


Fig 10.

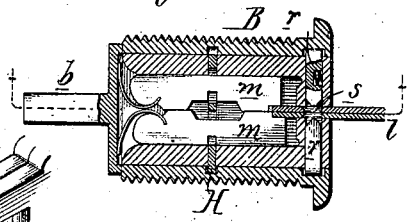
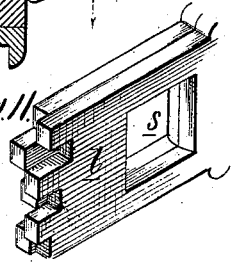


Fig 11.



Witnesses
Harry Hopson Jr
Harry Smith

Daniel K. Miller
by his Attorneys
Howson and Son

# UNITED STATES PATENT OFFICE.

DANIEL K. MILLER, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN LATCH-LOCKS.

Specification forming part of Letters Patent No. **180,255**, dated July 25, 1876; application filed December 11, 1875.

*To all whom it may concern:*

Be it known that I, DANIEL K. MILLER, of Philadelphia, Pennsylvania, have invented certain Improvements in Locks, of which the following is a specification:

The objects of my invention are, first, to so construct a lock that it can be applied to doors, &c., of different thicknesses; and, second, to increase the difficulty of picking the lock by instruments inserted through the key-hole. These objects I attain in a manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figures 1 and 2 are longitudinal sectional views, showing the interior of the lock-case and the mechanism for locking the bolt in either of its extreme positions; Fig. 3, a transverse section on the line 1 2, Fig. 1; Fig. 4, a transverse section on the line 3 4, Fig. 1; Fig. 5, a sectional plan on the line 5 6, Fig. 4; Figs. 6, 7, and 8, transverse sections on the lines 7 8, 9 10, and 11 12, Fig. 4, respectively; and Figs. 9, 10, 11, and 12, sectional views illustrating modifications of my invention.

The face-plate A of the lock is secured to the body of the door in any suitable manner, and is provided near one end with a tubular projection, *a*, and within the latter fits snugly a tubular sleeve, B, which can be moved longitudinally to and fro within the said projection *a*, and can be secured in any desired position, as hereafter described, so that the distance between the plate A and the rim *c* of the sleeve B can be increased or diminished to suit doors of different thicknesses.

Within the sleeve B fits snugly, but so as to turn freely, the cylinder D, which carries the working parts of the lock, as described hereafter, and has at its inner end a square stem, *b*, fitting into an opening of corresponding shape in a disk, *d*, which turns in a bearing on the inner edge of the tubular projection *a* of the plate A, and carries upon its face a lug, *e*, Figs. 1 and 5, which bears against a projection, *e'*, on the bolt E, and causes the latter to reciprocate as the lock-spindle is turned. This bolt E is guided in the casing F of the lock, and is retained in either of its extreme positions by means of a sliding bolt or plate, *f*, which can be so operated by means of its projecting pin *f'*, Fig. 3, that its lower end will project into a recess on either side of a projection, *g*, on the face of the bolt, the longitudinal movement of the latter in such case being prevented. Against the rear of the plate *f* presses a spring, *h*, which forces the said plate against a pin, *i*, the latter engaging with one or the other of two concave recesses formed on the said face, and serving to retain the plate in an elevated or depressed condition, as will be readily understood.

The manner of securing the sleeve B to the projection *a* of the plate A is shown in Figs. 4 and 6, on reference to which it will be observed that the inner end of the sleeve is slotted for a short distance from the end, and to the interior of the sleeve, at this slotted portion, is adapted a split ring, *j*, which can be expanded by means of a taper screw, *k*.

In fitting the lock to a door the plate A is first secured to the inside of the same, the projection *a* extending into an opening formed in the door. The slotted end of the sleeve B is then inserted from the outside into the central opening of the projection *a*, and forced inward until the rim *c* bears against the outside of the door. The split ring *j* is then inserted to its place in the slotted end of the sleeve, pressed up against the end of the cylinder D, and its taper screw *k* turned until the said slotted end of the sleeve has been expanded sufficiently to cause it to bear tightly against the inside of the projection *a*, when any movement of the sleeve is effectually prevented.

The working parts of the lock are carried by the cylinder D, and consist of a series of spring-tumblers, *m*, each having the usual false notches and one deep notch, and arranged to be moved by the key *l*, so as to bring the deep notches in line.

In a transverse opening in the cylinder D slides a dog, H, slotted for the reception of the tumblers *m*, and provided with a projection, *n*, Fig. 13, adapted to the deep notches of the tumblers, the ends of the dog H being adapted to recesses *o o'* formed in the interior of the tubular sleeve B.

When the deep notches of the tumblers are not in line the dog H cannot slide, except to the limited extent allowed by the false notches, so that the cylinder D cannot be turned,

owing to the fact that one end of the immovable dog comes in contact with the end of the slot *o*. When the deep notches are brought into line, however, the cam-like end of the notch *o* will, upon the rotation of the cylinder, so act upon the end of the dog that the latter will slide inward, its projection *n* entering the deep notches of the tumblers, and its opposite end entering the slot *o'*, which is of proper extent to allow a movement of the cylinder D sufficient to operate the bolt.

Near the outer end of the sleeve B, and at one side of the interior of the same, is formed another recess, *p*, to which is adapted one end of a bolt, *r*, sliding in an opening in the cylinder D, and arranged, when the spindle is turned, to be forced into an opening, *s*, in the key, which cannot be withdrawn until the cylinder has been restored to its normal condition.

It will be observed, on referring to Figs. 7 and 8, that the recesses *o* and *o'* are so arranged that a little lost motion is allowed the cylinder D before the dog can be caused to press upon the tumblers, but that the recess *p* is such that it commences to act on the bolt *r* the instant the cylinder commences to turn.

It will thus be seen that when the key-hole is unobstructed the tumblers are entirely free from the pressure of the dog, so that the insertion of an instrument for picking the lock by "feeling" the tumblers is rendered of no account, as this plan is only effective when the dog presses upon the tumblers, and when this is the case in my improved lock the key-hole is obstructed by the bolt *r*, and in addition to this the movement of the tumblers is prevented, owing to the fact that the dog projects into the false notches of the same.

In Figs. 9, 10, and 11 my invention is shown as applied to a lock in which two sets of tumblers and a double key are used, a duplex dog, H, adapted to notches in both sets of tumblers, and sliding bolts *r* being also used in this case.

In the modification, Fig. 12, the key-hole is enlarged slightly at its outer end, in order to allow the employment of obstructing-bolts *r* of the full width of the main key-hole, so that tampering with the lock is rendered still more difficult.

I claim as my invention—

1. The combination of the cylinder D with one or more sliding bolts, *r*, carried by the cylinder, and so operated that when the same is rotated the key-hole will be obstructed, substantially as set forth.

2. The combination of the cylinder D and its sliding bolt or bolts *r* with the perforated key *l*.

3. The combination of the cylinder D and its sliding bolt *r* with the sleeve B and its recess *p*.

4. The combination of the sliding dog H and sliding bolt *r*, carried by the cylinder D, with the recesses *o*, *o'*, and *p* in the sleeve B, said recesses being arranged, in respect to each other, as set forth.

5. The combination of the face-plate A of the lock and its tubular projection *a* with the slotted sleeve B and its expanding-ring *j*, as and for the purpose set forth.

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

DANIEL K. MILLER.

Witnesses:
HARRY HOWSON, Jr.,
HARRY SMITH.