Smith & Vickers,

Padlock.

No. 79,694. Patented July 7, 1868.

Fig: 1.

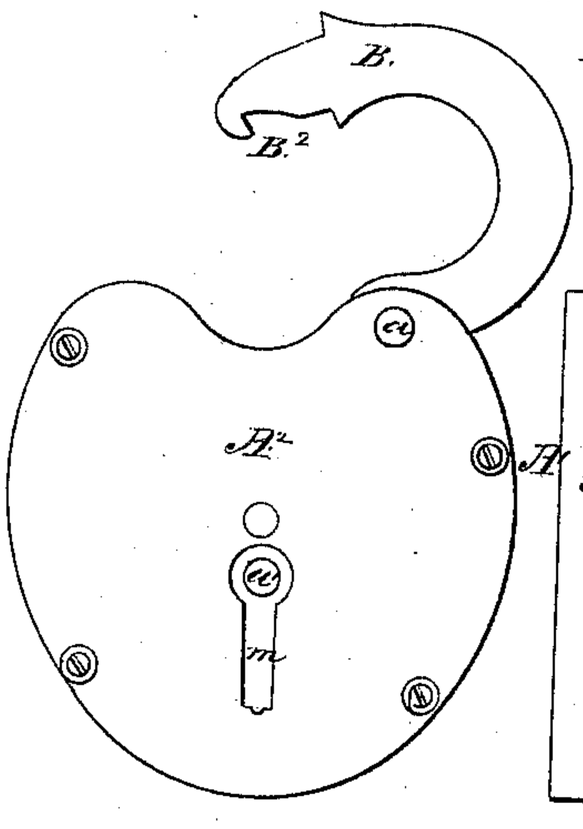


Fig: 2.

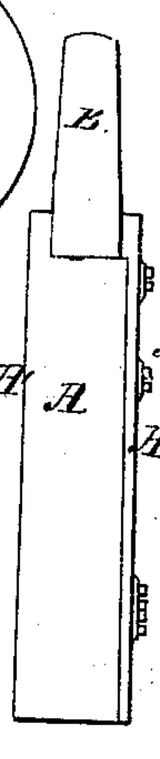


Fig: 3.

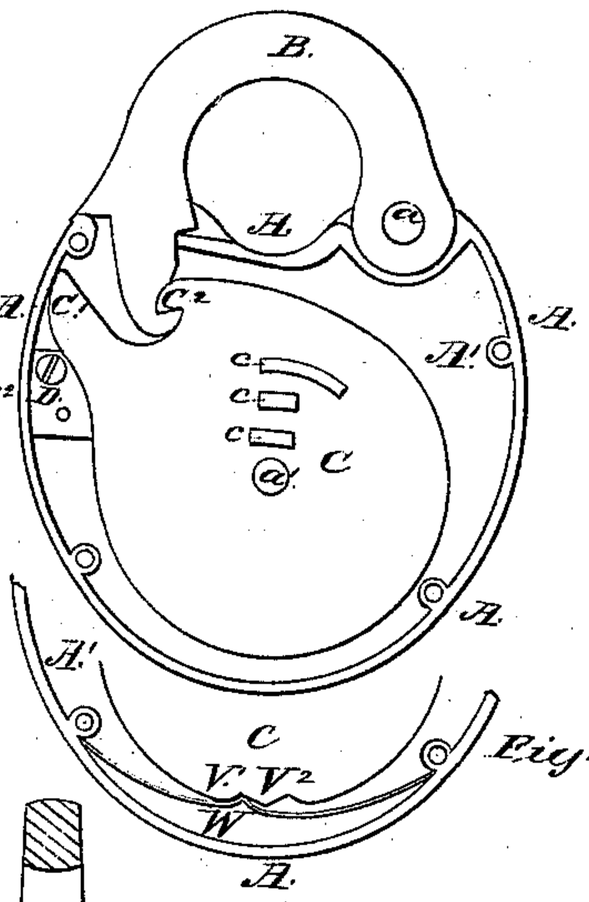


Fig: 3.a.

Fig: 4

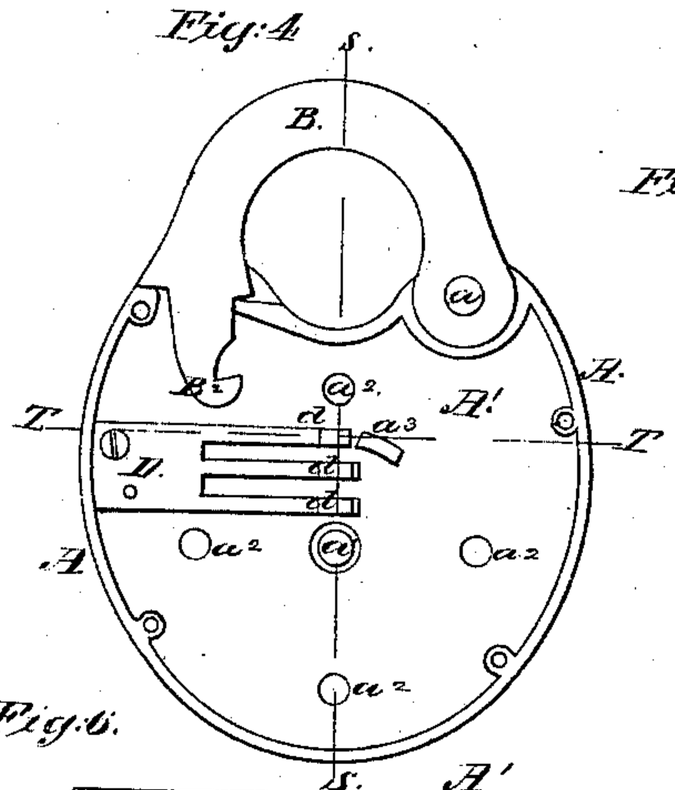


Fig: 6.

Fig: 5.

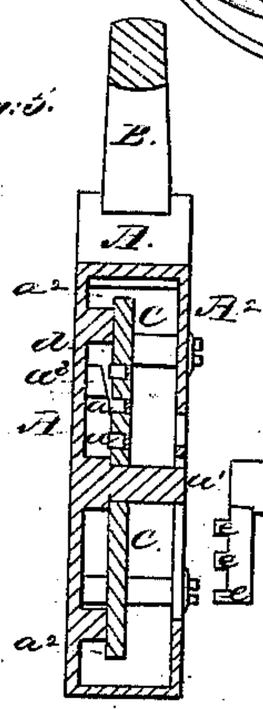


Fig: 5.a.

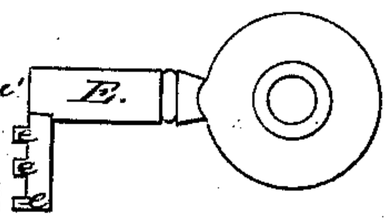


Fig: 7.

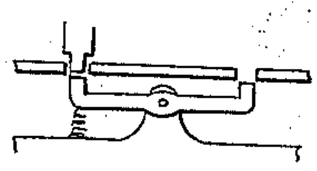
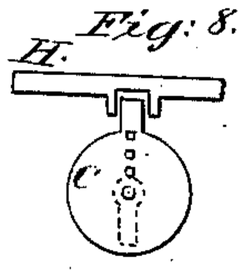


Fig: 8.



Witnesses.
J. M. Adams
C. C. Livingston

Inventors:
A. F. Smith
J. H. Vickers
By their Attorney F. D. Dodson

United States Patent Office.

ALBA F. SMITH AND JOHN H. VICKERS, OF NORWICH, CONNECTICUT, ASSIGNORS TO NORWICH LOCK COMPANY, OF SAME PLACE.

Letters Patent No. 79,694, *dated July* 7, 1868.

IMPROVEMENT IN PADLOCKS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, ALBA F. SMITH and JOHN H. VICKERS, of Norwich, in the county of New London, and State of Connecticut, have invented certain new and useful Improvements in Padlocks; and we do hereby declare that the following is a full and exact description thereof.

Our invention is intended to afford a very efficient and secure padlock, with very simple and cheap mechanism.

We will first describe what we consider the best means of carrying out our invention, and will afterwards designate the points which we believe to be new. The accompanying drawings form a part of this specification.

Figure 1 is a face view of the padlock with the shackle open.

Figure 2 is an edge view with the shackle shut.

Figure 3 is a face view of the works of the lock with the shackle closed, the face-plate of the lock having been removed to show the interior.

Figure 4 is a corresponding view, with a portion of the interior works removed.

Figure 5 is a central vertical section through the entire lock, on the line *s s* in fig. 4.

Figure 5ª represents the key.

Figure 6 is a horizontal section through the entire lock, on the line T T in fig. 4.

The red outlines, Figures 7 and 8, represent constructions which we have contemplated in connection with this invention, but which we do not consider it necessary to describe in detail.

Figure 3ª represents a modification, which may be of such service that we prefer to employ it in every lock. It was omitted in fig. 3 by an oversight. Fig. 3ª represents the lower part of fig. 3 as we prefer to make it, the spring and notches serving to aid very materially in the perfection of the lock. The device can be used, however, with success as carried out in fig. 3, and it will be so described at first.

Similar letters of reference indicate like parts in all the figures.

A is the main casing of the padlock. A^1 is the back plate. A^2 is the front plate. *a* is the centre upon which the shackle B turns. *a'* is the centre-pin on which the key is adapted to turn.

C is a partially-rotating disk which turns on the centre-pin a^1, and is supported at the back on the four short pins or supports a^2, and which constitutes the entire works of the lock, with the addition of certain catches which engage with it, and are detached by the proper key. C^1 is an arm on the disk C, which is struck by the end of the shackle, and partially turns the disk C as the shackle is closed. C^2 is a strong hook on the disk C, which engages with the hook B^2 on the end of the shackle B, and holds the shackle firmly in the locked condition until the disk C is allowed to partially rotate in the opposite direction.

The disk C is held firmly in the locked condition by means of spring-catches *d d d*, which are screwed to the back plate of the lock at the point D. These catches stand in holes in the disk C, indicated by *c c c*, and are of such strength as to be able to resist any violence to which the padlock may be subjected. A post, a^3, is fixed on the back plate of the casing A, and stands in an extension of one of the slots or holes *c*, as shown in fig. 3. Its face is inclined, as indicated in fig. 6. The key E is formed with projections *e*, adapted to enter the recesses *c* after the key has been turned sufficiently around. If a key is introduced not having the projections in proper number and proper place, no effect will be produced, but the right key, on being introduced through the key-hole *m*, and being turned around, presses with its several projections *e* upon the several catches *d*, and thus pushes them back in the holes *c* sufficiently to liberate the disk C. Now a further turning of the key E, and a pulling on the shackle B, or either of these forces alone, will cause the disk C to turn sufficiently to liberate the shackle. After having revolved a little distance, the disk C is arrested by the contact of the hook C^2 against the upper portion of the casing A, and the key is forced forward by riding up on the inclined face of the post a^3. This movement lifts the projections *e* entirely out of the holes *c*, and the key is allowed to revolve freely until it obtains the proper position from which it may be withdrawn. The lock now remains open until the shackle is again closed by turning the disk C back into its original position, a movement which allows the catches *d* to again take a firm hold in the holes *c*.

We have so far described the key as having been urged inward or backward in the lock with sufficient force to depress the catches *d*, by the force of the hand of the operator.

The parts above described are capable of being operated in such manner, and the lock when so operated will possess a portion of the advantages of our invention.

But we will now describe what we consider a very important additional element.

The front plate A^1 of the lock, carries on its rear face a post, a^4, having an inclined face, as indicated in fig. 6, and this is so placed relatively to the other parts, that as the key is turned around into the position where it it is ready to act on the catches *d*, it strikes the inclined face of the projection a^4, and is forced inward or backward by a wedge-like motion, thus insuring the effectual removal of the catches *d*, and the liberation of the disk C by the forcing inward of the key due to this wedge-wise action.

It will thus be seen that with this adjunct of the lock proper, the operator has simply to introduce the key through the proper key-hole and turn it around, without exercising any force whatever to depress or force in the key. The inclined face a^4 throws the key backward in the lock, at the proper position to depress the catches *d*, and the inclined face a^3 throws the key forward again so soon as it has turned the disk C to a sufficient extent to liberate the shackle.

We can make any number of catches *d*, from a single plate of steel, hard brass, or other suitable material, and the expense of the construction of our lock is less, and the liability to derangement is, we think, less than in any other equally strong and secure lock. Our catches *d* are not easily reached through the key-hole, except by means of a key turning as specified, and our key may be narrow and the key-hole small.

We esteem it an important feature of our lock that the key continues to turn and is thrown forward by riding up on the face of the post a^3, or some equivalent means, so that the projections *e* on the key are thrown out of the holes *c* as represented. The key is always turned in the same direction, the locking motion being effected without the aid of the key. One complete revolution of the key opens the lock, and allows the key to be removed and returned to the pocket.

Fig. 3ª shows a still preferable construction of the lower part of the lock. In this construction two notches, V^1 and V^2, are made in the disk, as shown, and a spring, W, having a short turn or angle as represented, is introduced between the casing A and the edge of the disk C, at this place. When the disk C is in the locked position, the angle of the spring stands in the notch V^1; when it is in the unlocked position, it stands in the notch V^2. This spring thus arranged holds the disk at one extreme or other of its motion, tends to induce a prompt action of the disk in changing from one position to the other, and while it costs a very little, say only one-fourth of a cent for each lock, may be made the means of avoiding expense at the upper side by doing away with the necessity for adapting the inside of the case at the top to arrest the motion of the disk after its unlocking movement.

The notches V^1 V^2 may sufficiently arrest the motion at each extreme of the motion.

We can increase or diminish the number of catches *d* at pleasure, and we can vary their position sufficiently so that instead of being in a direct line, as here represented, they may be placed irregularly, and instead of being spaced at equal distances apart, two or more may be close together. We may thus vary the construction indefinitely, taking care to vary the position of the other parts to correspond. We can without greatly complicating the work introduce wards on the front plate A^2 or on the disk C, taking care to arrange them so that they shall not arrest the pins *e*.

Fig. 7 represents in outline the arrangement which has been above referred to, where double catches mounted on their centres, and turning, operating like levers, are employed, in lieu of the simple catches *d*.

Fig. 8 represents the construction of disk C and its adjuncts as applied to a door-lock, trunk-lock, or other sliding-bolt lock. H represents the sliding-bolt. In such a lock the key would be employed both to lock and unlock.

We can, if it is deemed expedient, arrange the catches *d* in the form of levers, with two series of holes and two series of catches, one at each end of each lever. This will have the effect, that if one of the catches be depressed much beyond the proper limit by the introduction of a false key or otherwise, the catch on the other end of the lever shall catch in the corresponding hole, and prevent the turning of the disk C. We do not, however, consider such complications generally desirable, and prefer for ordinary uses the extremely simple and efficient form of lock here represented.

Some of the advantages due to several features of our invention may be separately enumerated as follows:

First, by reason of the fact that our catches *d* apply in the holes *c*, in our disk C, in the manner represented, at a point concealed and measurably protected by the front plate A^2, so that the proper key E *e*, can only reach to detach them by being inserted through a key-hole, E′, at a distance, and turned around as represented, we are all able to produce a very secure and strong lock, with a very simple construction, and with little expense for materials or workmanship; while, by reason of the fact that the incline, a^3, throws the key out of the holes *c* so soon as the unlocking is effected, our key may be turned continuously around after the unlocking is effected, and the lock may be operated with very little skill or care.

Second, by reason of the fact that the incline a^4, on the back of the front plate A^2, forces the key backward to the proper extent, when just opposite the holes *c*, we are certain that the catches *d* will be detached in turning the proper key around in the lock, without the necessity for exerting any force by the hand to press the key back in that part of its revolution. And by reason of the fact that the spring W is formed with an angle, as shown, and adapted, as represented, to the notches V^1 V^2, we insure the retention of the disk in its position at either extreme of its motion, so long as the lock stands at rest, and insure its prompt action to complete its motion, however sluggishly the key may be turned.

Having now fully described our invention, what we claim as new, and desire to secure by Letters Patent, is as follows:

1. The incline a^3, arranged as herein specified, and adapted to throw the key forward out of the holes c, so soon as the unlocking movement is completed, substantially as and for the purposes herein specified.

2. The within-described inclined projections a^4 on the back face of the front plate A^2, arranged as represented, relatively to the key E e and catches d, for the purpose herein specified.

ALBA F. SMITH,
JOHN H. VICKERS.

Witnesses:
JOSEPH SELDEN,
FRANK A. SMITH.