2 Sheets—Sheet 1

F. EGGE.
Padlock.

No. 207,407. Patented Aug. 27, 1878.

Fig 1

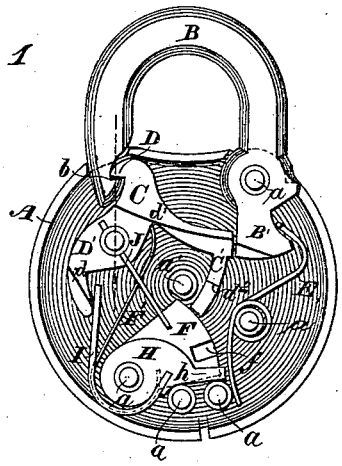


Fig 3.

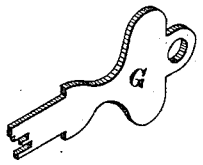
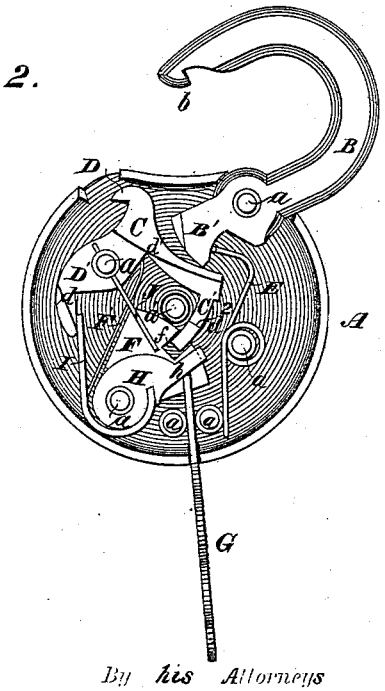


Fig 2.



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2 Sheets—Sheet 2.

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Fig 4

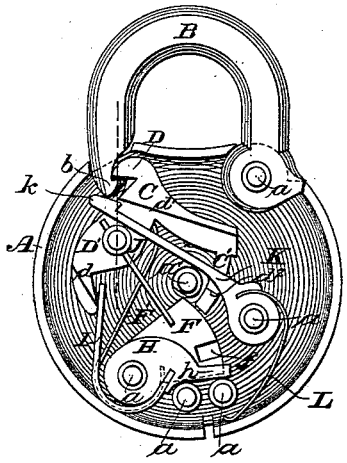
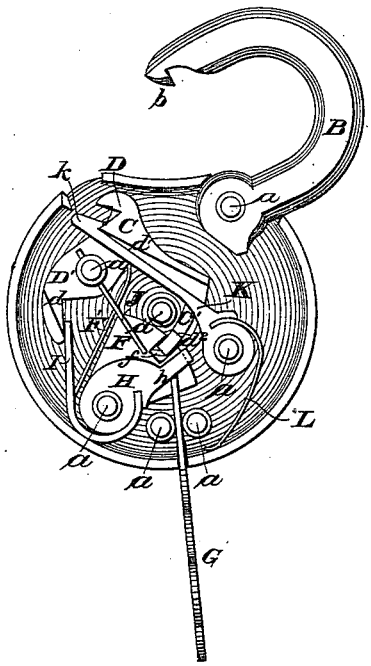


Fig 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

FREDERICK EGGE, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE SMITH & EGGE MANUFACTURING COMPANY, OF SAME PLACE.

IMPROVEMENT IN PADLOCKS.

Specification forming part of Letters Patent No. **207,407**, dated August 27, 1878; application filed January 12, 1878.

To all whom it may concern:

Be it known that I, FREDERICK EGGE, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Padlocks, of which the following is a specification:

My invention mainly relates to a padlock of the class having slotted or notched oscillating spring-tumblers and a pivoted bow or shackle, provided with a heel or extension projecting into the lock case or shell, and resembling in some respects the locks shown and described in Letters Patent of the United States issued to Friend W. Smith and myself December 23, 1873, and September 4, 1877, respectively numbered 145,853, 194,848, and 194,849.

My objects are to render more secure and generally to improve the lock; and my improvements consist in certain novel combinations of devices, and in peculiar constructions of parts, which will hereinafter specifically be designated.

In the accompanying drawings, Figure 1 is a plan or face view with one section of the lock-case removed to show the works and interior construction, with the parts in the locked positions; Fig. 2, a similar view with the parts in the unlocked positions, the shackle opened, and the key in place to unlock. Fig. 3 is a view, in perspective, of the key. Fig. 4 is a view, similar to Fig. 1, of a slight modification of my invention; and Fig. 5, a view similar to Fig. 2 of the same.

The lock case or shell A is made in sections, and united by a number of suitably-located rivets, *a*, about as described and shown in the before-mentioned Letters Patent. By the construction and arrangement of parts hereinafter described, I am, however, enabled to employ a central rivet, *a'*, and thus materially strengthen the connection between the sections of the case at a point where strength is very desirable, without in any way interfering with the free working of the parts. A shackle or bow, B, is pivoted, as in said patents, upon one of the rivets *a*. The shackle-nose *b* is formed with a suitable notch or shoulder to engage with and securely be held by a dog or detent, C, when locked. This dog, both of itself and in combination with other parts of the lock, constitutes a very important feature of my invention. It is pivoted so as to be capable of rocking on one of the rivets *a*, so as to cause its heel end or tail to move toward or away from tumblers, and is formed with a hook or lug, D, to engage the shackle-nose, a lever or arm, D', by which it is mounted on its pivot beneath the shackle-nose-engaging hook, and a tail-piece, C', to engage the slots or notches of suitable tumblers when in the unlocking and unlocked positions, as will hereinafter be described.

The shackle B has a short arm or extension, B', at its heel beyond or below the pivot *a*, and projecting into the shell. A spring, E, serves to throw open the shackle when its nose is released by unlocking and to hold the shackle open.

Oscillating spring-tumblers F, preferably substantially such as shown and described in the before-mentioned Letters Patent, and used in any desired number, are provided with slots *f*, and operated by a key, G. The tumbler-springs F' bear at their outer or free ends against the inner part of the dog-lever D', above its pivot, and at or near the juncture of the lever and main arm or part of the dog C. These springs, as will be seen, act upon the dog with a tendency to hold it in the locked position, and in engagement with the shackle-nose.

For the purpose of operating the dog C to unlock, I employ a lever, H, shown as mounted upon the same axis as the tumblers, and carrying a spring, I, which is secured at one end to the lever, and acts at its opposite or free end against the lowermost point or inner end of the dog-lever D'. This spring is stouter than those, F', of the tumblers—that is, it is capable of being made to exert a force upon the dog-lever sufficiently great to rock the dog upon its pivot against the action of the tumbler-springs. The spring-actuating lever H has a projecting end, *h*, to be operated upon directly by the key at the same time it actuates the tumblers. The spring, it will be seen, passes around the rounded end of the lever, and is secured to it between the pivot and arm

h. This lever, it will be observed, serves also as a washer to fill up the space between the top tumbler and the lock-case, and hold the tumblers in place.

The hooked dog C, its lever D′, and tail-piece C′ are all made in one piece, or rigidly connected together, and are, by preference, recessed or cut away between the shoulder *d* at the lever end and the shoulder d^1 of the dog, as well as between this latter raised portion of the dog and the shoulder d^2 on that part of the tail-piece which engages the slots of the tumblers. In this way I am enabled to employ a finger or small rod, J, preferably somewhat springy or slightly yielding, in the space thus provided, to bear upon the tumblers, as an additional precaution against their displacement, and keep the tumbler-springs in place. Besides this, the space thus provided between the works and lock-case lessens the liability of injury to the working parts by indenting or battering the case at this point.

In unlocking, the operation is as follows: The key being inserted and pushed against the tumblers and spring-carrying arm H, simultaneously, increases the strength or accumulates power in the spring I to such extent that by the time the tumbler-slots have been brought to register with each other and be in position to be engaged by the tail-piece of the dog, this spring overcomes the tumbler-springs and rocks the dog, thus moving its heel toward the tumblers to cause the tail-piece to enter the slots of the tumblers, as shown in Fig. 2, and release the shackle-nose, which is thrown out by the action of the spring E on the shackle-heel, which passes above and rests upon the dog. When the key is withdrawn or its pressure upon the tumblers ceases, the spring-lever rocks backward upon its pivot, thus relieving the spring I from strain, and the tumbler-springs then act with sufficient force upon the dog-lever to throw up the tail end or heel of the dog, and thus rock the dog to the locking position as soon as the shackle-heel (or any other suitable and equivalent dog-holding device) is rocked out from its position over the dog by pressing the shackle-nose in place.

The relative arrangement of the dog, the shackle-nose, the tumblers, and the shackle-heel is such, as shown, that strain upon the shackle does not cause the tail-piece of the dog to approach or bear upon the tumblers, but, on the contrary, has a tendency to draw the tail-piece farther from the tumblers.

A line drawn centrally and vertically through the dog-fulcrum or rivet *a* would pass slightly to the left (to that side away from the dog tail-piece) of the point of contact of the shackle-hook and dog-hook. (See dotted lines, Figs. 1 and 4.) Strain on the dog through the shackle-nose thus tends to rock the tail-piece away from the tumblers, and this tendency may be greater or less, according to how much to the right of the vertical plane of the dog pivot-center the contiguous surfaces or contact points of the dog-hook and shackle-hook are. When the shackle is locked the dog is disconnected from and is positively kept isolated from the tumblers. Obviously, the point of contact of the dog-hook and the shackle-nose hook or shoulder may be directly over or in the vertical plane of the dog-pivot center, so that the line of strain by a pull on the dog would be in said plane, and thus prevent the binding of the tumblers by the rocking of the tail-piece toward or against them.

At no time, except when in the unlocked and unlocking position, does the dog come in contact with the tumblers. It is impossible to feel the tumblers by manipulating them and the shackle. The dog-heel, or that end next the shackle-extension, does not touch the shackle-heel when locked, but lies so close to it that were force exerted upon the dog to move it endwise, it would soon bear upon the shackle-heel and prevent disengagement of the shackle-nose with the dog. Practically, the shackle-heel is dogged. The spring-lever H constitutes what may be termed a "false tumbler," without the operation of which by the key simultaneously with the registering of the tumbler-slots it is impossible to unlock the lock. The operations of the spring-lever and tumblers are entirely independent; but both are necessary to the operation of unlocking, and both are controlled by the key. The single dog, it will be seen, operates directly upon the shackle both in locking and unlocking, and serves to guard both at nose and heel against the rocking of the shackle. Ample room is provided for the rivet *a*′ between the dog and tumblers, and the case thus greatly protected against battering or indenting at an important point.

Obviously, my lock may be modified in some respects without departing from the spirit of my invention. For instance, instead of a flat thrust-key, a turning-key might be employed to operate the tumblers and dog-actuating lever; the shackle-heel might be dispensed with, and a supplementary dogging device employed to operate upon the dog and hold it in proper position when unlocked; or the shackle-heel, or its equivalent dog-holding device for controlling the dog when unlocked, be omitted, and a yielding stop—such, for instance, as shown in Figs. 4 and 5—acting in connection with the shackle-nose, be provided to limit the outward throw of the dog-hook D, and hold it against being thrown too far across the path of the shackle-nose by the tumbler-springs when unlocked, thus leaving it in position to be operated by the nose and engaged therewith in locking by pressing down the nose to rock the dog first slightly inward and then be engaged by its hook. The spring-lever H might be mounted on a separate pivot from the tumblers, or even dispensed with, so as to have the key operate directly upon the end of the spring itself, which might be provided with a proper bearing, or suitably fulcrumed,

with its lower end crossing the path of the key. In some cases, especially where a barrel or turning key is used instead of a thrust-key, a lever without any spring might be used, in place of the spring-lever or spring and lever H, for operating the dog C. Instead of the tumbler-springs F′ doing double duty—that is, acting on the dog-lever D, as well as upon the tumblers—a separate spring or springs independent of the tumbler-springs might be used to bear on the dog, and answer the same purpose in operating it as those F′. Reciprocating tumblers might be substituted for the pivoted ones shown, with suitable guides or controlling-ways for such tumblers and springs, independent of the dog-actuating spring or springs, operating upon them with a tendency to keep them in their normal positions, and yet admit of their being adjusted by the key to be engaged by the tail-piece of the dog.

In the modification shown by Figs. 4 and 5 the lock is the same both in construction and operation in all essential respects as that before described, and preferred by me, (shown in Figs. 1 and 2,) except that the shackle-heel B′ and its spring E are dispensed with and a substitute employed, consisting of a yielding stop-lever, K, pivoted upon one of the rivets, *a*, and provided with the spring L and hooked outer end, *k*.

In unlocking, the spring-lever throws up the shackle-nose, and when unlocked the dog is held with its tail-piece in the tumbler-slots by the engagement of the hook *k* with the dog.

Upon closing the shackle the lever is rocked by the dog-nose slightly upon its pivot against the pressure of its spring L, its hook is forced downward, and the shackle-nose automatically engages with and is locked by the dog.

I claim as of my own invention—

1. The combination, substantially as hereinbefore set forth, of a hooked or shouldered shackle, a rocking dog provided with a hook to engage the shackle-hook when locked, and having a tail end or heel moving toward tumblers in unlocking, and a pivot upon which the dog is fulcrumed, the vertical central plane of which pivot passes slightly to that side of the point of contact between the shackle-nose and dog-hook opposite the side on which the dog-heel is located, whereby the dog-heel cannot be moved in the direction of the tumblers by strain upon the shackle, as set forth.

2. The combination of the shackle, the hooked rocking dog, having a tail-piece, the dog-pivot arranged relatively to the dog-hook and shackle, as described, and the oscillating slotted tumblers, these members being constructed and operating substantially as hereinbefore set forth, whereby the shackle is locked by the dog, the dog held out of contact with the tumblers and prevented from being moved toward them by strain on the shackle, and in unlocking the dog simultaneously engages the tumblers and releases the shackle.

3. The combination, substantially as hereinbefore set forth, of the dog having a hook engaging the shackle when locked, and a heel moved toward the tumblers in unlocking, but held away from them in the locked position, the lever adapted to be operated directly by the key, and its spring acting on the dog to cause the release of the shackle and rock the dog-heel toward the tumblers when they are brought into the unlocking position.

4. The combination of the shackle, the single-pivoted dog provided with a tail-piece isolated from the tumblers, the tumbler-springs, and a spring acting with a variable pressure upon the dog in opposition to the tumbler-springs, and controlled by the key in unlocking, substantially as hereinbefore set forth.

5. The combination, substantially as hereinbefore set forth, of the dog, the tumbler-springs, and the lever adapted to be operated directly by the key and its spring, whereby the shackle is released by the action of the lever-spring upon the dog, and the dog held in the locked position by the direct action of the tumbler-springs.

6. The combination, substantially as hereinbefore set forth, of the dog, the tumblers, and the lever adapted to be operated independently of and simultaneously with the tumblers by the direct action of the key to release the shackle.

7. The combination of the pivoted shackle, the single rocking hooked dog engaging the shackle-nose and provided with a tail-piece, the slotted tumblers, their springs, the lever mounted on the tumbler-pivot, and its spring, these members being constructed and operating substantially as hereinbefore set forth.

8. The combination of the oscillating slotted tumblers, the pivoted shackle provided with a notched or hooked nose and a heel-extension, a spring bearing upon said heel, and the hooked dog provided with a tail-piece to engage the tumbler-slots, and located above the tumblers and between the heel and nose of the shackle, whereby the single dog, when in the locked position, serves to hold the shackle-nose and guard the heel-extension, and when unlocked the dog is held with its tail-piece in the tumbler-slots, as set forth.

9. The pivoted dog made in a single piece, with a hook, D, to engage the shackle-nose, a tail-piece, C′, to engage the tumblers, and an arm, D′, serving to pivot it, and as a lever to which to apply force to rock the dog to release the shackle, substantially as hereinbefore set forth.

10. The relative arrangement of the dog provided with the tail-piece, the oscillating tumblers, and the central rivet passing through the lock-shell, as hereinbefore set forth, whereby the tumblers and tail-piece are protected from injury by indenting the shell.

11. The combination, substantially as hereinbefore set forth, of the cut-away dog, the

tumblers, their springs, and the finger to hold down said springs and aid in keeping the tumblers in place.

12. The combination of the lock-shell, the oscillating tumblers, and the lever H, mounted upon the pivot of the tumblers, and serving both as a washer to hold the tumblers down to their place, and as a means of actuating the dog by the key independently of the tumblers, substantially as hereinbefore set forth.

In testimony whereof I have hereunto subscribed my name.

FREDERICK EGGE.

Witnesses:
F. W. SMITH,
CHARLES S. CANFIELD.