J. Nock,

Trunk Lock.

No. 86,778. Patented Feb. 9. 1869.

Fig. 1.

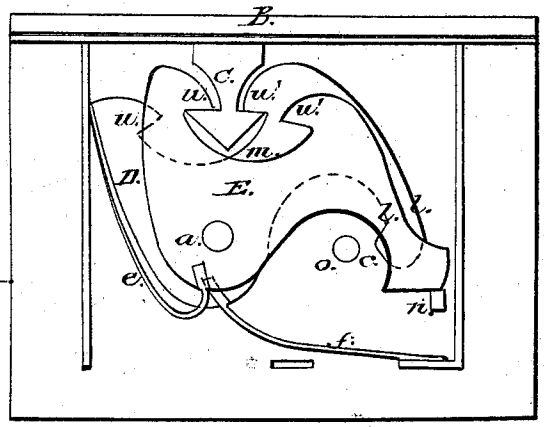


Fig. 2.

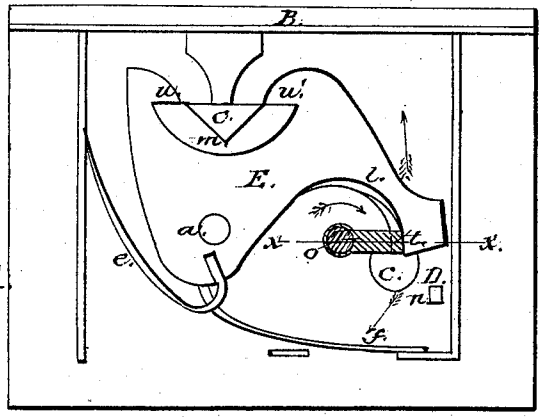


Fig. 3.

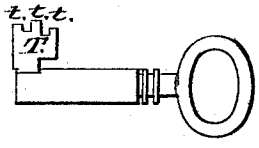
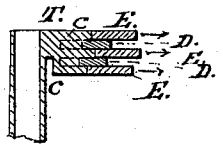


Fig. 4.



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United States Patent Office.

JOSEPH NOCK, OF WASHINGTON, DISTRICT OF COLUMBIA.

Letters Patent No. 86,778, *dated February* 9, 1869.

IMPROVEMENT IN TRUNK-LOCKS.

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

To all whom it may concern:

Be it known that I, JOSEPH NOCK, of Washington, in the county of Washington, and District of Columbia, have invented certain new and useful Improvements in Trunk-Locks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, making part of this specification, and to the letters of reference marked thereon, like letters indicating like parts wherever they occur.

To enable others skilled in the art to construct and use my invention, I will proceed to describe it.

My invention consists in a novel construction and arrangement of the tumblers, whereby the lock is rendered very secure and strong, as hereinafter more fully explained.

Figure 1 represents my improved lock, with one side of the case removed, with the tumblers in position, as when locked, and the key removed;

Figure 2 is a similar view, showing the position of the tumblers and key, when the lock is ready to open;

Figure 3 is a side view of the key; and

Figure 4 is a cross-section of the tumblers and key, taken on the line *x*–*x* of fig. 2.

My improved lock belongs to that class known as "spring-locks," which are fastened by the simple act of closing them.

In constructing it, I provide a case, A, of the usual form, in which the tumblers are located, as represented in figs. 1 and 2.

The hasp consists of a solid piece, C, which has a notch formed in its two sides, for the tumblers to lock or hook into, and may be either cast solid with, or otherwise secured to a bar, B, which is screwed fast to the lid, or cover, of the trunk; the form of these parts being also shown clearly in figs. 1 and 2.

The tumblers consists of plates, of metal, having a recess, *m*, cut in their upper edge, of such a form as to leave two hooks projecting inward from opposite sides, as represented by *u* and *u'*, in figs. 1 and 2, the recess *m* being of sufficient depth to permit the point or head of the hasp C to enter far enough to have the hooks *u* and *u'* enter the notches in the opposite sides of the hasp; and the points of the hooks *u* and *u'* being at such a distance apart as to permit the head of the hasp to enter freely between them, without touching, as shown in fig. 2.

The tumblers are all provided with a hole directly below the centre of the recess *m*, to receive a stud or pin, *a*, on which they are all hung, and on which they turn freely.

The tumblers are formed in two sets; one set, E, being arranged to lock into one side of the hasp, and the other set, D, into the opposite side, as shown in fig. 1, they being made to assume these positions by means of springs *f* and *e*, one end of which is secured permanently to the tumblers, and their other end bearing loosely against the side walls of the case A, as represented in the drawings.

The tumblers are all provided with a curved arm, *l*, for the key to operate against, in opening the lock, and the rear end of these arms *l*, in the set D, are also provided with an inward projection, *c*, as shown more clearly in fig. 2.

There may be any number of these tumblers used; there being five in the present instance, as shown in fig. 4.

All those composing the set D may be made precisely alike, while those composing the other set, for greater security, should have the curve on the under side of their arms, *l*, against which the key presses in opening the lock, varying somewhat in form, so that, in order to bring them all into the required position to release their hooks *u* from the hasp C, the key will have to be made with projections, *t*, of varying lengths, as represented in figs. 3 and 4.

A stud, or stop, *n*, is located in the case, in such a position as to have the end of the arms *l*, of the tumblers E, rest upon it, when the hasp C is either entirely in or out, and thus prevent the springs *e* from turning those tumblers so far over, back, as to prevent the hasp from being forced in between the hooks *u* and *u'*, to close the lock; this position of the tumblers E being represented in fig. 1, and the upper inner edges of the hooks *u* and *u'* being bevelled, or inclined, as is also the point of the hasp C, to permit the latter the more readily to enter the recess *m*, in closing the lock.

In placing the tumblers on the pin *a*, I prefer to have them alternate, as represented in fig. 4, slipping on, first, one of the set E, next, one of the set D, and so on alternately, the springs *f* being so arranged as to press all of the set D backward, thereby causing the hook *u'*, on them, to engage with the hasp C on one side, while the springs *e* press all of the set E forward, thereby causing the hook *u*, on them, to engage in the opposite side of the hasp, as represented in fig. 1,

It is obvious, however, that this arrangement may be varied by changing the relative position of the tumblers, and that, whenever a change is thus made, a differently-formed key will be required to open the lock; the number of changes that can thus be made in a five-tumbler lock being one hundred and twenty; the number of changes increasing, in accordance with the well-known principle of permutation, with each addition to the number of tumblers employed.

It will thus be seen that, with a lock thus constructed, in case any other than the rightful party should, by any means, become possessed of the key, the owner has but to change the position of the tumblers, and it cannot be opened by the original key, the lock, in the mean time, having another key fitted to correspond with the changed position of the tumblers, being as ready for use, and as safe and effective as before.

It is also apparent that with a set of tumblers thus formed, a great number of locks may be made, all precisely alike, except in the arrangement of the tumblers on the pin *a*, and yet each will require a different key to open it.

In order to open the lock, the key is inserted, and turned to the position represented in fig. 2, the curve on the under edge of the tumblers E being such that, as the key turns, its projections *t* will strike against the under edge of said tumblers, and throw them forward far enough to disengage the hooks *u* from the hasp C, the tumblers D remaining stationary until the key comes in contact with the projections *c*, which draws them back far enough to disengage their hooks *u'* from the notch in the opposite side of the hasp, when the latter may be withdrawn, and the trunk opened.

If, however, the key be turned beyond this point, the tumblers D will be moved so far that their hooks, *u*, will be caused to engage with the hasp on that side, and thus prevent the lock from being opened, while, on the other hand, if it be not turned quite to that point, the hooks *u*, on the tumblers E, will not be released, and then they will prevent the lock from being opened.

It will thus be seen that it will be impossible to pick this lock by the means ordinarily used for that purpose, for the reason that if the tumblers D be moved at all beyond the required point, or if the tumblers E be moved either too little or too much, in either case, the lock is just as securely fastened as though they had not been stirred at all.

By this method of construction, I am enabled to produce a lock that is strong, durable, cheap, efficient, and at the same time unusually secure.

Having thus described my invention,

What I claim, is—

The combination of the tumblers D, provided with the spring *f*, and projection *c*, with the tumblers E, constructed as shown, and having the spring *e* attached, said tumblers being pivoted on a common axis, and so arranged as to be operated by a key having a "bit," or projection, on one side only, all substantially as herein set forth.

In testimony that I claim the foregoing improvement in trunk and chest-locks, I have hereunto set my hand, this 25th day of May, 1867.

JOSEPH NOCK.

Witnesses:

SAMUEL HARRIS,

THORNTON SMITH.