

(Model.)

E. W. BRETTELL.

TRUNK LOCK.

No. 301,559.

Patented July 8, 1884.

Fig. 1.

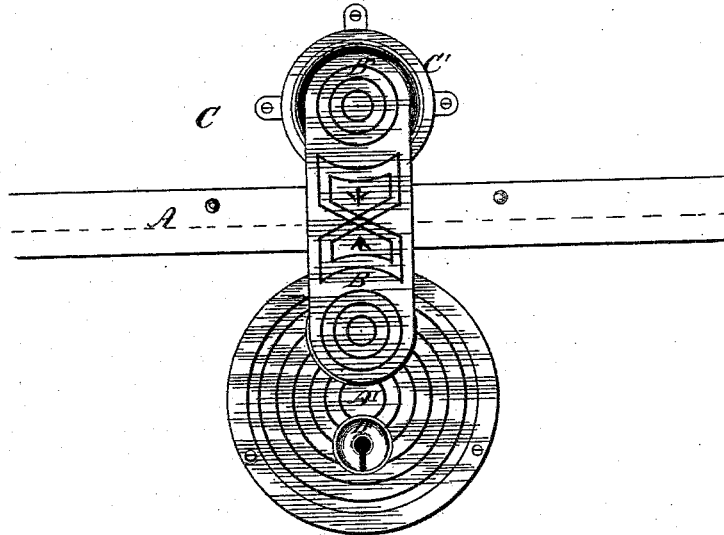


Fig. 2.

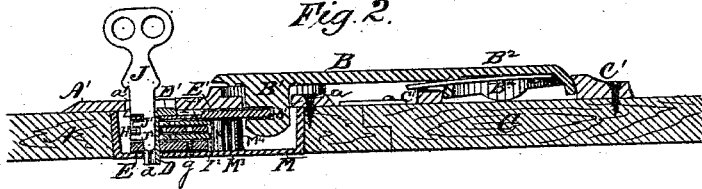
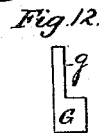
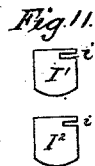
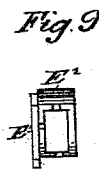
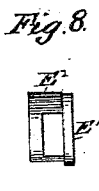
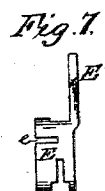
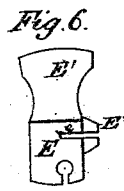
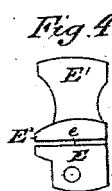
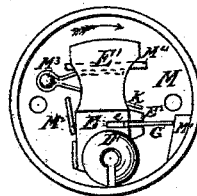


Fig. 3.



WITNESSES—
B. E. Stafford.
Charles R. Searle.

INVENTOR—
Edward W. Brettell
by his attorney
Thomas D. Stetson

UNITED STATES PATENT OFFICE.

EDWARD W. BRETTELL, OF NEWARK, NEW JERSEY.

TRUNK-LOCK.

SPECIFICATION forming part of Letters Patent No. 301,559, dated July 8, 1884.

Application filed June 12, 1883. (Model.)

To all whom it may concern:

Be it known that I, EDWARD W. BRETTELL, of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Locks, of which the following is a specification.

Some parts of the invention may apply to padlocks, mortise-locks, and the whole line of ordinary and extraordinary locks; but I will describe the entire invention as applied to secure a trunk. I make a peculiarly strong spring-hasp with a flattened ball-joint capable of yielding both facewise and longitudinally of the trunk. The catch of the hasp is recessed on the lower side to receive a member of the lock, serving as an equivalent of the bolt. This is carried on a partially-revolving part, which I term the "tumbler-case," carrying the tumblers, and also a member, which I term the "bridge," by means of which the key engages with the tumbler-case after the tumblers have been set in the proper position, and turns the tumbler-case to move the arm or bolt and liberate the hasp in unlocking, and also moves it back again to effect the locking. The tumbler-case also holds in a plane transverse to the tumblers a sliding piece, which serves as an oscillating fence, considerably too long to be held entirely in the tumbler-case. One end of this fence strikes a fixed surface or stump when the lock is unlocked and throws the fence to the left. The other end of the fence touches another fixed surface or stump when the parts are moved into the locked position and throws the fence to the right. This latter movement cannot be effected unless the proper key is used, so that the tumblers are set in the correct position. I use a flat key and insert it in a slotted cylinder, which serves as a central pivot, on which the tumbler-case and its attachments are vibrated or oscillated. When the tumblers are correctly set, an especially-provided portion of the key bears against a corner of what I term the "bridge-piece," mounted in the case. The bridge-piece is flat, and lies parallel to and preferably between the tumblers. It has no motion, except to turn, rock, or oscillate with the tumbler-case. A single spring of sufficient breadth performs the functions of inducing a sufficient friction on the tumbler-

case and its connections, which aids in holding it against any disturbing force, and pressing down the two or more tumblers employed.

The following is a description of what I consider the best means of carrying out the invention:

The accompanying drawings form a part of this specification.

Figure 1 is a general exterior view showing a portion of a trunk with the lock and hasp in place thereon. Fig. 2 is a central vertical section through the same parts. The succeeding figures represent details detached. Fig. 3 is a front view showing the principal works of the lock proper with the outer case removed. Fig. 4 represents the tumbler carrier or case with its arm, which, with the hasp, constitutes the bolt. Fig. 5 is an edge view of the same parts seen from the left. Fig. 6 is a rear view of the same parts. Fig. 7 is an edge view of the same parts seen from the right. Fig. 8 is a view of the same parts seen from below. Fig. 9 is the same parts seen from above. Fig. 10 is a face view of the bridge. Fig. 11 is a face view of the tumblers. Fig. 12 is a side view of the fence. Fig. 13 is a central section through the cylinder.

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

A is a portion of the trunk-body, of wood or other suitable material.

A' is the front plate of the lock-case.

M is the box for holding the works of the lock. Certain parts cast therewith will be designated, when necessary, by additional marks of reference, as M' M". The parts A' and M are held rigidly together by screws inserted in stumps cast on the inside of the front plate, as will be obvious. The front plate, A', has two circular holes, *a a'*. The hole *a* receives the catch of the hasp. The hole *a'* receives the smoothly-rounded head of the cylinder, which latter receives the key.

B is the hasp, certain portions thereof being designated, when necessary, by additional marks, as B' B", &c.

B' is the catch, deeply notched on its under face, as indicated by *b'*.

B" is a smoothly-cast spheroidal head engaged in a corresponding spheroidal cavity in

a socket-piece, C', which is riveted or otherwise strongly secured to the trunk-cover C. The main body of the hasp B is inserted through the socket-piece C' from the back before the latter is secured. The spheroidal head B² is too large to go through. It remains engaged in the smoothly-finished circular orifice, constituting a ball-joint with a limited amount of motion. A spring, B*, riveted in the back of the head B², bears against the front of C', and exerts a gentle but constant force to throw the hasp out of engagement with the lock below. The ball-joint is cut away for a sufficient width to allow this spring to extend out to its periphery and to have a sufficient amount of play. The construction of these parts allows the hasp to be moved out and in in the manner of an ordinary hinged hasp, and also allows it to roll or oscillate to right and left. There is no rivet or other pivot to fail by wearing or to become in any way deranged by accident or design.

D is the body and D' the head of the cylinder. It is formed with a slot, d, adapted to receive a suitable flat key, holding one edge of the latter in or near the center, and allowing the other edge to stand in the slot and actuate the parts of the lock as the cylinder is turned by a turning force imparted to the key. The head D' finds a bearing in the front plate, A'. The extremity of the body D is supported in a corresponding small bearing in the box M. The tumbler-case embraces this cylinder and oscillates thereon as an axis.

E is the tumbler carrier or case, certain portions being designated by additional marks, when necessary, as E' E².

E' is an arm of sufficient breadth and thickness, arranged to be moved by the oscillations of the tumbler-case alternately into and out of the notch b' in the catch B'.

E² are jaws which have the effect to give a longer bearing to the fence, which is L-shaped and mounted in a recess, e, one portion of which is adapted to receive the wide part and another the narrower part, and allow considerable changes of position longitudinally.

G is the L-shaped plate serving as the fence. By reason of its being mounted, as shown, in the tumbler-carrier E and oscillated therewith, it may be properly denominated an "oscillating fence." It is of such length that when the tumbler-carrier is moved toward one extreme of its motion, one end of the fence strikes against a stump, M', and by arresting the fence forces the L part or broad part of the fence farther inward. When the tumbler-carrier is moved toward the other extreme position, the narrow end strikes against a stump, M², and by arresting the fence causes it to be shifted by the continued movement of the tumbler-carrier into its original position out of contact with the tumblers. The inner edge, g, of the broad or L part serves as the effective portion of the fence. The tumbler-carrier is slotted to receive the tumblers, and also an associated

member, which I term a "bridge." I have shown two tumblers, one on each side of the bridge. The number of the tumblers may be increased at will.

I' I² are the tumblers. They lie one on each side of the bridge. A slot, i, in the side of each receives the edge of the fence if the tumbler is raised to exactly the correct position, otherwise the edge of the tumbler striking the fence prevents the tumbler-carrier from being rocked, serving effectually the usual functions of tumblers in lock mechanism.

K is a spring formed by a single piece of steel or hard brass of proper width, bent in the form required. It is centered on the stud M³, which is cast or otherwise firmly fixed in the box M. The short arm of this spring K abuts against a stump, M⁴, also cast on the interior of the box M. The long arm of the spring acts on both the tumblers I' and I². This arrangement allows a single spring to serve for both the tumblers. Whichever is uppermost will receive the full force of the spring, while the other tumbler is only held down by gravity and friction; but so soon as both tumblers are left free the uppermost sinks and the spring instantly commences to depress both.

H is the bridge. It is fixed in the tumbler-carrier E, and oscillates the latter by the force received from the key. The forming this piece separate from the tumbler-carrier and inserting it afterward facilitates giving it the required intricate shape. It is formed with a semicircular aperture, h, which receives the flat key and allows it to be rotated idly a half-revolution and back again. A lateral slot, h', receives the fence. There is a shoulder, h², on each side of the bridge. The cavity h is slotted out to the bottom of the bridge. This allows the passage through the bridge of a wide portion of the key, to operate the tumbler or tumblers beyond. The portion of the key which remains and turns in the bridge is narrower. It performs important functions.

J is the key, certain portions being designated, when necessary, by additional marks, as J', &c. It must be inserted with the plain edge upward and the irregularly-shaped edge downward. When the key is fairly inserted and is turned to the right, it turns easily a half-revolution, the wide side of the key sweeping through the arc of the cavity h in the bridge H. In performing this semi-revolution its projections J' J² act on the smooth lower edge of the tumblers I' I² and lift them so as to bring their respective notches i i both exactly into the plane of the corresponding notch, h, in the bridge H; but so soon as a half-revolution of the key has been effected a further turning of the key will, by pressing against the surface H*, compel the bridge H to turn, carrying with it the tumbler-case E and moving the arm E' out of its engagement with the catch B'. This unlocks the lock. The key cannot be removed while in this position. Previous

to removing it the parts must be turned back to the locked position, so as to leave the key with its broad edge directly downward in the plane of the slot in the bridge H and of the slot in the cylinder D. This return of the tumbler-case to the locked condition may be effected with the hasp in place, in which case the trunk will be locked; or, if the tumbler-case is returned to the locked condition with the hasp out of engagement therewith, the trunk will not be locked, although all the locking parts of the lock will be in the locked position, the difference being due to the engagement or non-engagement of the hasp therewith. In effecting this partial turning motion to return the parts to their locked position, the key will act strongly in the reverse position and in the reverse direction to that in which it acted before—that is to say, the lock-case E and its attachments will remain in the unlocked position as long as the key is left in the lock. There is no spring tending to return the tumbler-case to its upright position. The spring K exerts no force relatively to the returning of the tumbler-case, excepting to insure a reliable friction, which tends to hold it stationary.

In order to turn the tumbler-case back, the key is first revolved idly a half-revolution. This causes the wide edge of the key to sweep through the arc of the cavity *h*, and then causes it to act against the surface **. Now, a further turning of the key will bring it and the tumbler-case into the upright position or locked position. Now the key may be withdrawn. When the axis of the key is not in the straight edge, but a little within it, as shown, there must be a smaller semicircular recess, *h'*, opposite to the main one, *h*, to allow the straight edge of the key to turn idly in each direction, as will be readily understood.

Modifications may be made in the forms and proportions. I can use a greater number of tumblers. I can make the key turn on an axis which is coincident with the straight edge thereof, and thus dispense with the small arc

of the cavity *h*, in which case the main cavity will be simply D-shaped or semicircular. The slot reaching downward from the cavity *h* may be dispensed with by having the tumbler or tumblers beyond the bridge require but a slight amount of lifting, or by dispensing with such tumblers. I can adapt the invention to rim-locks, to mortise-locks, and to sliding-bolt locks generally, or even to curved boltlocks, by engaging the ordinary bolt of such lock with the arm E' of the tumbler-case. The invention may be similarly made to serve in padlocks. In these examples, as also in the trunk-locks shown, springs may be employed, tending to throw the tumbler-case always into the upright position suitable to receive a key and to allow its withdrawal. Parts of the invention may be used without the whole. I can use a separate spring for each tumbler. I can dispense with the separately-formed bridge, and equip a fixed portion of the tumbler-case to correspondingly receive the action of the key.

I claim as my invention—

1. In a trunk-lock, the hasp B, having a ball-joint, B², larger than the hasp-body, in combination with the plate C', in a single piece, receiving the body of the hasp through the orifice, and with a spring, B*, and a suitable lock engaging in the notch *b'* in the catch B', as herein specified.

2. In a lock, substantially as described, and in combination with the case E, having the arm E', as shown, the tumblers I' I², having notches *i*, and arranged to oscillate with said case, the catch B', and the bridge H, having aperture *h*, all adapted to serve with the key J J' J², as and for the purposes set forth.

In testimony whereof I have hereunto set my hand, at New York city, this 11th day of 85 June, 1883, in the presence of two subscribing witnesses.

EDWARD W. BRETTELL.

Witnesses:

W. C. DEY,
EDITH BROOKES.