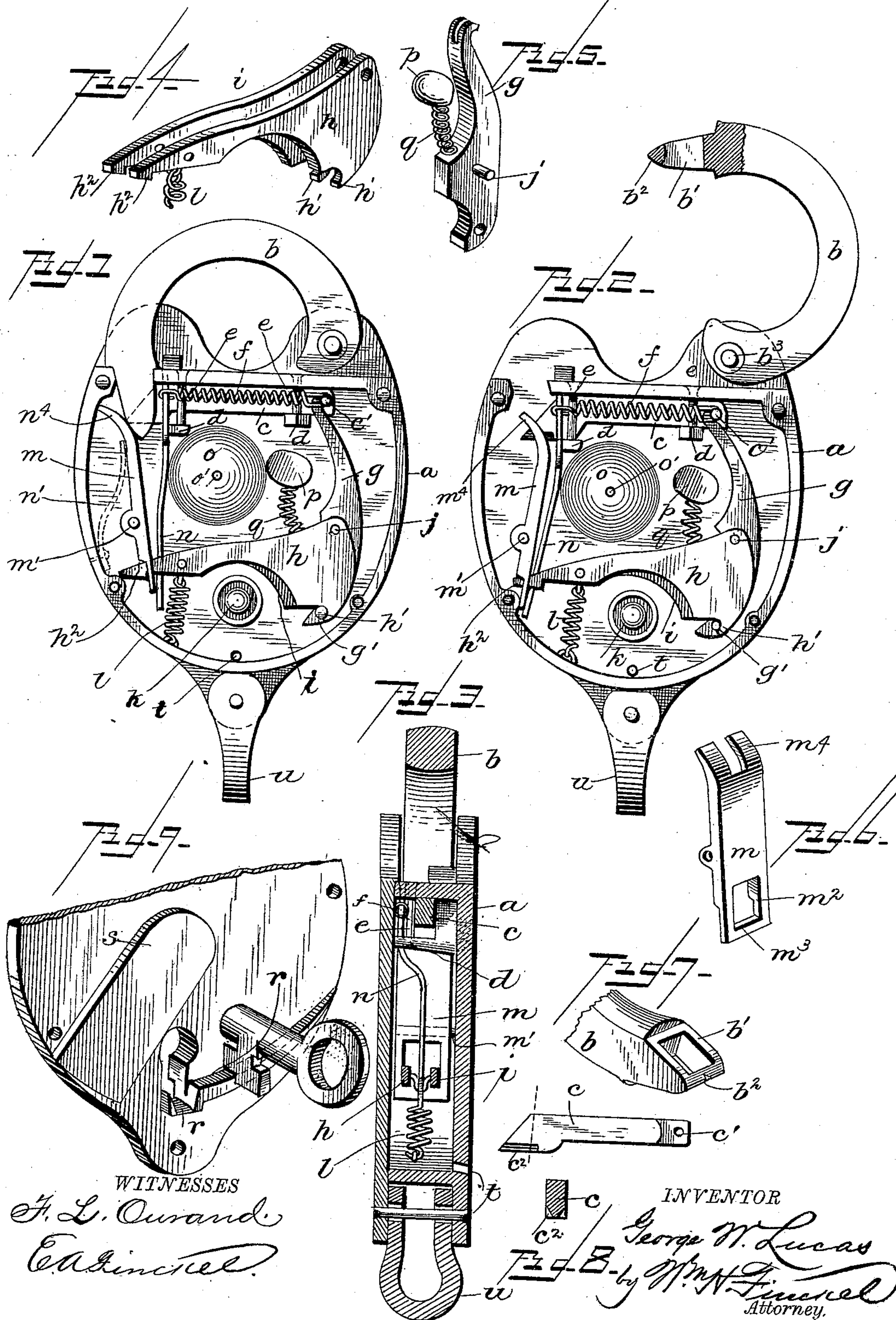


G. W. LUCAS.
PADLOCK.

Patented Jan. 13, 1891.



UNITED STATES PATENT OFFICE.

GEORGE W. LUCAS, OF SAN ANTONIO, TEXAS.

PADLOCK.

SPECIFICATION forming part of Letters Patent No. 444,449, dated January 13, 1891.

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To all whom it may concern:

Be it known that I, GEORGE WILLIAM LUCAS, a citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented a certain new and useful Improvement in Padlocks, of which the following is a full, clear, and exact description.

This invention relates to padlocks, and more particularly to those padlocks which are used for locking railway-switches, although the invention is applicable to padlocks for other purposes.

For the sake of conciseness I will describe my invention as applied to a switch-lock, but without thereby limiting the invention to that kind, or indeed to any particular kind, of padlock.

With this reservation the invention consists in a padlock comprising a bow, or hasp, or shackle, a spring-bolt for engaging the same, tumblers, and a lever connecting the tumblers and bolt, a locking device for the tumblers, and an audible alarm, such as a bell, the construction, combination, and arrangement of parts being substantially as hereinafter more particularly set forth and finally claimed.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a plan with the face-plate removed, showing the parts in locked position. Fig. 2 is a similar view showing the parts in unlocked position. Fig. 3 is a vertical section with the bell removed and looking to the left of Fig. 1. Fig. 4 is a perspective view of the tumblers detached. Fig. 5 is a perspective view of the lever. Fig. 6 is a perspective view of a tumbler-locking device. Fig. 7 is a perspective view of the locking end of the bow or shackle. Fig. 8 shows in plan and cross-section the locking-bolt; and Fig. 9 is a perspective view of the lower portion of the outer plate, showing a key-guide which may be employed.

The case may be of usual construction and adapted to receive a bow, hasp, or shackle *b*. The bow is provided with a bolt-receiving slot *b'*, and the cross-piece *b²* is reduced in thickness, so that in case of necessity for breaking the lock the break may occur at this end of

the bow or hasp. By this construction the repair of the lock is greatly simplified and cheapened, for all that is necessary to make the lock as good as new is to drive out the bow pin or rivet *b³* and insert a new bow and rivet. The bolt *c* is arranged to have a longitudinal movement between posts *d* on the case, and the forward locking end of the bolt is made with a sort of cold-chisel edge *c²*, as shown in cross-section in Fig. 8, to facilitate the breaking of the locking end of the bow, when, as before stated, it becomes necessary to break the lock in order to remove it. In switch-locks emergencies sometimes arise by the sticking of the lock and the inability to unlock it by means of the key or by reason of loss of the key, when it becomes necessary to break the lock, and oftentimes in breaking the lock it is broken beyond repair. If now an easily-replaceable part is made the vulnerable portion of the lock it will be readily seen that the lock may be repaired at small cost and its permanent loss prevented; hence my peculiar form of bow and bolt.

The locking-bolt *c* is held in place in the posts *d d* by means of transverse pins or rivets *e*. The rear end of the bolt is provided with a transverse pin or projection *c'*, to which a spring *f* is secured, and this spring is made fast at its other end to some stationary portion of the lock, with its tension set to force forward the bolt into the locking position normally.

The mechanism for unlocking the bolt consists of a lever *g*, the upper end of which is forked, as shown in detail in Fig. 5, to engage the cross-pin *c'* of the bolt, and the lever is pivoted at *g'* at its other end in the lower portion of the lock. Two or more tumblers *h i* are pivoted at *j* to the lever *g*, and these tumblers extend transversely of the lock and crosswise of the key-post *k*. The tumblers will be made to correspond with the desired form of key to be used in the lock. I have shown them as adapted for use in connection with a key such as shown in Fig. 9, the proper wards being employed for the bits in said key and the tumblers being made to correspond with said bits of the said key. The lower ends of the tumblers *h i* are provided with hooks *h'*, which engage pivot *g'* to control the upward

movement of the said tumblers and to transmit their movement to lever *g*. The forward ends of the tumblers *h* are provided with hooks *h*². A spring *l* is interposed between the tumblers and the casing, and the line of its operation is downward and toward the left, for a purpose presently appearing. A tumbler-locking lever *m* (see Figs. 1, 2, 3, and 6) is pivoted at *m*¹ in the lock-case, and its lower end is provided with an opening *m*², the cross-bar *m*³ of which is engaged by the hooks *h*² of the tumblers when the lock is in the locked position, so as to secure the parts from accidental displacement, and indeed from any displacement except by a key of proper construction to lift the tumblers. This tumbler-locking device is held in engagement with the hooks of the tumblers by means of a spring *n*. (Here shown as a wire fastened to the upper cross-plate of the lock and extending down and bearing against the lower end of the said tumbler-locking device.) Instead of the spring *n*, however, I may employ a flat spring *n*¹, (shown in dotted lines in Fig. 1,) and fastened to the side of the lock-case and bearing against the rear of the tumbler-locking device. This spring *n* may serve to receive the end of the spring *f*; but when this spring is not employed the said spring *f* may be secured, for example, to the post or rivet *e*, near the bow-receiving opening. The upper end *m*⁴ of the tumbler-locking device is curved toward the side wall of the lock-case, and is forked, as shown in Figs. 3 and 6, to permit the passage of the locking-bolt.

A gong *o* or other equivalent audible alarm is secured in the case upon a post *o*¹, and the lever *g* carries a bell-hammer or other sounding device *p*. I have shown the said hammer as mounted upon a spring *q*, in order to give it the necessary play with respect to the bell.

When the lock is unlocked, the parts are in the position shown in Fig. 2—that is to say, the tumblers *h* have been raised and their hooked ends disengaged from the tumbler-locking device *m*, and the spring *n* has thrown the tumbler locking device over toward the locking-bolt, and the bell-hammer has been thrown away from the bell. Now as the shackle is moved into the locking position its nose comes between the locking-bolt and the curved end of the tumbler-locking device and retracts the locking-bolt against the tension of its spring *f*, forces the tumbler-locking device against the tension of its spring over toward the left-hand side of the casing, and then passes on downwardly until its opening *b*¹ is in position for the bolt *c* to shoot into said opening. The lower end of the tumbler-locking device in the meantime moves over toward the tumblers until the hooked ends of said tumblers engage the cross-bar *m*³, and in so doing the movement of the tumblers is transmitted to the lever *g*, and the bell-hammer is actuated to strike the bell and sound an alarm. The sounding of the alarm is an audible signal to the operator that the lock is

locked, and this is an exceedingly useful device, for it often occurs in the haste in operating switches that the switch-lock is not completely locked, and is displaced and the switch left in a position of danger. The bell cannot possibly be sounded until the hasp or bow or shackle is locked, and hence it is only by gross carelessness that the accident mentioned can occur in the use of this switch-lock.

It will be observed that the positive connections of the various moving parts of my lock render it impossible for displacement of the locking parts by accident in use.

The lock is admirably adapted for other uses than switch-locks, and when no alarm is useful or desirable the bell and its hammer may be omitted.

In storm and in darkness time is frequently lost in inserting the key in the lock, and in order to overcome this difficulty there may be placed upon the outside or face-plate of the lock, a key-guiding flange *r*, extending from one side of the lock to and around the lower edge of the key-hole, so that by placing the key against the face-plate of the lock and moving it downwardly, its bit will come into contact with the key-guide and then, by movement to the left, the key will find its way to the key-hole unerringly. The key-hole may be provided with the ordinary spring key-hole guard *s*, and the key, as it moves along the flange *r*, will come in contact with and move this key-hole guard away from the key-hole.

Any moisture finding its way into the case will escape through a drainage-opening *t*, provided in the casing for this purpose, and carry with it any dust that may have accumulated in the said casing.

The usual chain-shackle *u* may be employed.

In the operation of my automatic alarm-lock for railroad-switches it is to be observed that a key is used to unlock the lock, and it is intended that after the lock is unlocked the key shall be removed, so that the parts will automatically set themselves, as shown in Fig. 2, for locking the hasp whenever it may be thereafter pushed home. When the spring *n*¹ is employed, it may be made strong enough to act upon the tumbler-locking device in such manner that the pressure of the said tumbler-locking device upon the nose of the bow or shackle will automatically throw the said shackle partly or entirely out of the lock-case when the lock is unlocked.

What I claim is—

1. An automatic alarm-lock for railway-switches, comprising a hasp, bow, or shackle, a locking-bolt, tumblers, and a lever to which the tumblers are pivoted and connecting said tumblers, a locking-bolt, and an audible alarm operated by the movement of the said tumblers, lever, and locking-bolt in locking the lock, substantially as described.

2. A hasp, bow, or shackle, a locking-bolt

and a spring normally forcing the said bolt into locked position, a retracting-lever connected to said locking-bolt, tumblers pivoted to the said lever and having hooks on their forward ends, a tumbler-locking device adapted to be engaged with and disengaged from the said hooks on the tumblers, and a spring for holding the tumbler-locking device in position, substantially as described.

3. A hasp, bow, or shackle, a locking-bolt and a spring normally forcing the said bolt into locked position, a retracting-lever connected to said locking-bolt, tumblers pivoted to the said lever and having hooks on their forward ends, a tumbler-locking device adapted to be engaged with and disengaged from the said hooks on the tumblers, and a spring for holding the tumbler-locking device in position, combined with an audible alarm operated by the movement of the locking-bolt, tumblers, and retracting-lever as the hasp is fully locked, substantially as described.

4. The case and the posts *d*, combined with

a locking-bolt *c*, supported on said posts, and pins or rivets *e*, secured in the case and the said posts to hold the bolt in place, bolt-operating mechanism, and a hasp, bow, or shackle, substantially as described.

5. In a padlock, a shackle having a cross-bar *b*² of comparatively small dimensions, combined with a locking-bolt *c*, whose end engaging the said hasp is reduced to a cutting-edge, substantially as and for the purpose described.

6. The combination, with a bow, of a tumbler-locking device and a spring acting upon the upper end of the said tumbler-locking device adjacent to the nose of the bow and adapted to throw the said bow partly or entirely out of the lock-case when the lock is unlocked, substantially as described.

In testimony whereof I have hereunto set my hand this 24th day of April, A. D. 1890.

GEORGE W. LUCAS.

Witnesses:

WM. H. FINCKEL,
H. Y. DAVIS.