(No Model.)

M. McGRATH.

SELF ACTING SWITCH LOCK.

No. 457,999. Patented Aug. 18, 1891.

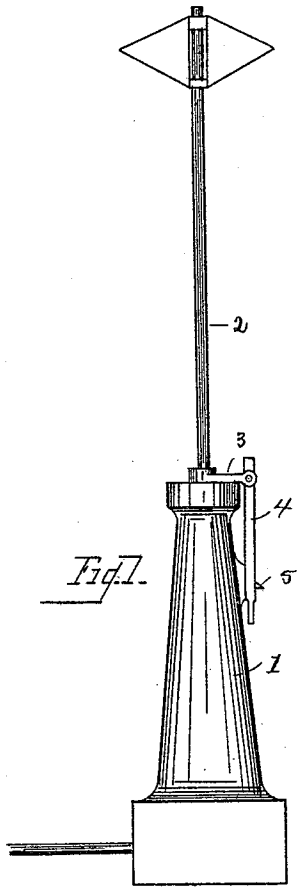


Fig. 1.

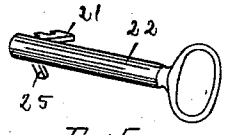


Fig. 5.

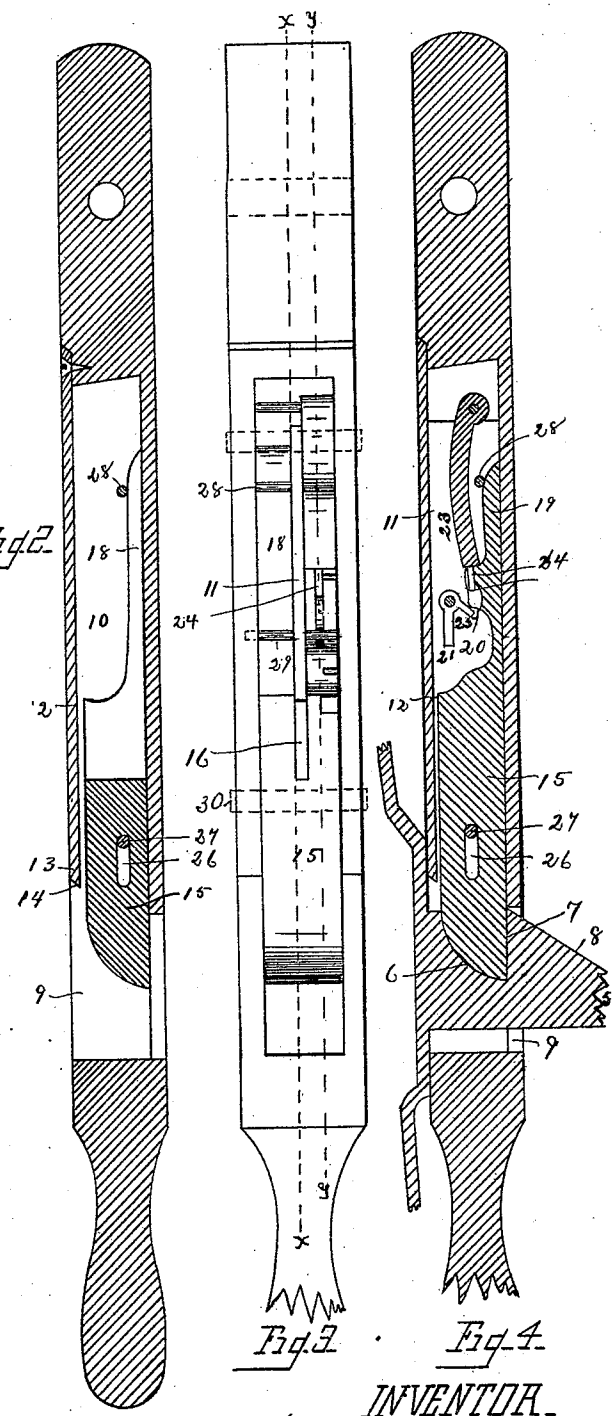


Fig. 2. Fig. 3. Fig. 4.

WITNESSES.

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UNITED STATES PATENT OFFICE.

MICHAEL McGRATH, OF TOLEDO, OHIO.

SELF-ACTING SWITCH-LOCK.

SPECIFICATION forming part of Letters Patent No. 457,999, dated August 18, 1891.

Application filed November 26, 1890. Serial No. 372,746. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL McGRATH, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Self-Acting Switch-Locks; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

My invention relates to a self-acting switch-lock, and has especial reference to a lock for railroad-switches.

The object of the invention is to provide an automatically-acting lock for the switch-lever, to thereby preclude the possibility of carelessly leaving the switch unlocked, thereby allowing of its being opened by unauthorized persons.

A further object is to provide a lock in which the locking-bolt is not only forced in locking position by gravity, but further secured against being tampered with by means of a gravity-pawl.

A further object is to provide a lock in which there are two compartments, the interior one of which contains the locking mechanism, thereby securing against the possibility of picking the lock.

As is well known, the most frequent cause of colliding trains is due to the fact of an open switch. Very often when the duty of opening a switch to side-track a train to allow of the passage of a train having the right of way devolves upon one of the brakemen, who, after the passage of the train, is hurried to mount the train to which he belongs, it occurs that in the present form of securing the switch-lever by means of a padlock he neglects this duty, thereby leaving the switch-rail in a condition to either jar open sufficiently to catch the flange of the wheel of the next passing train, or, if spread in the least, to yield to the flange and open. It is also frequent with switchmen to defer locking the switch while side-tracking a train, depending upon the gravity-weight of the lever to hold the switch closed during the passing of a train on the main line. This omission to lock the switch has been the frequent cause of collisions. These possibilities and dangers are entirely overcome by my invention, which consists, broadly, in providing a switch-lever with an automatically-operating lock that shall securely lock the switch-lever in place in the act of closing the switch-rail, thereby entirely precluding the possibility of inadvertently leaving the switch unlocked.

In the drawings, Figure 1 is an elevation of a switch-stand, showing the lever locked in position when the switch is closed. Fig. 2 is a sectional side elevation of the switch-lever on lines x x, Fig. 3, showing the locking bolt or latch and the slotted portion in which the central partition rests. Fig. 3 is a rear elevation of the switch-lever with the cap removed to disclose the locking mechanism. Fig. 4 is a sectional elevation of the switch-lever on lines y y, Fig. 3, showing the locking mechanism in side elevation; and Fig. 5 is a perspective view of the key used in unlocking the dog and raising the locking-ratchet.

1 designates the switch-stand, which may be of the usual or any preferred form of construction. 2 is the switch-lever shaft, to which is secured the arm 3, having a switch-lever 4 pivotally secured thereto in a manner to allow the lever to fold downwardly in a vertical position or be raised to a horizontal position.

The construction of the switch-stand and switch-lever shaft is of the usual form and has nothing to do with my present invention.

5 designates a rigid catch preferably formed integral with the switch-stand and having a notch 6 formed with a straight face 7 and a downwardly-inclined projecting end 8, the catch being designed to enter an opening 9, formed in the switch-lever, when the lever is forced into a position to close the switch. In the interior of the body portion of the switch-lever is formed a chamber 10, divided longitudinally through a portion of its length by a partition 11, the chamber being closed upon the rear side by a removable cover 12, held in place upon the lower end by seating the chamfered end 13 into beveled channels 14, formed upon each side of the lever, the upper end being held in place, preferably, by a screw.

15 designates the locking bolt or latch of a width corresponding to the width of the chamber 10 and bifurcated for a portion of its length, as at 16, to allow of passing upon

each side of the partition 11, secured centrally of and within the chamber, as has been described. Partition 11 is designed to prevent tampering with the lock, and it also subserves the purpose of steadying the key when inserted and being turned to raise the latch, as the mechanism with which the key co-operates to unlock the lever is upon the opposite side of the partition from that through which the key is inserted. The bifurcation of the bolt for a portion of its length results in the formation of two arms 18 and 19, the arm 18 simply serving the purpose of steadying the bolt and occupying a position upon the side of the partition opposite to that in which the locking mechanism is located. The arm 19, which rests in the chamber upon the opposite side of the partition, is formed with a projection 20, with which the web 21 of the key 22 contacts when being turned to raise the bolt. Projection 20 has a square upper and lower side, the upper side, or that above the one with which the web of the key contacts, being adapted to be engaged with the lower end of a locking-pawl 23, pivoted within the chamber in a manner to swing from engagement with the projection when the switch-lever is raised from its normally-vertical position and to swing into engagement when the lever is in position to lock the switch. Projection 20 is recessed centrally of its width to allow a pin 24, projecting from the end of the pawl, to rest therein when the pawl is in engagement with the projection, and to raise the pawl from engagement with the projection when urged out of the recess by a web 25 upon key 22.

In order to further guide the bolt in its movement within the chamber, there is an elongated slot 26 formed through the same, through which a pin 27 is passed, and, passing through each side of the chamber, is riveted upon the outer ends to secure it from removal. A pin 28, arranged transversely of the chamber, bears upon the arms 18 and 19.

In order to guide the key through the key-way formed in the outer side of the lever and also through the partition, there is a pin 29 secured coincident with the key-way, which enters the bore of the key.

From the above description the construction and operation of the device will be readily understood. When the switch is closed, the switch-lever is secured by the locking-bolt 15 being in engagement with the catch 5, and the bolt is not only locked by gravity, but is further secured by means of the pawl 23, which bears upon the upper side of projection 20, and as in this position the front and sides of the lever are solid and preferably integral with the lever, thus presenting no opportunity of reaching the interior locking mechanism only as it is effected by the key, and as the locking mechanism is on the side of the chamber, guarded not only by the outer side of the lever, but by the central partition 11, there is practically no means of unlocking the switch but by means of the key. The switchman now enters the key, and web 25 of the key contacts with the pin 24 of the pawl. As the key is turned the pawl is forced out of engagement with the projection 20, thereby allowing the web 21 of the key to contact with the lower side of projection 20, when by the further turning of the key the bolt 15 is lifted out of engagement with the catch 5, thus permitting the lever 4 to be raised to a horizontal position to open the switch. When it is desired to close the switch, the lever is turned to the desired point and depressed to a vertical position, (the pawl 23 being normally out of locking engagement with the locking-bolt when the lever is at an angle from a vertical position by reason of gravity,) and the end of catch 5 entering the opening 9 of the lever, the inclined face of the catch raises the bolt until it passes the highest point of inclination and drops into notch 6. The lever now being in a vertical position, the locking-pawl swings into engagement with the projection upon the bolt, and the bolt is locked from possible jar to effect its locked position or the possibility of being tampered with by unauthorized persons.

It will be seen from the foregoing description that the lever is always locked when forced to position, and that the locking mechanism is not only sure and simple, but that the lever as thus constructed adds but little, if any, cost to the ordinary form of lever and lock.

By referring to Fig. 3 it will be seen that I may chamfer the upper end of the cover 12 with a reverse inclination to that shown in Figs. 2 and 4, and form the bevel-channel upon the upper end of the lever, and secure the lower end of the cover by an enlarging band 30, (shown in dotted lines.) This construction is preferable to that previously described, as it precludes the possibility of water getting into the chamber.

What I claim is—

1. The combination, with a stand, of a laterally-projecting catch-pin and a vertically-swinging and horizontally-movable switch-lever formed with an aperture to receive the catch-pin and provided with an automatic locking-bolt adapted to engage said pin and lock the lever.

2. The combination, with a stand having a catch-pin, of a hinged switch-lever having a recess produced therein and an aperture in the casing forming the same at the end of said recess, a longitudinal partition, a bifurcated locking-bolt, and a key for unlocking the same.

3. The combination, with a stand carrying a projecting catch-pin, of the switch-shaft and the switch-lever secured to the shaft and hinged intermediate its ends, formed with an aperture adapted to receive the catch-pin and provided with an automatically-locking bolt.

4. A vertically and horizontally movable switch-lever having a movable bolt formed

with a projection, and a gravity-pawl for engaging the projection, in combination with a key for contacting with the projection and with the pawl to actuate the bolt.

5. A switch-lever having a movable bolt formed with a projection, and a locking-pawl adapted to engage with the projection, in combination with a key adapted to contact with the projection and pawl.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

MICHAEL McGRATH.

Witnesses:
WILLIAM WEBSTER,
CARROLL J. WEBSTER.