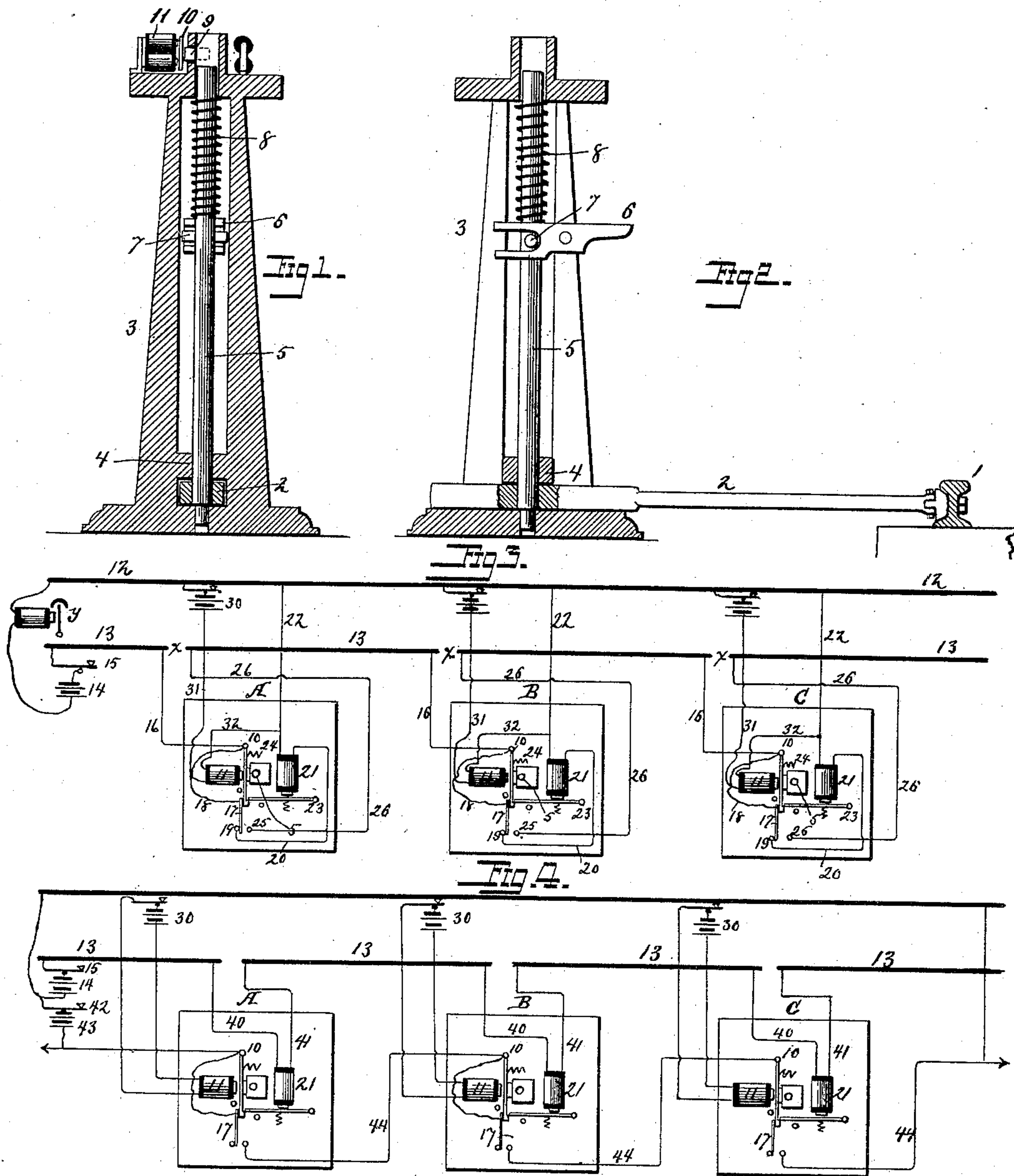


(No Model.)

E. L. ORCUTT.
ELECTRIC SWITCH LOCK.

No. 387,365.

Patented Aug. 7, 1888.



Witnesses,
Geo. G. Hinkel Jr.
Wm. A. Harries

Edward L. Orcutt Inventor.
By his Attorneys,
Foster & Freeman

UNITED STATES PATENT OFFICE.

EDWARD L. ORCUTT, OF SOMERVILLE, MASSACHUSETTS.

ELECTRIC SWITCH-LOCK.

SPECIFICATION forming part of Letters Patent No. 387,365, dated August 7, 1888.

Application filed February 9, 1887. Serial No. 227,041. (No model.)

To all whom it may concern:

Be it known that I, EDWARD L. ORCUTT, a citizen of the United States, and a resident of Somerville, Middlesex county, Massachusetts, have invented a new and useful Improvement in Electric Switch-Locks, of which the following is a specification.

My invention relates to electric switch-locks, and more especially to switch locks adapted for use in connection with electric signal apparatus; and it has for its object to provide means whereby the switch may be securely locked from a distance in position against accidental or other movement, and can be maintained until released by the proper party.

To these ends my invention consists in the combination and arrangements of devices, substantially as described more particularly hereinafter.

In the drawings, Figure 1 is a vertical section of a switch-lock stand embodying my invention. Fig. 2 is a similar section at right angles to the first. Fig. 3 is a diagrammatic arrangement of the electric circuits for operating the lock, and Fig. 4 is a similar view of a modified arrangement of circuits.

It often happens that a switch may be properly set for the passage of a train and the signals may so indicate, and after the train has started or progressed, in obedience to such signals, the switch may be accidentally or otherwise changed, so that the train may be improperly shunted or derailed. In order to avoid this result, I provide a switch-lock, which may be a part of or applied to an ordinary switch-stand, or may be entirely independent thereof, and which is under the control of the engineer or automatically operated by the train or in connection with a system of signals.

In the drawings, 1 represents the movable part of a switch-rail, to which is connected a slide-bar, 2, extending into the base of the stand 3, and provided with an aperture, 4, or similar device, by which the sliding bar may be secured in the stand, as by means of the upright bolt 5. Some means, as a foot-lever, 6, supported in a slot in the stand and engaging a pin, 7, in the bolt, is provided, by which the bolt may be raised to unlock the sliding bar and to allow the movement of the switch by the switchman. A spring, 8, may be employed to assist in throwing the bolt in place,

and this may be arranged around the bolt and bear upon the foot rest or treadle 6, as indicated.

Upon the table or platform of the stand is arranged a suitable locking device controlling the bolt, and I have shown a dog or key, 9, working through a slot and adapted to extend over the top of the bolt 5 when in locking position. This dog may be controlled in any suitable manner; but I preferably attach it to armature 10 of an electro-magnet, 11, which is included in suitable electric circuits, to be operated as set forth hereinafter.

In the arrangement shown in Fig. 3, 12 and 13 represent parts of two conductors, which may form portions of a system of signaling, and may be composed, in whole or in part, of the rails; and 14 represents a battery and 15 a circuit-controlling device, which also may be part of a system of signaling, and may be carried on the train and be under the control of the engineer, or otherwise; but as this forms no part of my present invention I do not deem it necessary to further illustrate it.

A B C represent my switch-locks applied to as many switches, draw-bridges, or the like, included in the section of the circuit, and the arrangement of the magnets and electric connections is graphically represented and needs no special description except to trace the circuits, which are as follows:

We will suppose a train approaches the section represented and the switches, draws, &c., to be properly set to allow the passage of the train over the main line, and, through the intervention of any desired means, the circuit-controlling device 15 is operated to close the circuit of the battery 14 through the conductors 12 and 13. The circuit may be traced from the battery 14 and circuit-closer 15 to the conductor 13, until the switch is reached, represented by a break, \times , in the conductor, when it passes to the wire 16, thence to an insulated extension, 17, of the armature 10 by means of wire 18, to the back contact 19, wire 20, to the locking-magnet 21, and thence to conductor 12 and to battery by wire 22. This operates to energize the locking-magnet 21 to attract its armature 23, and thereby release the armature 10, when the spring 24 causes the dog 9, carried thereby, to take up a position over the end of the bolt 5, as shown in dotted lines,

Fig. 1, and to retain the bolt against any movement to release the switch-rod 2. This operation causes the armature-extension 17 to leave the contact-point 19, and to break the locking-magnet circuit and to rest upon the contact-point 25, connected by wire 26 to the continuation of the conductor 13, leading to the next switch-lock, B, where the same operation is carried out, and so on throughout all the switches or breaks in the main conductor. It will thus be seen that the engineer or other person in charge can readily determine whether all the breaks in the circuit are properly arranged for the passage of the train, for if any one of the locks fails to work properly a continuous circuit is maintained through the locking-magnet and a suitable signal device, *y*, will indicate this fact. The locks hold the switches in position until released, as by the passage of the train or otherwise, and I have shown at 30 a releasing-battery and circuit-controller connected by wire 31 to the magnet 11, and thence by wires 32 and 22 to the conductor 12 and to battery. This operates to energize the releasing-magnet 11, which withdraws the dog on its armature, and the locking-armature 23 resumes its position to hold the dog until the locking-magnet 21 is again energized. The locks B and C are similarly operated, and it will thus be seen that the switches are securely held against any displacement until the passage of the train.

In Fig. 4 the construction of the locking devices is the same; but the circuits are differently arranged and the locking-circuit may be traced from the battery 14, key 15, to the conductor 13, thence by wire 40 to the locking-magnet 21, and thence directly by wire 41 to the conductor 13 again, and so on through the other locks. The releasing-magnets are shown as being connected in a separate circuit through battery 30, as before, and a signaling-circuit, controlled by battery 43 and key 42, passes through all the armature-extensions 17 and conductor 44, which may be used to operate a suitable signal to show that all the locks are in proper condition.

It will thus be seen that the switches and the like cannot be changed after being set until properly released by the passage of the train or otherwise, and the party in charge can readily determine whether they are all securely locked, so that it is safe to proceed.

It is evident that the construction of the devices may be varied without departing from my invention, and that the circuits may be variously arranged to accomplish the desired results.

What I claim is—

1. The combination, with a rail and a bar and a bolt for securing the same, of a lock for the bolt, a magnet for operating the lock to secure the bolt, a separate magnet to release the bolt, and a circuit-changer connected with and automatically operated by the lock, and a signal for the train controlled by the circuit-changer, substantially as described.

2. In a switch-lock, the combination, with the locking-bolt, of the releasing-magnet, the armature of which is provided with the locking-dog engaging the bolt, a locking-magnet the armature of which controls the locking-armature, a circuit-controller connected to the locking-armature, and a signal for the train controlled by the circuit-changer, substantially as described.

3. The combination, with the main conductors, of a series of locking devices in a single circuit, each of which is provided with a locking-magnet, a releasing-magnet, and a circuit-changer which switches the current past the lock after the same has operated, whereby the locks may be successively operated, substantially as described.

4. The combination, with the switch-rail, of a slide-bar, a sliding bolt, 5, which locks the slide-bar, a pivoted lever, 6, connected with the bolt 5 to move it, a lock securing the bolt, and electric means for controlling the lock from a distance, substantially as described.

5. The combination of a series of switches in a railroad-section, a lock for each switch, a locking-magnet for each lock, and a single circuit which operates all the locks in the section, substantially as described.

6. The combination of a series of switches in a railroad-section, a lock for each switch, a locking-magnet for each lock, a circuit which operates all the locks in the section, and a signal device operated by said current should any lock fail to operate, substantially as described.

7. The combination, with the conductors 12 and 13, one being broken at each switch, a switch-operating mechanism, a locking-magnet in a circuit including both said conductors on one side of the switch, and a locking-lever released by the locking-magnet and included in its circuit, and arranged, when moved, to break the circuit and to make electrical union of the parts of the conductor on opposite sides of the break at the switch, substantially as described.

8. The combination, with the conductors 12 and 13, broken at a switch, and a switch-operating mechanism, of a switch-lock-locking magnet, a circuit uniting conductors 12 and 13 and including the locking-magnet, a circuit uniting the parts of conductor 13 on opposite sides of the break, passing around the locking-magnet, and a circuit-controller carried by the switch-lock for shifting the circuit past the break as the lock operates, substantially as described.

9. The combination, with the conductors 12 and 13, broken at the switch, and a switch-operating mechanism, of a lock carried by the armature of a releasing-magnet, an insulated conducting extension, 17, carried by said section, a connection between said extension and conductor 13 on one side of the break, contacts 19 and 25, between which extension 17 works as the lock is worked, a connection including a locking-magnet between contact 19

and conductor 12, and another connection between contact 25 and conductor 13 beyond the break, substantially as described.

10. In an electric railway signal system, the
5 combination of a series of switches in a railroad-section, a lock for each switch, a locking-magnet for each lock, a circuit which operates all the locks in the section in succession, a circuit-controller carried by the switch-locks to
10 shift the current past the switches when they

are locked, and releasing-magnets operated successively as the train passes the switches, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD L. ORCUTT.

Witnesses:

JOSEPH J. GILES,
ELISA J. CHILSON.