

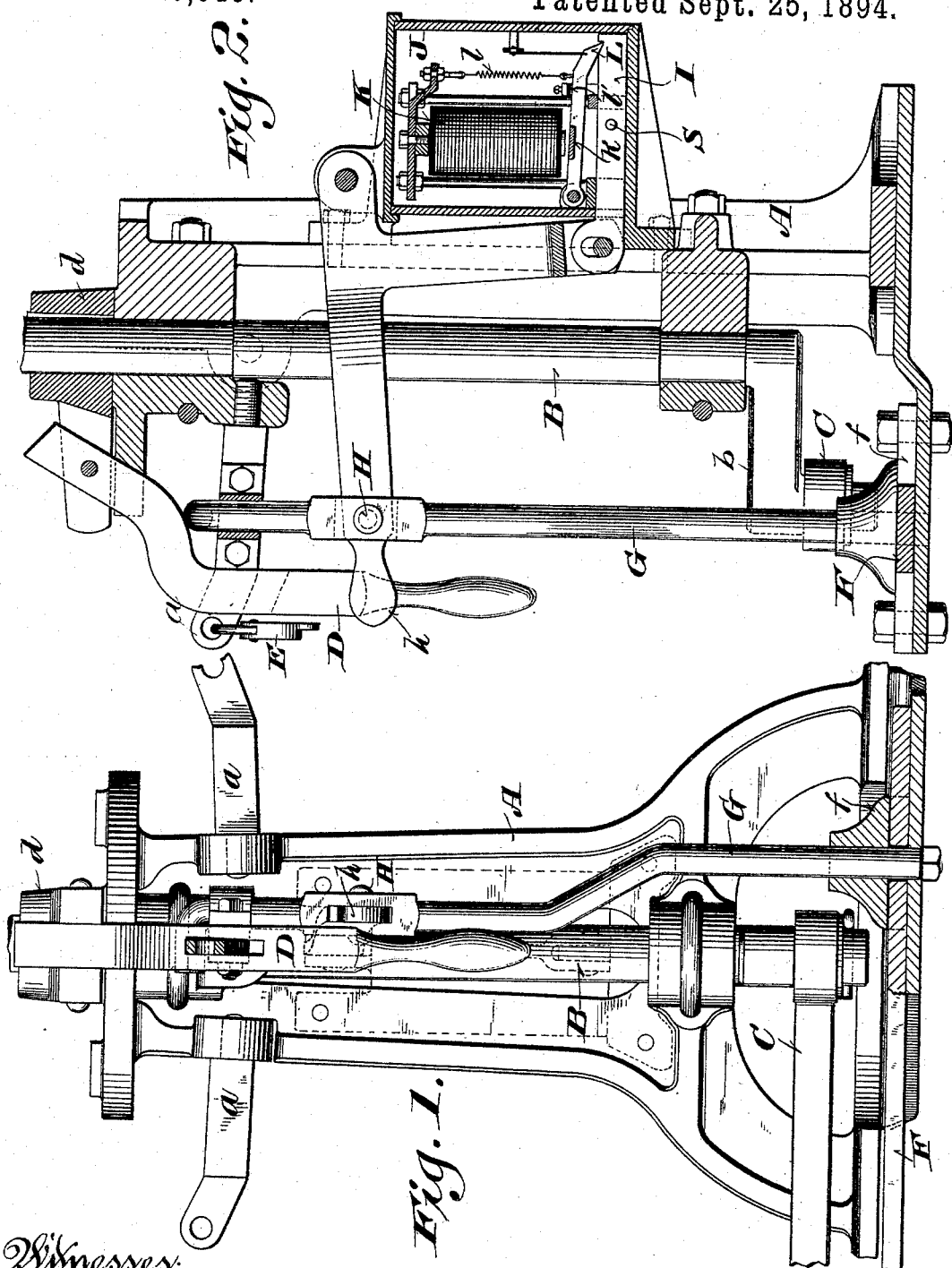
(No Model.)

2 Sheets—Sheet 1.

W. H. ELLIOTT.
RAILWAY SWITCH LOCK.

No. 526,619.

Patented Sept. 25, 1894.



Witnesses:
Geo. W. Young.
Chas. L. Coar.

Inventor:
William H. Elliott
By Wm. H. Elliott Smith, Portman & Allen
Attorneys

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UNITED STATES PATENT OFFICE.

WILLIAM H. ELLIOTT, OF MILWAUKEE, WISCONSIN.

RAILWAY-SWITCH LOCK.

SPECIFICATION forming part of Letters Patent No. 526,619, dated September 25, 1894.

Application filed August 13, 1894. Serial No. 520,102. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. ELLIOTT, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Railway-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 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The main object of my invention is to control the operation of a switch from a distant point or station.

It consists in certain peculiarities in the construction and arrangement of the mechanism and apparatus hereinafter particularly described and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a front view of a switch-stand to which my improvements are applied. Fig. 2 is a side elevation of the same. Fig. 3 is a view partly in side elevation and partly in vertical section of the electric locking and releasing device constituting a part of my invention. Fig. 4 is a view of the same partly in rear elevation and partly in section. Fig. 5 is a horizontal section on the line 5, 5, Fig. 4, and Fig. 6 is a diagram showing the arrangement of apparatus including electric circuits in connection with a section of railway track.

Referring to Figs. 1 and 2, A designates a switch-stand in common use provided with an upright rotary shaft B, having a crank *b* at its lower end which is connected with the switch in the usual manner by a rod C.

D is a lever or handle pivoted to the head *d* which is fixed on shaft B at the top of the switch-stand, so as to be swung vertically into and out of engagement with one or more arms *a a* with which the switch-stand is provided, and to which the lever or pivoted handle D is secured in the usual manner by a pad-lock E, so as to prevent accidental or unauthorized displacement or shifting of the switch.

F is a locking bar pivotally connected at one end with the switch and arranged to slide at the other end in a keeper *f* provided on the base of the switch-stand.

G is a vertically movable locking rod or bolt supported in suitable bearings provided therefor on the switch-stand, and adapted to engage at its lower end one or more holes in the locking bar F arranged to secure the switch in its normally closed or any other desired position. It is guided and held in place next to said bar F by a hub on the keeper *f*. At its upper end it projects when raised out of engagement with the bar F, into the path of the switch lever or handle D when the latter is turned opposite the arm *a* with which it is to be locked, and the switch thereby closed or moved to the desired position where it is to be locked. The lever or handle D is bent, as shown in Fig. 2, to engage when it is lowered with the upper end of the locking rod G and force it into engagement with a hole in the locking bar F. It will thus be observed that in the ordinary manipulation of the switch-lever in operating the switch, said lever cannot be lowered into position to be locked with an arm *a*, without at the same time forcing the locking rod or bolt G into a hole in the locking bar F, and thus securely fastening the switch in the desired position.

H is an elbow-shaped lever fulcrumed at or near its elbow to the switch-stand, and having one arm pivoted to the bar G, and its other arm to a sliding bar I which is inclosed by a case J on the back side of the switch-stand with an electro-magnet K. The armature *k* of said magnet is mounted upon a pawl or arm L also inclosed by said case, and arranged to engage at its free end with a notch in the sliding bar I when the latter is thrust into the case, and thereby lock and hold the rod or bolt G in engagement with the bar F. The lever H is formed at the front end of its horizontal arm with a handle *h* for lifting the rod G out of engagement with the bar F. The notch in the bar I and the pawl L are so constructed and arranged as to automatically engage with each other when the magnet K is de-energized and the locking rod or bolt G is lowered, thus locking the

switch in the desired position and preventing its operation, until the locking mechanism is released by the magnet K.

Referring to Fig. 6, showing the electrical connections with a distant station for controlling the locking mechanism, applied to the switch-stand, and for communicating between that station and the switch-stand, M designates an electro-magnet located at the distant station and arranged to operate a visual signal *m* for a purpose to be hereinafter explained.

N is a battery or other source of electricity with which the circuit is supplied with current at the operator's station or at any other convenient point in the line.

O O' designates magneto bells for transmitting and receiving messages or signals, one being located at or near the switch-stand, and the other at the operator's station. They each have a ground connection *o*, and a connection with a contact point *p* of a switch P or P', whereby they are connected or disconnected at will with a wire Q, forming a part of the circuit connecting the switch-stand with the operator's station. The lever or movable part of the switch P is held normally in engagement with the contact point *p'* by a spring *p*², but the lever or movable part of switch P' remains in engagement with whichever contact point it is left by the operator. One end of the coil of magnet K is connected by a wire R with one end of the coil of magnet M, the other terminal of which is connected by a wire *n* with the battery, thence with the contact point *p'* of the switch P'. The other terminal of magnet K is connected, as shown in Figs. 3 and 4, with a contact spring *s* of a circuit breaker inclosed with said magnet by the case J, and the other contact spring *s'* of said circuit breaker is connected, as shown in Figs. 3, 5 and 6, by a wire *q* with the contact point *p'* of the switch P. A pin or projection S on one side of the sliding bar I engages with the converging portions of said contact springs, and thus closes the circuit when the switch is locked and the mechanism is in the position shown in the drawings. When the switch is open or in abnormal position, and the bar I withdrawn, the pin or projection S is carried out of engagement with said contact springs and the circuit is broken and cannot be closed again until the switch is closed or returned to normal position and locked by the rod G, thus returning the pin S into engagement with both springs *s* and *s'*. By means of the spring *l* which tends to lift, and the spring *l'*, which tends to depress the pawl L, the resistance to the movement of said pawl may be adjusted as desired according to the pull of the magnet.

T designates a disk carried by one end of the lever *t*, the opposite end of which is connected with the pawl L, so that when said pawl is lifted by the magnet out of engagement with the bar I, said disk will be carried opposite an aperture *j* in the case J, shown

in Fig. 4, and thus indicate to the switch-man that the locking mechanism is released.

My improved switch-lock and apparatus operates as follows: Assuming that the switch is closed and the mechanism locked in the position shown in the drawings, and it is desired to open the switch so as to allow a train to pass from the main track X upon the side track Y, the switchman presses the lever of switch P into engagement with contact *p*, and by means of the instrument O, signals the operator at the distant station to unlock the switch. The operator replies by means of the instrument O', and if the track is in condition to open the switch, he turns the lever of his switch P' into engagement with the contact *p'*. The lever of switch P having been released by the switchman, is automatically returned by the spring into engagement with contact *p'* and closes the circuit through battery N, wire *n*, magnet M, wire R, magnet K and wires *q* and Q, thereby energizing said magnets, releasing the locking mechanism of the switch, and turning the signal *m* to "clear," which indicates to the operator that the switch is closed or in normal position, and the rod G is in engagement with the bar F although it is released. When the disk T is seen through the aperture *j*, it is understood that the locking mechanism of the switch is released, and the switchman then proceeds to withdraw the locking rod G by means of lever H, from engagement with the bar F, the switch lever D having been previously unlocked so as to permit the withdrawal of said rod G. The circuit is thus broken at *s s'*, de-energizing magnet M and allowing the operator's signal *m* to return to "danger," in which position it stands normally as the circuit through magnet K is normally broken at switch P'. The switch may then be shifted in the usual way by means of the lever D. While the switch remains open or unlocked, the circuit will be broken at *s s'*, as hereinbefore explained, and cannot be closed until the switch is closed or returned to normal position. After releasing the locking mechanism of the track switch, the operator leaves the lever of his circuit switch P' in engagement with the contact *p'* until the signal *m* is returned to "clear," indicating to him that the track switch is closed and the locking rod G returned to normal position in engagement with bar F. The operator now shifts the lever of his switch P' into engagement with contact *p*, thus de-energizing magnet K, locking the track switch and rendering his instrument O' responsive to a call transmitted by instrument O from the switch stand.

In place of the wire R, that portion of the circuit may be made through the ground by providing proper ground connections for the magnets K and M. In short, various changes in the details of the apparatus may be made within the spirit and intended scope of my invention, and I do not wish to be understood as limiting myself to the particular construc-

tion and arrangement of the switch operating mechanism and connections herein shown and described, to illustrate the application of my improvements.

5 I claim—

1. In a switch-lock, the combination with a switch-stand, of a lever having suitable operating connections with the switch, a locking bar connected with the switch, and a movable bolt arranged to engage said bar to hold the switch in the desired position, said bolt being arranged to project when withdrawn from the locking bar into the path of the switch lever, and prevent the return of said switch lever to normal position without locking the switch, substantially as and for the purposes set forth.

2. In an electric switch-lock, the combination with a switch-stand of a lever connected with the switch, a locking bar connected with said switch, a movable bolt arranged to engage with and lock said bar and to project, when withdrawn, into the path of said switch-lever when the latter is returned to normal position, and an electric locking device arranged to prevent the operation of said bolt, substantially as and for the purposes set forth.

3. In an electric switch-lock, the combination with a switch-stand, and a lever connected with and arranged to turn the switch, of a locking bar connected with said switch, a movable bolt arranged to engage with and lock said bar independently of the switch operating lever, locking mechanism arranged to secure said bolt in engagement with said bar, and an electro-magnet controlling the operation of said locking mechanism, substantially as and for the purposes set forth.

4. In a switch-lock, the combination with a switch-stand having an upright rotary shaft connected with and arranged to open and close a switch, a lever pivoted to said shaft so as to be swung in a vertical plane, and one or more projections on the switch-stand with which said lever is arranged to be engaged and locked in its depressed position, of a locking bar connected with the switch and adapted to slide endwise in the base of the switch-stand, a vertically movable bolt adapted to engage at its lower end one or

more holes in said bar, and projecting at its upper end when raised into the path of said switch-lever when the latter is returned to locking position, and an unlocking lever fulcrumed to the switch-stand and connected with said bolt, substantially as and for the purposes set forth.

5. The combination with a switch-stand provided with a locking bar and bolt, locking mechanism arranged to prevent the operation of said bar and bolt, an unlocking magnet for releasing said locking mechanism, and an indicator connected with the armature of the magnet so as to show when the locking mechanism is disengaged, substantially as and for the purposes set forth.

6. The combination with a switch-stand provided with locking mechanism, of an unlocking magnet connected by an electric circuit with a distant point or station, and an indicator connected with the armature of said magnet so as to show when the locking mechanism is released, substantially as and for the purposes set forth.

7. The combination with a switch-stand provided with locking mechanism, of an unlocking magnet connected by an electric circuit with a distant station, a circuit breaker at the switch-stand arranged to open the circuit when the switch is open or in abnormal position, and a signal at the distant station arranged to indicate when the switch is closed or returned to normal position, substantially as and for the purposes set forth.

8. The combination with a switch-stand provided with locking mechanism, of an unlocking electro-magnet connected by an electric circuit with a distant station, instruments for transmitting and receiving intelligence at the switch-stand and distant station, and a switch for connecting one of said instruments with said electric circuit, substantially as and for the purposes set forth.

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

WILLIAM H. ELLIOTT.

Witnesses:

CHAS. L. GOSS,
THOS. L. SMITH.