(No Model.)

N. W. BOYD.

AUTOMATIC INTERCHANGEABLE SWITCH AND SIGNAL STAND.

No. 456,645. Patented July 28, 1891.

Fig. I.

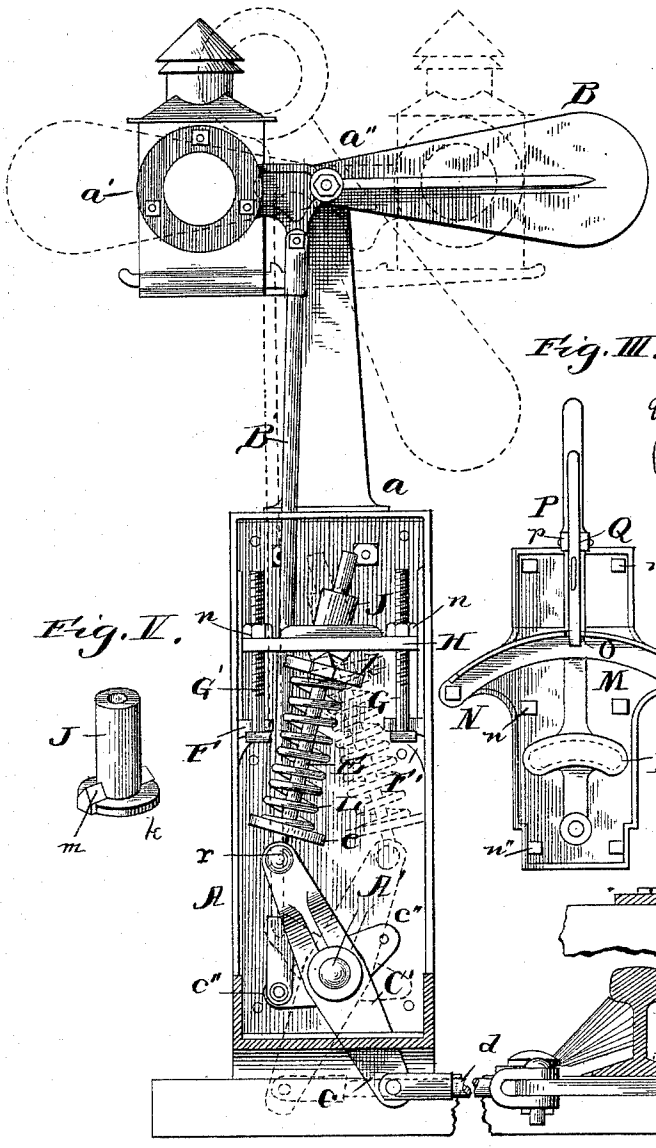


Fig. II.

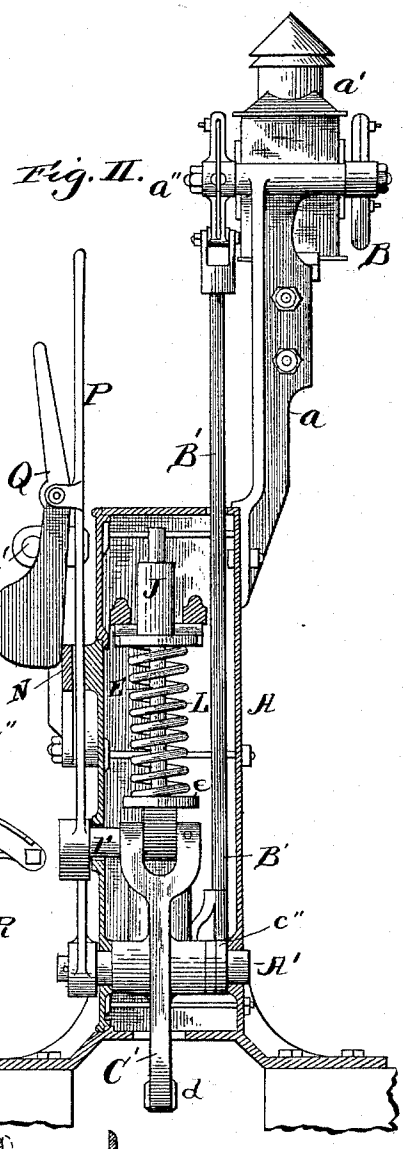


Fig. III.

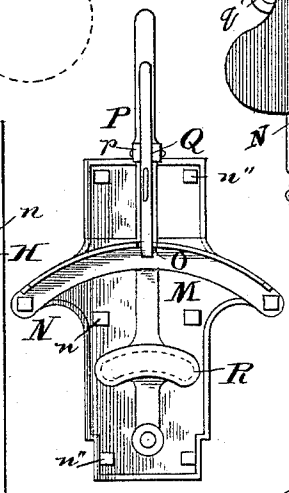


Fig. IV.

Fig. V.

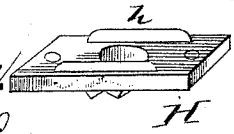
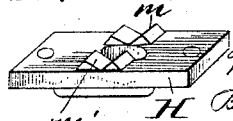


Fig. VI.



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UNITED STATES PATENT OFFICE.

NATHANIEL W. BOYD, OF CARLISLE, PENNSYLVANIA.

AUTOMATIC INTERCHANGEABLE SWITCH AND SIGNAL STAND.

SPECIFICATION forming part of Letters Patent No. 456,645, dated July 28, 1891.

Application filed March 11, 1891. Serial No. 384,589. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL W. BOYD, a citizen of the United States, and a resident of Carlisle, in the county of Cumberland and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Interchangeable Switch Stands and Signals; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to automatic interchangeable switch stands and signals designed more particularly as an improvement in apparatus of the class shown in a prior patent, No. 435,728, issued to me on the 20th day of September, 1890; and the objects of the present invention are, first, to provide an an automatic switch stand and signal which is interchangeable and capable of use either on a right-hand track or left-hand track; secondly, to improve and simplify the switch-operating and signal mechanism, and, finally, to provide a switch in which there is no possibility of the point-rail failing to come in contact with the stock-rail when the switch is closed.

With these and other ends in view, my invention consists in the combination, with a stand or case and a signal supported thereon, of an operating-lever fulcrumed on a shaft which extends transversely across the interior of the stand or case, in the lower portion thereof, and is journaled in the side walls of said case, said lever having one end extending through a slot or opening in the lower side or base of the switch-stand and connected by a suitable rod or link with the movable point-rail of a switch, and provided on the sides at an intermediate point of its length with outwardly-extending arms, a rod connecting one of said arms with the signal carried by the stand, a tension-spring connected to the upper end of the operating-lever, devices for regulating the tension of said spring, and means for manually or automatically operating said switch and simultaneously displaying the proper signal.

My invention further consists in the peculiar construction and arrangement of parts, as will be hereinafter more fully described and claimed.

To enable others to more readily understand my invention, I have illustrated the same in the accompanying drawings, in which—

Figure I is a front elevation of my improved switch stand and signal, the inclosing case being shown in section. Fig. II is a side elevation of the same, also partially in section. Fig. III is a view of the cover and operating arm or handle for manually setting the switch. Figs. IV and V are, respectively, detail views of the adjusting-plate and seat for the tension-spring.

Like letters of reference denote corresponding parts in all the figures of the drawings, referring to which—

A designates the inclosing case of a switch and signal stand constructed in accordance with my invention. At one side of this case A an upwardly-extending arm or bracket *a* is fastened, which carries at its upper end a lantern *a'*, and in suitable bearings near the upper end of this bracket *a* is mounted a rock-shaft *a''*, one end of which shaft carries a semaphore B. To the other end of the said shaft *a''* is connected one end of a vertical rod B', which extends down into the interior of the stand and is connected, in a manner to be hereinafter described, to the switch-operating mechanism.

In the side walls of the lower portion of the stand is journaled a transverse rock-shaft A', and on this shaft is secured or fulcrumed a lever C', one end of which extends through the base of the stand, as at *c*, and is, by means of a connecting-rod *d*, connected to the movable point-rail D of a switch. The lever C' is provided at an intermediate point of its length with outwardly-extending arms *c'' c''*, which extend from opposite sides of the lever at right angles to the length thereof, and to one of which arms the rod B' is detachably secured. The upper arm of the lever C' is connected to a vertical rod E, which is provided near its point of union with said lever with a fixed seat *e* for the tension-spring.

F F' designate lugs on the inner sides of the stand, and through suitable apertures in these lugs pass the threaded adjusting-bolts G G'. These bolts also extend through apertures in a plate H, and through a central aperture in this plate passes a sleeve J, which is provided at one end with an enlarged seat

k. The rod E passes loosely through this sleeve J, and around said rod is fitted a coiled spring L, which bears at its ends against the seats *e k*. The upper surface of the upper seat *k* is provided with a rib or projection *m*, preferably made triangular in cross-section, and this rib or projection, when the sleeve J is in the position shown in Figs. I and II, fits between two parallel ribs or projections *m' m''*, formed on the under surface of the plate H, said ribs *m' m''* having their contiguous sides inclined reversely, as shown in Fig. IV, whereby a knife-edge bearing is provided between the adjusting-plate and the seat *k* for the spring, which admits of an easy free motion of the parts with minimum friction. The adjusting-plate H is provided on its upper side with parallel ribs *h*, which are arranged on opposite sides of the central aperture in said plate, and the upper ends of which contact with the side walls of the sleeve K and hold said sleeve against lateral displacement.

The adjusting-plate H is normally fixed or stationary and capable of adjustment at any desired height on the bolts G G' by means of nuts *n n*, which are fitted on said bolts above the adjusting-plate.

The front plate M of the switch-stand is detachably secured in place by bolts *n''*, and the outer face of this front plate is provided with a quadrant-shaped casting N, which is suitably connected to said plate, and is provided near its center with a notch or recess O. Between the stand and the quadrant N is arranged a hand-operating lever P, having its lower end fitted on the projecting end of the rock-shaft A'. This lever P is provided near its upper end with parallel lugs or studs *p*, between which is pivoted a locking-bar Q, and when the lever P is in a vertical position the lower portion of this locking-arm fits in the recess O, the lever P and the operating mechanism being locked from manual interference by a chain, which is passed around said locking-bar Q and through an aperture *q'* in the outer end of a projecting arm *q*, secured to the lever P and receiving a padlock. (Not shown.) The lever P is provided above its fulcrum with a segmental recess R, formed in its inner face, as shown by dotted lines in Fig. III, in which recess fits the projecting end of the bolt *r*, which connects the rod E and the lever C', said bolt *r* being adapted to move in said segmental recess when the operating-arm P is locked and the switch is operated automatically by a passing engine, as explained at length in my prior patent, to which reference has been made.

The operation of my invention may be briefly stated as follows: To manually throw the switch by the lever P, the padlock is removed and the locking-bar Q adjusted to clear the recess O, after which the lever P can be turned in the desired direction. The shaft A' is thus rocked in its bearings, which movement, in connection with the spring L, causes the lever C' to assume the position shown in dotted lines in Fig. I and draws the movable point-rail D tightly against the fixed rail. As the lever C' is free to move in the stand without hinderance, it is only stopped by the movable rail coming in contact with the fixed rail, and the common danger of the switch failing to operate properly is thus entirely obviated. The movement of the lever C' on its fulcrum forces the rod B' upward and adjusts the semaphore into the position shown in the dotted lines in Fig. I. When the movable point-rail is forced away from the fixed rail by an engine passing on the main track, the lever C' is brought slightly past its center of movement and then forced over into the position shown in Fig. I by the spring L. The tension of the spring can be regulated to make the switch either a light or a heavy switch by raising or lowering the adjusting-plate H on the vertical bolts *f f'*.

The rod B' may be connected to either of the arms *c'' c''* of the lever C', according as it is desired to use a signal on a right-hand track or a left-hand track.

It is obvious that my improvements may be secured on one, two, or more ties or sills of a railway-track, as may be desired.

I am aware that changes in the form and proportion of parts and details of construction of the mechanism herein shown and described as an embodiment of my invention can be made without departing from the spirit or sacrificing the advantages of my invention. For instance, though I have shown and described my invention as applied to a low semaphore, it is obvious that equally beneficial results can be obtained with a high semaphore, and I therefore reserve the right to make such changes and modifications as fairly fall within the scope of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic switch-stand, the combination, with a case, of a switch-lever fulcrumed at an intermediate point of its length within said case or shell and connected at one end with the movable point-rail of a switch, a tension-spring connected to the other end of the lever, and means, substantially as described, for regulating the tension of said spring, substantially as shown and described.

2. In an automatic switch and signal stand, the combination of an inclosing case, a signal carried by said case, a switch-lever fulcrumed centrally within the inclosing shell and having one end connected with the movable point-rail of a switch, connections intermediate of the lever and the signal device, a vertical tension-spring connected to the other end of the lever, and means, substantially as described, for varying the tension of said spring, substantially as shown and described.

3. In a switch and signal stand, the combination of a stand, a signal carried by said stand, a rock-shaft fulcrumed in the inclos-

ing case, a lever fulcrumed on said rock-shaft, a rod connecting the lower end of said lever with the movable point-rail of a switch, a tension-spring connected to the upper end of said lever, a signal-rod detachably connected at one end to the lever, and a hand-lever for rocking said rock-shaft to simultaneously set the switch and display the proper signal, substantially as shown and described.

4. In a switch and signal stand, the combination of an inclosing case, a lantern carried by a suitable bracket on said case, a semaphore mounted on said bracket, a switch-lever fulcrumed within the inclosing case and provided with the intermediate outwardly-projecting arms, a rod connecting one of said arms with the semaphore, a connecting-rod intermediate of the lower end of the switch-lever and the movable point-rail of a switch, a tension-spring connected to the other end of the switch-lever, and a hand-lever for moving said lever to simultaneously set the switch and display the proper signal, substantially as shown and described.

5. In a switch-stand, the combination, with an inclosing case, of a switch-lever fulcrumed within said case or shell and connected at one end with the movable point-rail of a switch, a rod connected with the other end of said lever and provided with a fixed seat, a sleeve, also having a seat and loosely fitted on said rod and passing through an adjusting-plate, a coiled tension-spring fitted around the said rod between the fixed and movable seats, means for moving the adjusting-plate vertically, and a hand-lever for turning the switch-lever on its fulcrum, substantially as shown and described, for the purpose specified.

6. In a switch-stand, the combination, with an inclosing case, of a switch-lever fulcrumed within said case and connected at its lower end with the movable point-rail of a switch, a rod connected to the other end of said lever and provided with a fixed seat, a movable sleeve provided at one end with a seat on the upper surface of which is a triangular rib, a coiled spring arranged on said rod between the fixed and movable seats, an adjusting-plate fitted on said sleeve and provided on its under surface with the parallel ribs, between which fits the rib on the seat of the movable sleeve, threaded bolts passing through lugs on the interior of the case and through the adjusting-plate, and nuts fitted on said bolts to hold the plate in position, all combined and arranged for service, substantially as shown and described.

7. In a switch and signal stand, the combination, with a stand and a signal-rod, of a switch-lever having the signal-rod connected thereto, a plate supported within the stand, a rod connected to said switch-lever, and a tension-spring having its seats on the rod and plate, substantially as set forth.

8. In a switch and signal stand, the combination, with a stand, a signal-rod, and a movable point-rail, of a switch-lever connected to said point-rail and adapted to have the signal-rod connected to either side of said lever for the purpose set forth, and a tension-spring, substantially as and for the purpose set forth.

9. In a switch-signal stand, the combination, with a stand, a signal-rod, and a movable point-rail, of a switch-lever connected independently to said point-rail and to the signal-rod and capable of movement within the stand free from interference from stops, and a tension-spring connected to said switch-lever to exert the desired tension on the lever and point-rail and permit of the free movement of said switch-lever, substantially as described.

10. The combination, with a stand, a signal-rod, and a point-rail, of a switch-lever, an adjustable plate supported within the stand, and a spring-pressed rod connected to the switch-lever and to the adjustable plate, substantially as described.

11. The combination, with a stand, a signal-rod, and a movable point-rail, of a switch-lever, a vertically-adjustable plate, a rod connected to said switch-lever, and a spring bearing on said rod and having a knife-edge bearing on the adjusting-plate, substantially as described.

12. The combination, with a switch-stand and a movable point-rail, of a switch-lever fulcrumed in the stand to swing freely therein without interference from stops, a signal-rod connected to said switch-lever at an intermediate point of its length, a stationary adjusting-plate above the switch-lever, a rod connected to said switch-lever, and a coiled spring having its seats on the rod and the adjustable plate, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

NATHANIEL W. BOYD.

Witnesses:
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W. H. MCCREA.