S. K. BLAIR & C. B. HOYT.

SWITCH STAND.

APPLICATION FILED APR. 28, 1909.

937,758.

Patented Oct. 26, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

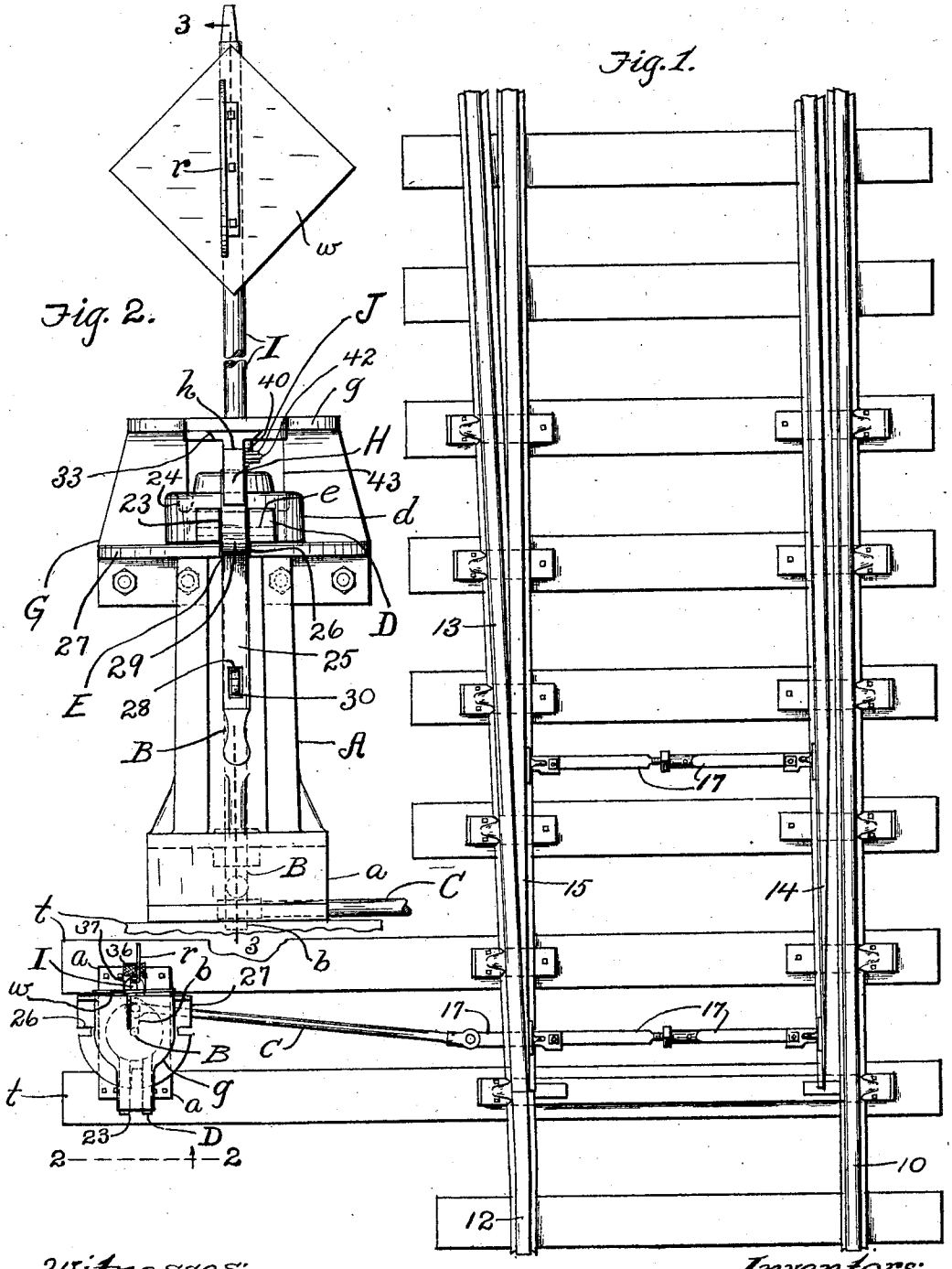

Fig. 2.

Witnesses:
H. J. Gettins.
B. L. Brown

Inventors:
Solon K. Blair
and Charles B. Hoyt
By Church & Church
their Attorneys.

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2 SHEETS—SHEET 2.

Fig. 3.

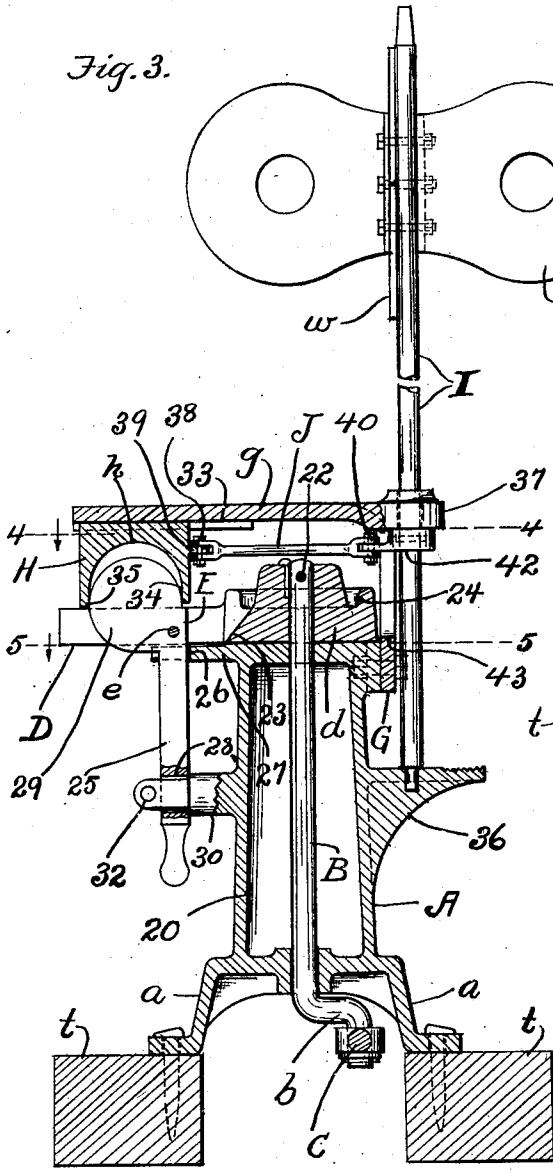


Fig. 4.

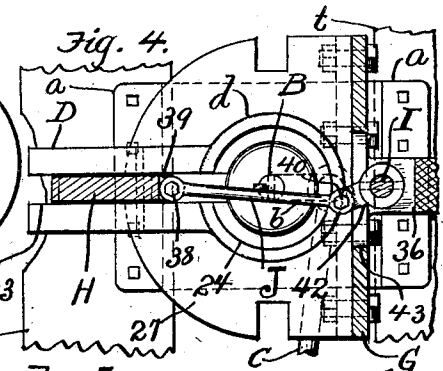


Fig. 5.

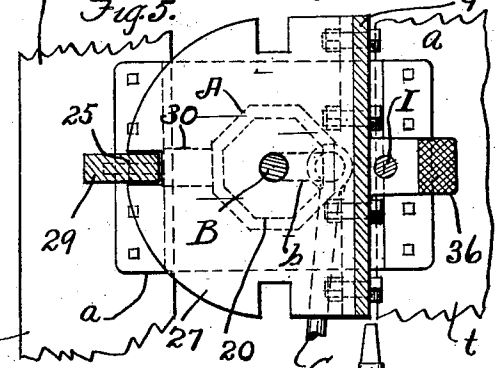
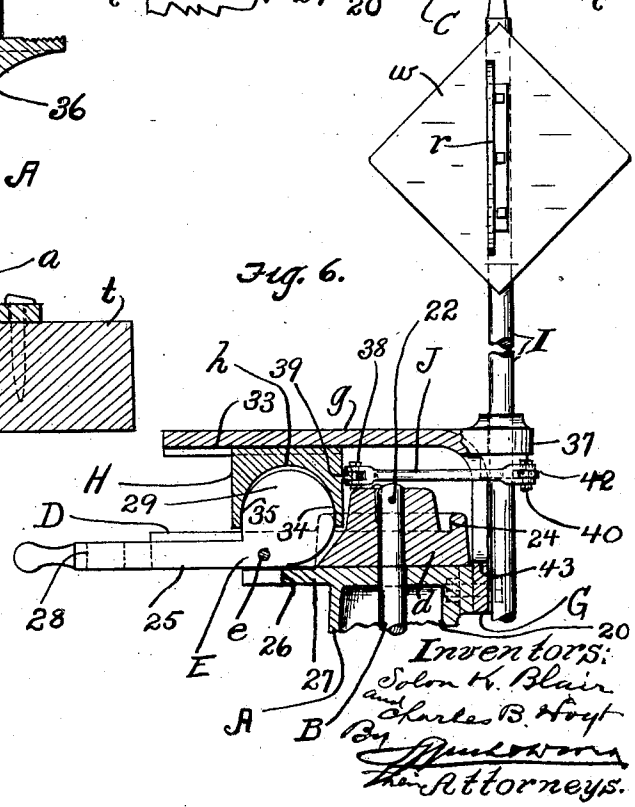


Fig. 6.



Witnesses:

H. J. Gettins.

B. L. Brown.

Inventors:

Solon K. Blair

and Charles B. Hoyt

By Munn & Co

their Attorneys.

UNITED STATES PATENT OFFICE.

SOLON K. BLAIR, OF FORT WAYNE, INDIANA, AND CHARLES B. HOYT, OF BELLEVUE, OHIO.

SWITCH-STAND.

937,758. Specification of Letters Patent. **Patented Oct. 26, 1909.**

Application filed April 28, 1909. Serial No. 492,691.

To all whom it may concern:

Be it known that we, SOLON K. BLAIR, a citizen of the United States of America, residing at Fort Wayne, in the county of Allen, State of Indiana, and CHARLES B. HOYT, a citizen of the United States of America, residing at Bellevue, in the county of Huron, State of Ohio, have invented certain new and useful Improvements in Switch-Stands; and we 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 pertains to make and use the same.

This invention relates to improvements in switch-stands for railways.

The primary object of this invention is the provision of a signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position by a suitably supported movable member and to provide means whereby the signal-shaft is rotated from its safety-position into its danger-position during the actuation of the said shaft-locking member from its shaft-locking into its shaft-unlocking position so that the switch-operating shaft can not begin to rotate from its switch-closing position into its switch-opening position before having actuated the signal-shaft of the switch-stand from its safety-position into its danger-position.

Another object is to provide mechanism whereby the said independent signal-shaft is not only rotated from its safety-position into its danger-position during the actuation of the aforesaid shaft-locking member from its shaft-locking into its shaft-unlocking position, but to have the said mechanism arranged to be actuated by the said shaft-locking member in the switch-closing position of the switch-operating shaft and operate to actuate the signal-shaft from its safety-position into its danger-position or vice versa according as the said shaft-locking member is actuated into its shaft-unlocking or shaft-locking position.

Another object is to have the signal-shaft locked and kept locked in its danger-position during the actuation of the switch-operating shaft of the switch-stand and upon the actuation of the said shaft into its switch-opening position.

Another object is not only to utilize the said shaft-locking member to effect the operation of the signal-shaft, and to provide such a relative arrangement of the parts that the safety-signal of the signal-shaft is being displayed or operative,—that is, faces toward a locomotive or train approaching the switch,—in the switch-closing position of the switch-operating shaft, but that during the actuation of the said shaft-locking member from its shaft-locking into its shaft-unlocking position the signal-shaft is actuated to display the danger-signal preparatory to the actuation of the switch-operating shaft from its switch-closing into its switch-opening position and the danger-signal is positively kept displayed during any actuation of the last-mentioned shaft and until after the latter has again been actuated into its switch-closing position.

Another object is to cause the signal-shaft to be locked against rotation at all times except when the aforesaid member employed in locking the switch-operating shaft in the switch-closing position of the said shaft is in position to be actuated from its shaft-locking into its shaft-unlocking position or vice versa.

Another object is to utilize the lever employed in actuating the switch-operating shaft in locking the signal shaft in its danger-position during the actuation of the switch-operating shaft in either direction and in the switch-opening position of the switch-operating shaft.

Another object is to utilize a portion of the mechanism employed in actuating the signal-shaft in coöperating with the switch-operating lever in locking the signal-shaft in its danger-position during the actuation of the switch-operating shaft in either direction and in the switch-opening position of the switch-operating shaft.

Another object is to provide a switch-stand which is simple and durable in construction, convenient and reliable in its operation and not liable to get out of order.

With these objects in view, and to the end of realizing any other advantage hereinafter appearing, this invention consists in certain features of construction, and combination of parts, hereinafter described, pointed out in the claims, and illustrated in the accompanying drawings.

In the said drawings, Figure 1 is a top plan of a railway-switch having a switch-

stand embodying our invention, and in this figure the switch is shown in its closed position. Fig. 2 is a side elevation taken along the line 2—2, Fig. 1, looking in the direction indicated by the arrow. Fig. 3 is an elevation, largely in vertical section taken along the line 3—3, Fig. 2, looking in the direction indicated by the arrow. Fig. 4 is a horizontal section on line 4—4, Fig. 3, looking downwardly. Fig. 5 is a horizontal section on line 5—5, Fig. 3, looking downwardly. Fig. 6 is a view of the upper portion of the switch-stand, largely in vertical section, and corresponding with Fig. 3, except that in Fig. 6 the signal-shaft is shown in its danger-position. Fig. 1 is drawn on a smaller scale than the remaining figures which are drawn on the same scale, and portions are broken away in the drawings to reduce their size.

Referring to Fig. 1 of the drawings, 10 and 12 indicate the two parallel rails of a main railway track. The rail 10 runs past the switch, whereas the rail 12 extends to the switch and there connects directly with one of the rails 13 of a side track, and 14 and 15 represent the two switch-rails of the switch. The switch-rails 14 and 15 are arranged in the usual manner between the side-track-rail 13 and the main-track-rail 10. The switch-rail 14 is arranged therefore at the inner side of and extends along the main-track-rail 10, and the switch-rail 15 is arranged at the inner side of and extends along the side-track-rail 13. The switch-rails 14 and 15 are connected together in the usual manner by bars 17, and one of the bars 17 extends under the switch-rail 15 and side-track-rail 12, as shown in dotted lines, Fig. 1, to and a suitable distance beyond the outer side of the said side-track-rail where it is operatively connected with the switch-connecting rod C at the inner end of the rod, which rod is operatively connected with the switch-operating shaft B of our improved switch-stand.

The application of a railway switch thus far hereinbefore described is too well known in the art to require further description in this specification. Suffice it to state that the switch-rail 14 forms a portion of the side track, that the switch-rail 15 forms a portion of the main track, that the switch is closed when as shown the said switch-rails are in position to cause a locomotive or train approaching the switch to continue past the switch on the main track, and that the switch is open when the switch-rails are actuated into their other position (not shown) so as to cause a locomotive or train approaching the switch to pass onto the side track.

The stationary frame-work of our improved switch-stand comprises a pedestal or standard A which is provided with two legs *a* and *a* adapted to rest upon the extended portions *t* of two adjacent railway ties, which legs are adapted to be secured to the said ties in the usual manner. The standard A preferably consists of a single casting which is hollow or chambered interiorly, as at 20.

The switch-operating shaft B of the switch-stand is arranged substantially vertically and centrally of the standard A, extending through the chamber 20 and having lateral bearing in the top and bottom walls of the said chamber. The shaft B extends below the chamber 20 a suitable distance and is provided between the legs *a* with a crank *b* which is operatively attached to the connecting rod C at the outer end of the rod. When the switch is closed, as shown in Fig. 1, the crank *b* projects rearwardly or in the direction in which a locomotive or train (not shown) approaches the switch, and obviously the shaft B to open the switch is rotated in the direction required to cause the crank of the shaft to shift the connecting rod C inwardly.

D represents the switch-operating lever which is arranged over the standard A and has a hub *d* which rests upon the standard and is operatively mounted on the upper end of the shaft B. The lever D is shown fastened to the shaft B by a pin 22 (see Figs. 3 and 4). In the switch-closing position of the shaft B as shown the lever D projects forwardly,—that is, in the direction of the locomotive or train approaching the switch,— and is in its switch-closing position.

The lever D has its outer portion provided between its sides with a slot 23 which extends vertically through and longitudinally of the lever. The slot 23 is arranged radially relative to the shaft B and extends from the outer extremity of the lever inwardly to the hub *d* and there communicates with a recess 24 which is formed in the top of the hub and extends from the right-hand side of the slot circumferentially of the said shaft in a direction opposite to the direction in which the shaft is rotated in actuating the shaft from its switch-closing into its switch-opening position to the opposite side of the slot and preferably communicates at both ends with the said slot. The recess 24 is arranged concentrically relative to the shaft B.

The lever D, and consequently the shaft B, are locked in their switch-closing position by a locking member which consists preferably of a lever E which engages the slot 23 and is arranged to swing in a vertical plane between the side walls of the said slot, being fulcrumed, as at *e*, horizontally and transversely of the said slot to the lever D. The lever E has an arm 25 which in the shaft-locking position of the lever depends, as shown in Figs. 2 and 3, through a slot 26

which is formed in and extends vertically through a flange 27 which is formed on and extends circumferentially of the upper end of the standard, the side walls of the said slot obviously preventing lateral movement of the lever E and thereby coöperating with the said lever in locking the shaft-operating lever D and consequently the shaft B against rotation in either direction.

The arm 25 of the lever E is provided near its free end with a slot 28 which extends through the said arm and in the shaft-locking position of the lever is loosely engaged by an arm 30 formed on and projecting forwardly of the standard A, and the last mentioned arm is provided at its outer end (see Fig. 3) with a hole 32 which is arranged forwardly of the said lever in the shaft-locking position of the lever to accommodate the application of a padlock (not shown) for positively locking the said lever in its shaft-locking position.

A bracket G is rigidly attached to the standard A at the rear of the upper portion of the standard. The bracket G extends upwardly from the standard A a suitable distance above the shaft B and at its upper end is provided with a forwardly projecting substantially horizontal arm *g* which overhangs the hub *d* of the lever D and is arranged radially relative to the said shaft. The bracket-arm *g* projects a suitable distance forwardly of the hub *d* and has its forward or outer portion provided at its under side with a slideway 33 which is arranged radially relative to the shaft B and engaged by a correspondingly arranged slide H which is suitably supported from the bracket-arm. Preferably the side walls of the slideway 33 are undercut as shown in Fig. 2 and the slide H has its upper portion overlapping and is thereby supported from the said walls.

The slide H is provided with a slot *h* which extends laterally through the slide and is open at the bottom of the slide, and the shaft-locking lever E has an arm or member 29 which engages the said slot and extends between the forwardly facing rear wall 34 and the rearwardly facing forward wall 35 of the said slot. The contour of the member 29 of the lever E and the dimensions of the slot *h* are such that the slide H during the actuation of the said lever from its shaft-locking position shown in Fig. 3 into its shaft-unlocking position shown in Fig. 6, is moved rearwardly or inwardly toward the shaft B and is actuated forwardly or outwardly from the said shaft during the movement of the said lever from its shaft-unlocking position shown in Fig. 6 into its shaft-locking position shown in Fig. 3. It will be observed therefore that the slide H is movable radially relative to the shaft B, that the engagement of the arm or member 29 of the lever with the outwardly facing rear wall of the slot *h* results in the inward actuation of the slide during the movement of the lever from its shaft-locking into its shaft-unlocking position, and that the engagement of the said member of the said lever with the inwardly facing forward wall of the said slot results in the outward actuation of the slide during the movement of the lever from its shaft-unlocking into its shaft-locking position.

I indicates the substantially vertically arranged signal-shaft of our improved switch-stand. The shaft I is preferably located rearwardly of the upper portion of the standard A and of course at the rear side of the bracket G. The shaft I rests at its lower end upon a bracket 36 which is formed on the standard A and arranged at the rear side and projects rearwardly from the standard. The signal-shaft is therefore supported from the standard A and extends through and has lateral bearing in an ear 37 formed on the bracket G at the rear of the bracket-arm *g*. The shaft I extends a suitable distance above the bracket-arm *g* and is provided above the latter with a danger-signal *r* and a safety-signal *w* which are spaced circumferentially of the shaft.

The signal-shaft I is operatively connected with the slide H, and the operative connection between the said slide and the signal-shaft consists preferably of a link J which is pivoted vertically at one end, as at 38, to a lug 39 formed on and projecting rearwardly of the inner end of the slide, which link is pivoted vertically at its opposite end, as at 40, to an arm or lever 42 with which the signal-shaft is operatively provided at the lower end of the ear 37 of the bracket G which is slotted, as at 43, to accommodate the location and operation of the said lever and the connected link.

The relative arrangement of the parts is such that when the switch-operating shaft B is in its switch-closing position and the shaft-locking lever E is in its shaft-locking position, the slide H is in its outer position, as shown in Fig. 3, and the safety-signal *w* of the signal-shaft is operative being displayed or facing toward the locomotive or train approaching the switch, and the safety-signal *w* and the danger-signal *r* are arranged radially relative to the signal-shaft and at a right angle to each other so that during the actuation of the slide H inwardly by the actuation of the lever E from its shaft-locking position shown in Fig. 3 into its shaft-unlocking position shown in Fig. 6 the signal-shaft is given a fourth of a complete rotation to bring the danger-signal into an operative position in which the danger-signal, as shown in Fig. 6, faces toward a locomotive or train approaching the switch.

By the construction hereinbefore described

it will be observed that the switch-operating shaft B is not rotated, but left undisturbed during the actuation of the lever E from its shaft-locking into its shaft-unlocking position or vice versa, and that the said shaft can only be rotated when the said lever is in its shaft-unlocking position, and that when the said lever is in its shaft-unlocking position, as shown in Fig. 6, the lever has its arm 25 arranged longitudinally between the side walls of the slot 28 in the lever D and between the flange 27 and the slide H so as to permit the swinging of the switch operating lever D in a horizontal plane and to the left to effect the rotation of the switch-operating shaft B in the direction required to shift the rod C inwardly and thereby open the switch, and the extension of the slot *h* laterally through the slide H of course accommodates the location of the member 29 of the shaft-locking lever E during the said actuation of the switch-operating shaft, but obviously as soon as the switch-operating lever D has begun to be swung in rotating the shaft B to open the switch the forwardly or outwardly facing rear wall of the slot *h* in the slide H is overlapped by the outer circumferentially extending wall of the recess 24 in the hub *d* of the lever D so as to lock the slide in its inner position and thereby lock the signal-shaft in its danger-position, and the signal-shaft remains locked in its danger-position until the switch-operating lever D has again been actuated into position to bring the slot 23 therein into registry with the slot 26 in the flange 27 of the standard A. It will be observed therefore that the signal-shaft is locked in position displaying the danger-signal during the actuation of the switch-operating lever D from the one to the other of its extreme positions; that the signal-shaft is only in position fully displaying the safety-signal when the switch-operating shaft is locked in its switch-closing position, that the signal-shaft is rotated from its safety-position into its danger-position during the unlocking of the switch-operating lever preparatory to the actuation of the switch-operating shaft from its switch-closing into its switch-opening position, and that as a train or locomotive approaching the switch must come to a stop before arriving at the switch whenever the signal-shaft is in its danger-position to permit a member of the crew of the locomotive or train to examine the switch there is no liability of such train or locomotive being run upon the wrong track past the switch because the switch can not be thrown from its closed into its open position before the actuation of the signal-shaft from its safety into its danger position.

What we claim is:—

1. In a switch-stand, the combination, with a suitably supported and suitably rotated switch-operating shaft which is in its switch-closing or switch-opening position according as the shaft has been rotated a predetermined extent in the one or the other direction, a movable member instrumental in locking the switch-operating shaft in its switch-closing position, and a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, of means whereby the signal-shaft is rotated from its safety-position into its danger-position during the actuation of the said shaft-locking member from its shaft-locking into its shaft-unlocking position in the switch-closing position of the switch-operating shaft.

2. In a switch-stand, the combination, with a suitably supported and suitably rotated switch-operating shaft which is in its switch-closing or switch-opening position according as the shaft has been rotated a predetermined extent in the one or the other direction, a pivotally supported member instrumental in locking the switch-operating shaft in its switch-closing position, and a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, of mechanism whereby the signal-shaft is rotated from its safety-position into its danger-position during the swinging of the said shaft-locking member from its shaft-locking into its shaft-unlocking position in the switch-closing position of the switch-operating shaft.

3. In a switch-stand, a suitably supported and suitably rotated switch-operating shaft which is in its switch-closing or switch-opening position according as the shaft has been rotated a predetermined extent in the one or the other direction, a lever operatively connected with the said shaft for rotating the latter, a movable member borne by the said lever and instrumental in locking the said lever and consequently the switch-operating shaft in the switch-closing position of the said shaft, a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, and means whereby the signal-shaft is rotated from its safety-position into its danger-position during the actuation of the said shaft-locking member from its shaft-locking into its shaft-unlocking position in the switch-closing position of the switch-operating shaft.

4. In a switch-stand, the combination, with a suitably supported and suitably rotated switch-operating shaft which is in its switch-closing or switch-opening position ac-

cording as the shaft has been rotated a predetermined extent in the one or the other direction, a movable member instrumental in locking the switch-operating shaft in its switch-closing position, a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, and mechanism whereby the signal-shaft is rotated from its safety-position into its danger-position during the actuation of the said shaft-locking member from its shaft-locking into its shaft-unlocking position in the switch-closing position of the switch-operating shaft, of means whereby the said mechanism is locked during the actuation of the switch-operating shaft and upon the actuation of the said shaft into its switch-opening position.

5. In a switch-stand, a suitably supported switch-operating shaft which is in its switch-closing or switch-opening position according as the shaft has been rotated a predetermined extent in the one or the other direction, a lever operatively connected with the said shaft for rotating the latter, a movable member borne by the first-mentioned lever and instrumental in locking the said lever and consequently the switch-operating shaft in the switch-closing position of the shaft, a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, and mechanism whereby the signal-shaft is rotated from its safety-position into its danger-position during the actuation of the said shaft-locking member from its shaft-locking into its shaft-unlocking position in the switch-closing position of the switch-operating shaft, said mechanism being arranged to be actuated by the said shaft-locking member in the switch-closing position of the switch-operating shaft and operated to actuate the signal-shaft from its safety-position into its danger-position or vice versa according as the said shaft-locking member is actuated into its shaft-unlocking or shaft-locking position.

6. In a switch-stand, a suitably supported switch-operating shaft which is in its switch-closing or switch-opening position according as the shaft has been rotated a predetermined extent in the one or the other direction, a lever operatively connected with the said shaft for rotating the latter, another lever borne by the first-mentioned lever and instrumental in locking the first-mentioned lever and consequently the switch-operating shaft in the switch-closing position of the shaft, a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, and mechanism whereby the signal-shaft is rotated from its safety-position into its danger-position during the actuation of the said shaft-locking member from its shaft-locking into its shaft-unlocking position in the switch-closing position of the switch-operating shaft, said mechanism being arranged to be actuated by the second-mentioned lever in the switch-closing position of the switch-operating shaft and operated to actuate the signal-shaft from its safety-position into its danger-position or vice versa according as the said lever is swung to the extent required in the one or the other direction.

7. In a switch-stand, a suitably supported and suitably rotated switch-operating shaft which is in its switch-closing or switch-opening position according as the shaft has been rotated a predetermined extent in the one or the other direction; a suitably supported movable member instrumental in locking the switch-operating shaft in its switch-closing position; a suitably supported endwise movable slide, and a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, said signal-shaft being operatively connected with the slide and rotated from its safety-position into its danger-position or vice versa according as the slide is actuated in the one direction or the other, said slide being arranged to be actuated by the aforesaid shaft-locking member in the switch-closing position of the switch-operating shaft and operated to actuate the signal-shaft from its safety-position into its danger-position or vice versa according as the said shaft-locking member is actuated into its shaft-unlocking or shaft-locking position.

8. In a switch-stand, a suitably supported and suitably rotated switch-operating shaft which is in its switch-closing or switch-opening position according as the shaft has been rotated a predetermined extent in the one or the other direction; a suitably supported movable member instrumental in locking the switch-operating shaft in its switch-closing position; a suitably supported endwise movable slide; a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety position when the switch-operating shaft is locked in its switch-closing position, said signal-shaft being operatively connected with the slide and rotated from its safety-position into its danger-position or vice versa according as the slide is actuated in the one direction or the other, said slide being arranged to be actuated by the aforesaid shaft-locking member in the switch-closing position of the switch-operating shaft and operated to actuate the signal-shaft from its safety position into its

danger-position or vice versa according as the said shaft-locking member is actuated into its shaft-unlocking or shaft-locking position, and means whereby the slide is locked during the actuation of the switch-operating shaft and upon the actuation of the said shaft into its switch-opening position.

9. In a switch-stand, a suitably supported switch-operating shaft which is in its switch-closing or switch-opening position according as the shaft has been rotated a predetermined extent in the one or the other direction; a lever operatively connected with the said shaft for rotating the latter; a movable member borne by the said lever and instrumental in locking the lever and consequently the switch-operating shaft in the switch-closing position of the shaft; a suitably supported endwise movable slide; a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, said signal-shaft being operatively connected with the slide and rotated from its safety-position into its danger-position or vice versa according as the slide is actuated in the one direction or the other, said slide being arranged to be actuated by the aforesaid shaft-locking member in the switch-closing position of the switch-operating shaft and operated to actuate the signal-shaft from its safety-position into its danger-position or vice versa according as the said shaft-locking member is actuated into its shaft-unlocking or shaft-locking position, and the shaft-locking member being movable with the aforesaid lever independently of the slide when the said shaft-locking member is in its shaft-unlocking position.

10. In a switch-stand, a suitably supported switch-operating shaft which is in its switch-closing or switch-opening position according as the shaft has been rotated a predetermined extent in the one or the other direction; a lever for rotating the said shaft, said lever being operatively mounted on the upper end of the shaft; a suitably supported endwise movable slide located above the said shaft and provided with a slot extending laterally therethrough; a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, said signal-shaft being operatively connected with the slide; another lever borne by the first-mentioned lever and instrumental in locking the latter and consequently the switch-operating shaft in the switch-closing position of the shaft, said shaft-locking lever in the switch-closing position of the switch-operating shaft having an arm or member extending between opposite walls of the aforesaid slot and arranged to actuate the slide and thereby rotate the signal-shaft from its safety-position into its danger-position or vice versa according as the said lever is actuated into its shaft-unlocking or shaft-locking position.

11. In a switch-stand, a suitably supported switch-operating shaft, a lever for rotating the said shaft, said lever being operatively mounted on the upper end of the shaft; a suitably supported endwise movable slide located above and forwardly of and radially relative to the said shaft and provided with a slot extending laterally therethrough; a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, said signal-shaft being arranged rearwardly of and extending above the switch-operating shaft and being operatively connected with the slide; another lever borne by the first-mentioned lever and instrumental in locking the latter and consequently the switch-operating shaft in the switch-closing position of the shaft, said shaft-locking lever in the switch-closing position of the switch-operating shaft having an arm or member extending between opposite walls of the aforesaid slot and arranged to actuate the slide and thereby rotate the signal-shaft from its safety-position into its danger-position or vice versa according as the said lever is actuated into its shaft-unlocking or shaft-locking position.

12. In a switch-stand, the combination, with a suitably supported signal-shaft provided with a danger-signal and a safety-signal which are spaced circumferentially of the shaft and arranged the one or the other in an operative position according as the shaft has been turned a predetermined extent in the one or the other direction, of a suitably supported slide operatively connected with the shaft, a correspondingly arranged slideway for the slide, and means for actuating the slide endwise of the slideway, the danger-signal or the safety-signal being in an operative position according as the slide is at the one or the other extremity of the range of movement, and the shaft being rotated in one direction to render the danger-signal operative or actuated in the opposite direction to render the safety-signal operative according as the slide is being actuated in the one or the other direction.

13. In a switch-stand, a suitably supported switch-operating shaft; a lever for rotating the said shaft, said lever being operatively mounted on the upper end of the shaft; a suitably supported endwise movable slide located above the said shaft and provided with a slot extending laterally therethrough; a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the

switch-operating shaft is locked in its switch-closing position, said signal-shaft being operatively connected with the slide, and another lever borne by the first-mentioned lever and instrumental in locking the latter and consequently the switch-operating shaft in the switch-closing position of the shaft, said shaft-locking lever in the switch-closing position of the switch-operating shaft having an arm or member extending between opposite walls of the aforesaid slot and arranged to actuate the slide and thereby rotate the signal-shaft from its safety-position into its danger-position or vice versa according as the said lever is actuated into its shaft-unlocking or shaft-locking position, and the first-mentioned lever being provided with means for locking the slide during the movement of the said lever and upon the actuation of the said lever into its switch-opening position.

14. In a switch-stand, a suitably supported switch-operating shaft which is in its switch-closing or switch-opening position according as the shaft has been rotated a predetermined extent in the one or the other direction; a lever for rotating the said shaft, said lever being operatively connected with the shaft; a movable member instrumental in locking the switch-operating shaft in its switch-closing position; a suitably supported signal-shaft which is independent of the switch-operating shaft and in its safety-position when the switch-operating shaft is locked in its switch-closing position, and mechanism whereby the signal-shaft is rotated from its safety-position into its danger-position during the actuation of the said shaft-locking member from its shaft-locking into its shaft-unlocking position, and the said signal-shaft-rotating mechanism and the aforesaid lever having members or portions coöperating to lock the signal-shaft in its danger-position during the actuation of the switch-operating shaft and in the switch-opening position of the last-mentioned shaft.

15. In a switch-stand, a suitably supported upright switch-operated shaft; a lever for rotating the said shaft, which lever is operatively mounted on the upper end of the shaft and provided in the top of its hub with a recess arranged circumferentially of and concentrically relative to the said shaft, said lever being provided between the said recess and its outer end with a slot which extends vertically through the lever and communicates at its inner end with the said recess; a suitably supported endwise movable slide movable toward and from the shaft and provided with a slot extending laterally therethrough; said slide in its inner position having the outwardly facing inner side wall of the slot arranged to be overlapped by the surrounding wall of the aforesaid recess during the actuation of the switch-operating shaft and in the switch-opening position of the said shaft; a suitably supported signal-shaft which is independent of the switch-operating shaft and operatively connected with the slide, said signal-shaft being in its safety-position or in its danger-position according as the slide is in its outer or inner position, and another lever borne by the first-mentioned lever and instrumental in locking the latter and consequently the switch-operating shaft in the switch-closing position of the last-mentioned shaft, said shaft-locking lever being arranged to swing in a vertical plane and having an arm or member extending between opposite walls of the aforesaid slot and arranged to actuate the slide and thereby rotate the signal-shaft from its safety-position into its danger-position or vice versa according as the lever is actuated into its shaft-unlocking or shaft-locking position.

16. In a switch-stand, the combination, with a suitably supported substantially vertically arranged signal-shaft which is in its danger-position or in its safety-position according as the shaft has been turned a predetermined extent in the one or the other direction, of a suitably supported slide operatively connected with the shaft and arranged radially relative to and movable from and toward the shaft, a correspondingly arranged slideway for the slide, and means for actuating the slide endwise of the slideway, the shaft being rotated in one direction or the other according as the slide is actuated in the one or the other direction.

17. In a switch-stand, a standard provided at its upper end with a bracket having a substantially horizontally arranged arm which overhangs the standard and is provided with a slideway, a suitably supported slide engaging the slideway, a suitably supported signal-shaft operatively connected with the slide, and means for actuating the slide endwise of the slideway, and the shaft being in its danger-position or safety-position according as the slide is at the one or the other extremity of its range of movement.

18. In a switch-stand, a standard provided at its upper end with a bracket extending above the standard and having an arm which overhangs the standard and is provided at its under side with a slideway, a suitably supported slide engaging the slideway, and a suitably supported signal-shaft operatively connected with the slide, and the shaft being in its danger-position or in its safety-position according as the slide is at the one or the other extremity of its range of movement.

19. In a switch-stand, the combination, with a suitably supported substantially vertically arranged signal-shaft operatively

provided with a lever for rotating the shaft, of a slideway arranged forwardly of the signal-shaft, a suitably supported slide engaging and movable endwise of the slideway, a link operatively connecting the slide with the aforesaid lever, and means for actuating the slide endwise of the slideway, the signal-shaft being in its danger-position or in its safety-position according as the slide is at the one or the other extremity of its range of movement.

Signed by us at Cleveland, Ohio, this 26th day of April, 1909.

SOLON K. BLAIR.
CHARLES B. HOYT.

Witnesses:
C. H. DORER,
B. C. BROWN.