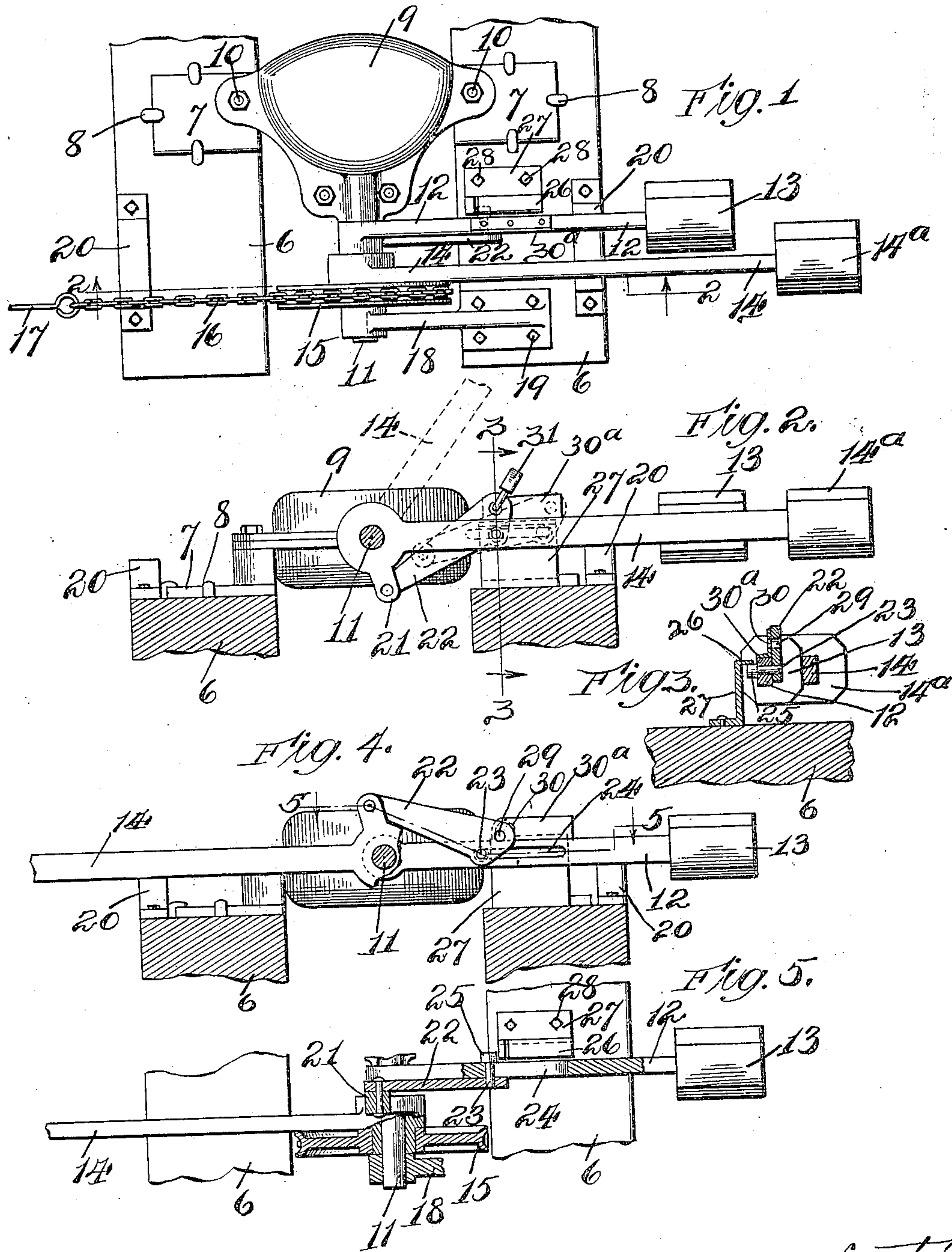


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C. A. DUNHAM & A. L. P. DAVIS.
COMBINED SWITCH AND SIGNAL STAND.

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UNITED STATES PATENT OFFICE.

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COMBINED SWITCH AND SIGNAL STAND.

No. 801,187.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CHARLES A. DUNHAM and ARTHUR L. P. DAVIS, residing at the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Combined Switch and Signal Stand, of which the following is a specification.

This invention relates to improvements in switch and signal stands in which heretofore there are at the stand two levers, one for throwing the switch and the other a signal located some distance from the switch and intended by its position to indicate to the engineer of an approaching train whether the switch is open or closed, which said prior-used levers have no connection with each other except through a padlock designed and intended to simultaneously lock said levers to a lug on the switch-stand when both levers are at the same extremity of their movements.

Now although the rules of railroads are very strict that brakemen and other persons in attendance at a switch shall lock the switch-lever and signal-lever to the stand immediately the switch is closed and the main track is clear it not infrequently happens that through forgetfulness induced by hurry he will lock the switch-lever to the stand in these prior constructions and not only fail to lock the signal-lever, but also fail to throw the signal-lever to the position it must have to indicate that the switch is closed or open, as may be.

When a switch is closed and the main track is clear, if the signal indicates an open switch the result is that a train running on the main line is stopped and delayed until the mistake in the setting of the signal is ascertained and by which time not only is the train belated and its connection lost, but its safety is in danger. On the other hand, if when the switch is open and the signal indicates that it is closed then it will be an exception if the train does not run into the open switch and be thereby wrecked.

The prime object of this invention is to have a connection between the switch-lever and the signal-lever by which when a switch is closed it is impossible to lock the switch-lever to the stand without at the same time locking the signal-lever, or, in other words, until the signal-lever is swung to the position causing the signal to indicate that the switch is closed.

The further object is to have a connection between the switch-lever and the signal-lever

by which it is impossible to move a switch-lever toward a position for opening the switch until after the signal-lever has been moved in the direction causing the signal to indicate the switch is open.

With these ends in view our invention consists in certain features of novelty and construction and combination and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the accompanying drawings, Figure 1 represents a top plan view of a combined switch and signal stand embodying our invention; Fig. 2, a side elevation on the line 2 2 of Fig. 1 with the switch and signal levers shown by full lines in the position they have when the switch is closed, and the signal operated by the switch-lever indicates a closed switch with dotted lines indicating the rearward movement of the pivot connection between these levers during the swinging of the switch-lever toward the position it occupies when the switch is open; Fig. 3, a detail cross-section on the line 3 3 of Fig. 2; Fig. 4, a side elevation indicating the depressed position of the padlock perforation in the connecting-link when the switch-lever is in position closing the switch and the signal-lever in position indicating an open switch and an illustration of the impossibility of locking the switch-lever when said two levers occupy the position shown; Fig. 5, a top plan view, partly in section, of Fig. 4, illustrating a sectional top plan view on the line 5 5 of Fig. 4.

Similar numerals of reference indicate the same parts in the several figures of the drawings.

6 6 indicate railroad-ties, to which plates 7 7 are respectively secured by spikes 8 8, and which plates form a base for the gear mechanism (not shown) inclosed in a casing 9, secured to the base-plates 7 7 by bolts 10 10 and in which is journaled in the usual manner a shaft 11. Rigidly keyed or otherwise secured to the shaft 6 is a switch-lever 12, having at its free end the usual weight 13. Sleeved on the shaft 11 is a signal-lever 14 with a weight 14^a at its free end, on the hub of which is a sprocket-wheel 15, having secured thereto a single weight 16 and in such a position that a half-turn of the sprocket will give the chain a movement lengthwise a distance corresponding with half the circumfer-

ence of the sprocket, the free end of the chain having attached thereto a wire or rod 17, connected with the signal (not shown) at some distance from the switch-stand, and particularly if said stand is at a curve in the main line, which signal is preferably of the usual vibrating-arm construction and which at night carries the lantern-signals in the arrangement and of the colors now commonly employed; but said signals may be of the rotating or other construction.

The outer end of the shaft 11 is journaled in a bracket 18, secured to one of the ties 6 6, as shown by bolts 19, passing through its flanges, and also preferably secured to both of said ties are chairs 20 20 for supporting the levers in the desired position at both extremities of their movement.

On the hub of the switch-lever 14 is an arm or lug 21, to which is pivoted a link 22, having secured at its free end a pin 23, projecting at a right angle therefrom through a longitudinal slot 24 in the switch-lever 12, which pin projects beyond the switch-lever and is preferably provided with an antifriction-roller 25, adapted to engage with the under side of a flange 26 on a bracket-arm 27, secured by bolts 28 28 to the tie 6 at the right hand of Fig. 1.

The link 22 is provided with a perforation 29 and the switch-lever 12 with a perforation 30, preferably in an angular plate 30^a, secured on top of the switch-lever, as shown in Fig. 3 and indicated in Fig. 4, and are thereby adapted for a padlock 31, locking them together, which perforations register for locking purposes when and only when both the switch and the signal levers are in a certain position, hereinafter described.

In operation after first removing the padlock from both levers in the position they have in Figs. 1 and 2 when the switch is closed and the signal indicates the main line to be open the signal-lever must first be thrown to the other extreme of its movement and the signal thereby moved to indicate the switch is open, because the switch-lever cannot be substantially moved until the pin-roller 25 has been moved out from under the bracket-flange 26 and that this cannot occur until the signal-lever has first been swung toward the other extreme of its movement far enough to move the signal to indicate the switch is open, and preferably not until it is first moved beyond a vertical position, so that thereby the switchman is induced to continue this movement before making any effort toward throwing the switch-lever to the same position, and thereby actually opening the switch. During the first part of the upward movement of the signal-lever from the position shown in Figs. 1 and 2 the pin 23 is moved to the position it is indicated by dotted lines to have at the right-hand end of the slot 24; but as this upward movement of the signal-lever proceeds the pin

23 gradually moves back, so that by the time the signal-lever passes just beyond its vertical position the pin-roller 25 clears the flange 26, by which time the signal has been substantially shifted toward the position it occupies to indicate a closed switch. By the time the pin 23 has cleared the slot 24 the position of the signal-lever is such as to induce the switchman to continue its movement until the signal is fully set before attempting to move the switch-lever, because the signal-lever is then passed beyond its center of gravity; but even if he does not the position of the signal-lever is such that he will certainly continue its forward movement to its limit concurrently with throwing the switch-lever to the same position opening the switch. To close the switch, it is impossible to lift the signal-lever from the position it then occupies until the switch-lever has been moved far enough for the pin 23 to pass under the flange 26—that is to say, until the switch-lever has passed a vertical position—because before that time the link 22 operates to lock the signal-lever against movement, and it therefore follows that the switchman must not only close the switch before moving the signal from an open to a closed position, but that it is impossible for him to move that signal to indicate the switch is closed until after its closing is actually accomplished, and, furthermore, that he cannot lock either lever to the switch-stand until both levers have reached the limit of their movement for those purposes. In securing these ends it should be observed that the slot and pivot device contain and embrace a shifting-fulcrum connection between the switch-lever and the signal-lever, and therefore that our invention is not limited to the special details of construction shown and not only includes the special form of shifting-fulcrum connection shown and described, but any other form thereof adapted to secure these ends. For example, it will be within the spirit of our invention in its broad sense to have the pin 23 on the switch-lever and the slot in the link 22 or to have a link pivoted to the switch-lever and connected with the link 22 by means of a pivot on one of said links and engaging an elongated slot in the other or by a link pivoted to the switch-lever and to the link 22 in the absence of such a slot.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a combined switch and signal stand, the combination of a switch-lever, a signal-lever and a shifting-fulcrum connection between said levers, substantially as described.

2. In a combined switch and signal stand, the combination of a switch-lever, a signal-lever, an axis common to both, and a shifting-fulcrum connection between said levers at a point removed from said axis, substantially as described.

3. In a combined switch and signal stand, a switch-lever and a signal-lever having a common axis, in combination with a pivoted shifting-fulcrum connection, and means for locking said levers against simultaneous movement from the extremes of the positions which they respectively have when a switch is open or closed, and accordingly indicated by the signal, substantially as described.

4. In a combined switch and signal stand, a switch-lever and a signal-lever having a common axis, in combination with a pivoted shifting-fulcrum connection and means preventing the throwing of the switch-lever in advance of the throwing of the signal-lever, substantially as described.

5. In a combined switch and signal stand, a switch-lever and a signal-lever having a common axis, in combination with a pivoted shifting-fulcrum connection, and means preventing throwing the switch-lever in the direction of either of its movements before the signal-lever has been substantially moved in the direction it must be to actuate the signal to indicate an open or closed switch as may be, substantially as described.

6. In a combined switch and signal stand, a switch-lever and a signal-lever, in combination with a link pivoted to one of said levers, and a shifting-fulcrum connection between said link and the other lever, substantially as described.

7. In a combined switch and signal stand, a switch-lever and a signal-lever, in combination with a link pivoted to the signal-lever, and a shifting-fulcrum connection between said link and the switch-lever, substantially as described.

8. In a combined switch and signal stand, a switch-lever and a signal-lever, in combination with a link pivoted to one of said levers and a pin upon said link, the other lever being provided with a slot receiving said pin,

and means maintaining said pin and with it the switch-lever depressed until after the signal-lever is elevated, substantially as described.

9. In a combined switch and signal stand, a switch-lever provided with an elongated slot, a signal-lever on an axis common to both of said levers, a link pivoted to the signal-lever and a pin secured to said link and projecting through and beyond the switch-lever slot, in combination with means engaging said pin and maintaining the switch-lever against movement until the signal-lever has been moved substantially toward the other limit of its movement, substantially as described.

10. In a combined switch and signal stand, a switch-lever, a link pivoted thereto and provided with a perforation, and a pin projecting from said link in combination with a switch-lever provided with an elongated slot and also a perforation registering with the perforation in the link only when both of said levers are at the extreme limit of their movements, substantially as and for the purpose described.

11. In a combined switch and signal stand, a signal-lever, a radial arm projecting therefrom, a link provided with a perforation, and a pin projecting from said link, in combination with a switch-lever having a perforation and an elongated slot, through the latter of which said pin projects, and a bracket or keeper adapted to be engaged by said pin and prevent the rising of the switch-lever until the signal-lever has been swung on its axis away from the switch-lever, substantially as and for the purpose described.

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