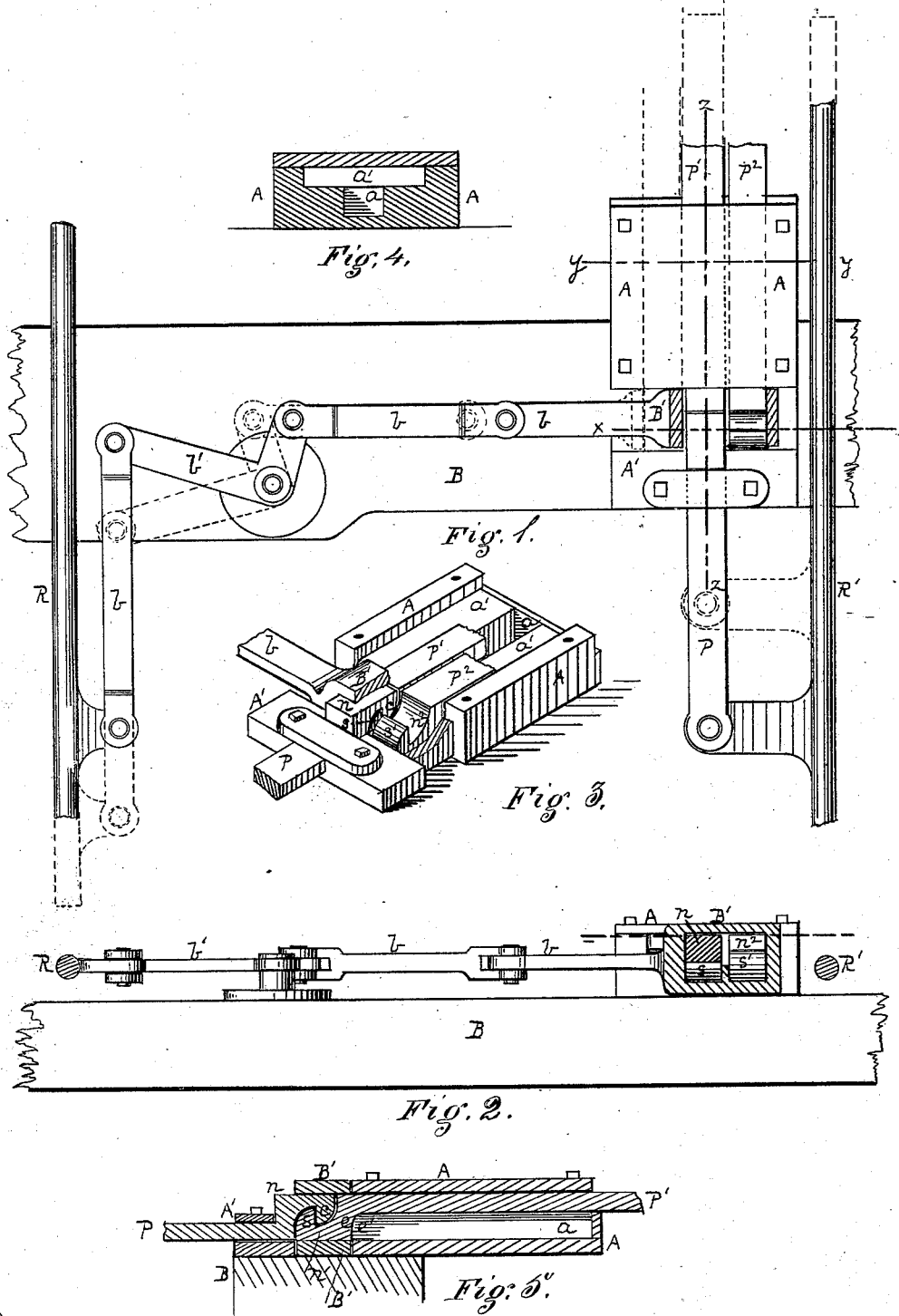


A. G. CUMMINGS.
Interlocking Switches and Signals.

No. 216,510.

Patented June 17, 1879.



Witnesses.
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IMPROVEMENT IN INTERLOCKING SWITCHES AND SIGNALS.

Specification forming part of Letters Patent No. **216,510**, dated June 17, 1879; application filed April 14, 1879.

To all whom it may concern:

Be it known that I, ALBERT G. CUMMINGS, of Harrisburg, county of Dauphin, State of Pennsylvania, have invented or discovered a new and useful Improvement in Interlocking Switches and Signals; and I do hereby declare the following to be a full, clear, concise, and exact description of the invention, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a plan view, partly in section, of so much of my improved apparatus as is necessary to illustrate its construction and operation. Fig. 2 is an end elevation of the same, but sectioned in part on the line *x x*, Fig. 1. Fig. 3 is a detached perspective view, partly in section, of the joint formed by the signal-bars, box, and shifting-link at their junction. Fig. 4 is a transverse section through the box in the line *y y*, Fig. 1; and Fig. 5 is a vertical section in the line *z z*, Fig. 1.

My present invention relates to certain improvements in what are commonly known as "interlocking switches and signals," in which, by a system of levers, stops, connections, &c., a single operator works any desired number of switches and signals near by or at a considerable distance, the construction and arrangement of said devices being such that no switch can be opened and its signal be shifted to "safety" until all switches that ought to be closed and all signals that ought to be at "danger" position are properly set or adjusted.

The present improvement may be incorporated into such a system; or the proper devices used in such system, such as levers, rocking bars, stops, or dogs, &c., may be added to the devices herein described, so as to complete it for separate use.

The object of my improved construction is to enable a switch—particularly a facing point switch—and two separate and distinct signals or branch lines to be operated by the use of only two levers.

Any suitable foundation may be provided, as at B. On this I arrange a guide-box, A. This box has a recess, as at *a*, a broader open space, *a'*, extending through it from end to end. Across its base end I arrange a link, B'.

In rear of the link is a boxed guide, A'. The link B' is connected by bars or rods *b* and bell-crank *b'* to a longitudinally-moving switch-rod, R, so as to be operated by the longitudinal motions of the same. This switch-rod is shifted either way by any suitable lever, (of the interlocking or other kind, as may be preferred,) and it is to be extended to the switch-rails to be operated, and is connected with them in any of the ways known to the art.

Lengthwise of the box A are two signal-rods, P¹ P², which are to connect in the usual or any desired way with semaphore or other desired signals, one on each of two branch lines, which unite at the switch.

Playing through the boxed guide A' is a signal-shifting bar, P, which at its rear end may be connected with an interlocking or other lever, or with a switch-locking bar, R', which, in turn, is to be operated by a lever, and which is to extend to the switch, so as to throw a bolt or other device for locking the switch-rails in either an open or closed position.

Devices referred to, but not shown, are so well known in the art as not to require detailed description.

The signal-shifting bar P is arranged in line with the recess *a* of the box A, and is so made that it may be operated forward and back therein. Its forward end and the rear end of the signal-rods P¹ P² are made to engage with each other by any suitable joint, such that by the bar P longitudinal motion may be imparted to either of the rods P¹ P², and also such that the rods P¹ P² may be shifted laterally, so as to bring either one into connection with P, as may be desired. Hence I term this a "laterally slip-joint."

One suitable form is shown in Figs. 3 and 5, where a hook, *c*, on the head *n* of P engages a counter-hook, *s*, on the head *n*¹ of P¹. These heads are so shaped that vertically they fill the link B'. The other signal-rod, P², has a like head, *n*², and a like hook, *s'*, and the two heads and hooks, when lying side by side in the link B', fill it, practically, in the direction of its length, so that one has a lateral bearing against one inside end of the link and the other against the other inside end.

Understanding now that the signal-rods P¹

P², in the position shown, are adjusted for showing danger-signals on both branches, it is important that one be free to be moved, so as to exhibit a safety-signal, and that at the same time the other shall be locked, so that its signal cannot be shifted from danger to safety.

To this end I make the recess *a*, so that when either P or P¹ is brought into line with it such signal-rod may be shifted so as to indicate safety. The other rod must then occupy a position in *a'* either to one side or the other of *a*. In order that such signal-rod may then be securely locked, I make on the back of each head *n*¹ *n*² a shoulder, as shown at *e*, Fig. 5, of such shape that it will slip into and engage the end *e'* of the side wall of the recess *a*. It is then free from engagement with the head *n* of the shifting-bar P, as shown in Fig. 3, and, one end of its head coming against the guide A' and the shoulder *e* against the end *e'* of the side wall of the recess *a*, (on one side or the other,) it is held securely in place, so that its signal is locked at danger.

Assuming that the rod P¹ operates the signal which is to be set at safety, it is done by giving a forward stroke to P. This motion is, however, possible only after a rod, R, has been shifted so as to set the switch properly for that signal, and the forward motion of P brings its stem forward inside the link B', in such manner that the switch-rod R is locked thereby, and the switch cannot be shifted until P¹ is brought back so as to show a danger-signal on its line or branch. The switch is then free to be reversed preparatory to bringing in a train on the line the signal of which is operated by P². The switch-rod R may then be shifted so as to bring it and its connections to the position shown in dotted lines, Fig. 1. This motion brings P² into connection with P, and shifts P¹ into a locking position on the left-hand wall of the recess *a*, and locks it there, and also makes a switch-connection with the line desired. A forward motion imparted to P then brings the signal of P² to a safety position, and also locks the switch-rod R, as before. If a locking-bolt or other equivalent device is used to lock the switch it may be operated by R', the back stroke of P unlocking it, (by drawing the bolt or otherwise,) and the forward stroke locking it in either position. This is, however, an element of additional safety, and may be employed or not, at pleasure.

It will thus be seen that with only two levers—one to operate the switch-rod R and the other to operate the signal-shifting bar P—I am enabled to set the switch to either one of two lines or tracks, lock it in either position, show a safety-signal on the open line and a danger-signal on the closed line, and also lock such signal at danger, and, furthermore, can doubly lock the switch by locking both the switch-rod and the switch itself.

In order that the signal-shifting bar P may lock the switch more certainly from the time

it commences its forward stroke and until it completes its back stroke, I prefer to affix a rib, *r*, to the inside of the link B' in such position that as P advances the rib will take a bearing on one side of its head and stem, the other side bearing against the left-hand end of the link. This rib is made low, so that in shifting the link B' it may readily pass under the hook *c*.

Instead of flat stems for P P¹ P², round stems may be employed, provided their lateral surfaces, with wings or without, are caused to operate between suitable guides, so as to have substantially a like operation. Also, any suitable open-sided joint may be substituted for the hooks described, and a groove and rib, or other mechanically-equivalent stop device, may take the place of the engaging surfaces *e e'*.

This device can be used with two or more signals, as circumstances may require, by introducing more signal-connections into the guide-box A and adding to length of link B.

In the fitting up of the apparatus provision may be made, if found necessary, either in the manner of jointing the rods P¹ P² at their outer ends, or in the joints of their connections, or in the spring of the rods or connections themselves, for the lateral movement described; but as such connections are usually of considerable length as compared with the length of lateral motion referred to, but little, if any, such provision will be found necessary. The bar R' is intended for use in the movement of locking-bars, wedges, or kindred devices, some of which, as known in the art, are shown in United States Patent to Saxby and Farmer, No. 131,788, October 1, 1872.

I claim herein as my invention—

1. In a switch and signal interlocking apparatus, two or more signal-rods capable of being moved longitudinally for the operating of signals, and laterally movable into and out of engagement with a signal-shifting bar by the same motion which shifts the switch or switch-rod, substantially as set forth.

2. The combination of two or more laterally-movable signal-rods, a signal-shifting bar, a link for shifting the signal-rods into and out of engagement with the shifting-bar, and suitable stop or stops for locking the signal rod or rods which are not in engagement with the shifting-bar, substantially as set forth.

3. A switch-shifting rod, R, with connections to a link, B, in combination therewith and with signal-shifting bar, substantially as described, whereby in either position of the switch it shall be locked and unlocked by the signal-shifting bar engaging or disengaging the link.

4. The combination of switch-rod R, link B' and suitable connections, signal-rods P¹ P², shifting-bar P, and switch-locking bar R', substantially as set forth, with reference to effecting a double locking of the switch.

5. The box A, having recess *a*, of suitable size for the operation therein of such signal-

rod as may be brought into line with the signal-shifting bar, and a broader box, recess, or space, *a'*, into which to shift and lock the other signal rod or rods, and in combination with such rods and bar, substantially as set forth.

6. The box A, having recess *a* and space *a'*, as a carrying and locking device for the laterally-movable rods, in combination with boxed guide A', as a carrying device for the

signal-shifting bar, and in further combination with the interposed link B', substantially as set forth.

In testimony whereof I have hereunto set my hand.

ALBERT GALLATIN CUMMINGS.

Witnesses:

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