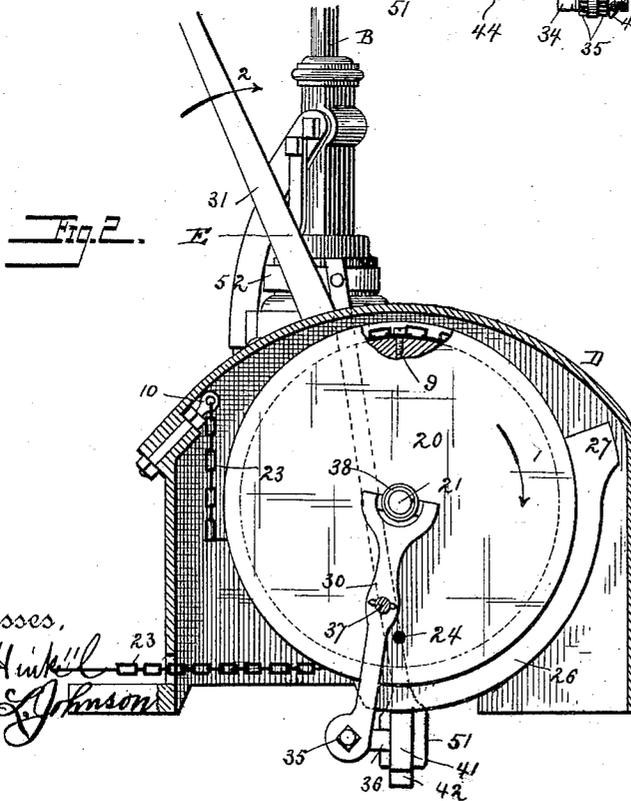
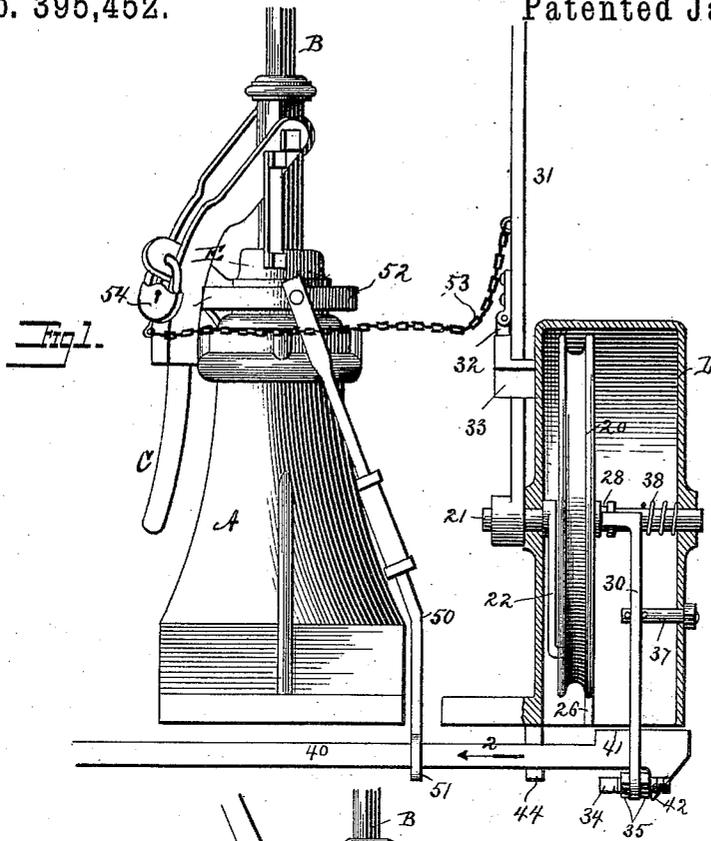


H. B. POTTER.

INTERLOCKING SWITCH AND SIGNAL.

No. 395,452.

Patented Jan. 1, 1889.



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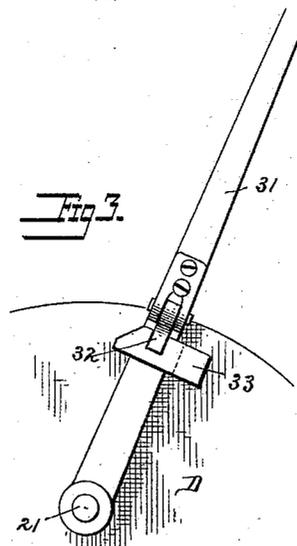
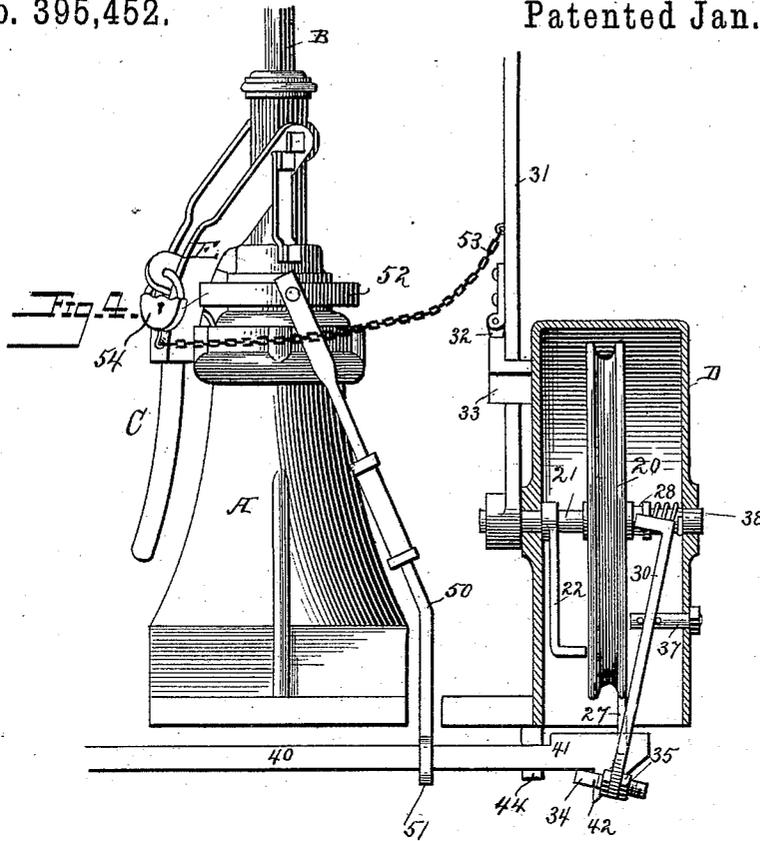
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# UNITED STATES PATENT OFFICE.

HOBERT B. POTTER, OF HILLBURN, NEW YORK.

## INTERLOCKING SWITCH AND SIGNAL.

SPECIFICATION forming part of Letters Patent No. 395,452, dated January 1, 1889.

Application filed January 20, 1888. Serial No. 261,391. (No model.)

*To all whom it may concern:*

Be it known that I, HOBERT B. POTTER, a citizen of the United States, residing at Hillburn, in the county of Rockland and State of New York, have made certain new and useful Improvements on Interlocking Devices for Railroad Switches and Signals, of which the following is a specification.

This invention relates to an interlocking device adapted to be connected with the moving rails of a switch, the switch-stand for operating said rails, and a signal for giving warning of the position of the switch-rails, it being particularly adapted for use in connection with that class of switches in which the rails may be thrown by the train under certain circumstances irrespective of the position of the actuating parts of the switch-stand.

It consists of devices to be hereinafter pointed out, whereby when the switch-rails are to be moved by hand it is always necessary to give the danger-signal before the rails can be set to "danger," and whereby also it is impossible to reset the signal to "safety" until after the rails have been shifted to safety position; and it consists, also, of certain arrangements of parts whereby when the rails are moved to "danger," either automatically by the train or otherwise than by the switch-stand devices, the signal will be automatically thrown to the danger position, where it will be held until the rails are again set to the safety position.

Figure 1 is a side view of an arrangement of devices embodying my invention, part of the inclosing-casing D being broken away to better show the position of parts. Fig. 2 is an end view of the same devices, part of the casing D being broken away. Fig. 3 is a detail view. Fig. 4 is a side view of the parts in a position different from that shown in Fig. 1.

As shown in said drawings, the improved interlocking devices are illustrated in connection with the automatic switch-stand patented to F. W. Snow, No. 299,176, and as improved by devices subsequently filed by him. While these improvements are shown so combined, it is obvious that many of the features of invention are equally applicable to other forms of switch-stands. The standard A of such

switch-stand is adapted to rest upon the cross-ties and to support the vertical actuating shaft or spindle B, provided with the usual crank, which is connected to operate the switch-rails. It is necessary before the rails can be shifted by the handle C of such Snow switch-stand to first raise the vertically-sliding block E, to which the handle is usually connected, from engagement with the head-block of the stand, after which the spindle B may be turned.

The various parts of the signal operating and interlocking devices are supported in a frame, D, that may also form a casing for inclosing the various operative parts, and which is mounted upon the ties adjacent to the switch-stand A.

The interlocking device consists, broadly stated, of an interlocking rod, 40, that is secured to move with the switch-rails or to be moved longitudinally whenever they are moved, a connecting-rod, 50, between the rod 40 and the vertically-moving block E of the switch-stand, arranged to move the rod transversely when the switch-actuating devices are moved, and a flange, 26, or equivalent engaging or obstructing device, combined with the signal-operating mechanism and so arranged as to lock the rod 40 against transverse movement to prevent movement of it and the connecting-rod 50, which in turn controls the switch-actuating devices of the switch-stand A until after the signal has been set to the danger position.

The interlocking rod 40 is supported to slide freely in a loop, 51, of the connecting-rod 50 and extend under and in the path of a flange, 26, formed on the periphery of the wheel 20, to be hereinafter described.

The upper end of the connecting-rod is hooked onto a curved band, 52, to which it may be bolted, as shown, carried by the block E of the switch-stand, so that when the block is raised and turned the supported end of the interlocking reciprocating rod 40 will be simultaneously raised and will swing with the block.

The free end of the rod 40—that is, its end opposite to its connection with the switch-rails—is provided with a rib, 41, along its upper edge, and with a downward-projecting

tongue or hook, 42, and is laterally supported and guided by downward-extending projections 44, carried by the frame D.

20 is a wheel or pulley provided with a circumferential groove, in which is seated a chain, 23, that is about centrally of its length secured to the wheel by a staple, as at the point 9, which chain 23 is secured at one end to a screw-eye, 10, adjustably held in the frame, and at the other end is connected with a wire or rod, 11, or other signal-operating mechanism of the ordinary construction, and not herein shown. The flange 26, before referred to, is preferably formed as an integral part of this wheel 20, and is so related thereto that when the wheel is in the position shown in Fig. 2, which position sets the signal to "safety," the flange is over the rib 41 on the rod 40. When, on the other hand, the wheel is partially rotated to set the signal to "danger," the end 27 of this flange has passed entirely by the rod 40 and no longer obstructs it in its movements in any direction. The end 27 of the flange is expanded somewhat, as seen in Fig. 2, for a purpose to be hereinafter described.

The wheel 20 might be splined to the shaft 21; but it is preferred to mount it loosely thereon and provide the shaft with an arm, 22, having a toe that engages with a recess or opening, 24, in the wheel. Any other form of clutch or locking device may, however, be interposed between the wheel and this shaft in place of the one just described. A hand-lever, 31, is secured to the end of the shaft, by which the latter and its connected devices may be rotated.

The signal is preferably so constructed and connected with the wheel 20 that its tendency is constantly to move to its danger position, and hence in the position of parts shown in Fig. 2 there will be a continual pull on said wheel tending to rotate it in the direction of the arrow, Fig. 2. In order, therefore, to hold the same with its flange 26 in a position to lock the reciprocating rod 40, the hand-lever is provided with a pivoted latch, 32, adapted to fall into a notch formed therefor in a locking-plate, 33, carried by the frame D, and back of which the lever 31 rocks. The wheel 20 has also a limited sliding motion on its shaft, it being normally held to engage with the toe of the arm 22 by a coiled spring, 38, encircling the shaft.

The hub of the wheel 20 opposite the arm 22 is somewhat extended, and provided with a circumferential groove, 28, with which engages the forked end of a shipping-lever, 30, which is pivotally mounted upon a stud, 37, projecting from the side of the case. The lower end of this lever 30 is provided with a projection lying in the path of the hook 42 of the reciprocating rod, and with which it, under certain conditions, engages, as will be hereinafter described. This projection consists of a finger, 36, carried by a contact-arm, 34, which is adjustably held in an aperture

formed in the lower end of the lever, in which it is adjustably held by clamping-nuts 35.

The switch-stand is locked in the usual manner by a padlock, 54, carried by a chain, 53, of proper length, secured at one end, by preference, to the lever 31.

In the class of switch-stands illustrated, known as "automatic" switch-stands, and with which I prefer to use my invention, the construction is such that the switch-rails may under certain circumstances be moved or thrown over into the danger position from a position of "safety" by the leading wheels of the train, irrespective of the position of and without lifting the handle C. I will therefore first describe the operation of the various devices when it is desired to set the switch-rails and the signal both to danger positions by hand, then the operations of the parts when the switch-rails are thrown to danger position automatically by the train or otherwise than by the handle C, and finally the operation of the parts in restoring the switch-rails and signal when automatically set to danger to their safety positions.

Now, suppose the parts are in the position shown in Figs. 1 and 2, which are safety positions of both the switch-rail-operating devices and the signal devices; and that it is desired to set the switch-rails to "danger" by hand. To so shift the rails it is first necessary to raise the block E, which carries with it in an upward direction both rods 50 and 40; but this cannot be done so long as the flange 26 on the wheel 20 is above and in the upward path of the rod 40. It is therefore necessary to first partially rotate the wheel to carry the flange past the rod, which is done by moving the handle 31 in the direction of the arrow 2, Fig. 2. This movement, besides removing the obstructing flange from above the reciprocating rod 40, sets the signal to "danger," after which the rails can be moved by means of handle C, during which movement the rod 40 is lifted by the rod 50 and the block E, so that the hook 42 thereof passes over the projection 36, carried by the shipper 30, without contact therewith.

The horizontal reciprocation of the rod 40 is so regulated that when the complete movement of the switch-rails to danger position is made the rib 41 has not entirely passed the shoulder 27 of the flange 26, but lies in the path thereof and obstructs its movements until it has been removed. It thus follows that when the signal has been put to "danger" by hand it is locked in such position by the rails as soon as they are moved in the least to the open or danger position, and will continue to be so locked until the rails have been completely returned to their safety position, after which the signal can be reset to "safety." Suppose, again, the parts being first set to the positions shown in Figs. 1 and 2, that the rails are thrown to the danger position, either automatically by the train or in any other manner than by the handle C, which, as

before stated, may be done without raising the block E and without reference to the position of the handle C. Such movement of the switch-rails slides the rod 40 in the supporting-loop 51 in the direction of the arrow 2, Fig. 1, such sliding motion taking place below the flange 26 and without interference therefrom. Before the rod completes its longitudinal motion its hooked end 42 comes into engagement with and shifts the lever 30, thereby freeing the wheel 20 from the arm 22 and permitting it to rotate under the influence of the signal, which automatically moves to "danger" when the parts are in the position shown in Fig. 4. As will be seen by reference to said figure, the wheel 20 is now so far slid to the right on its shaft by the shipper 30 that its flange 26 is out of the path of the rib 41, which latter will not therefore interfere with the turning of such wheel; but such wheel cannot be turned by the handle 31 when in position shown in Fig. 4, for the reason that it is unclutched from the shaft 21.

I will now describe the operation of the parts when it is desired to reset the various parts to "safety" from the position shown in Fig. 4. The first movement will be to unlock the handle C and raise it and the block E preparatory to turning the spindle B and shifting the rails. This movement lifts the rod 40, so that the hook or tongue 42 thereof is freed from engagement with the projection carried by the shipping-lever, which, being free, immediately goes toward the position shown in Fig. 1 under the influence of spring 38, the wheel 20 moving correspondingly, as will be understood. The wheel 20 is moved until it contacts with the toe of arm 22, which must be moved by handle 31 in the direction of the arrow 2, Fig. 2, into the danger position before the toe enters the slot 24, and the wheel and shaft will be locked together. This movement brings the expanded end 27 of the flange 26 opposite the rib 41 on the rod 40, thereby locking the signal in its danger position, so that it cannot be moved until the rails have been entirely shifted over to safety position and the handle C and block E brought down to lock them. This being accomplished, the signal may be reset, as will be understood.

It is evident that either the interlocking devices used in connection with the switch-stand or those used when the switch-rails are thrown automatically may be used alone—that is, without connection with the other—and still certain of the features of my invention be maintained.

Without limiting myself to the precise construction and arrangement of parts shown and described, I claim—

1. The combination, with an automatic switch-stand and signal devices which tend automatically to go to the danger position, of a reciprocating rod connected to move with the switch-rails, and a clutch or locking device which operates to hold the signal devices

in their safety position, and arranged to be operated by the said rod when moved, substantially as described.

2. The combination, with an automatic switch-stand and signal devices which tend to automatically go to the danger position, of a reciprocating rod connected to move with the switch-rails, a clutch or locking device which normally holds the signal devices against automatic movement, arranged to be operated by the said rod to release the signal devices, and an obstructing device operated by the signal devices and normally arranged in the path of the said rod when the signal is set to the safety position, substantially as described.

3. The combination, with the switch-stand having a vertically-moving block, E, and the signal devices, of a reciprocating rod, 40, connected to move with the switch-rails, a connecting-rod, 50, between the reciprocating rod and the block E, and an obstructing device actuated by the signal devices and arranged above and in the path of the rod 40 when the signal is set in the safety position, substantially as described.

4. The combination, with the switch-actuating devices and the signal devices, of a reciprocating rod connected to move longitudinally with the switch-rails, a connecting-rod between the reciprocating rod and a moving part of the switch-actuating devices, arranged to move the reciprocating rod transversely while the switch-actuating devices are moved, and an obstructing device connected with the signal devices and arranged by the side of the reciprocating rod when the signal is set to safety position to obstruct its transverse movement, substantially as described.

5. The combination, with the switch-rails and the switch-stand A, of the reciprocating rod 40, connected to move with the switch-rails, a connecting-rod between the rod 40 and a moving part of the switch-stand, arranged to move the rod 40 transversely when the switch-stand is operated, the wheel 20, by which the signal is operated, and an obstructing projection carried by said wheel and arranged to lie in the path of the rod 40 when the signal is set to "safety," to obstruct its transverse movement, substantially as described.

6. The combination, with the switch-rails and the switch-stand A, having the vertically-moving block E, of a reciprocating rod, 40, connected to move with the switch-rails, a connecting-rod between the rod 40 and the block E, the wheel 20, by which the signal is operated, and a flange, 26, provided with an expanded end, 27, carried by said wheel, said flange being arranged to lie above the rod 40 when the signal is set to "safety," and the expanded end 27 being arranged to one side of the rod 40 when the signal is set to "danger," substantially as and for the purpose set forth.

7. The combination, with the switch-rails,

of the reciprocating rod 40, connected to move therewith, a signal-operating wheel, 20, loose upon its shaft, but normally held clutched thereto, an operating-handle by which the wheel is turned, and a shipping-lever operated by the rod 40 when reciprocated to throw the wheel out of engagement with its shaft, substantially as set forth.

8. The combination, with the switch-rails, of the rod 40, connected to move with the switch-rails, a signal-operating wheel, 20, loose upon its shaft, but normally held clutched thereto by a spring, a shipping-lever adapted to slide the wheel on its shaft out of engagement with its clutching device, and an adjustable contact-arm carried by the shipping-lever in the path of the rod 40 as it moves with the rails to the danger position, substantially as described.

9. The combination, with the switch-rails, a switch-stand, A, and the signal devices, of the rod 40, connected to move with the switch-rails, a connecting-rod between the rod 40 and a moving part of the switch-stand, a signal-actuating wheel, 20, loose upon its shaft, but normally held clutched thereto by a spring, an interlocking or obstructing device operated by the signal-actuating wheel to be moved into the path of the rod 40 to obstruct the same when the signal is set to "safety,"

and a shipping-lever for releasing the wheel from its shaft and provided with a projection in the path of the rod 40, substantially as set forth.

10. The combination, with the switch-rails, a switch-stand having a vertically-moving block, E, and the signal devices, of the reciprocating rod 40, connected to move with the switch-rails, the connecting-rod 50 between the block E and the rod 40, which latter is seated in a loop, 51, through which it slides freely, a signal-operating wheel, 20, loose on its shaft, but normally held clutched thereto, the operating-handle 31, by which the wheel is turned, the flange 26, carried by said wheel and arranged above the rod 40 when the signal is set to "safety," whereby it obstructs the upward movement of the rod by the connecting-rod 50, and a shipping-lever for releasing the wheel from its shaft, provided with a projection in the path of the rod 40, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HOBERT B. POTTER.

Witnesses:

PETER D. JOHNSON,

H. SEYMOUR JOHNSON.