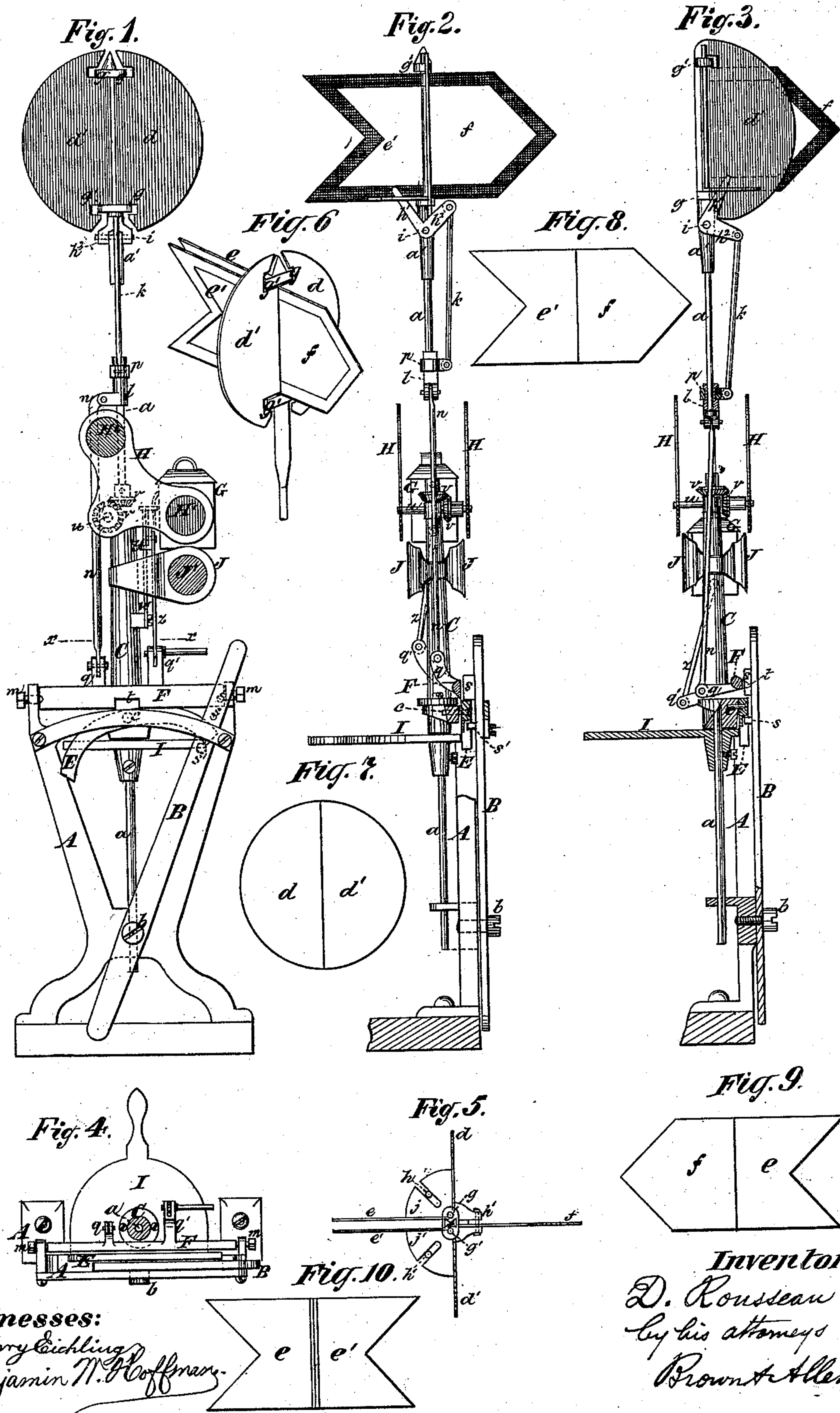


D. ROUSSEAU.  
Switch-Signaling Apparatus.  
No. 209,423.      Patented Oct. 29, 1878.



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN SWITCH-SIGNALING APPARATUS.

Specification forming part of Letters Patent No. **209,423**, dated October 29, 1878; application filed March 25, 1878.

*To all whom it may concern:*

Be it known that I, DAVID ROUSSEAU, of Morrisania, in the city, county, and State of New York, have invented certain new and useful Improvements in Switch-Signaling Apparatus for Railways; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention consists in certain novel means of combining the mechanism for operating a switch-signal with the switch-operating lever, whereby the several positions or conditions of the switch are caused to be indicated with more absolute certainty.

It also consists in certain improvements in the signal-indicating devices and in the mechanism for operating the same, whereby provision is made for giving, with a single signaling apparatus, accurate indications of a greater number of positions or conditions of the switch than has heretofore been attainable with accuracy by a single apparatus.

The signal apparatus represented in the drawings to illustrate my invention is one which serves to indicate the position or condition of a switch which is capable of being shifted to three different tracks; but, as will be hereinafter explained, many parts of it are applicable in connection with switches intended only to be shifted from one to the other of two tracks.

Figure 1 is a front view of the apparatus. Figs. 2 and 3 are side elevations of the same, both partly in section, showing different positions of some of the parts. Fig. 4 is a horizontal section of the same in the line *xx* of Fig. 1. Fig. 5 is a plan of a target-signal, which is part of the invention. Fig. 6 is a perspective view of the same. Figs. 7, 8, 9, and 10 are face views, showing the different indications obtained by said signals.

A is the standard or frame which forms the support for the fulcrum *b* of the switch-operating lever B, and to which is firmly secured the hollow column C, through which works the upright shaft *a* of the target-signal D. This shaft *a* has secured to it the locking-plate I, which is similar to the locking-plate described in my Letters Patent No. 199,107,

dated January 8, 1878, and which operates and is operated upon in a similar manner to prevent and permit the moving of the target or signal as required.

E is a positively-operated stop, which is intended as a substitute for the spring-stops described in my above-mentioned Letters Patent, its purpose being to stop the locking-plate I, and prevent the turning of the signal from the position indicating danger while the switch is unlocked. This stop E consists of a curved bar arranged behind the switch-lever, where it is pivoted to the standard A by a pin, *c*, upon which it is capable of vertical oscillation in a plane parallel with the movement of the lever itself. The curved upper and lower edges of this stop-bar are received between projections *s s'* on the back of the switch-lever, for the purpose of enabling the said bar to be moved on its pin *c* by the movement of the said lever, the curvature of the edges of the said bar being such that when the switch-lever is thrown over to the full extent in either direction to set the switch the end of the said bar farthest from the lever will be down in front of the straight edge of the locking-plate I, as shown at the left of Fig. 1, and so prevent the said locking-plate and the signal-shaft from being turned in one direction, while the end of said bar next the lever will be lifted up out of the way of the locking-plate to enable the said plate and the signal-shaft to be turned in the other direction, to enable the signal to be properly set for the switch. The said curvature is, moreover, such that soon after the switch-lever has commenced its movement in one direction the stop-bar will be moved by the said lever to such a position that both ends of the said bar will be in front of the locking-plate, and will remain so until the lever has nearly completed its movement, when the end of the bar next the lever will be raised out of the way of the locking-plate and the other end will be depressed in front of the said plate, and thereby act as a stop thereto. This stop-lever E has the advantage over the spring-stops described in my above-mentioned Letters Patent in being not only thrown out of operation by the switch-lever, but also thrown into operation by the said lever, and of also being positively locked by the said



lever, so that it cannot by any means be moved when the switch is set in either direction.

In order to provide for making the target-signal indicate, besides the unlocked condition of the switch, three different settings of the switch for as many different tracks, the target is made with five wings, as shown in plan view, Fig. 5, and the perspective view, Fig. 6, two of which,  $d d'$ , are semicircular; two,  $e e'$ , are in the form of arrow-tails, and the one,  $f$ , is in the form of an arrow-point. By this means I am enabled to obtain four indications visible both up and down the track—viz., first, the circular danger-signal, represented in Fig. 7, composed of the two wings  $d d'$ ; second, an arrow pointing to the right, as shown in Fig. 8, composed of the wings  $e' f$ , and indicating that the switch is set for the right-hand track; third, an arrow pointing to the left, as shown in Fig. 9, composed of the wings  $e f$ , and indicating that the switch is set for the left-hand track; and, fourth, two arrow-tails, composed of the two wings  $e e'$ , as shown in Fig. 10, and indicating that the switch is set for the middle track.

The first, second, and third indications above mentioned are obtained without moving the wings relatively to each other by simply turning the whole target by means of its shaft  $a$ , the wings being so fixed that the two wings  $d d'$  are in line with each other, and the two wings  $e e'$  and  $f$  are in line or parallel with each other and at right angles to  $d d'$ . But in order to enable the fourth indication to be obtained, the pair of wings  $d$  and  $e$  are secured firmly together at right angles to each other, and pivoted into lugs  $g g$ , provided in a head-piece,  $a'$ , secured on the top of the shaft  $a$ ; and the pair of wings  $d'$  and  $e'$  are secured firmly together and separately pivoted into similar lugs  $g' g'$  on the head-piece  $a'$ , and provision is made for turning the said wings to bring the wings  $d d'$  parallel with  $f$  and spread the wings  $e e'$  in line with each other by means of an elbow-lever,  $h h^1 h^2$ , the fulcrum  $i$  of which is secured in the head-piece  $a'$ . The forked upper arms,  $h h^1$ , of this lever work in slots in brace-plates  $j j'$ , which connect the pair of wings  $d e$  and the pair of wings  $d' e'$ , respectively, and the lower arm,  $h^2$ , of the said lever is connected by a rod,  $k$ , with a slide,  $l$ , working up and down on the shaft  $a$ . The slide  $l$  is worked by means of a rock-shaft,  $F$ , which works between centers  $m$  in the top of the standard  $A$ , and the arm  $q$  of which is connected with the slide by a rod,  $n$ . This rod prevents the slide from turning, and therefore, in order to provide for turning the shaft  $a$  without disturbing the proper relation of the wings for giving the first, second, and third indications, the lower end of the rod  $k$  is connected with the slide  $l$  by a loose band or swivel-connection,  $p$ , which is free to turn on the said slide as the shaft  $a$  turns, the said band or swivel being fitted into a groove formed around the slide.

The rock-shaft  $F$  is arranged close to and parallel with the movement of the switch-lever, and is of a length greater than the length of the range of movement of that part of the said lever in proximity to it, and it is made with a broad flat side or face, which is turned, as shown in Fig. 2, toward the said lever when the slide  $l$  is raised, and the wings of the target are consequently set in the relative position shown in Figs. 5 and 6, for making the first, second, and third indications, hereinabove described. The upper projection,  $s$ , on the said lever has a flat face, which, when the rock-shaft is turned to the position above described, presents itself against the said broad flat face of the rock-shaft, and so locks the rock-shaft and prevents it from being turned to change the relation of the target-wings to each other at any time but when the switch-lever is in its central position to set the switch for the middle track, when a notch,  $t$ , on the said shaft (shown in Fig. 1) is presented opposite to the said lever, and the shaft is permitted to be turned, as shown in Fig. 3, by the crank-handle  $q'$ , provided on it for the purpose, to the extent of about or nearly a quarter-revolution, which causes the arm  $q$  to pull down the slide  $l$  to shift the wings  $d d' e e'$ , and thereby set the signal for the middle track, the notch  $t$  on the rock-shaft then receiving within it and locking the switch-lever.

In order to provide for making night-signals to correspond with the day-signals, a lantern,  $G$ , is attached to the column  $C$ , to show a light up and down the track, and there are attached to a horizontal shaft,  $u$ , which works in bearings on the said column, two plates,  $H H$ , in each of which there are two colored glasses,  $H^1$  and  $H^2$ —say, red and green—the glasses of the lantern being colorless. This shaft  $u$  is so geared with the shaft  $a$  of the target by a pair of bevel-gears,  $v v$ , that as the said shaft and the target are turned by the handle of the locking-plate  $I$ , the shaft  $u$  is turned in such manner that when the target-signal is set for the left track the lantern is uncovered by the plate  $H$  and the white light shows, and when the target is turned to show the danger-signal the red lights  $H^1$  are placed before and behind the lantern, as shown in Fig. 1; and when the target-signal is set for the right track the green lights  $H^2$  are shown before and behind the lantern, which, during these three indications, remains stationary.

In order to provide for indicating by the night-signal the setting of the switch for the middle track, there are secured to the column  $C$ , in a fixed position, two plates,  $J$ , which contain glasses  $J'$ , of another color; and the lantern is made capable of being moved down to a position between the said glasses  $J'$  on a slide,  $w$ , attached to the column by means of a rod,  $z$ , connecting the lantern-holder  $y$  with the handle  $q'$  of the rock-shaft  $F$ , so that when the rock-shaft is turned, as before described, to set the target-signal for the middle track



the lantern is pulled down to a position between the glasses J', to render their color visible up and down the track.

By this system of signals a road can be equipped with signals so that one color—red, for instance—indicates in all cases whatever and in both directions that the train must stop.

It is obvious that the colors and forms of the target-wings and colors of the night-signal glasses may be varied, provided that some arbitrary system of forms or colors, the meanings of which are well understood by the employés on the road, is used.

What I claim as my invention is—

1. The combination, with the switch-lever and a locking-plate attached to the signaling device for locking the said lever, of a stop positively operated by the said lever, for the purpose of stopping the motion of the said locking-plate in either direction according to the position of the said lever, substantially as herein described.

2. The combination, with the switch-lever for operating a switch for three tracks, of a notched signal-operating rock-shaft, F, which locks the said lever when the switch is set for the middle track, but is locked by the said lever during all other positions.

3. A target-signal having five wings, of which four consist of two pairs, the two composing each pair being permanently connected together, and adjustable together independently of the target-shaft, and the fifth wing, whereby four signal-indications may be obtained from the same target, substantially as herein described.

4. The combination, with the target-shaft and a target attached thereto having separately-movable wings, of mechanism which moves the said wings independently of said shaft, and which is connected with the said wings by a slide and a swivel, which provide for the turning of the shaft independently of said mechanism, substantially as herein described.

5. The combination, with the switch-lever B and the notched rock-shaft F, for locking the said lever in the central position, of the movable lantern connected with and operated by said rock-shaft, substantially as and for the purpose herein set forth.

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Witnesses:

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