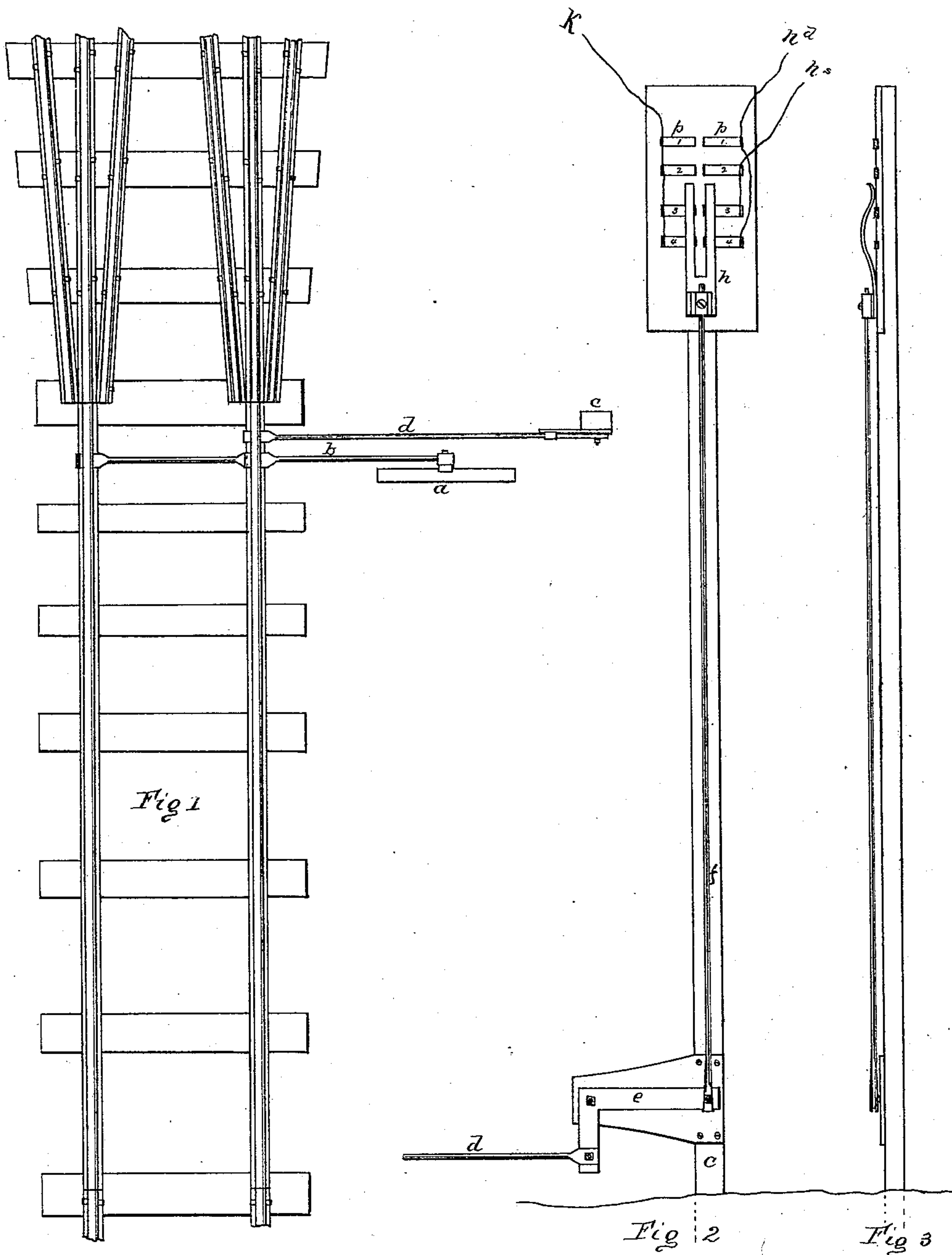


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CIRCUIT-CLOSER FOR ELECTRO-MAGNETIC RAILWAY  
SWITCH-SIGNALS

No. 191,076.

Patented May 22, 1877.



Witnesses  
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# UNITED STATES PATENT OFFICE

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## IMPROVEMENT IN CIRCUIT-CLOSERS FOR ELECTRO-MAGNETIC RAILWAY-SWITCH SIGNALS.

Specification forming part of Letters Patent No. 191,076, dated May 22, 1877; application filed March 22, 1877.

*To all whom it may concern:*

Be it known that I, HORACE N. ROWELL, of Concord, in the county of Merrimack and State of New Hampshire, have made certain Improvements in Electric Signals for Railway-Switches and Draw-Bridges, of which the following is a specification, reference being had to the accompanying drawings and the letters of reference marked thereon.

Figure 1 is a portion of railway-track, showing a three-throw switch—the switch-frame *a*, the switch-rod *b*, signal-post *c*, and connecting-rod *d*. Fig. 2 shows the signal-post *c*, connecting-rod *d*, crank or bent lever *e*, rod *f* provided with the circuit-closer *h*, consisting of two or more brass or metallic fingers, insulated upon the rod *f*, and adjustable to the proper position on the rod *f* by the screw, as shown.

Upon the post are placed metallic plates or strips  $p^1$   $p^2$   $p^3$   $p^4$ , cut off by a space which breaks the circuit, as shown. The battery-wire *k* connects with one end of each of said plates, as shown. The other end of the upper and lower plates  $p^1$  and  $p^4$  are attached to the signal-wire  $n^d$ , which moves the danger-signal; and the plates  $p^2$  and  $p^3$  are attached to the signal-wire  $n^s$ , which moves and sets the safety-signal, and removes or lets down the danger-signal. The plates  $p^1$ ,  $p^2$ ,  $p^3$ , and  $p^4$  are suitably insulated upon the post. The wire *k* extends to a battery. The wires  $n^d$  and  $n^s$  extend to signals, which may be situated at any desirable distance in either direction from the switch, or in both directions, if desirable.

Suppose the switch to be set upon the main track, as shown in the figures, the signal of safety being displayed, or no signal displayed, (thus indicating that the switch is right,) at the points either side the switch selected for the purpose. In this position the circuit-closer will be in the position shown in Fig. 2, the fingers resting upon the space between the middle plates  $p^2$  and  $p^3$ , the circuit being broken. If the switch-rail be now thrown over to the right and set for the right-hand siding, the connecting-rod *d*, Fig. 2, acting through the crank *e*, will throw up the rod *f*, carrying the circuit-closer first across the plates  $p^2$  and closing the circuit, which sets the safety-signal or lets down the danger-signal, or both,

as the case may be. But this does no harm, as the safety-signal is already set or the danger-signal already let down. When the fingers of the circuit-closer pass onto the space between  $p^1$  and  $p^2$ , the circuit is again broken. When the circuit-closer passes across the plates  $p^1$  the circuit is closed, and the battery acts upon and sets in position the danger-signal at the distant points; and when the switch-rail is thrown fully over and secured upon the siding, the circuit-closer will have passed across the upper plate  $p^1$ , setting the danger-signal in passing and leaving it set, so that the engineer of an approaching train may know that the switch ahead of him is wrong.

Suppose the switch be now set back again to the main track. The circuit-closer first passes across the upper plates, again closing the circuit for the danger-signal; but no effect is produced, the danger-signal being already set. It then passes across plates  $p^2$ , closing in its passage the circuit which lets down the danger-signal or sets up the safety-signal, or both, as the case may be; and when the switch is fully in place and secured upon the main track, the circuit-closer has resumed its original position, all the circuits being broken, and danger-signals withdrawn, or safety-signals set, as the case may be.

When the switch is set to the left-hand track, the circuit-closer is drawn downward, producing the same effects in passing the plates  $p^3$  and  $p^4$  that have been described in passing  $p^2$  and  $p^1$ .

In case a single switch is used, having but one throw, but two plates need be used instead of the four shown in the drawing.

In the case of a double or single switch, it may be desirable to use my improvement upon a closed circuit, instead of a broken one, as above explained. In this case, when the switch is double but three plates need be used instead of the four shown, the three plates being so adjusted that when the switch is set upon the main track the circuit-closer will rest upon the plate which sets the safety-signal, thus keeping the circuit closed, and passing onto the plate which sets the danger-signal and stopping there, when the switch is thrown over to the siding. If the switch is a



single one, but two plates would be used, the circuit-closer resting upon the safety-plate when the switch was set for the main track, and upon the danger-plate when set for the side track.

The signals at the distant points where warning is to be given are moved by magnets, the operation of which need not be explained here.

When applied to a draw-bridge the circuit-closer may be moved by suitable mechanism, so applied that the draw cannot be opened without setting the danger-signal, or closed without removing it.

Fig. 3 is a side view of the circuit-closer and rod which moves the same.

The circuit-closers, plates, and insulators may be boxed, to keep them dry and protect-

ed from the weather; and the circuit-closer may be provided with four fingers, instead of two, as shown, to insure greater certainty in their action.

I claim as my invention and desire to secure by Letters Patent—

The combination of the switch *a*, switch-rod *b*, connecting-rod *d*, post *c*, crank *e*, rod *f*, circuit-closer *h*, plates *p*<sup>1</sup> *p*<sup>2</sup> *p*<sup>3</sup> *p*<sup>4</sup>, battery-wire *k*, and signal-wires *n*<sup>d</sup> and *n*<sup>s</sup>, adjusted and operating as and for the purposes above set forth.

Concord, New Hampshire, March 17, 1877.

H. N. ROWELL.

Witnesses:

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