

(No Model.)

2 Sheets—Sheet 1.

J. W. RIGGS.  
RAILWAY SIGNAL.

No. 440,925.

Patented Nov. 18, 1890.

Fig. 1.

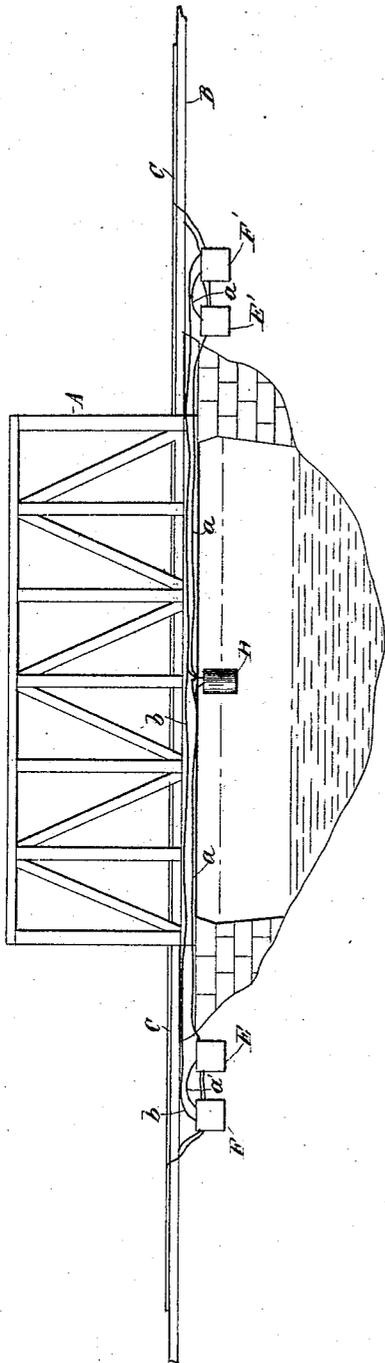
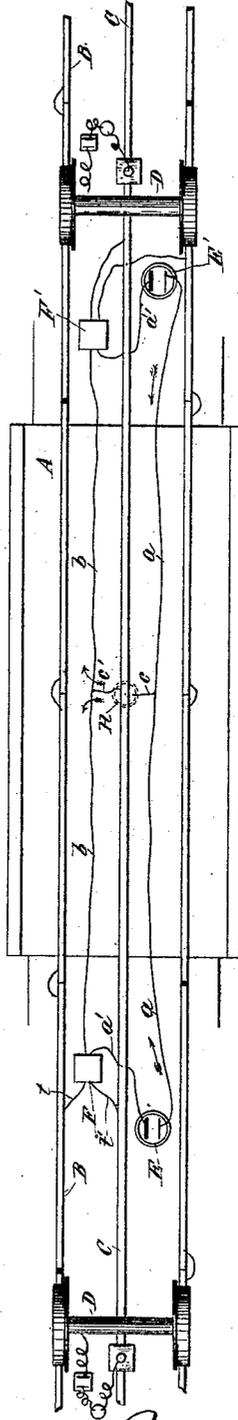


Fig. 2.



Witnesses  
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 Williams & Blozgett.

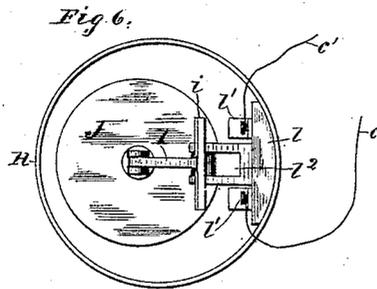
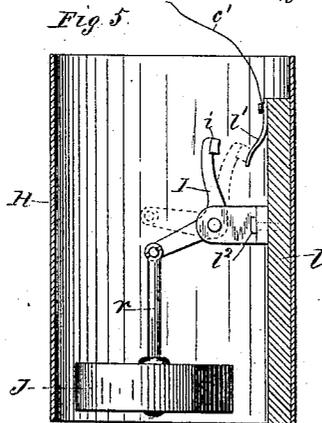
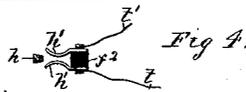
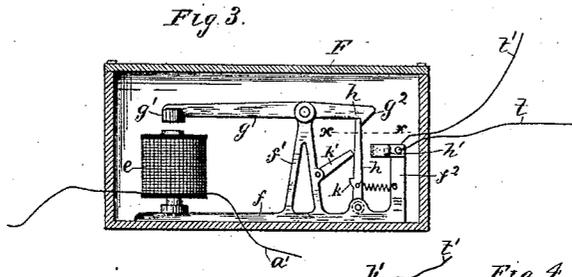
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2 Sheets—Sheet 2.

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No. 440,925.

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Witnesses

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# UNITED STATES PATENT OFFICE.

JOSEPH W. RIGGS, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE RIGGS  
ELECTRIC TRAVELING DANGER SIGNAL COMPANY, OF SAME PLACE.

## RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 440,925, dated November 18, 1890.

Application filed August 31, 1889. Serial No. 322,631. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH W. RIGGS, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Improvement in Railway-Signals, of which the following is a specification.

In an application filed contemporaneously herewith, (Case A.) Serial No. 322,630, I have shown and described an electric signaling system, in which rails of the track are arranged to break joints with each other, and have between their meeting ends suitable insulating material. A single continuous conductor properly insulated from the ground is placed between the track-rails. Each locomotive carries electric generating and signaling devices and a brush, trolley, or other suitable device in contact with the insulated conductor, so that should two trains arrive on the same section of track the circuit will be closed and the alarm or other danger-signal will be given in the cab of each engine.

In the present application the track and intermediate conductor are the same as in the case above referred to, and a section thereof is shown as laid across a bridge.

The object of the invention is to provide means for signaling trains approaching the bridge from either direction, in case the structure is endangered or has been carried away by a flood. Either in the abutment or embankment at each end of the bridge I place an electric battery and a circuit-closer. Each battery is of equal strength, and the current flowing therefrom in opposite directions neutralize each other. The main circuit-wires from the batteries are connected to the bridge in any suitable manner, and by branch wires with two contact-springs normally insulated from each other, mounted on a standard or block in an open-ended case or barrel attached to the under side of the bridge. Within this case is a float connected by a rod with a bell-crank lever carrying at its upper end a contact-piece. The circuit-closer is the same as that described in another application, (Case B.) Serial No. 323,787, executed of even date herewith.

In the accompanying drawings, Figure 1 is

a side elevation of a bridge, showing the invention as applied thereto. Fig. 2 is a plan view of a bridge and track representing diagrammatically parts of the trucks of locomotives. Figs. 3 and 4 are views of the circuit-closer. Fig. 5 is a vertical section of the float case or barrel, showing the float and its attached parts in side elevation; and Fig. 6 is a plan view thereof.

Similar letters refer to similar parts throughout the several views.

A is a bridge, shown as spanning a water-course.

B is the main track, the rails of which are divided into sections and are arranged to break joints, and have insulating material between their meeting ends.

C is a single continuous conductor properly insulated from the ground.

D D represent parts of the trucks of locomotives carrying suitable electric generating and signaling appliances.

As thus far described the track and its accessories are the same as those set forth in Serial No. 322,630, to which recourse may be had for a full description thereof.

E is a battery composed of the desired number of cells secured either in the abutment or embankment at one end of the bridge, and E' is a similar battery mounted in the same manner at the other end. Connected to a like pole of each battery is a main circuit-wire *a*, attached in any desired manner to the bridge. Batteries E E' are of equal strength, and as the current from a like pole of each battery flows in an opposite direction the two currents neutralize each other.

F and F' are circuit-closers located, respectively, at each end of the bridge. In practice the battery and circuit-closer will both be placed in a single box. I have shown them as separated in order to more clearly illustrate the invention. Each circuit-closer comprises an electro-magnet *e*, connected by a wire *a'* with the battery, and also, in connection with the main circuit-wire *b*, a frame *f*, composed of insulating material, having standards *f'* *f*<sup>2</sup>, a pivoted lever *g*, with armature *g'* at one end and a hook or latch *g*<sup>2</sup> at the other, a spring-actuated pivoted switch *h*, having a

shoulder *k*, a gravity-dog *k'*, and contact-springs *h' h'*, connected by wires *t t'* with one of the main-track rails and with the insulated conductor C. Normally the parts of the circuit-closer are in the position represented by Fig. 3. Connected to the main circuit-wires *a b* are branch wires *c c'*, and in communication therewith is an open-ended float case or barrel H. Attached to this case or barrel is a strip of insulating material *l*, and upon this strip is a pair of contact-springs *l' l'*. A bracket *l<sup>2</sup>* is also attached to the strip, and between the arms of this bracket is pivoted a bell-crank lever I, having a contact-piece *i* attached to its upper end. Connected to a rod *r*, attached to the other end of this lever, is a float J.

Having fully described my invention, the operation thereof is as follows: The track-rails and insulated conductor and the locomotives equipped with electric generating and signaling appliances are, as before stated, the same as those described in my application Serial No. 322,630, heretofore mentioned. In case the bridge is endangered by flood the rising water will lift the float J and cause the piece *i*, attached to the upper end of bell-crank I, to be brought into engagement with contact-springs *l' l'*, thereby bringing the wires *c c'* into electrical connection with the main circuit and energizing the electro-magnet *e* of the circuit-closer. This magnet will then attract armature *g'* and withdraw the latch *g<sup>2</sup>* from switch-piece *h*, which will be immediately pulled between contact-springs *h' h'* by its spring and will be locked in such position by gravity-dog *k'*. Should a locomotive provided with the electric generating and signaling devices set forth in Serial No. 322,630 come onto the section of track adjacent to either end of the bridge, if it is standing, or near the embankment or abutment thereof, if it has been carried away, the current from the battery of said locomotive will traverse the closed circuit, consisting of one of the track-rails, the central conductor, the wires *t t'*, and contact-springs *h' h'*, and will ring the alarm or give the other desired danger-signal to the engineer.

It will be seen that the rising water causes the float to establish a circuit through the main wires by permitting the currents from each battery which were before in equilibrium to traverse the branch and main wires and energize the magnet of the circuit-closer, and the circuit will remain closed until the parts thereof are returned by hand to the position illustrated in Fig. 3. Consequently

whether the bridge be endangered or wholly carried away by the freshet the alarms on the trains approaching from either direction will be sounded and all danger of derailment avoided.

It is obvious that the wires and float could be connected to the bridge in any desired manner without departing from my invention.

Having fully described the invention, what I claim is—

1. In a railway-signal, the combination, with track-rails and an insulated conductor, of an electric battery, a circuit-closer connected with one of the track-rails and with the conductor, a bridge, and a float attached thereto and operating to establish the circuit through the circuit-closer when the bridge is endangered by flood, substantially as described.

2. The combination, with a bridge, of track-rails insulated at their ends and arranged in sections, a single continuous conductor, a battery, a circuit-closer connected with one of the track-rails and with the conductor, a float, and electrical connections intermediate the float and circuit-closer and battery, substantially as and for the purpose specified.

3. The combination, with a bridge, of a battery and a circuit-closer located in the abutment or embankment thereof and connected with one of the track-rails and with the conductor, a float attached to the bridge and in electrical connection when raised with the circuit-closer, a track the rails of which are arranged in sections and are insulated at their ends, a continuous insulated conductor, and a car provided with electric generating and signaling devices, substantially as set forth.

4. The combination, with a bridge carrying a section of track the rails of which are insulated from each other, of a conductor, a main circuit, a battery, a circuit-closer connected with one of the track-rails and with the conductor, a float, and electrical connections from the float to the main circuit, substantially as and for the purpose specified.

5. The combination, with a bridge, of a case, a strip of insulating material within said case, a bell-crank lever pivoted between the arms of a bracket attached to said strip, a float connected to one end of said lever, a contact-piece carried by the other end thereof, and contact-springs secured to the strip by binding-posts in connection with the branch wires of a main circuit, substantially as set forth.

JOSEPH W. RIGGS.

In presence of—

WM. H. BLODGETT,  
A. H. OPSAHL.