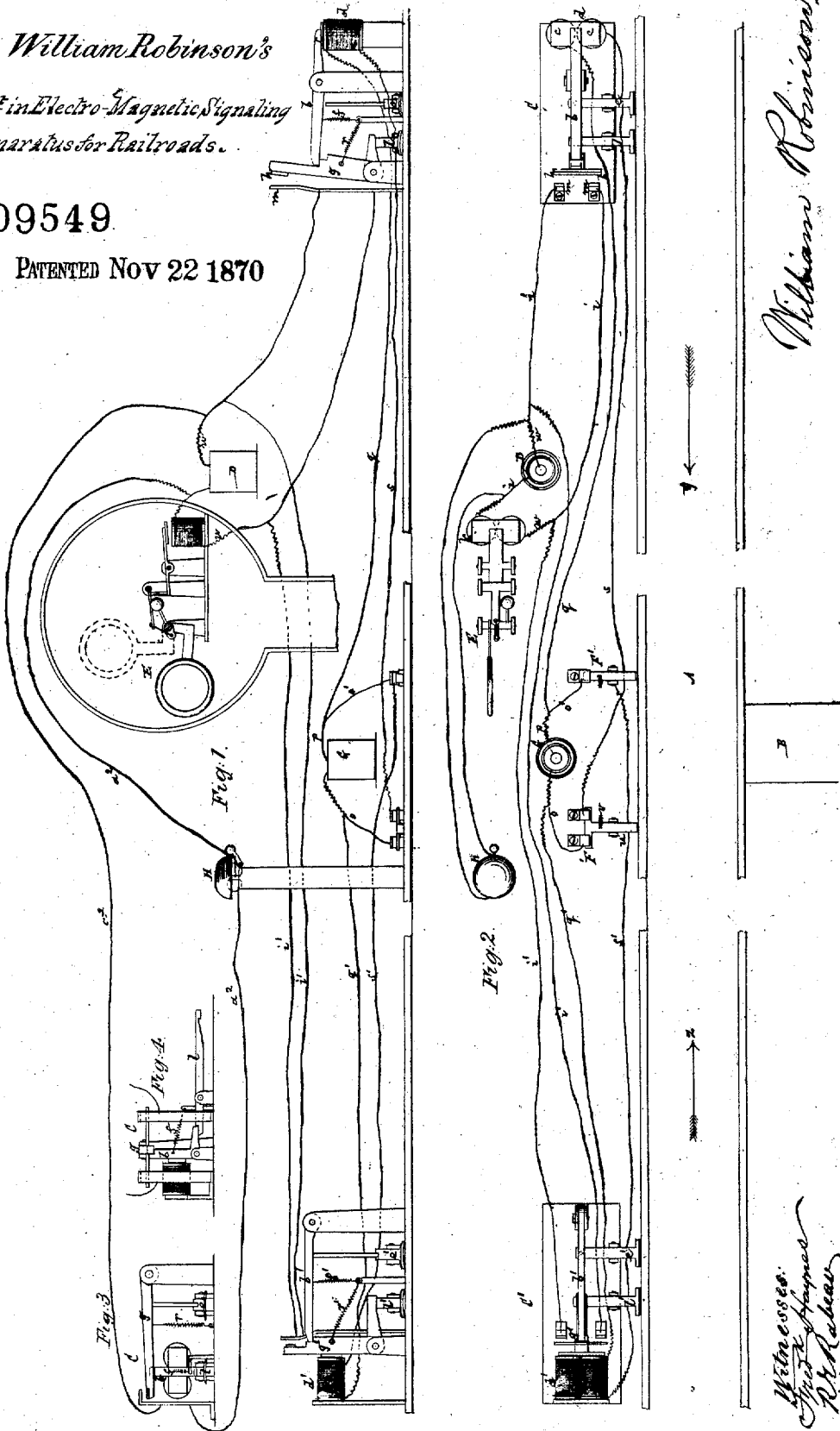


William Robinson's
Impt in Electro-Magnetic Signaling
Apparatus for Railroads.

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PATENTED NOV 22 1870



William Robinson

Witnesses:
John Hayes
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United States Patent Office.

WILLIAM ROBINSON, OF BROOKLYN, NEW YORK.

Letters Patent No. 109,549, dated November 22, 1870.

IMPROVEMENT IN ELECTRO-MAGNETIC SIGNALING APPARATUS FOR RAILROAD CROSSINGS, &c.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM ROBINSON, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Electro-magnetic Signaling Apparatus, for use at crossings on railroads, and other purposes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a longitudinal elevation, and Figure 2, a plan of my improved apparatus as applied to a line of railroad.

Figures 3 and 4 are front and side elevations of a modified construction of circuit-closer used in said apparatus.

My invention is applicable to the operation of approach-opening or closing gates, and audible or visible signals, by a vehicle while in motion, and is mainly designed for use at crossings and other places or breaks on railroads, but is not restricted to said use, although the invention will only here be described in such relation.

It consists in various combinations and peculiarities in the construction of circuit-closers and breakers in an electro-magnetic signaling apparatus, whereby the number of batteries to perform a certain work is reduced, and a most efficient and reliable action is obtained for the apparatus.

Referring, in the first instance, to figs. 1 and 2 of the accompanying drawing—

A represents a line of railroad, and B a crossing thereon.

C is one of the circuit-closers for operation by a moving train. This closer is composed in part of a lever, *b*, having armatures *c c* at its one end, and operated by a magnet, *d*, or lever, *e*.

A spring, *f*, serves to draw said lever down at its opposite end into notches of a circuit-closing lever, *g*, as represented. Points *h h* and *m m* complete the circuit, through a battery, D, wires *t*, and a signal E, operated by said battery through a magnet, *k*.

Supposing a train to be moving in direction of the arrow *y*, it is caused to bear upon a lever, *l*, which acts on the circuit-closing lever *g*, bringing the points *h h* in contact with the points *m m*, which completes the circuit, when the spring *f* draws the lever *b* into the lower notch of the lever *g*, thus holding the circuit closed.

When the train arrives at an independent circuit-closer, F, beyond the crossing, or at any particular point, it closes circuit through wires *o p q s*, a battery, G, and the magnet *d*, which latter, operating on the armatures *c c* and lever *b*, throws said lever into or opposite the upper notch of the lever *g*, when a spring,

z, draws away the points *h h*, leaving the main circuit open, and lowering the visible signal E, or stopping the ringing of a bell, H, in suitable connection by wires with the battery D.

A train passing in the opposite direction will press on the lever *e* of the circuit-closer O last, and leave the main circuit open, serving the same purpose as the magnet *d*. The circuit through F is active only while the wheels of the train press on the lever *u*, a spring, *v*, keeping the circuit broken when the pressure of the wheels is removed.

O' is another circuit-closer, situated on the opposite side of the crossing B, at a distance of half a mile, (more or less,) from the crossing. It is similar to the circuit-closer O, excepting that the spring *r* holds the circuit closed, instead of open; also, pressure on the lever *l* opens the circuit, and the lever *b'*, being drawn down into the lower notch of the circuit-closing lever *g*, keeps the circuit open.

In the operation of this circuit-closer, the magnet *d* acts in a direct manner on the closer. The train approaching the crossing B in the direction of the arrow *z*, pressure on the lever *e* raises the lever *b'*, and allows the spring *r* to act, closing the circuit, when it is left closed, the train passing onto the independent circuit-closer F', which operates through the wires *p o' s' q'*, the magnet *d* and battery G. The main circuit through the circuit-closer C' passes through the wires *v' v' w w*, the signal E, and battery D.

By these several connections the battery G is used with two distinct circuit-closers, F and F', to complete two circuits through the magnets *d* and *d'* independently of each other; also, the circuit-closers O and O' independently operate the signals E or H through a single battery, D. In this way a multiplicity of batteries and complicated mechanism for operating the signals is avoided.

In figs. 3 and 4 is shown a modified construction of the circuit-closer C, by which the lever *b*, that holds the circuit closed, lies against the circuit-closing lever *g*, and is drawn under it by a spring, *f*, when the circuit is closed by the lever.

The battery D, as hereinbefore observed, may be made to operate not only the signal E, but also the signal H, either independently of E, through a circuit-closer, or in connection with it, by suitably arranged mechanism, thus making one battery serve several purposes.

Again, the one signal H may be operated by supplementary circuit-closers arranged in proximity to the track outside of or beyond the circuit-closers C O, using either the same battery D, or an independent battery, to signal at a station the location of the train on the track, or otherwise give an alarm, independently.

of its operating the visible or other signal E, or gate, at the crossing. Thus the circuit-closer shown in figs. 3 and 4 may be used for such purpose, and be connected with the battery D by wires $a^2 a^2$ of an independent circuit, as represented.

The circuit-closers O O' might be placed away from the track, and be operated by a magnet or magnets through any simple circuit-closer acted upon by the train. In the circuit-closer C the circuit is kept closed by means of the lever b , while in the circuit-closer C' the lever b' serves to keep the circuit open, the spring r' keeping it closed. Weights may in every case take the place of springs, and must be regarded as the equivalents thereof.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination, with the circuit-closer C or C', of the lever b or b' , so arranged that said lever holds the circuit-closer in position when opened or closed, substantially as specified.
2. The spring r or r' , in combination with the circuit-closing lever g or g' , substantially as and for the purpose indicated.
3. The combination of the lever b or b' , the springs $f r$ or $f' r'$, and the circuit-closing lever g or g' , substantially as and for the purpose herein specified.
4. The magnet d or d' , so arranged with reference to the circuit-closing lever g or g' that the charging of said magnet shall open the main or additional circuit, substantially as described.

5. The magnet d or d' , in combination with a circuit-closing lever, g or g' , of a main or additional circuit, and a circuit-closer, F or F', of an independent circuit, essentially as and for the purpose or purposes described.

6. The combination of the lever b or b' , the signals E and H, or either, with a battery, D, and the circuit-closing lever g or g' , operating essentially as specified.

7. The wires v , v' , and w , so combined or arranged with a single battery, D, a signal or signals, and two or more circuit-closers, O C', that a circuit may be closed and signal operated independently by either of said circuit-closers, essentially as herein set forth.

8. The arrangement of the wires $p q s o' o' q' s'$ with the magnets $d d'$, circuit-closers F F', and battery G, so that said battery will charge one of the several magnets $d d'$ independently, through or by different circuit-closers F F', essentially as and for the purposes described.

9. The circuits $i w i i w$, and $a^2 a^2$, so arranged with reference to a battery and circuit-closers that two or more circuits may be closed, and two or more signals be operated independently of each other, by one and the same battery D, substantially as specified.

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Witnesses:

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