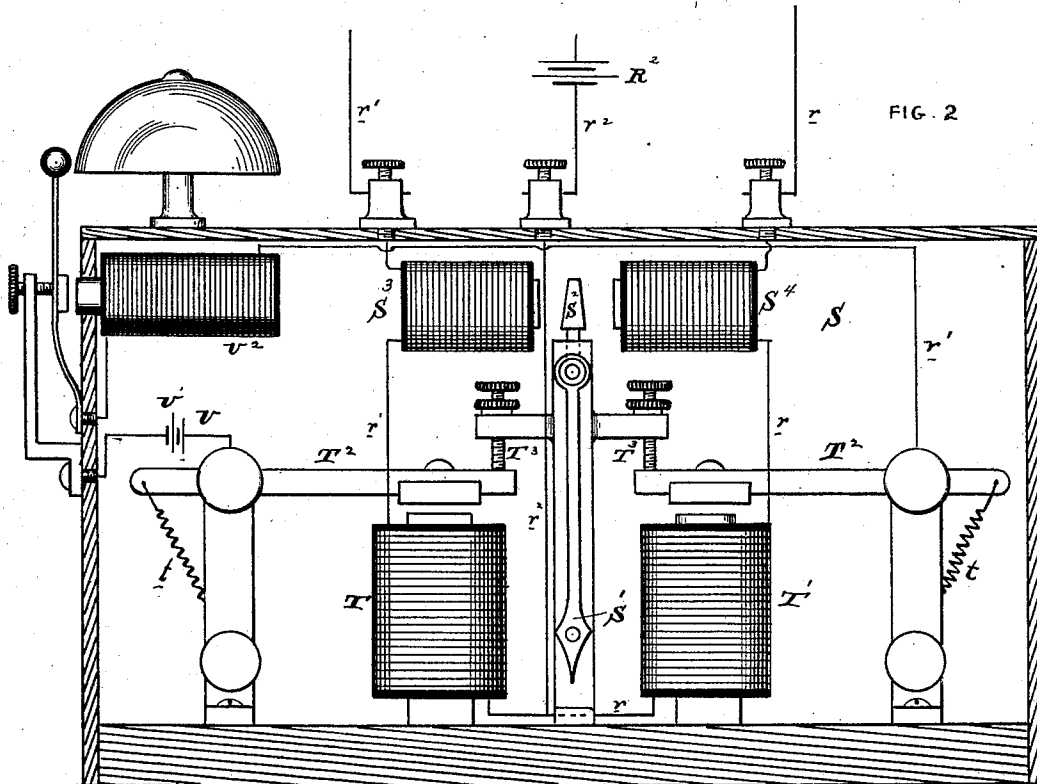
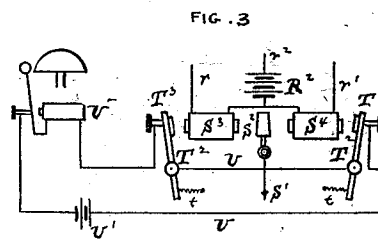
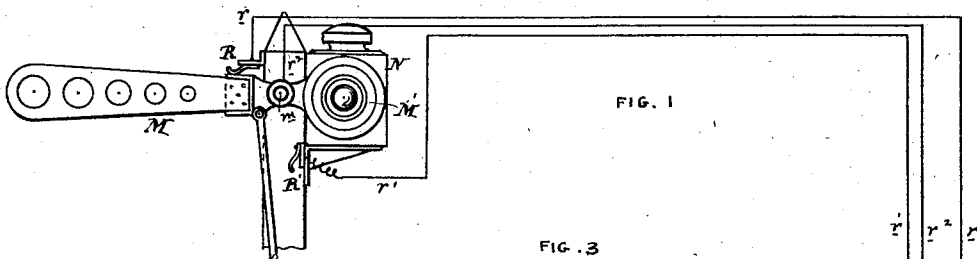


(No Model.)

J. W. HENDERSON.
ELECTRICAL INDICATOR.

No. 472,500.

Patented Apr. 5, 1892.

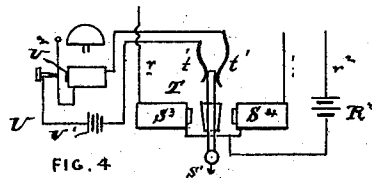


ATTEST

J. L. Maguire
E. M. Buckenred

INVENTOR

John W. Henderson
By *Wm. A. [unclear]*



UNITED STATES PATENT OFFICE.

JOHN W. HENDERSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE WHARTON RAILROAD SWITCH COMPANY, OF SAME PLACE.

ELECTRICAL INDICATOR.

SPECIFICATION forming part of Letters Patent No. 472,500, dated April 5, 1892.

Application filed November 13, 1885. Serial No. 182,672. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HENDERSON, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Electrical Indicators or Detectors, of which the following is a specification.

My invention has reference to electrical indicators; and it consists in certain improvements by which, through the aid of electricity, the various portions of a distant-moving object may be automatically indicated, all of which is fully set forth in the following specification, and shown in the accompanying drawings, which form part thereof.

This invention is excellently adapted to detecting whether a distant railroad-signal is fully raised or lowered or is in an intermediate position, as is specified in my application filed January 2, 1884, and Serial No. 116,200, patented December 8, 1885, No. 331,879. The advantage of this is evident when we consider that in railroad-signals, particularly those at long distance from the operating-station, the rods or cables therefor, through contraction or expansion or defective working, are varied to fully raise or lower the said signal, and the engineer on the train is therefore unable to determine whether it means "safety" or "danger." With this detecting apparatus, however, if the signal fails to come home when being raised or lowered an automatic alarm is rung and continues to ring until the said signal is fully raised or lowered, and whichever position is thus assumed is clearly denoted by the pointer on the indicator. The same invention is also applicable to switches, doors, or any other object which should move between two points.

In the drawings, Figure 1 is an elevation of the upper part of a railway-signal post and its arm and shows its connection with the electric detector or indicator. Fig. 2 is a sectional elevation of the electric detector or indicator, and Figs. 3 and 4 are modified forms of construction of the electric indicator or detector.

M is the signal-arm or semaphore, which is pivoted to the vertical post *m*, and is provided with the red-glass bull's-eye *M'* to warn "danger" in the night-time, and is adapted to

swing in front of the lantern N, secured to the top of the post. The arm M, when brought to its two extreme positions, comes in contact with contact-springs R R', connected by wires *r r'* with an indicator S in the operator's house. The pivot *m* of the arm M is also connected with said indicator S by a wire *r*² and has a battery R² located therein. If desired, this line *r*² may be made a ground-wire.

The indicator may be constructed as follows: Referring to Fig. 2, the wires *r r'* are in circuit with magnets S³ S⁴, between the poles of which is an armature S², connected with a pivoted band or pointer S', which, when in the position shown in said figure, indicates that the arm M is neither up nor down and the signal is either in a state of transition or working defectively; but when attracted by electro-magnet S³ indicates that the arm is down, and when attracted by electro-magnet S⁴ indicates that it is up. The wires *r r'* are also in circuit with electro-magnets T T', and are then connected together and unite with the wire *r*². The armatures T² of the electro-magnets T T' are pressed against contact-screws T³ by springs *t* when no current passes, and this closes a local circuit by wire U, through battery U' and alarm U². If desired, the battery U' may be dispensed with and the circuit U derive its current from battery R³. When the arm M is up, as shown in Fig. 1, the circuit is closed through wire *r* and electro-magnets S⁴ and T', the former of which attracts the armature S², causing the needle or pointer S' to point to "red," and the latter to break the local circuit U by attracting its armature T². When the arm is down, the same effect is produced, but by magnets S³ and T, and the pointer S' points to "white." In the act of raising or lowering the arm the alarm U' should ring. If it does not the device is out of order.

In place of the construction of indicator shown in Fig. 2 that shown in Fig. 4 may be used, in which the magnets T T' are dispensed with and spring-contacts *t' t*² used for the local circuit U, or that shown in Fig. 3 may be used, in which the magnets T T' are also dispensed with, but the armatures T² worked by the magnets S³ S⁴.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a railroad-signal, the combination of
5 the signal-arm M, contacts R R', circuits $r r' r'^2$,
battery R², and an electric detector S to indicate the position of said arm M and sound an alarm while said arm is passing from one of its extreme positions to the other, the said
10 detector and alarm consisting of electro-magnets S³ S⁴, armature S², pointer S', contacts T³, local circuits U', and alarm U², substantially as and for the purpose specified.

2. A detector or indicator for indicating the
15 two extremes or the intermediate position of a moving object, consisting of two electric circuits, each provided with an electro-magnet adapted to attract the armature of a needle

or pointer, and also an electro-magnet to attract an armature, the circuit having an alarm 20 located therein and made continuous when both of said armatures are drawn away from their electro-magnets, and a moving object in circuit with the aforesaid mentioned electro-magnets and adapted in its extreme positions 25 to close the circuit through either of said sets of electro-magnets and a battery to provide the current for either of said circuits, substantially as and for the purpose specified.

In testimony of which invention I hereunto 30 set my hand.

JOHN W. HENDERSON.

Witnesses:

R. M. HUNTER,

E. M. BRECKINREED.