

No. 894,886.

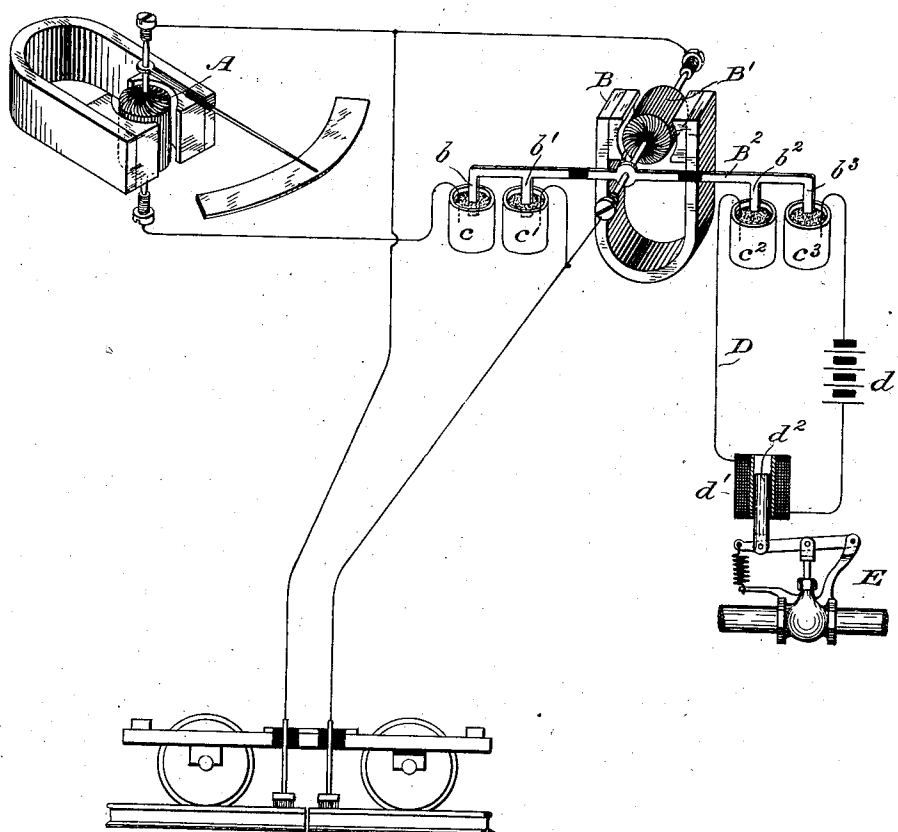
PATENTED AUG. 4, 1908.

A. B. HERRICK.
AUTOMATIC CUT-OUT FOR INDICATING MEANS.

APPLICATION FILED MAY 21, 1904.

2 SHEETS—SHEET 1.

Fig. 1.



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AUTOMATIC CUT-OUT FOR INDICATING MEANS.

No. 894,886.

Specification of Letters Patent.

Patented Aug. 4, 1908.

Application filed May 21, 1904. Serial No. 209,116.

To all whom it may concern:

Be it known that I, ALBERT B. HERRICK, a citizen of the United States, resident of Ridgewood, county of Bergen, and State of New Jersey, have invented a new and useful Improvement in Automatic Cut-Outs for Indicating Means, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

My invention relates to means for automatically disconnecting an electrical indicating instrument and concomitantly effecting the actuation of means for performing a separate function, its object being to prevent the burning out of the conductors of such instrument and at the same time locate and determine the media tending to effect such burning out.

The said invention consists of means hereinafter fully described and particularly set forth in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing, Figure 1 represents a diagrammatic view of an apparatus embodying my said invention as particularly applied to a car for testing the conductivity of rail bonds or rail-joints. Fig. 2 represents a view similar to that of Fig. 1, showing additional mechanism connected therewith.

In the particular application of my invention illustrated, the car-truck is provided with two insulated brushes bearing upon the track and forming the terminals of a shunt through which a portion of the current along the rail passes as will be readily understood. This shunt is divided into two branches as is shown. In circuit in one of these branches is placed the armature A of a voltmeter, so that any difference in potential between those parts of the rail in contact with the brushes respectively will effect the actuation of the indicating pointer of the voltmeter. In circuit in the other of such branches is placed the armature B' of a relay B. The device including armature B' is, however, so arranged that its actuation is not effected by current having a voltage within the adjusted or full range or capacity of the voltmeter, but

is, on the contrary, arranged so as to be actuated when such capacity of the meter is approximated or exceeded. It will therefore appear that a predetermined voltage only will insure the movement of armature B'.

Attached to the armature B' is a metallic arm B² which is oscillated by the movement of said armature. Upon one end of this arm are formed or secured two contact points *b* and *b'* which normally, that is, when the voltage of the current is such as will not actuate armature B, dips into two mercury-cup contacts *c* and *c'*, these cups being in series in the voltmeter circuit as shown. It will therefore appear that the withdrawal of contact points *b* and *b'* from the mercury cups will break the volt-meter circuit. The opposite end of said arm is similarly provided with two contact points *b*² and *b*³ which are normally withdrawn from two mercury cups *c*² and *c*³. These two cups are in series in an independent circuit D which includes a source of current such as a battery *d*, and an electro-magnet *d'*.

The core *d*² of the electro-magnet is connected with an air-valve E so as to actuate same to open, when the circuit D is completed. This air-valve controls the actuation of mechanism (not shown) for performing a separate function such as setting the brakes of the testing car upon which the apparatus is mounted, or operating a device for ejecting white wash upon the rails or rail-bed to indicate the point in the road-bed where the completion of circuit D took place, as will be readily understood. Such completion will, it will be seen, from the above described relation of the elements comprising the invention, take place concomitantly with the breaking of the circuit containing the voltmeter. Assuming now that the car containing the above described apparatus is moving over the rails, it will be seen that the variation in the conductivity of the rails or contact with the brushes will be indicated by the voltmeter. So long as these variations remain within the adjusted or full limitations of the voltmeter, the circuit D remains open and the mechanism for performing the separate function remains inoperative. Assuming now that a very defective rail bond is encountered, the defect being such as to effect a difference of potential at the brushes such as would cause the burning out of the voltmeter armature or beyond the adjusted range of

the meter, before such action can take place, the armature B is operated and volt-meter armature A cut out of the circuit. Concomitantly with such action, circuit D is completed, the air valve actuated, and the connected mechanism operated. This may be effected to either apply brakes to stop the car so that the defective bond may be at once replaced, or may be caused to effect a marking of the location of such defective bond, so that the necessary repairs may be made subsequently.

In the particular application of the principles of my invention described, a duplicate apparatus would be supplied for testing the other rail of the track and the bonds connected therewith.

When the above described device is used in connection with recording mechanism such as shown, described and claimed in my application filed May 21, 1904, Serial No. 209,115, I provide additional mechanism for automatically recording upon the record-sheet the location of such above-mentioned varying condition in connection with other records upon such sheet. This mechanism includes a pen N mounted upon a suitably supported retractile holder N' arranged to be movable in a plane parallel with the plane of the record sheet, and to cause said pen to rest upon said sheet. Said holder as shown consists of an elastic arm the end of which is rigidly mounted upon a stationary post n, and is hence retractile. Intermediately of its ends is secured an armature adjacent to which is mounted an electro-magnet O, which when energized will attract the armature and move the pen laterally. The magnet coil is located in a shunt circuit p as shown, which receives its current from the battery d. To arrange for the proper connection for the circuit, an additional contact point b' on arm B² and mercury cup c' are provided as shown. It will therefore be seen that if the pen is allowed to normally rest upon the record sheet, a straight line will be drawn thereon, but each time the voltage rises as previously described a deviation, as shown, is effected in said line.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. The combination with electrically controlled means for recording variations in an electric circuit, of a normally closed switch in the recording instrument actuating circuit,

means for opening said switch when a current of predetermined value flows in said instrument circuit and closing a circuit around said instrument, and a separate indicating device adapted to be actuated upon closing of said latter circuit to make a record thereof.

2. The combination with electrically controlled means for recording variations in an electric circuit, and a record sheet upon which such variations are indicated, of a normally closed switch in the recording instrument actuating circuit, means for opening said switch when a current of predetermined value flows in said instrument circuit and closing a circuit around said instrument, and a separate indicating device acting upon said record sheet and actuated to make an indication thereon upon closing of said latter circuit.

3. The combination with electrically controlled means for recording variations in an electric circuit, of a normally closed switch in the recording instrument actuating circuit, means for opening said switch when a current of predetermined value flows in said instrument circuit and closing a circuit around said instrument, a separate indicating device adapted to be actuated upon closing of said latter circuit to make a record thereof, and another circuit also controlled by said switch for actuating a valve magnet.

4. The combination with a movable record surface, of an indicating instrument having an indicating needle separated from said sheet, a circuit for said indicating means, a normally closed switch in said instrument circuit, and a circuit around said indicating instrument for opening said switch to cut out the instrument and make a separate indication in the record sheet when a current having a predetermined value flows in said indicating instrument.

5. The combination with a movable record surface, of movable indicating means separated from said surface and including an indicating needle, a pair of traveling contacts adapted to make connection with a section of track or the like, a shunt circuit between said contacts around said indicating instrument for controlling a cut-out switch, said cut-out switch being normally closed to complete said instrument circuit, and means in said shunt circuit for opening the instrument circuit and closing an alarm circuit upon passage of a predetermined current in said instrument circuit.

Signed by me, this 19th day of May, 1904.
ALBERT B. HERRICK.

Attested by:
G. W. SAYWELL,
A. E. MERKEL.