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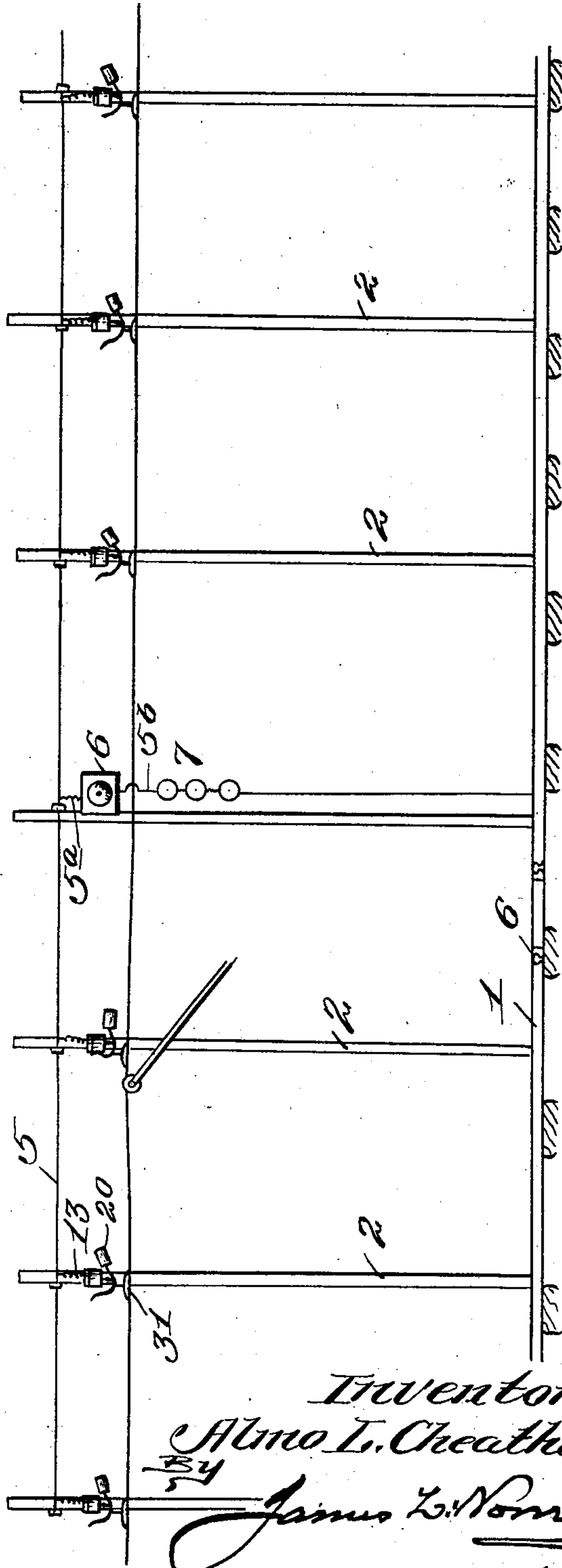
A. L. CHEATHAM.
SIGNAL APPARATUS FOR TROLLEY RAILWAYS.

APPLICATION FILED AUG. 8, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. A.



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UNITED STATES PATENT OFFICE.

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SIGNAL APPARATUS FOR TROLLEY-RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 756,156, dated March 29, 1904.

Application filed August 8, 1903. Serial No. 168,793. (No model.)

To all whom it may concern:

Be it known that I, ALMO L. CHEATHAM, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in Signal Apparatus for Trolley-Railways, of which the following is a specification.

This invention relates to electric alarm and signal apparatus for overhead electric railways, and has for its object to provide novel, simple, and efficient mechanism for indicating the approach of a car at a railway-crossing or intersecting railway either by an audible alarm or visual signal, or both.

To this end my invention consists in the features and in the construction, combination, and arrangement of parts hereinafter described, and particularly pointed out in the claims following the description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a view in side elevation, partly in section, of the tilting hanger and circuit-closer. Fig. 2 is an end view thereof. Fig. 3 is a detail view of a modification, and Fig. 4 is a diagrammatic view illustrating the operation of the invention.

Referring to the drawings, the numeral 1 indicates the rails of a single line of railway-track, and 2 the poles arranged alongside thereof supporting span or guy wires 3 or other suitable support, from which is suspended the trolley-wire 4 in the manner hereinafter described.

Arranged alongside the track is a wire 5, extending parallel with the track for a suitable distance on each side of the crossing or intersecting line of railway 6. At the point where the wire crosses the crossing or intersecting railway is arranged an electric bell 6 and a plurality of incandescent lamps 7. A branch wire 5^a leads from the wire 5 to one of the binding-posts of the electric bell, and from the other binding-post leads a wire 5^b, in which are arranged in series the lamps 7, said wire 5^b being electrically connected to the grounded rail of the track.

The numeral 8 indicates an insulator con-

structed of porcelain or other material suitable for the purpose and provided with two circumferential grooves 9 and 10. The guy-wire 3 lies in the groove 9 and partially surrounds the insulator and is clamped to its place in said groove by a hooked yoke 11 in the well-known and usual manner. Arranged in the groove 10 is a split ring 12, and said ring is connected by an insulated wire 13 with the signal-wire 5.

Passing centrally through each of the insulators 8 is a bolt 14, which is provided at its lower end with a hollow and nearly circular head 15, having an aperture 16 formed in its bottom. Said head and bolt are secured rigidly in place in the insulator by a nut 17, screwed over the upper threaded end of the bolt 14.

The numeral 18 indicates a lever provided at one end with an extension 19, on which is slidably arranged a counterweight 20, said counterweight being adjustably held in place on said extension by a set-screw 21. The other end, 22, of the lever is curved, as shown, and is provided at its free end with a contact-point 23. Intermediate its ends the lever 18 is provided with an upward extension 24, terminating at its extremity in an eye 25, which is disposed within the hollow head 15, and passing through said eye and through the hollow head 15 is a bolt 26, which forms a pivot for the lever to oscillate upon.

One side of the hollow head 15 is provided with a shoulder 27, which limits the movement of the lever in one direction. The lever 18 at a suitable point between its fulcrum and its contact end 23 is provided with a grooved lug 28, which forms a seat for one end of a hooked link 29, the other end of said link being hooked in a suitable perforation formed in the hanger-plate 31 of ordinary construction and soldered or otherwise secured to the trolley-wire 4 in the usual and well-known manner. The weight of the trolley-wire is sufficient to normally hold the lever 18 in the position shown in Fig. 1 of the drawings; but the counterweight 20 in practice is so adjusted on the extension 19 of the lever that it will require but slight force—say two or three pounds pressure—to

overcome the weight of the trolley-wire and cause the end 22 of the lever to rise owing to the weight of the counterbalance 20.

It will of course be understood that there
 5 are a number of the hangers constructed as above described, there being one such hanger for each pole or pair of poles 2 for a suitable distance on each side of the crossing or intersecting railway.
 10 The operation of the apparatus is as follows: A car approaches one of the hanger-plates 31. The trolley raises the trolley-wire a slight distance, whereupon the counterbalance 20 will depress the extension 19 of the lever 18, and
 15 consequently raise the other end, 22, of said lever, thus throwing the contact end 23 of said lever into engagement with the ring 12. When this occurs, a circuit will be formed from the trolley-wire over the hanger-plate 31, link 30,
 20 lever 18, split-ring 12, and wires 13 and 5 to the bell and lamp and thence to the grounded rail. When the circuit has been thus completed, the bell 6 will be sounded to give an audible alarm and the lamp 7 will be lighted,
 25 thus giving warning at the railway-crossing or at the point where the intersecting railway crosses the tracks that a car is approaching. This operation will be repeated as many times as there are hangers. It will of course be un-
 30 derstood that either the audible alarm or the lamps may be omitted and only one of such signals employed in the manner described, and it will also be manifest that other forms of signals may be substituted for those herein
 35 shown, the particular signal employed forming no part of the present invention. After the car has passed a hanger a certain distance the weight of the trolley-wire 4 will overcome the weight of the counterbalance 20 and will draw
 40 down the free end of the lever 18 into the position shown in Fig. 1 of the drawings, thus breaking the circuit and throwing the signals out of operation.

When it is desirable to reduce the weight
 45 of the hangers, it may be accomplished in the manner shown in Fig. 3 of the drawings. As shown in said figure, the counterbalance 20 and extension 19 of the lever are dispensed with, and in such case I provide two springs, each
 50 coiled intermediate its ends, as at 32, one end of each of said springs being clamped between the insulator 8 and the head 15 and the other end of the spring resting on the under side of a pin or lug 33, formed on or inserted in the
 55 lever 18. All the other parts of the device are constructed precisely in the manner before described, and the operation of the device is also the same as that before described, the spring merely being a substitute for the
 60 extension 19 and the counterbalance 20.

I prefer to provide the lever 18 with one or more additional grooved seats 28^a for the reception of the link 30, whereby when the spring is substituted for the weight the link
 65 30 may be shifted from one or more of its seats

on the lever to produce a variable or adjustable downward pressure against the action of the spring.

Having thus fully described my invention, what I claim is—

1. In a signaling apparatus for trolley-railways, the combination with a conductor arranged alongside the track, and a signal electrically connected with said conductor intermediate the ungrounded ends of the latter and
 70 also connected with earth, of a tilting hanger supported above the trolley-wire, means for suspending the trolley-wire from one end of said hanger, a contact arranged in the path of the free end of the hanger and electrically
 75 connected with said conductor, and means for raising the free end of the hanger into engagement with said contact when the trolley-wire is lifted by the trolley and thus complete the circuit from the trolley-wire to the signal. 85

2. In a signaling apparatus for trolley-railways, the combination with an ungrounded conductor arranged alongside the track, and a signal electrically connected with said conductor intermediate the ends of the latter and
 90 also connected with earth, of a tilting hanger supported above the trolley-wire, means for suspending the trolley-wire from one end of the hanger and in electrical contact therewith, a contact arranged in the path of the free end
 95 of the hanger and electrically connected with said conductor, and a weight arranged on the other end of said hanger for raising the contact end of the hanger into engagement with said contact when the trolley-wire is lifted by
 100 the trolley and thus complete the circuit from the trolley-wire to the signal.

3. In a signaling apparatus for trolley-railways, the combination with an insulator supported above the trolley-wire, of a tilting
 105 hanger pivotally connected with said insulator, means for connecting said hanger to the trolley-wire, means for suspending the trolley-wire from said hanger, a contact arranged in the path of movement of the free end of the hanger,
 110 a signaling apparatus in circuit with said contact, and means for moving the hanger into electrical engagement with said contact when the trolley-wire is raised, for the purpose specified. 115

4. In a signaling apparatus for trolley-railways, the combination with an insulator supported above the trolley-wire, of a tilting hanger pivotally connected with said insulator,
 120 means for suspending the trolley-wire from the free end of said hanger and electrically connecting it therewith, a contact arranged in the path of movement of said free end of the hanger, a signaling apparatus in circuit with said contact, and means for moving said free
 125 end of the hanger into engagement with said contact when the trolley-wire is raised, for the purpose specified.

5. In a signaling apparatus for trolley-railways, the combination with an insulator sup- 130

ported above the trolley-wire, of a bolt passing through the insulator and provided at its lower end with a hollow head, a tilting hanger pivoted within said hollow head, means for
 5 suspending the trolley-wire from the free end of said hanger and electrically connecting it therewith, a contact arranged in the path of movement of said free end of the hanger, a signaling apparatus in circuit with said contact,
 10 and means for moving the free end of the hanger into electrical engagement with said contact when the trolley-wire is raised, for the purpose specified.

6. In a signaling apparatus for trolley-railways, the combination with an insulator supported above the trolley-wire, of a bolt passing through the insulator and provided at its lower end with a hollow head, a tilting hanger pivoted within said head, means for suspending
 15 the trolley-wire from the free end of the hanger and electrically connecting it therewith, a contact arranged in the path of movement of said free end of the hanger, a signaling apparatus in circuit with said contact,
 20 means for moving the free end of the hanger into engagement with the contact when the trolley-wire is raised, and a shoulder formed on said head for limiting the movement of the hanger in one direction, for the purpose
 25 specified.

7. In a signaling apparatus for trolley-railways, the combination with an insulator supported above the trolley-wire, a split ring encircling said insulator, a signaling apparatus
 30 electrically connected with said split ring, of a tilting hanger pivotally connected with said insulator, means for suspending the trolley-wire from the free end of said hanger and electrically connecting it therewith, and means
 35 for moving the free end of the hanger into engagement with said split ring when the trolley-wire is raised, for the purpose specified.

8. In a signaling apparatus for trolley-railways, the combination with an insulator supported above the trolley-wire, of a metallic
 40 plate fixed to the trolley-wire, a tilting hanger pivotally connected with said insulator, a metallic link connecting said plate to the free end of said hanger, a contact arranged in the path of movement of the free end of the hanger, a signaling apparatus in circuit with said contact, and means for moving the free end of the hanger into engagement with said contact when the trolley-wire is raised, for the purpose specified.

9. In a signaling apparatus for trolley-railways, the combination with an insulator supported above the trolley-wire, of a plate fixed to the trolley-wire, a tilting hanger pivotally connected with said insulator, a metallic link connecting said plate to the free end of said hanger, a contact arranged in the path of movement of the free end of the hanger, a
 50 signaling apparatus in circuit with said contact, and means for moving the free end of the hanger into engagement with said contact when the trolley-wire is raised, for the purpose specified.

10. In a signaling apparatus for trolley-railways, the combination with a cylindrical insulator supported above the trolley-wire, of a
 55 bolt passing vertically through said insulator and provided at its lower end with a hollow head, a tilting hanger pivoted within said hollow head, a metallic link for suspending the trolley-wire from the free end of said hanger and electrically connecting it therewith, a split ring arranged within the groove formed in the periphery of the insulator, a signaling apparatus in circuit with said split ring, and
 60 means for moving the free end of the hanger into engagement with said split ring when the trolley-wire is raised, for the purpose specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALMO L. CHEATHAM.

Witnesses:

R. V. CHEATHAM,
 R. S. HORN.