

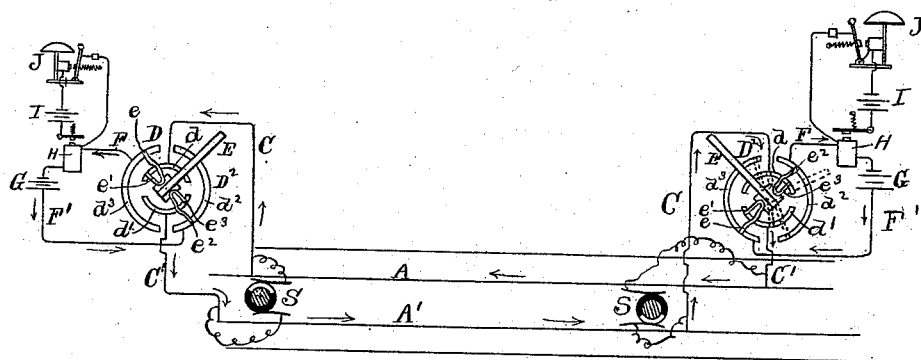
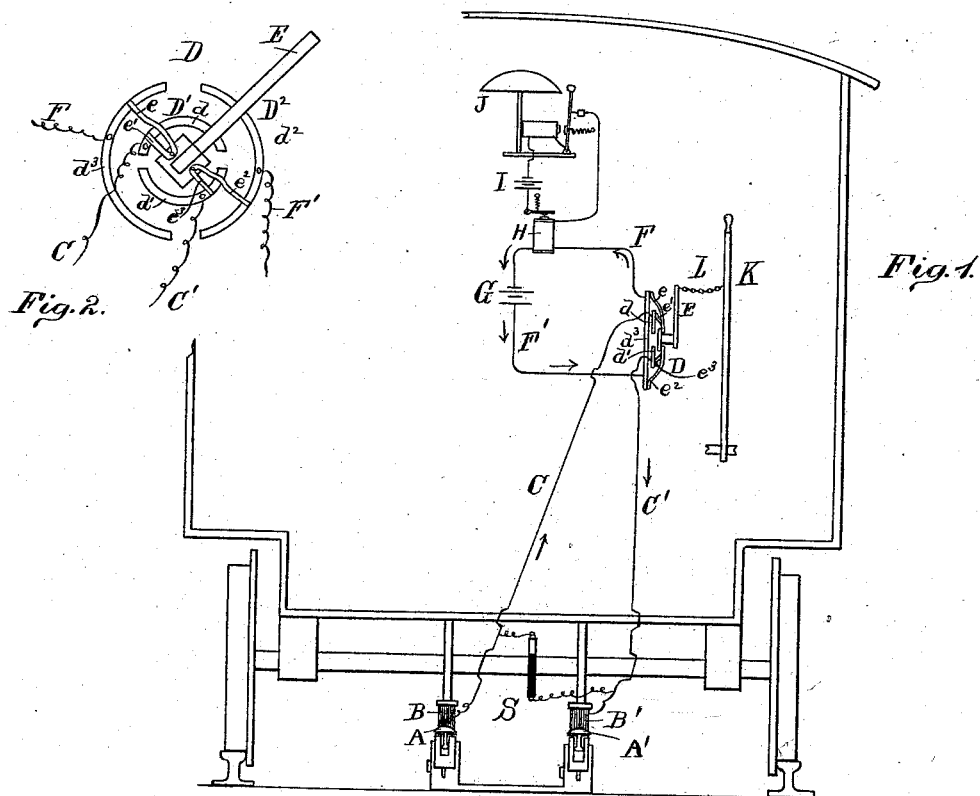
(No Model.)

B. H. GEDGE.

ELECTRIC RAILWAY SIGNAL.

No. 382,299.

Patented May 8, 1888.



*Fig. 3.*

Attest.  
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# UNITED STATES PATENT OFFICE.

BURTON H. GEDGE, OF COVINGTON, KENTUCKY.

## ELECTRIC RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 382,299, dated May 8, 1888.

Application filed July 25, 1887. Serial No. 245,233. (No model.)

*To all whom it may concern:*

Be it known that I, BURTON H. GEDGE, of Covington, Kenton county, Kentucky, have invented certain new and useful Improvements in Electric Railway-Signals, of which the following is a specification.

The present invention is an improvement on my former device, described in Letters Patent No. 344,099, dated June 22, 1886; and it consists in an improved arrangement of the signal-bell, and also in an improved switch.

In the accompanying drawings, forming part of this specification, Figure 1 is a transverse section of the track and conductors and a diagrammatic representation of a locomotive cab and the electrical apparatus of my device. Fig. 2 is a face view of the switch and its connections. Fig. 3 is a diagram illustrating the operation of the device.

The conductors A A' extend parallel to the rails throughout the portion of track intended to be protected by the signal. Their particular construction, beyond careful insulation, is not important, but is preferably that described in my patent No. 364,009, dated May 31, 1887. From the bottom of the cab two contact-brushes, B B', project downwardly in such position as to sweep over the conductors A A' and make electrical connection therewith.

The wires C C' connect the brushes B B' with the switch D. The switch D is provided with the inner ring, D', consisting of two halves,  $d$   $d'$ , insulated from each other, and also with an outer ring, D<sup>2</sup>, consisting of two halves,  $d^2$   $d^3$ , insulated from each other. The two rings are so arranged with reference to each other that lines drawn through their respective points of insulation will cross each other substantially at right angles. The switch-lever E is fulcrumed concentrically with the rings. The lever E is provided with two sets of arms,  $e$   $e'$  and  $e^2$   $e^3$ . The two arms of each set are continuous with each other, but are insulated from the rest of the lever. The arms  $e$   $e^2$  bear against the outer ring, D<sup>2</sup>, and the arms  $e'$   $e^3$  bear against the inner ring, D'.

In the drawings the wire C from the brush B is connected with the part  $d$  of the inner ring, D', and wire C' from the brush B' is connected with the part  $d'$  of the inner ring. The wires F and F' are connected, respectively, to the parts  $d^3$  and  $d^2$  of the outer ring, D<sup>2</sup>. These

wires F F' form a continuous line in which is placed the battery G and the electro-magnet H. The battery I and bell J are included in a separate circuit, the wires of which connect with the armature-lever and frame of the electro-magnet, this circuit being closed by the passing of a current through the electro-magnet. I also preferably provide this device, as my former one, with a commutator, S, on the axle of the locomotive, wires from the brushes of which connect with the wires C C'. This commutator does not form any part of the present invention, and is fully described in Letters Patent No. 344,099, previously referred to.

The mode of operation of the device is as follows: When two engines are on a portion of the track provided with the conductors A A' and approaching each other, the switches D will occupy the relative positions indicated by the diagram, Fig. 3. In this position a current will pass through the signal apparatus of both engines and the conductors A A', causing a continuous ringing of the bell in each engine, which, under the present arrangements of parts, is the signal given when the engines are approaching each other. The current may be traced as follows: Commencing at the battery G of left-hand locomotive, Fig. 3, it passes through the wire F', section  $d^2$  of ring D<sup>2</sup>, arms  $e^2$   $e^3$ , section  $d'$  of ring D', wire C', brush B', conductor A' to the other engine, then through its brush B, wire C, section  $d$  of ring D', arms  $e^2$   $e^3$ , section  $d^2$  of ring D<sup>2</sup>, wire F, electro-magnet H, battery G, wire F', section  $d^3$  of ring D<sup>2</sup>, arms  $e$   $e^2$ , section  $d'$  of ring D', wire C', brush B', conductor A, thence to the first engine to brush B, wire C, section  $d$  of ring D', arms  $e'$ , section  $d^3$  of ring D<sup>2</sup>, wire F, electro-magnet H, to battery G, the starting-point. This current, passing through both electro-magnets, closes the short circuit of battery I in each engine and causes a continuous ringing of the bells J. It is evident that in order that the apparatus may work, the currents from both batteries G must be in the same direction. In the case of two locomotives headed toward and approaching each other, the signal would be given by continuous ringing of the bell, when the switch of each locomotive is in the position shown in Figs. 1 and 2 of the drawings. If, however, these engines were headed in the same direction and approaching each

other—that is, one going forward and the other backing, the switches remaining unchanged—the currents from the two batteries G would counteract each other, except that the commutator closes the circuit through the track-rails at intervals, giving an intermittent ringing which, were the switches properly placed, would indicate the engines to be moving in the same direction. The switch D here comes into play to change the direction of the current from the engine which is backing, so that the proper signal may be given.

By reference to Fig. 2 it will be seen that by moving the lever E about ninety degrees, as shown at right hand in Fig. 3, the arms  $e$   $e'$  will connect the section  $d^2$  with the section  $d'$  instead of section  $d$ , and the arms  $e^2$   $e^3$  will connect the section  $d^2$  with the section  $d$  instead of  $d'$ . With the connections thus changed the current will pass out through the wire C and return by wire C', instead of as shown in Fig. 1 of the drawings. This change would make the currents from both batteries G in the same direction when the engines are headed in the same direction, but moving toward each other, and give the continuous signal.

To insure having the switch D in proper position, I prefer to have it operated automatically by the reversing-lever of the engine. A convenient means for this purpose is that illustrated in the drawings, where the lever E is shown connected by a loose chain, L, to the reversing-lever K.

In case of engines moving in the same direction, the signal is given intermittently through

the commutator, as fully explained in patent No. 344,099, previously referred to.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the conductors A A', brushes B B', wires C C', connecting the brushes to the two segments of the ring D', the ring D', made in two insulated sections, lever E, provided with arms  $e$   $e'$  and  $e^2$   $e^3$ , wires F F', battery G, electro-magnet H, and bell J in a circuit operated by the electro-magnet H, substantially as and for the purposes specified.

2. The combination of conductors A A', brushes B B', wires C C', a reversing-switch, wires F F', battery G, electro-magnet H, and bell J and battery I in a circuit operated by the electro-magnet H, substantially as and for the purposes set forth.

3. The combination of conductors A A', brushes B B', wires C C', a reversing-switch, wires F F', battery G, electro-magnet H, and bell J and battery I in a circuit operated by the electro-magnet H, and commutator S and its connections, substantially as and for the purposes specified.

4. The combination of the rings D' D<sup>2</sup>, each divided into two sections insulated from each other, and lever E, provided with arms  $e$   $e'$   $e^2$   $e^3$ , substantially as and for the purposes specified.

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Attest:

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