

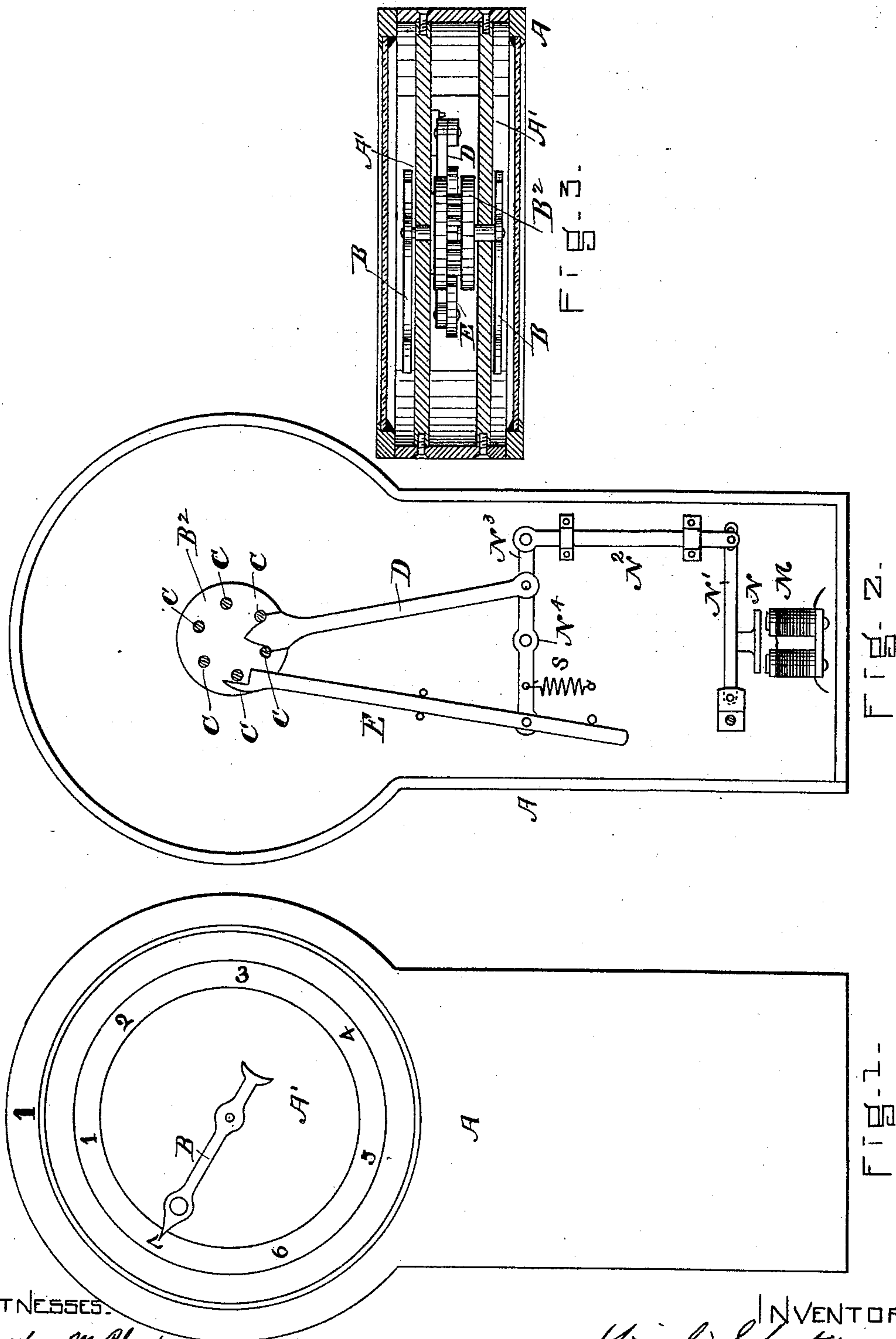
(No Model.)

2 Sheets—Sheet 1.

U. S. JACKSON.  
ELECTRIC SIGNAL FOR RAILWAYS.

No. 451,157.

Patented Apr. 28, 1891.



WITNESSES.

Matthew M. Blunt.  
Edward S. Day

INVENTOR.  
Uriah S. Jackson  
per Frank S. Parker, Atty.

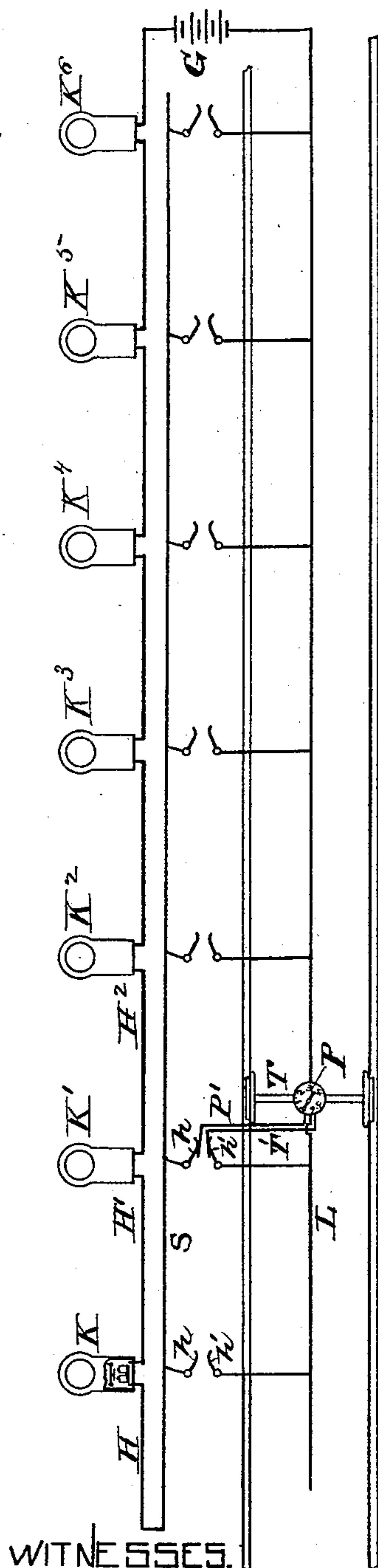
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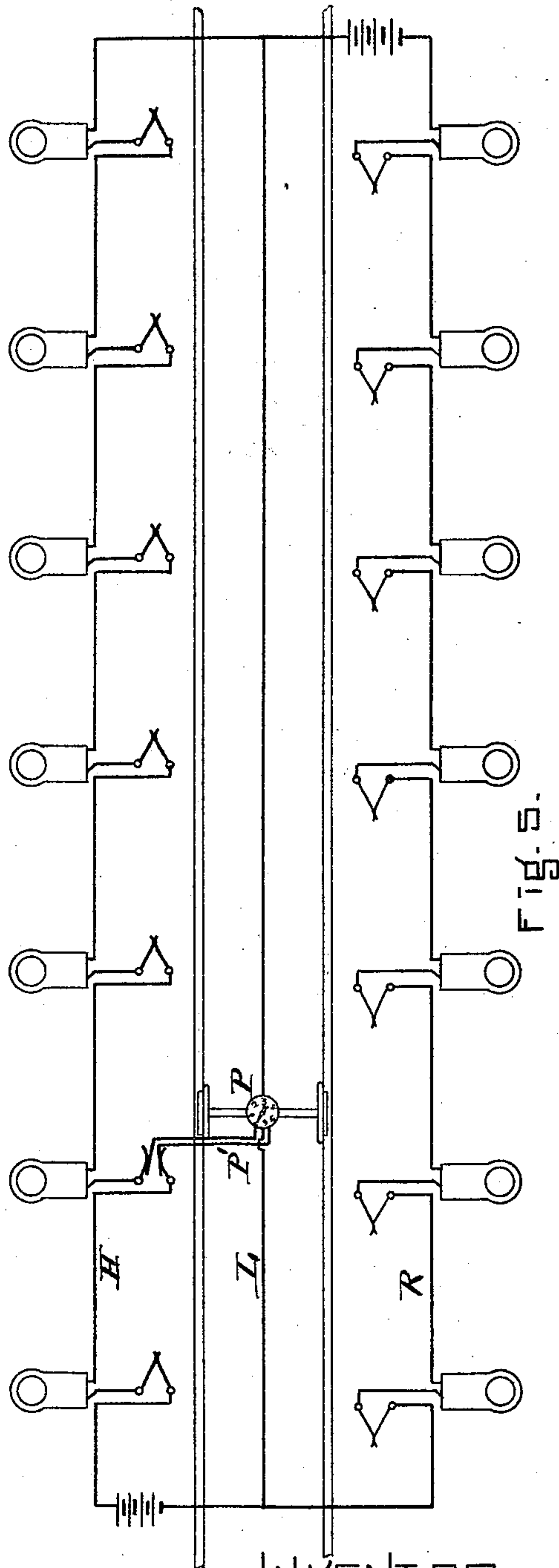
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# UNITED STATES PATENT OFFICE.

URIAH S. JACKSON, OF OSSIPPEE, NEW HAMPSHIRE, ASSIGNOR OF ONE-HALF  
TO HARRY F. CADY, OF LOWELL, MASSACHUSETTS.

## ELECTRIC SIGNAL FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 451,157, dated April 28, 1891.

Application filed June 26, 1890. Serial No. 356,869. (No model.)

*To all whom it may concern:*

Be it known that I, URIAH S. JACKSON, of Ossipee, in the county of Carroll and State of New Hampshire, have invented certain new and useful Improvements in Electric Signals for Railways, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of my invention is to so construct and arrange a simple series of signals operated electrically that the engineer as well as station-officers may know the position of trains on the road. This object I attain by the mechanism shown in the accompanying drawings, in which—

Figure 1 is an elevation of one of the signal-dial boxes. Fig. 2 shows the interior mechanism of the dial-boxes in elevation. Fig. 3 is a plan view of the interior mechanism of one of the dial-boxes, the case being in section. Fig. 4 is a diagram showing the electric system for operating the signals on an open circuit. Fig. 5 is a diagram showing the electric system for operating the dials on a closed circuit.

In the drawings, A represents one of the dial-boxes, and A' the dials, of which there are two, one on each side of the box. These dials are numbered as indicated. The numbers may indicate miles or stations or determined points on the route, as may be desired. Each engine may also have dials in its cab for the use of the engineer and conductor, the cab-dials being substantially like the road-dials, and are provided with index-hands and a device for working the hands electrically, similar to the one used in the road-dial boxes, the construction and operation of which I will now describe, reference being had to Figs. 2 and 3.

A magnet M, connected to the main line or by a relay to a local battery, is adapted to act upon the armature N on the lever N' and through the lever N', rod N<sup>2</sup>, and lever N<sup>3</sup>, pivoted at N<sup>4</sup>, actuate the pawl E and auxiliary pawl D, which operate on the pins C C of the index-wheel B<sup>2</sup>, and as the wheel B<sup>2</sup> is connected to the hands B on the dials the hands must also move.

The pawls E and D operate as follows: 50  
When the lever N<sup>3</sup> is drawn down by the magnet M, the auxiliary pawl D is withdrawn from the pins C C and the pawl E ascends and in its ascent pushes the pin C with which it is in contact forward, thus advancing the wheel B<sup>2</sup> and the connected hands B a part of one division. Now as the armature N is released the springs S act upon the lever N<sup>3</sup>, and through it draw the pawl E down and send the auxiliary pawl D upward, so as to complete the movement of the wheel B<sup>2</sup> and index-hands and to hold them in place until the magnet M is again charged. Then the operation is repeated.

The circuit is so arranged that the passage of an engine by certain determined points will automatically close an open circuit, and thus give the signal, or in case a closed circuit is used will break said circuit, which will give the required signal either on the road-boxes or in the box in the engine, or both.

The dials may be so arranged as to give the miles run by the train or give the location of the train. I do not wish to confine myself to any particular style of dial or system of indicating symbols or numbers on the dials, as these details may be varied indefinitely.

My signals may be operated by either an open or closed circuit. If an open circuit is used, it is arranged as indicated by the diagram Fig. 4, in which G represents the electric generator, and H, S, and L the main circuit. The circuit-wire H leads to the magnet in the first dial-box K, and from the magnet out through the wire H' to the second dial-box K', and so on through all of the dial-boxes. The device for closing the circuit is represented diagrammatically by T. This consists of an arm extending from the engine and having two electric conductors T' and P' leading to the dial-box P in the cab of the engine. The terminals of these wires are arranged to come in electric contact with the terminals of the wires h and h', connected, as shown, to the circuit-wires S and L. Thus the current is closed from the generator G and around the magnet of the road-dial boxes K K', and also around the magnet of the en- 95



gine-dial box P. Thus the index-hands of the dial-boxes K, K<sup>6</sup>, and P are moved, and the position of the engine is indicated in the engine and on the dial of all of the road-boxes.

5 As the engine advances, the index-hands of all of the road-dials will be acted upon. Thus the position of the train can be known by inspection of any of the dials. The index-hand in the engine may serve to indicate to the engineer that the contact is made at each station, and thus to warn him of any failure of the working of the system.

When a closed circuit is used, as indicated in the diagram Fig. 5, an arm P' from the engine serves to break the circuit as the engine passes each station or signal-box. In this case the pawl-levers E and D are made to move the index-hand by the retractile action of the spring S, and are drawn back to the normal place by the magnets when the circuit is closed as the engine leaves the electric switch.

In the diagram Fig. 5 two complete circuits—that is, H L and L R—are shown, one

circuit being for the outward-bound trains and one for the inward.

I claim—

In an electric signal system for railways, the combination of electric-signal boxes K K, &c., each having an electric magnet M and mechanism for connecting it with pawls D and E, adapted to operate, wheels B<sup>2</sup>, having pins C C, index-hands B, and dials A, as described, with an electric generator G, system of circuit-wires connected to said electric-signal boxes and with the circuit-terminals h h', said terminals adapted to be made electrically operative by the action of the arm P', extending from the engine, all substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 23d day of June, A. D. 1890.

URIAH S. JACKSON.

Witnesses:

FRANK G. PARKER,  
MATTHEW M. BLUNT.