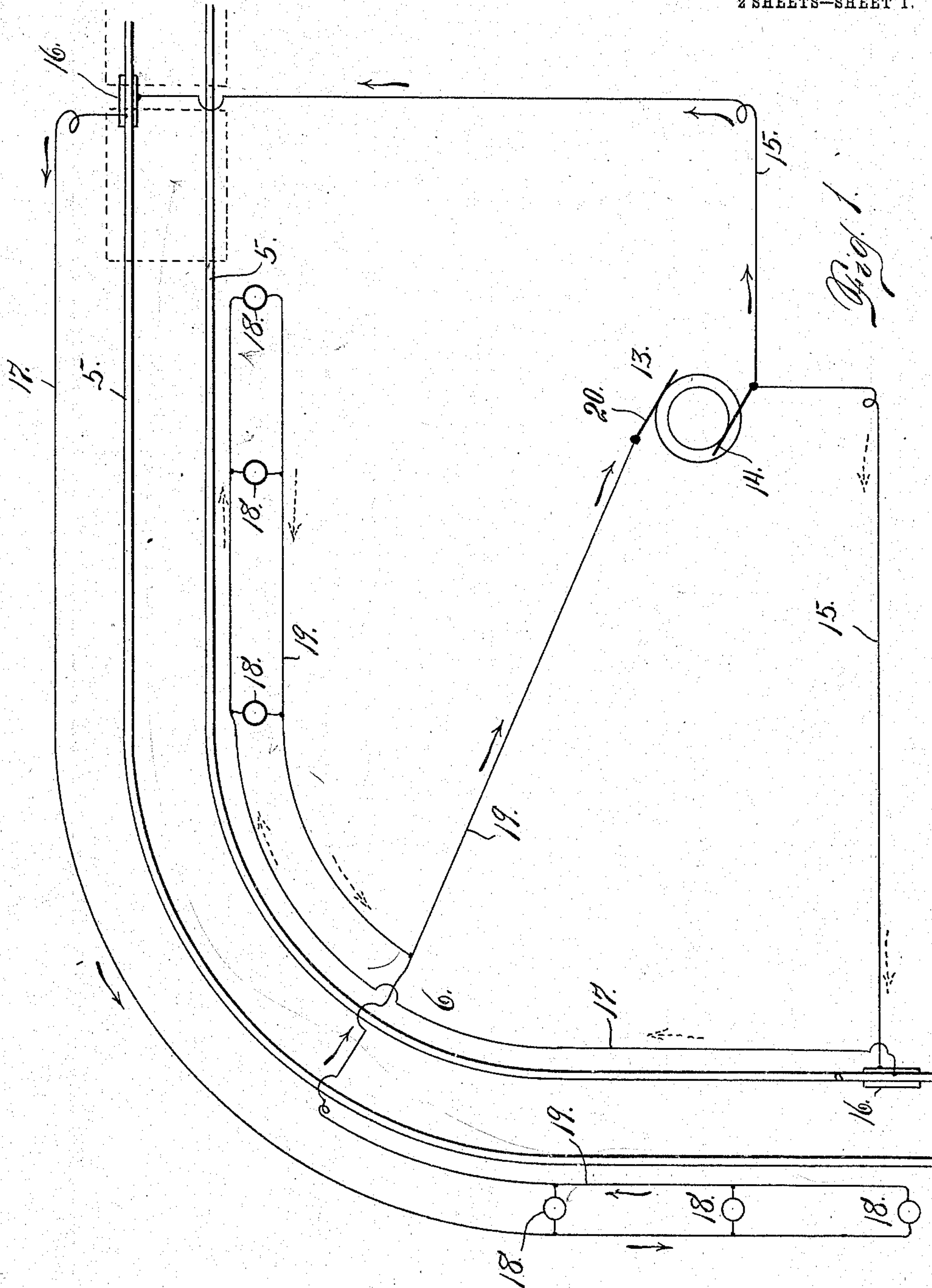


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 AUTOMATIC ELECTRIC SIGNAL FOR RAILWAYS.  
 APPLICATION FILED FEB. 16, 1909.

953,109.

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2 SHEETS—SHEET 1.



Witnesses  
 Otto E. Hoddick  
 Juanita Knight

Inventor  
 Wm. Tullock.  
 By *W. D. O'Brien* Attorney

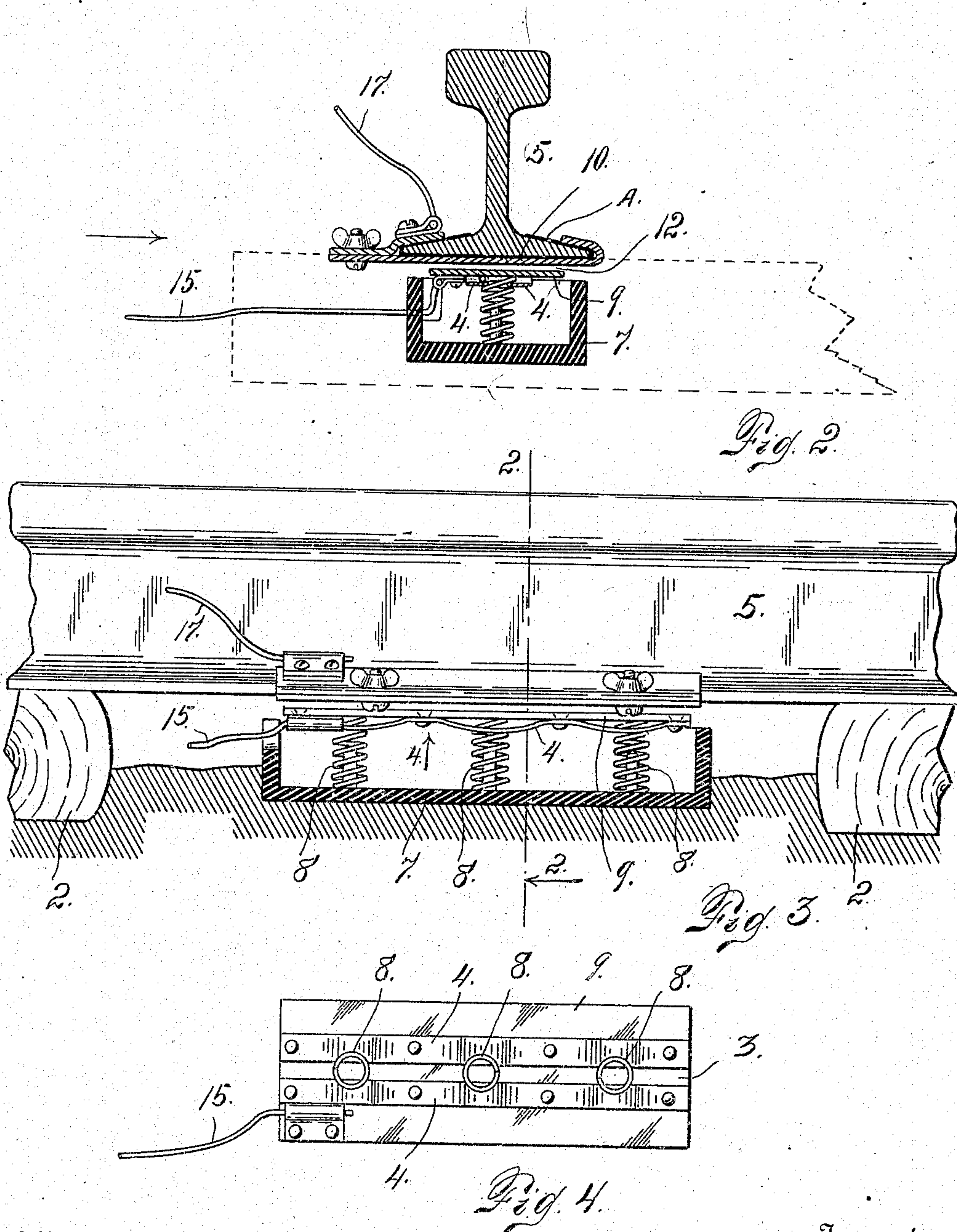


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 Wm. Tullock.  
 By *W. H. D. Mearns* Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM TULLOCK, OF DENVER, COLORADO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-TENTH TO WILLIAM J. THOMPSON, ONE-TENTH TO THOMAS McKERNAN, OF DENVER, COLORADO, ONE-FIFTH TO WILLIAM M. LAURIE, ONE-FIFTH TO THOMAS PHILLIPS, AND ONE-FIFTH TO HARRY RUSSELL, OF LEYDEN, COLORADO.

## AUTOMATIC ELECTRIC SIGNAL FOR RAILWAYS.

953,109.

Specification of Letters Patent.

Patented Mar. 29, 1910.

Application filed February 16, 1909. Serial No. 478,184.

*To all whom it may concern:*

Be it known that I, WILLIAM TULLOCK, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Automatic Electric Signals for Railways; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in automatic electric signals for railways, my object being to arrange these signals at all danger points along the line of railway, particularly at curves, the said signals being so arranged that a train approaching the curve from either direction will automatically close an electric circuit in which lamps are so arranged that a train approaching from the opposite direction will be warned, the distance of the lamps from the point where the train acts to close the circuit, being regulated as desired, the said distance in any event being sufficiently great as to prevent either train from coming upon the other unawares. In my improved construction the circuit is normally open. One contact is mounted upon the base of the rail, while the other contact is yieldingly supported below the rail, but slightly separated therefrom, whereby the circuit is broken except when the train is passing, the weight of the train, however, serving to depress the rail sufficiently to bring the two contacts into engagement, thus closing the light circuit while the train is passing.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof.

In this drawing Figure 1 is a top plan view, largely diagrammatic, illustrating my invention applied to a section of railway track having a curve. Fig. 2 is a cross-section taken through one of the track rails, cutting the normally separated contacts, the

parts being shown on a larger scale. This is a section taken on the line 2—2, Fig. 3. Fig. 3 is a fragmentary side elevation of a rail, showing my improved device partly in section. Fig. 4 is an underneath view of the lower contact plate, looking in the direction of arrow 4, Fig. 3.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate each of two track rails. Underneath one of these rails, on the opposite sides of a curve 6, and at a considerable distance from the curve, is located a sort of box 7, in which are located vertically disposed coil springs 8, upon whose upper extremities rest a contact plate 9, normally slightly separated from a plate 10 secured to the base of one of the track rails 5. Normally there is a space 12 between the contacts 9 and 10. A suitable source of electricity, preferably a dynamo or generator 13, is suitably located for the purpose. From a pole 14 of this generator, wires 15 lead to a lower contact plate 16 of the signals, while from the upper contact plates 10 lead wires 17 to a number of lamps 18, from which wires 19 lead to an opposite pole 20 of the electric source.

From the foregoing description the operation of my improved automatic signal will be readily understood.

As a train approaches the curve 6 from either direction, one of the track rails 5 is depressed sufficiently to bring the copper contact plate 10 into electrical engagement with the lower copper plate 9, thus closing the circuit through the set of lamps 18 on the opposite side of the curve. A set of these contacts should be arranged far enough from the curve 6 in both directions to prevent any possibility of a collision between either approaching or following trains.

Attention is called to the fact that the invention is not limited to the use of lamps as signals, since audible signals of any kind, as well as visual signals of any character that may be produced by electricity may be employed, or both kinds of signals may be used, if desired. In the drawing, electric lamps are diagrammatically illustrated, and these will probably be most commonly employed in my improved system. It must be



understood, however, as heretofore stated, that the invention is not limited thereto.

In order to prevent the possible grounding of the circuit, the box 7, which forms the support for plate 9, is formed of insulating material. The lower surface of the plate 9 is provided with metal strips or narrow plates 4 arranged parallel with each other, and separated by a space 3. As shown in the drawing, the upper extremities of the springs 8 are connected with the plate 9 by inserting the upper end of each spring underneath one of the strips 4, and then giving the spring one or more turns, whereby one or more of its convolutions is interposed between the said strips and the plate 9, thus securely attaching the spring to the plate. Attention is also called to the fact that the upper plate 12 is insulated from the rail, as shown at A, since it is desirable to prevent the current from entering the rail, as under some circumstances this might result in grounding the circuit.

My improved apparatus, composed of the box 7 and the copper contact plates 9 and 10, should be located between two cross-ties 2 (see Fig. 3). If desirable, these ties may be separated somewhat farther than usual, in order that the depression of the rail, due to the passage of the train thereover, may be sufficient to form a given contact between the two plates. This matter, however, may be determined by experiment.

Having thus described my invention, what I claim is:

1. In automatic signals for railways, the combination with an electrical circuit, of a signal therein, and a circuit make-and-break device for operating the signal, composed of two plates, one of which is mounted on a rail of the track but insulated therefrom, the other being supported directly beneath the rail and cooperating with the rail member to close the circuit without the use of intermediate parts, by the direct contact of

the adjacent surfaces of the two plates when the rail is flexed, due to the passing of a train.

2. In automatic signals for railways, the combination with an electric circuit, of a signal therein, and a make-and-break device for operating the signal, comprising two plates, one of which is mounted on a rail of the track and extends entirely underneath the base of the rail, the other plate being yieldingly supported directly below the rail, the adjacent surfaces of the two plates being normally separated but adapted to be brought together by the flexure of the rail, due to the passing of a train, whereby the circuit is closed by the bringing of the two plate surfaces directly into engagement without the use of intermediate parts substantially as described.

3. In automatic signals for railways, the combination with an electrical circuit, of a signal therein, a circuit make-and-break device for operating the signal, comprising two plates, one of which is secured directly to the base of the rail but insulated therefrom and extending entirely underneath the said base, the other plate being located directly underneath the rail and provided on its under surface with separated metallic strips and spiral springs whose upper extremities are interlocked with said strips, forming a yielding support for the lower plate of the make-and-break device, the two plates being normally separated but adapted to be brought into direct engagement to close the circuit without the use of intermediate parts, by the flexure of the rail due to the passing of a train, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM TULLOCK.

Witnesses:

A. J. O'BRIEN,  
A. EBERT O'BRIEN.