

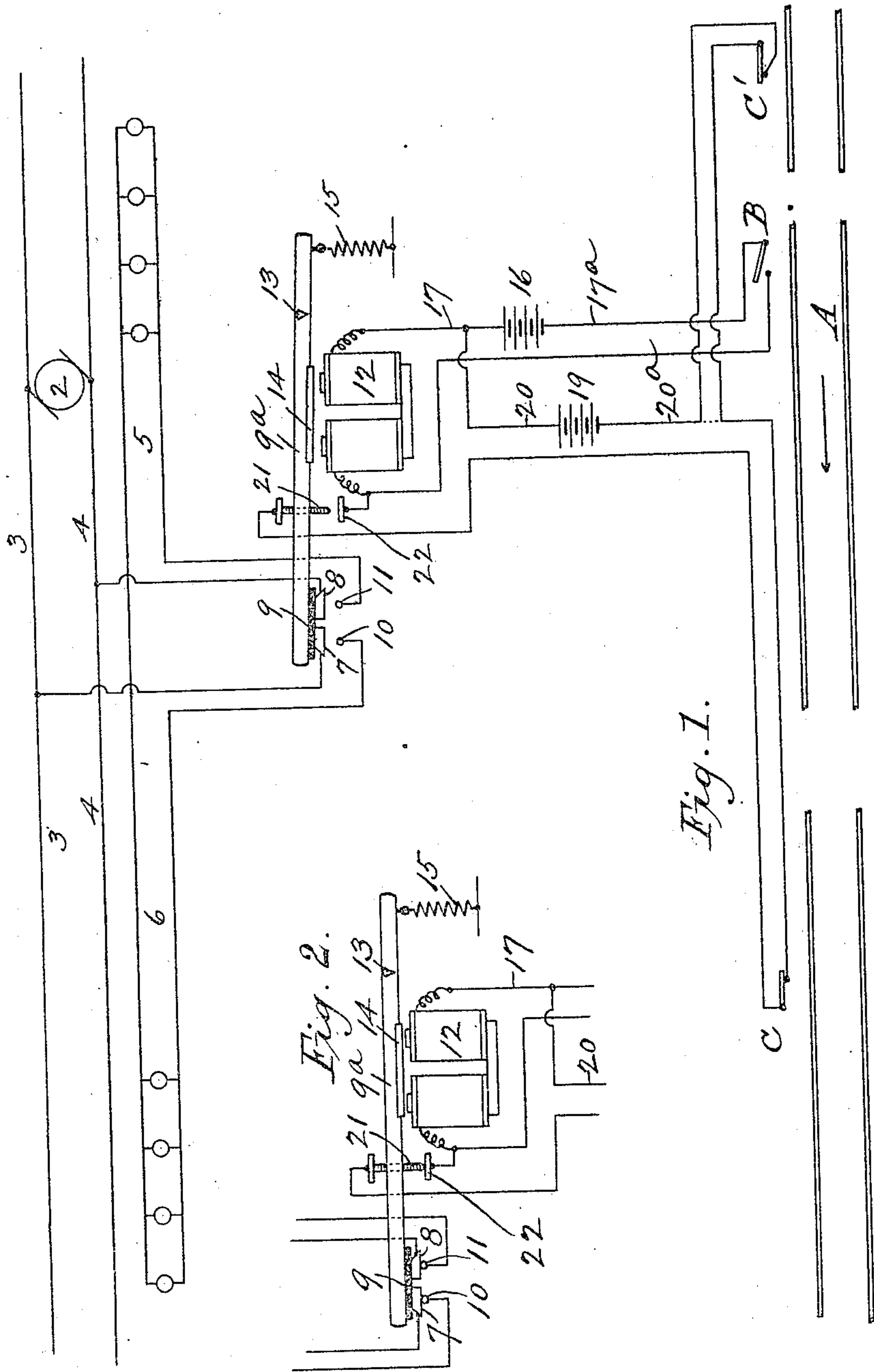
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PATENTED NOV. 27, 1906.

J. G. HORAZDOVSKY.
RAILWAY SIGNALING SYSTEM.
APPLICATION FILED MAY 21, 1906.

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2 SHEETS--SHEET 1.



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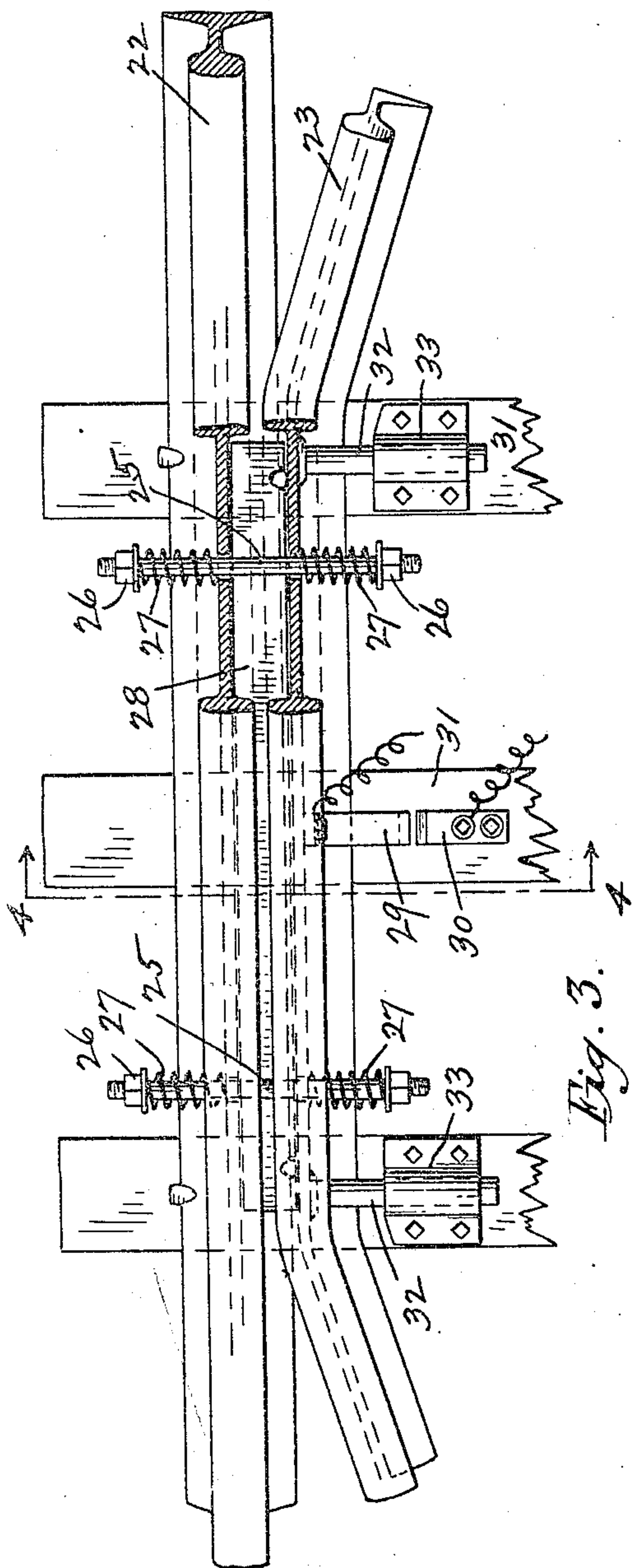


Fig. 3.

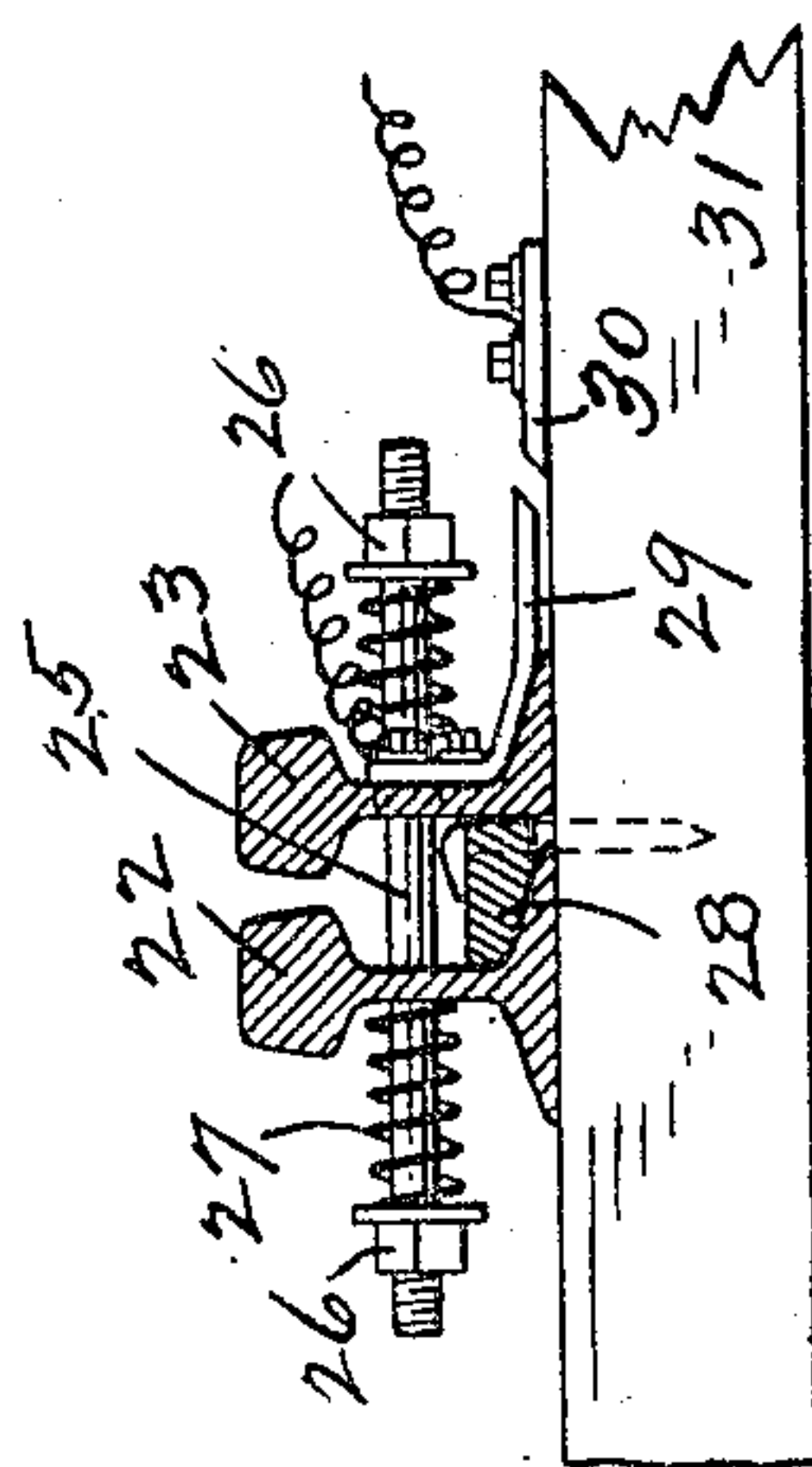


Fig. 4.

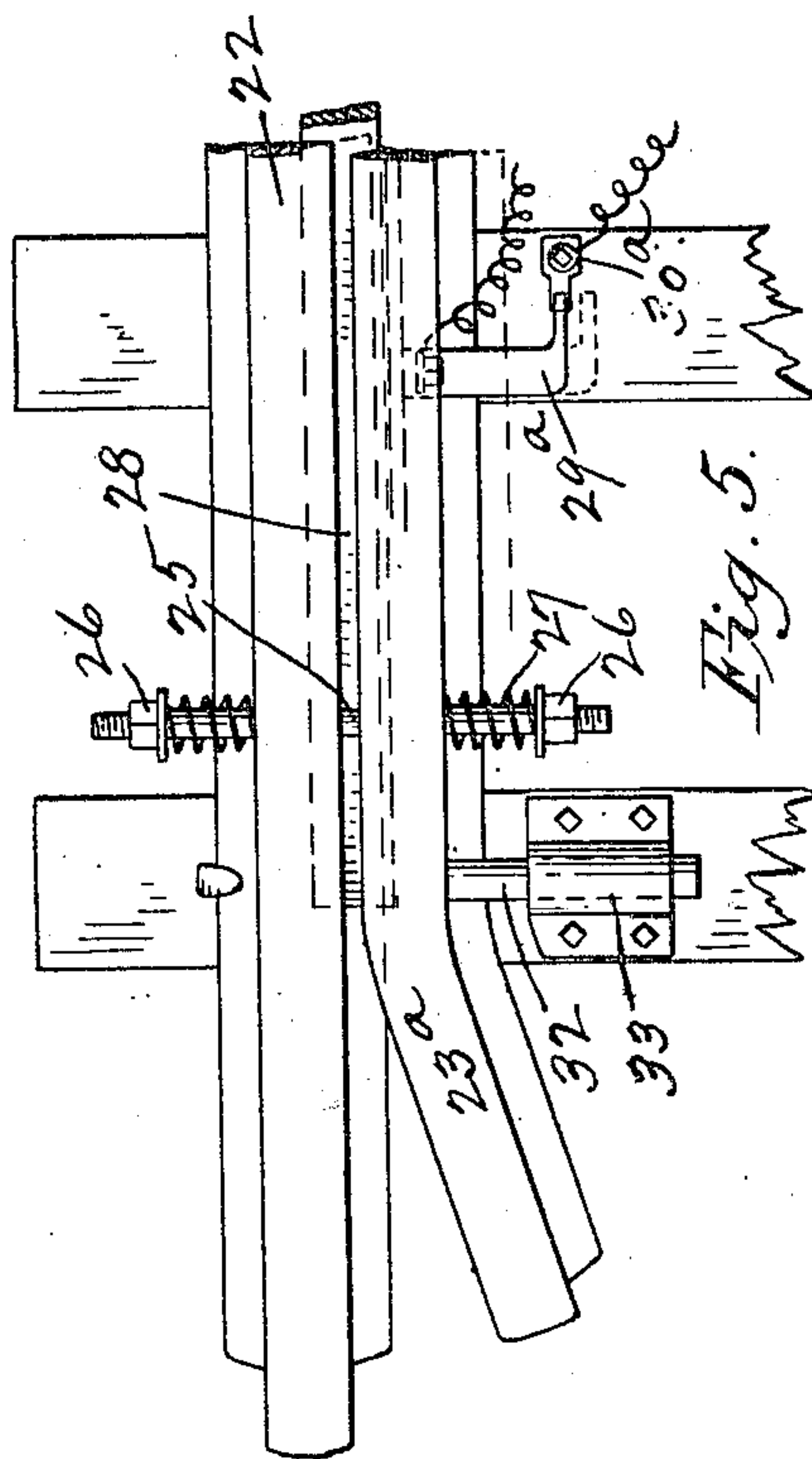


Fig. 5.

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UNITED STATES PATENT OFFICE.

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RAILWAY SIGNALING SYSTEM.

No. 837,227.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed May 21, 1906. Serial No. 317,874.

To all whom it may concern:

Be it known that I, JOSEPH G. HORAZDOVSKY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Railway Signaling systems, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to railway signaling systems, and has for its object to provide simple, inexpensive, and effective means whereby a signaling device may be operated to display a warning-signal at either or both ends of or at a predetermined distance ahead of or behind a block or section which a train may be traversing.

In the case of double tracks rear-end collisions frequently occur which could be prevented by the display of a signal to the rear of the advance train. In the case of a single track both rear and head-on collisions may be prevented by the display of a suitable signal at a sufficient distance at the rear of and in advance of a train.

The object of the invention is to provide means for accomplishing these results in a simple, inexpensive, but effective manner.

Referring to the drawings, Figure 1 represents a diagrammatic view of one form of my invention; Fig. 2, a detail of the device which makes and breaks the signal-circuit shown in Fig. 1, showing the circuit closed. Fig. 3 represents a plan view, with parts broken away, of one form of make-and-break device which I employ in my system. Fig. 4 represents a sectional view on the line 4-4 of Fig. 3; and Fig. 5 is a plan view of a make-and-break device similar to that shown in Figs. 3 and 4, but operating in the reverse manner to the device shown in said figures.

The diagrammatic view represents a section or block of a railway with my signaling system applied thereto. 1 1 represent the signaling devices shown at each end of the block or section. In the embodiment shown herein these signaling devices are illustrated as electric lamps, although they may be replaced by any well-known type of signal in use on railways—as, for instance, semaphores or lanterns displaying a red light. 2 designates any source of electric energy for supplying said lamps, as a dynamo. 3 4 repre-

sent the main wires leading from said dynamo. This same dynamo may be employed to transmit current along the whole length of the line of way. 5 and 6 designate the two branches of the lighting-circuit in which the lamps are located. The main branches 3 and 4 are connected, respectively, with terminals 7 and 8, carried by a block 9 of insulating material on the lever 9^a. 10 and 11 designate the terminals of the lighting or signal displaying circuit. With the parts in the position shown in Fig. 1 the current from the generator 2 is broken between terminals 7 8 and 10 11, and the signals are not displayed, the lamps not being illuminated. Should the lever be moved to the position indicated in Fig. 2, however, the circuit will be closed between 7 8 and 10 11, and the current will then flow through the branches 5 and 6, illuminating the lamps at both ends of the block or section.

To make the display of the warning-signals automatic upon the entry of a train upon the block or section and to keep the signal thus displayed until the train passes off the block or section, I make use of the following device: 12 designates an electromagnet in operative relation to the lever 9^a, said lever being provided with a pivot 13 and a plate 14, of iron or similar magnetic material, adjacent the poles of the magnet, whereby the said lever constitutes, in effect, an armature for said electromagnet. Beyond the pivot 13 a spring 15 is provided, which normally holds the lever in the position shown in Fig. 1 with the circuit open.

With the electromagnet I employ two local circuits, one of which is closed by the entrance of a train upon the block or section. One circuit comprises the battery 16 or other source of electrical energy, from which extend the branches 17 and 17^a, the former being connected to a terminal of a track-switch or instrument B, placed adjacent the track A. As indicated diagrammatically in Fig. 1, the track switch or instrument is normally open, the terminals being separated, but being adapted to be closed by the passage of a train in any desired manner, as by the construction illustrated more specifically in Figs. 3 and 4. The electromagnet 12 is also in circuit with another local circuit comprising a battery 19 (or other source of electrical en-

ergy) and branches 20 20^a. Branch 20 may be connected with the winding of the electromagnet through an adjacent portion of the conductor 17, as indicated in the diagram.

5 The circuit including 19, 20, and 20^a is normally broken between the terminals 21 and 22, being closed at the track switches or instruments C C', the terminals of which are shown in contact in the diagram. The terminal 21 may be a screw carried by the lever 9^a and separated from terminal 22 a sufficient distance to be brought into contact therewith when the electromagnet is energized. It will thus be seen that the local circuit 16, 17, 12, and 17^a serves to initially close the signal-displaying circuit, as well as to close the other local circuit 19, 20, 12, 22, 21, and 20^a, and that the latter circuit remains closed and keeps the signal-displaying circuit closed until a train reaches either of the track switches or instruments C C', whereupon the terminals at said switch or instrument will be separated in any convenient manner, as illustrated in detail in Fig. 5, and the signal-displaying circuit will be effectively broken.

As a means for closing the circuit at the track instrument B, I may employ the construction shown in Figs. 3 and 4, wherein 22 designates one of the rails of the track and 23 a short rail-section adjacent thereto and held in proximity thereto, as by means of bolts 25 extending through the webs of the main rail and rail-section. Each bolt is provided at opposite ends thereof with nuts 26 and with a spring 27, interposed between each nut and the adjacent rail-web, said springs being under compression. A plate 28 spaces 23 from 22 a sufficient distance to enable the outer edge of the car-wheel flange to enter this space. The entrance of the wheel-flange into this space is facilitated by bending the ends of the section 23 away from the rail 22, as shown in Fig. 3. The rail-section 23 carries one terminal 29, the other terminal 30 being carried by one of the ties 31, and the space between such terminals being such as to enable them to be brought into contact when one of the wheels of a locomotive or car is passing between the rail 22 and section 23. To maintain the section 23 in proper relation to the rail 22, I provide the former with guide pins or rods 32, entering into sleeves 33, carried by the ties.

55 In Fig. 5 the arrangement is similar to that shown in Fig. 3 except that rail-section 23^a is provided with a terminal 29^a, which is normally in contact with the other terminal 30^a, but is moved out of contact therewith when a train passes, as indicated in dotted lines in Fig. 5.

60 With the parts arranged as described when a train enters the section traveling in the direction indicated by the arrow in Fig. 1 the circuit including the local battery 16 is

closed, electromagnet 12 is energized, and the terminals 7 and 8 are brought into contact with terminals 10 and 11, thereby placing the lighting or signal-displaying branches into circuit with the generator 2. At the same time terminal 21 is brought into contact with terminal 22, closing the local circuit through battery 19, electromagnet 12, and track instruments C C'. After the train has passed beyond track instrument B the circuit including such instrument is broken; but the circuit including track instruments C C' will remain closed until the train reaches either of the same, whereupon the circuit will be broken at the said instrument and the signals will be no longer displayed. Ordinarily there will be no occasion for employing the track instrument C', and said instrument might be omitted from the circuit including the track instrument C, as indicated by dotted lines in Fig. 1. It frequently occurs, however, that a switching engine or train will enter a block and back off or otherwise leave the same without passing therethrough. The train or engine in passing B will close the circuit including the track instrument C, and said circuit will remain closed unless the train or engine either passes the point C or some other provision be made for breaking the circuit. By placing the normally closed track instrument C' in front of B the train or engine in backing off the block or section will break the signal-circuit at this point, and no signal will be displayed unless a train or engine is actually on the block or section.

100 The location of the signals will depend upon the special circumstances of the case. They should be placed at a sufficient distance ahead of and behind the train to enable an approaching train to be stopped in time to avoid collision, and a sufficient number of signaling devices should be provided to cover all dangerous points on the railway. In the case of a single track it will be evident that the opposite side of the track must be provided with an apparatus like that shown in the diagram to be operated by trains running in a direction the reverse to that shown in said diagram.

115 Numerous changes may be made in the details of construction herein set forth without avoiding the spirit of my invention, and I do not propose to be limited to such details except as the same may be included in the claims hereto annexed or may be rendered necessary by the state of the art.

Having described my invention, I claim—

1. In a railway signaling system, the combination of a lighting-circuit having two sets of terminals; an electromagnet, an armature therefor, a conductor carried by said armature and normally in contact with one set of terminals, a pair of terminals carried by said armature and so located that, when the electromagnet is energized they are brought into

contact with the second set of terminals of the lighting-circuit, and a pair of track instruments in circuit with said magnet and adapted to close and break the magnet-circuit respectively by the passing of a train adjacent thereto, substantially as specified.

2. In a railway signaling system, the combination of a block or section having at each end thereof one or more signaling devices, an electric circuit including both sets of signaling devices, said circuit being provided with two sets of terminals, an electromagnet, an armature therefor, a conductor carried by said armature and normally bridging the space between the terminals of one set, a pair of terminals carried by said armature and so located that when the electromagnet is energized they are brought into contact with the second set of terminals of the signaling-circuit, and a pair of track instruments in circuit with said magnet and adapted to close and break the magnet-circuit respectively by the passing of a train adjacent thereto.

3. In a railway signaling system, the combination of a block or section, one or more signaling devices adjacent each end of said block or section, an electric circuit including said signaling devices, means including an electromagnet and an armature for making and breaking the signaling-circuit, a track instrument or switch at each end of said block or section, said track instruments or switches being in circuit with said electromagnet, one of said switches being adapted to be closed by the entrance of a train upon the block or section, and the other switch being adapted to be opened by the departure of the train from said block or section.

4. In a railway signaling system, the combination of a block or section having at each end thereof one or more signaling devices, an electric circuit including said devices, an electromagnet, an armature therefor adapted when the electromagnet is energized to operate the said devices at both ends of the block or section, and a pair of track instruments in circuit with said electromagnet and

adapted respectively to energize and deenergize said electromagnet by the passage of a train adjacent thereto.

5. In a signaling system, the combination of a signaling device, and means for displaying said device, said means comprising an electric circuit, a rail-section adjacent one of the rails of the main track and carrying a terminal of said circuit, a second terminal cooperating with the former terminal to make and break the circuit, means tending to hold said rail and section in engagement and spacing means between said rail and section, substantially as specified.

6. In a railway signaling system, the combination of a block or section, a signaling device at each end of said block or section, and means for operating the same, said means comprising a pair of circuits, one of said circuits being normally open and the other having a normally closed switch at each end of the block or section, means controlled by the entrance of a train upon a block or section for closing the former circuit, means for closing the latter circuit by the closing of the former circuit, and means for breaking the latter circuit by the passage of a train or engine adjacent to either of the switches thereof.

7. In a signaling system, the combination of a signaling device and means for displaying said device, said means comprising an electric circuit, a rail-section adjacent one of the rails of the main track and carrying a terminal of said circuit, a second terminal at one side of the rail-section and cooperating with the former terminal to make and break the circuit, a bolt extending through the main rail and rail-section, adjusting-nuts on each end of said bolt, a spring interposed between one of said nuts and the main rail, and a second spring interposed between the other adjusting-nut and the rail-section.

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

JOSEPH G. HORAZDOVSKY.

Witnesses:

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J. B. HULL.