

No. 819,677.

PATENTED MAY 1, 1906.

P. J. SIMMEN.  
ELECTRIC BLOCK SIGNAL SYSTEM.  
APPLICATION FILED JULY 31, 1905.

2 SHEETS—SHEET 1.

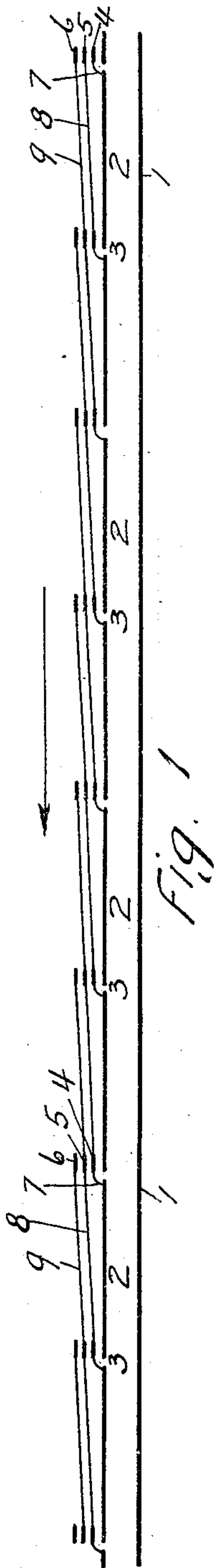


Fig. 1

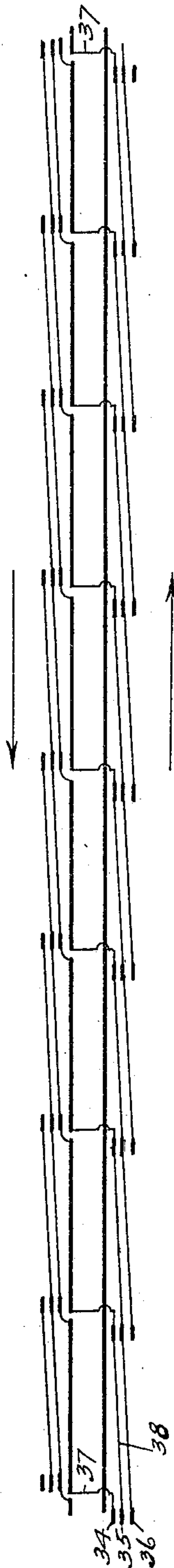


Fig. 2

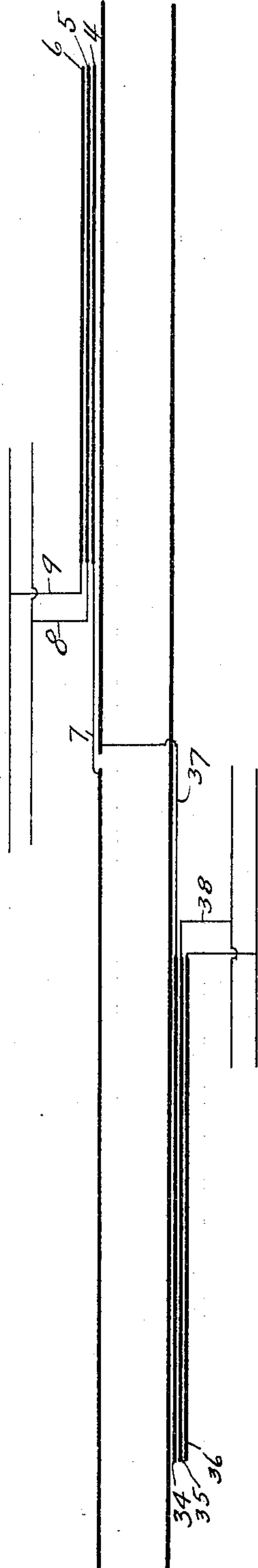


Fig. 3

Witness

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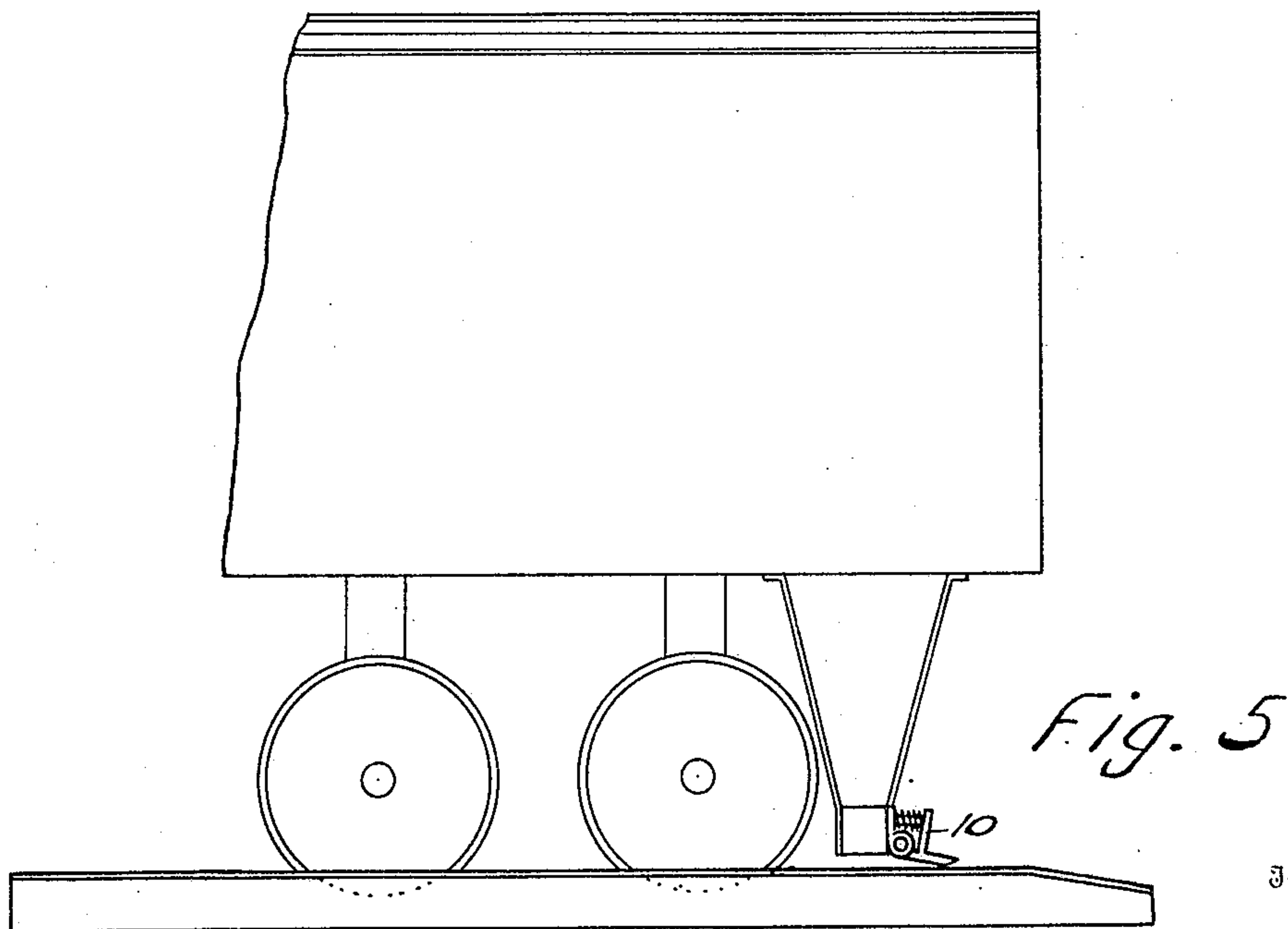
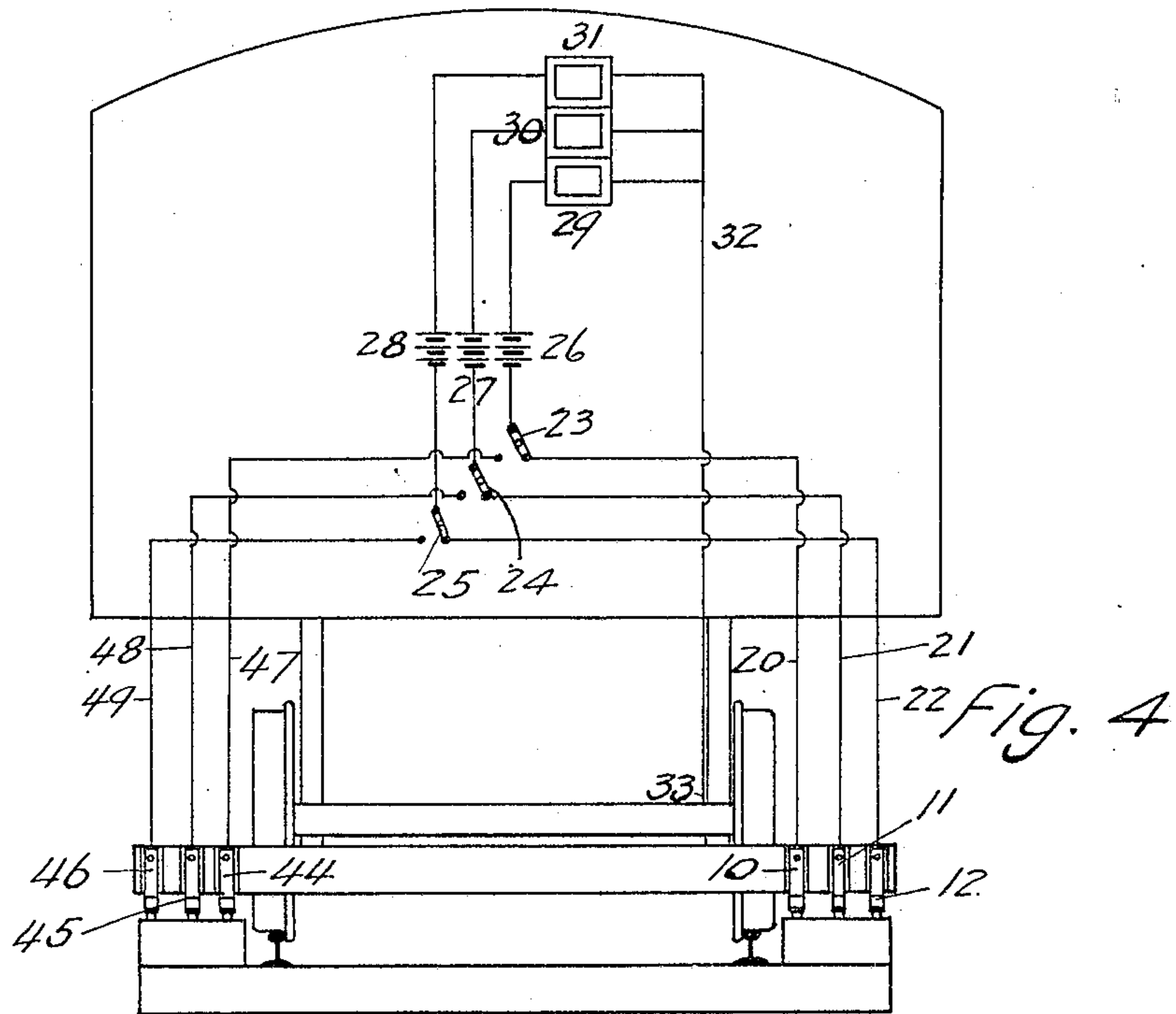
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# UNITED STATES PATENT OFFICE.

PAUL J. SIMMEN, OF CHICO, CALIFORNIA.

## ELECTRIC BLOCK-SIGNAL SYSTEM.

No. 819,677.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed July 31, 1905. Serial No. 272,114.

*To all whom it may concern:*

Be it known that I, PAUL J. SIMMEN, a citizen of the United States, residing at Chico, in the county of Butte and State of California, have invented certain new and useful Improvements in Electric Block-Signal Systems, of which the following is a specification.

This invention relates to an electric block-signal system for railways, the object of the invention being to provide a simple and effective system by means of which the engineer can at any time ascertain the presence of trains upon sections adjacent to that upon which his train is located.

In the accompanying drawings, Figure 1 is a diagrammatic view of a track equipped with my improved block-signal system operating on a train running in one direction only. Fig. 2 is a similar view of the system equipped for trains running in either direction. Fig. 3 is an enlarged detailed view of a portion of the track shown in Fig. 2. Fig. 4 is a diagrammatic end view of a locomotive-cab, showing the circuits therein. Fig. 5 is a side view of the same to show the contact-shoe.

Referring to the drawings, 1 represents an electrically-continuous rail of a track. The other rail of the track is divided into sections 2, electrically separated from each other, as shown at 3. These sections may be of any convenient length according to the amount of the traffic or other conditions, say, from two to ten miles. At the side of the track opposite to the end of each section is arranged a group of parallel contact-rails, the number of rails in each group being selected according to the distance ahead or in the rear upon which it is thought necessary to give the engineer information as to the presence of trains on the track. For this purpose I have herein shown three such contact-rails 4 5 6 in a group. Of these the innermost rail 4 is connected by a comparatively short wire 7 to the end of the section 2 next in advance. The middle rail 5 is connected by a wire 8 with the rail 4 of the series next in advance, which in its turn is connected by the short wire 7 with the rail 2 in advance. The outermost contact-rail 6 is connected by a wire 9 with the rail 5 of the series in advance, the latter being again connected by the wire 8 with the rail 4 of the next series in advance, and thence by the wire 7 with the section 2, which is the third section in advance of the group of rails 4 5 6 under consideration.

With the rails 4 5 6 contact a correspond-

ing series of contact-makers 10 11 12, carried in proper position to make contact with said rails 4 5 6. These contact-makers are of the usual construction in common use with the third-rail system of electric railways and therefore need not be more particularly specified. Said contact-makers are connected, respectively, to wires 20 21 22, leading through switches 23 24 25 to batteries 26 27 28, thence to signals 29 30 31, which have been, for the purpose of illustration, represented as annunciator-drops, although they may be of any other convenient character—as, for instance, colored electric lamps. The wires lead from said signals to a common wire 32, which connects with the bearing of the wheel and thence to the opposite rail 1. It will be seen that with this arrangement should there be a train upon a section of the track in advance when the locomotive arrives at the end of any section so that the contact-maker 10 contacts with the rail 4 at the end of said section then the engineer will be apprised thereof by the closure of the following circuit: contact-maker 10, wire 20, switch 23, battery 26, signal 29, wire 32, wheel-axle 33, all in the locomotive of the train in the rear, thence by the rail 1 to the train in advance, the wheel-axle thereof, section 2, wire 7, a contact-rail 4. Thus the signal 29 is actuated. In like manner should there be a train on the next section but one in advance at the time of arrival of the succeeding train at the end of any section a similar circuit will be closed through the rail 5 and contact-maker 11, actuating the signal 30, and in like manner a signal 31 will be actuated should there be a train on the next section but two in advance. It will readily be seen that this system can be extended to any number of sections by providing a proper number of contact-rails and contact-makers.

Fig. 2 illustrates the construction necessary for completing the system for trains traveling in either direction on the same track. In this case there are provided on the outer side of the rail 1 opposite to the end of each section 2 (proceeding now in the opposite direction—that is, from left to right instead of from right to left)—rails 34 35 36, corresponding in number with the rails on the other side of the track. The innermost rail 34 is connected with the end of the section in advance by a wire 37, the next outer rail 35 being connected by a wire 38 with the innermost rail 34 of the group in advance, and the



outermost rail 36 being connected with the rail 35 of the group in advance. It will readily be seen that these rails are arranged in precisely the same manner for a train 5 traveling from left to right as the rails on the other side for one traveling from right to left.

The contact-makers 10 11 12, carried by the locomotive, will contact with these rails 34 35 36 in traveling in the other direction. 10 However, it sometimes happens that a locomotive is traveling with the tender foremost, in which case the shoes would not make the proper contact with the rails. A second set of contact-shoes 44 45 46 is therefore pro- 15 vided on the opposite side of the locomotive, and these shoes are connected with the switches by the wires 47 48 49. In such case the engineer will move the switches so as to make the circuit through the second set of 20 shoes. Preferably a switch will be used which will serve for closing all three circuits at the same time and which will do this automatically on the action of the reversing-lever. This same set of shoes 44 45 46 on the 25 left-hand side of the engine will also be used when the engine is running backward on the track.

As it is evident that for the contact-rails trolley-wires could be substituted, the word 30 "rail" in the claims is to be understood to be sufficiently broad to include any piece of metal which will make contact with a moving contact on a train for a sufficient length of time to give the desired signal or other 35 effect.

I claim—

1. In an electrical block-signal system for railways, the combination of an electrically-continuous rail of a track, electrically-insu- 40 lated sections of the other rail of a track, a group of contact-rails, arranged adjacent to each such section at convenient points therefor, an electrical connection between each member of said group and sections in ad- 45 vance of the section to which they are adjacent, a corresponding group of contact-makers carried by the locomotive, signaling devices carried by the locomotive corresponding with the respective contact-makers, 50 circuits through the respective signaling devices to the wheel-axle, and means for supplying electricity to said circuits, substantially as described.

2. In an electrical block-signal system for 55 railways, the combination of an electrically-continuous rail of a track, electrically-insulated section of the other rail of the track, a

series of contact-rails adjacent to each such section at a convenient point thereof, an electrical connection between the first member of 60 said series with the next section in advance, an electrical connection between each succeeding member of the series with the preceding member of the series adjacent to the section in advance, a corresponding series of contact- 65 makers carried by the locomotive, individual circuits through said contact-makers, and signaling devices, said circuits leading through the axle of the locomotive, substantially as described. 70

3. In an electrical block-signal system for railways the combination of an electrically-continuous rail of a track, electrically-insu- 75 lated sections of the other rail of the track, a group of contact-rails arranged to each such section at a convenient point thereof, an electrical connection between each member of said group and sections in advance of the section to which they are adjacent, a corresponding 80 group of contact-makers carried by the locomotive, signaling devices carried by the locomotive corresponding with the respective contact-makers, circuits from said shoes through the respective signaling devices to the wheel-axle, means for supplying elec- 85 tricity to said circuits, a second group of contact-makers on the opposite side of the locomotive, wires severally leading therefrom to the corresponding circuits through the opposite contact-makers, and switches control- 90 ling said wires, substantially as described.

4. In an electrical block-signal system for railways, the combination of an electrically-continuous rail of a track, electrically-insu- 95 lated sections of the other rail of the track, a group of rails for each section at each side of the track and transversely opposite to the corresponding section, an electrical connection between one member of the group on each side with the section in advance, an 100 electrical connection between another member of the group and the next section but one in advance, and so on for each member of the group, the direction of such electrical connection being symmetrical in regard to the 105 corresponding groups and sections with which they connect.

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

PAUL J. SIMMEN.

Witnesses:

FRANCIS M. WRIGHT,  
BESSIE GORFINKEL.