

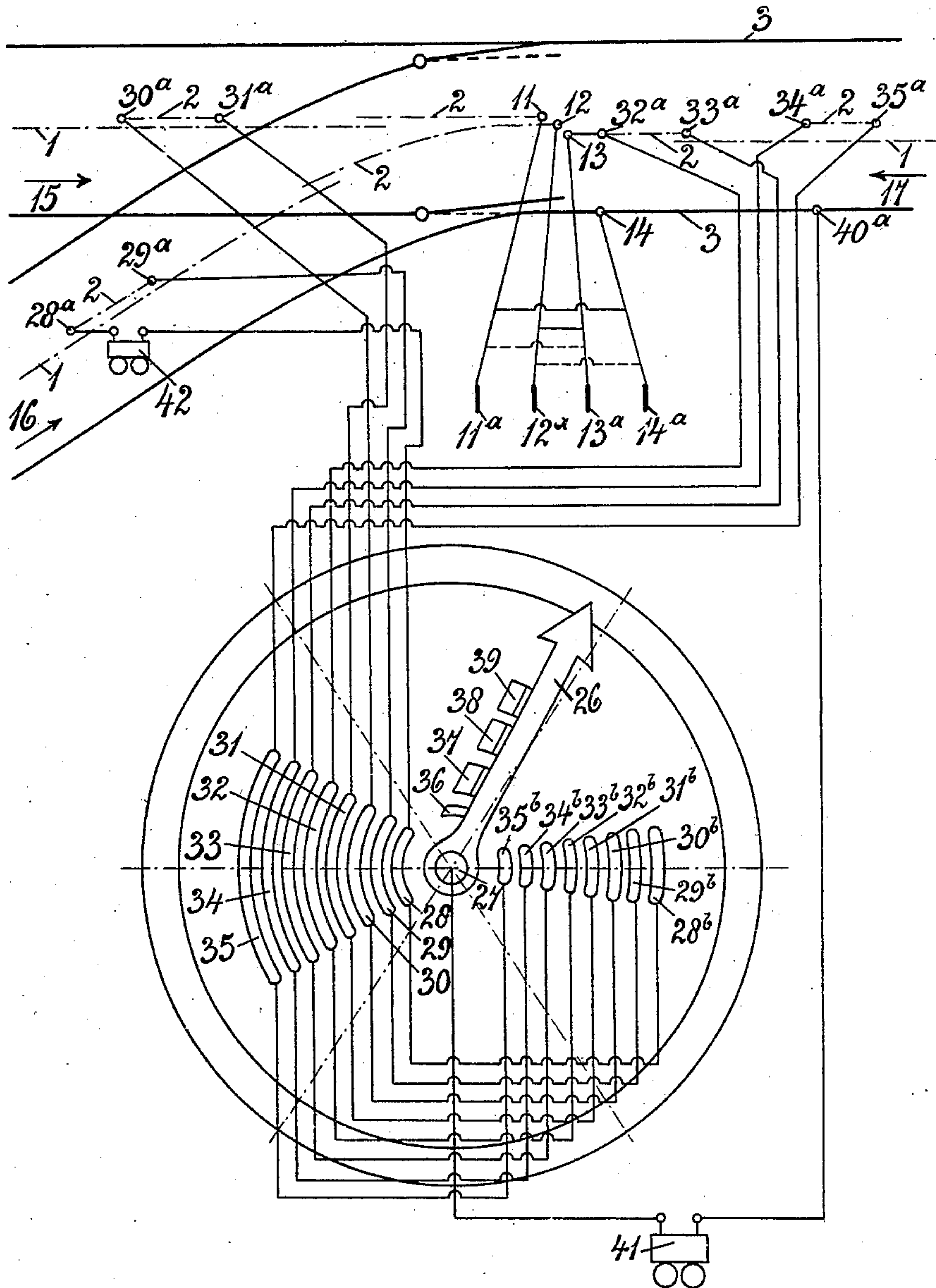
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P. J. PORTMAN.

CONTROLLING APPARATUS FOR RAILROAD SIGNALING.

APPLICATION FILED JUNE 8, 1906.



Witnesses

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# UNITED STATES PATENT OFFICE.

PETRUS JOHANNES PORTMAN, OF AMSTERDAM, NETHERLANDS.

## CONTROLLING APPARATUS FOR RAILROAD SIGNALING.

No. 863,755.

Specification of Letters Patent.

Patented Aug. 20, 1907.

Application filed June 8, 1906. Serial No. 320,833.

*To all whom it may concern.*

Be it known that I, PETRUS JOHANNES PORTMAN, a subject of the Queen of the Netherlands, residing at Amsterdam, Netherlands, have invented a certain new and useful Improved Controlling Apparatus for Railroad Signaling, of which the following is a specification.

The invention relates to improved controlling apparatus for railroad signaling and is designed as an improvement upon a controlling device of the character described in my patent application in the United States filed on July 6th 1905 under Serial No. 268511 and operated in connection with signaling systems of the character therein described, and the principle of which is the excitation of an electric current in a conductor by means of a magnetic inductor through the completion of the circuit when any irregularity occurs in the system and which rings a bell joined upon the circuit.

The controlling device described in the above mentioned specification while affording a control in so far that it indicates the condition of the conductor to the nearest station in front of a train, does not furnish any indication of irregularities in the conductor to the rear of a passing train, and the present invention is designed to obviate this defect by providing a control device of extended scope whereby the reliability of such signaling systems is increased.

The principle on which the invention is based is that the locomotive engineer or engine-driver, when he is running in a given direction, instead of a short ring every minute, presently hears every minute first a long ring and then a short one. This long ring signal is therefore a check indicating that the conductor is all right ahead of him, and the short ring a sign that all is in order to the rear of him. When traveling in the other direction, the engineer or driver hears the rings in reversed order.

In the accompanying drawing is illustrated a more or less diagrammatic representation of the improved control device with its circuit connections to a normal set of points.

The contact buttons in the switch lever frame are indicated at 11<sup>a</sup> 12<sup>a</sup> 13<sup>a</sup> 14<sup>a</sup> and they are respectively connected by terminals 11 and 12 with the auxiliary conductors 2 to the left of the points, by the terminal 13 to the auxiliary conductor 2 to the right of the points, and by the terminal 14 to the main track 3. The dial plate of the control device carries a set of long contact strips and a set of short contact strips arranged at diametrically opposite points on said dial, which strips are insulated from the plate and from each other. The strips are connected in pairs with the terminals of the main and auxiliary conductors of the installation.

The set of long strips on the left of the dial plate is numbered from the center outward 28 to 35 inclusive.

The long strips 28 and 29, are in connection with the terminals 28<sup>a</sup> and 29<sup>a</sup> of the auxiliary conductor 2 of the curved section of the track 3 in front of the points; the strips 30 and 31 are connected with the terminals 30<sup>a</sup> and 31<sup>a</sup> of the auxiliary conductor 2 of the straight section of track 3 to the left of the points; the strips 32 and 33 are connected with the terminals 32<sup>a</sup> and 33<sup>a</sup> of the auxiliary conductor of the straight section to the right of the points, and finally the strips 34 and 35 are connected with the terminals 34<sup>a</sup> and 35<sup>a</sup> of the auxiliary conductor to the right of the points.

The auxiliary conductors 2 of the curved and the straight sections of track 3 to the left of the points represent for instance conductors for barriers at a level crossing, the auxiliary conductors 2 of the straight section to the right of the points show conductors for a swing-bridge. In the conducting-wire 28<sup>a</sup>—28 is joined up in circuit an electric bell 42, which is provided suitably at the house of an attendant of a level crossing, while at the railroad station is provided a trembling bell 41, which is joined up in circuit between the center 27 of the controlling apparatus and the track 3 at 40<sup>a</sup>.

On the movable pointer 26 of the device slide contacts 36, 37, 38 and 39 are arranged of which 36, is conductively connected with the pointer, the other three, being insulated therefrom and from each other.

In turning the pointer 26 round over the long strips, the slide contact 36 thereon is placed in connection with the long strip 28 which consequently becomes connected with the track 3 at 40<sup>a</sup> through the pivotal connection at 27 formed therewith by the pointer 26; the latter also connects the strip 29 with 30 through the sliding contact 37; 31 with 32 through sliding contact 38, and 33 with 34, through sliding contact 39 while the latter strip is in connection with the strip 35 by way of the auxiliary conductor 34<sup>a</sup>—35<sup>a</sup>. By this means the circuit is completed and current therefore flows through all the auxiliary conductors and the main conductor appertaining to an installation in which a train may be situated. As soon as the pointer reaches the set of contacts belonging to a certain conductor, this conductor is placed in connection with the return conductor. If a train is in the section, the circuit of the magnetic inductor on the locomotive is completed for an instant and the bell on the locomotive rings.

The sets of short strips on the right side of the apparatus is numbered from the center outward, 35<sup>b</sup>, 34<sup>b</sup>, 33<sup>b</sup>, 32<sup>b</sup>, 31<sup>b</sup>, 30<sup>b</sup>, 29<sup>b</sup>, and 28<sup>b</sup>, and each is connected with the correspondingly numbered long strip, *i. e.*, 35<sup>b</sup> with 35, 34<sup>b</sup> with 34, and so on down to 28<sup>b</sup> with 28. The arrangement of the strips is also such that, on turning the pointer 26, the connection of the auxiliary conductors in series with the short strips is effected in the same way as with the long strips, but in reverse order. If a train enters a section of the railroad-track, for instance in the direction of 17, the current-circuit of the



magneto-machine on the locomotive is completed as soon as the bow-trolley on the engine comes in contact with the auxiliary conductor 2 and its terminals 32<sup>a</sup> and 33<sup>a</sup> and a current is induced therein which sets the bell on the locomotive ringing. For on turning the pointer 26, which passes the set of long strips the current-circuit 32<sup>a</sup>, 32, 31, 31<sup>a</sup>, 30<sup>a</sup>, 30, 29, 29<sup>a</sup>, 28<sup>a</sup>, 42, 28, 36, 27, 41, 40<sup>a</sup> is completed for a moment. The current flows through all the auxiliary conductors in series belonging to the section of a railroad-track and under circumstances also through the main conductor. The engine-driver hears a long ring. On turning the pointer 26 over the short strips the slide contact 36 connects the strip 35<sup>b</sup>, the contact 37 connects the strips 34<sup>b</sup> and 33<sup>b</sup>, the contact 38 connects the strips 32<sup>b</sup> and 31<sup>b</sup>, and the contact 39 connects the strips 30<sup>b</sup> and 29<sup>b</sup>. When the pointer in turning has moved past this set of short strips the current-circuit 33<sup>a</sup>, 33, 33<sup>b</sup>, 34<sup>b</sup>, 34, 34<sup>a</sup>, 35<sup>a</sup>, 35, 35<sup>b</sup>, 36, 26, 41, 40<sup>a</sup> is completed for a moment, whereupon the engine driver hears a short ring. Since the contact strips are arranged diametrically opposite each other and the pointer 26 makes one complete revolution every minute, the control device causes a long and a short ring every minute. This signal is therefore a check indicating that the signaling conductor in the installation attached to the apparatus is in good order.

It will be seen that the current completed over the long strips, flows through the end of the auxiliary conductor 2 to the terminal 32<sup>a</sup> ahead the train, but that the current, completed over the short strips, flows through the part of the conductor 2 to the terminal 33<sup>a</sup> at the rear of the train. It follows that the long ring is an indication that the conductor is all right ahead of the train, the short ring, that it is in order to the rear of it.

When the engine driver is running in a given direction he hears, at intervals of a minute, first a long ring and then a short one. The long ring is an indication that the conductor is all right ahead of him, the short ring a sign that it is in order to the rear of him, as when traveling in this direction the control device closes the contacts in the same direction as the train passes all the auxiliary conductors in succession. If the pointer comes over the short strips the circuit is completed and the current flows through all the auxiliary conductors in a direction opposite to that in which the train is moving. Should the engine driver fail to hear the short rings, it is an indication that the signaling conductors in the rear are not in order; though, it is true, he excites an electric current by means of the magneto inductor on his engine, this current does not flow through the auxiliary conductors which it has passed to the control device, the connection being broken. The current that passes away over the long contact strips, however, traverses the still intact supplementary conductors ahead, and indicates to the driver that the signaling conductor ahead is not out of order.

When traveling in the other direction the rings are reversed in order, and the driver hears first a short ring and then a long one. In this case the absence of the short ring indicates injury to the conductor ahead.

The trembling bell 42 is provided in the supplement-

tary conductor for the level crossing, in order to warn the attendant, the bell 41 is provided in order to guard the section of work out of the railway station.

In single line railways this rearward signal is of great advantage, since it affords a very accurate control of the section of track entered by the train, and although the driver cannot tell the nature of the damage to the conductor, when the signal is lacking he knows that he must at once drive carefully, and he may by other means at his disposal, ascertain what is the matter with the track or the conductor. The same applies also to the other officials whose duty it is to look after a control apparatus.

Instead of the described set of long and short strips, several similar sets may if desired be arranged diametrically opposite one another, for instance in the positions indicated in the figure by intermediate broken lines, and may be connected up with other portions of the installation.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In a controlling apparatus for railroad signaling systems and in combination with the main and auxiliary conductors thereof, a dial plate, a pointer in connection therewith and with the track, a number of long contact strips on said dial plate, connection in series between said strips and the main and auxiliary conductor, and means carried by the pointer which on the rotation of the latter connect the long strips in series and with the track to complete the circuit and give a prearranged signal both on the engine and at the station or other desired point to provide a check on the proper working of any desired section of the system.

2. In a controlling apparatus for railroad signaling systems and in combination with the main and auxiliary conductors thereof a dial plate, a pointer in connection therewith and with the track, a number of long contact strips on said dial plate, a number of short contact strips on said dial plate opposite to said long strips, connections in series between said long contact strips and the main and auxiliary conductors, connections in series between said long and short contact strips, and means carried by the pointer and adapted on the rotation thereof to connect said long and short strips, and alternately to connect both the long and short strips in series with the track to complete the circuit and give a series of long or short signals both on the engine and at the station or other desired point to provide an indication as to the working of the conductors both ahead and in rear of a passing train.

3. In a controlling apparatus for railroad signaling systems and in combination with the main and auxiliary conductors thereof a dial plate, a pointer in connection therewith and with the track, a number of long contact strips on said dial plate, a number of short contact strips on said dial plate opposite to said long strips, connections in series between said long contact strips and the main and auxiliary conductors, connections in series between said long and short contact strips, and sliding contacts carried side by side on said pointer and in part insulated therefrom and adapted on the rotation thereof to connect said long and short strips, and alternately to connect both the long and short strips in series with the track to complete the circuit and give a series of long or short signals both on the engine and at the station or other desired point to provide an indication as to the working of the conductors both ahead and in rear of a passing train.

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

PETRUS JOHANNES PORTMAN.

Witnesses:

THOMAS HERMANN TERHAVE,  
AUGUST SIEGFRIED DOCEN.