

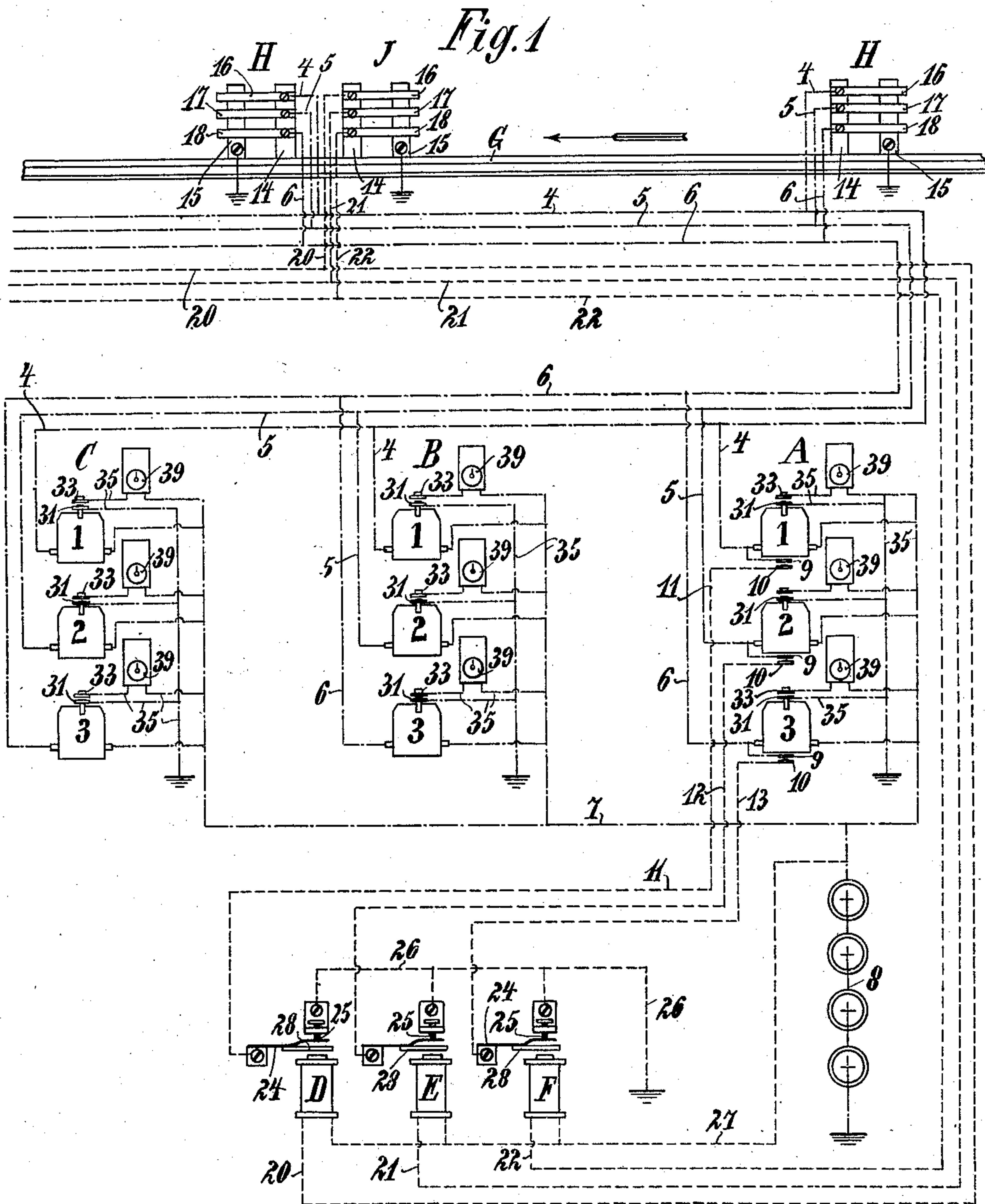
No. 865,730.

PATENTED SEPT. 10, 1907.

M. TRAUTMANN.
CONTROLLING SYSTEM FOR RAILWAYS.

APPLICATION FILED MAR. 21, 1907.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2

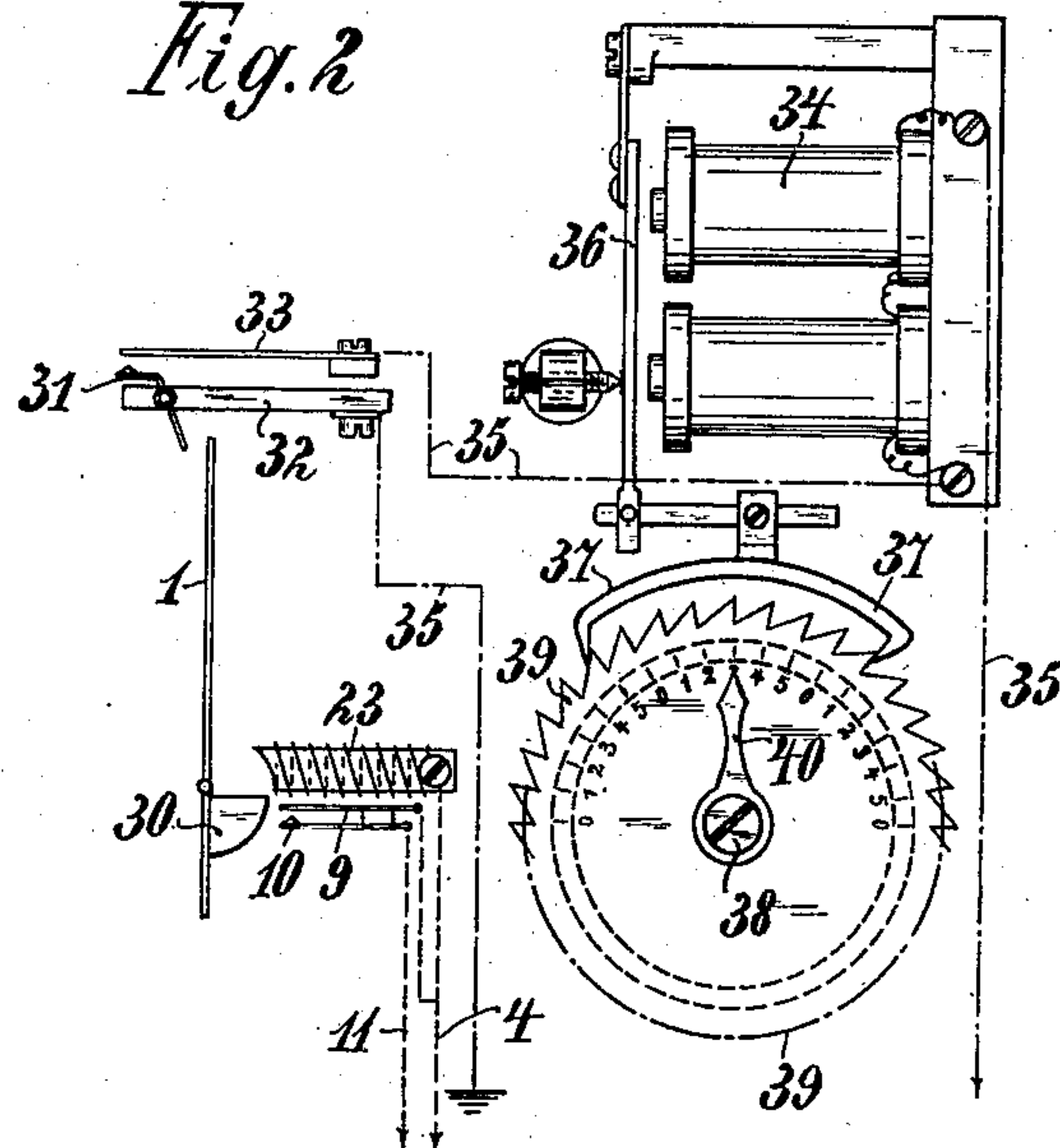


Fig. 3

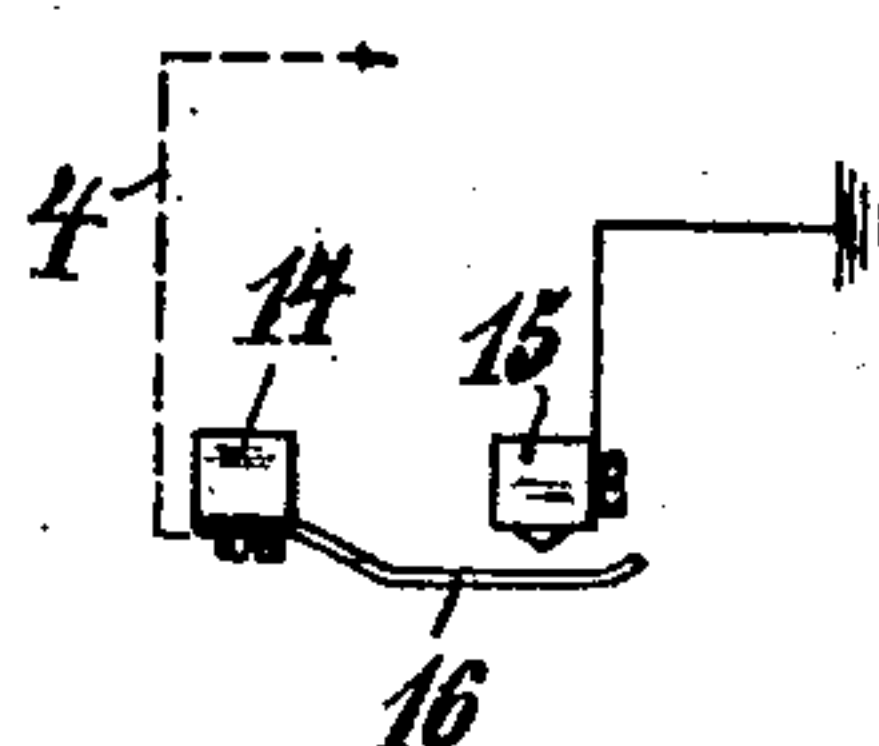
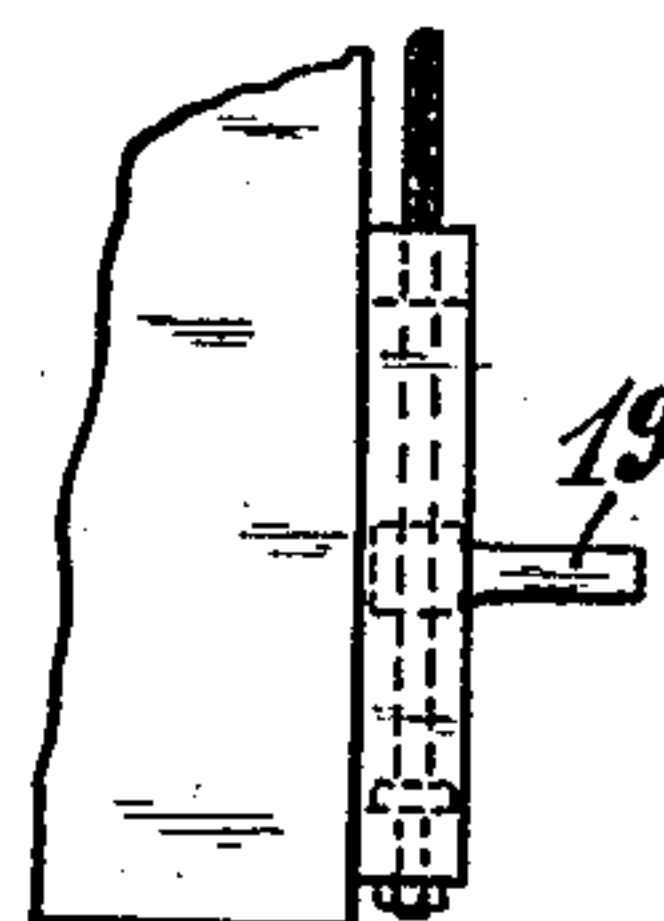


Fig. 4



Witnesses:

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UNITED STATES PATENT OFFICE.

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CONTROLLING SYSTEM FOR RAILWAYS.

No. 865,730.

Specification of Letters Patent.

Patented Sept. 10, 1907.

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To all whom it may concern:

Be it known that I, MAX TRAUTMANN, a subject of the King of Saxony, and residing at Dresden, Saxony, Germany, have invented certain new and useful Improvements in Controlling Systems for Railways, of which the following is a description.

The present invention relates to a railway controlling-system, in which a series of conductors divided into two groups and corresponding to the number of passing trains, is arranged, which conductors lead from the line to indicators and, at the place to be controlled, are put in circuit by suitable line-contacts operated by the passing trains.

The novel feature of the invention consists in that the series of conductors are arranged in two groups in such a manner that the one group receives current when the train departs from a station, the said current freeing the indicator-drops by means of electromagnets so that they drop down against the action of a spring or their own weight, while the said indicator-drops close special circuits, provided at the places to be controlled so that readjusting-magnets are permanently excited and keep the indicator-drops in their dropped-down position. The other group receives current at the next station when the train arrives there, and this current interrupts the circuit closed by the indicator-drops by means of electromagnetic switches, so that said indicator drops return to their initial position again.

In the accompanying drawings, Figure 1 is a diagram, showing the electric railway controlling-system in connection with the railway-line and Figs. 2—4 are details of the controlling-system.

A, B and C indicate switch-systems of the kind as used in telephony, which are arranged at those places at which the trains are to be controlled, as, for instance, at stations, at switch-men's houses or similar places.

4, 5, 6 are conductors, to which the said switch-systems are electrically connected. The said conductors are arranged in both directions along the tracks of the railway-lines to be controlled. 1, 2, 3 are drop-devices, which are connected with the conductors 4, 5, 6 of the switch-systems, and the number of conductors and drops correspond to the number of trains passing over said line. The example shown in the drawings comprises three trains.

Each of the drops 1, 2, 3 of the switch-systems A, B, C is, on the one hand, connected with one of the conductors 4, 5 and 6 of the track G and, on the other hand, with the common line 7, which latter is in conductive connection with a current generator 8 provided at a suitable place. In case the three drop-systems are arranged far from each other, then every drop system may have its own current generator.

9 and 10 are two contact-springs, which two springs are provided under every single drop of the switch-system, and insulated from each other. The springs 9 are in contact with the conductors 4, 5 and 6, while the springs 10 are; by means of lines 11, 12, 13 each connected with relays 24, which in turn are connected with relays 25 and thus earthed by the common line wire 26. At the controlling-places of the line in question, for instance, at stations, contact-devices H and J are provided near the track G, of which contact-devices the one, J, is installed at the side of arrival, and the other, H, at the side of departure. The said contact-devices consist of two posts 14 and 15 parallel to each other. The posts 15 are electrically connected with the ground, while the posts 14 are insulated. At the said posts 14 contact-springs 16, 17, 18 are mounted one below the other and insulated. These springs extend with their free ends over the posts 15, but in their initial position do not touch the same. The springs 16, 17, 18 of the contact-device are connected to the conductors 4, 5, 6. Likewise the springs 16, 17, 18 of the post J are in connection with cable lines 20, 21, 22, which are also provided along the track G and led to the electromagnets D, E, F of the said relays 24, 25. These electromagnets, by means of a common line 27, lead with their other pole to the same pole of the current generator as the drops-system 1, 2, 3 by means of the line 7.

The mode of operation of the controlling-system is as follows:—Prior to the departure of every train a contact-lever 19 (Fig. 4), arranged sidewise at the engine, is adjusted in such a manner that, if the train leaves the first station, one group of the contact-springs of the contact-devices H and J, for instance, the springs 16 are touched by the said contact lever 19 and pressed with their free ends against the post 15. Circuit is then closed and the current flows from the current-generator 8, over earth, post 15, spring 16, conductor 4 along the track G to the electromagnet-coils 23 of the drops 1 and back to the current generator 8 over the common line 7. The electromagnets attract their armatures 30 (Fig. 2) and release the drops, to fall into a horizontal position, while normally *i. e.* if the armatures 30 are switched off, the drops are kept in a vertical position owing to the weight of the said armature. The dropped-down drop 1 of the system A connects in its horizontal position the contact-springs 9 and 10 and so closes a second circuit, which, flowing from the one pole of the current generator 8 over the common line 7, coils 23 of all drops 1, springs 9 and 10, line 11, relay-spring 25 of the magnet D and line 26, returns to the other pole of the current-generator. By this circuit the magnets 23 are permanently excited and keep the drops in their horizontal position. Now, when the train arrives at the next station the contact lever 19 will press the spring 16 against

the post 15 thus closing a new circuit. The current flows now from the current-generator 8, over earth, post 15, spring 16, line 20 to the electromagnet D and returns over line 27 to the current generator 8. Conse-

5 quently the electromagnet D will be excited and its armature 28 attracted, so that the contact at the relay 25 will be interrupted and the electromagnet without current, so that now the drops return to their vertical position owing to the weight of the armature 30. If the
10 train starts, it influences again the contact-device H so that the operation just described is repeated, and if the train arrives at the next station those operations will be repeated, which took place at the arrival of the train as above described.

15 Now, in order that the officials at the several controlling places may be informed, in which block-line the train is at the time in question, every drop is provided with an indicator. For this purpose over each drop of A, B and C there are arranged two contact-springs 32
20 and 33, which are connected with the said drop by a movable contact-piece 31. The first contact-spring 32 is earthed, while the other contact-spring 33 leads to a line 35, connected with the current-generator 8. 34 is an electromagnet, which is arranged in the said line 35.
25 The movable armature 36 of the said electromagnet 34 carries a pawl 37, which engages a step-wheel 39, rotatably mounted upon a stationary spindle 38, the said pawl 37 being designated to move stepwise the said step-wheel 39 opposite to an indicator 40, rigidly fastened
30 upon the said spindle 38. That side of the step-wheel 39 which is in front of the indicator 40 is provided with a scale, consisting of division lines and figures, which are arranged in the present case so as to correspond to the daily to and from traffic of six trains on the said line.

35 As soon as a drop falls down, the step-wheel 39 is advanced for a division line corresponding to one station in that the said drop establishes connection between the movable contact-piece 31 and the spring 32, whereby the circuit, containing the electromagnet 34,
40 is closed, the armature 36 consequently attracted by the said electromagnet and thus the step-wheel 39 advanced, so that the figure just under the indicator 40 shows where the train in question is at the said time. When the said drop slides off from the contact-piece 31 it re-
45 turns to its initial position owing to its own weight, so that the circuit in question is opened again.

It is thus evident that the electric-indicating-device shows, in which block-line the train is at the time in question, while the drops merely indicate whether the
50 train is stopping at a station or is traveling. Other trains traveling on the same line will in the manner, as heretofore described, influence the springs 17 and 18 and the drop-devices 2 and 3, connected with the said spring by means of the lines 5 and 6 and consequently
55 a special contact-spring, line, drop, relay etc. must be provided for each train.

I claim as my invention:—

60 1. In electric controlling systems for railways the combination of two groups of conductors, the one for starting and the other for arriving trains, a series of line-contacts

for electrically connecting the lines of one group with those of the other group, a series of switch-systems, means for closing a circuit to drop down drops and means for interrupting the circuit to return the said drops to their initial position, substantially as described. 65

2. In electric controlling systems for railways the combination of two groups of conductors, means for feeding current to one group when a train starts, a switch-system, means for dropping-down the drops of the switch-system, means for holding the drops in their dropped-down position, means for feeding current to the other group of con-
70 ductors when the train arrives at the next station, means for interrupting the current fed to the first group of conductors and means for returning the drops to their initial position again. 75

3. In electric controlling systems for railways the combination of two groups of conductors, means for feeding current to one group when a train starts, a switch system, drops connected to the said switch-system, an electro-
80 magnet receiving current from the said first group of conductors and dropping down the drops of the said switch system, circuits provided at the controlling places, such circuits being closed by the dropped-down drops, re-adjusting magnets, permanently excited by the said circuits and holding the drops in their dropped-down position, means for feeding current to the second group of con-
85 ductors, when the train arrives at the next station, an electromagnetic switching-device, interrupting the said circuit, closed by the dropped-down-drops and returning the latter to their initial position. 90

4. In electric controlling-systems for railways, having a series of conductors, corresponding to the number of the passing trains and arranged in two groups, line contacts operated by the passing trains and electrically connecting the said conductors, indicating devices, connected with the
95 said conductors, means for operating the said indicating devices when the train passes one of the line contacts, substantially as described.

5. In electric controlling systems, for railways the combination of a switch-system, of indicating drops, connected
100 with the said switch system, a conductor, means for connecting the said conductor with the said indicating drops, a counter, an electromagnet, influencing the said counter and arranged in the said conductor, means for dropping-
105 down the indicating drops, means for advancing the counter for one step at each dropping-down of a drop and means for returning the drops into their initial position, substantially as described.

6. In electric controlling systems for railways the combination of two groups of conductors, means for feeding
110 current to the one group when a train departs, a switch-system, drops in connection with the said switch-system, means for dropping down the said drops and means for holding them in their dropped-down position, means for feeding current to the other group of conductors, when
115 the train arrives at the next station, means for breaking the current fed to the first group of conductors and means for returning the drops to their initial position, a line-wire, connected with the said switch system, an electro-
120 magnet, arranged in the said line wire, a counting device, influenced by the said electromagnet, means in connection with the two groups of conductors and the said line wire for exciting the said electromagnet and closing a circuit between the dropped-down drops and the counting device, a dial at the said counting device, an indicator in connection
125 with the counting device, and means for advancing the counting device stepwise, when the circuit is closed by the traveling train, substantially as described.

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

MAX TRAUTMANN.

Witnesses:

MORITZ SPREER,
RUDOLPH FRICKE.