

No. 893,402.

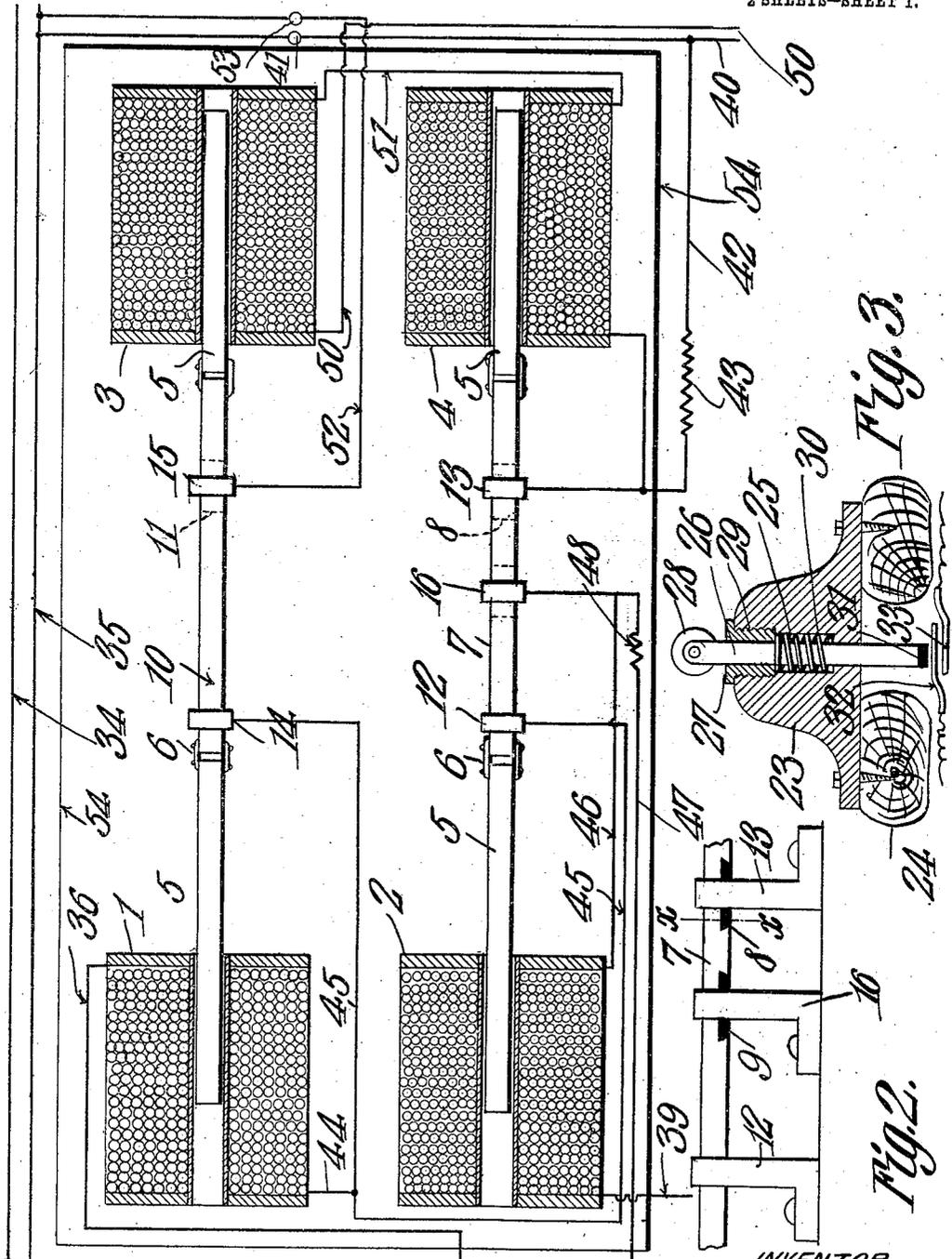
PATENTED JULY 14, 1908.

E. VAN BRIGGLE.

AUTOMATIC ELECTRIC SIGNAL SYSTEM.

APPLICATION FILED DEC. 10, 1907.

2 SHEETS—SHEET 1.



Witnesses
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Fig. 1.

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Fig. 2.

Fig. 3.

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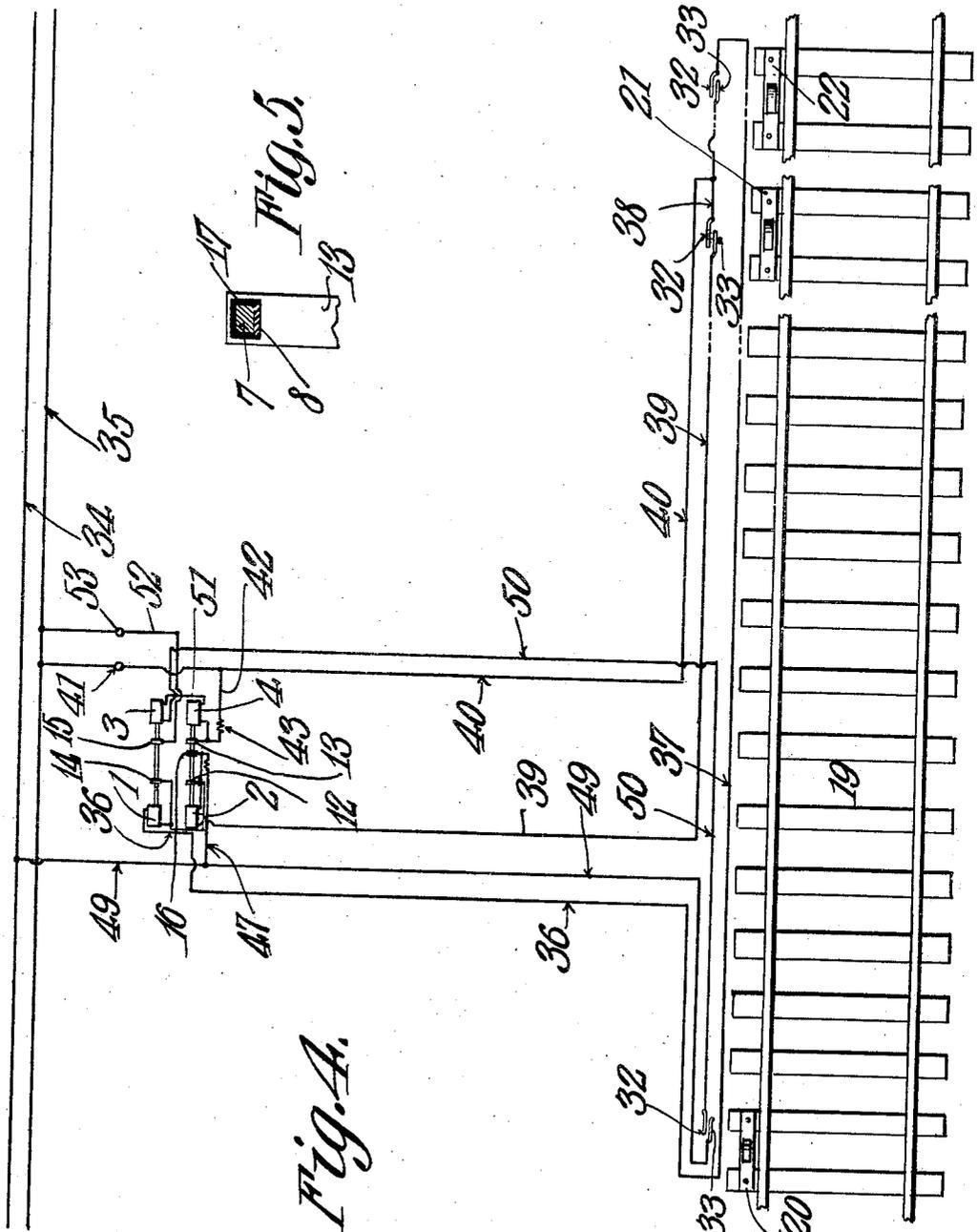


Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

EARLE VAN BRIGGLE, OF KOKOMO, INDIANA, ASSIGNOR OF ONE-HALF TO CHARLES M. BROOKER, OF KOKOMO, INDIANA.

AUTOMATIC ELECTRIC SIGNAL SYSTEM.

No. 893,402.

Specification of Letters Patent.

Patented July 14, 1908.

Application filed December 10, 1907. Serial No. 405,918.

To all whom it may concern:

Be it known that I, EARLE VAN BRIGGLE, a citizen of the United States, residing at Kokomo, in the county of Howard and State of Indiana, have invented a new and useful Automatic Electric Signal System, of which the following is a specification.

This invention has reference to automatic electric signal systems, and is designed to prevent trains running in opposite directions upon a single main line from coming together into close enough proximity to collide, by the display of signals at different points along the road, said signals being automatically energized by different trains as they pass different points.

The invention is designed more particularly for the display of signals on single line roads at switches so that when a train or car approaches a switch there is automatically set at the next succeeding switch a signal which will indicate to the approaching train or car the fact that there is a train upon the block between the switch approached and the next succeeding switch so that the engineman or motorman is notified and will side track his train or wait for the coming of the train within the block which itself may be sidetracked when reaching the switch. This applies particularly to single track roads where the trains are designed to enter turnouts at stated points in order that the trains may pass each other in their progress along the track.

In accordance with the present invention signals are displayed at the turnout in advance of the turnout at which the train is at the time and the signal at a turnout already passed is put into the safety condition as soon as the car or train has reached the next succeeding turnout.

The present invention comprises an electromagnetically-operated contact making and breaking device which when the circuit is closed at an appropriately distant point, will cause the closure of a signal-operating circuit at the station under consideration, and this will remain closed although the initial operating circuit be broken until another circuit is closed at another appropriate point by the passing train, which last-named circuit causes the actuation of electrically-magnetic devices setting the circuit-controlling

devices to their initial or inoperative position, thus cutting the signal out.

Should it be desired to run two trains in the same direction between switches or turnouts, then the first train displays the prescribed signal and the second train will display another signal differentiated from the first signal, at the switch head and the switch just being left to notify the engineman of the train going in the opposite direction that there are two trains in the block.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification, and in which drawings,—

Figure 1 is a partial diagrammatic view, with parts in section, of the signal-operating means at a switch or block station with the more distant circuits omitted. Fig. 2 is a detail view of a portion of the circuit-closing means. Fig. 3 is a sectional view of one of the circuit closing structures. Fig. 4 is a diagrammatic view illustrating the application of the system to a single track railroad. Fig. 5 is a section on the line $x-x$ of Fig. 2.

Referring to Figs. 1 and 2, there are shown four solenoids 1, 2, 3 and 4, each having an armature 5. The solenoids 1 and 3 are spaced apart and arranged in alinement, and the solenoids 2 and 4 are spaced apart and also arranged in alinement. The armatures 5 of the solenoids 2 and 4 are connected by links 6 to the respective ends of a bar 7 in which is inserted two insulating blocks 8 and 9, which may be dovetailed into one edge of the bar, as indicated. The solenoids 1 and 3 have their armatures 5 connected by links 6 to another bar 10 similar to the bar 7, and in this bar is an insulating block 11, like the blocks 8 and 9 in the bar 7. The bar 7 is supported upon posts 12, 13, and 16, through which the bar passes, and the bar 10 is supported upon other posts 14, 15. The post 13 has an insulating lining 17 which, together with the block 8, insulates the bar 7 from the post except when the bar 7 is moved longitudinally to carry the block 8 away from the post 13, and the bar 7 is likewise insulated from the post 16. Also, the bar 10 is in the same manner insulated from the post 15.

In Fig. 4 is shown a line of track 19 which may be taken as indicative of a single track

railway with suitable turnouts at suitable intervals although these turnouts are not shown in the drawings. In the line of the track are set mechanical circuit closers 20, 21 and 22, all identical in structure and shown in detail in Fig. 3 where it will be seen that each consists of a block 23 which may be made fast to the ties 24, and this block has a central recess or chamber 25 through which extends the longitudinally-movable pin 26 guided by a suitable screw bushing 27. This pin has on its upper end above the bushing a roll 28 and below the bushing is formed with a collar 29, between which latter and the bottom of the recess the pin is surrounded by a helical spring 30 tending at all times to maintain the pin in an elevated position with the collar 29 in engagement with the under side of the bushing. The pin extends beyond the block 23 and has its lower end suitably insulated, as shown at 31, and in the path of its lower end are contact terminals 32 and 33.

The showing of the contact device is in a measure conventional since this contact device may be otherwise constructed, the purpose being that a passing train shall cause the momentary closure of a circuit at the terminals 32 and 33.

Considering Fig. 4 in connection with Fig. 1, there is disposed along the line of way two main conductors 34 and 35. One side of the solenoid 1 is connected by a conductor 36 to another conductor 37 extending along the line of way and ultimately connected at one end adjacent to the mechanical circuit closer 22 to the terminal 32 of the said mechanical circuit closer. The other terminal 33 of this circuit closer is connected by a conductor 38 to the terminal 32 of the mechanical circuit closer 21, and the terminal 33 of this circuit closer is connected by a conductor 39 to one side of the solenoid 2. The conductor 38 is connected by another conductor 40 to the main conductor 35 and includes a signal lamp 41 which may have a distinctive color. Branched off from the conductor 40 is another conductor 42 including a resistance 43 and coupled both to the post 13 and to one side of the solenoid 4. Coming back to the solenoid 1, it will be seen that the side remote from that connected to the conductor 36 is connected by a conductor 44 to another conductor 45 having one end terminating at the contact terminal 14.

That side of the solenoid 2 remote from the side connected to the conductor 39 is connected by a conductor 46 to the post 16, which latter is also connected by a conductor 47 through a resistance 48 to a conductor 49 leading to the main line conductor 34 and also extending to a circuit terminal 33 of the mechanical circuit closer 20, the other terminal 32 of which is connected by a conductor 50 to one side of the solenoid 3, the other side of which is connected by a conductor 51

to the solenoid 4. The supporting post 15 is normally out of contact with the bar 10 and is connected by a conductor 52 to the main line conductor 35 and includes a signal lamp 53 differing characteristically from the lamp 41.

The solenoids and the parts connected therewith are mounted upon a suitable base-board 54 and suitable casings will be provided to protect the apparatus against stress of weather and against malicious tampering. Such casings, however, have been omitted from the drawing for the sake of clearness.

In the position of the parts shown in Figs. 1 and 4, the circuits are all open. Now let it be assumed that a train approaches from the right hand side of Fig. 4 and closes the circuit at the mechanical circuit closer 22. Under these conditions nothing will happen since the circuit so closed is otherwise broken. Ultimately the train comes upon the circuit closer 21. The circuit there closed between the contacts 32 and 33 may be traced from the main conductor 35 through the conductor 40, thence by the conductor 39 to the solenoid 2, thence by the conductor 47 to the resistance 48 to the conductor 49 and thence to the main line conductor 34. This energizes the solenoid 2 and its armature 5 is drawn in bringing the bar 7 into electrical contact with the posts 12, 13 and 16. Now, there is established a circuit through the conductor 40 and lamp 41, conductor 42, resistance 43, post 13, bar 7, post 16, conductor 47, conductor 49 to the other main conductor 34, so the lamp 41 will glow uninterruptedly until this circuit is broken. Now assume that the train proceeds until the mechanical circuit closer 20 is reached, which may be located close to the point where the light 41 is displayed. Now, there is established a circuit from the conductor 34 through the conductors 49 and 50 to the solenoid 3, thence to the solenoid 4 and by the conductor 42 to the conductor 40, back to the other conductor 35. Under these circumstances the solenoids 3 and 4 are energized and their armatures, if already out, will be drawn into them. Under the original assumption the solenoid 2 only had been energized and consequently on the energization of the solenoids 3 and 4 the bar 7 only will be drawn to the right, as shown in Fig. 1, and the circuits thereby opened at the posts 13 and 16. This breaks the circuit through the lamp 41 and the latter is put out. Now assume that the first train is followed by another upon the same block purposely. Then while the lamp 41 is still glowing the mechanical circuit closer 22 is closed, when the circuit will pass from the main conductor 35 through the conductor 40, contacts 33 and 32 of the circuit closer 22, conductor 37, thence to the solenoid 1, then by the conductors 44 and 45 to the post 12, bar 7, contact post 16, conductors 47 and 49 to the other main conductor 34. This will

draw the bar 10 toward the solenoid 1 and close the circuit between said bar 10 and the circuit terminal 14. Now the circuit is closed by the conductor 45 to the circuit terminal 14, thence by bar 10 to the post 15, conductor 52 to the main conductor 35 through the lamp 53, thus indicating by the characteristically different light displayed by the lamp 53 that there is another train upon the track following the first train. So after the first train had passed it is the duty of the engineman or motorman holding a train on the siding to await the passage of the second train before pulling out.

Since the solenoids 3 and 4 are energized together, the circuits are all again broken when the circuit closer 20 is actuated by the passing train. For controlling the passage of the train moving in the opposite direction to the one considered, it is only necessary to duplicate the circuit closers 20, 21 and 22 on the other side of the track, so that projecting parts of the train arranged for the purpose will cause the actuation of the circuit closers without affecting the circuit closers on the first considered side of the track.

1. In a signal system for railways, electro-magnetic circuit closing devices, two circuit closers distant from the said electro-magnetic circuit-closing devices and arranged along the line of way, one in advance of the other and in the path of an approaching car or train, and means whereby the circuit closer which is the nearer to the approaching car or train is rendered inactive unless the second circuit closer has first been actuated.

2. In a signal system for railways, two circuit closers arranged along the line of way, distant electro-magnetic circuit-closing devices, means whereby the first circuit closer remains inactive until after the second circuit closer has been actuated, and another circuit closer in proximity to the point where the signals are displayed for causing the opening of all circuits.

3. In a railway signal system, a circuit closer in the path of a train, a circuit controlled thereby, an electro-magnetically operated circuit-closing means included in said circuit, another circuit, a circuit closer on

the same side of the electro-magnetically circuit-closing means as is the first circuit closer but more remote therefrom and included in the last-named circuit in the path of a train, an electro-magnetically operated circuit-closing means in the last named circuit, the said last-named circuit including the electro-magnetically operated means of the first-named circuit, and signal means operated by the closure of the circuits.

4. In a railway signal system, a circuit closer in the path of a train, a circuit controlled thereby, an electro-magnetically operated circuit closing means included in said circuit, another circuit, a circuit closer included in the last-named circuit in the path of a train, an electro-magnetically operated circuit closing means in the last-named circuit, the said last-named circuit including the electro-magnetically operated means of the first-named circuit, signal means operated by the closure of the circuits, and train controlled means for restoring the circuit to normal conditions.

5. In a railway signal system, two solenoids arranged in line one with the other, other two solenoids arranged in line one with the other, an armature for each pair of solenoids and common thereto, a circuit including one of the solenoids, a train-controlled circuit closer in said circuit, another circuit-closer in said circuit controlled by the armature of the second solenoid, another circuit including one of the second pair of solenoids, a train-controlled circuit-closer in the second circuit, signal means under the control of the said circuit, and a third circuit and train-controlled circuit closer therein, said third circuit including the other solenoid of each pair and operating to cause restoration of all the electrically actuated parts to normal or open circuit conditions.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EARLE VAN BRIGGLE.

Witnesses:

E. L. PARKER,
U. G. WALDON.