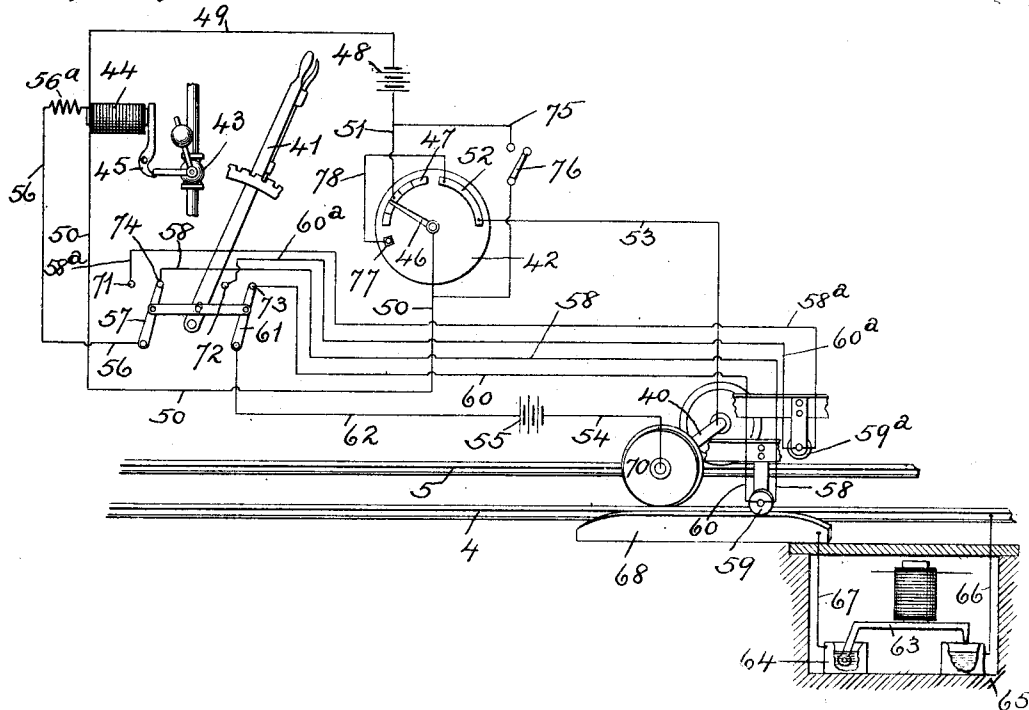


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ELECTRIC SIGNAL FOR RAILWAYS.
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Witnesses

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UNITED STATES PATENT OFFICE.

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ELECTRIC SIGNAL FOR RAILWAYS.

1,063,691.

Specification of Letters Patent.

Patented June 3, 1913.

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To all whom it may concern:

Be it known that we, HELENA J. JONES and FRANK T. JONES, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Electric Signals for Railways, of which the following is a specification.

This invention relates to improved electric controlling devices for railways.

One object of the invention is to provide an improved construction, arrangement and combination of devices whereby to cause an operation of the air-brake mechanism if it is attempted to take a train into a block already occupied by a train at a rate of speed greater than a predetermined speed.

Another object is to provide an improved construction of electrically operated mechanism for permitting a train traveling below a predetermined rate of speed to enter a block already occupied by a train without operating the air brakes.

A further object is to provide a construction of switching levers which may be operated by the reversing lever on the vehicle to change the circuits when the direction of travel of the vehicle is reversed.

Another object is to provide an improved construction whereby when a plurality of motors or locomotives are employed to move a train the automatic air-brake operating mechanism on all but one motor or locomotive may be maintained in the normal inoperative condition.

The drawing shows a diagrammatic view of the mechanism for operating the air-brakes and the speed indicator for controlling the same.

It is to be understood that the invention is applicable to either a double or single track road—the only difference being that in a single track road the mechanism will be duplicated. In the drawing the mechanism is provided and arranged for a single track road.

In the drawing the track rails designated, 4, and, 5, of one block are shown.

The present invention includes an improved arrangement of mechanism and devices for automatically operating the air brakes on a train that approaches or enters a block already occupied by a train, at a rate of speed greater than a predetermined

speed and by reference to the drawing this mechanism, which is carried on the motor or locomotive will now be described.

The numeral, 40, indicates the axle of the vehicle; 41, the reversing lever; 42, the speed switch; 43, the air-valve for controlling the air-brakes; 44, an electro-magnet for attracting and holding trip lever, 45, which maintains the valve in the normal inoperative condition.

It will be noted that the speed switch has an arm, 46, which is pivotally mounted so as to swing through an arc of a circle and over a low-speed contact plate, 47. The construction of this switch and its connection with the axle of the vehicle to vary with the speed is immaterial and may be of any well known form that will cause the arm, 46, to swing as the speed of the vehicle is increased or decreased; such for example as shown in the U. S. patent to Benton, No 876,256 of January 7th, 1908. When running at a low rate of speed, for example under six miles an hour, the arm, 46, will have contact with low-speed contact plate 47, and at such times a circuit will be maintained from battery, 48, by wire, 49, through electro-magnet, 44, wire, 50, to switch arm, 46, contact plate, 47, and wire, 51, to switch arm, 46, contact plate, 47, and wire, 51, back to battery. By means of this circuit the magnet, 44, will be kept energized and the lever, 45, will hold the air-valve, 43, in the normal inoperative position even though the ramp rail, 68, and rail, 41, are connected. As hereinbefore stated while the train is traveling at a speed below the predetermined rate which has been referred to, for example at six miles an hour, the electro-magnet, 44, will remain energized, but when the speed exceeds the so-called low speed, the switch arm will move over onto a high-speed contact plate, 52, and the low-speed circuit just referred to and which includes battery, 48, will be broken and a new high-speed circuit through the electro-magnet, 44, will be formed, as will now be described.

It will be noted that the speed switch is provided with a high-speed contact plate, 52, with which the arm, 46, will contact while the train is traveling at a speed over six miles an hour and that said latter plate is in electrical connection with the axle, 40, by wire, 53, while a wire, 54, electrically

connects said axle with a battery, 55. While the switch arm, 46, is in contact with a plate, 52, a high-speed circuit will be established through magnet, 44, by wire, 50; wire, 56; switching lever, 57; wire, 58; roller, 59; wire, 60; switching lever, 61, and wire, 62, to battery, 55, then from battery by wire, 54, axle, 40, and wire, 53, back to contact plate, 52. Thus it will be seen that the switch arm, 46, acts as a switch to complete the high-speed circuit from battery, 55, through magnet, 44, upon the breaking of the low-speed circuit from battery, 48. A resistance, 56^a, is provided in this circuit for purposes presently to be explained. When in this condition, that is, with the arm, 46, on high-speed plate, 52, any attempt to pass a danger-set signal into a block will result in the application of the air-brakes, by means of mechanism and connections now to be described.

A circuit which includes the rails, 4, and 5, also includes an electro-magnet near one end of the block. The mechanism coacting with or operated by these magnets is alike and a brief description of one is deemed to be sufficient. The particular location of the magnet with respect to the rails is immaterial but a pivoted contact bar or lever, 63, is mounted so that its free end may project beneath the core of the magnet and be held in an elevated position as long as the magnet is energized. In order to produce a good contact we provide a suitable receptacle, 64, containing mercury or other substance in which one end of the contact bar is pivoted while another receptacle, 65, containing a similar substance is provided below the free end of said bar. An electrical connection, such as a wire, 66, is provided between the rail, 4, and the conductor substance in the receptacle, 65, while a similar connection, 67, is provided between the receptacle, 64, and a short ramp rail section, 68, at the side of the track rails on which the vehicle travels. Supposing a train to have entered a block the track magnet would become de-energized so as to release the bar, 63, and allow its free end to drop into receptacle, 65, thus forming an electrical connection between rail, 4, and ramp rail-section, 68. A train approaching a block, if traveling at a low speed or say under six miles an hour could pass the ramp rail-sections, 68, but if traveling at a high speed, when it reaches the ramp rail-section, 68, the high speed circuit heretofore referred to, would be effective to cut-out or deenergize the electro-magnet, 44, and permit the valve, 43, to open and thus apply the brakes. This latter circuit would be from battery, 55, on the vehicle through wire, 54, wheel, 70, rail, 4, wire, 66, receptacle, 65, bar, 63, receptacle, 64, wire, 67, to rail-section, 68, then through wire, 60, switch-lever, 61, to wire,

62, back to battery thereby short-circuiting the magnet, 44. The current flows as just described for the reason that it is the shortest route and of the least resistance.

It will be noted by reference to the drawing that each vehicle is provided with a roller, 59, at one side and a roller, 59^a, at the opposite side of the rails but it should be understood that these rollers have no electrical connection whatever with each other. It will also be noted that the roller, 59^a, has electrical connection by wires, 58^a, and, 60^a, with contact points, 71, and, 72, while roller, 59, at the opposite side of the vehicle has connection with contact points, 73, and, 74. The switching levers, 57, and, 61, are movable with the reversing bar, 41, so that when the vehicle is moving forward said levers will engage contacts, 74, and, 73, whereas when the bar, 41, is reversed the said levers will engage contacts, 71, and, 72. By further reference to the drawing it will be noted that a shunt line, 75, is provided in the circuits around the switch arm, 46, and contact plates, 47, and, 52, and that a switch, 76, is provided in said circuit. The object of this shunt line is that when two motors or locomotives are attached to the same train the closing of the switch on the second motor will prevent the operation of the brakes on said second motor. The current from battery, 48, keeps the magnet, 44, energized and the resistance, 56^a, prevents the current from being shunted around the magnet by way of wire, 56. We have also provided that in case the speed switch should become useless or disarranged the arm, 46, will be returned to a contact, 77, which is connected by a wire, 78, with contact plate, 52. By this means the current instead of passing through plate, 52, to arm, 46, would pass around by wire, 78.

Having thus described our invention what we claim and desire to secure by Letters Patent is:—

1. The combination with a vehicle having an air-brake valve, of an electro-magnet for controlling the valve; two contact plates also on the vehicle; a circuit including one of said contact plates and said magnet while the vehicle is moving at a low speed; a second circuit including the other contact plate and said magnet while the vehicle is moving at a greater speed; a switch-arm and means whereby it is movable from one contact plate to the other according to the speed of the vehicle for closing one or the other of said circuits and means cooperating with elements in said second or high speed circuit for short circuiting the said valve magnet and releasing the air-brake valve.

2. The combination with a vehicle having an air-brake valve; of an electro-magnet for controlling the same; two contact plates on the vehicle; a switch arm and means

whereby it is automatically movable from one contact plate to the other according to the speed of the vehicle; a circuit normally including one of said contact plates the
5 switch arm and said magnet; another circuit to include said other contact plate said magnet and the switch arm when the latter is automatically moved from one contact to the other, and means coöperating with the
10 last named circuit for effecting a deenergization of said electro-magnet to release the valve controller.

3. The combination with a vehicle having an air-brake valve and a magnetic controller
15 therefor; of a low-speed contact plate; a high speed contact plate; a switch arm and means whereby it is automatically movable from one plate to the other according to the speed of the vehicle; a battery and connections to maintain a closed circuit through
20 the low speed contact plate, the switch arm and valve controller during the travel of the vehicle at a low speed; a battery and connections to maintain a closed circuit through
25 the high speed contact plate, switch arm and valve controller during the travel of the vehicle at a higher rate of speed; and two contacts on the vehicle and in the high speed circuit,—one contact being between a pole

of the battery and one side of the controller 30 and the other between the other pole of the battery and the other side of said controller.

4. The combination of a vehicle having an air-brake valve and magnetic controller therefor; two contact plates on said vehicle; 35 a movable switch arm; a circuit including a battery, one of said contact plates, the switch arm and the valve controller,—said circuit being maintained while the arm is in contact with said plate; a side contact at each
40 side of the vehicle; a reversing lever on the vehicle; switching means operated by the said reversing lever; a second circuit including the other of the first named two contact plates, a second battery, the said
45 valve controller, movable switch arm, the said switching means and one of the said side contacts, and connections between the switching means and the other of said two side contacts whereby the latter side contact
50 may be included in said second circuit.

In testimony whereof we affix our signatures in presence of two witnesses.

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Witnesses:

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