

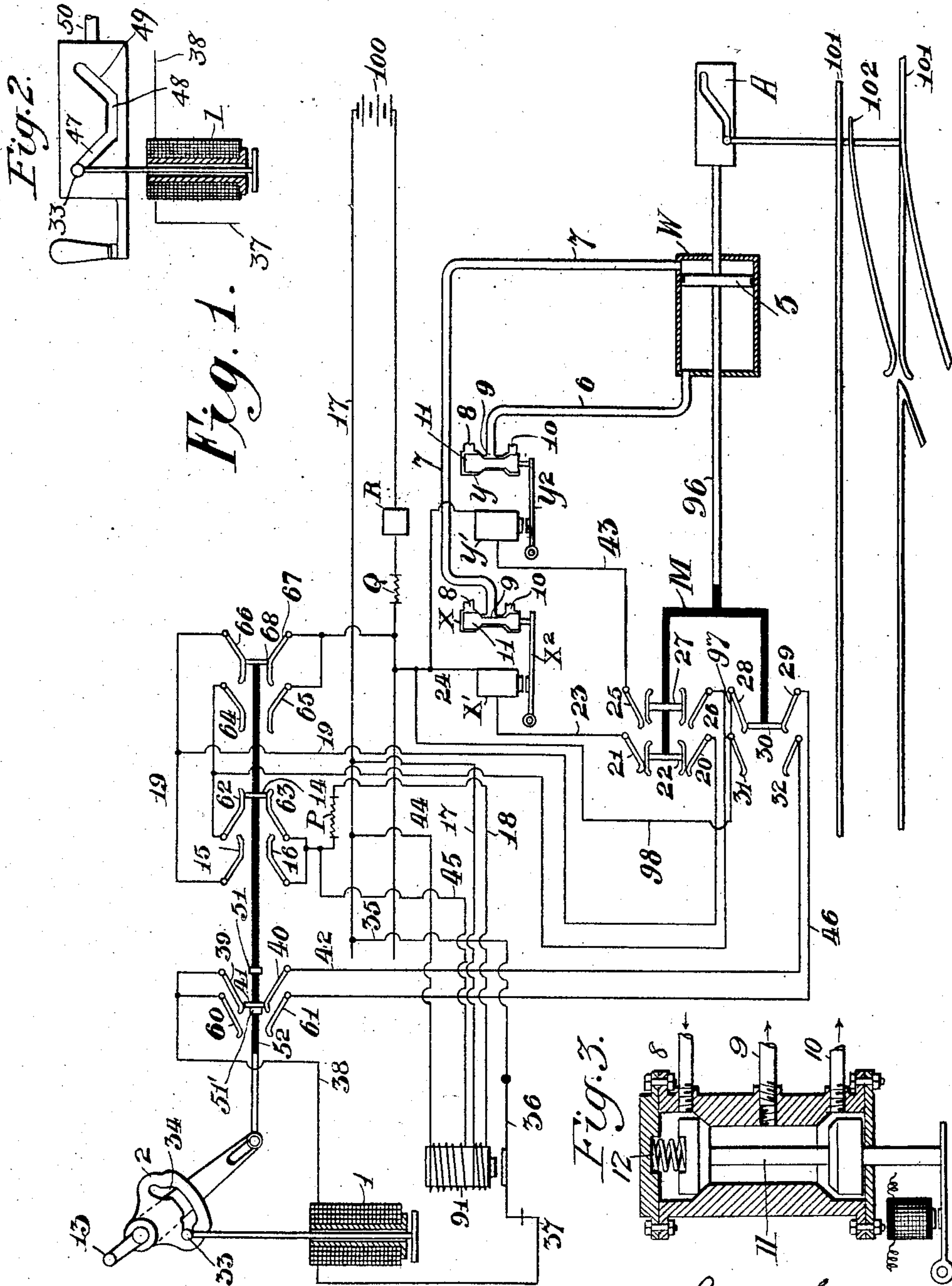
No. 814,658.

PATENTED MAR. 6, 1906.

L. GRIFFITH.

SAFETY DEVICE FOR RAILWAY SWITCH AND SIGNAL APPARATUS.

APPLICATION FILED NOV. 5, 1904.



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# UNITED STATES PATENT OFFICE.

LAWRENCE GRIFFITH, OF YONKERS, NEW YORK.

SAFETY DEVICE FOR RAILWAY SWITCH AND SIGNAL APPARATUS.

No. 814,658.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed November 5, 1904. Serial No. 231,514.

*To all whom it may concern:*

Be it known that I, LAWRENCE GRIFFITH, a citizen of the United States of America, residing in the city of Yonkers, county of Westchester, and State of New York, have invented certain new and useful Improvements in Safety Devices for Railway Switch and Signal Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to railway switch and signal apparatus, and its objects are to provide safety devices for both the indicator and the motor of such apparatus.

To these ends my invention consists, broadly, of means whereby at certain times the indicator or the motor may be prevented from acting, though the apparatus in other respects would be adapted to operate them.

Reference may be made to United States Letters Patent No. 724,180, granted to me March 31, 1903; No. 776,238, granted to me November 29, 1904, and to my pending application, Serial No. 151,578, dated April 8, 1903.

In order that my invention may be clearly understood, I shall first describe in detail the manner in which I carry the same into practice and then point out the novel features of the invention in the claims, reference being had to the accompanying drawings, forming part of the specification, in which similar characters of reference indicate similar parts in all the views, of which—

Figure 1 is a diagrammatic view of my invention as applied to a pneumatically-operated motion-plate. Fig. 2 shows a modification; Fig. 3, a detail sectional view of one of the electropneumatic valves shown in Fig. 1.

In Fig. 1 I have shown the motion-plate A operated pneumatically or by fluid under pressure, and reference may be had to above-mentioned Patent No. 724,180, the valves X and Y being controlled in this case by electric relays or magnets X' and Y' instead of by pneumatic diaphragms. In Fig. 1 I have also shown the indicator 1 cooperating with operator's quadrant 2 of my said Letters Patent No. 776,238, and in Fig. 2 I have shown the indicator 1 cooperating with operator's stroke-completing bar 3 of my said application, Serial No. 151,578.

Referring to Fig. 1, the motion-plate A is operated by piston 5 of pneumatic motor W. Pipe 7 supplies power from valve X to operate piston 5 in one direction and pipe 6 from

valve Y to operate said piston in the other direction in the usual way. Said valves X and Y are counterparts of each other, each having three ports. Ports 8 lead to the supply of compressed air or other fluid under pressure. Ports 10 lead to the atmosphere or exhaust. Ports 9 lead to opposite side of piston 5 of the motor W. The valves X and Y are provided with pistons 11, adapted normally to close supply-ports 8 and open exhaust-ports 10. Springs 12 normally hold said pistons 11 in the position just above described. Coöperating with said pistons 11 are relays X' and Y', so that when said relays are energized pistons 11 will close exhaust-ports 10 and open supply-ports 8. Upon the movement of the operator's bar or lever 13 bridge 14 will be brought into contact with springs 15 and 16, and valve X will be opened to admit compressed air by pipe 7 to motor W, as follows: wire 17, relay 91, wire 18, contact-springs 15 and 16, bridge 14, wire 19, contact-springs 20 and 21, bridge 22, wire 23, relay X', wire 24, to battery, so that armature X<sup>2</sup> of relay X' will be raised; and by energy supplied through valve X and pipe 7 piston 5 will be moved and will carry with it motion-plate A and switch or controller M, thereby breaking connection between contact-springs 21 and 20 and making connection between contact-springs 25 and 26 by bridge 27 and breaking contact between springs 28 and 29 by bridge 30 and making contact between springs 31 and 32 by said bridge 30. In this position roller 33 will abut against shoulder 34 of the slot in the quadrant 2, and said roller 33 will be raised by the action of indicator 1, which is energized as follows: wires 17 35 36 37, solenoid or indicator 1, wire 38, contact-springs 39 and 40, bridge 41, wire 42, contact-springs 31 and 32, bridge 30, wire 98, to battery. It will be understood that stops 51 and 51' operate to move bridge 41 during a portion only of the stroke of rod 50, which rod is mechanically connected with quadrant 2 or bar 3, as the case may be, and moves with it, carrying bridge 14 and bridge 68, whose functions with contact-springs 64 and 65 and 66 and 67 will be hereinafter described. The said relay 91, being connected with the circuits of relays X' and Y', as above described, is energized whenever current is on the circuit of either of said relays X' or Y', and it will be understood that when said relay 91 is energized the circuit of solenoid 1 will be broken between wires 36 and 37. I



sometimes provide relay 91 with additional windings of higher resistance than that connected with wires 17 and 18 and connect such higher resistance by wires 44 and 45 with the circuits of relays X' and Y' and in parallel with the low-resistance winding. In such case should an abnormally large current be sent through the circuit containing the lower winding, causing the blowing out of fuse P, the relay 91 would still act to break the circuit of solenoid 1 by the action of the upper winding; but normally the upper winding merely aids the lower winding in doing its work. Should there be a cross or accidental current on the circuit of relay X' when the apparatus is in the position shown in the drawings, the same will be shunted away from said relay back to battery, as follows: wire 19, contact-springs 66 and 67, bridge 68, and thence to battery.

Should the switch-points 102, and therefore the motion-plate A, be moved while the apparatus is in the position shown in Fig. 1, connection will be immediately made between contact-springs 25 and 26 by bridge 27 and relay Y' will be energized to admit pressure to piston 5 to replace said switch-points and motion-plate A, as follows: wire 17, relay 91, wire 18, contact-spring 63, bridge 14, contact-spring 62, and thence by wire contact-spring 26, bridge 27, contact-spring 25, wire 43, relay Y', so as to open valve Y, and thereby replace the motion-plate.

Referring now to Fig. 2, it will be understood that solenoid or indicator 1 coöperates with slot 47 48 49 of stroke-completing bar 3 to throw the apparatus to full-reverse or normal position, as more fully described in my said application Serial No. 151,578.

It will be understood that the invention hereinabove described may be used with a plurality of motion-plates and motors therefor without departing from my invention and that Q and R are the ordinary fuse and cut-out box, respectively, but they are introduced in the main circuit of the relays X' and Y' to prevent any movement of the relays X' and Y' upon a continuation of the circuit formed by bridge 68 with either contact-springs 64 and 65 or 66 and 67.

Should the circuit of solenoid 1 be accidentally returned to battery while the apparatus is in the position shown in the drawings, connection being made between contact-springs 39 and 40 by bridge 41, said solenoid 1 will be energized, and the apparatus will be held by the pushing up of the roller 33 in slot 47.

Of course I do not limit myself to either a series or a parallel electrical connection nor to a return to battery by metallic circuit, as distinguished from grounding.

What I claim, and desire to secure by Letters Patent, is—

1. In apparatus for operating switches, signals, and the like, comprising an electric indi-

cator and an electrically-controlled pneumatic motor for the motion-plate or device to be moved, means for preventing the action of the indicator while there is air under pressure supplied to the pneumatic motor of said motion-plate.

2. In apparatus for operating switches, signals, and the like, comprising an electric indicator, a pneumatically-operated motion-plate or device to be moved, and two electropneumatic valves for controlling the supply of air under pressure to the operative means of said motion-plate, means for preventing the action of the indicator while there is electric energy supplied to either of said valves.

3. In apparatus for operating switches, signals, and the like comprising an electric indicator and an electrically-controlled pneumatic motor for the motion-plate or device to be moved, means for preventing the action of the indicator while there is electric energy supplied to the controlling means of said motor, which consists of a relay adapted to break the electric connection of said indicator at said times.

4. In apparatus for operating switches, signals, and the like comprising an electric indicator and an electrically-controlled fluid-pressure motor for the motion-plate or device to be moved, means for holding the apparatus by the action of the indicator upon its circuit being accidentally returned to source of energy.

5. In apparatus for operating switches, signals, and the like having an electrically-controlled fluid-pressure motor for the motion-plate or device to be moved, the combination of an electric indicator, means for shunting current away from the controlling means of said motor, with means for preventing action of the indicator while there is electric energy supplied to said controlling means of the motor.

6. In apparatus for operating switches, signals, and the like having an electrically-controlled fluid-pressure motor for the motion-plate or device to be moved, the combination of means for shunting current away from the controlling means of said motor when the apparatus is at normal or reverse position, with a fuse or cut-out device in the circuit of said controlling means.

7. In apparatus for operating switches, signals, and the like having an electrically-controlled fluid-pressure motor for the motion-plate or device to be moved, an indicator consisting of a mechanical device operated by a single electric unit and means for connecting said unit with the same source of electric energy that actuates the controller of said motor.

8. In apparatus for operating switches, signals, and the like having an electrically-controlled fluid-pressure motor for the motion-plate or device to be moved, an indicator

whereby the apparatus is thrown to full-reverse or normal position, consisting of a mechanical device operated by a single electric unit.

thrown to full - reverse or normal position upon each complete movement of said motion-plate.

In witness whereof I have hereunto set my hand this 4th day of November, 1904.

LAW. GRIFFITH.

In presence of—

FRANCIS L. FIELD,  
J. F. BONDREAU.

5 9. In apparatus for operating switches, signals, and the like having an electrically-controlled fluid-pressure motor for the motion-plate or device to be moved, an electric indicator whereby the apparatus is automatically