J. H. McQUILLEN.

TRAIN CONTROLLING MEANS.

APPLICATION FILED MAY 6, 1917.

1,351,182.

Patented Aug. 31, 1920.

2 SHEETS—SHEET 1.

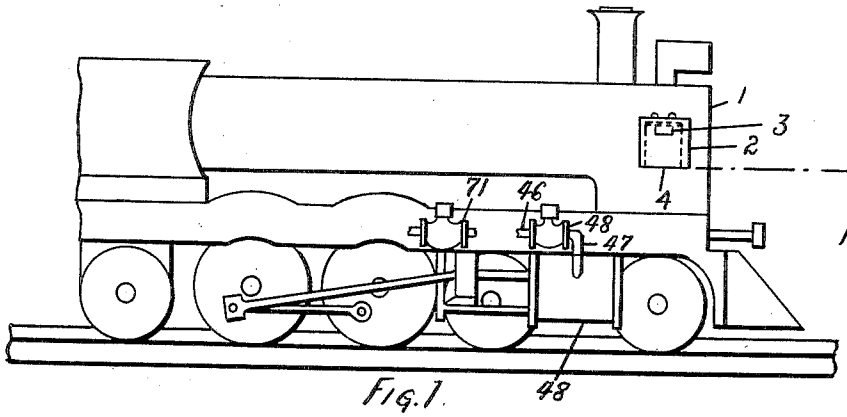


FIG. 1.

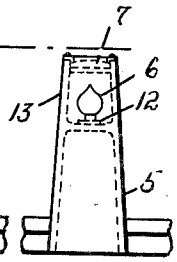


FIG. 2.

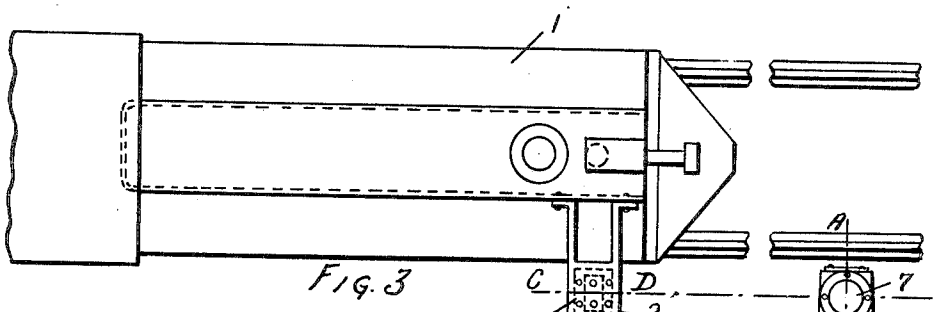


FIG. 3.

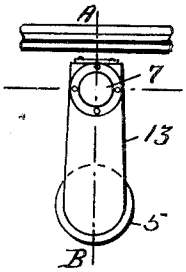


FIG. 4.

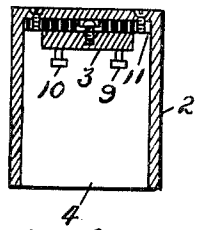


FIG. 6.

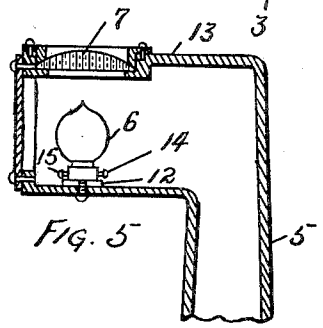


FIG. 5.

WITNESSES:

Albert C. Gow

Milton S. Reed

INVENTOR

John Hugh McQuillen

BY

Howard E. Cade

ATTORNEY

J. H. McQUILLEN.

TRAIN CONTROLLING MEANS.

APPLICATION FILED MAY 8, 1917.

1,351,182.

Patented Aug. 31, 1920.

2 SHEETS—SHEET 2.

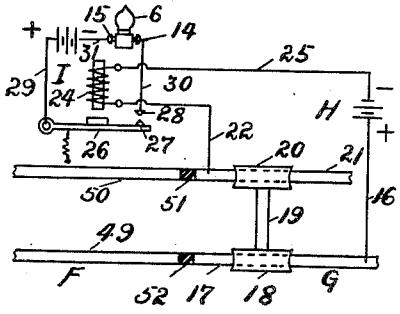


FIG. 7

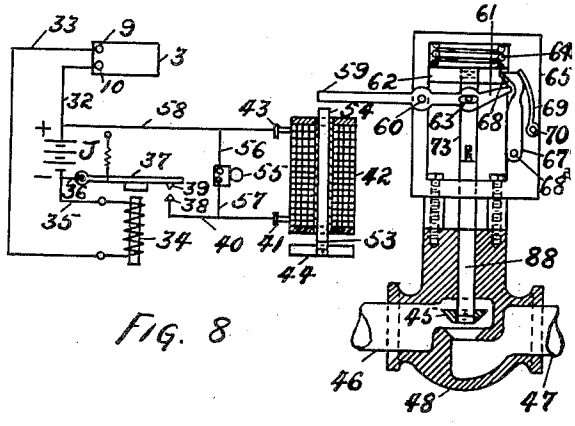


FIG. 8

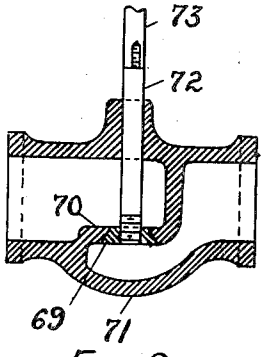


FIG. 9

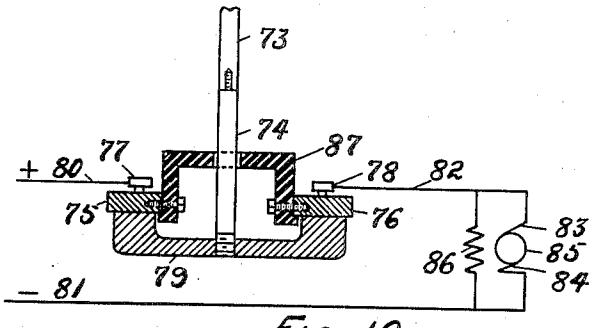


FIG. 10

WITNESSES:

Albert C. Gaw

Milton G. Reed

INVENTOR.

John Hugh McQuillen

BY

Howard E. Cade

ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN HUGH McQUILLEN, OF PHILADELPHIA, PENNSYLVANIA.

TRAIN-CONTROLLING MEANS.

1,351,182. Specification of Letters Patent. Patented Aug. 31, 1920.

Application filed May 8, 1917. Serial No. 167,240.

To all whom it may concern:

Be it known that I, JOHN HUGH McQUILLEN, a citizen of the United States, and residing in Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Train-Controlling Means, of which the following is a specification.

My invention relates to the application and use of the electrical properties of the metal selenium under varying light intensities, said metal having the peculiar characteristic of varying its resistance under various light intensities and of applying this characteristic to the improvements heretofore mentioned.

Primarily the objects of my invention contemplate novel and practical means for, (first) stopping a locomotive by cutting off the steam or other supply of motive power when locomotive is passing a block signal rail section of which the signal has been set against locomotive from the next adjacent rail signal section, and, (second) to sound an alarm upon passing a block signal rail section of which the signal has been set against locomotive from next adjacent rail signal section, and it is proposed to utilize the aforesaid properties of the metal selenium to accomplish the same in conjunction with a signal set by a train on an adjacent rail signal section.

With these objects in view, my invention consists in certain novel features of construction and arrangement of parts as will hereinafter more fully be described and pointed out in claims; reference being had to the accompanying drawings forming part thereof and in which similar numerals of reference refer to similar parts throughout the several views.

Figure 1 designates the locomotive.

Fig. 2 is an elevation of a signal tower.

Fig. 3 is a plan view of the locomotive.

Fig. 4 is a plan view of signal tower.

Fig. 5 is a section AB through Fig. 4.

Fig. 6 is a section CD Fig. 3.

Fig. 7 shows diagrammatically the ordinary means for closing the signal circuits.

Fig. 8 shows diagrammatically the electrical steam control.

Fig. 9 shows the arrangement of compressed air valve.

Fig. 10 shows the arrangement for interrupting the circuit of an electric motor.

Referring to Fig. 1, the numeral 1 designates the locomotive and to which is rigidly secured a box 2 and containing a selenium cell 3. The box 2 has an aperture 4 in its bottom, said aperture being more particularly shown in Fig. 6. Said selenium cell 3 is rigidly secured to box 6 and insulated therefrom by an insulating strip 11; said selenium cell 3, (Fig. 6), has terminals 9 and 10 numeral 71 designates valve controlling compressed air supply from compressor to air brakes of locomotive.

Referring to Fig. 2, the numeral 5 designates the signal tower on which is provided the horizontal bracket 13, more particularly shown in Fig. 5, to which is secured a socket 12 for containment of an incandescent lamp 6. Socket 12 is provided with terminals 14 and 15, (Fig. 5). To said bracket 13 (Fig. 5) is secured a lens 7 for projecting a beam of light on selenium cell 3, (box 2, Fig. 1), when locomotive passes signal tower.

Referring to Fig. 4, this view shows more particularly the location of the lens in reference to the selenium cell 3, the center of selenium cell 3 passing directly over center of lens 7 as locomotive speeds by signal tower.

Referring to Fig. 7, F and G represent adjacent track sections, 21 and 17 designate track respectively adjacent to tracks 50 and 49 and insulated by members 51 and 52. 18 and 20 represent the wheels of a truck of a train on section G said wheels being electrically connected through axle, numeral 19. H designates the battery energizing translating devices for control of incandescent lamp 6, Fig. 2, installed in signal tower 5, Fig. 2. 24 designates an electro-magnet for operating the translating members previously referred to. I designates the source of current supply for lighting the incandescent lamp 6 located on tower 5, Fig. 2.

It will be evident to those skilled in the art to which this invention relates, if wheels of a train are on section G, that a current of electricity will flow through the electro-magnet 24, as follows:—positive side of electric current supply H, line 16, track 17, wheel 18, axle 19, wheel 20, track 21, line 22, winding of electro-magnet 24, line 25, to negative side of battery H. It will also be evident, upon the energizing of the magnet winding of the magnet 24, that its armature 26 will be attached to its core, closing contacts 27 and 28. With the clos-

ing of contacts 27 and 28 current will flow through the incandescent lamp 6, as follows: the positive side, electric current supply I, line 29, armature 26, contacts 27 and 28, line 30, terminal 14, incandescent lamp filament 6, terminal 15, line 31, to negative side electric current supply. It will also be evident that the current flowing through lamp 6 will bring the filament of said lamp 6 to a condition of incandescence.

Referring to Fig. 8, this figure represents diagrammatically the electric wiring means for controlling the steam supply to the motive power of the locomotive and sounding an alarm when passage of locomotive by signal tower with signal set from next adjacent train section. Numeral 48 designates a valve inserted in steam supply to locomotive. As shown, this valve is of spring loaded release type with valve in open position. To set valve in the open position the lever numeral 59 is forced downward which moves piston 62 upward in yoke 65, due to pin 63, rigidly secured to valve stem 73, engaging extension part 61 of lever 59. Yoke 65 is rigidly secured to valve body 48, as shown. The upward movement of piston 62 compresses spring numeral 64. With further downward movement of lever 59, a finger 67 pivoted at 68^a on yoke 65 and augmented by a spring 69 rigidly secured at 70 to yoke 65, forces finger 67 to engage a recess 68 in piston 62 and holding piston in position with spring 64 under compression. It will be evident that with the downward movement of the lever 59 that valve stem extension 73 and valve stem 88 will move upward and opening the valve from steam supply to the motive power of the locomotive. It will be further evident that if lever arm 59 is forced upward the extension part 61 of lever 59 will engage the finger 67 forcing same from engagement with recess 68 in piston 62, allowing compression spring to force piston downward, which downward movement will be imparted to valve stem extension 73, valve stem 88, valve 45 and forcing valve on seat and closing steam to the motive power of the locomotive.

Further, referring to Fig. 8, numeral 42 designates the winding of a solenoid magnet, 53, iron portion of plunger, 54 non-magnetic extension to plunger and 44 armature. 43 and 41 designate terminals to magnet. 34 designates an electro-magnet having an armature 37, carrying a contact 39. 38 designates a fixed contact which engages with contact 39 upon attraction of armature 37 to magnet 34, J designates a source of electric current supply, 55 designates a bell and 3 the selenium cell located in box 2, Fig. 1.

As previously stated, the center of lens 7 is directly in line with center of selenium cell 3 as train speeds by. Box 2 is so arranged on locomotive 1, that lower edge of same passes over the bracket 13 of signal tower 5 without interference.

As previously explained if a train is on section G, Fig. 7, incandescent lamp 6 in signal tower, Figs. 2 and 5, will be burning. It will also be evident that if locomotive, Fig. 1, passes by signal tower, Fig. 2, that the electrical resistance of selenium cell 3, Fig. 1, will be lowered, due to the projected light from incandescent lamp 6 being passed through lens 7, and on to the selenium cell 3. It will also be evident that with the lowering of the electrical resistance of the selenium cell 3, that a greater amount of current will flow through magnet 34 and by suitable adjustment will operate its armature 37, as follows: positive side of electric current supply J, line 32, terminal 10, selenium cell 3, terminal 9, line 33, electro-magnet winding 34, line 35, to negative side of electric current supply J. It will also be evident that upon the attraction of armature 37 to core of electro-magnet 34 that this will close contacts Nos. 38 and 39 and energize solenoid magnet 42, as follows: positive side of electric current supply J, line 58, terminal 43, magnet winding of 42, terminal 41, line 40, contacts 38 and 39, armature 37, line 36 to negative side of electric current supply J. It will further be evident that with the energizing of the magnet 42, armature 44, together with iron part 53 of plunger will move upward and said upward movement will be imparted to non-magnet part of plunger 54. It will further be evident that with the continued upward movement of non-magnet part 54, that this part will engage lever arm 59 and force its extended portion 61 against finger 67, knocking finger 67 out of engagement with recess 68 in piston 62, and as previously explained, forcing valve to seat and closing steam to the motive power of the locomotive and thereby accomplishing the heretofore first mentioned object of my said invention.

It will further be evident that upon the attraction of armature 37 to core of electro-magnet 34, that a current of electricity will flow through bell 55 as follows: positive side of electric current supply J, line 58, line 56, electric bell 55, line 57, line 40, contacts 38 and 39, armature 37, line 36 to negative side of electric current supply J. It will further be evident that with the passage of current through the electric bell, same will be made to ring, sounding an alarm, and accomplishing the heretofore second object of my said invention.

Referring to Fig. 9, it will further be evident that if yoke 65 (Fig. 8) and its containing parts be similarly secured to valve body 71, Fig. 9, as is done to valve body 48, Fig. 8, and extended stem 73, Figs. 8 and 9 be secured to valve stem 72, Fig. 9, that upon

the upward movement of non-magnetic core 54, Fig. 8, due to locomotive passing signal tower, with signal set against locomotive, that upon striking the lever 59 and releasing piston 62, Fig. 8, that valve 69 (Fig. 9) will be forced from its seat, opening the valve allowing compressed air to enter air brakes and thereby stopping the locomotive and also accomplishing the heretofore first mentioned objects of my said invention.

Referring to Fig. 10, 75 and 76 designate two terminal blocks of a single pole circuit breaker, and 77 and 78, respective terminals. 79 designates a brush spanning the circuit breaker terminal blocks 75 and 76. 80 and 81 designate respectively positive and negative incoming leads of electric current supply to a main propelling motor having an armature 85, field 86 and brushes 83 and 84. 82 designates positive line from circuit breaker terminal 76 to field 86 and armature 85. It will be evident that if brush 79 is forced downward that same will disengage itself from terminal blocks 75 and 76, thereby opening the main circuit to the main propelling motor and stopping the locomotive. It will further be evident that if insulated stem 74 is connected to extended stem 73, Fig. 8, and insulated spanner 87 is similarly secured to yoke 65, Fig. 8, of valve 48, Fig. 8, that upon the striking of extended non-magnetic part of plunger 54 against lever arm 59 due to locomotive passing signal tower with signal set against locomotive, that piston 62, Fig. 8, acting through extended stem 73, Figs. 8 and 10, and insulated stem 74 (Fig. 10), will cause the brush 79 to move downward, opening the supply circuit to main propelling motor, stopping the locomotive and thereby also accomplish the heretofore first mentioned objects of my said invention.

It will be apparent from the foregoing that in my novel combination I employ with electro-mechanical locomotive-control means, means having the two-fold capacity of function of affording a visual signal and affecting a light-influenced element in the first named means to bring about operation of said means; the second named means being located adjacent to one block of a railway and being actuatable by a locomotive or train in an adjacent block. This manifestly is an important step forward in the art.

I do not wish to limit myself to the exact construction and arrangement of parts as shown as it is obvious that slight changes and departure can be made without departing from the spirit and intent of my said invention.

What I claim as new and desire to secure by Letters Patent is:—

1. In a train control system, the combination of electro-mechanical locomotive-control means including a light-influenced element and actuatable only when said element is influenced by the action of light, and means arranged to function as a visual signal and to affect the light-influenced element of the first-named means; the second-named means being located adjacent to one section or block of a railway and being actuatable by a locomotive or train in an adjacent section or block of the railway.

2. A train power controlling means, in combination with a wayside light signaling means, a light sensitive element, and electrical means on the train operatively connected with said controlling means, said electrical means being arranged normally in open circuit with a source of electric current supply, and said normally open circuit being closed when said light sensitive element passes said light signaling means, and operating the said controlling means.

3. In a train control system, the combination of electromechanical control and signal means including a light influenced element and electromechanical control means, said electromechanical control means being arranged normally in an open circuit with a source of electric current supply, said open circuit being closed when said light influenced member is affected by light, and said closing of circuit operating the electromechanical control means, and means arranged to function as a visual signal and to affect said light influenced element, said visual signal means being located adjacent to one section or block of a railway and including an incandescent lamp arranged in a normally open circuit with a source of electric current supply, said circuit being closed by a locomotive or train in an adjacent block of the railway.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN HUGH McQUILLEN.

Witnesses:
MARCELLA DIEMER,
SAMUEL D. DIEMER.