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W. L. ADAMSON.

ELECTRICALLY OPERATED STOPPING MEANS AT RAILWAY DANGER SIGNALS.

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NO MODEL.

Fig. 2

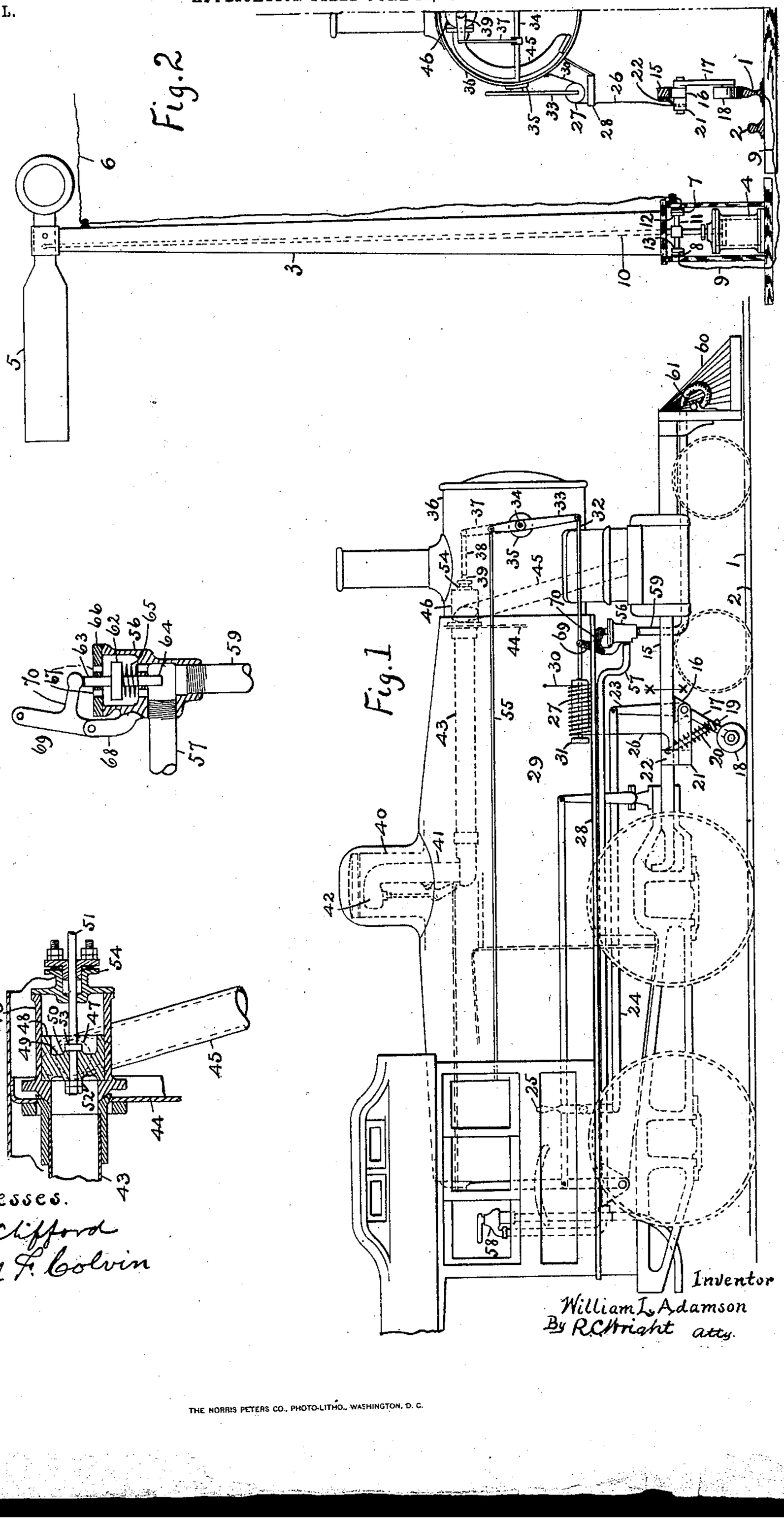

Fig. 1

Fig. 4

Fig. 3

Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM L. ADAMSON, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRICALLY-OPERATED STOPPING MEANS AT RAILWAY DANGER-SIGNALS.

SPECIFICATION forming part of Letters Patent No. 754,406, dated March 15, 1904.

Application filed June 12, 1903. Serial No. 161,193. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. ADAMSON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electrically-Operated Stopping Means at Railway Danger-Signals, of which the following is a specification.

This invention relates to automatically-operative mechanism in combination with railway-signals for the purpose of preventing the passing of danger-signals in cases where by sudden sickness or other causes of inattention by the engineer of a locomotive a block is entered without slackening speed while the signal indicates the presence of a previous train in the block, the locomotive being provided with means electrically operated whereby the steam is shut off from the cylinders and the train-pipe opened to apply the air-brakes. Any of the present well-known signal systems in which the signal is operated by pneumatic or hydraulic power may be used by the addition of current-conductors to a third rail, to which the circuit is formed by the action of setting the signal to "danger." The usual throttle and engineer's brake-valve are not interfered with, and means are provided to enable the engineer to break the contact with the third rail at all points on the line when signals are set. Locomotive throttle-levers are usually constructed with means to latch or lock them controlled by the engineer's hand as he opens or closes the throttle, and if death or sudden sickness overtakes him, so that he releases his hand from the throttle-lever at a time when the signal is set against him, there is great liability of collision with a train previously entering and still in the block either of slower speed or having come to a stop. The mechanism herein employed does not interfere with the throttle-lever, the throttle-valve, or the engineer's brake-valve; but separate and independent means are employed to intercept and shut off the steam between the throttle-valve and the cylinders and at the same time apply the air-brake.

The invention is illustrated in the accompanying drawings, in which similar parts are denoted by similar characters of reference, in which—

Figure 1 is a side elevation of a locomotive with the appliances attached. Fig. 2 is a signal, (set at a right angle to Fig. 1,) a semicross-section of the track, the open front of the locomotive's smoke-box, showing the position of the cut-off or intercepting valve in its position relative to the branch steam-pipes to the cylinders, and a section of the locomotive's frame on line X X, Fig. 1, showing the contact-wheel on the third rail. Fig. 3 is a vertical cross-section of the valve interposed between the throttle-valve and the cylinders and by which the flow of steam is stopped. Fig. 4 is a vertical cross-section of the valve employed to open the train-pipe and set the brakes.

Within the track is laid a third rail 1, insulated and preferably having its top higher than the regular rails 2, of a length sufficient to accomplish its purpose, and placed opposite the signal.

The signal-stand 3 is of any form adapted to its work which has a cylinder 4 operated by pneumatic, hydrostatic, or other pressure means to set the semaphore 5. A conductor 6 from any adequate source of electrical energy runs to the stand 3 at a point above cylinder 4, where it has a terminal 7, opposite which is a terminal 8 of a conductor 9, leading to the third rail 1. Upon the rod 10 of the signal is an insulated arm 11, having a plate 12 adapted to contact with terminal 7 and a plate 13 adapted to contact with plate 8 and form a circuit between conductors 6 and 9 whenever piston 14 is forced up to set the signal, and thereby energize the third rail 1 ready to stop the locomotive and its train if the engineer has failed to see the signal or has been suddenly incapacitated from performing his duty. Insularly attached to the locomotive, preferably to its frame 15, is a stand 16, to which is pivotally supported a rod 17, which has at its lower end a contact-wheel 18, rotatably attached thereto and adapted to run on the third rail 1. A rod 19, which is attached to frame 15 at its upper end and to rod 17 at its lower end, has a spring 20, which keeps wheel 18 to rail 1 and permits the wheel to be lifted to break the circuit.

From stand 16 is a horizontally-disposed arm 21, which at one end is secured to rod 17 to be moved thereby, and at its free outer end it engages an insulated spring-plate 22, preferably attached to frame 15. An arm 23, with a rod 24, running to the engine's cab and having a lever 25 in the cab, is the means whereby the engineer lifts wheel 18 from rail 1 to break the circuit if the engine comes to a stop at the third rail. Different types and classes of locomotives will necessitate slight modifications of the attachments to its frame, all of which can readily be made. Attached to spring-contact 22 is a conductor-wire 26, leading to a solenoid 27, preferably located above the running-board 28 and insularly attached thereto, or it may be attached to the boiler-jacket 29. The ground-wire 30 is shown attached to the locomotive-jacket 29; but it may be attached at any convenient point on the locomotive. The solenoid operates pole-plate 31 on a rod 32, which at its front end is attached to a lever 33 on a shaft 34, seated in bearings 35 on the smoke-box 36. Within the smoke-box are upright arms 37, attached at their upper ends to rods 38, which in turn attach to a yoke 39 of the cut-off or intercepting valve. This means of construction avoids the splitting of the exhaust from the cylinders. Within the dome 40 is the usual throttle-pipe 41, in which is located the throttle-valve 42, from which the dry pipe 43 passes forward, as usual, through the front tube-sheet 44 for its connection to the branch steam-pipes 45. At the joining of the dry pipe and branch steam-pipes the T-pipe has a cylindrical projection 46, (see Fig. 3,) from which are openings 47 to the branch pipes thereto attached, and within the cylinder 46 is the cut-off or intercepting valve, comprising a cylindrical part 48, with a cross connection 49, having a central hub 50, through which stem 51 is secured by nuts 52 and a collar 53, the stem at its opposite end passing through a stuffing-box 54 and then united to yoke 39. Cylinder 46 does not project far enough into the smoke-box to interfere with the exhaust or the draft through the upper tubes, and the cut-off or intercepting valve is balanced, it being a hollow open cylinder, and therefore will be readily and easily moved. As shown, the valve is in its position to stop the engine. When the engineer lifts contact-wheel 18 and breaks the circuit, the engineer will open the valve by moving forward the rod 55, connected to lever 33, and there will then be a clear course for the steam to flow through openings 47 to the branch pipes 45.

In Fig. 4 will be seen the valve employed to apply the air-brakes. It comprises an outer case 56, to which are connected the horizontal train-pipe 57 from the engineer's valve 58 and a vertical train-pipe 59, which runs forward to the pilot 60 and having a hose connection 61. Within case 56 is a piston 62, having an upper stem 63 and a lower stem 64, by which it is guided, and it is provided with a spring 65, by which it is held up to cover 66 of the case, the cover being pierced with openings 67 for air-exit. At the side of the case is a lug 68, supporting a bell-crank having an upper arm 69 and a lower arm 70 at right angles to 69. Arm 69 is operated by rod 32, so that when the solenoid is energized to move rod 32 the piston 62 will be depressed to allow the air to escape through the openings 67. This action will be simultaneous with the shutting off of the steam. The piston will resume its seat and prevent air escape when the engineer operates rod 55 to again admit steam to the cylinders. The brake-valve can, if desired, be placed below the engineer's valve and be operated by extending rod 32 back for such purpose. As the appliances are shown attached to an American type or eight-wheeled engine, it may be necessary when applying them to "Consolidations," "Moguls," and other types to somewhat vary the locations and attachments to avoid the various parts of such types; but this can be done within the spirit of this invention without departing therefrom, as it will involve only mechanical skill of adaptation.

I claim—

1. The combination of a third rail electrically energized by a signal, with a contact-wheel adapted to ride the rail, a solenoid energized by the contact of the wheel and rail, and a valve interposed between the throttle-valve and the cylinders of a locomotive and adapted to prevent the flow of steam to the cylinders when the wheel and third rail are in contact.

2. The combination of a third rail electrically energized by a signal, a contact-wheel adapted to ride the rail, a solenoid energized by the contact of the wheel and rail, an intercepting-valve adapted to stop the flow of steam, an air-valve adapted to release air-pressure while the wheel and rail contacts continue, and means to simultaneously open the steam-valve and close the air-valve when the contact-wheel is released from contact with the rail.

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

WILLIAM L. ADAMSON.

Witnesses:

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