

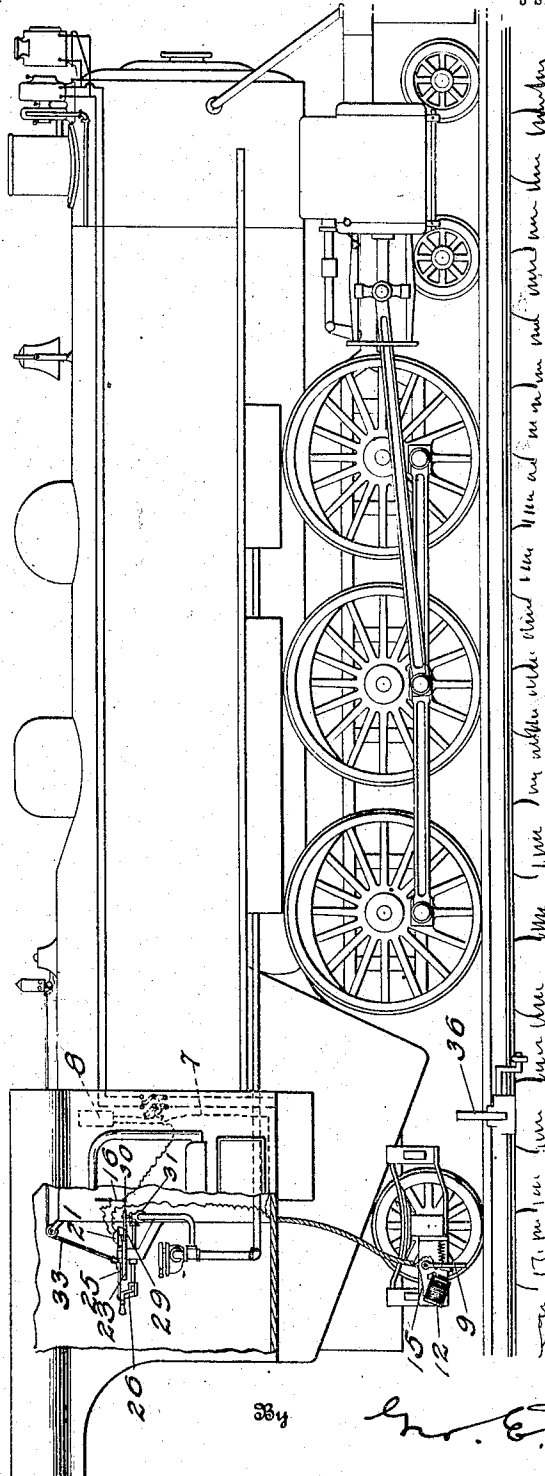
W. H. HARRIS.
 AUTOMATIC TRAIN STOP AND SIGNAL.
 APPLICATION FILED FEB. 1, 1909.

933,440.

Patented Sept. 7, 1909.

3 SHEETS—SHEET 1.

Fig. 1



When the train is stopped the wheels will be in contact with the rails and the train will be stopped.

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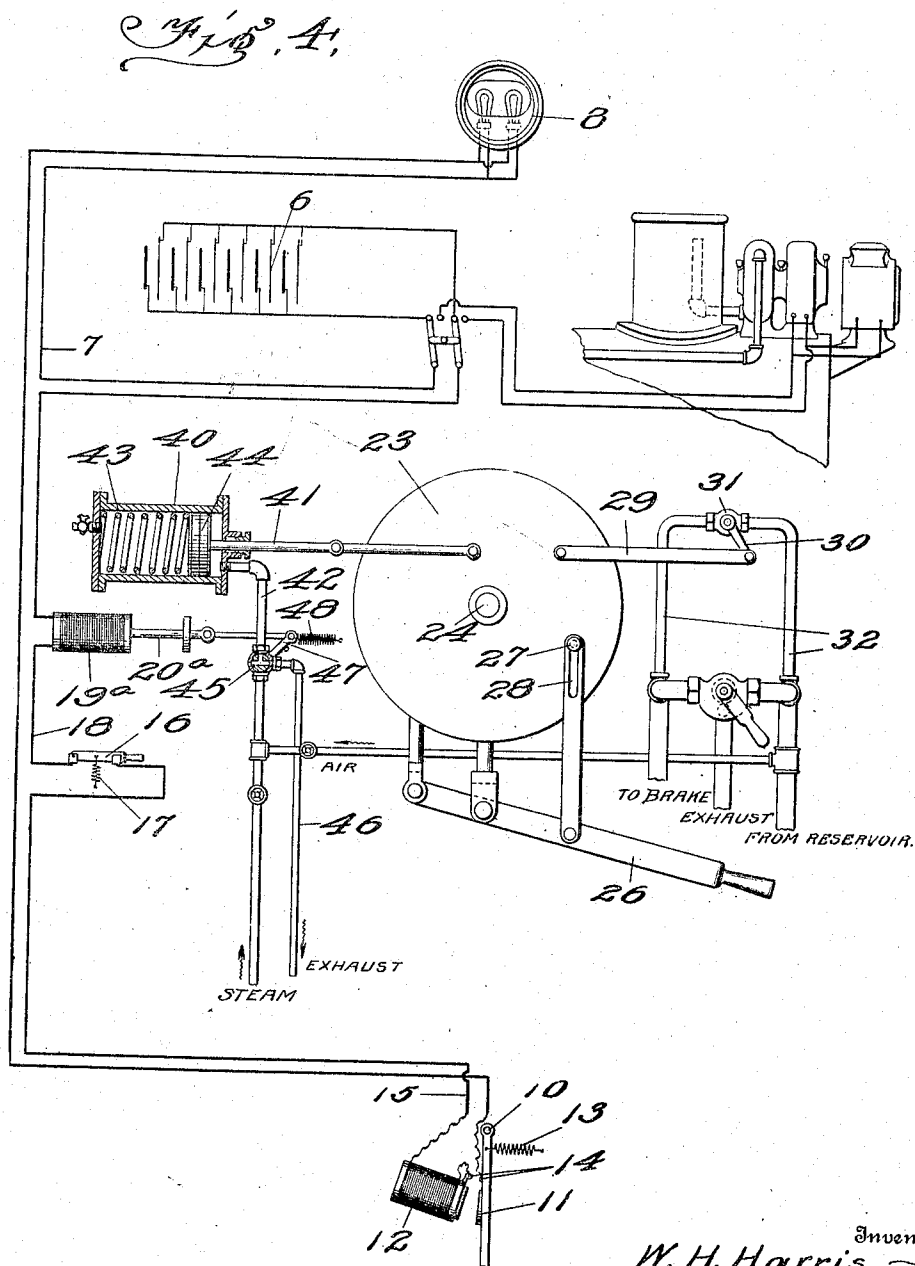
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UNITED STATES PATENT OFFICE.

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AUTOMATIC TRAIN STOP AND SIGNAL.

933,440.

Specification of Letters Patent.

Patented Sept. 7, 1909.

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To all whom it may concern:

Be it known that I, WILLIAM HENRY HARRIS, a citizen of the United States, residing at Stark, in the county of Missoula and State of Montana, have invented certain new and useful Improvements in Automatic Train Stops and Signals, of which the following is a specification.

This invention is an automatic engine and train stop and signal device for use on railways, and designed to be carried in the cab of the engine and to operate automatically to stop the train under certain conditions, acting to apply the air brakes and close the throttle and at the same time to exhibit a signal to the engineer to indicate that the track is not clear.

The invention relates particularly to devices used in the cab, and will be actuated by any suitable trip placed at the side of the track, which trip may be connected to a switch or to a signal tower or otherwise actuated when conditions exist requiring that the train be stopped.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of an engine provided with the device. Fig. 2 is a diagrammatic plan view illustrating the various connections and devices. Fig. 3 is a side elevation of the throttle closing appliances. Fig. 4 is a plan view of a modification, in which the throttle-closing devices are operated by steam.

The apparatus is electrically operated and may be supplied with necessary current from any suitable source. I have shown storage batteries at 6, but at night the current may be taken from an electric head light dynamo, if the engine is provided with one, by means of suitable switch connections which any person skilled in the art can supply. One line 7 from the source of current is connected through signal lamps 8, which may be the ordinary incandescent lamps, to a swinging arm or pendulum 9 hinged at 10 at its upper end to a suitable bracket or support on the side of the engine. This arm has an armature 11 located opposite an electro-magnet 12, and normally held away from the magnet by a spring 13. A contact point 14 is supported adjacent the magnet in such position that when the armature swings to the magnet the circuit is closed,

the wire 7 being connected to the arm 9 and the coil of the magnet being connected to the contact 14. From the magnet the wire 15 extends to a switch 16 in convenient position for operation by the engineer. This switch is held normally closed by a spring 17, and from the switch a return wire 18 extends to the battery, passing immediately through the coils of a solenoid 19.

The core 20 of the solenoid has an armature 21 and is pivotally connected at 22 to a disk 23 which is mounted in horizontal position to turn upon a standard or post 24 adjacent to the ordinary throttle valve of the engine. This disk is connected by a link 25 to the throttle lever 26, the connection between the disk and the link being formed by a pin 27 in a slot 28 in the end of the link. The disk is also connected by a link 29 to a lever 30 on the stem of the valve 31 in the air supply pipe 32 which is connected to the air brake system of the engine or train. The disk may also be connected by a cord 33 to the whistle. A spring 34 is fastened to the post 24 and its free end bears between lugs 35 at the rim of the disk, and tends to turn said disk back to retracted or inoperative position. A trip suitable to operate the pendulum or arm 9 is indicated at 36, erected beside the track in position to strike said arm when the trip is elevated in any suitable manner.

In operation, when the trip is set, it strikes the lower end of the arm 9 and throws the armature 11 against the magnet 12, at the same time closing the circuit of said magnet, the switch 16 being closed. The solenoid 19 is also actuated. The magnet 12 is energized and holds the armature 11 thereto, keeping the circuit closed even after the engine passes the trip. The solenoid 19, by means of the core rod 20, turns the disk 23 in the direction indicated by the arrow. This pulls the throttle lever forward and closes the throttle, and at the same time opens the air-valve 31 and applies the brakes. The whistle is also sounded by means of the core 33, and the lamps 8, being in circuit, are lighted. To restore the parts, the engineer opens the switch 16, allowing the arm 9 to drop to original position, and the spring 34 turns the disk back and releases the brakes. The throttle remains closed by a movement of the pin 27 in the slot 28, but can be immediately

opened by the engineer, who can also control the brakes by the usual engineer's brake valve.

The turning disk and connected parts will be located in the cab, under the observation of the engineer, and the parts will be so connected and arranged as to perform the functions indicated. Obviously many changes may be made in the particular arrangement or construction of the parts, within the scope of the invention, which is not limited to the exact embodiment shown. The devices work on a normally open circuit, which saves the battery, but by having the arm 9 close the circuit of the magnet 12 the circuit remains closed until manually opened by the engineer.

In the modified form shown in Fig. 4 the disk 23 is operated by steam, by means of a cylinder 40 having therein a piston with a rod 41 connected to the disk 23 the same as the solenoid core 20 above described. This cylinder is supplied at its front end with steam by a pipe 42 leading from the boiler. 43 is a spring behind the piston 44, and it serves to normally advance the piston to the front end of the cylinder. The pipe 42 is controlled by a two-way valve 45 which in one position lets steam into the cylinder and into the other position exhausts the same therefrom through a vent-pipe 46. The stem of the valve 45 has a lever 47 connected to the core 20^a of a solenoid 19^a which is in the circuit the same as the solenoid 19 above described. When the solenoid is actuated the steam valve will be opened and steam will be admitted to the cylinder and the disk 23 will be turned by a movement of the piston. When the solenoid is deenergized, the spring 48 will serve to close the steam valve and exhaust the cylinder and the spring 43 will return the disk to original position. The operation of the disk by steam may be advantageous in view of the fact that considerable power is required to shift an ordinary throttle-lever.

I claim:

1. In an electric signal for railroad engines, the combination with a circuit having therein a swinging trip-actuated arm which acts to close the circuit and a magnet in the circuit which then holds said arm in closed position, and signals in the circuit.

2. In an electric signal for railroad engines, the combination of a turning disk, a solenoid operatively connected to said disk to turn the same, trip-operated means to energize the solenoid, and means to stop the engine, connected to said disk.

3. In an electric signal for railroad engines, the combination of a turning disk, a solenoid operatively connected to said disk to turn the same, trip-operated means to energize the solenoid, and a slotted link connecting the disk and the throttle lever of the engine.

4. In an electric signal for railroad engines, the combination of a turning disk, a solenoid operatively connected to said disk to turn the same, trip-operated means to energize the solenoid, and a link connecting the disk and a valve in the air brake pipe, to apply the brakes when the disk is turned by the solenoid.

5. In an electric signal for railroad engines, the combination of a turning disk, a solenoid operatively connected to said disk to turn the same, trip-operated means to energize the solenoid, and a brake device and a throttle device connected to said disk, to apply the brakes and close the throttle when the disk is turned by the solenoid, means to manually open the solenoid circuit, and means to return the disk to original position without opening the throttle.

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

WILLIAM HENRY HARRIS.

Witnesses:

W. J. GERRITY,
EUGENE WESSINGER.