

941,541.

Witnesses:
Francis O. ...
And ...

Inventor
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UNITED STATES PATENT OFFICE.

PAUL J. SIMMEN, OF LOS ANGELES, CALIFORNIA.

CAB-SIGNAL CIRCUIT.

941,541.

Specification of Letters Patent.

Patented Nov. 30, 1909.

Original application filed June 19, 1908, Serial No. 439,334. Divided and this application filed December 15, 1908. Serial No. 487,618.

To all whom it may concern:

Be it known that I, PAUL J. SIMMEN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Cab-Signal Circuits, of which the following is a full, clear, and exact description.

This invention relates to improved signal systems for use on trains and locomotives to apprise the motorman or engineer of danger conditions.

The general features of the present invention have been set forth by me in my copending applications Serial Numbers 383,713 and 439,334, in conjunction with certain other apparatus, and features, but the present invention is not specifically claimed in said applications.

This invention being capable of general use with installations of various characters in addition to those of my said applications, I have made such invention particularly the subject of the present divisional case in which it is particularly claimed.

The invention will be clear from reference to the accompanying drawing and specification and is particularly pointed out in the appended claims.

The drawing represents circuits embodying the principles of my invention diagrammatically.

A denotes a third rail section or contact which is normally electrified, but which is non-electrified under danger conditions. Various means are well known for accomplishing these functions in a third rail. Examples embodying other inventions of my own may be found in the applications above referred to.

B denotes a relay, which may be of any desired character, having a magnet or solenoid and an armature which moves against a front stop when the magnet or solenoid is energized. I have shown an ordinary magnet 1 with a pivoted armature 2, a front stop 3 and also a back stop 4. The armature is impelled against its back stop by gravity or by a spring (not shown).

C denotes a source of current of any suit-

able character, for example a battery on the train. This battery is in a permanent circuit including the relay magnet, the armature thereof and the front stop, denominated 1, 2 and 3 in the drawing, respectively. The circuit is adapted to be completed by a switch D attached to a blade or third rail shoe E on the train, when said blade or third rail shoe hangs normally downward on account of its being out of engagement with any third-rail section A. When the blade or shoe is elevated or displaced by contact with a third-rail section, this circuit is opened. The opening of this circuit effects, however, the simultaneous closing of another circuit including the magnet B, as follows: from the normally electrified rail section A through a connection F (provided for this purpose) through magnet B to ground. Before considering the operation, I will describe certain additional features of the present invention which I have employed in conjunction with the foregoing circuits.

k designates a wire extending from the back stop 4 of the relay through an alarm and through a speed governor controlled contact 8 on the train. I have shown this circuit additionally completed by the controlling lever 9 which applies the motive power of the train (for example the throttle valve of a steam engine). The arrangement is such that the circuit of the alarm 5 may be completed and the alarm actuated whenever the train is in motion, or in motion at more than a predetermined speed, assuming that the relay armature is against its back stop, but the alarm is silenced when the train comes to rest. The circuit may also be interrupted when the power is turned off.

10 denotes a clear signal lamp or the like which may be bridged in a circuit l between the front stop 3 of the relay and ground. Or the relay itself may be considered a visual clear signal when its armature is against the front stop 3.

The operation is as follows: Assuming that conditions are normal, and that the rail sections A are all electrified as the train passes them, it is evident that current will flow through connection F and through the

relay magnet B to ground, attracting the armature against the front stop 3. In the blocks intermediate the third rail sections A the circuit of the relay magnet B is completed from battery C through the switch D and the relay armature 2, the relay magnet being kept continuously energized in this way, so that the last mentioned circuit is maintained at 3 without interruption under normal circumstances. The clear signal lamp 10 will therefore be continuously exhibited under the normal or safety conditions. When a rail section A is passed which is not electrified, however, the relay B no longer obtains current from any source, since the local circuit of battery C is broken by the switch D at this time, and if the rail section A is not electrified, it, of course, cannot furnish the current required. The armature 2 accordingly moves against the back stop 4 and if the train is moving with the power turned on, the alarm 5 will be actuated. This condition will continue after the rail section has been passed because the local circuit of battery C cannot be completed as long as the relay armature is against the back stop. In other words the alarm conditions will continue until a rail section A is finally passed which happens to be electrified. When such rail section is passed, the relay B again obtains current and is energized, restoring conditions to normal as first described. Except by this, however, the alarm conditions will continue as is desirable.

The nature of the alarm condition is specially designed for train service because any continuous and indefinite ringing of a bell deadens the sensibilities of the motor-man or engineer who is apt to forget its significance. It is accordingly the purpose of my invention to make the alarm intermittent to the extent that it is silenced when the power is turned off. I prefer to have the alarm silenced when the train is slowed down or stopped, by the use of a speed governor as described, in case a governor is present on the train for any purpose, as, for example, in my said application 439,334. Where there is no governor normally provided, the connection with the throttle or controller lever, will answer, or a connection may be provided for both the governor and the controller lever as particularly illustrated.

What I claim, is:

1. In a signal system for a vehicle moving on a trackway, a signal on the vehicle and a current source, a normally closed circuit on the vehicle including the signal and current source, means for intermittently interrupting said circuit in the passage of the vehicle on its trackway, means for maintaining the circuit broken when once so interrupted re-

gardless of any condition or change of conditions on the vehicle, and means in the trackway for again closing said circuit, whereby the signal in the vehicle is self-restoring when normal running conditions are restored on the trackway.

2. In a signal system having a vehicle moving on a trackway and having intermittently interrupted normally electrified contacts along the trackway, a shoe on the vehicle adapted to be displaced by said contacts, a switch on the vehicle opened by such displacement, a magnet on the vehicle having an armature with a front stop, a current source, and a normally closed self-restoring signal circuit including said magnet, said switch, said armature, said front stop and said current source, and having branch connections to said shoe and to ground in permanent connection on opposite sides of said magnet, respectively, whereby said magnet is automatically self-restoring to its normal condition attracting said armature whenever said shoe passes an electrified contact.

3. In a signal system having a vehicle moving on a trackway and having intermittently interrupted contacts along the trackway, a shoe on the vehicle adapted to be displaced by said contacts, a switch opened by such displacement, a magnet on the vehicle having an armature with a front stop, a current source on the vehicle, and a normally closed self-restoring signal circuit exclusively including said magnet, said switch, said armature, said front stop and said current source and having branch connections to said shoe and to ground in permanent connection with said circuit and adapted to include said magnet in a branch circuit through ground and one of said contacts, said branch circuit being exclusive of said switch.

4. In a signal system for a vehicle moving on a trackway, a signal on the vehicle, means along the trackway for setting said signal at danger, an alarm on the vehicle, and a circuit altered into alarm actuating condition by movement of said signal to danger, said circuit being non-alarm actuating when the vehicle is not in motion.

5. In a signal system for a vehicle moving on a trackway, a signal on the vehicle, means in the trackway for setting said signal at danger, an alarm on the vehicle, means for actuating said alarm when said signal is at danger, and means for rendering said alarm inoperative when the vehicle is not in motion.

6. In a signal system for a vehicle moving on a trackway, a signal on the vehicle, means in the trackway for setting said signal at danger, an alarm on the vehicle, means for actuating said alarm when said signal is at

danger, and speed governor controlled means for rendering said alarm inoperative when the vehicle is not in motion.

5 7. In a signal system for a vehicle moving on a trackway, a signal on the vehicle, means in the trackway for setting said signal at danger, an alarm on the vehicle, means for actuating said alarm when said signal is at danger, and means operated by the power

controller of the vehicle for rendering said 10 alarm inoperative when the power is turned off.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

PAUL J. SIMMEN.

Witnesses:

A. MOORE,

F. P. BEEMER.