

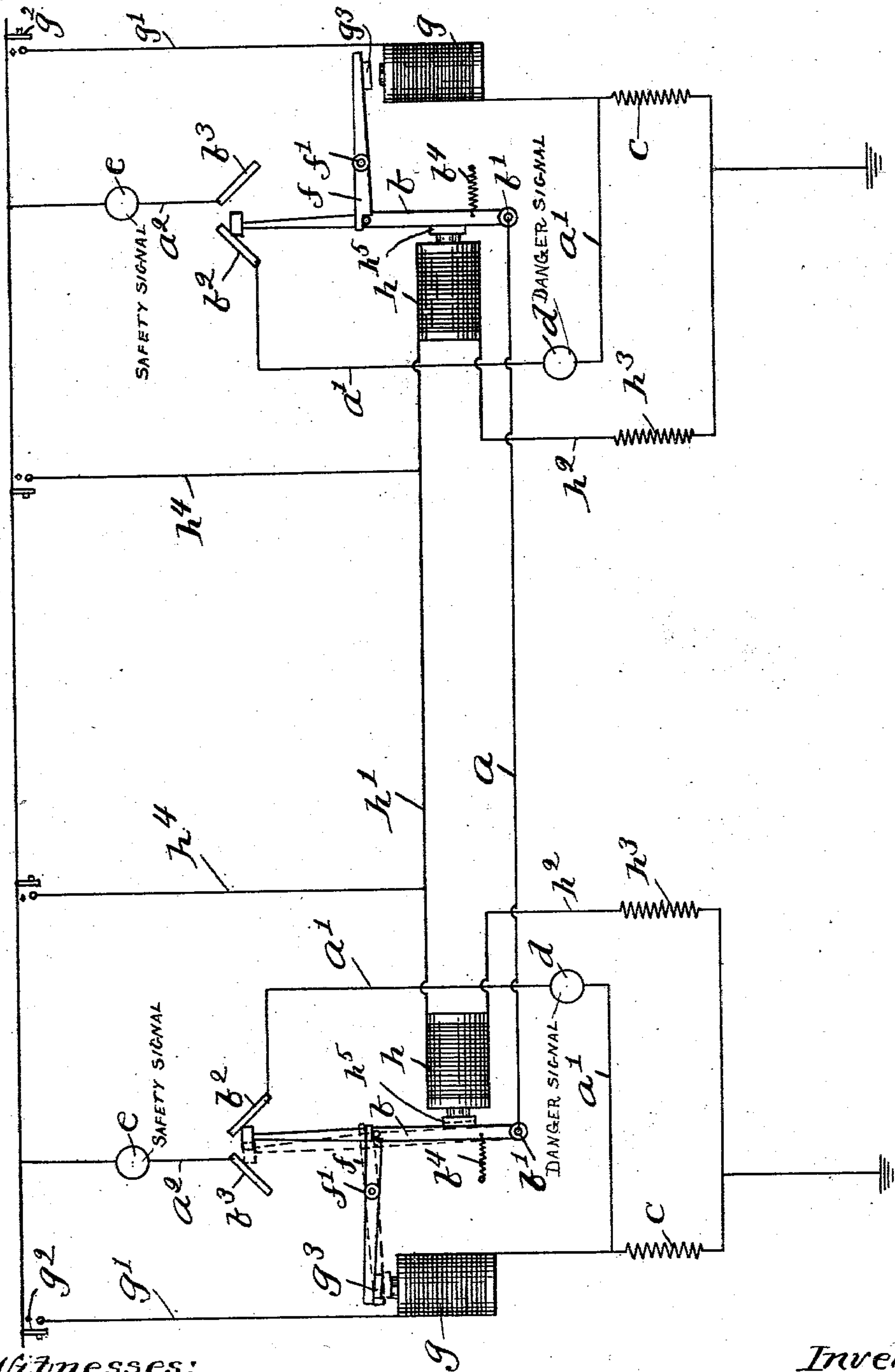
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C. H. MORSE.
TROLLEY SIGNAL.

APPLICATION FILED JUNE 25, 1901.

NO MODEL.



Witnesses:

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TROLLEY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 743,542, dated November 10, 1903.

Application filed June 25, 1901. Serial No. 65,959. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. MORSE, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Trolley-Signals, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention relates to trolley-signals, and has for its object to improve the construction of the same, to the end that fewer parts may be employed for setting the danger-signal and safety-signal at the opposite ends of a block and for restoring said signals, thereby simplifying the apparatus and rendering it less liable to get out of order.

In accordance with this invention a signal-operating circuit extends from end to end of a block—as, for instance, from one to another turnout—comprising, essentially, a signal-wire and suitable branches, and a signal is provided at each end of the block adapted to be operated by said circuit to serve as a danger-signal, and also, preferably, another signal is provided at each end of the block, also operated by said circuit, to serve as a safety-signal. A normally latched switch-lever is provided at each end of the block having a pair of switch-contacts, one contact for connecting one of said signals (the danger-signal) in circuit and for connecting the signal-wire with the ground and the other for connecting the other signal (the safety-signal) in circuit and for connecting the signal-wire with a current-carrying wire. The switch-levers are normally held by their latches in engagement with the contacts by which the signal-wire is connected with the ground at both ends of the block. Means are also provided at each end of the block—such, for instance, as an electromagnet included in a circuit and adapted to be connected with a current-carrying wire by the operation of a suitable trolley-operated switch—for releasing the switch-lever at the corresponding end of the block—as, for instance, by unlatching it—to thereby disconnect the ground branch thereat and to also connect the signal-wire with the current-carrying wire at said end of the block, cutting out the danger-signal and cutting in the

safety-signal at the corresponding end of the block and operating the circuit to set the danger-signal at the opposite end of the block. Said electromagnet therefore serves as a signal-setting magnet and the circuit which operates it as the signal-setting circuit. Means are also provided at each end of the block—such, for instance, as an electromagnet included in a restoring-circuit adapted to be connected with a current-carrying wire by the operation of a suitable trolley-operated switch—for restoring said unlatched switch-levers, and thereby putting out the safety and danger signals.

The figure shows in diagram a trolley-signal embodying this invention, the parts being shown in full lines in their normal position of rest and in dotted lines in the position they will occupy when the danger-signal is set at one end of the block and the safety-signal is set at the opposite end of the block.

a represents a signal-wire, which extends from end to end of a block—as, for instance, from one to another turnout. At each end of the block the signal-wire a is connected to a switch-lever b , pivoted at b' , and adapted to engage either one of a pair of switch-contacts $b^2 b^3$.

The switch-contact b^2 is connected to a wire a' , which passes to the ground through a resistance c , and said wire a' includes one of the signals, as d , which for the purpose of illustrating this invention may be an incandescent lamp and arranged to be used as a danger-signal.

The switch-contact b^3 is connected to a wire a^2 , which is connected with the trolley-wire or other current-carrying wire and includes another signal e , which is likewise herein represented as an incandescent lamp and arranged to be used as a safety-signal. The signal-wire a and its branches a' a^2 constitute the signal-operating or signal-setting circuit. Normally the switch-levers b remain in engagement with the switch-contacts b^2 , and hence the wire a is connected with the wires a' at each end of the block and include the danger-signal d at each end of the block. When the switch-levers are thus held, no current is passing over the signal-wire or

its branches a' connected thereto, and consequently the danger-signals d are not set. To normally hold the switch-levers in this position in engagement with the switch-contacts b^2 , a latch f is provided for each switch-lever, which is pivoted at f' and engages a pin on the switch-lever.

To release the switch-levers, the latches will be lifted, and to accomplish this result an electromagnet g is provided at each end of the block, which is included in a circuit g' , one end of which is adapted to be connected with the trolley-wire or other current-carrying wire by means of a trolley-operated switch g^2 of any suitable construction adapted to be operated by a passing car, and the other end passes to the ground through a suitable resistance, as c .

The electromagnet g serves as the signal-setting magnet and the circuit g' as the signal-setting circuit.

The electromagnet g when energized attracts the armature g^3 , which is carried by the latch f , and thereby operates to lift the latch out of engagement with the switch-lever b , permitting said switch-lever to be moved by means of a spring b^4 , attached to it, out of engagement with the switch-contact b^2 and into engagement with the switch-contact b^3 . When the switch-lever b is thus moved, the signal-wire a is disconnected from the branch wire a' and connected with the branch wire a^2 , and the current from the current-carrying wire is free to pass along the branch wire a^2 to the signal-wire a and thence to the opposite end of the block, and at said opposite end of the block, the switch-lever b not having been likewise operated, the current passes by means of said switch-lever along the branch wire a' to the ground. The safety-signal e at the entering end of the block and the danger-signal d at the leaving end of the block will therefore be operated.

To restore the switch-levers to their normal latched positions, and thereby restore or "put out" the signals, a restoring-magnet h is provided at each end of the block which is included in a circuit h' , extending from end to end of the block, having a ground connection h^2 at each end of the block through a resistance h^3 and also having a branch wire h^4 at each end of the block extending to the trolley-wire or other current-carrying wire, adapted to be connected thereto by a trolley-operated switch of any suitable construction adapted to be operated by a passing car.

The electromagnets h when energized attract the armatures h^5 , borne by the switch-levers, and thereby pull said switch-levers back to their normal position to be automatically engaged by the latches.

As usual in trolley-signals, one of the trolley-operated switches g^2 at each end of the

block is adapted to be operated only by a car entering the block, and the other trolley-operated switch, which connects the wire h^4 with the current-carrying wire, is adapted to be operated only by a car leaving the block, and in the drawing the arms of the several switches are shown in diagram so disposed relative to their contacts as to be moved onto said contacts by the car moving in the proper direction.

It will be seen that the car entering the block at either end will set the safety-signal at the entering end and the danger-signal at the leaving end and upon leaving the block will restore said signals, leaving the apparatus in operative condition for another car entering the block at either end.

While two wires are herein employed for the purpose of carrying out this invention, yet the operating parts at each end of the block are few and may be arranged in a simple compact form, and hence the apparatus as an entirety is very simple and not liable to get out of order.

The signals when set are positively held, so that a temporary cessation of the current on the current-carrying wire will not operate to restore the signals, which is a feature of importance in an apparatus of this description.

I claim—

1. In a trolley-signal, a signal-operating circuit comprising a signal-wire, and a ground branch at each end thereof, a signal in each ground branch, a spring-controlled switch-lever connected to each end of said signal-wire, a pair of switch-contacts for each switch-lever, one contact connected with the ground branch, and a wire connecting the other contact with a current-carrying wire, a latch for normally holding each switch-lever in engagement with the contact connected with the ground branch, a signal-setting magnet at each end of the block for operating said latch, a circuit therefor, and a restoring-magnet also at each end of the block for restoring the unlatched switch-lever, and circuit therefor, and means for connecting said restoring-circuit with the current-carrying wire at each end of the block, substantially as described.

2. In a trolley-signal, a signal-operating circuit comprising a signal-wire and a ground branch at each end thereof, a signal in each ground branch, a spring-controlled switch-lever connected to each end of said signal-wire, a pair of switch-contacts for each switch-lever, one contact connected with the ground branch, and a wire connecting the other contact with a current-carrying wire, and a signal in each said connecting-wire, a latch for normally holding each switch-lever in engagement with the contact connected with the ground branch, a signal-setting magnet at each end of the block for operating said

5 latch, a circuit therefor and a restoring-magnet also at each end of the block for restoring the unlatched switch-lever, and circuit therefor, and means for connecting said restoring-circuit with the current-carrying wire at each end of the block, substantially as described.

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

CHARLES H. MORSE.

Witnesses:

B. J. NOYES,

JOHN W. DECROW.