

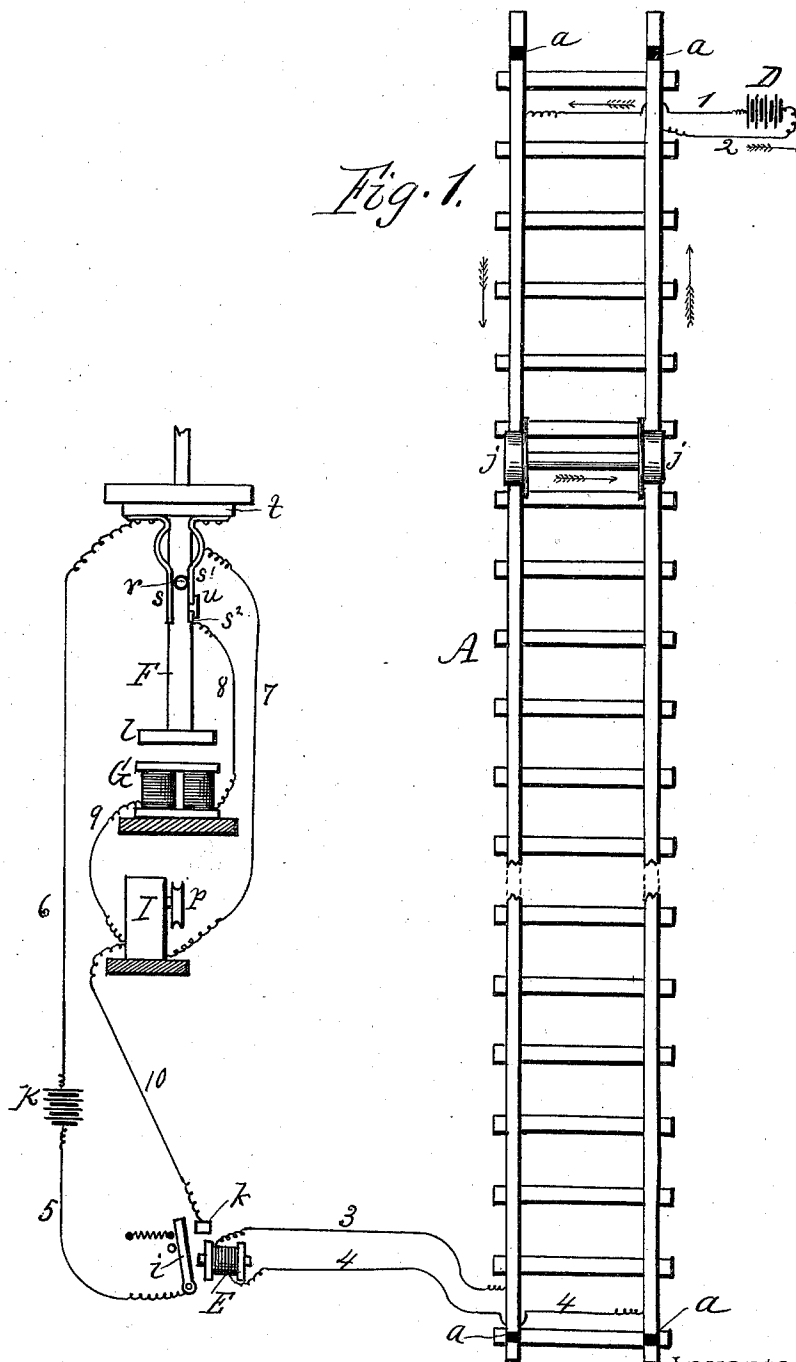
(No Model.)

2 Sheets—Sheet 1.

A. C. GORDON.
ELECTRIC BLOCK SIGNAL FOR RAILROADS.

No. 542,761.

Patented July 16, 1895.



Witnesses:

J. G. Coulson
J. C. Culver

Inventor.
Angus C. Gordon
per *R. F. Osgood*,
Attorney.

(No Model.)

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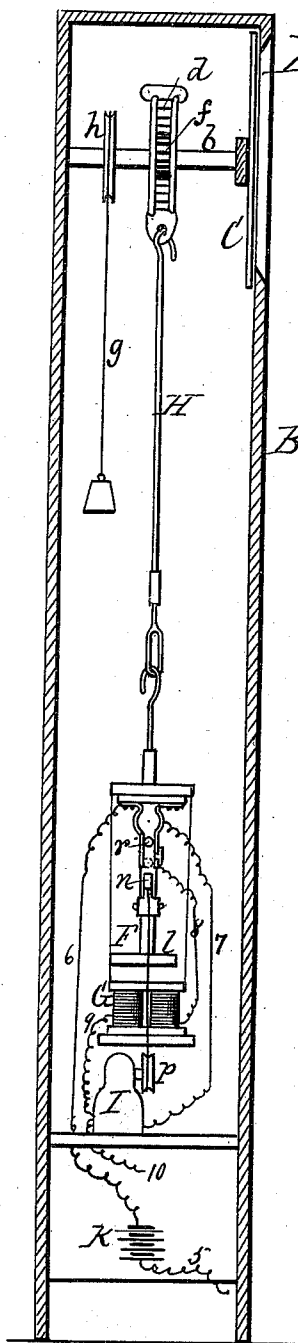


Fig. 2.

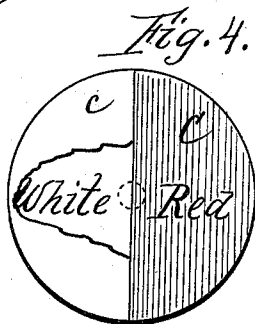


Fig. 4.

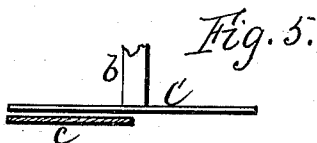


Fig. 5.

Fig. 6.

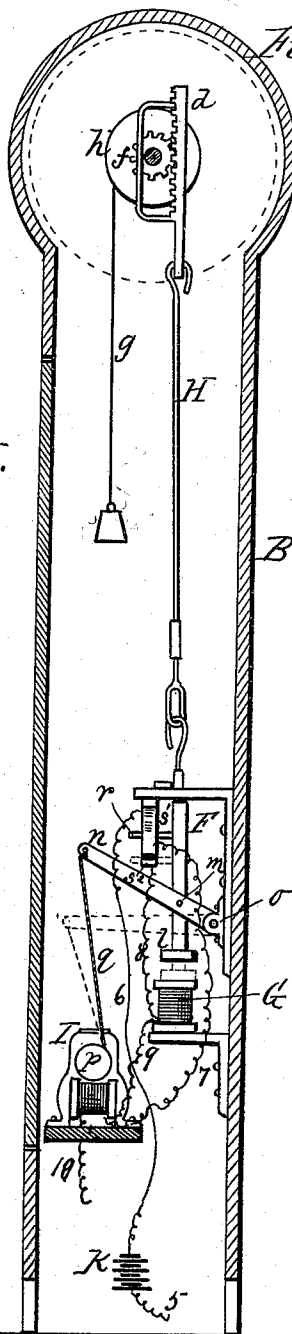
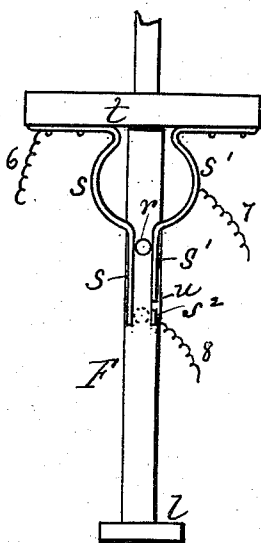


Fig. 3.

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UNITED STATES PATENT OFFICE.

ANGUS C. GORDON, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE GORDON RAILWAY SIGNAL COMPANY, OF SAME PLACE.

ELECTRIC BLOCK-SIGNAL FOR RAILROADS.

SPECIFICATION forming part of Letters Patent No. 542,761, dated July 16, 1895.

Application filed May 13, 1895. Serial No. 549,050. (No model.)

To all whom it may concern:

Be it known that I, ANGUS C. GORDON, of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Electric Block-Signals for Railroads; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the drawings accompanying this application.

My improvement relates to electric block-signals for railroads, in which, where a train or car is on the block, a short circuit is established through the wheels and axle, thereby opening the main circuit that controls the signal and leaving a standing signal of "danger." On the removal of the train or car from the block the relay operates by closing the main circuit and changing the signal to "safety." Such devices are already known, and I lay no claim to such broadly.

My invention consists in certain combinations of parts hereinafter claimed, whereby the parts in the signal-box are made simpler and more effective in operation.

In the drawings, Figure 1 is a diagram exhibiting one block in a railroad and the circuit connected therewith for operating the signal. Fig. 2 is a longitudinal vertical section of the signal-box. Fig. 3 is a similar section at right angles to Fig. 2. Fig. 4 is a face view of the shifting signal. Fig. 5 is a sectional plan view of the same. Fig. 6 is an enlarged face view of the conducting-plates.

A indicates one block in a railroad, the same being insulated from the adjacent blocks by non-conducting packings *a a*.

B is the signal-box. Within this box are located the shifting signal C and the connections by which it is operated. Preferably the signal consists of a disk attached to a shaft *b*, by which it receives half-rotation in opposite directions, but, if desired, may be made of other form and arranged to slide instead of rotate. One half of the face of the signal is red and the other half white to indicate "danger" and "safety," and over one half is placed a black screen *c*, Fig. 5, behind which the unused half of the signal is hidden when the other half is in use. The signal is turned

in one direction by a rack *d*, which engages with a pinion *f* on the shaft *b*, and it is retracted or turned in the other direction by a weighted cord or chain *g*, that winds on a pulley *h* of the shaft.

With the block A is connected an electric circuit, consisting of a battery D with two wires 1 2, connecting with the opposite rails at one end of the block, and wires 3 4, connecting with the rails at the opposite end of the block, said wires 3 4 connecting at their outer ends with an electromagnet E, which operates a switch *i*, and by bringing it in contact with an electrode *k* closes the main circuit and operates the signal, as will be hereinafter described.

It will be seen that when the block is clear the circuit through the wires 1 2 3 4 is closed and the armature switch *i* is drawn in contact with the electrode *k*, and the main circuit through the signal-box is closed; but in case a car is on the block, as shown at *j*, a short circuit is established through the wires 1 2, the rails, and the wheels and axles, as indicated by the arrows, Fig. 1, and the magnet E is consequently demagnetized, and in that case the switch *i* in the main circuit is open, as shown. This feature, as before stated, is old.

The mechanism and connections in the signal-box for operating the signal are as follows:

F is a vertically-sliding rod forming a connection provided at its lower end with an armature *l*, which engages with an electromagnet G when drawn down. This rod is pivoted at *m* to a rock-lever *n* fulcrumed at *o* to the side of the box. The upper end of the rod F is connected with the sliding rack *d* by a rod H. When the sliding rod is drawn down the rack gives rotary motion to the signal-shaft, as before described. I is a motor provided with a pulley *p*, on which winds a cord *q* attached to the outer end of lever *n*. When the motor is operated the pulley draws the sliding-rod F downward and brings its armature near to the magnet G. Instead of the cord winding on the pulley a rack and pinion may be used.

The sliding rod F has a projecting pin *r*, and

forming a switch, which plays between two conducting-plates s s' , separated from each other and attached to an insulated block t . The pin rests in contact with both plates. To the bottom of plate s' is attached a small metallic contact plate s^2 , separated from the plate s' by a thin insulated block u . In its downstroke the pin r passes from contact with the two plates s s' to contact with plate s and the small contact-plate s^2 , thereby changing the circuit, as will presently be described. The circuit for operating these parts has a battery K , from which extends a wire 5, connecting with the switch-armature i , and a wire 6 extending to the conducting-plate s . 7 is a wire connecting the plate s with the motor L . 8 is a wire connecting the contact-plate s^2 with the magnet G . 9 is a wire connecting magnet G with the motor L , and 10 is a wire connecting said motor with the electrode k .

When the block A is clear the circuit through the relay is closed and the switch-armature i also closed, which closes the main circuit through the signal-box. The current from battery K passes through wire 10, giving motion to the motor, thence through wire 7, the conducting-plate s' , the pin r , (which is then at its highest point,) through the plate s , and through wire 6 back to the battery. The motion given to the motor winds up the cord q , draws down with it the rod F and its pin r , until finally the pin r passes from contact with the two plates s s' and comes in contact with the plates s s^2 . The circuit is now changed, passing from battery K through wire 5, armature i , wire 10, wire 9, the magnet G , (charging same,) the wire 8, conducting-plate s^2 , the pin i , conducting-plate s , and wire 6 back to battery. This stops the motor, and by changing the magnet G draws down and holds the armature, which has previously been drawn down near to the magnet by the motor. In this position the signal has been shifted so that the white stands outward as the signal of safety. It is so retained as long as the block is clear. When a car passes onto the block the relay is short-circuited and the switch of the main circuit opened, as before described, and the armature i released from the magnet G , and the signal is then shifted from white to red, indicating "danger," by means of the weighted cord q , and so remains so long as the car remains on the block. A broken rail, or any other defect in the track by which the circuit is broken, sets the signal to "danger" in the same way.

The essential feature in this invention is the motor, or its equivalent, for drawing down the connection that operates the signal, and the electromagnet for holding the same in its depressed position so long as the block is occupied. The magnet alone cannot produce the desired effect, as the throw is too great to enable it to act upon the armature. The motor draws it down within the reach of the magnet, and the latter seizes and holds it,

while the motor releases its hold. The whole is accomplished with the minimum expenditure of battery-power.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric railroad signal, the combination of a shifting signal, a magnet, a rod between the signal and magnet provided with an armature, a motor, a connection between the motor and rod whereby the latter is operated, and an electric circuit connected with the motor and magnet and provided with a switch, whereby when the circuit is closed the motor first draws down the armature, then stops, while the magnet continues to hold the armature in place, as described.

2. In an electric railroad signal, the combination of a shifting signal, a magnet, a rod between the signal and magnet provided with an armature, a motor, a connection between the motor and rod whereby the latter is operated, an electric circuit connected with the motor and magnet and provided with a switch, whereby when the circuit is closed the armature is drawn down by the motor and held by the magnet, and means for retracting the signal when the armature is released by the magnet, as specified.

3. In an electric railroad-signal, the combination of a shifting signal, a magnet, a connection provided with an armature operating with the magnet, a motor, a circuit connected with the motor and magnet whereby the motor first draws the armature down to the magnet, and then stops while the magnet continues to hold the armature in place, and a circuit connected with the block controlling the main circuit, the whole arranged to operate in the manner and for the purpose specified.

4. The combination of a shifting signal, a rod for operating same provided with an armature at its end, an electro magnet for holding the armature when drawn in connection therewith, a motor connected with the rod to draw the same in contact with the magnet, electrical connections for giving motion to the motor and charging the magnet, and means for retracting the signal when released by the magnet, as specified.

5. The combination of a shifting signal, a rod for operating the same provided with an armature at its end, a magnet for holding the armature when in contact therewith, a rock lever to which the rod is pivoted, a motor with a connection for operating the rock lever, electrical connections for giving motion to the motor and charging the magnet, and means for retracting the signal when released by the magnet, as herein shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ANGUS C. GORDON.

Witnesses:

R. F. OSGOOD,
CHAS. A. WIDENER.