

(No Model.)

2 Sheets—Sheet 1.

G. A. TOWER.
ELECTRIC SIGNAL FOR RAILWAYS.

No. 436,025.

Patented Sept. 9, 1890.

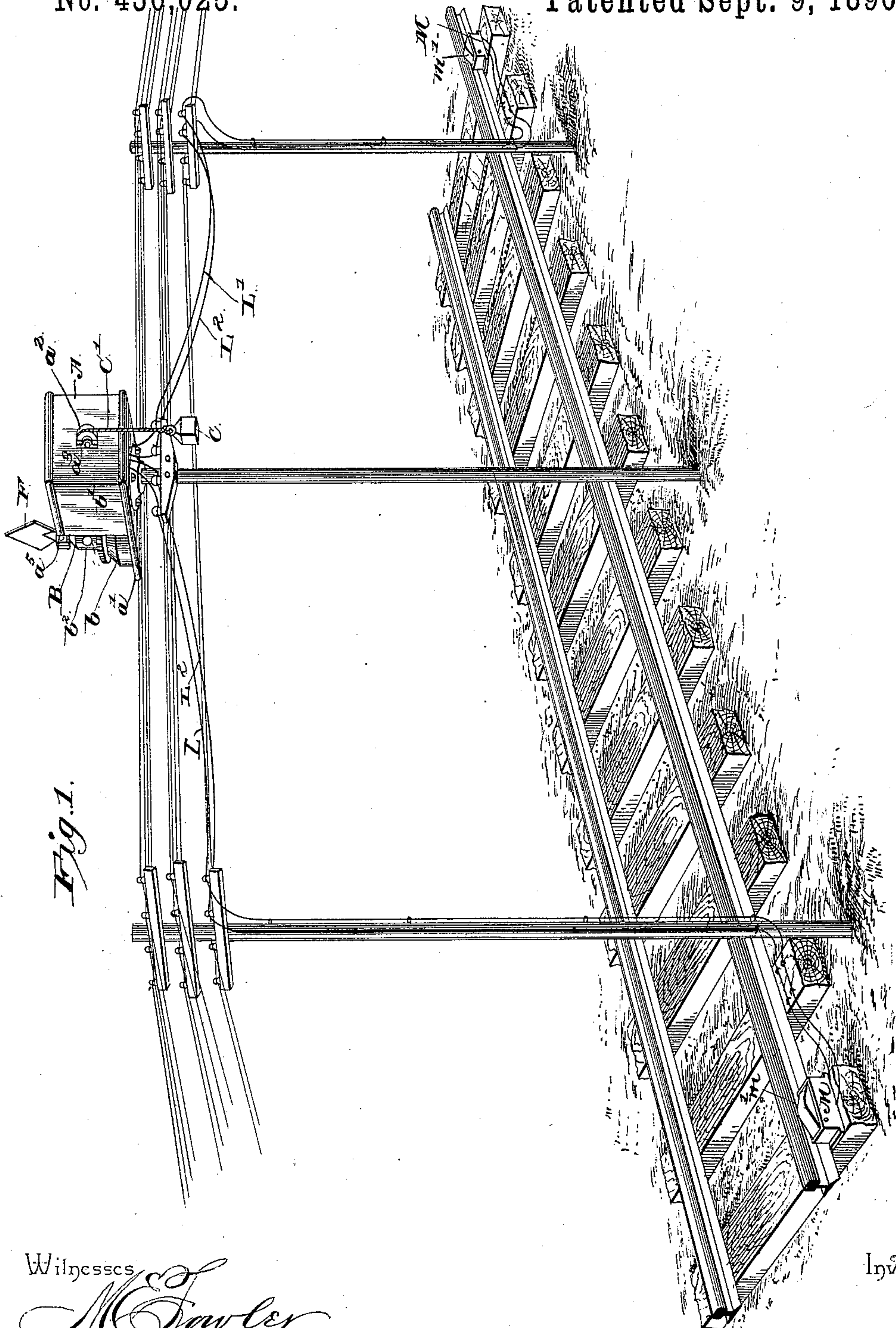


Fig. 1.

Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE ARMES TOWER, OF RICHMOND, VIRGINIA.

ELECTRIC SIGNAL FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 436,025, dated September 9, 1890.

Application filed June 11, 1889. Serial No. 313,857. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ARMES TOWER, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented a new and useful Electric Signal for Railways, of which the following is a specification.

The invention relates to electric signals for railways.

10 The object of the invention is to provide a signal designed to be employed upon railways at dangerous places—such as curves, steep grades, bridges, and the like—where there is a liability of accident, and capable of indicating 15 to an approaching train the condition of the road and the presence of another train and the direction in which the latter is going.

The invention consists in the construction and novel combination and arrangement of 20 parts hereinafter fully described, and illustrated in the accompanying drawings.

In the drawings, Figure 1 is a perspective view showing the application of the signal to a railroad. Fig. 2 is a detail perspective view of 25 the signal-operating mechanism. Fig. 3 is a side elevation of the same, partly in section. Fig. 4 is a side elevation, partly in section, of a circuit-closer designed to be operated by a locomotive.

30 Referring to the accompanying drawings, A designates the signal box or house, which is mounted upon the top of a pole and has its floor extended to provide a platform a' , upon which is secured a stationary base or oil-tank 35 b of a lantern B.

The signal-operating mechanism is actuated by a weight C, which is attached to a cord C' , that passes over guide-pulley a^2 , journaled in a suitable bracket fixed to the rear 40 side of the box A. The cord C' enters the box A through a perforation and is wound around the upper portion of a winding-shaft D, that carries a cog-wheel E, that projects through a slot a^4 in the front of the box A and gears 45 with a cog-rim b' around the lower end of the lantern-frame b^2 , which is capable of rotation, whereby when the shaft D, which is normally held against rotation, is released, the weight C will actuate it and cause the lantern-frame 50 b^2 to be turned to present a different signal. The movable lantern-frame b^2 is provided with circular openings b^3 , which are arranged upon

opposite sides of the frame and contain different-colored lenses, preferably white and red, and the cog-rim b' and the cog-wheel E are of 55 the same size, whereby the signals will be reversed at every half-rotation of the shaft. The base b of the lantern and the burner remains stationary, and the frame b^2 , which turns upon the base b and incloses the light, 60 is provided at its top with a diamond-shaped piece F, which is constructed of sheet-iron and is painted white and red to correspond to the color of the lenses and to exhibit the signals by day. The sheet-iron signal F is attached 65 to the top of the lantern B by means of a short rod f , which is journaled in suitable bearings a^5 formed at the front of a projection a^6 of the top of the box A. The upper end of the rod is flattened and enlarged and the sheet-iron signal is riveted or similarly secured 70 thereto.

The shaft D is provided with a small wheel G, which has upon its upper face lugs g , situated at diametrically-opposite points and 75 designed to be engaged by a detent-lever H to prevent the rotation of the shaft D. The lever H is pivoted in the upper bifurcated end i of a rod I, which has an enlarged base i' , by means of which it is secured to the floor 80 of the box A, and which is provided with an arm i^2 , extending out laterally in the direction of the long arm of the lever H. The arm i^2 carries a spiral spring J, which is secured thereto and bears against the under side of 85 the lever H and holds the detent h normally in engagement with one of the lugs g . The end h' of the lever has secured to its under side a soft-iron armature K, which is designed to be attracted by an electro-magnet K' to 90 disengage the detent h from the lug g to allow the shaft D to make a half-revolution to reverse the signals, the detent dropping again in time to engage the other lug g and prevent further rotation. 95

The wires L and L' leave the coils of the electro-magnet K' in opposite directions, and are carried along on telegraph-poles a suitable distance, and are run to circuit-closers M, arranged upon the side of the track, and 100 are designed to be operated by passing trains. In practice the batteries (not shown) are arranged within the box A.

The circuit-closer M consists of a rectan-

gular iron casing m , having a push-plate m' hinged to one of its sides and held normally elevated by a spring m^2 , which is secured to the bottom of the casing m by screws, to one of which is attached a return-wire L^2 , forming a part of the circuit. The wire L is connected to one of the screws that secure the short spring m^3 to the casing m , and the spring is separated from the bottom of the casing by block m^4 of insulating material, and is normally out of contact with the push-plate or the spring m^2 , which holds the push-plate m' elevated. The push-plate m' is triangular in longitudinal section, and the inclined sides are engaged by arms N , which are pivoted to the sides of the cow-catcher of an engine and swing between the two projections n and n' . The arm N hangs vertically against the projection n , and when the train is running forward the arm on one side will depress the push-plate, complete the circuit, and reverse the signals; but when the train is backing that arm will swing to the projection n' and will not depress the push-plate. The action of the arm N on the other side is reversed. A similar circuit-closer is arranged on the other side of the signal-box A , and when the train passes it the signals are again reversed, leaving them in their original position. The arms A are provided at their lower ends with wheels n^2 to facilitate their passage over the push-plates m' .

The signals are arranged at suitable intervals between stations, at junctions, curves, crossings, steep grades, bridges, and similar places where accidents are liable, and, as readily understood, they will indicate the presence of trains and the directions in which they are traveling.

From the foregoing description and the accompanying drawings the construction, oper-

ation, and advantages of the invention will readily be understood.

What I claim is—

1. The combination of the box A , the lantern having a stationary base and a frame revolving upon the same and provided with the cog-rim, the winding-shaft actuated by a weight, the cog-wheel mounted upon the shaft and meshing with the cog-rim, the wheel G , fixed to the shaft and provided with lugs arranged diametrically opposite each other, and the detent-lever engaging said lugs, substantially as described.

2. The combination of the box, the lantern having the revolving frame provided at its top with the sheet-metal signal and at its bottom with the cog-rim, the shaft actuated by a weight, the cog-wheel mounted upon said shaft and of the same size as the cog-rim with which it meshes, the wheel G , provided with lugs, and the detent-lever engaging said lugs, substantially as described.

3. The combination of the box, the lantern having the revolving frame provided with the cog-rim, the winding-shaft actuated by a weight, the cog-wheel E , the wheel G , having the lugs g , the rod I , having an arm i^2 , the detent-lever pivoted to the upper end of the rod and carrying the armature K , a spring secured to the arm i^2 and bearing against the lever and holding it in engagement with the lugs g , and the electro-magnet K' , adapted to withdraw said lever from engagement with said lugs, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

GEORGE ARMES TOWER.

Witnesses:

H. F. RILEY,

JOHN H. SIGGERS.