J. I. CONKLIN, Jr.

ELECTRIC RAILWAY-SIGNAL.

No. 183,642. Patented Oct. 24, 1876.

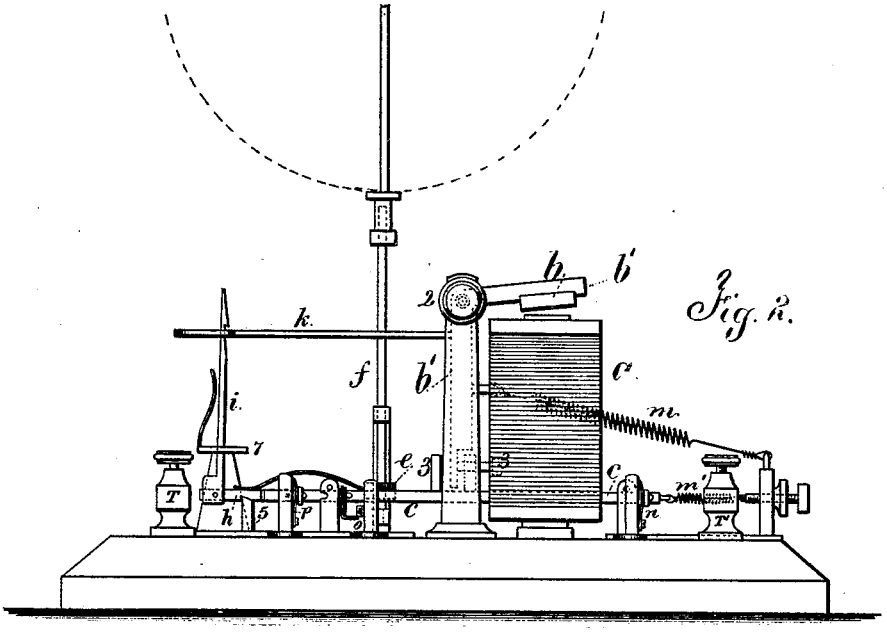
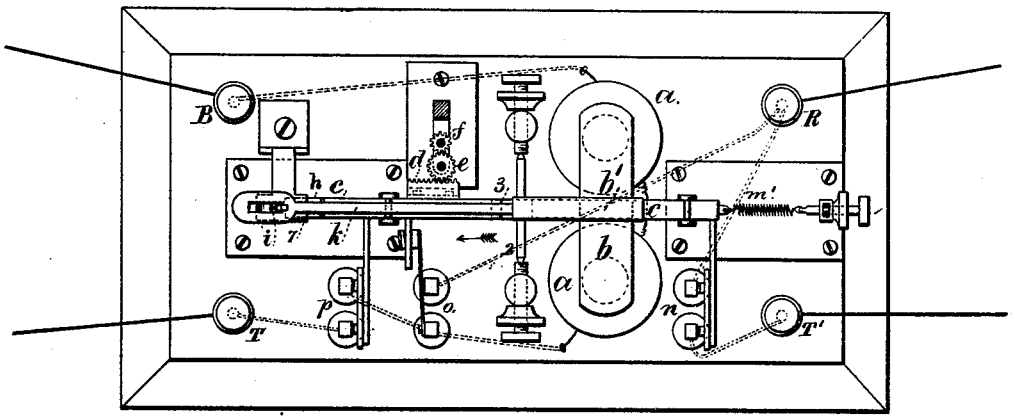


Fig. 2.

Fig. 1.



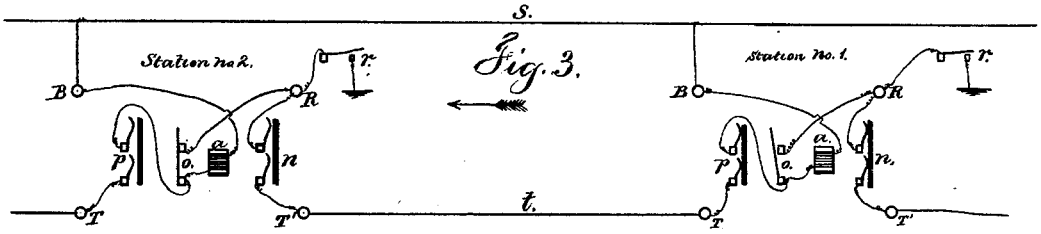


Fig. 3.

Witnesses

Chas. H. Smith

Geo. D. Walker.

Inventor.

Joseph I. Conklin Jr.

per L. W. Serrell

atty.

UNITED STATES PATENT OFFICE.

JOSEPH I. CONKLIN, JR., OF NEW YORK, ASSIGNOR TO HIMSELF AND CHARLES A. DRESSER, OF BROOKLYN, N. Y.

IMPROVEMENT IN ELECTRIC RAILWAY-SIGNALS.

Specification forming part of Letters Patent No. **183,642**, dated October 24, 1876; application filed April 20, 1876.

To all whom it may concern:

Be it known that I, JOSEPH I. CONKLIN, Jr., of the city and State of New York, have invented an Improvement in Electric Railway-Signals, of which the following is a specification:

The object of this invention is to display a danger-signal as soon as a train passes a given point, and keep that signal in view until the same train passes the next signal-station, thereby preventing one train from running into the rear of another train. The same device may be employed in displaying any other than a danger-signal.

The circuit-closer, that is operated by the pilot-wheels of the engine, closes a circuit to an electro-magnet, the magnet in which, attracting the armature, moves a bar that rotates into view the signal, and the signal is locked into position, and simultaneously the circuit from the track circuit-closer is broken and another circuit closed to the distant instrument. This prevents the other wheels of the train from operating the signal until the train arrives at the next instrument, the closing of the circuit of which operates, as aforesaid the instrument at that station, and at the same time the circuit is closed through the instrument that had been previously set at the next station behind, and the electro-magnet turns the signal back to the normal position.

In the drawing, Figure 1 is a plan of the instrument. Fig. 2 is a side view of the same; and Fig. 3 is a diagram representing the electric connections.

The electro-magnet *a* is provided with an armature, *b*, and bent lever *b'*, swinging upon the fulcrum 2, and the lower end operates between the studs 3 upon the sliding-bar *c*, that is provided with a rack, *d*, operating upon the pinion *e* to turn the vertical signal-shaft *f* first one way and then the other. Upon this signal-shaft is a hoop or frame of wire, covered with red flannel or other material, and this signal is made to turn a quarter of a revolution, so that when standing edgewise to the approaching train it indicates that the track is clear, and when turned to present its face to the engineer it indicates danger.

It is to be understood that any other character of signal may be operated by this electric apparatus, and that the position edgewise to the approaching train indicates one signal, and the position at right angles, or with the face to the approaching train, denotes the other signal.

The downward movement of the armature toward the electro magnet moves the bar *c* along endwise, and turns the signal, as aforesaid, and the latch *h* falls over the stop 5, and holds both the bar *c* and signal in the position to which it has been turned. Upon the latch *h* there is hinged a vertical catch-bar, *i*, with a spring to keep the upper end toward the armature, and this upper end of *i* is in a slot in an arm, *k*, that extends backward from the armature-lever, and this catch-bar *i* also passes through a stationary loop, 7. As the bar *c* is moved endwise the latch *h* falls upon the stud 5, and the catch-bar moves at its upper end toward the armature, and as the electro-magnet becomes demagnetized and the armature falls back, the arm *k* descends, and the catch-bar *i* catches over it. The parts are now in such a position that when the magnet is again energized the catch-bar *i* will be lifted and the latch *h* raised off the stud 5, and the parts will move together as the armature recedes from the magnet, and return to the normal position, giving the signal a quarter-revolution backward to the edgewise position, and the parts are again in position to be operated the next time the magnet is energized. The springs *m m'* act upon the armature-lever *b'* and bar *c* to give the same the return movement, and to raise the armature when the electro-magnet ceases to act.

There are three circuit-closing connections, *n*, *o*, and *p*. Two of these, *n* and *p*, are closed when the bar *c* is moved in the direction of the arrow, Fig. 1, and the other one, *o*, opened or broken. When the bar *c* is allowed to return by the spring *m'* to the normal position of rest the circuit-closer *o* is closed, and the two *n* and *o* are opened.

In the diagram, Fig. 3, two stations, No. 1 and No. 2, are shown, and the train is supposed to be moving in the direction of the arrow. It will be seen that in operating a num-

ber of these instruments along a line of railways it is preferable to employ two wires, one of which, *s*, is connected with the battery and extends the entire length of the railway, and the other, *t*, passes from one instrument to the next. The circuit-closing device upon the track at *r* is of any desired character, and when it is closed at station No. 1 by the first wheel of an approaching train the circuit is closed from *s*, through binding-screw B, electro-magnet *a*, circuit-closer *o*, binder R, track-circuit *r*, to earth. As the bar *c* moves, *o* is opened, which breaks the circuit through the magnet *a* from the battery, and the electro-magnet can no longer be energized by the aforesaid circuit, and in the movement of the bar *c* the connections are closed at *n* and *p*. In this way the instrument at station No. 1 remains with the danger-signal displayed until the train reaches the next track circuit-closer at station No. 2, and at that place the instrument is moved to danger by the circuit through *s* B *a o* R *r*, as before, and the instrument being set, by the motion of *c*, with *o* open and *p n* closed, a circuit is completed at station No. 2 to the instrument next in the rear at station No. 1, and the current passes from *s* through B, magnet *a*, at station No. 1, thence by *p* and binder T and line *t* to binder T′, at station 2, thence by *n* and R to track circuit-closer *r* and ground. In this last circuit the magnet *a* at station No. 1, being energized, returns the signal to a normal position, as before described, and it will be evident that any number of signals may be operated successively, as aforesaid.

I claim as my invention—

1. The vertical shaft *f*, carrying the signal, the pinion *e*, rack *d*, and sliding bar *c*, in combination with the electro-magnet *a*, armature *b*, armature-lever *b′*, and electric circuits arranged substantially as specified, to give the signal a quarter-turn when one track circuit-closer is operated, and to turn the signal back again when the next circuit-closer is operated, as set forth.

2. In an electro-magnetic railway-signal, the sliding bar *c*, latch *h*, and catch-bar *i*, in combination with the signal, the electro-magnet *a*, armature *b*, and circuit-closers *n o p*, substantially as set forth.

Signed by me this 12th day of April, 1876.

JOSEPH I. CONKLIN, JR.

Witnesses:

GEO. T. PINCKNEY,

CHAS. H. SMITH.