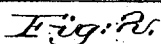


H. F. EATON.  
SIGNALING APPARATUS.

Patented July 14, 1891.



*Inventor:*  
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*Atty*

# UNITED STATES PATENT OFFICE.

HOWARD F. EATON, OF QUINCY, ASSIGNOR TO GEORGE W. GREGORY, OF BOSTON, MASSACHUSETTS.

## SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 455,873, dated July 14, 1891.

Application filed September 23, 1889. Serial No. 324,778. (No model.)

*To all whom it may concern:*

Be it known that I, HOWARD F. EATON, of Quincy, county of Norfolk, State of Massachusetts, have invented an Improvement in Signaling Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In United States Patent No. 359,688, granted to Bernice J. Noyes March 22, 1887, a signaling apparatus is shown especially adapted for police-signaling purposes, it comprising several signal-boxes and a receiving-station, each signal-box containing a signal-transmitter adapted to transmit special and patrol or post signals, distinguished, however, one from the other by an audible alarm which is brought into operation by a current change of different duration. The particular means shown in the said patent for carrying out the result was a creeper mechanism, and two relays are required at the signal-station, one for effecting the operation of the register and the other for effecting the operation of the creeper mechanism.

This invention has for its object to provide a simple yet efficient means by which the results specified in said patent may be carried out, the effect being produced by current changes of different duration.

In accordance with this invention, at the receiving-station a relay is connected or included in a circuit, the armature of which is adapted, whenever retracted for a short period of time, to close a local circuit containing a register, and whenever retracted for a long period of time not only closes said local circuit containing the register, but also moves a switch or key to close another local circuit having connected to or included in it, directly or indirectly, a bell. To simplify the construction as much as possible, the switch or key is herein represented as an elastic arm carrying a contact for the local circuit containing the register. To cause the armature to move a long distance only upon the occurrence of a long change in the circuit, a retarding device is connected with it.

Figure 1 shows in side elevation a receiving-relay and retarding device connected with the armature thereof; Fig. 2 a plan view

of the relay shown in Fig. 1; Fig. 3, a diagram of the circuits arranged to carry out this invention; and Fig. 4 is a sectional detail to be referred to.

The signaling-circuit  $a$  will contain one or more signal-boxes  $a'$ , although several are usually employed, also a receiving-relay  $b$ , the latter being located at the receiving-station. The signal-boxes each contain a multiple signal-transmitter arranged to transmit different signals, some of which signals are more important than others, and hence are termed "special signals," while those of less importance are termed "patrol or post signals."

One class of signals—as the patrol or post signals, for instance—are transmitted by current changes of short duration, while those of the other class—as special signals, for instance—are transmitted by current changes of long duration, or it may be by current changes of both short and long duration. The receiving-relay  $b$  comprises the usual coil  $b'$  and armature  $b^2$ . The armature  $b^2$  when retracted strikes a front contact  $c$ , closing a local circuit  $c'$ , containing a battery  $c^2$  and a register  $c^3$ . The arm carrying the contact  $c$  is made elastic or spring-acting, so that when pressed upon by the armature  $b^2$  and moved a short distance it closes against the contact  $d$ , thereby closing a local circuit  $d'$ , containing a battery  $d^2$  and electro-magnet  $d^3$ , the armature of which magnet controls a drop  $d^4$  of a local circuit  $d^5$ , containing a battery  $d^6$  and a bell  $d^7$ , although the bell  $d^7$  may be included in the local circuit  $d'$  in lieu of the magnet  $d^3$ . The armature  $d^2$  is acted upon by a weight, or it may be a spring, a weight, as  $b^3$ , being herein shown, to move it away from the core of the relay. The armature  $b^2$  has fixed to it an arm 2, which has a pin 3 projecting laterally from it, which enters a slot formed in an arm 4, loosely mounted on a shaft, said arm 4 being fixed to or formed integral with a ratchet-wheel 5. An escape-wheel 6 is mounted on the same shaft, with which wheel co-operates a suitable pallet 7, said escape-wheel carrying a pawl 8, adapted to engage the teeth of the ratchet-wheel 5. This escapement pawl and ratchet connected with the armature constitutes a retarding device

vice for retarding its movement from the cores of the relay.

As the armature  $b^2$  is retracted it is permitted to move freely the length of the slot in the arm 4, or sufficiently to close on or against the contact  $c$ ; but should the circuit be open or in an abnormal condition a sufficient length of time the weight  $b^3$  will move the armature against the action of the retarding device and press the elastic contact-arm against the contact  $d$ . Thus it will be seen that by short changes in the circuit the local circuit  $c'$  will be closed, and by long changes the local circuit  $d'$  in addition thereto will be closed; and again, upon the occurrence of short changes the register  $c^3$  will be operated, while upon the occurrence of a long change both the register and bell will be operated.

I claim—

1. One or more signal-transmitters and a signal-receiving relay connected by an electric circuit, the said transmitters, being constructed and arranged to change the condition of the circuit for intervals of different duration, combined with a register contained in a local circuit governed by the armature of said signal-receiving relay and a bell contained in another local circuit but governed

by the same armature, and a retarding device for the armature, whereby it is caused to differentiate, substantially as described.

2. One or more signal-transmitters and a signal-receiving relay connected by an electric circuit, the said transmitters being constructed and arranged to change the condition of the circuit for intervals of different duration, combined with a register the circuit of which is controlled by the armature of said relay, a bell located at the station containing the register, and a switch for controlling the bell-circuit, the movable member of which is governed by said armature as it retracts, and a retarding device operatively connected with the said armature, but effective only as the armature retracts, whereby the switch may be moved and the bell respond only with signals containing a current change of long duration, substantially as described.

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

HOWARD F. EATON.

Witnesses:

JAS. H. CHURCHILL,

E. J. BENNETT.