

C. C. BLAKE.
ELECTRIC SIGNAL.
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1,039,247.

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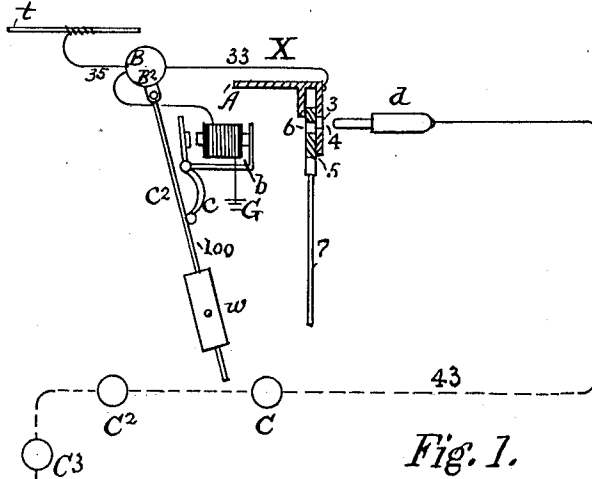


Fig. 1.

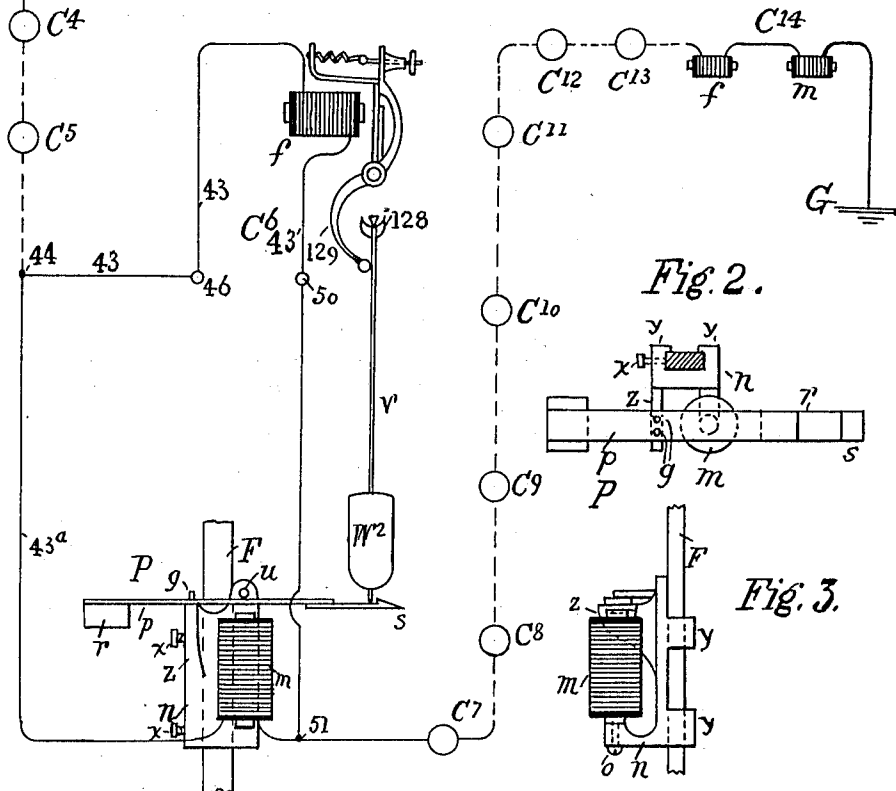


Fig. 2.

Fig. 3.

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ELECTRIC SIGNAL.

1,039,247.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES C. BLAKE, residing at Brookline, in the county of Norfolk and State of Massachusetts, have invented certain Improvements in Electric Signals, of which the following is a specification.

My present invention is an improvement upon the electric signal described in Patent No. 810,027, granted to me January 16, 1908, such as are employed in connection with long-distance electric trolley-railways wherein there is a central or signal-transmitting station and a plurality of way or signal-receiving stations connected by electric circuits, with means at the central station for selecting any particular way-station to the exclusion of the remainder, to automatically light a lamp at said way-station and cause a semaphore-arm to fall, in order to indicate to an approaching car a call from the train-despatcher or other official of the road.

The means preferably employed for selecting the signal apparatus at a station preferably consists of a series of controlling pendulums at the central station, all of unequal length, normally held locked, any one of which is adapted to be released and vibrated to send electric impulses to the line, and also of a series of single pendulums one at each of the way-stations corresponding in length with those at the central station. The selection of any particular way-station instrument depends upon its responding to the vibrations of its controlling central-station pendulum, as it is well known that pendulums of equal length are responsive to a similar number of vibrations, and when any central-station pendulum is set in motion the pendulums at all of the way-stations will respond and vibrate, but only the way-station pendulum which is of the same length as the transmitting-pendulum will become operative and cause a circuit-closer to close a normally open grounded circuit to a source of current and light a signal-lamp at the way-station upon the release of a semaphore-arm and also operate a return-signal at the sending-station. The controlling-pendulums at the central station are arranged in a suitable frame and are normally held from vibrating by an automatic locking and releasing device and are each provided with a mechanical circuit-making and breaking device to send electric impulses to the line,

combined with which is an electromagnetic mechanism for closing at frequent intervals a local circuit including a source of current by means of which the pendulum is kept vibrating after having been released. The automatic locking and releasing devices of the controlling-pendulums are each provided with a switch-socket and are controlled by a plug which forms the terminal of the line, which when inserted in any one of the said sockets releases that particular pendulum and connects the line thereto. Upon the termination of the ensuing conversation the conductor of the car mechanically resets the semaphore-arm and thus effaces the lamp-signal, and the despatcher having previously withdrawn the said connecting-plug the several parts automatically become normal.

In the patent referred to the single pendulums at the way-stations are not provided with locking devices but hang straight downward, and I find in practice several disadvantages from this construction.

The present invention, therefore, relates to means for locking the single pendulums at the way-stations during the time the switch-plug is out of a switch-socket, while they are not responding to the vibrations of the controlling central-station pendulums; but upon the insertion of a plug in a socket the way-station pendulums will be free to vibrate and perform their functions, and upon the withdrawal of the plug from the socket they will again become locked and cease to vibrate.

In the appended drawings Figure 1 is a schematic illustration of the invention and covers enough of the general system to intelligently comprehend the improvement constituting the present invention, reference being had to the before-mentioned patent for further details. Fig. 2 is a plan view of the relay P shown in the former figure; and Fig. 3 is a side view of the relay P.

In the drawings X is the central-station and C, C², C³ to C¹⁴ are the way-stations indicated merely by a circle except C⁶ and C¹⁴, which represent details sufficiently to indicate the invention, reference being had to the drawing of the patent referred to.

At the central-station X, *t* is the trolley-wire of the electric railway, which is the source of current, from which extends the wire 41 to the electromagnet *b* and ground G.

B, B² indicates the circuit-closing devices which regulate current to the local circuit to operate the electromagnet *b* by means of which the pendulums *W* on the rod 100
5 (only one of which is shown) are actuated by the lever *c*, *c*² to keep them in full vibration.

A is a portion of the frame which supports the members of the operating device.
10 3 is a depending part of the frame to which is connected the wire 35—33 from the trolley wire *t*, and in which are the plug holes 4, and 7 is a rod connecting the bar 5 having plug holes 6 with the pendulum tripping device, not shown.

The line-wire 43 which connects station X with the way-stations terminates in the plug *d*, and includes at each station an electromagnet *f*, and is grounded at the last station.
20

The apparatus at each way-station is adapted to be secured to a pole, tree or other suitable support, and consists essentially of a pendulum device, with a pendulum *W*² depending from a rod *V* supported by a knife-edge 128 in a suitable hanger, and adapted by means of the lever 129 and intermediate members to be operated by the electromagnet *f* when suitable impulses are
25 conveyed over the line from X.

It has been found in practice that the pendulums at the way-stations are liable to disturbances occasioned by the vibrations due to the shaking of the poles or other
35 support of the apparatus, by passing electric cars and other causes, which sometimes trips the members so that a false signal is made, to remedy which a locking device for the pendulum is provided in a multiple or
40 derived circuit 43^a around the electromagnet *f* from the point 44 to the point 51, including the high resistance electromagnet *m* which is adapted to lock all the pendulums *W* when the plug *d* is withdrawn from its
45 socket, and permit them all to become unlocked when the said plug is inserted into the plug socket. Electromagnets *f* and *m* may also be in series as shown at way-station C¹⁴.

The electromagnet *m* is secured to the standard *n* by the bolt *o*, and the latter is provided on its opposite side with the hollow projections *y y* and is adapted to be adjustably secured for different lengths of
55 pendulums to the frame *F* by means of the set screws *w w*; extending from the upper part of the standard toward the front is a bracket *z* having in its upper side two pins *g* and projecting over the top of the magnet

from the standard is a stop-rod *u*; and *p* is 60 an armature provided with holes into which enter the pins *g* as it extends across the upper pole of the magnet. The armature has a weight *r* upon one end and on the other is a tapered catch *s*, and in its normal position 65 the weight *r* is adjusted to hold the tip of the pendulum caught on the inside of the catch *s* and prevent the pendulum from vibrating.

In operation the current comes from the 70 trolley-wire *t* over the line wire 43 to the point 44 of all the stations where it splits, the main portion continuing to screw post 46, electromagnet *f*, screw post 50, and point 51, and to the other stations, and ground 75 *G*; the lesser current continues from point 44, wire 43^a and electromagnet *m* to the point 51 over a multiple circuit to the main line, and there will be sufficient current over the derived circuit 43^a to unlock the pendu- 80 lums so that they can vibrate and one only be selectively operated by the current over the main line, and upon the withdrawal of the plug all the pendulums become locked, as there will be no current on the line, the 85 electromagnet *m* will become demagnetized, and the pendulums in swinging will be caught by the catches *s* and held from vibrating.

By this improvement all tendency to trip the signals when no current is on the line is 90 avoided, and the margin of safety in setting the signals and the speed of operation is increased.

When the electromagnets *f* and *m* are arranged in series the operation will be the 95 same as previously described of the magnet *m* in shunt with the electromagnet *f*, and in this case both electromagnets may be of equal resistance if desired.

I claim as my invention:— 100

A selective signal system consisting of a transmitting-station having means for sending impulses of different frequencies over a line-wire when connected thereto; a series of way-stations each provided with a pen- 105 dulum device adapted to respond to said impulses, with means at each way-station to lock said pendulum device and prevent its vibrating, as set forth.

In testimony whereof, I have signed my 110 name to this specification in the presence of two subscribing witnesses, this 28th day of February 1912.

CHARLES C. BLAKE.

Witnesses:

JOHN L. WARREN,

REGINALD H. JOHNSON.