

1,245,894.

The diagram illustrates an electrical circuit with the following components and connections:

- Central Component (R):** A circular element containing internal components labeled 10, 11, 15, 16, and 24. It is connected to a power source 12 via a switch 14.
- Power Source (12):** A main power supply connected to the circuit.
- Series Components:** A resistor 25, a capacitor 26, and a variable resistor 21 are connected in series.
- Battery (17):** A battery connected to the circuit.
- Branches:** The circuit branches into two paths, each containing a resistor (27 and 30) and a battery (23 and 23').
- Ground Connections:** Several ground symbols are shown, indicating connections to a common reference point.

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UNITED STATES PATENT OFFICE.

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TELEGRAPHIC RECEIVING SYSTEM.

1,245,894.

Specification of Letters Patent.

Patented Nov. 6, 1917.

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To all whom it may concern:

Be it known that I, JOHN M. FELL, residing at Hackensack, in the county of Bergen and State of New Jersey, have invented certain Improvements in Telegraphic Receiving Systems, of which the following is a specification.

This invention relates to telegraph systems and especially to means for receiving signals. Its principal objects are to provide an organization in which the time of travel of the armatures of the receiving apparatus between their contact stops will be reduced and the firmness of contact with the engaged stops increased, thus improving the quality of the signals.

One arrangement for carrying out the invention is illustrated diagrammatically in the accompanying drawing.

My invention will be described in connection with a polarized relay adapted for use in a differential duplex telegraph system, the more essential portions of this apparatus being indicated at R. It is to be understood, however, that other types and forms of relay may be employed. The main windings 10 carried by cores 11 are shown as connected in an operating circuit, of which 12 may be the main conductor leading to a distant station, 13 that of the artificial line of a duplex system, and 14 the common conductor connected to the contact of a pole changer, this artificial line, pole changer and relay being at the receiving station and arranged in the usual manner. The relay magnets are preferably polarized by a winding 15 upon a core 16 and supplied with current from a battery 17. The armature 18 of the relay, playing between contacts 19 and 20, is joined through a relatively high resistance 21 with the grounded winding of a signal receiving apparatus R', which may be a polarized sounder. The contacts 19 and 20 are united to grounded batteries 23 and 23', respectively. Upon the cores 11 is an auxiliary winding 24 independent of the main and polarizing windings. One terminal of this auxiliary winding is joined to the relay armature, while the other terminal is connected to ground through a resistance 25 and condenser 26, and preferably through the winding of sounder R'.

Such a signaling current arriving over the line that the armature 18 is moved against the stop 19, the condenser 26 is charged from

battery 23, causing an impulse to flow from said battery through resistance 27, contact 19, armature 18, conductor 28, auxiliary winding 24, conductor 29, resistance 25, condenser 26 and the winding of sounder R'. The auxiliary winding is so connected that the impulse, continuing until the condenser is fully charged, acts to hold the armature against the contact while the operating current is building up toward its maximum. The magnetization thus imparted to the cores 11, 11 resists the tendency of the armature to chatter upon the contact and thereby produce false signals, a condition often caused by induced or earth currents. When upon a reversal of the line current the armature 18 leaves contact 19, the condenser discharges through the winding 24 and sounder R', giving an impulse opposite to that occurring when the condenser was charged. The effect of the magnetization of the cores 11, 11 is now such as to aid the operating current to move the armature, this coming at a time when said current is weakest. Upon reaching the contact 20 battery 23' charges the condenser through resistance 30, contact 20 and the path first traced, with a succeeding discharge, resulting in a similar retaining and accelerating action of the auxiliary circuit upon the armature as that just described. By varying the capacity of the condenser 26 and the magnitude of the resistance 25, the value of current in the auxiliary winding may be changed to control its effect. A suitable resistance has been found in practice to be 3000 ohms, while the capacity of the condenser may be 2 microfarads. A resistance of about ten thousand ohms may be used at 21.

It should be further noted that as the charge and discharge of the condenser passes through the winding of the sounder R', which constitutes another element of the receiving apparatus, like beneficial results will be attained, the charging impulse holding the sounder lever in more firm engagement with its stop, and the impulse upon discharge assisting its travel toward the opposite stop.

I claim:

1. In a telegraph receiving system, a receiving apparatus, an initial energizing circuit therefor, a second energizing circuit therefor including a signal-receiving device, said circuit being controlled by the receive-

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ing apparatus, and means for causing a current impulse through the receiving apparatus and said device when the continuity of the last-named circuit is altered.

5 2. In a telegraph receiving system, an operating circuit, a relay having a main winding and an auxiliary winding, the main winding being connected in the operating circuit, an auxiliary circuit including said
10 second-named winding, a signal-receiving device and a source of current controlled by contacts of the relay, and means for delivering a current impulse to the auxiliary winding upon initial change of engagement
15 between the relay armature and a contact.

3. In a telegraph receiving system, an operating circuit, a relay having a main winding and an auxiliary winding, the main winding being connected in the operating
20 circuit, and an energizing circuit for the relay including; a source of current, a contact of the relay, its auxiliary winding, a condenser for delivering a current impulse to said auxiliary winding upon initial change
25 of engagement between the relay armature and a contact, and a signal-receiving device controlled by said relay.

4. In a telegraph receiving system, an operating circuit, a relay having its winding
30 in said circuit, a source of current connected

to contacts of the relay, means for delivering an energizing impulse to the relay upon initial change of engagement between its armature and a contact, and signal receiving apparatus included in the path of said energizing impulse. 35

5. In a telegraph receiving system, an operating circuit connecting stations, a relay having its winding in said circuit, an energizing circuit for the relay independent of
40 the operating circuit and including a condenser, and a signal receiving apparatus included in said energizing circuit.

6. In a telegraph receiving system, an operating circuit, a relay having a main winding and an auxiliary winding, the main winding being connected in the operating
45 circuit, an energizing circuit for the relay including a source of current, a contact of the relay, its auxiliary winding and a condenser, and a sounder having its winding included in said energizing circuit. 50

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this first day of
July, 1916. 55

JOHN M. FELL.

Witnesses:

EDW. F. WATSON,
B. PERRY HAMILTON.