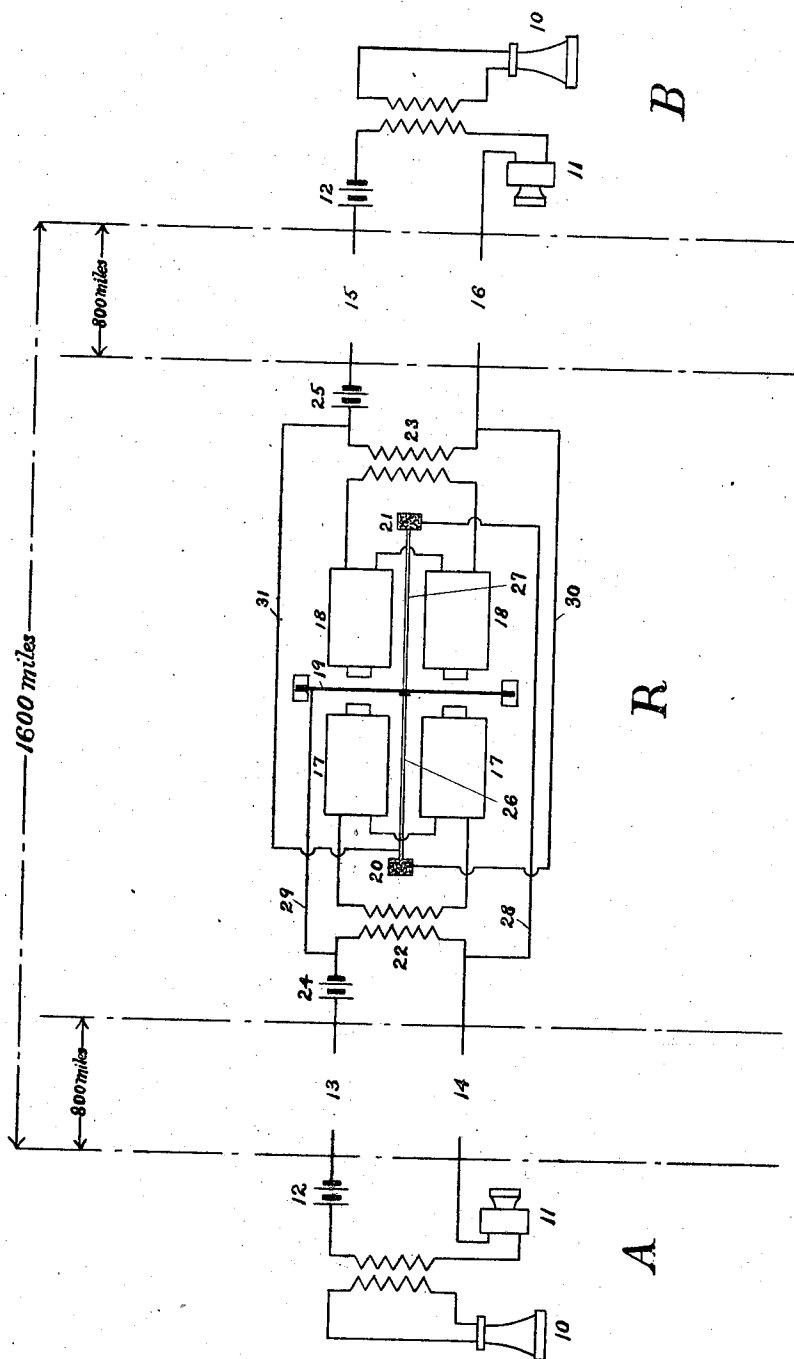


No. 847,656.

PATENTED MAR. 19, 1907.

D. S. DICKERT.
TELEPHONE RELAY.
APPLICATION FILED MAY 22, 1906.



Witnesses
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UNITED STATES PATENT OFFICE.

DILPERT S. DICKERT, OF SALT LAKE CITY, UTAH.

TELEPHONE-RELAY.

No. 847,656.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed May 22, 1906. Serial No. 318,152.

To all whom it may concern:

Be it known that I, DILPERT S. DICKERT, a citizen of the United States, and a resident of Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Telephone-Relays, of which the following is a specification.

My invention relates to relays for telephone-circuits; and it has for its object a telephone-relay which when inserted into the telephone-circuit will enable sound-waves to be transmitted much greater distances than is at present possible without a relay.

For this purpose my invention consists, essentially, of a telephone-relay comprising two sets of magnets, a diaphragm controlled by said magnets, and means in connection with said diaphragm to transmit and strengthen weak incoming vibrations.

The nature of my invention will best be understood in connection with the accompanying drawing, which is a diagrammatic view showing my relay connected in circuit between two stations.

Referring to the drawing, A and B indicate two telephone-stations, for example, sixteen hundred miles apart and each eight hundred miles from the transmitting-relay R, eight hundred miles being about the present limit of direct transmission.

10 represents the usual telephone-receiver, and 11 the transmitter.

12 is a local battery located either at the instrument or at a central station.

13 and 14 are the line-wires from station A, and 15 and 16 the line-wires from station B.

The relay-transmitter R comprises the two sets of receiving-magnets 17 and 18, one for each station, a common diaphragm 19, placed between said magnets, transmitters 20 and 21, and the induction-coils 22 and 23, and batteries 24 and 25.

The line-wires 13, 14, 15, and 16 terminate, respectively, in the primary coils of the induction-coils 22 and 23, whose secondary coils are in a closed circuit including, respectively, the magnets 17 and 18. The relay-battery 24 is located in series in one of the line-wires from station A and the relay-battery 25 in one of the line-wires from station B. The transmitting devices 20 and 21 are preferably of the carbon type with contact-

point operated by the diaphragm 19. The transmitter 20 is connected by wire 30 with line-wire 16, and the contact-rod 26, insulated from the diaphragm 19, is electrically connected by wire 31 with the line-wire 15. The transmitter 21 is connected to the line-wire 14 by wire 28, and the contact-rod 27 is electrically connected with the diaphragm itself, which is in connection with line-wire 13 through wire 29.

The operation and circuits of my improved relay-transmitter are as follows: A weak telephonic impulse on the line 13 14 enters the relay and completes the circuit through the primary of induction-coil 22. A current is thus set up in the secondary of this coil, thereby energizing the magnets 17, which in turn move the diaphragm 19. The movement of the diaphragm 19 varies the resistance of the transmitter 20 through varying the degree of contact, and thereby varies the current through the circuit 20 30 16, station B, 15 25 31 20 reproducing the received telephonic impulses, but considerably strengthening them through the local battery 25. A telephonic impulse coming from the station B operates similarly by energizing the magnets 18 and operating the transmitter 21, which sends a corresponding strengthened impulse to the line-wires 13 14 through local battery 24.

In providing a common diaphragm between the two sets of magnets I avoid the objectionable effect of repeating back into the sending-line, causing a consequent confusion of vibrations. It might be supposed that the pulsations from one transmitter would affect the opposite primary and secondary, and thereby the corresponding magnets, and thus cause a repeating back into the sending-line. This does not occur, however; as the primary coil becomes partly short-circuited by the transmitter-circuit, thus weakening the magnets and releasing the diaphragm, and thereby the attached contact-rod, and increasing the contact resistance of the transmitter. Also since both contact-rods are attached to a common diaphragm, as the one is drawn toward its carbon block the other is drawn away, tending to increase the resistance of the transmitter-circuit. The one transmitter in operating thus automatically increases the contact resistance of the other by means of the common controlling-diaphragm and the part short-circuiting of the opposite primary.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a relay for telephone-lines, two magnetically-operated transmitting devices respectively shunted across the incoming and outgoing lines, and means to increase the contact resistance of one of said transmitting devices when the other is in operation.

2. In a relay for telephone-lines, two magnetically-operated transmitting devices respectively shunted across the incoming and outgoing lines, and means to automatically increase the contact resistance of one of said transmitting devices when the other is in operation.

3. In a relay for telephone-lines, two magnetically-operated transmitting devices respectively shunted across the incoming and outgoing lines, and a common diaphragm operatively connected therewith and adapted to increase the contact resistance of one of said transmitting devices when the other is in operation.

4. In a relay for telephone-lines; two induction-coils; two transmitting devices; magnetically-controlled means operatively connected therewith; and two independent electromagnetic means included in closed circuits with the secondaries of said induction-coils.

5. In a relay for telephone-lines; two induction-coils; two transmitting devices; two electromagnetic means included in closed circuits with the corresponding secondaries of said induction-coils; and a common diaphragm operated by said electromagnetic means and controlling said transmitting devices.

6. A relay adapted to be inserted in a telephone-line, and comprising two induction-coils whose primaries are respectively in series with the incoming and outgoing lines; two electromagnets, included in closed circuits with the corresponding secondaries of said induction-coils; a common diaphragm interposed between said electromagnets; and two transmitting devices controlled by said diaphragm and operated through said magnets.

7. A relay adapted to be inserted in a telephone-line, and comprising two induction-coils whose primaries are respectively in series with the incoming and outgoing lines; two electromagnets included in closed circuits with the corresponding secondaries of said induction-coils; a common diaphragm interposed between said electromagnets; a transmitter-circuit shunted across said outgoing line; a transmitter-circuit shunted across said incoming line; a source of electricity in series with said outgoing line; a source of electricity in series with said incoming line; a transmitting device in said transmitter-circuit shunted across the outgoing line; a transmitting device in said transmitter-circuit shunted across said incoming line, said transmitting devices being controlled by said diaphragm and operated through said electromagnets.

Signed at Salt Lake City, in the county of Salt Lake and State of Utah, this 3d day of May, A. D. 1906.

DILPERT S. DICKERT.

Witnesses:

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