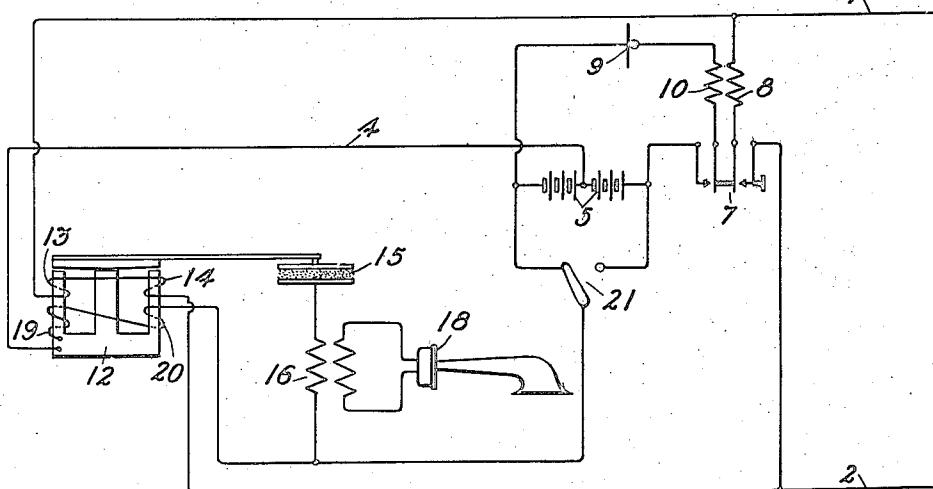


H. C. EGERTON.
ELECTRIC AMPLIFIER SYSTEM,
APPLICATION FILED NOV. 15, 1915.

1,232,514.

Patented July 10, 1917.



Inventor:
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by S. C. Barnes. Amy

UNITED STATES PATENT OFFICE.

HENRY C. EGERTON, OF PASSAIC, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO WESTERN ELECTRIC COMPANY, INCORPORATED, A CORPORATION OF NEW YORK.

ELECTRIC AMPLIFIER SYSTEM.

1,232,514.

Specification of Letters Patent. Patented July 10, 1917.

Application filed November 15, 1915. Serial No. 61,550.

To all whom it may concern:

Be it known that I, HENRY CLIFFORD EGERTON, a citizen of the United States, residing at Passaic, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Electric Amplifier Systems, of which the following is a full, clear, concise, and exact description.

10 This invention relates to amplifier systems for electric currents, and more particularly to amplifier systems for increasing the intensity of telephone currents.

15 The object of this invention is to simplify the arrangement of circuit connections to permit all of the devices at one station, or all of the devices at a plurality of stations on a telephone system of this character, to be supplied with current from one and the 20 same source.

25 In accordance with this invention, a common source of current supply is provided with a derived circuit, whereby a transmitter element operated by an electromagnetically-actuated amplifier means may be supplied with current at a potential lower than the potential of the current supplied to a primary transmitter. A switching means also provides that the transmitter 30 element may be included with different sections of the source of current supply.

35 This invention is illustrated diagrammatically in the accompanying drawing, in which a single telephone station completely equipped in accordance with this invention is shown.

40 Referring to the drawing, this invention provides that a plurality of stations, equipped in a manner similar to that illustrated in the drawing, may be connected with two main line conductors 1 and 2 in such a manner that a message transmitted from either one of the stations will be reproduced in unison at each one of the several stations, including the station which 45 may be transmitting the message.

45 The operation of this system may be described by tracing the processes and circuit action taking place when a message is transmitted from the station shown. A switching key 7 is first depressed, thereby including a secondary winding 8 of an induction coil in bridge on the line conductors 1 and 2. A second circuit also completed by this key includes a transmitter 9 in series with a pri-

mary winding 10 of the induction coil on a battery 5. The operating windings 13 and 14 of an electromagnetically-operated amplifier motor 12 established in bridge on the line conductors 1 and 2 are responsive to 60 current action set up by the primary transmitter 9, and a transmitter element 15 responds to the armature movement of this amplifier motor. The transmitter element 15 in turn sets up current action in the primary winding 16 of a second induction coil, which is therewith included in series over a derived circuit conductor 4 on the left-hand portion of the battery 5. The frame and armature of the electromagnet 70 12 form a path to complete the circuit from the conductor 4 to the transmitter element 15. A telephone receiver 18 included in series with the secondary winding of the last-mentioned induction coil accordingly 75 reproduces in an intensified manner a message spoken into the transmitter 9, and in like manner the message is also reproduced at all stations which may be connected with the line conductors 1 and 2. 80

85 In order to secure the necessary sensitivity in the electromagnet 12, it is provided with windings 19 and 20, which for convenience, are connected to receive current in parallel with the series formed by the transmitter element 15 and the induction coil primary 16. The coils 19 and 20 are connected in such relation one with the other that opposite magnetic polarities are present with each core; therefore a given impulse of 90 current through the operating windings 13 and 14 acts to increase the magnetic pull at one end of the armature while decreasing the magnetic pull at the other end of the armature all in a well-known manner. Suitable bearings at the middle pole piece of the amplifier electromagnet 12 permit the armature of this magnet to move reciprocally in a rocking manner in unison with reversals or changes in amplitude of the telephone 95 current through the coils 13 and 14, thereby varying the pressure on the active material of the transmitter element 15. 100

105 A switch 21 provides that the transmitter element 15 and the magnetizing coils 19 and 20 may from time to time be switched to either the left-hand or the right-hand portion of the battery 5, in order that the current drain may be equalized throughout the battery. 110

The battery 5 may be employed as a common current source for a plurality of stations included in a system, or an individual battery may be furnished for each station.

5 Although a battery has for convenience been shown as the source of current for this system, it will be understood that any suitable arrangement of generators capable of supplying current at three or more different

10 potentials may be substituted therefor.

It will be further understood that the switching arrangement 21 for controlling the derived circuits of the battery may be adapted to separate the circuits of the

15 secondary transmitter 15 from the circuits of the magnetizing coils 19 and 20, and that these separated circuits may at the same time be included on different portions of the battery 5.

What is claimed is:

In a telephone amplifier system, a primary transmitter, an electromagnetic means controlled by said transmitter, a transmitter element controlled by said electromagnetic means, a common source of current supply 25 for said system, means included in derived relation with said source of current adapted to supply current to said transmitter element at a potential less than the potential of the source of supply, and means for obtaining current at said reduced potential from different portions of said common source of current supply.

In witness whereof, I hereunto subscribe my name this eighth day of November A. D., 35 1915.

HENRY C. EGERTON.