

C. D. BABCOCK.
 TELEPHONE TRANSMITTER.
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936,207.

Patented Oct. 5, 1909.

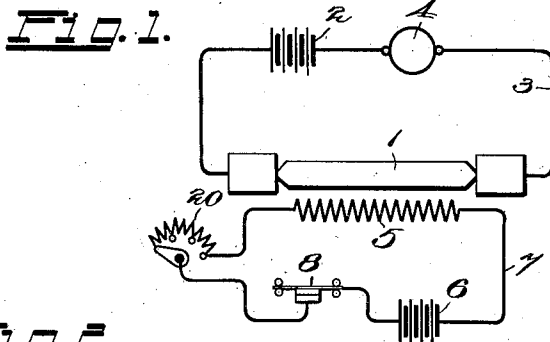


Fig. 2.

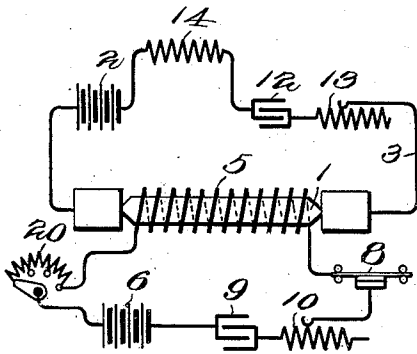


Fig. 3.

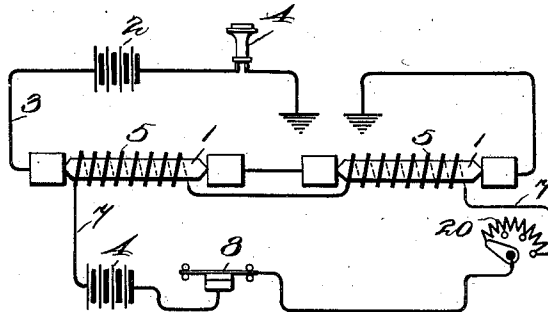


Fig. 4.

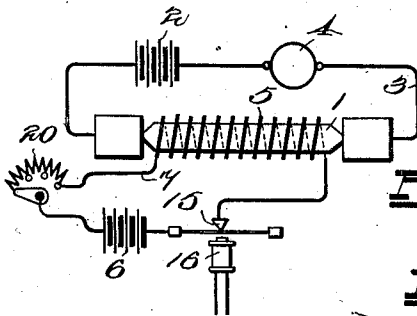


Fig. 5.

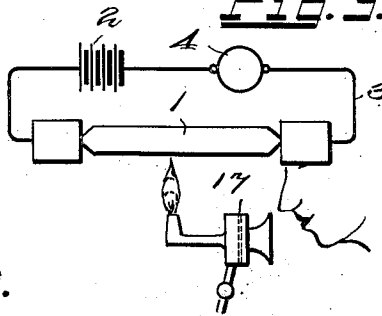
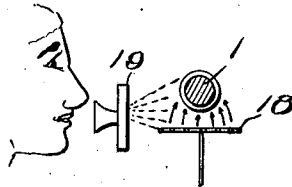


Fig. 6.



Witnesses
N. May Durrall
E. Dodge

Inventor
Clifford D. Babcock,
 by *Wickinson Grohn*
 & *Wicherspoon*
 Attorneys

UNITED STATES PATENT OFFICE.

CLIFFORD D. BABCOCK, OF NEW YORK, N. Y., ASSIGNOR TO UNITED WIRELESS TELEGRAPH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF MAINE.

TELEPHONE-TRANSMITTER.

936,207.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLIFFORD D. BABCOCK, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Telephone-Transmitters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to a telephone transmitter, and has for its object the production of such a transmitter as will be exceedingly sensitive in operation to faint sounds, and will at the same time be capable of transmitting by and in accordance with sound waves comparatively large differences of electrical energy without any sparking being heard in the receiver.

It is well known that certain chemical compounds and mixtures of compounds have the remarkable property of changing their electrical conductivity to an abnormal degree upon a small increase of temperature after a certain critical temperature has been reached, and I take advantage of this property to cause a current while passing through such compounds to be varied, all as will be more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification, in which like numerals refer to like parts in all views:—Figure 1, is a diagrammatic illustration of one form of the invention. Fig. 2, is a like view showing a modification in which oscillating sending and receiving circuits are employed. Fig. 3, a further modification showing the sensitive conducting elements in series. Fig. 4, another modification showing a telephone relay. Fig. 5, still another modification showing a sensitive flame as the heating means, and Fig. 6, a sectional view of a device employing a spiral heating means.

1 represents a sensitive conducting element composed of any suitable chemical compound or mixture of chemical compounds, such as certain oxids of the metals; certain chlorids; sulfids and certain iodids. Cupric oxid CuO , magnesium oxid, plumbic oxid, the mercury sublimates, and even common glass may be mentioned as examples of such suitable compounds, and which are dis-

tinguished from other compounds by the following properties:—At normal temperatures their resistances are very high, and as the temperature changes their conductivities correspondingly change, until critical temperatures are reached, when their conductivities experience changes for very small changes in temperature, which are very greatly in excess of the increases or decreases to be noted in their respective conductivities before the critical point is reached.

2 represents any suitable source of current; 3 a circuit passing through the element 1, and 4 any suitable receiver.

5 represents a heating means, included in the circuit 7, supplied from the source of current 6, and 8 any suitable telephonic transmitter.

In the form of the invention shown in Fig. 2, a capacity 9 and an adjustable inductance 10 are included in the heating circuit 7, and a capacity 12 and an adjustable inductance 13 are included in the circuit 3, which is also provided with a coil 14 by which the circuit 3 may be placed in inductive relation with an aerial of a wireless telephone or telegraph system.

In Fig. 3, two sensitive elements are joined in series, and the sending circuit 3 is shown as grounded.

In Fig. 4, the sending circuit is the same as in Fig. 1, but the heating circuit 7 is provided with any suitable variable contact device 15 which may be actuated by a telephone receiver 16, which in turn may be operated from a distant station.

Fig. 5, represents a sending circuit 3, as before, and a well known sensitive flame apparatus 17 is employed to keep the element 1 at or above the critical temperature.

In Fig. 6, a spiral or other means 18 may be dipped in a suitable combustible, as alcohol, the latter ignited, and while burning, or even after being extinguished, the heat from the spiral may be varied by the cooling action of sound waves directed on the element and spiral from the funnel 19.

In all cases the operation is as follows:—The sensitive conducting element 1 is raised to or above the critical temperature by manipulating the rheostat 20 or other suitable device controlling the quantity of heat delivered to the said element, and then the transmitter 8 or other device 17 or 19 is

brought into action to vary the heat received by said element 1. The result is, greater variations of energy in the sending circuit 3, than in the heating circuit 7, and consequently louder signals at the distant station.

It is evident that this invention is capable of wide variation by those skilled in the art without departing from the spirit of the invention, and therefore I do not wish to be limited to the details disclosed, except as pointed out in the claims.

What I claim is:—

1. In the art of transmitting speech, an element whose electrical conductivity is abnormally sensitive to small changes in temperature, when a given critical temperature is approached, and comprising in its composition a chemical compound, substantially as described.

2. A member of a telephone transmitter comprising in its composition an oxid whose conductivity is abnormally sensitive, when a certain temperature is approached, substantially as described.

3. A telephone transmitter provided with an element comprising a chemical compound, whose conductivity is abnormally sensitive to changes of temperature, when a certain temperature is approached, and means for heating said element, substantially as described.

4. A telephone transmitter provided with an element composed of an oxid whose conductivity is abnormally sensitive to temperature changes when a critical temperature is approached, and controllable means for heating said element, substantially as described.

5. A telephone transmitter provided with an element comprising a chemical compound whose conductivity is abnormally sensitive to changes in temperature, when a critical temperature is approached; a sending circuit passing through said element; a heating means for the same, and means for controlling said heating means; substantially as described.

6. In a telephone transmitter the combination of a sending circuit; a receiver and an element whose conductivity is abnormally sensitive to temperature changes when a critical temperature is approached and composed of a metallic oxid included in said

circuit; and means for raising said element to any desired temperature; substantially as described.

7. In a telephone transmitter the combination of a sending circuit; a receiver and an element whose conductivity is abnormally sensitive to temperature changes when a critical temperature is approached, said element being composed of a metallic oxid included in said circuit; means for raising said element to any desired temperature comprising a heating circuit provided with a coil in proximity to said element; and means to control the current through said coil; substantially as described.

8. In a telephone transmitter the combination of a sending circuit; a receiver and a conducting element composed of a metallic oxid included in said circuit; means for raising said element to any desired temperature comprising a heating circuit provided with a coil in proximity to said element; a telephone transmitter in said heating circuit; and means to control the current through said coil, substantially as described.

9. In a telephone transmitter the combination of a sending circuit; a receiver and a conducting element composed of a metallic oxid included in said circuit; means for raising said element to any desired temperature comprising a heating circuit provided with a coil in proximity to said element; a telephone transmitter in said heating circuit; means to actuate the same from a distant station; and means to control the current through said coil, substantially as described.

10. In a telephone transmitter the combination of a sending circuit provided with a capacity and an adjustable inductance; a conducting element sensitive to small changes in temperature in said circuit; a heating circuit for said element also provided with a capacity and an adjustable inductance, and a telephone transmitter in said heating circuit, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

CLIFFORD D. BABCOCK.

Witnesses:

JOSEPH G. HUNT,
CHAS. A. CONLON.