(No Model.)

R. P. GREEN.

TELEPHONE TRANSMITTER.

No. 582,200. Patented May 11, 1897.

Fig. 1.

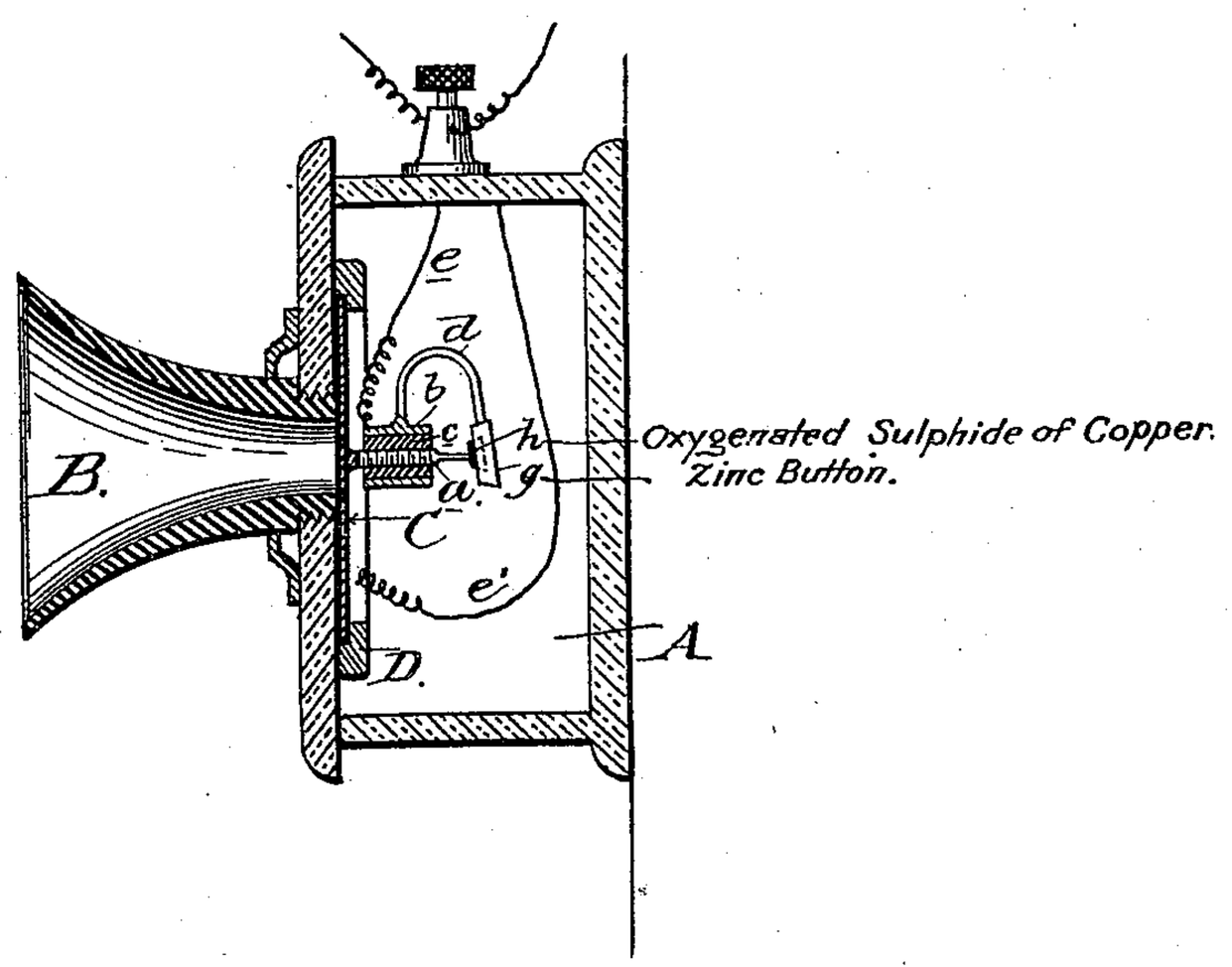
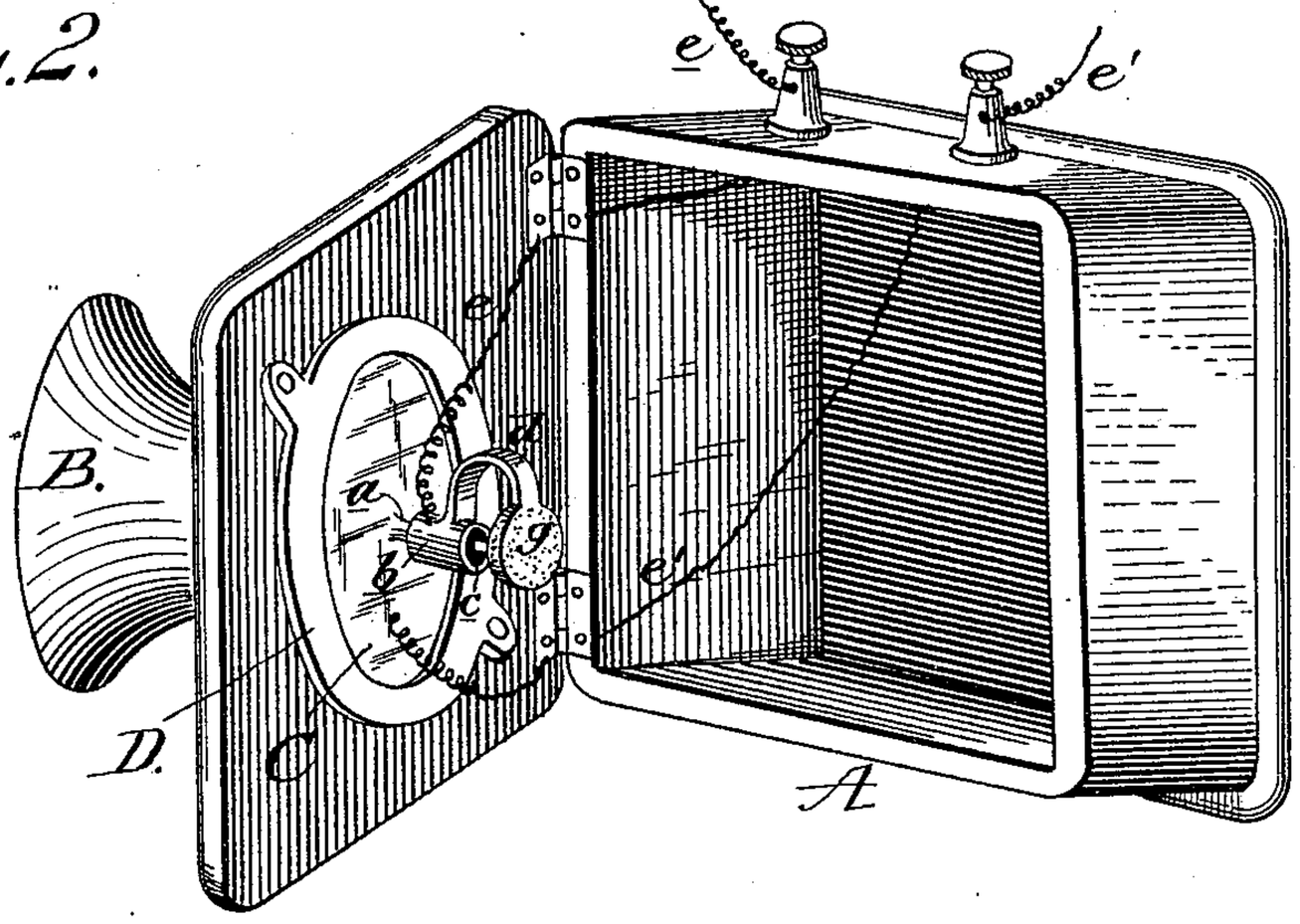


Fig. 2.



WITNESSES

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ROBERT P. GREEN, OF COLUMBUS, OHIO.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 582,200, dated May 11, 1897.

Application filed January 11, 1897. Serial No. 618,837. (No model.)

To all whom it may concern:

Be it known that I, ROBERT P. GREEN, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Telephone-Transmitters, of which the following is a specification, reference being had therein to the accompanying drawings.

The present invention relates to telephones which are used in connection with a battery or other suitable source of electricity and operate to throw the electric current into undulations corresponding to the sound-waves representing articulate speech or other sounds by varying the resistance of the battery-circuit, such instruments being generally known as "telephone-transmitters" or "variable-resistance telephones."

In this class of devices various substances have been used and included in the electric circuit and combined with a vibratory plate or diaphragm for receiving the sound-waves and for producing by its vibrations the variations in resistance of said substances, many of which latter have been found to be of too high conductivity for efficient use. Therefore the main object of my invention is to produce a substance or combination in which the conductivity thereof is suitably lowered, while there is produced an increased distinctness of articulation results in the receiving instrument and an absence of any break or slurring in the transmission of sound.

With this object in view my invention consists in the employment of an oxygenated sulfid of copper or a subsulfid of copper or combination or product resulting from the fusion of a sulfid of copper in the presence of oxygen as an electrode for telephone and other sound-producing apparatus and forming a variable-resistance medium for telephone-transmitters.

My invention also consists of the parts and the constructions and combinations of parts which I shall hereinafter describe, and point out in the claims.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts, Figure 1 is a sectional view of a telephone-transmitter embodying my invention. Fig. 2 is a perspective view of a box or case, showing the door or movable side, which preferably carries the mouthpiece, open to expose the internal construction of the said box or case.

In carrying out my invention I construct the box or case A of any suitable material, size, and design, and I may provide it with induction-coils, batteries, and other well-known features of a telephone-transmitter. As these features are well known, they are not shown, and they may be used or omitted, as circumstances require or choice dictates, without departing from the spirit of my invention.

Through the front of the box or case A is made an opening in which is secured, in any appropriate manner, a mouthpiece B of the usual or any suitable form. Back of the inner end of this mouthpiece is a diaphragm C, preferably of metal, held in place on the inside of the front of the box by a metallic ring D, screwed or secured thereto and clamping the periphery so that the central portion may be vibrated under the influence of the sound-waves. This diaphragm has fixed to and projecting from its inner face a pin or electrode *a*, which, while it may be smooth, is preferably threaded and has a reduced outer end or point.

Circumscribing the pin is a metallic sleeve *b*, having a non-conducting core or piece *c*, through which the pin or electrode passes, said sleeve carrying an elastic arm or bent plate *d*, to which or to the sleeve, if preferred, is connected the usual battery-wire *e*, the other wire *e'* being connected with the diaphragm in any suitable manner.

The free end of the elastic arm or bent plate carries a button, disk, or member *g*, of conducting material, which serves as a vehicle to receive and carry the opposing electrode *h*, which latter consists of an oxygenated sulfid of copper in the form, preferably, of a hard, solidified, or agglomerated mass, and which is the resultant product of a process that contemplates the heating to or about fusion of sulfid of copper in the presence of oxygen or when exposed to the air, said mass being then

allowed to cool or run into molds or otherwise manipulated to form the electrode for a telephone or other sound-producing apparatus.

In my experiments I have discovered that the combination or mixture which is the result of fusing or heating sulfid of copper in the presence of oxygen or when exposed to the atmosphere can be most successfully used to vary the strength of an electric circuit, as by thus oxygenating the sulfid of copper I lower its conductivity, so that when it is used as an electrode or part of the circuit conveying the electric current the requisite changes in the resistance of this substance results in the loudness and distinctness of the sounds being greatly increased.

The heating to or about fusion of sulfid of copper in an open vessel or when otherwise exposed to the air allows for the escape of a portion of the sulfur and the combination of oxygen with the resultant product, and it is this oxygenated sulfid, containing an excess of copper, which I have found produces by far the best results in the receiving instrument, the loudness and distinctness of the sound-waves being far superior when using the oxygenated sulfid than when using granulated carbon and other substances or combinations well known as variable-resistance mediums for telephonic transmitter-circuits.

To provide for the variations in the rapidity and amplitude of the variations of the diaphragm, and to obtain a full, clear, and steady sound, I place the oxygenated sulfid in the metal button, disk, or envelop *g*. The metal which I prefer to use in the composition of this button or envelop is zinc, for the reason that it has been found by experiment to be the best substance for the purpose, while certain other metals tried have proved failures. When the oxygenated sulfid is thus placed within the button or envelop, the electrode, or point of the pin *a*, rests in contact with the opposing electrode or oxygenated sulfid, and the vibrations of the diaphragm pass from this point to the said sulfid and thence through the zinc to the wires, producing clear, steady, full, and intensified sound in the receiving instrument.

Owing to the sleeve, which carries the button or envelop, being mounted on a core that is threaded on the electrode or pin *a*, the point of the pin may be accurately adjusted in contact with the opposing electrode or oxygenated sulfid, and the degree of tension of this contact may be increased or lessened when desired by simply turning the sleeve and its core upon the threaded pin upon which they are supported.

An instrument of the character described has been found to be very effective, producing full, clear, and distinct sound, and it is simple in its construction and entails but small expense in its manufacture.

Although I have shown and described herein a form of box or case and mouthpiece, it is evident that these parts may be changed or altered or omitted and other types substituted without affecting the scope of my invention.

I also do not limit my invention to the oxygenated sulfid being of solidified form, although in this form it is believed to produce the best results.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A microphonic element composed of oxygenated sulfid of copper.

2. A microphonic element composed of an oxygenated sulfid containing an excess of copper.

3. An electrode or element for use in transmitters composed of an oxygenated sulfid containing an excess of copper, in combination with a metallic vehicle or envelop in which it is carried.

4. An electrode or element for use in transmitters consisting of oxygenated sulfid of copper, in combination with a vehicle or envelop composed of zinc in which it is carried.

5. A telephonic electrode or element for use in transmitters consisting of an oxygenated sulfid containing an excess of copper and a vehicle or carrier composed of zinc, in combination with conductors for including said sulfid and zinc in an electric circuit, and a diaphragm having an electrode in contact with said sulfid.

6. In a telephone-transmitter, the combination of a diaphragm having a stem or pin projecting from it and forming an electrode, an opposing electrode and a metallic envelop or body inclosing the same, means for suspending the said envelop or body from the stem or pin and conductors including said electrodes in an electric circuit.

7. In a telephone-transmitter, the combination of a diaphragm having a stem or pin projecting from it and forming an electrode, an opposing electrode and an inclosing body of zinc therefor, means adjustably mounted on the pin or stem and suspending the opposing electrode and adjusting the contact between said electrodes, and conductors including the electrodes in an electric circuit.

8. In a telephone-transmitter, the combination, of a diaphragm, having a threaded stem or pin projecting from it, and forming an electrode, a non-conducting core adjustably mounted on said stem or pin, and having an exterior sleeve of conducting material, an elastic arm or plate carried by the sleeve and suspending a metallic button or body, an electrode in said button or body, opposing the first-named one, and conductors for including said electrodes in an electric circuit.

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

ROBERT P. GREEN.

Witnesses:
DAVID C. MEEHAN,
EUGENE POWELL.