

(No Model.)

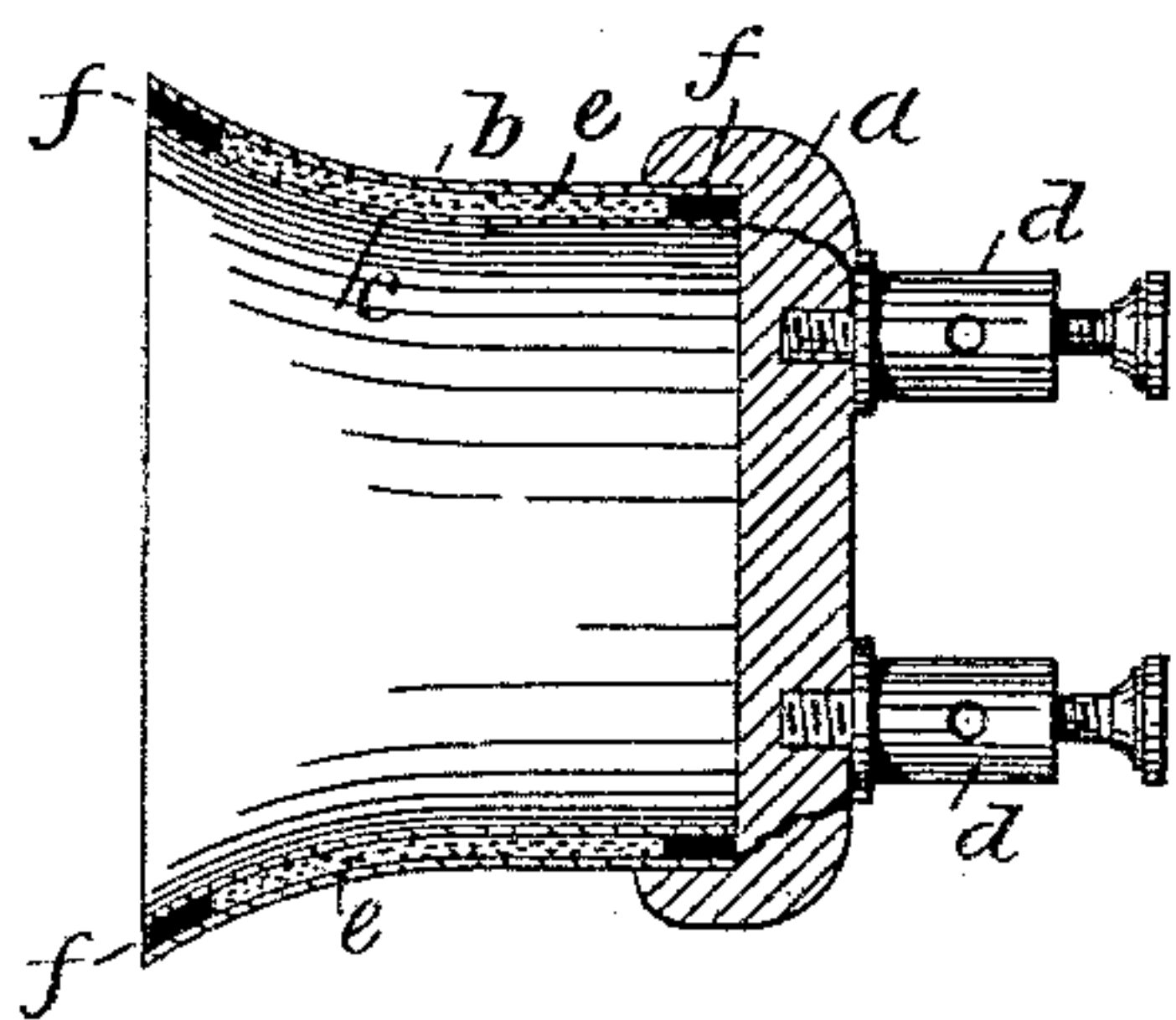
J. D. HUSBANDS.

TELEPHONE.

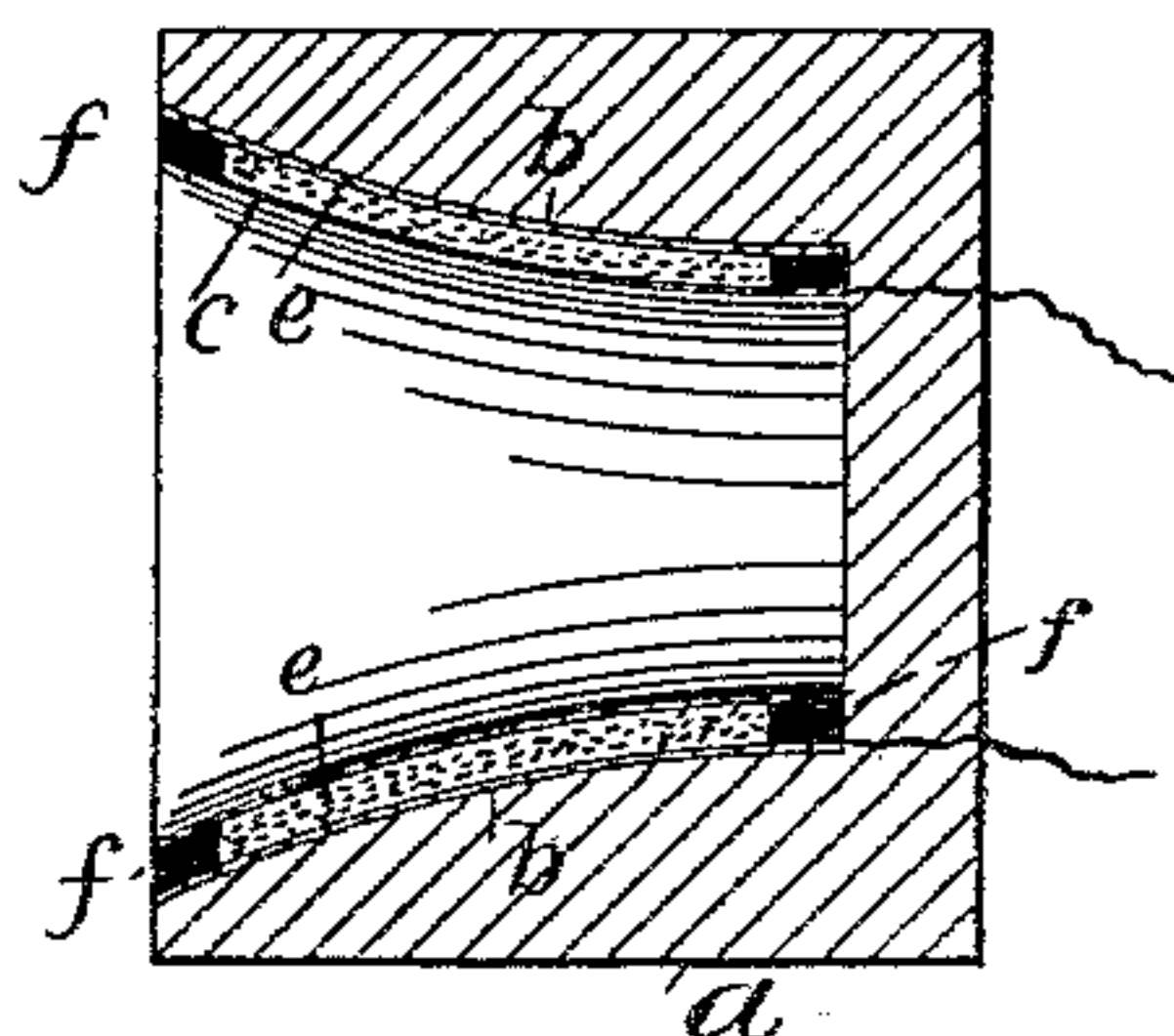
No. 318,907.

Patented May 26, 1885.

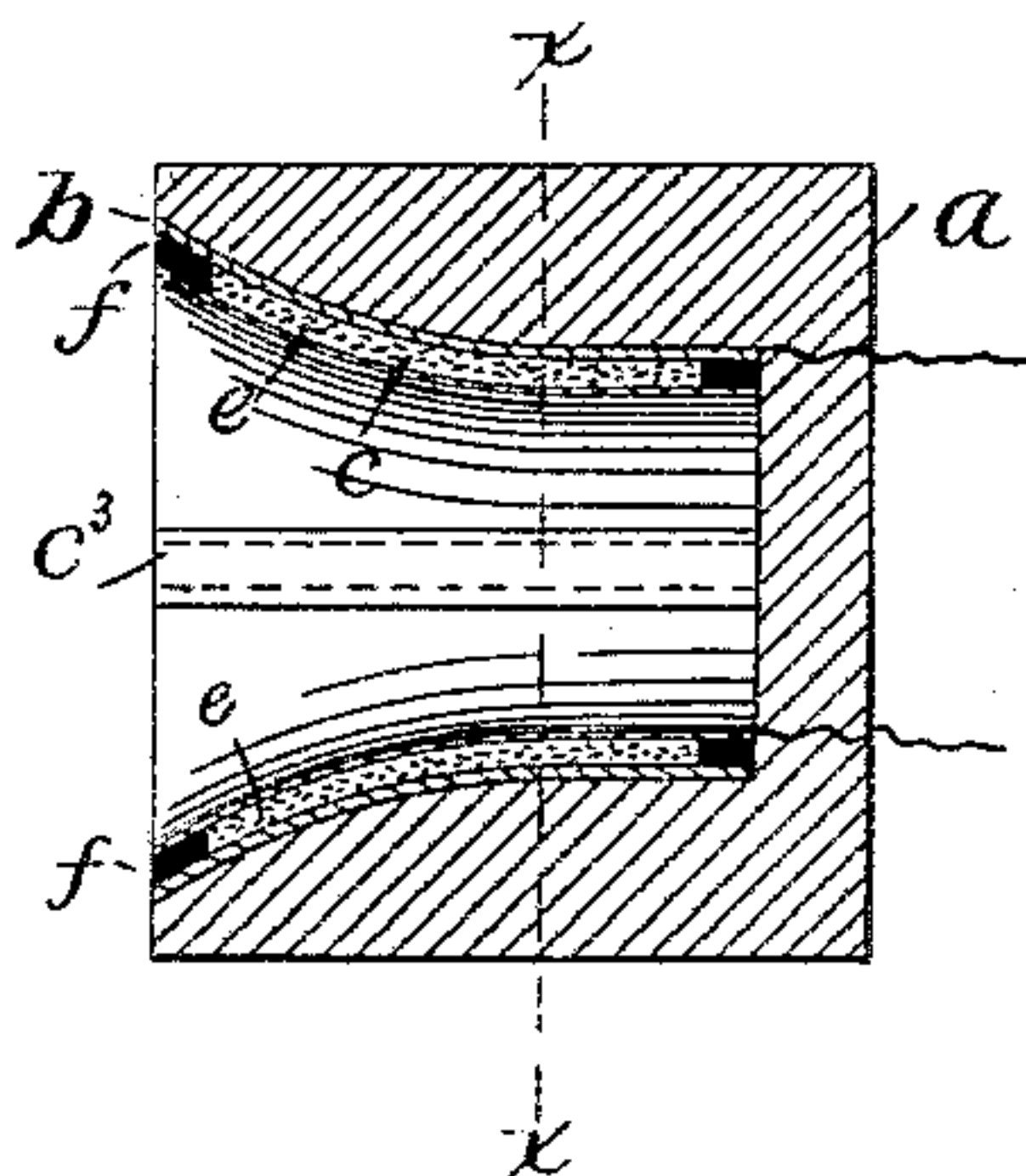
*Fig. 1.*



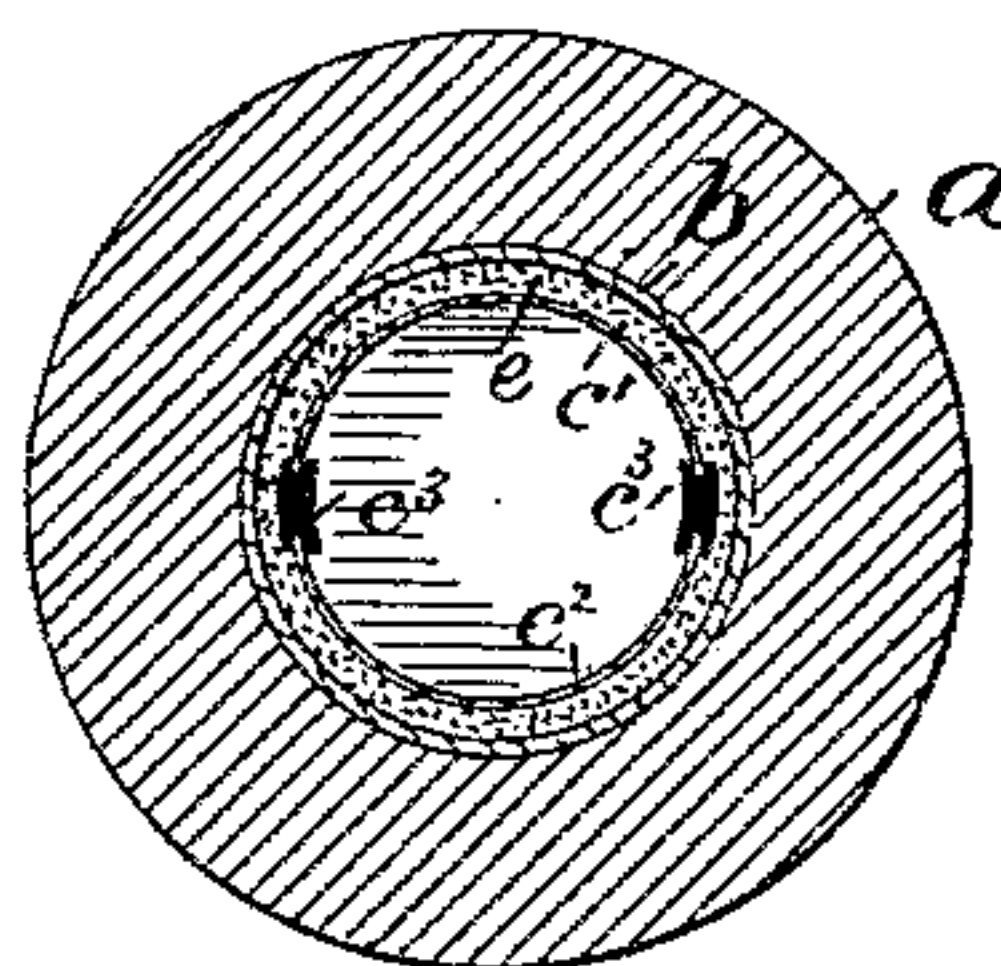
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Witnesses.

*Philip Mauro*

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Inventor.

*Jose Dutton Husbands*  
by *A. Pollock*  
his attorney.



# UNITED STATES PATENT OFFICE.

JOSÉ DOTTIN HUSBANDS, OF VALPARAISO, CHILI, ASSIGNOR TO THE AMERICAN BELL TELEPHONE COMPANY, OF BOSTON, MASSACHUSETTS.

## TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 312,907, dated May 26, 1885.

Application filed October 13, 1884. (No model.) Patented in England March 10, 1882, No. 1,177.

*To all whom it may concern:*

Be it known that I, JOSÉ DOTTIN HUSBANDS, of Valparaiso, Chili, South America, have invented certain Improvements in Telephones, (for which Letters Patent of Great Britain were granted me March 10, A. D. 1882, No. 1,177,) of which the following is a specification.

My invention relates to that class of telephone instruments known in the art as "battery-transmitters."

The object of my invention is to provide a transmitting-instrument which shall be highly efficient while simpler and cheaper of construction than anything of the kind now in use or known.

My invention consists of an arrangement of parts whose principle of action is the variation of resistance in a closed circuit by and in sympathy with the air vibrations due to the sound-waves produced by the voice or otherwise within the mouth-piece. In battery-transmitters as heretofore constructed the variations or changes in the resistance are due to variations of pressure on a variable contact introduced into the circuit between two good conducting points or surfaces; and for this purpose a diaphragm, disk, or plate is ordinarily provided, and a mouth-piece so arranged as to concentrate the sound-waves upon the said diaphragm or disk. In my invention, however, I dispense with the diaphragm, disk, or plate, and so construct the instrument that the mouth-piece itself, or a chamber connected therewith, forms the medium upon which the sound-waves act to produce the vibrations. I prefer to use a tubular mouth-piece placed within a suitable chamber or cavity, containing a current-regulator or variable-contact medium, consisting of loose particles of finely-divided conducting material, such as granulated or powdered coke or carbon. The walls of the chamber are of conducting material, and form one electrode. The tubular mouth-piece is also of conducting material, and forms the second electrode; and the finely-divided conducting material is placed in position to form a variable resistance or tension regulator between the two electrodes in response to

and in sympathy with the air-waves or sound-vibrations, as aforesaid.

In the accompanying drawings, Figures 1 and 2 show two forms of my transmitter; Figs. 3 and 4, a modification.

In Fig. 1, *a* is a block of ebonite, wood, or other suitable insulating or non-conducting material, to which is attached the mouth-piece, consisting of two cylinders, short tubes, or funnels, *b c*, of brass or other suitable material, forming the electrodes or conducting-surfaces, between which the regulator is placed. These cylinders are of such diameter that when one is inserted centrally within the other there will be between the electrodes an annular space, within which is placed a finely-divided conducting material—as granulated carbon *e*—loosely confined by packings of cloth or india-rubber *f*. *d d* are two screw-posts, one of which is electrically connected to cylinder *b*, the other to cylinder *c*.

In Fig. 2, *a* is a block of wood or other suitable insulating material. This block has a cavity or chamber formed therein and lined with metal or other good conducting material, as shown at *b*. Within this lined cavity or chamber I insert a tube, *c*, constructed of thin metal or of a thin substance coated with metal, and so formed and arranged that there is an annular space between it and the said lining *b*—that is to say, between the two metal surfaces—which space is filled, or partially filled, with powdered or granulated coke or other substance suitable to serve as a regulating medium in a telephone-circuit. The wires or conductors of the circuit are connected with the two metal surfaces *b c*, so that the current has to pass through the coke or other regulator, and is therefore subject to vibrations in sympathy with the vibrations caused by the impingement of the sound-waves upon the tube *c*.

Upon connecting the posts *d d* in circuit with a generator of electricity and subjecting the instrument to sound-vibrations, the current is varied in harmony therewith.

In Figs. 3 and 4 I have shown another modification of my invention, wherein the vibrating tube or mouth-piece is divided into two



parts or halves,  $c'$   $c^2$ , placed together with insulating material  $c^3$  between them. The action is similar to that of the instruments above described.

5 What I claim as my invention is—

1. In a telephone-transmitter, the combination of a vibratory tube or chamber forming the mouth-piece and a variable resistance in contact therewith, said tube and resistance  
10 being included in the circuit, substantially as described.

2. In a transmitting-telephone, a mouth-piece consisting of two concentric cylinders, tubes, or chambers, forming, respectively, the two  
15 terminals of an electrical circuit, combined with an interposed variable resistance.

3. In a telephone, a mouth-piece or chamber consisting of a flexible vibratory surface, responsive to sound vibrations, and forming  
20 part of the circuit.

4. In a telephone, a vibratory mouth-piece surrounded with a chamber lined with a conducting material, said mouth-piece and material being included in the circuit, substantially as described.

5. In a telephone, two concentric surfaces, one or both of which are capable of vibration, forming, respectively, the opposite electrodes of an electrical circuit, and an interposed variable-resistance medium consisting of carbon  
25 30 in a loose finely-divided or granulated condition.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 9th day of August, 1884.

JOSÉ DOTTIN HUSBANDS.

Witnesses:

FRANCIS C. McLELLAN,  
T. OLIVER WHEELER.