

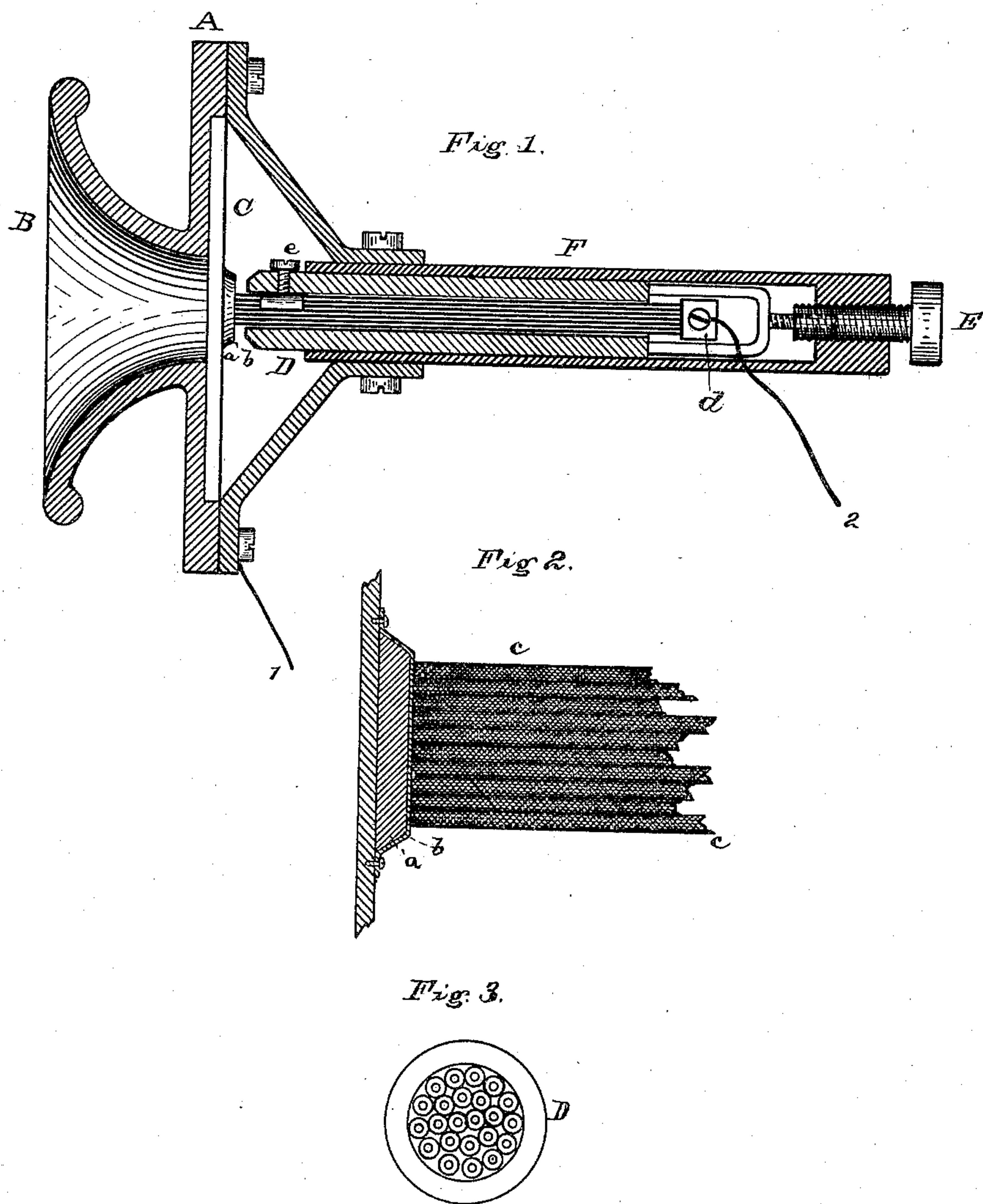
(No Model.)

E. H. JOHNSON.

ELECTRIC TELEPHONIC TRANSMITTER.

No. 319,415.

Patented June 2, 1885.



ATTEST:

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EDWARD H. JOHNSON, OF NEW YORK, N. Y.

ELECTRIC TELEPHONIC TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 319,415, dated June 2, 1885.

Application filed March 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDWARD H. JOHNSON, of New York city, in the county and State of New York, have invented a certain new and useful Improvement in Electric Telephonic Transmitters, of which the following is a specification.

My invention relates to instruments for transmitting articulate speech of that class in which the vibrations given a diaphragm open and close circuit at metallic contact-points, thereby varying the current in the primary of an induction-coil, and thus sending electrical waves upon the line, or producing such waves directly on the line without the interposition of such induction-coil; and my invention consists in employing in such a transmitter a compound electrode—that is, one consisting of a number of points massed together but insulated from each other, and each extended to such a length as to be of considerable resistance, these extended contacts forming multiple-arc circuits which are opened and closed by the movements of the diaphragm. This compound electrode is placed in contact with an electrode attached to the diaphragm, and as such diaphragm is vibrated by the sound-waves of the human voice the electrode attached to it makes contact with a greater or less number of the points of the compound electrode. These points are all finally connected with the line, either through an induction-coil or without the interposition of such coil, and therefore as more or less points come in contact with the opposing electrode the resistance of the circuit is varied, and consequently the current on the line is increased or diminished, and these electrical waves are retranslated into articulate speech at the receiving-instrument. Articulate speech is transmitted by this instrument wholly by opening and closing circuit at metallic contacts, and not by variations in contact.

The compound electrode preferably consists of a bundle of wires, preferably of German silver, and each of such length as to have a considerable resistance, massed together into a solid mass and insulated from each other, except at one end, where they are soldered together and held in a suitable clamp with which the line-wire or primary of the induction-coil is connected. At the other end of the bundle

the wires may be bound together in a solid mass by dipping them in varnish or other cementing material, and the wires and insulation are filed off smooth, so as to leave the ends of the wires exposed and presenting a flat surface. This bundle of wires is placed and properly secured in a tube which is adjustable within another tube, the last being supported by the frame which holds the diaphragm. Attached to the center of the diaphragm is a flat disk of cork, rubber, or other elastic material faced with platinum-foil or other suitable metallic foil, which is secured to the diaphragm or extended outwardly to the circuit-binding screw. The compound electrode is placed in contact with the platinum face, which vibrates with the diaphragm, and electrical waves are thus produced, as previously explained. In this way great variations of resistance can be produced, and consequently the induction-coil can be very strongly affected if one is used; but with this instrument the variations can be made so great that the induction-coil can be dispensed with and the current sent directly upon the line. This transmitter can be used direct on long lines where those operating by variations in contact would be practically inoperative. The longer the wires of the bunch the louder will be the sound-reproductions. In practice I have found ten inches to be sufficient; but by coiling the wires on bobbins either separately or together and connecting their ends to the line they may be made many feet in length. I prefer to use very fine wire, preferably German silver No. 40, B. W. G., massing about fifty of such wires together. I find that the greater the number of points presented to contact the more smooth and clear will be the sounds produced.

In the annexed drawings, Figure 1 is a vertical section of a transmitter embodying my invention; Fig. 2, an enlarged sectional view of the electrodes, and Fig. 3 an enlarged end view of the compound electrode.

A is a suitable frame provided with a mouth-piece, B. C is the diaphragm, having attached to its center the elastic disk *a*, faced with platinum-foil *b*, forming the vibrating electrode.

The compound electrode is formed of the bunch of insulated wires *cc*, their bared ends being in contact with the platinum *b*. The

other ends of the wires are preferably soldered together and united by a clamp, *d*, to which the wire 2 is attached. The bundle of wires is inclosed and properly secured in a tube, D, being held stationary therein by screw *e*, or in any other suitable manner. The tube D is movable longitudinally by means of a differential adjusting-screw, E, within the stationary tube F, so that the contact of the electrode can be adjusted. The circuit 1 2 may be connected directly with the line, or may include the primary of an induction-coil.

What I claim is—

1. In a telephone-transmitter, the combination, with an opposing electrode, of a compound electrode composed of a number of metallic points secured together in a solid body and electrically insulated from one another, and a separate resistance connected with each of such points, substantially as set forth.

2. In a telephone-transmitter, the combination, with an opposing electrode, of a compound electrode composed of a number of insulated metallic wires of high resistance secured together in a solid body and presenting at one end to the action of the opposing elec-

trode electrically-separated points, and electrically connected at the other end to a common circuit terminal, substantially as set forth.

3. In a telephone-transmitter, the combination of a flat-surfaced electrode attached to the diaphragm and a compound electrode consisting of a number of insulated high-resistance conductors massed together and having exposed ends opposed to such flat-surfaced electrode, substantially as set forth.

4. In a telephone-transmitter, the combination, with an opposing electrode, of a compound electrode composed of a number of insulated metallic wires of high resistance secured together in a solid body and having separated bare points at one end and electrically connected at the other end to a common circuit terminal, and a tube inclosing such body of wires and adjustably supported in the instrument, substantially as set forth.

This specification signed and witnessed this 2d day of February, A. D. 1883.

EDWD. H. JOHNSON.

Witnesses:

WM. H. MEADOWCROFT,
H. W. SEELY.