

(No Model.)

T. A. EDISON & S. BERGMANN.  
TELEPHONE.

No. 337,254.

Patented Mar. 2, 1886.

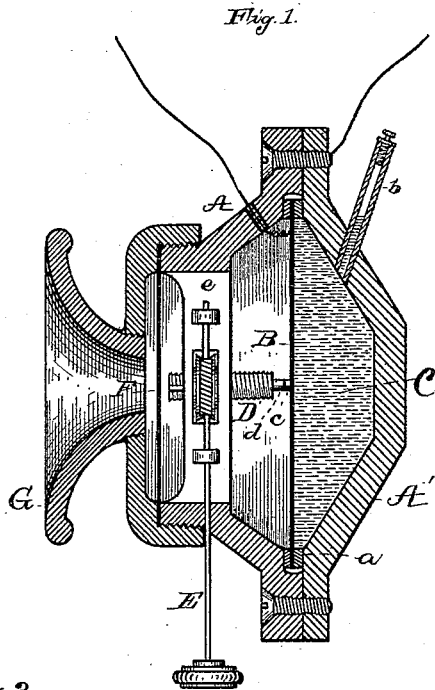


Fig. 2.

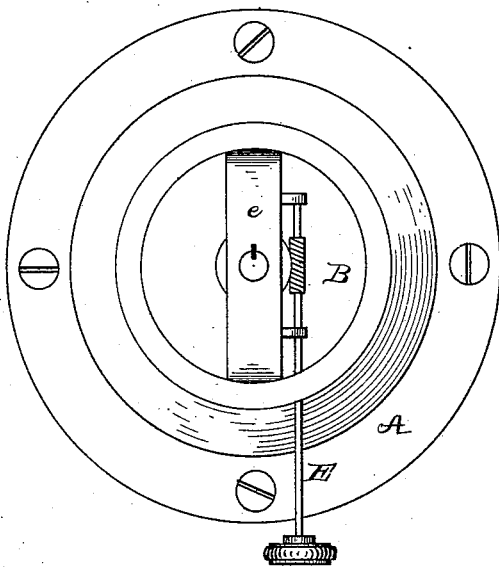
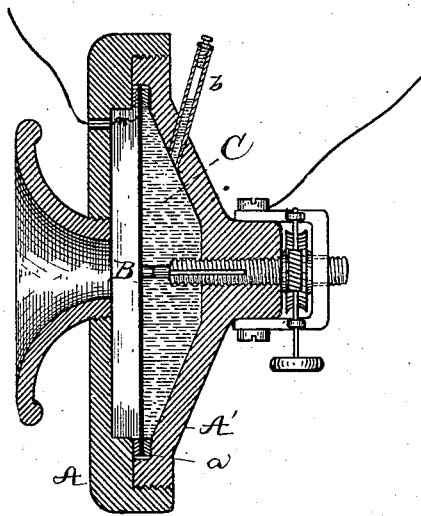


Fig. 3.



ATTEST:

*E. C. Rowland*  
*Atty. Genl.*

INVENTORS:

*Thomas A. Edison,*  
*Sigmund Bergmann,*  
By *Rich<sup>d</sup> N. Dyer Atty.*

# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY, AND SIGMUND BERGMANN, OF NEW YORK, N. Y.

## TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 337,254, dated March 2, 1886.

Application filed November 13, 1883. Serial No. 111,644. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, and SIGMUND BERGMANN, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Telephones, of which the following is a specification.

The object of our invention is to produce a telephone-transmitter in which metallic contact-points are effectively employed in the transmission of articulate speech. We accomplish this by the use of a diaphragm, metallic electrodes affected by the movements thereof, and a body of liquid limiting the movement of said diaphragm, and thereby limiting and controlling the separation of the electrodes. The liquid body, by preventing an excessive movement of the diaphragm, prevents the electrodes from moving too far, so that they quickly return to their normal position, and all the sound-vibrations are responded to from the normal position of the electrodes. The liquid body is preferably of oil, but may be of any other liquid—mercury, for instance. We prefer to place the body of liquid behind the diaphragm, between it and the rigid inclosing-case of the instrument, and the electrodes on the side of the diaphragm opposite the liquid that is between the diaphragm and the mouth-piece. One of said electrodes is preferably carried directly by said diaphragm and the other supported rigidly from the case of the instrument. An outer protecting-diaphragm may be employed at the mouth-piece, if desired.

In the accompanying drawings, forming a part hereof, Figure 1 is a vertical section of a telephone-transmitter embodying our invention; Fig. 2, a front elevation of the instrument with the mouth-piece removed, and Fig. 3 a vertical section of a modified form of transmitter.

A A' are the two parts of a suitable case, preferably of metal, within which is held the diaphragm B. This diaphragm is clamped between packing-rings *a*, by which it is insulated from the case, and by which a closed chamber, C, is formed back of the diaphragm. The chamber C is filled with a liquid through the tube *b*, which is closed so as to seal the

liquid within the instrument, preventing escape or evaporation. The contact-points are located, preferably, outside of the liquid, as shown in Fig. 1. A platinum contact-point, *c*, is carried by the front of the diaphragm, and against it bears a contact-point, *d*, of platinum, carried by a screw, D. This screw is supported rigidly in the bridge *e* within the front A of the case, and is adjusted by spindle E. To close up the telephone and prevent the saliva from reaching the contact-points, a second diaphragm, F, may be employed, held in place by the mouth-piece G. In the transmitter shown in Fig. 3, the contact-points being within the chamber C and protected thereby, there is no need of the second diaphragm. The electrical connections, it will be seen, are made so as to bring the contacts into the circuit, one with the case and the other with the diaphragm; but it will be understood that if a diaphragm of insulating material such as mica is used, instead of one of metal, as shown, one connection will run directly to the contact-point carried by the diaphragm.

We are aware that it has been proposed to provide a telephone-transmitter having carbon electrodes with a hydrostatic column pressing the electrodes together and toward the diaphragm; but the movement of the diaphragm in a direction to separate the contacts would not be limited by such a construction.

We are also aware that battery-telephones have been proposed wherein the diaphragm would form one plate of a galvanic battery and would be separated from the other battery-plate by the exciting-liquid, the distance between the battery-plates being varied by the movements of the diaphragm.

What we claim is—

1. In a telephone-transmitter, the combination, with a diaphragm and electrodes controlled thereby, of a body of liquid connected with and limiting the movement of said diaphragm, substantially as set forth.

2. In a telephone-transmitter, the combination, with a diaphragm and metallic electrodes controlled thereby, of a body of liquid connected with and limiting the movement of said diaphragm, substantially as set forth.

3. In a telephone-transmitter, the combina-

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tion, with a diaphragm and electrodes in direct contact controlled thereby, of a body of liquid behind said diaphragm and covering the active surface thereof, substantially as set forth.

- 5 4. In a telephone-transmitter, the combination of a diaphragm, a body of liquid behind said diaphragm, and two electrodes, one of which is carried by said diaphragm on the side opposite the liquid, substantially as set forth.
- 10 5. In a telephone-transmitter, the combination of a diaphragm, a body of liquid behind said diaphragm, and two electrodes on the opposite side of the diaphragm from the liquid, one carried by said diaphragm, the other independent thereof, substantially as set forth.
- 15 6. In a telephone-transmitter, the combination of a diaphragm, a body of liquid behind

it, electrodes affected by said diaphragm situated between the diaphragm and mouth-piece, and an outer diaphragm protecting the electrodes, substantially as set forth. 20

7. In a telephone-transmitter, the combination, with a diaphragm and electrodes in direct contact controlled thereby, of a body of liquid held between said diaphragm and a closed rigid case, substantially as set forth. 25

This specification signed and witnessed this 10th day of November, A. D. 1883.

THOMAS A. EDISON.  
SIGMUND BERGMANN.

Witnesses:

P. H. KLEIN, Jr.,  
RICH'D. N. DYER.