

No. 652,508.

Patented June 26, 1900.

C. B. & C. E. CLARK.  
MICROPHONE TRANSMITTER.

(Application filed July 25, 1899.)

(No Model.)

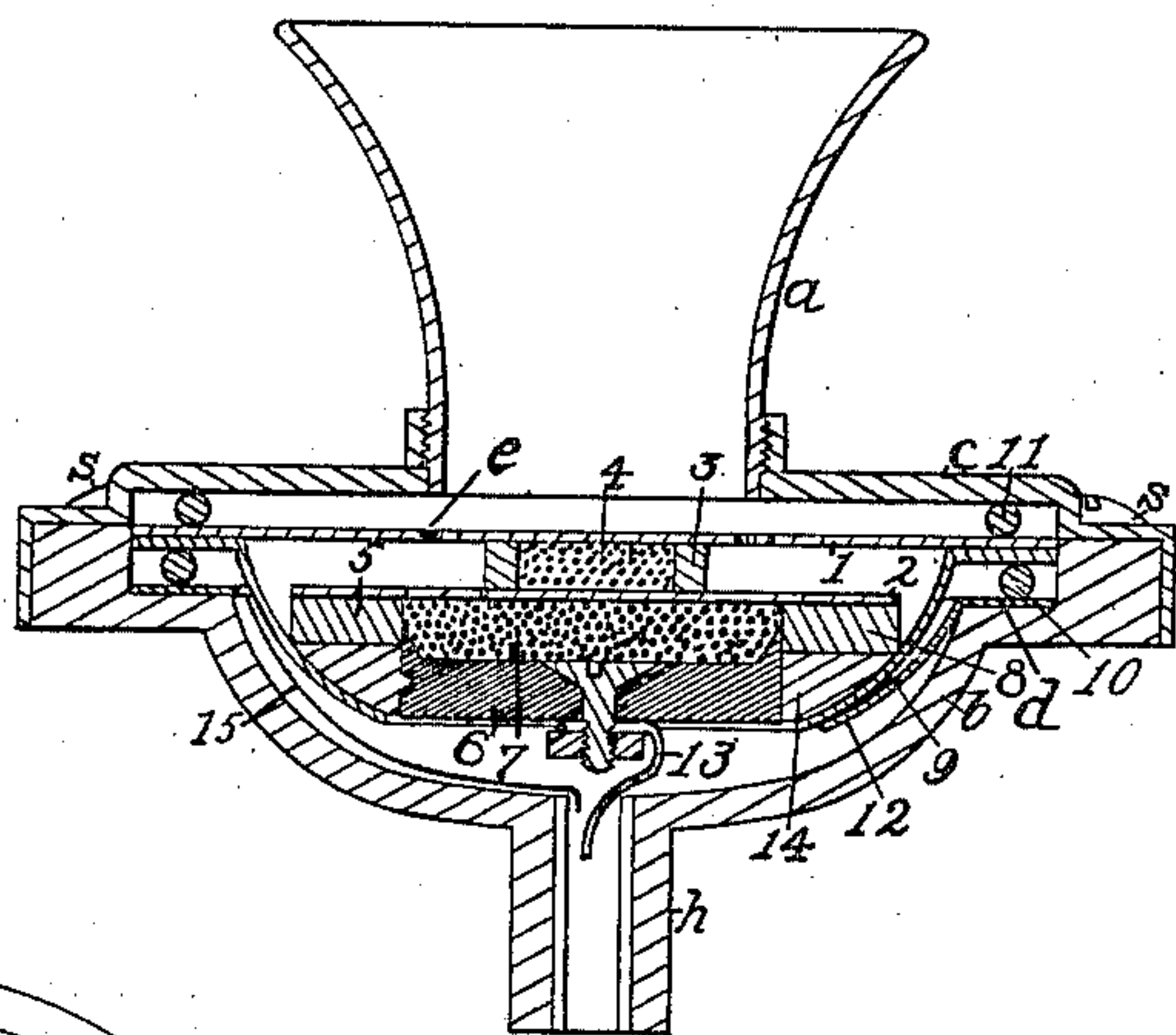


Fig. 1

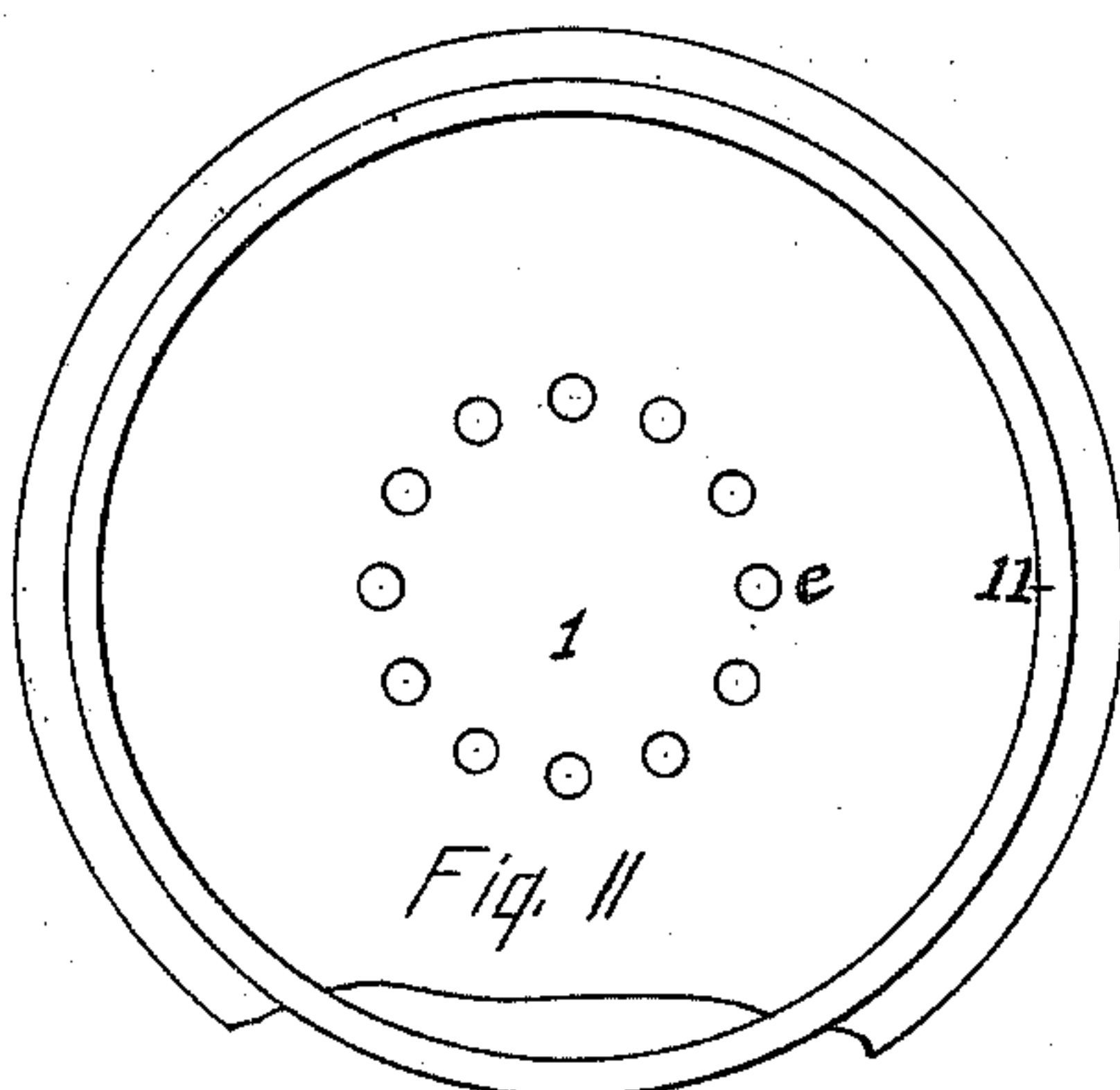


Fig. II

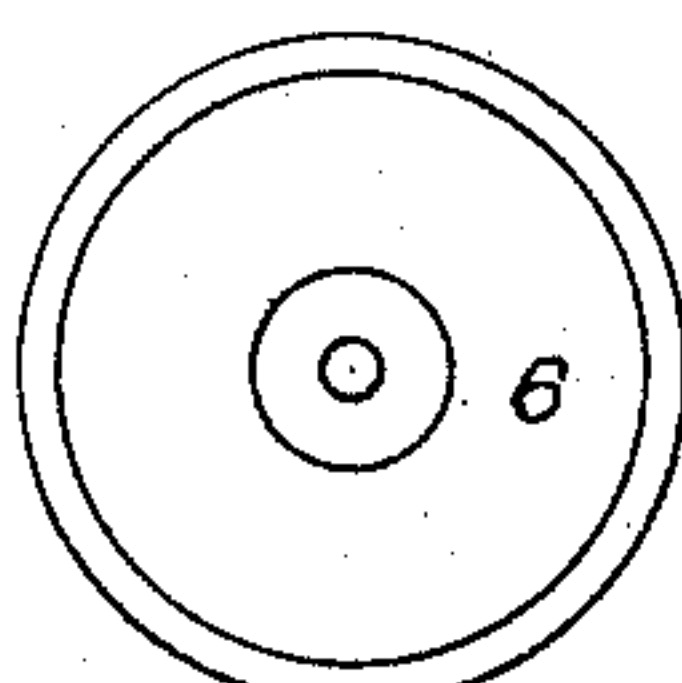


Fig. III

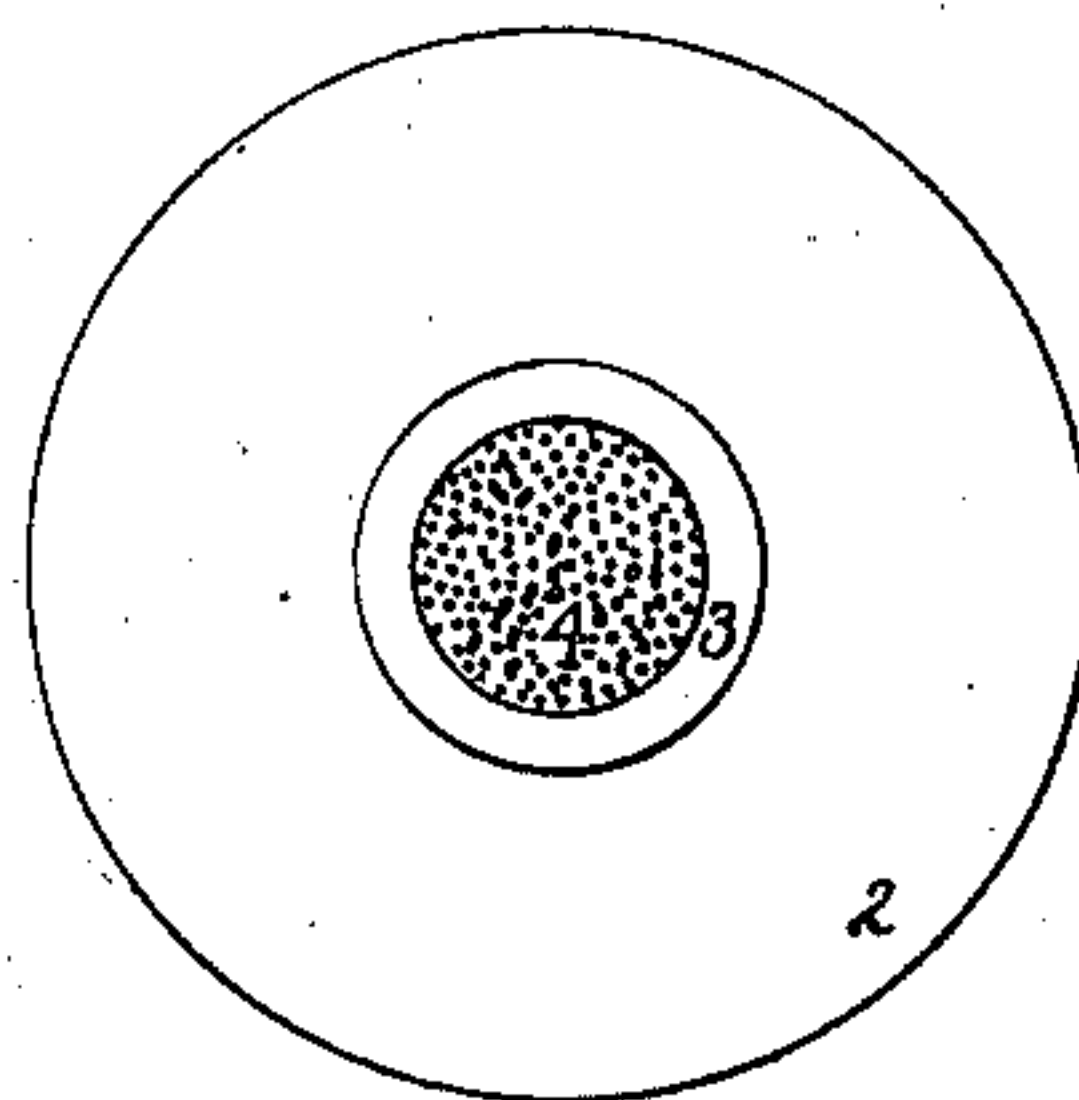


Fig. IV

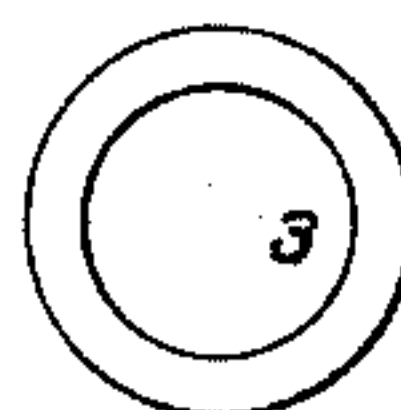


Fig. V

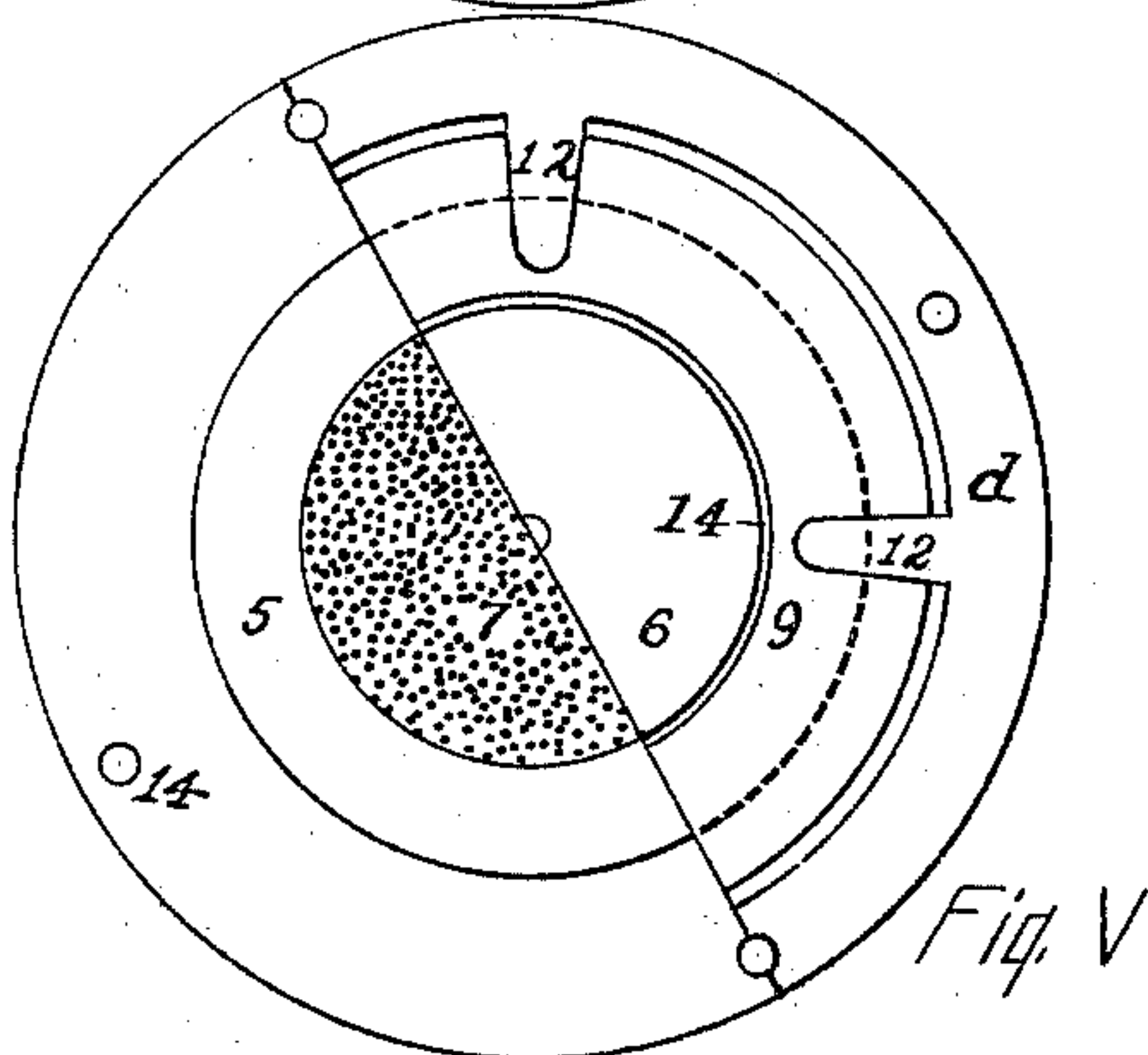


Fig. VI

WITNESSES

*Fredrick A. Oakes*  
*D. de F. Andersson.*

INVENTORS

*Clayton B. Clark*  
*Charles E. Clark*

BY

*H. Anderson*  
ATTORNEY



# UNITED STATES PATENT OFFICE.

CLAYTON B. CLARK AND CHARLES E. CLARK, OF SING SING, NEW YORK.

## MICROPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 652,508, dated June 26, 1900.

Application filed July 25, 1899. Serial No. 725,055. (No model.)

*To all whom it may concern:*

Be it known that we, CLAYTON B. CLARK and CHARLES E. CLARK, citizens of the United States, and residents of Sing Sing, in the county of Westchester and State of New York, have invented a certain new and useful Microphone-Transmitter, of which the following is a specification.

Our invention relates to the electrical transmission of speech, and has for its object an improved form of microphone-transmitter that will amplify the effect of the air vibrations and the electric impulses in consequence, giving more distinct tones in the receiver than has been heretofore obtainable. The object is accomplished by the means set forth in this specification and the accompanying drawings, forming a part thereof.

The drawings will be first explained.

Like numerals and letters refer to similar parts throughout the several views.

Figure I is a vertical sectional view of the transmitter. Fig. II is a plan of the outer diaphragm and packing-ring. Fig. III is a top view of a carbon-backing disk. Fig. IV is a top view of the inner diaphragm and outer body of granular carbon. Fig. V is a view of the under side of the instrument, parts removed from the casing, the view being partly in section, showing portions of the two diaphragms. Fig. VI is a plan of the ring inclosing the outer body of granular carbon.

In Fig. I the usual mouthpiece *a* is shown screwed into the upper portion *c* of the case, the piece *c* being secured to the cup *b* by means of screws, as shown at *s s*. The cup *b* is provided with a hub extension *h*, by means of which it is secured to a suitable support. The diaphragms and attachments are all placed within the cup *b*, having wire terminals extending through the hub, as shown, or out of the sides, as may be desired. First, a metallic ring *d*, Figs. I and V, is placed within the cup. This ring, as shown in Fig. V, is provided with thin springy projecting lips 12, that curve downward and centrally of the cup. An elastic packing-ring 10 is placed on this metal ring, and then a cup-shaped piece 9, open at the bottom, as shown in Fig. I, is placed upon the rubber ring.

Within the cup *b* is a disk of carbon 6, firmly held at the bottom of the cup and out of con-

tact with it by cement or plaster-of-paris 14. Upon the bed of cement 14 is placed a rim of wool or felt material 5. It will be observed that the upper surface of the carbon 6 is recessed, leaving an edge that extends partly within the rim of felt. The space formed by the recess in the carbon and the felt rim is filled with granular carbon 7.

Upon the surface of the felt and granular carbon is placed a diaphragm 2, which may be of metal or carbon, preferably the latter, the diaphragm having no contact with the metal cup 9. Upon the diaphragm 2 is a ring 3, of rubber, which also incloses a quantity of granular carbon. The surface of the rubber and carbon should be on a level with the rim of the cup 9, so that when the diaphragm 1 is placed it will just lie against the carbon. Last, an elastic ring 11 is laid on the outer diaphragm and the cap *c* is put in place, with a pressure upon the rings 10 11 that will hold all the parts with the requisite rigidity.

It will be observed that the cup 9 contains all the operating parts of the instrument and that the cup is held between the rings 10 11 and by the rim of the case in such a manner that it is free from contacts that would interfere with sound vibrations, the springs 12 being too delicate to be objectionable.

Through the carbon disk 6 is a screw by which electrical contact with the instrument is made through a conductor 13. This gives a circuit through the carbon and disks to the diaphragm 1 and from the diaphragm to the cup *b*. The springs 12, pressing against the cup, lead the circuit out through the ring *d* at any desirable point, as indicated by the line 15.

The diaphragm 1 is perforated outside of the ring 3, within the radius of the carbon 7, with holes *e*, Figs. I and II. There may be one or more of these rows, and the holes should be about one-eighth of an inch in diameter, although the size should be proportional to the number.

The action upon the compounded diaphragms is as follows: Notwithstanding the perforations in the outer diaphragm the air between the inner and outer diaphragms is more or less confined, so that the outer diaphragm imparts its motion to the air behind it, and this air in turn acts upon the inner



diaphragm. In addition to this through the perforations in the outer diaphragm some of the direct vibrations from the voice act through the perforations directly upon the inner diaphragm. This combined action so amplifies the vibrations as to produce greater pressure upon the beds of granular carbon, thus allowing of a freer passage of current through them, with a consequent increased action upon the diaphragm in the receiving instrument, giving greater efficiency than is attained by other means.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination in a microphone-transmitter of two diaphragms, the outer one provided with perforations and supported by its rim substantially as described, an inner diaphragm less in diameter than the outer one, unconfined at its rim, resting on a bed of carbon and felt substantially as herein shown, and separated from the outer diaphragm by a bed of carbon retained by an elastic ring within the circle of perforations in the outer diaphragm, substantially as herein shown and described.

2. A microphone-transmitter combining the

following elements: an outer perforated diaphragm, an inner diaphragm less in diameter than the outer one, the two diaphragms inclosing an elastic ring filled with granular carbon, the inner diaphragm resting on a backing of granular carbon held within a rim of felt, said rim also supporting the outer edge of the inner diaphragm, and a disk of solid carbon as a backing and contact for the granular carbon, the whole inclosed and supported substantially as herein shown and described.

3. In a microphone-transmitter the combination with a perforated diaphragm of an inner diaphragm placed against the granular carbon contact of the outer perforated diaphragm, said inner diaphragm having its periphery free from solid contact and its inner side resting against a bed of granular carbon and felt, supported and inclosed substantially as herein shown and described.

Signed at Sing Sing, in the county of Westchester and State of New York, this 19th day of July, A. D. 1899.

CLAYTON B. CLARK.  
CHARLES E. CLARK.

Witnesses:

JOHN McNALLY,  
PETER S. McMAHON.