

No. 637,453.

Patented Nov. 21, 1899.

E. F. FROST.
TELEPHONE TRANSMITTER.

(Application filed Aug. 19, 1899.)

(No Model.)

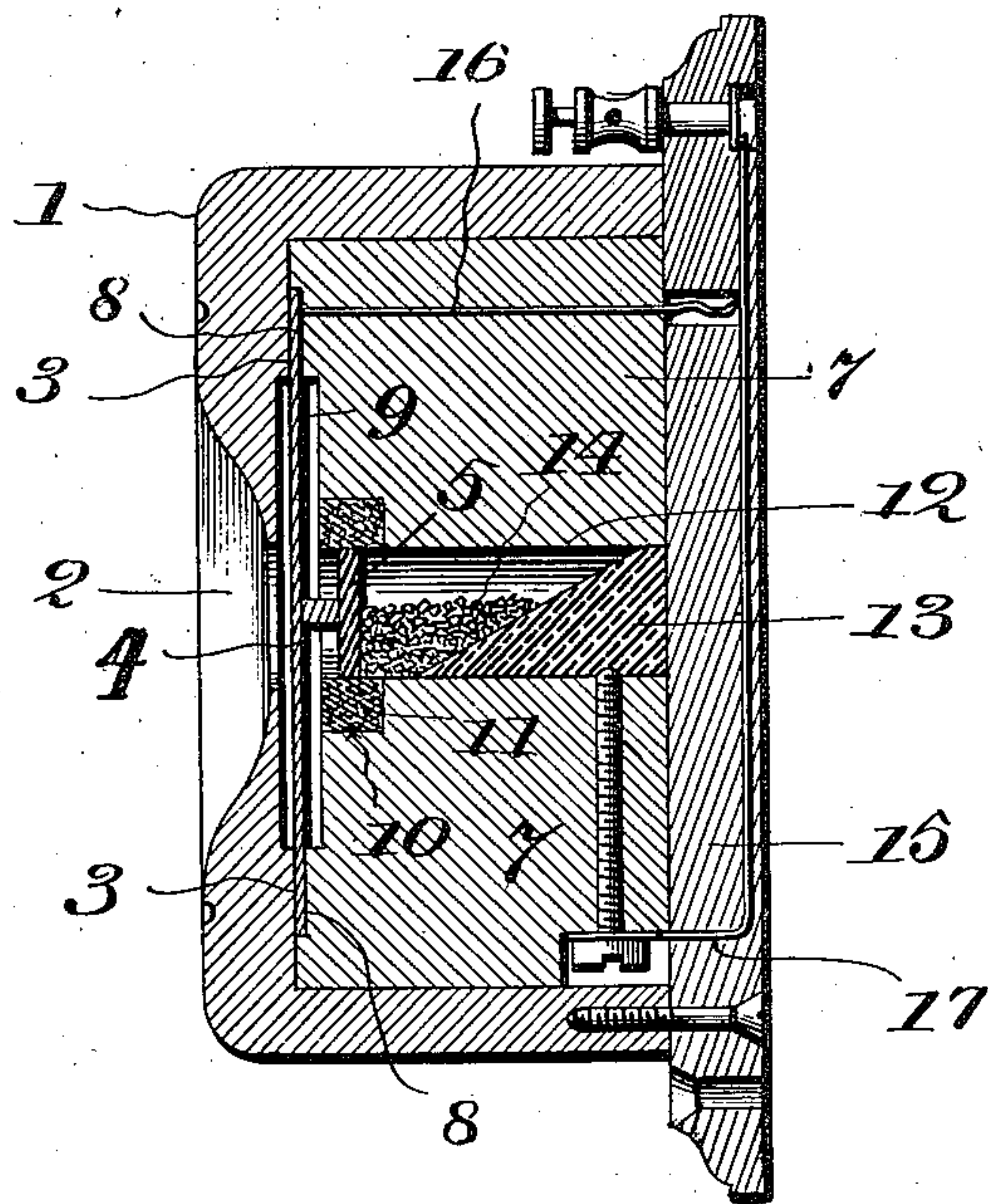


Fig. 1.

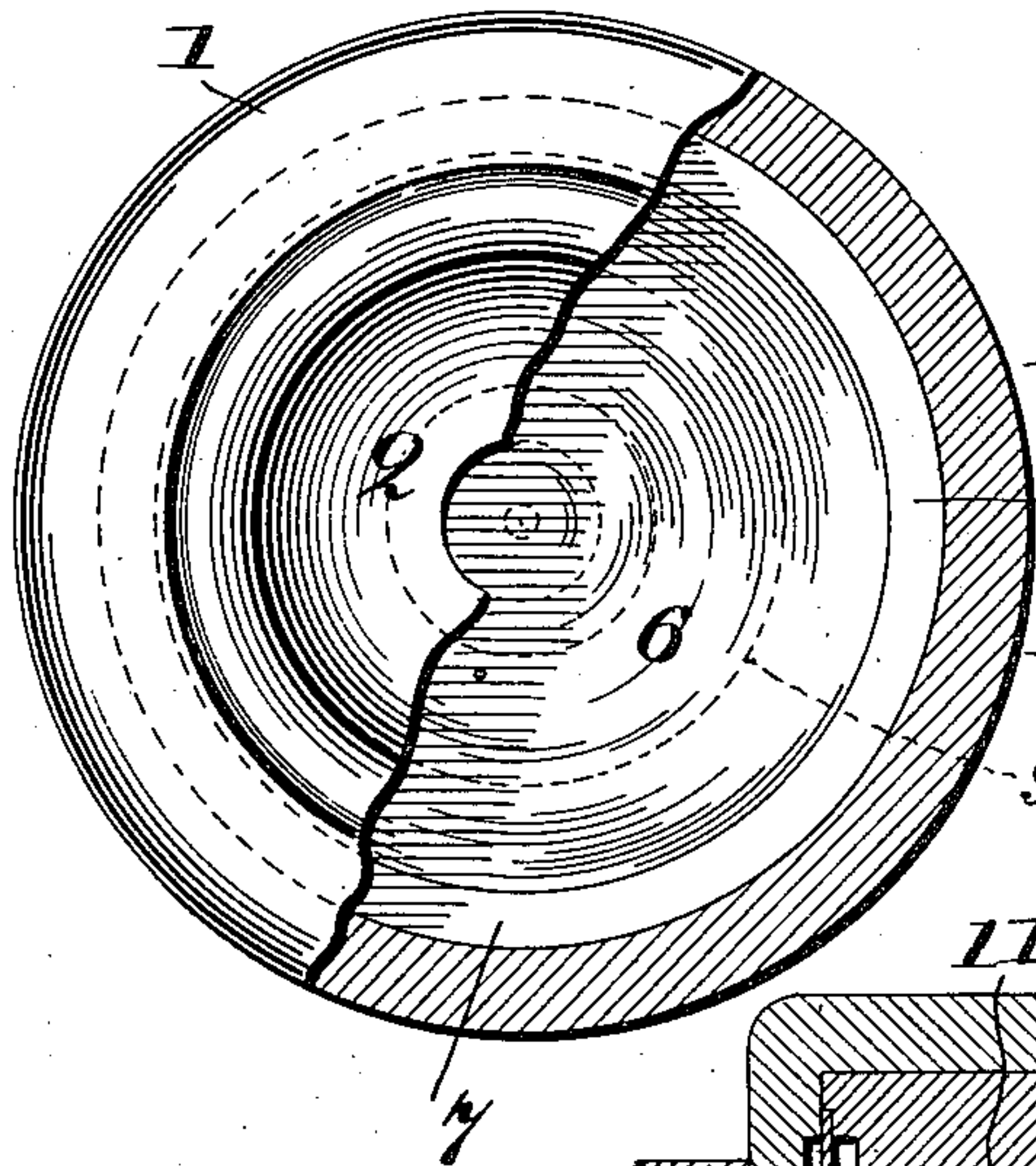


Fig. 2.

Fig. 3.

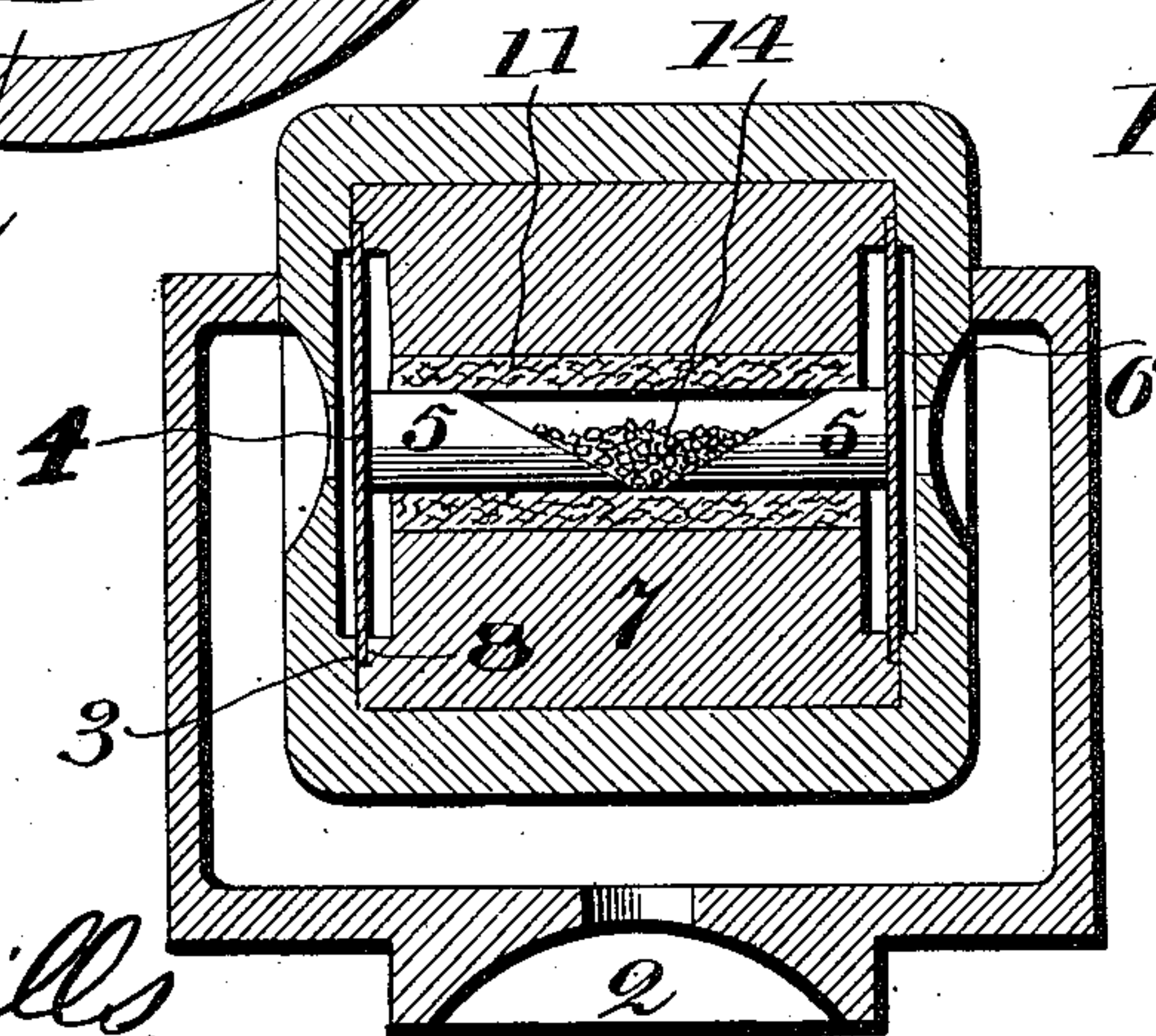
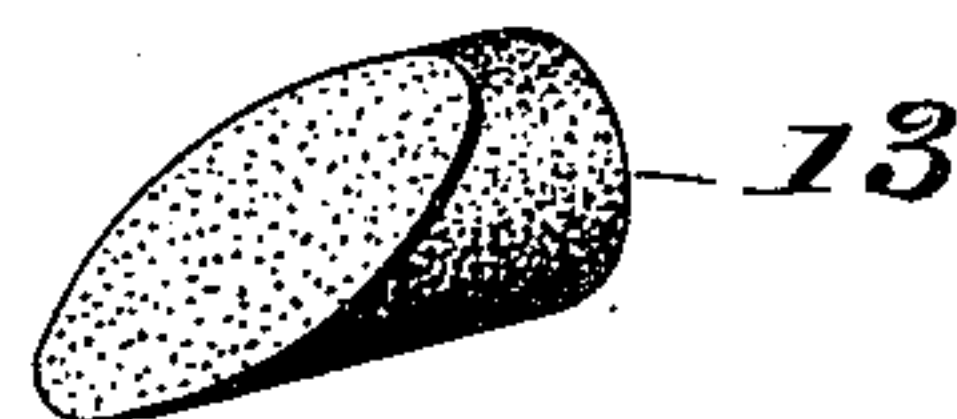


Fig. 4.

Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

ELLIS F. FROST, OF THE UNITED STATES ARMY.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 637,453, dated November 21, 1899.

Application filed August 19, 1899. Serial No. 727,825. (No model.)

To all whom it may concern:

Be it known that I, ELLIS F. FROST, of the United States Army, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Telephone-Transmitters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to telephone microphone-transmitters.

The object of my invention is to produce a telephone-transmitter possessing all the resonant and sensitive qualities of the "Blake transmitter" type combined with the desirable qualities of the transmitters of the "Hunning transmitter" type.

It is also one object to produce a telephone-transmitter which will completely avoid the "packing" of the Hunning type of instruments.

Another object is to produce an instrument of great simplicity, ease, and cheapness of manufacture, ease of assemblage, and great durability.

My invention consists of such a combination of electrodes and granular conducting material with a chamber, diaphragm, and casing as to accomplish the above results.

My invention consists more particularly of a suitable casing in which is formed the speaking - orifice, of a diaphragm mounted therein, which diaphragm carries an electrode, of a chambered block to surround this electrode and clamp the diaphragm; also, of a second electrode in said chamber, but not in contact with the first electrode, yet whose surface opposed to the first electrode is not parallel to the opposed surface thereof, of a granular conductor between said electrodes, and of means for assembling said parts.

The following is a description of my invention, in which reference is made to the accompanying drawings.

Figure 1 is a vertical section of my transmitter. Fig. 2 is an elevation with portions

broken away. Fig. 3 is a detail in perspective of the back electrode. Fig. 4 is a modification showing the same construction, but involving electrodes mounted on two separate diaphragms, the diaphragms leading to a common speaking-orifice.

In the various views like parts are indicated by like figures of reference.

1 indicates the outside casing, in which the speaking-orifice 2 is made. Against a shoulder 3 on the inside of the casing 1 and opposite the orifice 2 a diaphragm 4 is placed. On the diaphragm 4 a disk of conducting material 5, as carbon, is mounted by means of a metallic stud 6. A block 7 is bored so as to form a shoulder 8 to rest against the diaphragm 4 and yet leave a vibration-chamber 9, so as to form a chamber 10 to receive a felt ring 11, also so as to form the chamber 12. The inner diameter of the felt ring 11 and the chamber 12 are the same. When the block 7 is in place, its shoulder 8 clamps the diaphragm 4 against the shoulder 2 of the case and brings the electrode 5 in the felt ring 11. Also in the chamber 12 is a back electrode 13, but whose surface opposite the electrode 5 is inclined away from the perpendicular upward, as shown in Fig. 1. Between the electrodes 5 and 13 a granular conducting material 14, as carbon, is placed to electrically connect the two electrodes. A backboard 15 is screwed on the case 1 and serves to clamp the whole together.

Suitable conducting-wires, one, 16, from the diaphragm and the other, 17, from the back electrode 13, are led to binding-posts on the back-board.

Obvious modifications of this construction are clearly within the scope of this invention. For instance, the front or diaphragm electrode 5 may be beveled and the back one, 13, perpendicular, or both may be beveled, but in non-parallel directions. Also each electrode may be mounted on separate diaphragms and both diaphragms lead to a common speaking-orifice, as in Fig. 4.

It is essential to the attainment of the objects of my invention that the surfaces of the electrodes be non-parallel and that each beveled surface be inclined from the perpendicular

lar upward. It is also essential that the bevel be across the line of direction of the vibration of the diaphragm.

It is clear, by reason of the foregoing construction and arrangement of the several parts as shown in Fig. 1, that the direction of pressure of the front electrode 5 against the granular conductor 14 will be at right angles to the plane of the diaphragm, and also that this direction of pressure after being transmitted through the granular conductor to the inclined face of the back electrode will be turned through an angle by the said inclined face, thus discharging the pressure of the vibratory electrode at an angle to the direction of vibration of the vibratory electrode.

It is clear, by reason of the foregoing construction and arrangement of the several parts as shown in Fig. 4, that the direction of pressure of the electrodes 5 against the granular conductor 14 is discharged at an angle to the direction of vibration of these vibratory electrodes because of the inclined surfaces of the electrodes 5.

Having thus described my invention, I claim—

1. In a telephone-transmitter, the combination with a diaphragm, an electrode mounted thereon, a chamber inclosing said electrode,

and an electrode therein inclined to the first, of a granular conductor partially filling said chamber and between said electrodes.

2. In a telephone-transmitter, the combination with a diaphragm, a chamber inclosing electrodes of non-parallel opposed surfaces, of a granular conductor partially filling said chamber and between said electrodes, and means for enabling the vibrations of the diaphragm to disturb the granular conductor.

3. In a telephone-transmitter, the combination with a diaphragm, electrodes of opposed non-parallel surfaces one or both inclined to the direction of vibration, and a chamber inclosing said electrodes, of a granular conductor partially filling said chamber and between said electrodes.

4. In a granular telephone-transmitter, means for directing the pressure of the vibratory electrode against the granular conductor and means for discharging said pressure at an angle to the direction of vibration of the vibratory electrode.

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

ELLIS F. FROST.

Witnesses:

HOWARD W. SHUSTER,
THOMAS BRADLEY.

correction in Letters Patent No. 637,453.

It is hereby certified that the residence of the patentee in the grant and in the printed specification of Letters Patent No. 637,453, granted November 21, 1899, upon the application of Ellis F. Frost, for an improvement in "Telephone-Transmitters," were erroneously written and printed "United States Army," whereas said residence should have been written and printed *Washington, District of Columbia*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 28th day of November A. D., 1899.

[SEAL.]

WEBSTER DAVIS,

Assistant Secretary of the Interior.

Countersigned:

C. H. DUELL,

Commissioner of Patents.