

G. ANGELINI.  
MICROPHONE.

APPLICATION FILED MAR. 28, 1907.

928,096.

Patented July 13, 1909.

Fig. 1

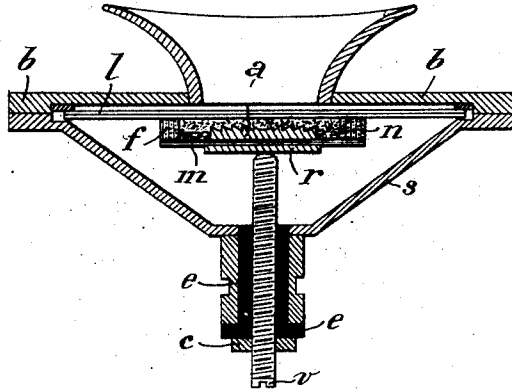


Fig. 2

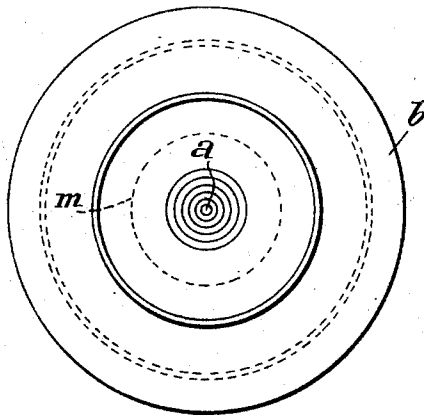


Fig. 3

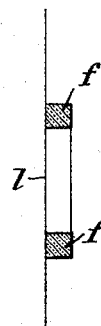


Fig. 4

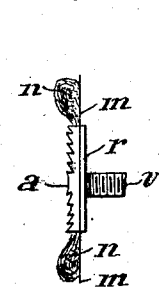
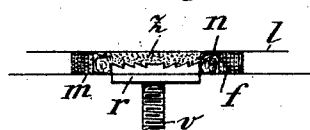


Fig. 5



ATTEST.  
Bentley & Stahl.  
Edw. L. Tolson.

INVENTOR.  
GIUSEPPE ANGELINI.  
By Spear, Middleton, Dorman & Spear  
ATTY'S

# UNITED STATES PATENT OFFICE.

GIUSEPPE ANGELINI, OF ROME, ITALY.

## MICROPHONE.

No. 928,096.

Specification of Letters Patent.

Patented July 13, 1909.

Application filed March 28, 1907. Serial No. 365,057.

*To all whom it may concern:*

Be it known that I, GIUSEPPE ANGELINI, subject of the King of Italy, residing at Rome, Italy, have invented certain new and  
5 useful Improvements in or Relating to Microphones, of which the following is a specification.

This invention relates to a microphonic transmitter of simple construction which  
10 enables the sound to be transmitted in a very powerful way and with great clearness. In order to obtain this result, the parts of the microphone are arranged in such manner that, while maintaining the grains of carbon  
15 or the like between the two plates or electrodes of the microphone, and the oscillations of the plate being sufficiently softened, the latter can produce their maximum effect.

The invention is illustrated in the accompanying drawing, in which:—

Figure 1 is a vertical section of the box, the mouthpiece being mounted on the cover  
—*b*—. Fig. 2 is a front elevation of the box of the microphone, in the center of which is  
25 placed the adjustable electrode —*a*—. Fig. 3 is a cross section of the felt ring, and Figs. 4 and 5 are detail views.

In the central portion of the bottom of the box, having the shape of a truncated cone  
30 —*s*—, is mounted a screw —*v*— electrically insulated from the box itself, say by means of an ebonite cylinder —*e*—. To the upper end of the said screw is soldered or secured the adjustable electrode —*a*— constituted  
35 by a circular disk of carbon or silver plated or gilt metal, provided with small concentric grooves. A flexible mica plate —*m*—, the diameter of which is larger than that of the disk —*a*— and on which is placed a layer of  
40 wadding —*n*—, is clamped between the said disk and a metal washer —*r*— screwed on the screw —*v*—. By operating the screw —*v*—, the electrode can be brought nearer to, or moved away from, the disk —*l*—. A  
45 lock nut —*c*— serves for securing the screw in the most suitable position.

The carbon disk —*l*— rests on a felt ring —*f*— supported on the mica plate —*m*—, and its edge lies in a recess made in the inner  
50 portion of the box. Between the cover —*b*— and the outer edge of the disk is inserted a ring of felt or other material, which keeps the disk in a fixed position. Screws, not shown in the drawing, serve to secure the  
55 cover to the box in a reliable manner.

The felt ring —*f*— having a diameter

equal to that of the mica plate and a thickness of only a few millimeters is secured to the carbon disk, a receptacle thus being formed between the two disks or electrodes, 60 in which the grains of carbon are placed. When the disk is put in place, the felt ring presses against the wadding on the mica plate and thus forms a closed chamber in which the grains are confined between the 65 carbon disk and the adjustable electrode. The mica plate, owing to its elasticity, can follow the vibrations of the carbon disk, and in that way the felt ring does not oppose any resistance to the oscillations of the disk 70 itself, while the adhesion to the felt ring of the layer of wadding covering the edge of the mica disk, absolutely prevents any grains of carbon from escaping and coming between the mica and the felt. The grains of carbon 75 being inclosed by the felt ring which forms an integral portion of the disk, are in better condition for immediately assuming all the vibrations of the disk itself. When the electrode —*a*— is adjusted in position by 80 turning the screw —*v*—, the grains of carbon on the part —*a*— will be compressed against the disk —*l*— while the surrounding grains between the outer edge of the disk —*a*— and the felt ring are more or less freely 85 movable. Thus the grains in the center at every vibration of the disk —*l*— can receive the greater variations of pressure while the excess will be taken up by the elasticity of the movable mass of grains around the cen- 90 tral part, which on account of their mobility will follow the oscillations of the mica disk and continually change their position. In this way a double effect or combination is obtained, of variation of pressure and varia- 95 tion of position of the grains.

It will be noticed that the recess or cavity in which the grains of carbon are contained, has its walls chiefly formed by soft material like wadding and felt, to which to a certain 100 extent the carbon grains adhere, and which are thus prevented from moving at any slight shock, to which cause is due the humming noise which affects so greatly the clearness of the voice in usual constructions of micro- 105 phones. The drawbacks of microphones with grains which are too free, are thus avoided, and it may be asserted that the whole of the grains will keep their normal position, while being sufficiently free to participate in the quick vibrations of the disk 110 when a person talks in front of it.

The air tight closing of the cavity containing the grains and of the metal box of the microphone, prevents dampness from reaching the grains of carbon.

- 5 Electric communications take place by means of two springs, one of which presses against the end of the screw —*v*—, and the other against the groove made in the hub of the casing —*s*—.
- 10 Having now fully described my said invention and the manner in which the same is to be performed, what I claim and desire to secure by Letters Patent of the United States of America is:—
- 15 1. A microphonic transmitter comprising an outer vibratory disk, a ring of felt at its under side and in contact therewith, a fixed electrode constituted by a rigid plate, a flexible disk of greater diameter than the electrode and fixed concentrically therein and  
29 free and unsupported at its periphery, a covering of wadding for said flexible disk, said vibratory disk, felt ring, fixed electrode and

wadding covered disk forming a closed chamber, and grains of carbon contained in said chamber substantially as and for the purposes set forth.

2. In a microphone transmitter having a closed grain containing chamber, the combination of an outer vibratory disk, a lower rigid electrode, a flexible disk supporting said electrode, wadding extending around the same and supported upon part of said flexible disk, grains of carbon in said chamber and in contact with both said electrode and wadding, the grains of carbon being more closely compacted toward the center than around it, substantially as and for the purposes set forth.

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

GIUSEPPE ANGELINI.

Witnesses:

A. RAZZI,  
DULIS NARDONI.