Nov. 17, 1942. N. A. J. VOORHOEVE ET AL 2,302,278

CARBON MICROPHONE

Filed Jan. 11, 1941

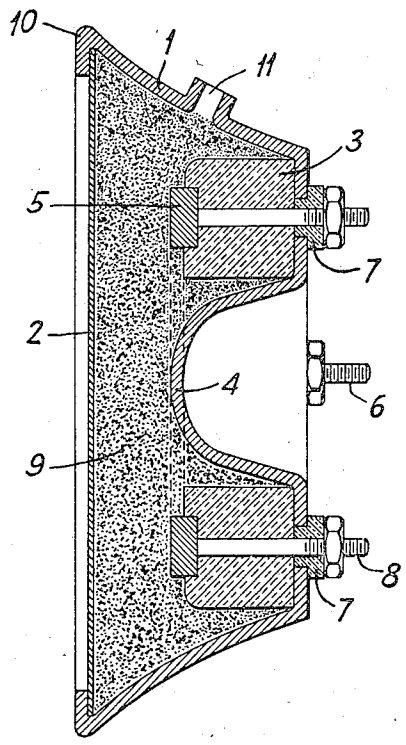


FIG. 1.

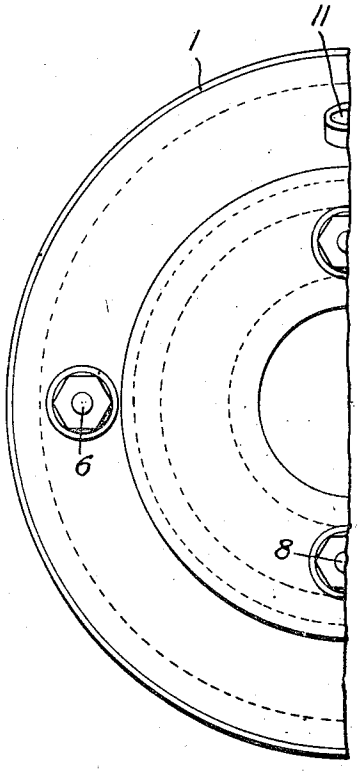


FIG. 2.

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Patented Nov. 17, 1942 2,302,278

UNITED STATES PATENT OFFICE

2,302,278

CARBON MICROPHONE

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Application January 11, 1941, Serial No. 374,054
In Germany June 17, 1939

3 Claims. (Cl. 179—122)

This invention relates to an improved carbon microphone in which the casing member serves as one of the electrodes of the microphone.

Carbon microphones comprise a chamber which contains granulated carbon, at whose wall the electrodes are provided and which is closed by a diaphragm responding to the sound waves. For as true as possible a reproduction it is necessary that this diaphragm can easily yield to the acoustical pressure variations of the air. For this reason, high-quality microphones are equipped with thin diaphragms free from resonance, preferably thin mica foils.

In a well-known type of microphones, this diaphragm obturates a marble chamber. However, such marble blocks are comparatively expensive. The object of the invention is to do away with this marble chamber without affecting the quality of the microphones.

Carbon microphones have already come to be known in which the carbon chamber entirely consists of metal and constitutes itself one of the electrodes. In this case, the other electrode is provided on the diaphragm or constituted by the diaphragm, itself. However, such microphones are of much inferior quality, since with such diaphragms resonances cannot be avoided and the sensitiveness is less on account of requiring the use of the heavier diaphragm.

According to the present invention, in microphones having a metal chamber, the second electrode consists of a metal member which is secured to the metal wall of the chamber with the interposition of an insulating layer.

In such microphones, the diaphragm may be kept entirely beyond the electric circuit so that thin mica foils can be used to permit of making high grade microphones.

The invention will be more fully explained by reference to the accompanying drawing in which Fig. 1 is a cross-sectional view of a microphone of this invention, and Fig. 2 is a partial rear elevation of Fig. 1.

This drawing represents a section of a microphone according to the invention. The housing 1 of the microphone, which constitutes the carbon chamber at the same time, is formed from sheet metal by pressing. Principally all metals capable of being pressed are suitable for this purpose. Due to temperature variations, however, such housings are liable to expansion and shrinking which involves tension variations of the diaphragm 2 so that a metal is preferably used which has a low coefficient of expansion such as an iron-nickel-copper alloy commercially known as "Invar."

For constructional reasons, the housing is given a round shape. A ring 3 of insulating material, such as hard paper, mouldable material, synthetic resin, ceramic material or the like, is arranged concentrically with the housing between the side wall and a central dome portion or reentrant part 4. This insulating ring is secured in a suitable manner, for instance by screwing, to the rear wall of the housing and it supports in a cavity a concentrical metal ring which acts as one of the electrodes of the carbon chamber, the other electrode being constituted by the reentrant part 4 and the side-wall of the housing. For taking off the voltage the housing itself is furnished with a connecting bolt 6, whereas the connecting terminal 8 of the electrode 5 passes to the outside through the insulating ring 3 and, through the intermediacy of an insulating disc or bushing 7, through the metal housing.

The space 9 between the diaphragm 2 and rings 5 and 3 is filled up with carbon granules.

After the diaphragm 2 has been placed on the housing 1 and secured therein by flanging over at the edge 10, the carbon chamber 9 is filled with granulated carbon through the filling aperture 11 which is closed by means of a cotton pellet.

The housing 1 and the second electrode 5 should be made of a material which is not liable to corrosion so as to ensure excellent contact between the carbon granules and the electrodes. Furthermore, these electrodes are preferably furnished with a rust-proof coating, for instance gilded. The electrodes may consist of meshing or copper and, if desired, the housing may also consist of the commercial alloy "Invar."

What is claimed is:

1. In a carbon type microphone, a metallic casing which acts as a first electrode of said microphone, a central dome portion extending within said casing, a large aperture in said casing located at the end opposite said central dome, a second electrode located within said casing and arranged to concentrically surround said central dome, an insulating member interposed between said casing and said second electrode, carbon granules filling said casing, and a diaphragm closing the aperture in said casing.

2. A microphone comprising a metallic casing which acts as a first electrode, a central dome portion extending within said casing, a large aperture located at one end of said casing and at an end opposite said central dome, filling means located in the side wall of said casing adjacent

said large aperture, a second electrode located within said casing, an insulating member interposed between said casing and said second electrode, a diaphragm closing the large aperture in said casing, carbon granules filling said casing which are passed through said filling means, and means for closing said filling means after said carbon granules are in place.

3. In a carbon type microphone, a metallic casing composed of a low coefficient of expansion metal, which acts as a first electrode of said microphone, a central dome portion extending within said casing, a large aperture in said casing located at the end opposite said central dome, a ring-shaped second electrode located within said casing and arranged to concentrically surround said central dome, an insulating member interposed between said casing and said second electrode, carbon granules filling said casing, and a diaphragm closing the aperture in said casing.

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