June 28, 1932. W. S. PURSER 1,865,210

ELECTRICAL APPARATUS

Filed July 25, 1928

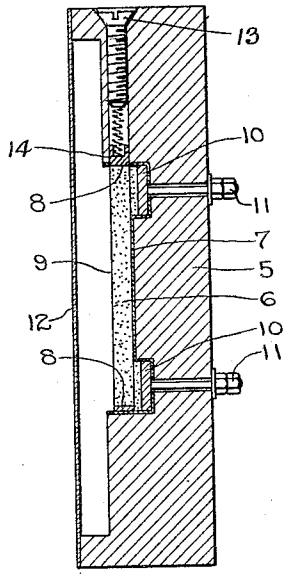


Fig. 2

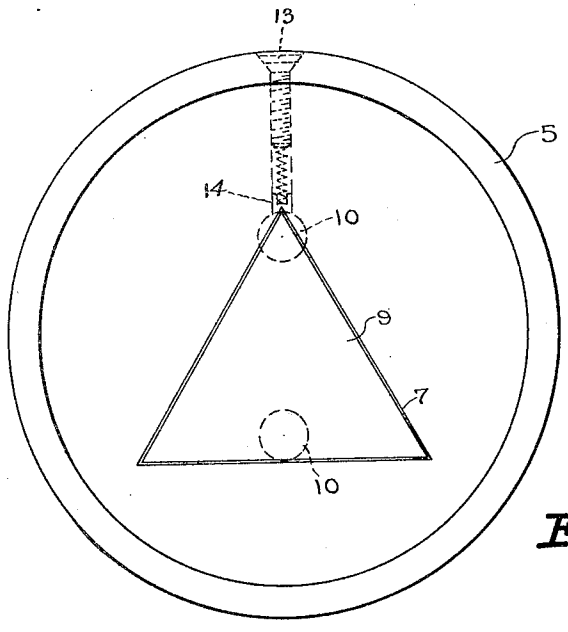


Fig. 1

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UNITED STATES PATENT OFFICE

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ELECTRICAL APPARATUS

Application filed July 25, 1928, Serial No. 295,336, and in Great Britain September 9, 1927.

This invention relates to microphone transmitters of the kind embodying a diaphragm and carbon granules such as is employed in connection with the electrical recording of sounds, wireless telephony, public address installations and for other like purposes.

The principal object of the invention is to provide a microphone which will be responsive to a much wider range of frequencies than those hitherto constructed and which will give a substantially equal response over the entire audible frequency range with which the microphone will be called on to deal.

A further object of the invention is to increase the sensitiveness of the microphone and to eliminate or minimize the hissing noise commonly experienced with carbon granule microphones as hitherto produced.

A still further object is to reduce or eliminate the rattling sounds due to looseness of the granules at the top of the microphone which sometimes occurs owing to age.

The invention consists in a microphone of the kind referred to having a diaphragm of substantially triangular shape.

The invention also consists in a microphone of the above character having a carbon granule chamber of substantially triangular shape with the apex at the top.

The invention further consists in a microphone of the above character having two electrodes, the one arranged at or approximately at the apex of the triangle and the other at or approximately at the middle point of the base.

The invention also consists in other details and arrangements hereinafter described or indicated.

The accompanying drawing illustrates one convenient form of microphone in accordance with the invention.

Fig. 1 is a front elevation; and

Fig. 2 is a side sectional elevation.

In carrying my invention into effect in one convenient manner I form my improved microphone with a circular or other shaped retaining case 5 which may be made of metal or of any other suitable material but which is preferably relatively heavy. Within the casing is a recess 6 lined with some insulating lining 7 such as ebonite and of substantially triangular form with the apex arranged at the top, the recess being provided with gaskets 8 on which is supported the diaphragm 9 which is formed of suitable material and which is of a shape similar to that of the recess, that is to say, of substantial triangular form.

Within the carbon granule recess I arrange two electrodes which conveniently take the form of polished carbon microphone buttons 10, one of such electrodes being arranged at the apex of the triangle while the other is at the centre of the base so that a line drawn through the centres of the buttons would form a right angle with the base line of the triangle as clearly seen from Fig. 1.

Connection to the electrodes is effected by means of insulated wires passing through the container to terminals 11 at the back of the microphone while a cover 12 of suitable form may be fitted in front of the diaphragm to prevent the same being accidentally damaged.

The triangular shape of the granule recess results in the prevention of the packing of the carbon granules which has hitherto been an undesirable feature of carbon granule microphones and which is due to the weight of carbon in the top half of the granule container bearing upon the granules in the lower part.

Owing to the triangular shape in accordance with the present invention, the weight of carbon granules in the top half of the chamber is very much less than that in the lower half so that such packing is thereby avoided or reduced to a minimum. Should, however, any slight tendency to pack occur due to a blow or to excessive mechanical vibration, the electrical disadvantages due to this are avoided by the disposition of the polished carbon electrodes since any packing of the lower half of the carbon chamber will be compensated by a corresponding loosening in the upper half so that the feed current of the microphone will remain constant.

A further means of avoiding packing and of blast also is by keeping the carbon granule chamber as small as possible and by recessing the carbon electrodes 10 slightly in the in-

sulated lining so that there is more carbon immediately in front of the electrodes than there is in other portions of the chamber.

The triangular shape of the diaphragm results in the microphone having a substantially equal response at all audible frequencies since the diaphragm may be viewed as a large number of horizontal strips of negligible width but of varying lengths, decreasing from the maximum at the base of the triangle to a minimum at the apex. Moreover, if a thickness of diaphragm be chosen such that a small strip of a length equal to the length of the base will resonate at a point where the higher frequencies normally commence to fall off in power considerably, it will be seen that each strip of the diaphragm will resonate from this frequency right up to the limit of audibility. Moreover, since the diaphragm is triangular in shape and is rigidly supported on each side, the diaphragm as a whole will have no resonance of its own.

The sides of the diaphragm and of the carbon granule chamber are preferably straight but may be slightly curved if desired.

In the case of carbon granule microphones, it has been found that owing to age, the carbon granules settle down and occupy less space after a time than they did when first put into the microphone. This results in a small air space between the top of the granules and the filling hole plug, and gives rise to rattling sounds due to looseness of the granules at the top of the microphone.

In order to overcome this, a plug 13 fitted with a spring plunger 14 may be provided of such dimensions and strength of spring that there will be always the same tension or pressure on the granules, and any settling down will be taken up by the spring, thus preventing the rattling.

The invention is not to be limited to the constructional details hereinbefore given by way of example, since these may be modified to suit any particular apparatus for which the microphone is to be employed or any practical requirements that may have to be fulfilled.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a microphone, a body portion, a substantially triangular-shaped carbon granule chamber within said body portion, two electrodes within said carbon granule chamber, and one of said electrodes being arranged approximately at the apex of the triangle and the other of said electrodes being arranged approximately at the middle point of the base of the triangle.

2. In a microphone, a body portion, a substantially triangular shaped carbon granule chamber within said body portion, carbon granules in said chamber, a plunger extending into said chamber through the apex thereof, and a spring normally acting to urge the plunger against the granules to prevent rattling thereof in the chamber.

Signed at London, England, this 11th day of July, A. D. 1928.

WILLIAM SPENCER PURSER.