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TRANSMITTER

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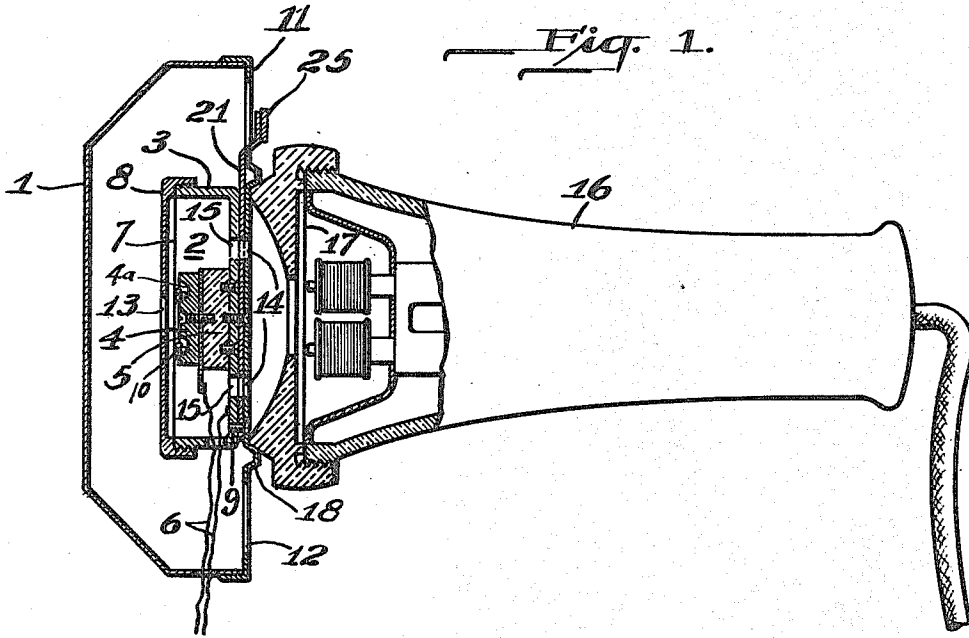


Fig. 1.

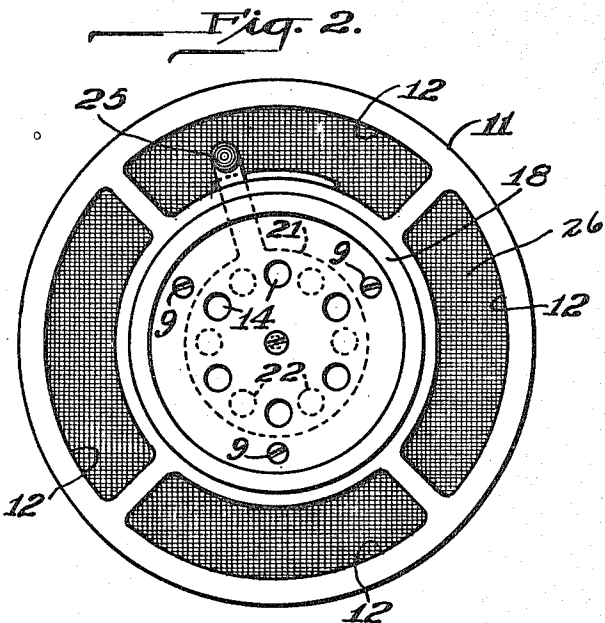


Fig. 2.

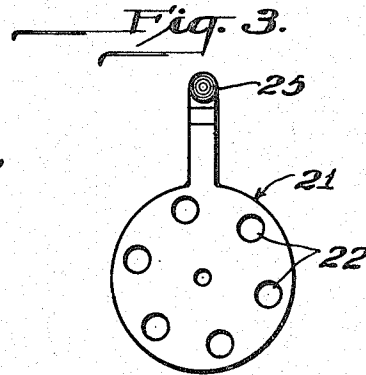


Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE

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TRANSMITTER

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5 Claims. (Cl. 179—107)

This invention relates to sound-transmitting apparatus, and more particularly to an improved microphone of the type utilized for the reception of sound vibrations in ear-phone circuits by people afflicted with defective hearing.

Among the most efficient microphones of this character in use today are those in which resonating and reflecting shells are employed to convey the sound vibrations to the diaphragms of the instruments where such vibrations are converted into electrical vibrations. In this type of instrument the microphones are often inverted, that is, the diaphragms are arranged in the back of the instruments facing the rear wall of the reflecting shell instead of in the front facing the source of the sound vibrations which they are used to pick up and amplify. As now constructed it is most difficult, if not impossible, as it is in many such microphones, to obtain a sufficiently efficient coupling between them and an ordinary telephone receiver for the user to carry on a telephone conversation, which is highly desirable.

With such difficulty in mind it is the primary object of this invention, generally stated, to provide in a microphone of the aforementioned type for easily and readily effecting a highly satisfactory and efficient coupling between it and an ordinary telephone receiver, so that the user can utilize such instrument for carrying on telephone conversations.

Another object is to provide a simple and sturdy instrument embodying the aforementioned features, but in which the coupling feature is adapted to be rendered completely ineffective when not in use.

These and various other objects, as well as the various other novel features and advantages of the invention, will be apparent when the following detailed description is read in conjunction with the accompanying drawing, of which Fig. 1 is a sectional view of a simple embodiment of the invention, showing a telephone receiver partly in section placed in operative relation therewith; Fig. 2 a front view of the microphone alone; and Fig. 3 a plan view of a shutter employed in the face of the microphone.

Referring in detail to the drawing, the particular embodiment of the invention therein illustrated comprises a resonating shell 1 provided with an open-faced cover 11 in which a microphone designated generally by the numeral 2 is mounted. This microphone, as shown, although it may take other forms, is housed in a metallic dish-shaped casing 3 which is attached by screws 9 to the center of the cover 11 with its open end

facing the back wall of the shell 1. To the back wall of this casing 3 there is attached a block of insulating material 5 which functions as a support and insulator for a current-conducting back plate 4 which, with the casing 3, is connected by a pair of conductors in an ear-phone circuit, not shown. In the face of this back plate a number of pockets 4a are provided and in them a quantity of carbon granules 10 is arranged in a well known fashion, being held therein by a metallic diaphragm 7 which in turn is held in place by a cover 8 that is screwed onto the outer end of the casing 3. In such cover 8 there is provided a central opening 13 to allow the sound vibrations entering the shell 1 to impinge against the diaphragm 7. To permit the sound vibrations freely entering the shell 1 a series of windows 12 is provided in the cover 11 beyond the central portion thereof to which the microphone is attached.

Up to this point in the description the construction of the instrument is not materially different from the usual inverted microphone now in use. In accordance with this invention, however, a series of registering holes 14 and 15 is provided in the otherwise normally closed central portion of the microphone-supporting cover 11 of the resonating shell and in the base, or what in effect is the front wall, of the microphone casing 3, respectively. The purpose of these holes is to provide for transmitting sound vibrations from an ordinary telephone receiver, such as indicated at 16, when placed thereover to the adjacent face of the microphone diaphragm, and in such way provide a direct coupling between the diaphragm 17 of the telephone receiver and the microphone diaphragm 7.

To provide for free movement of the sound waves propelled from the telephone receiver diaphragm 17 to the microphone diaphragm 7, the casing 3 of the microphone is made sufficiently larger in diameter than the carbon back plate 4 and insulating disk 5 disposed in it so that they will not deleteriously interfere with such waves, and to provide a closed circuit so as to improve the efficiency of the coupling, the face of the microphone outer cover 11 is preferably adapted to provide a closed seat for the face of the telephone receiver. In the present instance such cover is made flat to receive an old style receiver, and is provided with a circular ridge 18 in its face for aiding in effecting such seat and centering the receiver over the microphone. It will be appreciated, however, that any suitable means may be employed to accomplish this result with any shape of receiver.

In order for the microphone to function properly for normal sound reception, it is, of course, necessary to close the openings 14 and 15, otherwise the sound vibrations would impinge against both sides of the microphone diaphragm 7 with confusing results. For this purpose a shutter 21 in the shape of a flat disk, as shown best in Fig. 3, is adjustably mounted between the front wall of the microphone casing 3 and the cover 11 of the resonating shell, and provided with openings 22 in it which may be moved into registration with the holes 14 and 15 in the casing 3 and cover 11, when it is desired to carry on a telephone conversation, and out of registration therewith when the microphone is used for normal reception. As shown, the holes 14 and 15 in the casing 3 and shell cover 11, as well as those in the shutter, are spaced about concentric circles of equal diameter with sufficient space between them to allow the shutter to completely shut off the ingress of air to the inside of the microphone casing 3 when properly adjusted.

To permit the shutter 21 to be readily adjusted, the casing 3 is spaced by the screws 9 sufficiently from the cover 11, to allow it to move with ease, and for effecting its adjustment an arm 25 is projected from it beyond the edge of one of the windows 12 in the shell cover 11 where it is bent upwardly through a slot formed in a screen 26 that is mounted over such windows.

According to the provisions of the patent statutes, I have explained the principle and mode of operation of my invention, and have illustrated and described what I now consider to be its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A sound transmitter, comprising a resonating and reflecting shell provided with openings in it for the ingress of sound waves, a microphone mounted in a casing attached at its rear side to the inner side of said cover and disposed to be normally operated by the sound waves admitted to said shell through the openings therein, and means for admitting and preventing the ingress of sound vibrations to the interior of said microphone casing through said cover and its rear side in a manner adapting it to be effectively coupled to an ordinary telephone receiver.

2. A sound transmitter, comprising a resonating and reflecting shell having a rear and front

wall and provided with window openings in the latter adjacent the periphery thereof for the ingress of sound waves, a microphone enclosed in a casing attached to the inner side of said front wall with its diaphragm disposed to be activated by the sound waves admitted by said openings to said shell, and means cooperating with the rear wall of said microphone and the front wall of said shell for allowing and preventing sound vibrations entering the back of said microphone casing so as to adapt it to be operatively coupled to an ordinary telephone receiver.

3. A sound transmitter, comprising a resonating and reflecting shell having a front and rear wall, the former of which is provided with an opening in it adjacent its outer periphery for the ingress of sound waves, a microphone enclosed in a casing attached to the inner side of the front wall of said shell with its operating diaphragm exposed to the rear wall of said shell, and a movable shutter mounted between the front wall of said shell and said microphone casing to prevent and permit the ingress of sound waves to the interior of said microphone casing.

4. A sound transmitter, comprising a resonating and reflecting shell provided with an opening therein for the ingress of sound waves, a microphone enclosed in a casing mounted in the inside of said shell with its diaphragm arranged for operation by the sound waves entering said shell, means for allowing and preventing the ingress of sound waves to the interior of said microphone casing, and means for seating an ordinary telephone receiver over said latter means to thereby aid in effecting a coupling between such a receiver and said microphone.

5. A sound transmitter, comprising a resonating and reflecting shell, a cover provided with window openings in it about its periphery, for the ingress of sound waves, mounted on said shell, a microphone casing attached at its back to the inner side of said cover, a back plate mounted in said casing, a diaphragm operably associated with said back plate but disposed to be normally operated by the sound waves admitted to said shell through the openings in the cover thereof, and means cooperating with the rear wall of said microphone casing and said shell cover for allowing and preventing sound vibrations entering the interior of said casing by way of said cover and the back of said casing to adapt the transmitter for use with an ordinary telephone receiver.

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