No. 608,255. Patented Aug. 2, 1898.

R. B. G. GARDNER.

APPLIANCE FOR ENABLING THE DEAF TO HEAR.

(Application filed Nov. 18, 1897.)

(No Model.)

Fig. 1.

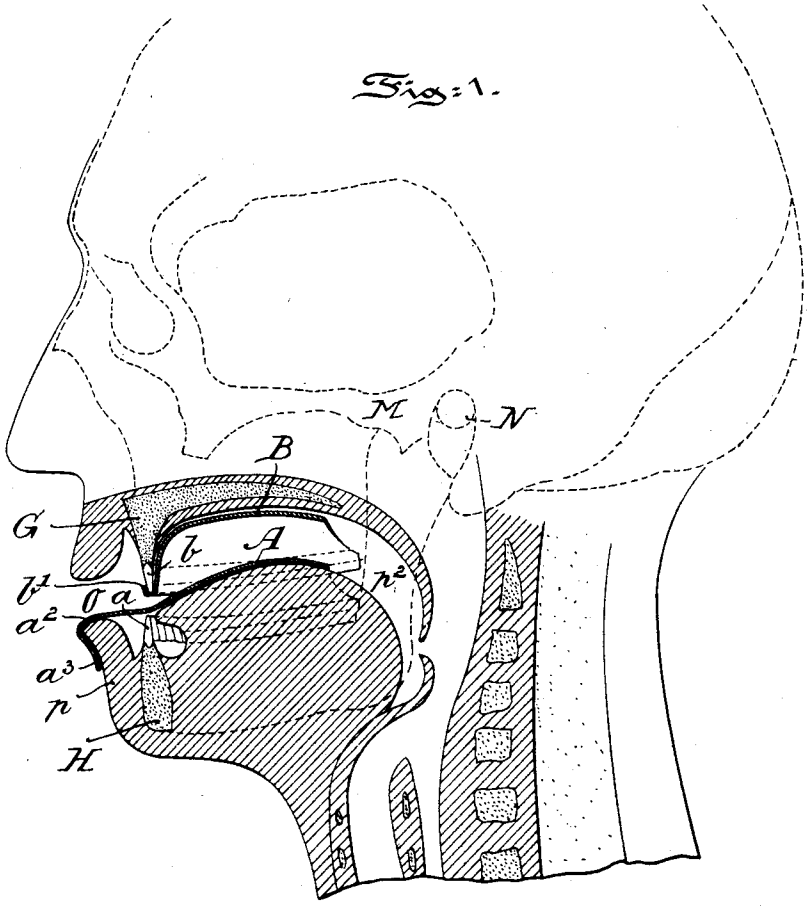
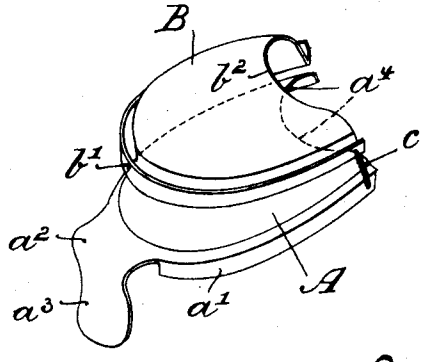


Fig. 2.



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UNITED STATES PATENT OFFICE.

RICHARD B. G. GARDNER, OF PHILADELPHIA, PENNSYLVANIA.

APPLIANCE FOR ENABLING THE DEAF TO HEAR.

SPECIFICATION forming part of Letters Patent No. 608,255, dated August 2, 1898.

Application filed November 18, 1897. Serial No. 658,900. (No model.)

To all whom it may concern:

Be it known that I, RICHARD B. G. GARDNER, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Appliances for Enabling the Deaf to Hear, of which the following is a specification.

My invention has relation to a mechanical appliance or device for enabling the deaf to hear; and in such connection my invention has for its objects, first, to provide a simple and effective means of conveying to the internal ear direct through the maxillary and temporal bones by impact of sound-waves against tympans or plates inserted in the mouth by the superior and inferior maxillary bones through reflection and direct contact of sound-waves communicated to the temporal bone in which the internal ear is situated, and, second, to provide a suitable appliance or device for application to the mouth to permit of speech by sound-wave conduction and reflection to be transmitted through the intervention of the teeth, maxillary and temporal bones direct to the internal ear to aid or facilitate the deaf to hear the speech transmitted to the person.

My invention, stated in general terms, consists of an appliance or device for aiding the deaf to hear by transmission of speech conveyed and reproduced through the internal ear.

The nature, scope, and characteristic features of my invention will be more fully understood from the following description and the accompanying drawings, illustrating a device or appliance adapted to be inserted and held in the mouth for transmitting speech by reproduced sound-waves to the temporal bone of the ear, to effect thereby hearing of the communicated and conveyed speech by the deaf.

Figure 1 is a side elevational view, partly in section, of a head, showing the upper and lower jaws, and also in application a device or appliance of my invention designed to enable the deaf to hear by the use of the same; and Fig. 2 is a perspective view of the device or appliance of my said invention removed from the mouth.

In the drawings is illustrated a device or appliance found practically efficient for carrying out my invention adapted to convey to the internal ear direct through the teeth, maxillary bones G and H, and temporal bone M, or in the absence of teeth the maxillary and temporal bones G, H, and M, by contact and reflected sound-waves upon and against upper and lower tympans or plates A and B to the maxillary and the temporal bones to the auditory nerve in the field of the internal ear, the sound-wave reproductions of the articulate speech transmitted through said maxillary conductors being direct to the temporal bones and then to the auditory nerve within the field of the internal ear N.

The bottom tympan or plate A is adapted to be fitted into the mouth O, so as to span the top of the teeth a, and flanged at a', so as not to completely cover the faces of said teeth, and in front provided with a curved lug a^2, fitting over the lower lip and extending down onto the chin p at a^3. The rear portion of the plate is recessed at a^4 in the direction in its position in the mouth of the throat-opening p^2. The upper tympan or plate B is adapted to span the upper teeth b by embracing the bottom of the same, but flanged at b', so as not to completely inclose the face of the teeth, and the rear of said plate is provided with a semicircular recess b^2. These two tympans or plates A and B are coupled together by means of helical, spiral, or other suitable springs c in order to prevent displacement of the said plates A and B in the mouth, and also to permit of the quick introduction of the same into the mouth by a single application, so as to be brought into position to permit of sound-wave reproduction of the speech transmitted and conducted by the maxillary and temporal bones and reflected by the auditory nerve located in the field of the internal ear N, which, as practice has demonstrated, greatly aids or facilitates hearing by a deaf person of the articulate speech so transmitted to such person.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for enabling the deaf to hear, comprising tympans or plates adapted to be placed in the mouth so as to contour

with the teeth leading to the superior and inferior maxillary bones to convey sound-waves to and by the temporal bones to the auditory nerve within the field of the internal ear and one of said tympans or plates extended and contracted so as to fit over one of the lips, substantially as and for the purposes described.

2. An appliance of the character described, comprising a flanged tympan or plate recessed in the rear thereof and adapted to contour with the teeth of the mouth and also to contour with the lip and extend onto the face or chin, substantially as and for the purposes described.

3. An appliance of the character described, comprising a tympan or plate flanged and adapted to contour with the teeth of the lower jaw and provided with an arched lug adapted to span the lip and engage the chin and recessed in the back thereof, a second tympan or plate adapted to contour with the teeth of the upper jaw and recessed in the rear of the same, and means for connecting said tympans or plates with each other, substantially as and for the purposes described.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

RICHARD B. G. GARDNER.

Witnesses:
J. WALTER DOUGLASS,
THOMAS M. SMITH.