Oct. 25, 1932. C. FENSKY 1,884,638

HEARING DEVICE

Filed June 22, 1929

Fig. 1.

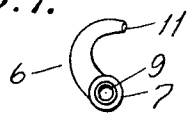


Fig. 2.



Fig. 4.

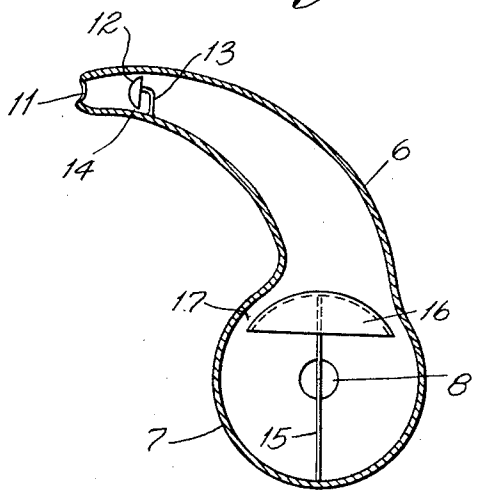


Fig. 3.

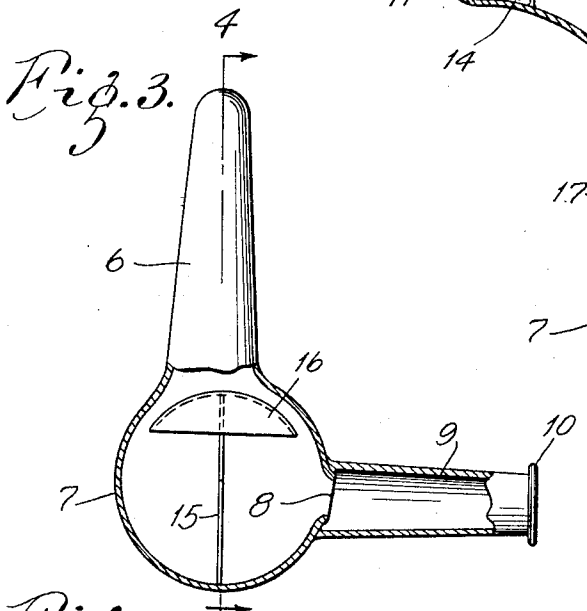
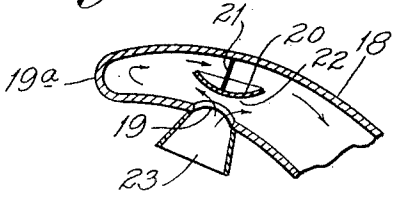


Fig. 5.



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UNITED STATES PATENT OFFICE

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HEARING DEVICE

Application filed June 22, 1929. Serial No. 372,855.

My invention relates to improvements in hearing devices, and has for its primary object a device which is to be supported within the outer ear passage and the concha of the ear and which will direct the sound waves entering the same to the ear drum.

A further object is to construct a hearing device which is provided with a plurality of deflectors or obstructions which cause the sound waves to impinge on the ear drum with greater force than is ordinarily the case, thereby causing an ear drum which has become thickened, to vibrate so that the person so afflicted will be enabled to hear better.

In the drawing:

Fig. 1 is a side elevation of my device viewing the same from the side which will be next to the head;

Fig. 2 is a similar view viewing the same from the opposite side;

Fig. 3 is an enlarged edge view with portions thereof broken away and in section illustrating the position of one of the deflectors;

Fig. 4 is a section taken on the line 4—4 of Fig. 3; and

Fig. 5 is an enlarged fragmental section of the outer end of my device showing a modified form of construction.

In the construction of my device I employ a tubular member 6. This tubular member is preferably curved as illustrated in Figs. 1, 2 and 4 and gradually increases in diameter from one end. The large end of the curved member 6 terminates in a globular member 7. This globular member has an opening 8 formed in its wall surrounding which is a tubular extension member 9. This tubular member is preferably provided on its outer end with a bead 10 so as to eliminate the sharp edges. It will be noted from Fig. 3 that the tubular member 9 is arranged at an angle to the tubular member 6. The tubular member 6 is provided with an opening 11 which may be formed in its end as illustrated in Fig. 4.

Spaced rearwardly from the opening 11 is a convex-concavo deflector 12. This member is preferably carried by means of a support 13. The member when in position forms a restricted passage 14 in the member 6.

The globular portion 7 carries a stem 15 to the upper end of which is attached a convex-concavo deflector 16. This deflector is placed directly opposite the point where the member 6 opens into the member 7 and forms a restricted passage 17. In Fig. 5 I have shown a modified form of construction in which 18 represents a curved member similar to the member 6. In this form of construction, however, a sound opening 19 is formed in the wall of the member 18 at some distance to the rear of the outer end 19*a*.

Directly opposite this opening is a convex-concavo deflector 20 which is carried by the stem, or other supporting means, 21 and which forms a restricted passage 22. If desired, an outwardly flaring member 23 may be secured around and extending from the opening 19.

I do not desire to limit myself to the specific location of either of the openings 11 or 19, as they may be placed at various positions on the member 6.

In using my device the tubular member 9 is inserted in the outer ear passage so that the enlargement 7 and the tubular member 6 lie in the concha of the ear and are supported thereby and thus no external supporting means is necessary for my device.

The operation of my present structure is as follows:

After the device has been placed in the ear, sound waves entering the interior of the member 6 through the opening 11 first strike the convex side of the deflector 12. These pass around the deflector through the restricted passage 14. After passing the deflector 12 they enter the unobstructed portion of the member 6. These sound waves then strike the deflector 16 and are again restricted in passing through the passage 17. They then enter the globular member 7 and then pass through the member 9 to impinge violently on the ear drum, thus causing the drum to vibrate even if the same has lost its elasticity through becoming diseased.

In the modification shown in Fig. 5 the sound waves entering the opening 19 impinge

on the convex side of the deflector 20. A portion of these sound waves is deflected through the narrow passage 22 directly toward a deflector similar to the deflector 16 of Fig. 4. The remainder of the sound waves passing through the restricted passage 22 are deflected toward the end 19*a* of the member 18. Thence they pass to the rear of the deflector 20 and intermingle with the sound waves which are passing toward the deflector 16 augmenting these sound waves. Thus it will be seen that none of the sound waves entering the device are lost, and it has been my experience from actual tests that hearing is improved by the use of my device.

While I have shown two deflectors in my device, I do not desire to limit myself thereto, because in mild cases of defective hearing, one deflector will serve the purpose, whereas in every serious afflictions it may be necessary to use a greater number in order to obtain the desired result.

I have also discovered that where my device was used by persons in which the external ear drum was entirely destroyed and rendering them deaf, the device placed in position in the ear set up vibrations which were communicated to the inner ear, and these persons who thought themselves totally deaf have been able to use telephones and hear ordinary conversations. In fact my device might be termed an external ear drum because it gathers the sound waves in such a manner as to cause unaffected parts of the inner ear to vibrate and transmit sound through the auditory nerves to the brain.

I have also discovered that by the use of my device people who could not hear their own voices when speaking have been enabled to hear the same.

Having fully described my invention, what I claim is:—

1. A hearing device comprising a pair of communicating tubular members arranged at an angle to each other, one of said members having an opening formed in its wall, and a convex-concavo deflector located across the interior of said member opposite said opening and spaced from said wall.

2. A hearing device comprising a pair of communicating tubular members arranged at an angle to each other, one of said members having an opening formed in its wall, a plurality of deflectors located in said members, one of said deflectors being opposite said opening, and means for supporting said deflectors so that they will be out of contact with said members.

3. A hearing device comprising a tubular member having an opening in its wall, a convex-concavo deflector located across said wall in said member opposite said opening but out of contact with said wall, and a second tubular member carried by said first mentioned member adjacent one end and communicating with and arranged at an angle to said first mentioned member.

4. A hearing device comprising a tubular member having an opening in its wall, a convex-concavo deflector in said member opposite said opening and out of contact with the wall of said member, a second tubular member carried by said first-mentioned member adjacent one end thereof and at an angle thereto and communicating therewith, and a convex-concavo deflector in said second member and out of contact with the walls thereof.

5. A hearing device comprising a pair of communicating tubular members arranged at an angle to each other, one of said tubular members having an opening formed in the wall thereof, a deflector located in the last mentioned tubular member opposite said opening for forming a restricted passage in said tubular member, and supporting means for holding said deflector out of contact with said member.

6. A hearing device comprising a pair of communicating tubular members arranged at an angle to each other, one of said tubular members having an opening formed in the wall thereof, a convex-concavo deflector located in said member for forming a restricted passage therein, said means being opposite said opening, and means for holding said deflector out of contact with said member.

In testimony whereof I have affixed my signature.

CHARLES FENSKY.