

Aug. 8, 1939.

J. PETERSEN

2,168,781

HEARING DEVICE

Filed Sept. 21, 1937

Fig. 1



Fig. 3

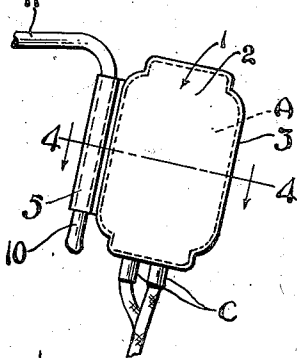


Fig. 6

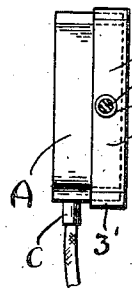


Fig. 7

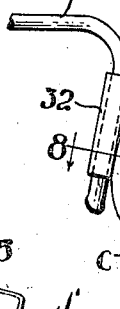


Fig. 8

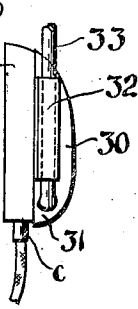


Fig. 5

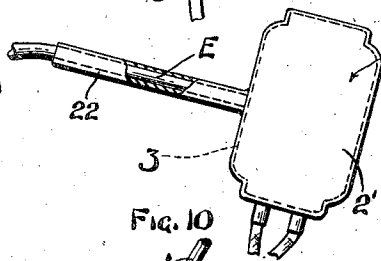


Fig. 4

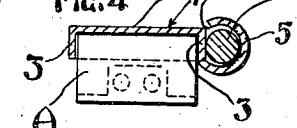


Fig. 9

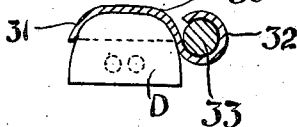


Fig. 10

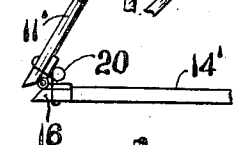
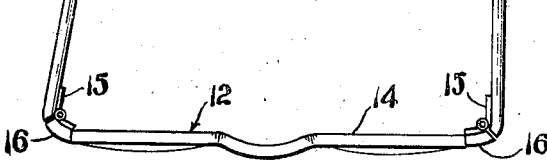


Fig. 2



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# UNITED STATES PATENT OFFICE

2,168,781

## HEARING DEVICE

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Application September 21, 1937, Serial No. 164,857

9 Claims. (Cl. 179—107)

This invention relates to telephonic devices for assisting or enabling partially deaf persons or persons whose hearing is impaired, to hear, and more particularly to means for holding such hearing assisting devices in proper position and with proper tension against the head of the user.

In such cases where deafness is not accompanied by impairment of the auditory nerve, and is due solely to defects in the ear structure, it is an established fact that sound vibrations can be made to act on the auditory nerve through bones of the head such as the mastoid temporal bone or the nasal bone.

There are many telephonic devices of various shapes and manufacture on the market, known generally as audiphones, and the most practical and successful of these are those of the type which act on the mastoid temporal bone.

Various types of apparatus have been devised for holding such audiphones in place, and with proper pressure against the mastoid temporal bone, but the ones which have been most successful to date and are at present in general use are awkward and cumbersome in appearance and in many instances uncomfortable to wear.

Attempts have been made to incorporate the audiphones in eye-glasses but such attempts heretofore made have required specially constructed eyeglasses, specially constructed audiphones, and the audiphones have been incorporated in the eye-glass structures as a part thereof, and one could not be used without the other.

The primary object of the present invention is to provide a convenient, neat-appearing, inconspicuous device for holding an audiphone in proper contact with the mastoid temporal bone of the user.

More specifically, an object of the present invention is to utilize eye-glasses of ordinary construction, and particularly the ear-pieces or bows thereof, to which is detachably attached a carrier member shaped and designed to receive the particular make of audiphone preferred by the user, and constructed so that the audiphone and/or the carrier may be attached to or detached from the glasses as desired.

It has been found that the ordinary construction of eye-glasses does not provide sufficient pressure to hold an audiphone in the proper tensioned contact with the mastoid temporal bone, and it is therefore another object of the present invention to provide novel changes in the construction of eye-glasses, which will in no wise interfere with their efficiency, to provide sufficient tension or pressure and insure proper contact of the

audiphone or hearing device with the bones of the head of the user.

With these and other objects in view, as may appear from the accompanying specification, the invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawing, showing a hearing device embodying the invention, and the features forming the invention will be specifically pointed out in the claims.

In the drawing:

Figure 1 is a view showing the improved hearing device in edge elevation and illustrating its application to eye-glasses, in use.

Figure 2 is a top plan of eye-glasses showing the improved audiphone carrier attached thereto and illustrating one form of modifying the eyeglasses to provide the necessary pressure or tension to hold the audiphone in place.

Figure 3 is a rear elevation of the carrier showing it attached and having the audiphone therein.

Figure 4 is a cross section on the line 4—4 of Figure 3.

Figure 5 is a view of a modified form of the carrier showing it applied to a straight bow of eye-glasses.

Figure 6 is an edge elevation of the modified form of carrier shown in Figure 5.

Figure 7 is a rear elevation of a modified construction of the carrier adapted for use with a different shaped audiphone than that shown in Figures 1 to 4 inclusive.

Figure 8 is an edge elevation of the carrier shown in Figure 7.

Figure 9 is a cross section taken on the line 8—8 of Figure 7.

Figure 10 is a detailed view showing a modified construction of eye-glasses to provide the necessary pressure and tension to hold the audiphone in place.

The present invention is extremely simple in construction, operation and use and consists essentially in the combination of two elementary features, namely the provision of a simple, inexpensive, practical device by means of which an audiphone may be attached to any suitable type of eye-glass of the bow type, and second in the slight modifying of the structure of the eyeglasses to provide the necessary tension or pressure to securely hold the audiphone in place with sufficient pressure against the mastoid temporal bone to provide the necessary transmission of sound vibrations through the bone to the auditory nerve, and in the drawing are shown certain

types or shapes of carrier members designed to properly fit and carry well-known types of audiphones, but it is to be understood that the invention is not limited to the shapes of carrier shown or to any particular shape of carrier, but embraces the broad idea of the carrier as hereinafter more specifically described for use in connection with any of the many types of audiphones now on the market.

The carrier, one form of which is shown in Figures 1 to 4 inclusive, comprises a body 1 which includes a back plate 2 shaped preferably to conform to the shape of the audiphone, indicated at A, but if it is so desired the carrier may be of any desired shape, in the present instance, oblong or oval. The back plate 2 has sides 3 formed thereon which are bent or extend substantially at right angles to the back plate 2 and are tensioned or constructed so as to frictionally grip the audiphone A and hold it securely in position in the carrier. As clearly shown in Figures 2 and 4 of the drawings, the frictionally gripping sides 3 extend only partway over the edges of the audiphone A so as to leave the plug receiving sockets B exposed to receive the plugs C of the hearing device.

The carrier 1 has an attaching sleeve 5 formed thereon which is rolled or formed from the same piece of material of which the carrier 1 is made and is provided with sufficient tension to frictionally grip the down-turned portion 10 of one of the bows 11 of a pair of glasses 12. The attaching sleeve 5 is open at both ends so that it may be slipped over the end 10 of the bow 11 for attaching the carrier to the eye-glasses 12. The provision of the frictionally gripping attaching sleeve 5 will also permit the carrier 1 and the audiphone to be disconnected from the eye-glasses whenever desired, allowing the eye-glasses to be used independently of the hearing device.

The usual construction of eye-glass does not provide sufficient lateral tension to the bows, for holding the audiphone or hearing device against the head bone of the wearer with sufficient pressure to insure the proper transmission of the sound vibrations to the bone and from thence to the auditory nerve, and in the form shown in Figure 2 of the drawing a very simple alteration is made to the eye-glasses, which can be made to practically any approved type of eye-glasses having sufficient body and stability to carry the hearing device, by any one and at practically no cost. The bows of the eye-glasses 12 are attached to the frame 15 by hinges 15 and the hinge extensions 16. Normally the hinge extensions 16 are substantially in the same plane as the frame 14 of the glasses, and the bows 11 normally extend substantially at right angles to the frame as shown at the right-hand side of Figure 2 of the drawing. By bending the hinge extension 16 to which the audiphone carrying body 11 is hinged, at an abrupt angle to the frame 14 so as to reduce the internal angle between the frame 14 and the body 11, additional side tension is provided through the body 11 when it is forced outwardly to fit along the side of the head of the user and this additional side tension which is provided by the resiliency of the bow and its increased inward inclination will press the audiphone or hearing device A against the mastoid temporal bone of the user with sufficient pressure to insure the proper transmission of the sound vibrations.

If the particular application of the hearing device requires it or it is found desirable to do so

both of the hinge extensions on the frame of the eye-glasses may be bent as shown in the drawing and thus provide a counter tension or pressure on the opposite side of the head of the wearer. Also the present invention embraces the idea of bending the bows of the eye-glasses to provide the necessary or desired pressure against the head of the user of the hearing apparatus.

Figure 10 of the drawing shows a modified construction of the eye-glass structure and in this form a spring 20 is provided which is connected to the hinge extension 16' of the frame 14' of the eye-glasses and to the bow 11' for urging the bow inwardly on its hinged connection towards the bridge or center of the eye-glasses and provide the lateral tension to the bows, through the medium of the spring, for holding the audiphone or hearing device against the bone in the head of the user with the necessary pressure.

In the modified form shown in Figures 5 and 6 of the drawing, the carrier 1' comprises a body 2', shaped like the body 2 to receive the audiphone indicated at A and it has the turned sides or edges 3' for frictionally gripping the audiphone and holding it. The edges 3' terminate intermediate the sides of the audiphone A so as to permit the attachment of the wire plugs C to the audiphone. This far, the modified form of the carrier is the same as the form shown in Figures 1 to 4 of the drawing. It has, however, a different structure for attaching it to a bow of a pair of eye-glasses. To permit attachment of the carrier 1' to a bow indicated at E, a tube 22 is formed upon or attached to one of the sides 3' of the bow 2', preferably centrally of the side as shown in Figure 6 of the drawing. The tube 22 extends laterally from the bow 2' and has its outer end open so that it may be slipped over the body E for securely attaching the carrier 1' to the bow.

Figures 7, 8 and 9 show a slight modification of the carrier but all of the essential features of this modification are the same as those of the other forms heretofore described and the modification is due merely to the fact that it is shaped to fit a different type of audiphone than that shown in Figures 1 to 4 inclusive.

The carrier 30 shown in Figures 6 to 8 inclusive includes a body having its edge portions 31 extending at angles to the main body so as to frictionally engage the audiphone indicated at D and hold it in place in the carrier and against the mastoid temporal bone of the user. The body 30 has an attaching sleeve 32 formed thereon, preferably being rolled or formed from the same piece of material of which the carrier body is formed and the attaching sleeve 32 is tensioned for gripping one of the bows of a pair of eye-glasses as indicated at 33 for attaching the carrier and the audiphone to the eye-glasses. The sides 31 of the carrier 30 extend downwardly over the body of the audiphone D only a sufficient distance to provide the necessary frictional gripping engagement with the audiphone and they leave sufficient space to permit unimpeded attachment of the plugs C to the audiphone.

It will be understood that the invention is not to be limited to the specific construction or arrangement of parts shown but that they may be widely modified within the invention defined by the claims.

What is claimed is:

1. The combination with a pair of eye-glasses including bows, and an audiphone, of a carrier member detachably carried by one of said bows

and provided with means for frictionally gripping said audiphone.

2. The combination with a pair of eye-glasses including bows, and an audiphone, of a carrier member on one of said bows and provided with means for frictionally gripping said audiphone, and means associated with said carrier carrying bow for increasing the lateral tension thereof for firmly pressing said audiphone against the mastoid temporal bone of the wearer.

3. In combination with a pair of eye-glasses including bows, a frame and hinge extensions on the frame, an audiphone, a carrier member detachably carried by one of said bows and provided with means for frictionally gripping said audiphone, the hinge extension to which said carrier carrying bow is hinged being bent so as to force the bow inwardly towards the bridge of the eye-glass frame at an angle less than the normal angle of the bow relative to the frame to increase the lateral tension of the bow when worn for firmly pressing the audiphone against the mastoid temporal bone of the wearer.

4. In a hearing device, a carrier member including a body having semi-resilient edge portions shaped for frictionally engaging an audiphone and means on said body for attaching it to a bow of a pair of eye-glasses.

5. In a hearing device, a carrier member including a body having semi-resilient edge portions shaped for frictionally engaging an audi-

phone and a resilient attaching sleeve formed on said body for receiving and frictionally gripping a bow of a pair of eye-glasses.

6. In a hearing device, a carrier member including a body having semi-resilient edge portions shaped to frictionally engage an audiphone, and a glasses bow receiving sleeve on said carrier and extending laterally from one side thereof.

7. The combination with a pair of eye glasses including bows, and an audiphone, of a carrier member for removably carrying said audiphone, and a sleeve on said carrier member for mounting upon one of the bows of said glasses.

8. The combination with a pair of eye glasses including bows, and an audiphone, of a carrier member provided with means for frictionally gripping an audiphone, and a sleeve on said carrier member for mounting upon one of the bows of said eye glasses.

9. The combination with a pair of eye glasses including bows, and an audiphone, of a carrier member provided with means for frictionally gripping an audiphone, and a sleeve on said carrier member for mounting upon one of the bows of said eye glasses, and means associated with said carrier carrying bow for increasing the lateral tension thereof for firmly pressing said audiphone against the mastoid temporal bone of the wearer.

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