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B. LANGENBECK ET AL

HOLDING OR ATTACHING MEANS FOR EAR TELEPHONES, LISTENING TUBES, AND SIMILAR DEVICES FOR IMPROVING THE HEARING

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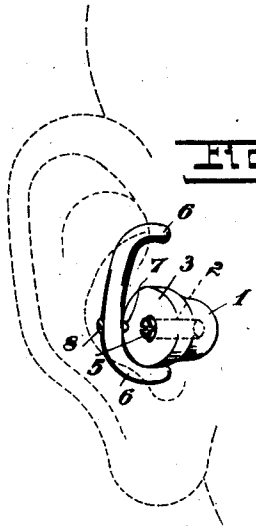


Fig. 1

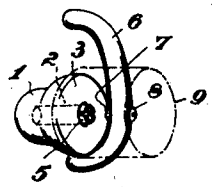


Fig. 2

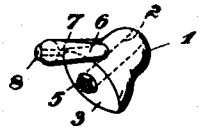


Fig. 3

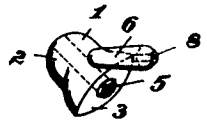


Fig. 4

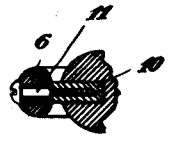


Fig. 5

Inventors
Bernhard Langenbeck, and
Artur Martin
by Knight Bros
Attorneys

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UNITED STATES PATENT OFFICE.

BERNHARD LANGENBECK, OF LICHTERFELDE-WEST, NEAR BERLIN, AND ARTUR MERTEN, OF PANKOW, NEAR BERLIN, GERMANY, ASSIGNORS TO SIEMENS & HALSKE, AKTIENGESELLSCHAFT, OF SIEMENSSTADT, NEAR BERLIN, GERMANY, A CORPORATION OF GERMANY.

HOLDING OR ATTACHING MEANS FOR EAR TELEPHONES, LISTENING TUBES, AND SIMILAR DEVICES FOR IMPROVING THE HEARING.

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Means of this kind suited to be fixed to the external organs of the ear have been known for a long time, but the known means leave much to be desired in regard to reliability and comfort. The attachment of the telephone to the ear was hitherto effected by introducing the olive into the outer portion of the auditory conduct, the telephone or a tubular extension upon it being frequently bent so as to form a hook. It has also been proposed to employ special bows for the purpose, which pass externally around the shell of the ear in the manner of the bow of a pair of spectacles. By all known arrangements however a disturbing and not altogether harmless pressure is exerted upon the adjacent parts of the ear.

A further drawback of the known constructions consists in the necessity of manufacturing several sizes of the holding means on account of the varying sizes of the human ears. It is also necessary to manufacture two forms of each size, one for the right and one for the left ear. A merchant dealing in such articles will thus have to hold all sizes and forms in stock.

The drawbacks of the known constructions are according to our invention avoided by combining with the miniature telephone, the listening tube or any other apparatus to be connected with the ear a holder fitting closely into the shell of the ear and of such shape or configuration that it is securely held in position by the overlapping edges of the central portion of the shell of the ear, an extension furnished with a sound passage entering simultaneously the orifice of the auditory conduct. In this manner the attachment is rendered extremely secure and owing to the elasticity of the holding parts of the ear shell the pressure of the apparatus is so distributed that no disagreeable sensation is caused in the ear.

A further notable feature of our invention is the construction of the holder of two or more different parts, which are mutually connected and may be adjusted and fixed in any desired position in relation to each other. This is very advantageous as it becomes possible to adjust any holder to the different forms and sizes of the ear shell and to employ the same holder for the right or the left ear as may be required. Henceforth it is according to our invention only necessary to manufacture holders of a single form and size.

A preferred embodiment of our invention is shown in the accompanying drawing in which Figures 1 and 2 show a holder adapted for the right and the left ear respectively.

Figures 3 and 4 show the same holder seen from above and adjusted for the right and the left ear respectively.

Figure 5 shows on an enlarged scale a partial section through a modified form of the connection between parts of the holder.

The improved holder is preferably moulded or pressed from vulcanite or a similar material and is provided with an extension 1 which is inserted into the orifice of the meatus or auditory conduct and is provided with a sound passage 2. 3 denotes a profiled surface in the central part of which the edge of a slotted metal sleeve 5 is visible, which is located in the sound passage and to which the telephone is to be fastened. The telephone proper in the form of a cylindrical body 9 is indicated in dotted lines in Fig. 2. It has been omitted from Fig. 1 so as not to unnecessarily obscure the important elements of the invention. The element 9 is meant to designate the entire telephone receiver, which in this case comprises a so-called miniature receiver, of which various types are known in the art. The wire connection leading from the miscrophone to element 9 and the microphone itself are not shown here, being immaterial to the subject matter claimed in this application. Casing 9 may also represent any other sound supplying means, such as the end portion of a speaking tube or the like as is pointed out at the beginning. The other part 6 of the device is formed to adapt itself to the interior of the ear shell shown in dotted lines in Fig. 1. The upper end of this bow- or wing-shaped part is formed so as to fit between and under the helix and the antihelix whereas the lower end of this element is formed so as to engage under the antitragus. The two parts of the holder are rotatably

connected by means of a pin shaft 7 which is inserted in inclined position into the edge of the main part 3 and which assumes a horizontal position when the device is used.

In accordance with the Figures 1–4 pin shaft 7 is securely fastened in the conical part of the holder and the bow 6 is loosely pivoted on the said shaft. The position of the bow part in relation to the shaft is secured by means of a screw 8, which is screwed into the shaft 7 and the head 8 of which is visible on the outer part of the bow 6.

By holding the bow 6 and turning the conical piece 1 on the shaft 7 the holder may be brought from a position (Figs. 1 or 3) in which it fits the right ear into a position (Figs. 2 or 4) in which it fits the left ear.

The surface 3 is profiled in correspondence with the ear-ward pointing diaphragm end of the telephone casing at which the telephone is attached to the holder. If the casing surface at that end is straight or plane, so would be the surface 3 of the holder, and if the one of the two surfaces is covex, the other is concave and vice versa so that both surfaces may join tightly. Furthermore the joining of said surfaces and the fastening of the telephone to the device here shown is attained for instance by making the hole in the telephone casing near the diaphragm, and through which the sound emanates slightly smaller in diameter than the outside diameter of the slotted sleeve 5, so that when the telephone casing is pushed over sleeve 5 the slotted portions of the latter yield inwardly and thus press against the walls of the hole in the casing with sufficient pressure to frictionally hold the telephone in place. The sound vibrations of the telephone are communicated then through the hollow slotted sleeve 5 and the passage 2 to the auricle.

According to the constructional form of the connection of the conical and the bow-shaped parts of the holder shown in Fig. 5 a metal sleeve 10 is inserted into the conical part and the bow 6 is rotatably connected to the cone by means of a threaded pin 11. By setting the pin 11 forcibly the two parts of the holder will become rigidly connected to each other, so that the holder may be delivered to a patient adjusted for his ear and ready for use, whereby the patient is spared the inconvenience and trouble of adjusting the holder himself. The constructional forms described in the specification and shown in the drawings are only to serve as examples. The device may be designed in many other ways within the scope of the invention.

What we claim as our invention and desire to secure by Letters Patent is:—

1. A holder for ear telephones, listening tubes or similar sound supplying devices for improving the hearing, consisting of a supporting element adapted to be inserted within the antihelix and antitragus and to fit the interior of the shell of the ear, so as to be held in position by the overlapping edges of said portions of the shell above and below the orifice of the meatus, and a sound conducting element attached to said supporting element and containing a sound passage and being shaped at its inner end to fit the orifice of the meatus.

2. A holder for ear telephones, listening tubes or similar sound supplying devices for improving the hearing, consisting of a supporting element adapted to be inserted within the antihelix and antitragus and to fit the interior of the shell of the ear, so as to be held in position by the overlapping edges of said portions of the shell above and below the orifice of the meatus, and a sound conducting element adjustably attached to said supporting element and containing a sound passage and being shaped at its inner end to fit the orifice of the meatus.

3. A holder for ear telephones, listening tubes or similar sound supplying devices for improving the hearing, consisting of a supporting element adapted to be inserted within the antihelix and antitragus and to fit the interior of the shell of the ear, so as to be held in position by the overlapping edges of said portions of the shell above and below the orifice of the meatus, and a sound conducting element attached to said supporting element and containing a sound passage and being shaped at its inner end to fit the orifice of the meatus, said sound conducting element having means for holding the sound supplying device.

4. A holder for ear telephones, listening tubes or similar sound supplying devices for improving the hearing, consisting of a supporting element adapted to be inserted within the antihelix and antitragus and to fit the interior of the shell of the ear, so as to be held in position by the overlapping edges of said portions of the shell above and below the orifice of the meatus, and a sound conducting element adjustably attached to said supporting element and containing a sound passage and being shaped at its inner end to fit the orifice of the meatus, said sound conducting element having an outer surface extending substantially in parallel to the side of the wearer's head and being suitably contoured to fit the contour of the adjacent portion of the sound supplying device attached to said conducting element.

5. A holder for ear telephones, listening tubes or similar sound supplying devices for improving the hearing, consisting of a supporting element adapted to be inserted within the antihelix and antitragus and to fit the

interior of the shell of the ear, so as to be held in position by the overlapping edges of said portions of the shell above and below the orifice of the meatus, and a sound conducting element adjustably attached to said supporting element to assume two corresponding symmetrical portions corresponding with the use in the left or right ear of the wearer, said conducting element containing a sound passage and being shaped at its inner end to fit the orifice of the meatus, said sound conducting element having means for holding the sound supplying device.

6. A holder for ear telephones, listening tubes and similar sound supplying devices for improving the hearing, consisting of a supporting element adapted to fit the interior of the shell of the ear so as to be held in position by the overlapping edges of the central portion of the said shell above and below the orifice of the meatus and of a sound conducting element containing a sound passage and adapted to fit the orifice of the meatus, said elements being joined and movable in relation to each other in such a manner that they may assume two positions symmetrically to the meridian plane of the head.

7. A holder for ear telephones, listening tubes and similar sound supplying devices for improving the hearing, consisting of a supporting element adapted to fit the interior of the shell of the ear so as to be held in position by the overlapping edges of the central portion of the said shell above and below the orifice of the meatus and of a sound conducting element containing a sound passage and adapted to fit the orifice of the meatus, said elements having a pivotal shaft adjustably interconnecting them, said shaft lying parallel to the meridian plane of the head.

8. A holder for ear telephones, listening tubes and similar sound supplying devices for improving the hearing, consisting of a supporting element adapted to fit the interior of the shell of the ear so as to be held in position by the overlapping edges of the central portion of the said shell above and below the orifice of the meatus and a sound conducting element containing a sound passage and adapted to fit the orifice of the meatus, said elements being movably joined to each other and means for rigidly locking said elements to each other in the desired relative position.

In testimony whereof we affix our signatures.

BERNHARD LANGENBECK.
ARTUR MERTEN.