

May 8, 1928.

1,668,890

S. T. CURRAN ET AL

UNIVERSAL ADJUSTABLE EARPIECE FOR AUDIPHONES

Filed Sept. 26, 1925

Fig. 1.

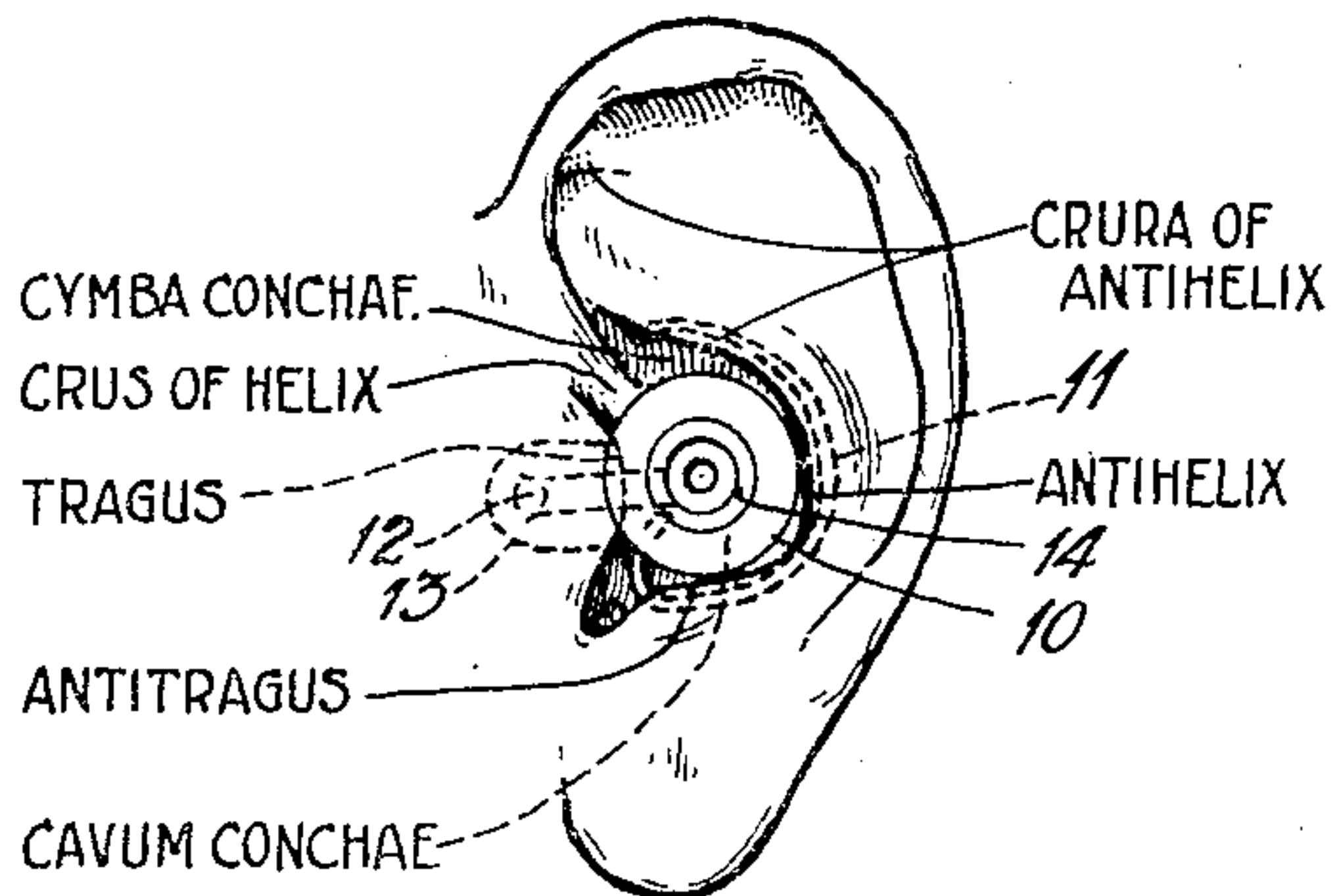


Fig. 2.

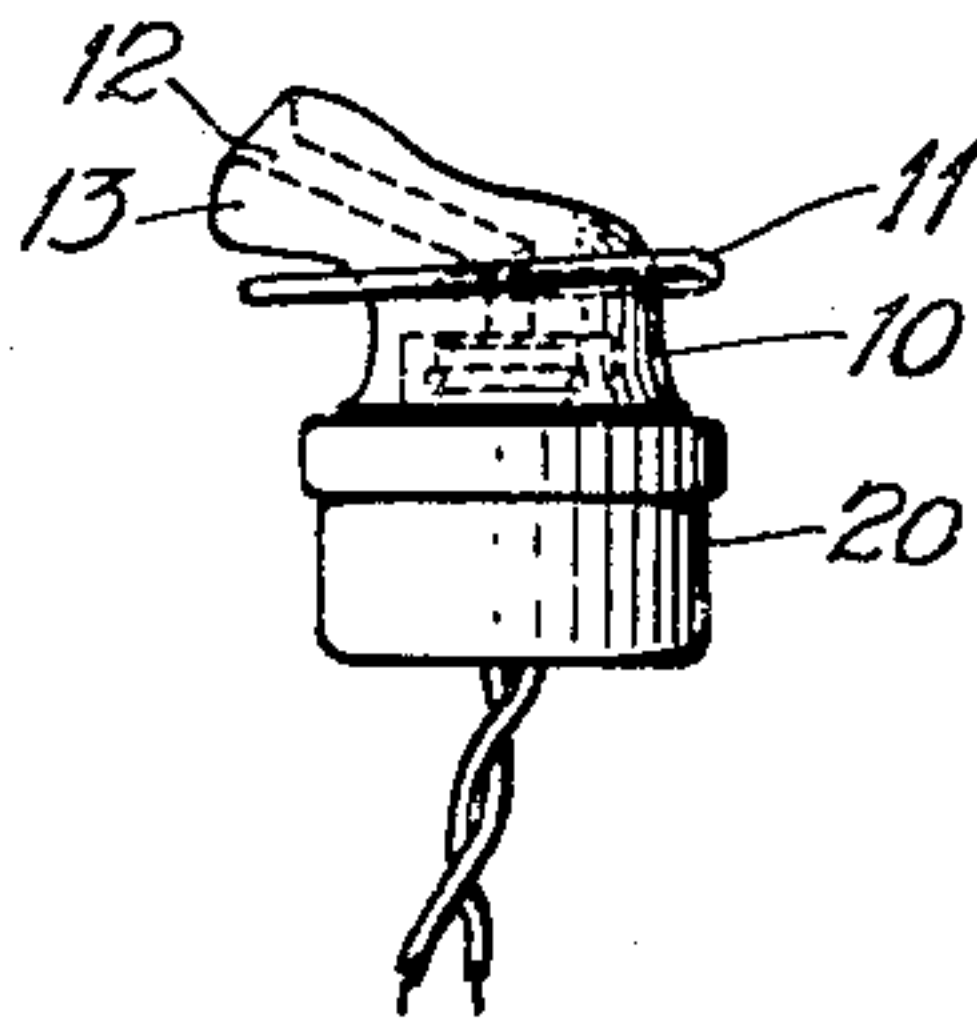


Fig. 3.

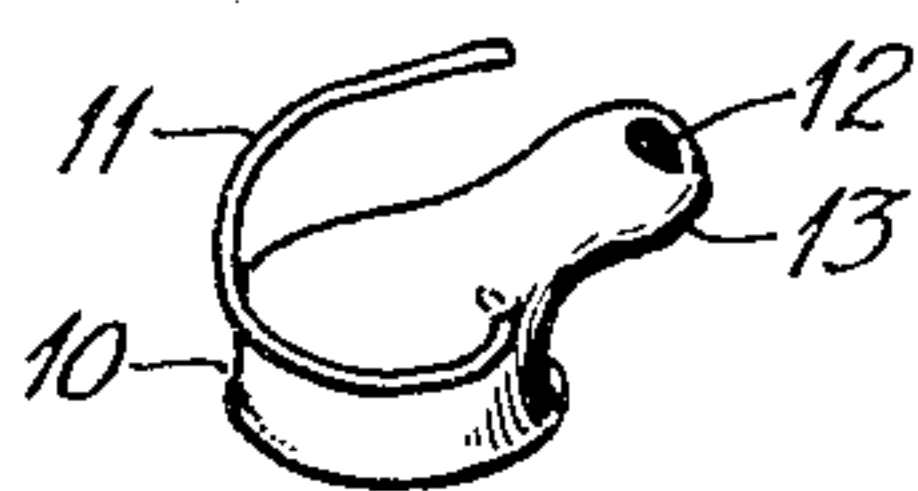
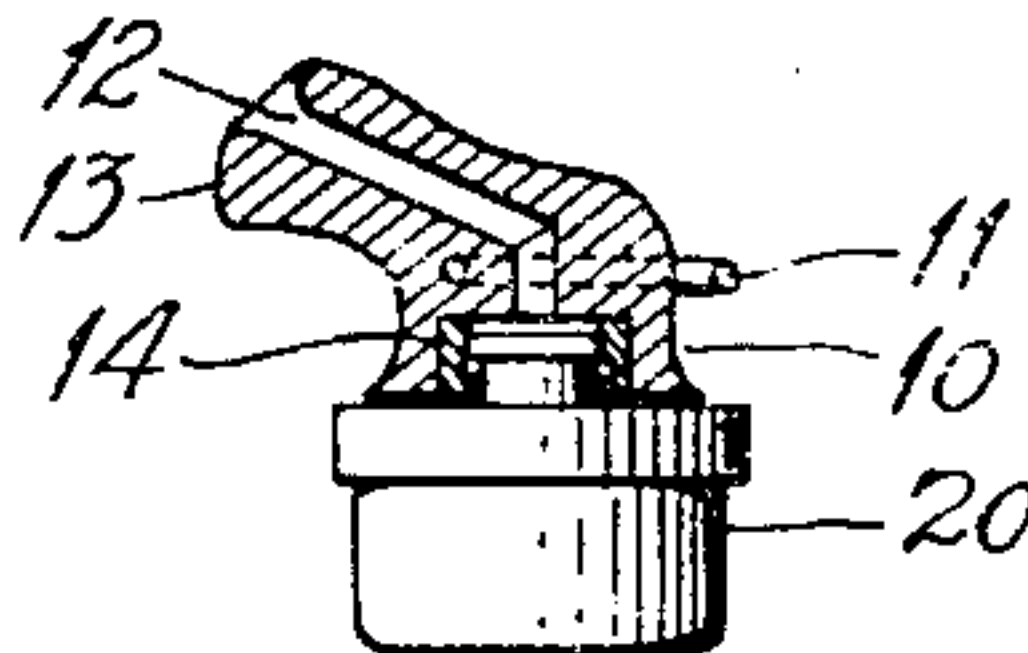


Fig. 4.



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UNITED STATES PATENT OFFICE.

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UNIVERSAL ADJUSTABLE EARPIECE FOR AUDIPHONES.

Application filed September 26, 1925. Serial No. 58,748.

This invention relates to a small universal adjustable ear-piece held by and within the ear for supporting a telephone receiver.

An object of this invention is to provide a universal adjustable ear-piece which may be adjusted to fit ears of different sizes and shapes.

The ear-piece is constructed so as to fit a large number of ears of different sizes and shapes. It is only necessary to have a few ear-pieces of different sizes, as ear-pieces constructed in accordance with the invention comprise a formed part which engages and fits into the mouth of the auditory canal and a flexible adjustable wire which is formed to fit within and conform to the contour of the lower, rear and upper parts of the outer ear. The flexible wire or member elastically tightly holds the ear-piece in place as the flexible member is under elastic tension at all times. To fit an ear, it is only necessary to select an ear-piece having a nozzle of the proper size to fit into the mouth of the auditory canal and then form the flexible wire or spring to fit the contour of the inner ear. This arrangement not only has the advantage of requiring but few different sizes of ear-pieces to fit a large number of ears of different sizes and shapes, but it also comfortably maintains the sound passage and telephone receiver supporting member in uniformly tight connection with the auditory canal due to the elasticity and adjustability of the spring support. The formed member may be made of hard rubber, phenol compound or other suitable material. The spring supporting member may be made of such material as "comfort cable" commercially used in making up ear-bows for spectacles. This spring can be molded directly in the ear-piece or cemented in a drilled hole or otherwise affixed to the formed member.

The ear-piece has a positive grip in the ear at a number of different points. The sound passage nozzle enters the auditory canal under the tragus, the flexible supporting spring engages the inner walls of the outer ear behind the antitragus, the antihelix, and the crura of antihelix, the free end of the spring engaging at the latter position. The ear-piece shown is arranged to fit in the

left ear, but by bringing the flexible spring wire out from the opposite side, the ear-piece will fit the right ear. The axis of the tip or nozzle of the ear-piece is positioned approximately at right angles to the axis of the attached telephone receiver and this allows the tip to project under the tragus of the ear and tightly fit into and close the auditory canal against the entrance of external noises and also against escape of sounds which are transmitted through the sound passage of the ear-piece from the receiver. The mouth of the sound passage at the tip or nozzle end is flared or bell-shaped so that there will always be a free passage from the sound channel into the ear even though the ear is so shaped that there is a tendency to shut off or partially close the sound passage when the ear-piece is in position.

Referring to the drawings, Fig. 1 is a side view of the human ear with the ear-piece in place and showing its outer side;

Fig. 2 is a side view of the ear-piece with the telephone receiver attached thereto;

Fig. 3 is a bottom and inner side view of the ear-piece; and

Fig. 4 is a cross section of the ear-piece through the sound passage with the telephone receiver attached.

Similar reference characters designate similar parts in different views.

The names of certain parts of the human ear which are most directly associated with the ear-piece are shown in Fig. 1 so as to facilitate description of the way the ear-piece is held in place.

The formed mounting member of the ear-piece is shown at 10, and it is so shaped that its tip or nozzle fits into and fills the mouth of the auditory canal, while the lower, rear and top sides clear the inner walls of the outer ear as shown. An adjustable spring or flexible member 11 is attached to the lower side of the mounting 10 and is so shaped that it extends toward the bottom of and around to the rear and top of the conchæ as shown. The sound passage 12 extends through the mounting 10 from the receiver end to the tip or nozzle 13. At the outer side, the mounting member 10 is provided with any suitable means for mounting and connecting the telephone re-

ceiver 20 so that it may transmit sound vibrations into the sound passage 12. The receiver may be of the type disclosed and claimed in an application of W. C. Jones, Serial No. 714,476, filed May 19, 1924.

The nozzle 13 of the sound passage is firmly held in the mouth of the auditory canal by passing under the tragus and by means of the spring 11 exerting a forward pressure and engaging within the conchæ behind the antitragus, the antihelix and the crura of antihelix. The mounting member is positioned within the cavum conchæ while the flexible spring member is positioned both within the cavum conchæ and the cymba conchæ. The mounting member is pressed firmly into the auditory canal, and the entire ear-piece is positioned within the outer ear and prevented from falling outwardly from the ear by engagement with the ear behind the tragus, the antitragus, the antihelix, and the crura of antihelix. The flexible member after once being adjusted comfortably holds the ear-piece in place and permits a given ear-piece being fitted and adjusted for a large number of ears of different sizes and shapes. By the employment of two adjustable springs extending from each side of the mounting member the ear-piece is adaptable to either the right or the left ear.

The invention disclosed herein is obviously susceptible to variations, modifications and adaptations without departing from the scope and spirit of the invention, and it is not intended to limit the invention to the specific construction herein shown and described, except as defined by the scope of the appended claims.

What is claimed is:

1. An ear piece for insertion within the ear comprising a formed sound passage member for engaging the auditory canal, and a bow shaped spring partially encircling

said sound passage member and having one end attached thereto and adapted to make contact for the greater part of its length with the inner surface of the ear.

2. An ear piece for insertion within the ear comprising a formed sound passage member having a base portion, a nozzle portion oblique to said base portion for engaging the auditory canal, and a spring member for engaging the inner surface of the ear, said spring member partially encircling said base portion and having one end attached thereto.

3. An ear piece consisting of a formed sound passage member having a substantially cylindrical base portion for connection with a telephone receiver, a nozzle portion projecting obliquely from one end of said sound base portion and adapted to engage the auditory canal, said nozzle portion having a slightly enlarged tip and a bow shaped flexible member having a single substantially semi-circular loop attached to and partially encircling said base portion for holding said sound passage member within the ear.

4. In combination with a telephone receiver, a mounting for insertion within the ear, said mounting comprising a base portion connected to said receiver, a nozzle portion oblique to the diaphragm of the receiver for insertion within the auditory canal, a spring member having one end free and partially encircling said mounting and lying in a plane substantially parallel to the plane of the diaphragm of the receiver, said spring member being adapted to engage the inner surface of the ear.

In witness whereof, we hereunto subscribe our names this 24th day of September, A. D. 1925.

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