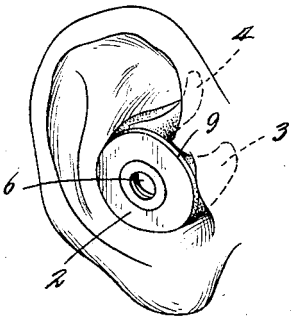
Jan. 3, 1933. H. LIEBER 1,893,474

EARPIECE FOR EAR PHONES

Filed May 27, 1931

Fig.1.



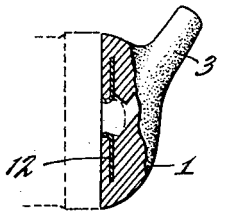


Fig.5.

Fig.2.

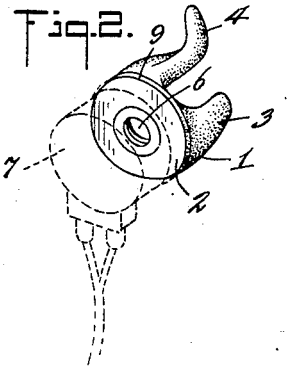
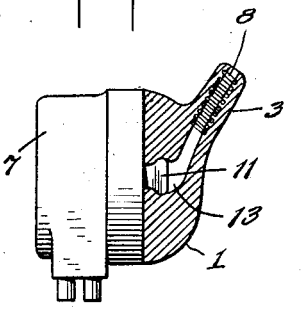


Fig.4.



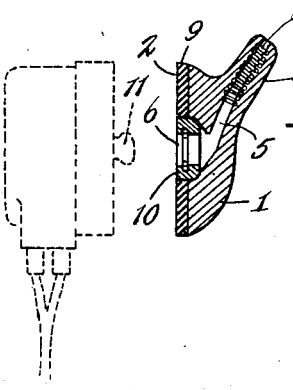


Fig.3.

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UNITED STATES PATENT OFFICE

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EARPIECE FOR EAR PHONES

Application filed May 27, 1931. Serial No. 540,317.

This invention relates to earpieces adapted to be held by and within the ear for supporting a small telephone receiver, or earphone. Such earpieces as heretofore constructed have been formed of hard material, usually hard rubber or bakelite, and are consequently of fixed, unyielding form.

Individual ears differ in size and shape, and it has been customary to make earpieces of the kind referred to of a number of different sizes from which the user selects the one which most nearly fits his ear. Only rarely is the fit more than approximately exact. The result is that usually the earpiece either presses unduly hard against one or more parts of the ear or is not held securely positioned in the ear.

The object of the present invention is to provide an improved earpiece which will adapt itself within reasonable limits to ears of different sizes and shapes, so that a small number of different size earpieces will do for all ordinary ears. I have found three sizes of earpieces according to the invention sufficient for all but very exceptional ears.

To accomplish this purpose, I form the earpiece of flexible material, such as and preferably soft rubber, so that it may yield somewhat and thereby adapt itself to the individual ear. To advantage, all portions of the earpiece which contact with the ear are made of soft rubber. However, improved results over the present forms of earpieces are also obtained when only the inner body portion, including the part which extends into the mouth of the auditory canal, is made of soft rubber. The earpiece is most desirably made separate from the telephone receiver and so as to be detachably connected thereto.

Illustrative embodiments of the invention in the form of separate earpieces for detachable connection to telephone receivers are shown in the accompanying drawing, wherein:

Fig. 1 is a side elevation of an ear and an earpiece in position therein;

Fig. 2 is a perspective view of the earpiece and a telephone receiver supported thereby, the latter being shown in dotted lines;

Fig. 3 is a central section through the earpiece, the receiver being shown in dotted lines separated from the earpieces;

Fig. 4 is a central section through a modified form of earpiece, with a receiver connected thereto shown in full lines; and

Fig. 5 is a view similar to Fig. 4 showing another modification, with a receiver connected thereto indicated in dotted lines.

The earpiece comprises a body 1 of soft rubber having on one side a flat face 2 and having the other side shaped to fit into an average ear with reasonable accuracy. The soft rubber body is made small enough to fit within the cavity of the outer ear between the antihelix and the tragus, and is formed with two projecting parts, one of which, 3, is adapted to fit into and engage the mouth of the auditory canal, and the other of which, 4, is adapted to extend behind the crus of the helix of the ear to aid in holding the earpiece in positon in the ear. The earpiece when placed in the user's ear will thus seat on the antitragus and be held against outward and downward turning movement by engagement of the projecting part 4 with the crus of the helix; and the part 3 also aids in holding the earpiece in position. The earpiece will thus remain in place in spite of the weight of the receiver and of any ordinary downward pull of the cord extending from the receiver.

The part 3 is hollow and the passage 5 therein leads to a central opening 6 in the flat face 2 of the earpiece to form a channel for sound waves passing to the eardrum from a telephone receiver 7 supported by the earpiece. As the part 3 is of soft rubber, pressure of a part of the ear thereagainst might cause closure of the passage 5 unless means were provided to prevent such closure. In order to prevent such closure, there is inserted in the passage 5, or embedded in the walls of the latter, a helical metallic spring 8 which while permitting the part 3 to bend to fit the ear of the wearer, prevents closure of the passage 5.

In order to provide for detachably securing the earpiece to a telephone receiver by connecting means such as are used for securing the hard rubber earpieces to receivers,

the face 2 of the earpiece is formed by a plate or disk 9 of suitable relatively hard material, most desirably hard rubber, which is vulcanized to the soft rubber body of the earpiece. The sound passage 5 opens through this hard rubber plate, and the opening 6 in the plate is made large enough to receive a bushing 10 which is permanently secured in position in the plate, as by being molded therein. The bushing serves to receive a pivot stud 11 extending from the face of the telephone receiver, the bushing and pivot stud being formed to co-act as connecting members for holding the earpiece and the receiver detachably together. Most desirably they are formed to provide a snap fastening device by having the usual spring set in the bushing to snap over the slightly enlarged end of the pivot stud, as shown. This is a form of connecting means commonly employed in devices of this kind.

Instead of having a disk of hard rubber or other relatively hard material on the face of the body 1, a construction such as shown by Fig. 5 may be employed, in which a disk 12 of thin metal is molded into the body, the disk having a central opening with a forwardly extending flange to engage the pivot stud of the telephone receiver.

Fig. 4 shows an earpiece made entirely of soft rubber or other suitable flexible material connected to the receiver by having the pivot stud of the receiver formed with an enlarged end which enters past the constricted mouth of an enlarged end portion 13 of the passage 5. In this way suitable connection between the earpiece and the receiver is secured without the use of any hard or relatively hard material in the earpiece other than the flexible spring 8.

What is claimed is:

1. An earpiece for earphones, comprising a body of flexible material of a size to enter the cavity of the outer ear and shaped to fit between the antihelix and the tragus of the ear and to seat on the antitragus, and having a projecting part of flexible material formed to extend behind the crus of the helix of the ear to aid in holding the earpiece in position in the ear, and having a tubular part to extend into and engage the mouth of the auditory canal of the ear.

2. An earpiece for earphones, of a size to enter the cavity of the outer ear and shaped to fit between the antihelix and the tragus, and having all the parts thereof which contact with the ear made of flexible material.

3. An earpiece for earphones, comprising a body of soft rubber of a size to enter the cavity of the outer ear and shaped to fit between the antihelix and the tragus, and having a soft rubber tubular part to extend into and engage the mouth of the auditory canal, said tubular part being resistant to closure under pressure of parts of the ear thereagainst.

4. An earpiece for earphones, comprising a body of flexible material of a size to enter the cavity of the outer ear and shaped to fit between the antihelix and the tragus, and having a tubular part of flexible material to extend into and engage the mouth of the auditory canal, and having flexible means within the passage of said tubular part for preventing the closure of such pasasge by pressure of a part of the ear against said tubular part.

5. An earpiece for earphones, comprising a body of soft rubber of a size to enter the cavity of the outer ear and shaped to fit between the antihelix and the tragus, and having a soft rubber tubular part to extend into and engage the mouth of the auditory canal, and having a helical spring arranged within the passage of said tubular part to prevent the closure of such passage by pressure of a part of the ear against said tubular part.

6. An earpiece for earphones, comprising a body of a size to enter and shaped to fit within the cavity of the outer ear and to seat on the antitragus and having a soft rubber projecting part adapted to extend behind the crus of the helix of the ear to aid in holding the earpiece in position in the ear.

7. An earpiece for earphones, comprising a body of a size to enter and shaped to fit within the cavity of the outer ear and to seat on the antitragus and having a tubular soft rubber part adapted to extend into and engage the mouth of the auditory canal and which is resistant to closure under pressure of parts of the ear thereagainst and having a soft rubber projecting part adapted to extend behind the crus of the helix to aid in holding the earpiece in position in the ear.

8. An earpiece for earphones, comprising a body of flexible material of a size to enter and shaped to fit within the cavity of the outer ear and having a sound passage therethrough, and a face portion of relatively hard material through which the sound passage opens, said face portion being provided with a connecting member for detachably securing the earpiece to a telephone receiver.

9. An earpiece for earphones, comprising a body of soft rubber of a size to enter and shaped to fit within the cavity of the outer ear and having a sound passage therethrough, and a face plate of hard rubber vulcanized to the soft rubber body and through which the sound passage opens, said plate having secured in the opening thereof a metal bushing formed to serve as a connecting member to cooperate with a pivot stud of the telephone receiver.

10. The combination with a telephone receiver, of an earpiece having a body of soft rubber of a size to enter and shaped to fit within the cavity of the outer ear between

the antihelix and the tragus and having a soft rubber projecting part adapted to extend behind the crus of the helix to aid in holding the earpiece in position in the ear, the body having an outer flat face provided with means for detachably securing the earpiece to the telephone receiver.

In testimony whereof, I have hereunto set my hand.

HUGO LIEBER.