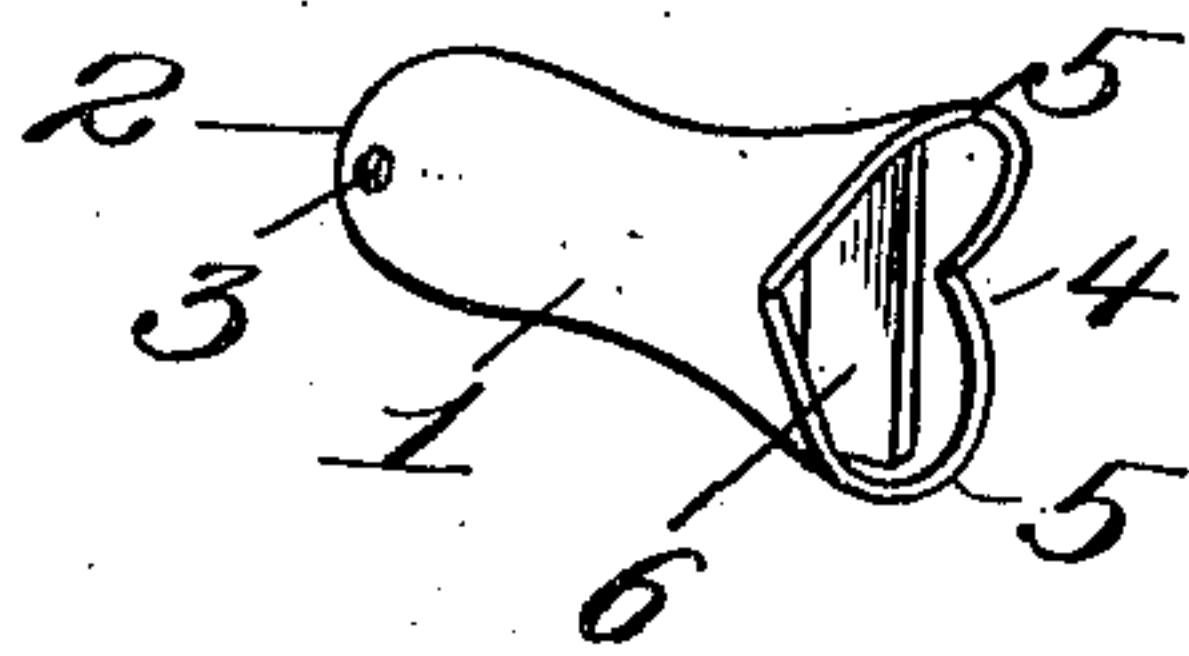


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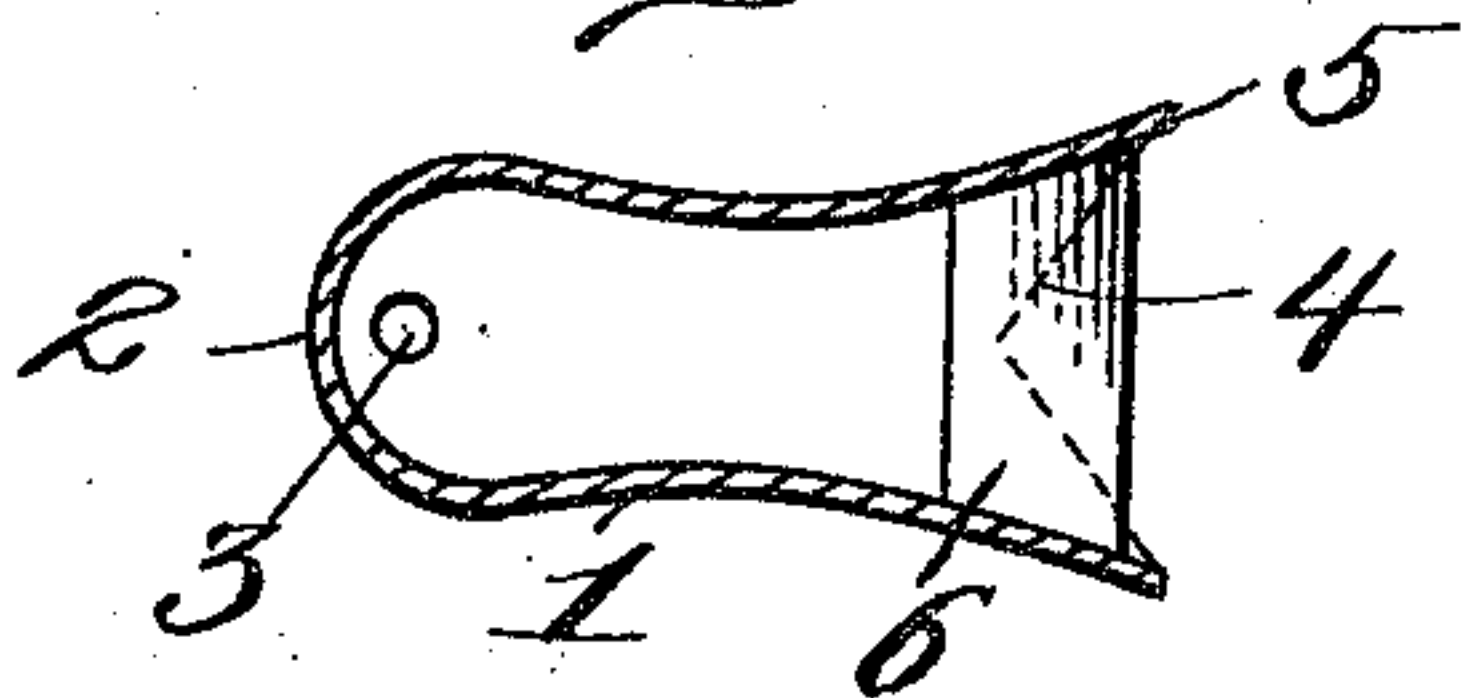
PATENTED MAY 12, 1908.

G. H. WILSON.  
ARTIFICIAL EAR DRUM.  
APPLICATION FILED SEPT. 14, 1907.

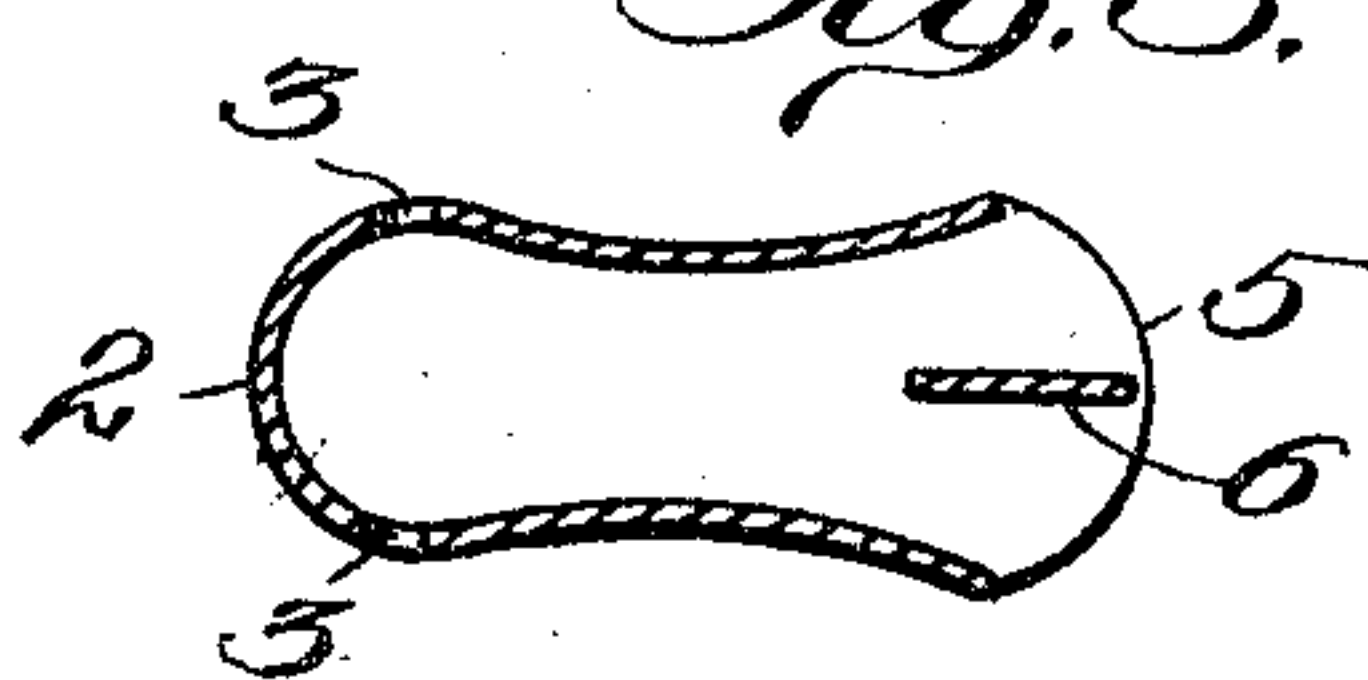
*Fig. 1.*



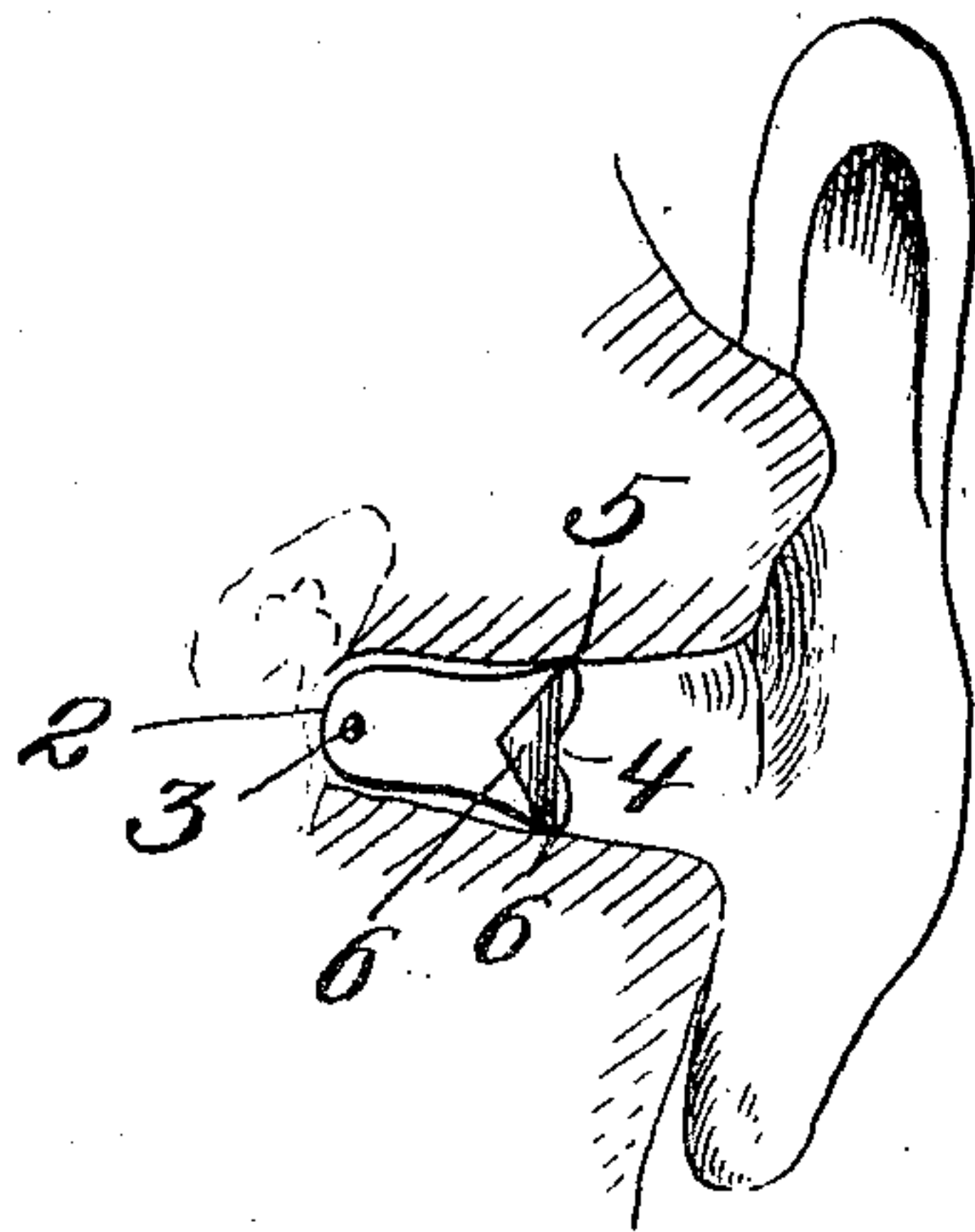
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Witnesses:

*W. H. Keeler*

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# UNITED STATES PATENT OFFICE.

GEORGE H. WILSON, OF LOUISVILLE, KENTUCKY.

## ARTIFICIAL EAR-DRUM.

No. 887,563.

Specification of Letters Patent.

Patented May 12, 1908.

Application filed September 14, 1907. Serial No. 392,910.

*To all whom it may concern:*

Be it known that I, GEORGE H. WILSON, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in Artificial Ear-Drums, of which the following is a specification.

My present invention relates to improvements in artificial ear drums adapted to be employed supplementary to or as substitutes for the natural tympanum, and it has for its object to provide an improved device of this character that is so shaped as to conform closely to the contour of the orifice of the ear for the purpose of facilitating positioning of the drum and prevent its dislocation, the edges at the outer or open end of the drum being so formed that they are capable of automatically adjusting themselves to the size of the orifice.

Another object of the present invention is to provide a drum of this character having a bulbous portion at its inner end which is adapted to fit against the walls of the tympanic cavity, the inner end of the bulbous portion constituting a relatively large diaphragm which is adapted to cooperate with the natural tympanum, or to serve as a substitute for the latter when destroyed, the relatively large area of the diaphragm insuring sensitiveness, and the bulbous portion engages the walls of the orifice and thereby prevents displacement of the diaphragm.

A further object of the invention is to provide an ear drum of this character having means for properly ventilating the inner cavities of the ear for the purposes of insuring a healthy condition thereof.

To these and other ends, the invention consists in certain improvements, and combinations and arrangements of parts, all as will be hereinafter more fully described, the novel features being pointed out particularly in the claims at the end of the specification.

In the drawings—Figure 1 is a perspective view of an artificial ear drum constructed in accordance with my present invention; Fig. 2 represents a longitudinal section taken in a vertical plane relatively to the drum shown in Fig. 1; Fig. 3 is a view similar to Fig. 2, the section being taken in a plane at right angles to that of the preceding figure; Fig. 4 is a diagrammatic view showing a manner of applying the artificial drum to the human ear.

Similar parts are designated by the same reference characters in the several figures.

The ear drum shown in the present embodiment of my invention, comprises generally a hollow body that is shaped to conform substantially with the walls of the orifice or canal of the human ear, that is to say, one end thereof is substantially closed and of approximately bulbous form, the sides 1 of the bulbous portion of the drum being adapted to lie in close relation to or to engage the walls of the tympanic cavity of the ear, the rear end 2 of the bulb being preferably rounded and serves as a sensitive diaphragm which is adapted to engage or cooperate with the natural tympanum in those cases wherein the latter is injured or diseased so that its acoustic properties are impaired, and should the tympanum be wholly destroyed, the diaphragm serves as an artificial tympanum through the medium of which sound waves are transmitted to the auditory nerve. In either case the close fit of the bulb within the walls of the canal serves to accurately center or position the diaphragm thereof, so that the artificial drum may be readily applied, and dislocation thereof is prevented.

In order to provide a proper ventilation of the inner cavity of the ear, it is preferable to provide the bulbous portion of the drum with one or more ventilating openings, a pair of these openings 3 being shown in the present instance which are located in the side walls of the bulb, this arrangement being generally preferable for the reason that direct currents of air cannot reach the sensitive parts of the ear, but it will be understood that any number of these openings may be employed and they may be arranged, as desired. The ventilation thus afforded insures a uniform temperature within the ear, and the drums promote a sweating process which overcomes the dryness of the membranes due to catarrhal conditions, and also producing a healthy and normal flow of ear wax.

The open end of the drum is flared to form a relatively wide and tapering mouth 4, the flaring form thereof facilitating the collection of sound waves entering the ear, and they conform substantially to the outer portion of the orifice or auditory canal. In order to enable the drum to adjust itself according to the peculiar shape and size of the canal in each particular case, it is preferable to provide yieldable or resilient lips 5



which are capable of expanding or contracting in diameter according to the size of the canal into which they are fitted, those shown in the present instance being formed by  
 5 recesses in the edge of the drum adjacent to the mouth or opening therein.

A cross piece 6 preferably extends diametrically of the drum in proximity to the mouth or opening therein, and it serves the  
 10 dual function of spacing the opposite walls of the drum to prevent collapsing, and it provides a convenient hold for forceps or other instruments that are usually employed in removing the drum, the notched portions being  
 15 preferably arranged at opposite sides of the cross piece in order to facilitate application of the forceps.

In practice, the artificial drums may be made of rubber or other suitable material, and while I have illustrated and described  
 20 what I now consider to be the best embodiment of the invention, it will be understood, of course, that the drums may be made in various forms which will possess the advantages that I have described.

I claim as my invention:—

1. An artificial ear drum having a bulbous portion at its inner end adapted to engage the walls of the tympanic cavity of the ear  
 30 the inner end of the bulbous portion being rounded and forming a diaphragm of substantially the full diameter of the bulbous portion.

2. An artificial ear drum embodying a hollow body having a closed bulbous portion at one end adapted to engage the walls of the tympanic cavity and forming an enlarged diaphragm of regular curvature having its convex side directed inwardly and adapted  
 40 to cooperate with the natural tympanum.

3. An artificial ear drum composed of a hollow body reduced at an intermediate point to form a bulbous portion at its inner end, and a flared mouth at its outer end, the

edges of the mouth end of the body being  
 45 notched to form relatively yieldable lips, and the inner end of the bulbous portion being closed by a relatively large rounded diaphragm having its convex side adapted to cooperate with the natural tympanum, and a  
 50 cross-piece extending across the open mouth of the body and connecting the relatively yieldable lips thereof.

4. An ear drum comprising a hollow body having a mouth at one end provided with  
 55 yieldable lips adapted to accommodate themselves to the auditory canal of the ear and having its opposite end closed to form a vibratory diaphragm.

5. An ear drum comprising a hollow body  
 60 having a flared mouth at one end, the edges of the body adjacent to the mouth being notched to form yieldable lips adapted to accommodate themselves to the diameter of the auditory canal and having its opposite end  
 65 closed by a diaphragm formed integrally therewith.

6. An ear drum comprising a hollow body substantially closed at one end to form a diaphragm and having a mouth at its opposite  
 70 end provided with yieldable lips, and a rigid cross piece connecting the said lips in proximity to the mouth.

7. An ear drum comprising a hollow body substantially closed at one end to form a diaphragm and provided with a mouth at its opposite end, a cross piece connecting the walls  
 75 of the body in proximity to the mouth, and a pair of yieldable lips formed by notching the edges of the body adjacent to the mouth  
 80 thereof and connected by the cross piece.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE H. WILSON.

Witnesses:

B. G. SNYDER,  
 P. M. O'REILLY.