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METHOD OF TREATING OTOSCLEROTIC DEAFNESS BY SUBSTITUTING AN ARTIFICIAL STAPES FOR THE HUMAN STAPES

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FIG. 1

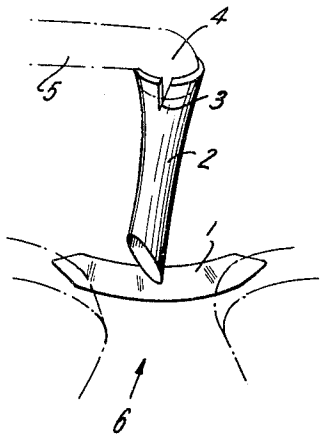
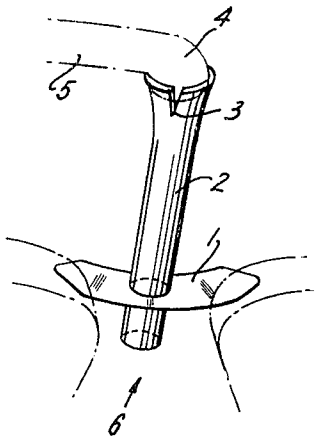


FIG. 2



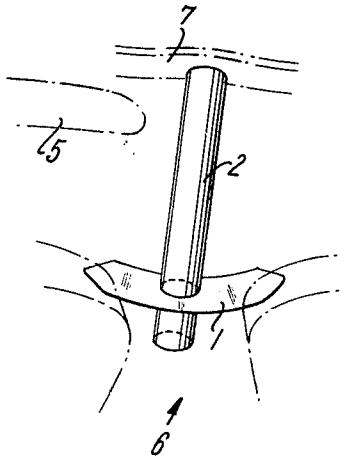


FIG. 3

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METHOD OF TREATING OTOSCLEROTIC DEAFNESS BY SUBSTITUTING AN ARTIFICIAL STAPES FOR THE HUMAN STAPES

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3 Claims. (Cl. 3—1)

The present invention deals with a new, original and practical stapes, which is extremely efficient, made of polyethylene (or some other suitable modern plastic material), meant to be used as a substitute for the human stapes in cases where, in the mobilizing operation as treatment of otosclerotic deafness, the crura thereof are broken.

Physicians are well aware of the fact that certain cases of deafness may be remedied by means of an adequate surgical treatment, and more precisely, through a substitution of the affected human stapes by artificial prosthesis.

In previons instances, also according to the experience of the applicants, a neutral point had been attained in the so-called mobilizing surgery of otosclerosis, since in practice, when the branches of the stapes have been broken and the fenestration of the foot-plate has been done without auditory improvement, the only thing to be done was fenestration of the labyrinth.

The purpose of the present invention is to give a final solution to these problems of the mobilizing surgery of otosclerosis, through the supply of an artificial stapes, according to several models of achievement, fundamentally similar, each of them consisting of a thin laminar base adaptable to the niche of the oval window, from which lamina rises a tubular strut or stem, which articulates with the incus, the union point of the strut with said lamina being shaped like the mouth-piece of a flute, while the other end, which is free before using the unit, has two cuts forming a cross and allowing expansion or elastic yielding of the walls, to lodge adjustedly the lenticular process of the incus. Likewise, the strut may in another manner of achievement go through said laminar base.

In this manner, truly remarkable results are obtained, since a normal transformation of sound pressure is attained, due to good mobility of the tympanic membrane and of the stapes, with a good mobile communication between each other.

Therefore, with the use of the present invention, and as already proved in practice, a good transmission of the sound pressure is attained, as well as a good adaptation to the fenestra of the oval window and good location; finally, through the use of said unit, it is possible to decrease the percentage of regressions due to reankylosis.

The achievement of this invention will be made in the sizes, materials and shapes to be deemed most convenient to the aims sought.

So that this invention may be clearly understood, it will be described in detail, with reference to the illustrating drawings hereto annexed, merely by way of example, and in which:

FIG. 1 illustrates a form of achievement of this invention, applicable in such cases where the incus presents an accentuated lenticular process, made deeper at the upper end of the tubular strut of the artificial stapes.

FIG. 2 shows a variation of achievement of the invention in which the tubular strut goes through the laminar base. Both in this case and in that of FIG. 1 the upper end of the tubular strut will be conveniently expanded to admit inside of it the lenticular process of the incus.

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FIG. 3 shows a variation of achievement, carried out in the cases where the end of the incus has no lenticular process, or else when the same is deficient, in such circumstances the recourse being to cause the upper end of the strut to rest on the eardrum.

In all said figures, the same numbers refer to equal or corresponding parts.

On the annexed illustrating drawing, under a form of execution of the invention, the artificial stapes consists of a laminar base **1**, having an irregular polygonal configuration substantially elongated, from which rises a lengthy tubular strut **2**, imbedded approximately in the middle of the upper face of the base, said stem taking at the union point, the shape of the mouth-piece of a flute. This strut, at the opposite end, is substantially widened or else provided with longitudinal cuts **3**, in order to allow the entrance, at that end, of the lenticular process **4** of the incus **5**, thus firmly pressed and held. On the other hand, the base **1** will rest on the edge of the oval window **6** and more precisely, on the fenestration previously made on the ankylosed foot-plate.

Under another form of achievement, the end of the strut opposed to that of the linking with the lenticular process goes through the basic lamina (cases illustrated in FIGS. 2, 3) the strut showing in these cases, a peripheric cut in the manner of an "axe out," i.e. angularly deepened, which due to the elasticity of the material forming the base, determines a secure and firm union, when the edge of the respective perforation on the above said lamina fits into said cut.

The extension of the strut, which goes through the oval window, tends to prevent eventual closing of same.

Finally, when the end of the incus is defective, the strut rests directly against the tympanic membrane **7**, as shown in FIG. 3.

It is hereby stated that the present invention is by no means limited to the example described and represented, since it is possible to introduce several modifications in shape and/or detail, to be found comprised within the scopes of this invention, clearly determined in the claims appearing after the present specification.

We claim:

1. A method of alleviating otosclerotic deafness, comprising the steps of carrying out a stapedectomy and replacing the removed stapes with a prosthesis comprising a hollow tubular strut having two opposite end portions and a lamina integral with and extending across said strut spaced from said two opposite end portions thereof, so as to rest said lamina on the edge of the niche of the oval window.

2. A method of alleviating otosclerotic deafness, comprising the steps of carrying out a stapedectomy; and replacing the removed stapes with a prosthesis consisting essentially of a hollow tubular strut having two opposite end portions and a lamina integral with and extending across said strut spaced from said two opposite end portions thereof, in such a manner as to rest said lamina on the edge of the niche of the oval window with one end portion of said strut engaging the incus and the other end portion of said strut extending into the niche of the oval window adapted to contact directly the reformed endosteum.

3. A method of alleviating otosclerotic deafness, comprising the steps of carrying out a stapedectomy; and replacing the removed stapes with a one-piece prosthesis of polyethylene consisting essentially of a hollow tubular strut having two opposite end portions and a lamina integral with and extending across said strut in a direction substantially perpendicular to the axis of said strut spaced from said two opposite end portions therof, in such a manner as to rest said lamina on the edge of the niche of the oval window with one end portion of said strut engaging the incus and the other end portion of said strut extending into the niche of the oval window adapted to contact directly the reformed endosteum.

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