

No. 692,556.

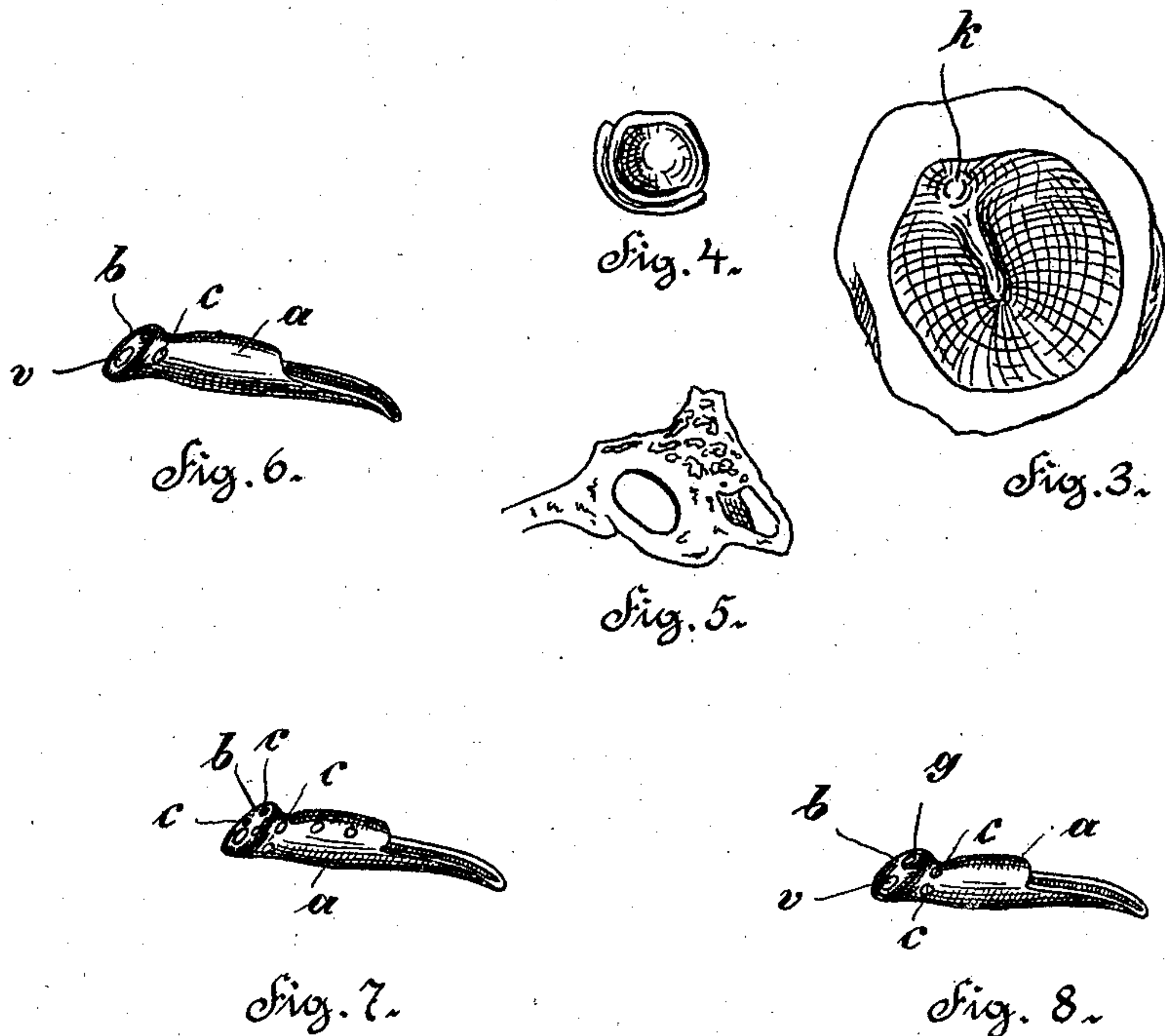
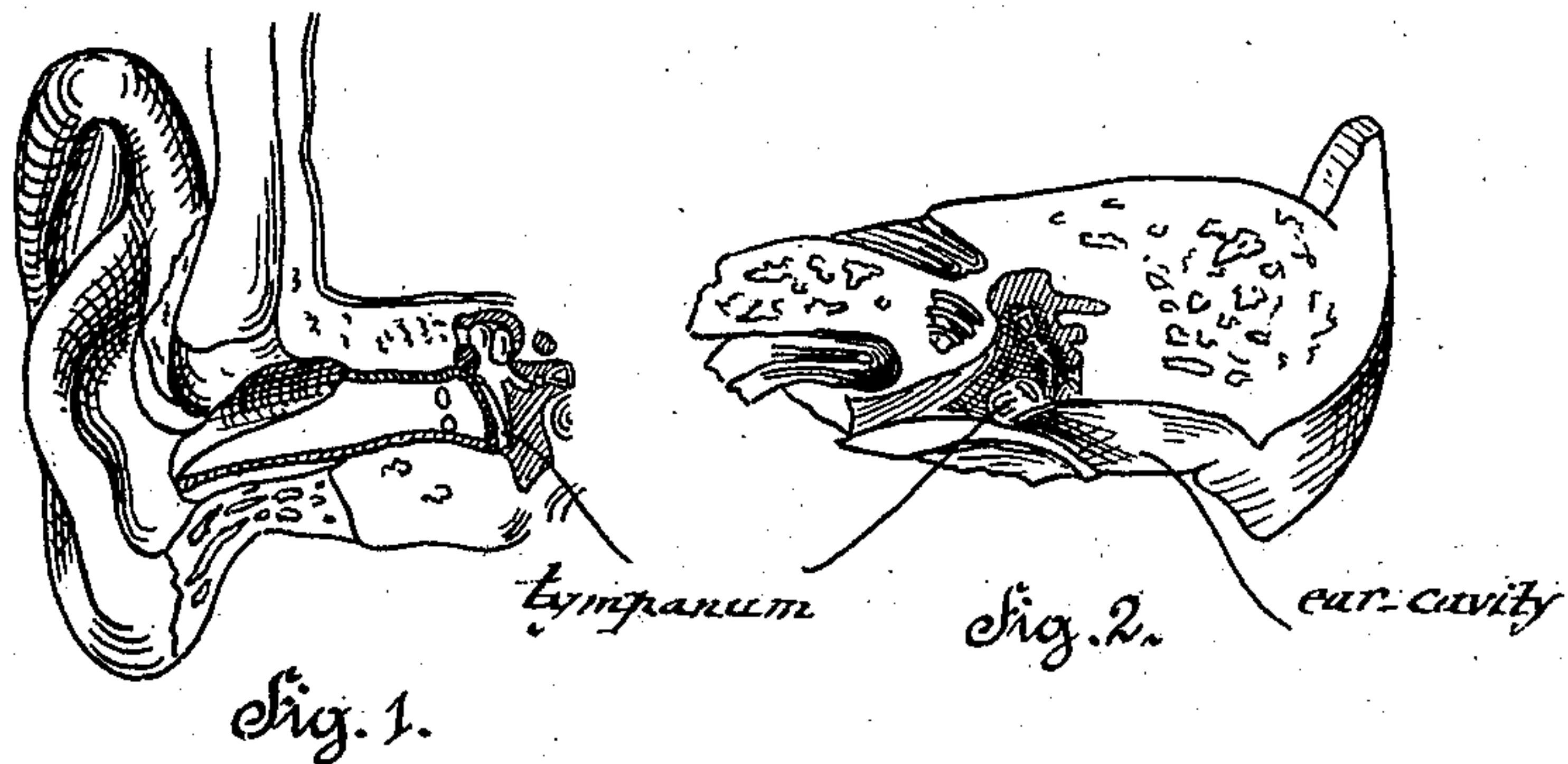
Patented Feb. 4, 1902.

A. VON SUCHORZYNSKI & M. KOHL.

ARTIFICIAL EAR DRUM.

(Application filed Oct. 8, 1901.)

(No Model.)



Witnesses
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ANTON VON SUCHORZYNSKI AND MAX KOHL, OF BRESLAU, GERMANY.

ARTIFICIAL EAR-DRUM.

SPECIFICATION forming part of Letters Patent No. 692,556, dated February 4, 1902.

Application filed October 8, 1901. Serial No. 77,968. (No model.)

To all whom it may concern:

Be it known that we, ANTON VON SUCHORZYNSKI, engineer, of Lohestrasse No. 7, and MAX KOHL, merchant, of Brandenburgerstrasse No. 44, Breslau, Germany, have invented certain new and useful Improvements in Artificial Ear-Drums, of which the following is a specification.

The objects of the invention are to secure a free escape of air from between the natural and artificial tympan in the adjustment of the device in the ear without reducing the active surface of the artificial tympan, and to provide means in the apparatus for distending sunken portions of the natural tympan and bringing it into natural position. To this end the tympan of the artificial drum is provided with an inwardly-opening valve, which closes automatically after adjustment of the artificial drum and practically preserves the whole area of the artificial tympan for active service, and this tympan is also preferably provided with a metallic plate which presses on the apophysis of the malleus.

Figure 1 of the accompanying drawings represents a vertical section of the human ear with this improved ear-drum introduced therein. Fig. 2 represents a horizontal section of a human ear-cavity, showing the position of the tympanic membrane at an angle to the axis of the auditory cavity and the situation of the ossicles and cochlea. Fig. 3 represents, on an enlarged scale, an exterior view of a tympan of the left human ear, showing the position of the handle of the malleus. Figs. 4 and 5 represent cross-sections of the cartilaginous and bony parts of the ear-cavity. Fig. 6 represents a perspective view of this artificial ear-drum. Figs. 7 and 8 represent perspective views of different forms thereof.

The same reference-letters indicate corresponding parts in all the figures.

This artificial ear-drum is preferably constructed of the best thin vulcanized rubber and comprises a bag-like tube *a*, having an elongated lip at its outer end and an artificial tympan *b*, closing the inner end thereof. This tympan *b* is disposed at an angle to the axis of the tube *a*, and it is provided with a small ventilation-valve *v*, which opens to-

ward the interior of the tube, being an outward opening considered with respect to the apparatus when in position in the ear. This artificial tympan *b* may be provided also with a small metallic plate *g*, preferably of gold, secured to the exterior surface of said plate *b* above the center thereof. The tube *a* is preferably provided with holes *c*, which may be few in number, as indicated in Fig. 8, or sufficient to give the bag a sieve-like structure, as in Fig. 7.

In the use of this artificial ear-drum the tube *a* is inserted into the ear-cavity until the artificial tympan *b* comes in contact with the natural ear-drum. During this insertion the air within the cavity may escape through the valve *v*, and this valve also permits the escape of air from between the natural and artificial tympan, so that a close contact between them is effected. When the artificial tympan *b* is provided with a metal plate *g*, this plate presses on the short apophysis of the malleus *k*, Fig. 3, and tends thereby to distend the sunken portions of the tympanic membrane, which are pushed together with a chain of ossicles toward the exterior part of the ear-cavity, and thus brought into a normal situation. By means of the springy membrane *b* the pressure of the plate *g* is very elastic, and this pressure can be regulated by the person using the apparatus to suit his sensibility. In old cases where the ossicles and tympanic membrane have grown together the pressure can be repeated and a kind of shampooing exercise imparted thereto. This shampooing operation gradually pushes the membrane toward the outside and brings it approximately into normal position, where it has a greater susceptibility to the action of the sound-waves, and the hearing is improved.

In cases of suppurating ear diseases a thin layer of cotton impregnated, if desired, with some medicament may be laid in the pipe-tube *a*, and a thin layer of cotton may also be wrapped around the membrane *b*, and the suppurating matter will be completely absorbed by the cotton through the perforations *c*.

These ear-drums will be differently shaped for the right and left ears, and will be of different sizes adapted for men, women, and children. Generally three or four different sizes in the apparatus will suffice, notwith-

standing the sizes and extensions of the ear-cavities greatly vary, as these artificial ear-drums are composed of very elastic material.

We claim as our invention—

- 5 1. An artificial ear-drum consisting of an elastic tube having an inclined inner end, a membrane secured on said inclined end and a valve on said membrane adapted to open inwardly of said tube.
- 10 2. An artificial ear-drum consisting of a bag-shaped tube having an inclined inner end, a membrane secured on said end, a valve on

said membrane adapted to open inwardly of said tube and a metallic plate secured to the exterior surface of said membrane above the center thereof. 15

In witness whereof we have hereunto set our hands in presence of two witnesses.

ANTON VON SUCHORZYNSKI.
MAX KOHL.

Witnesses:

HERMANN BARTSCH,
ALBERT SCHENK.