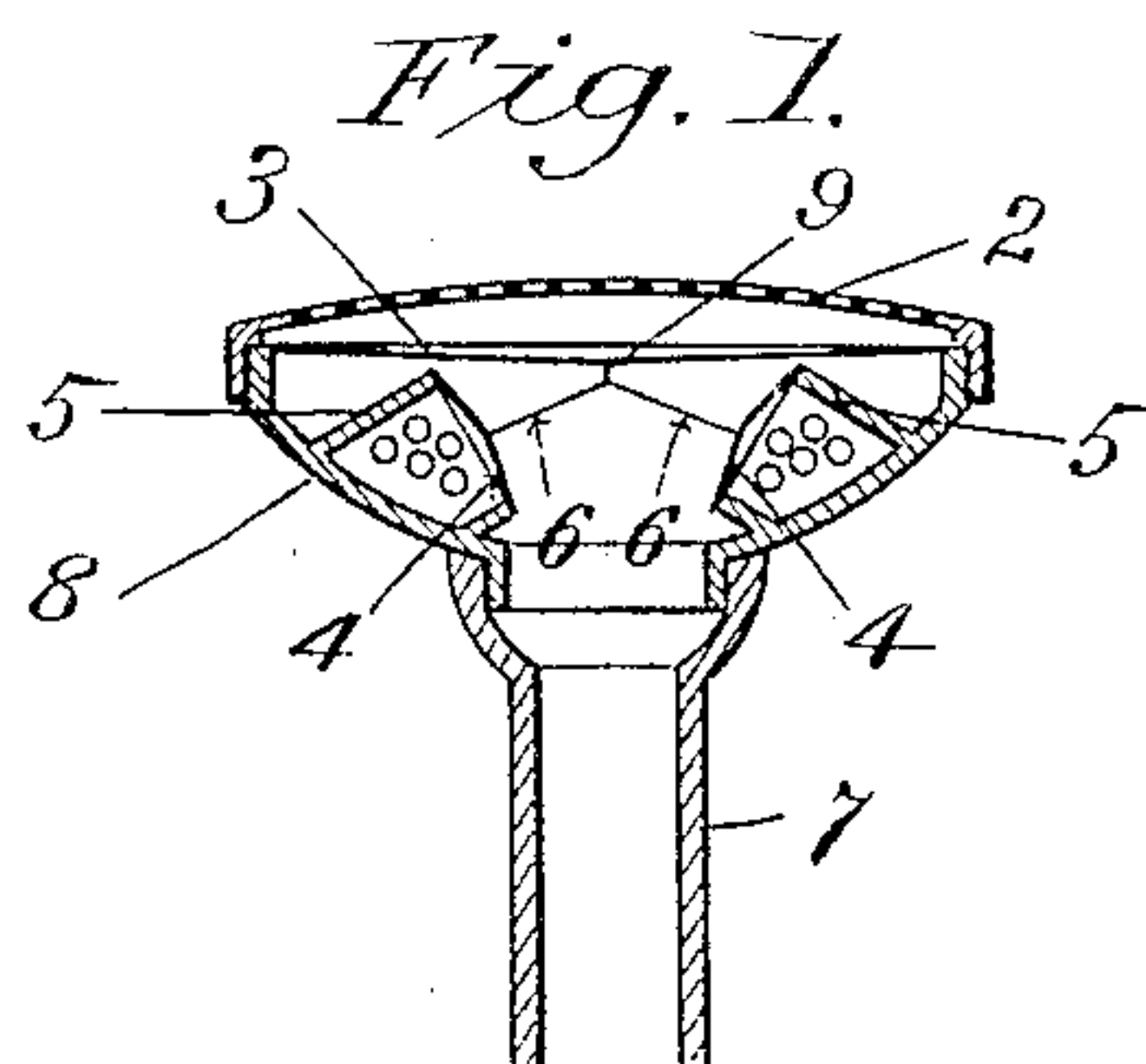


(No Model.)

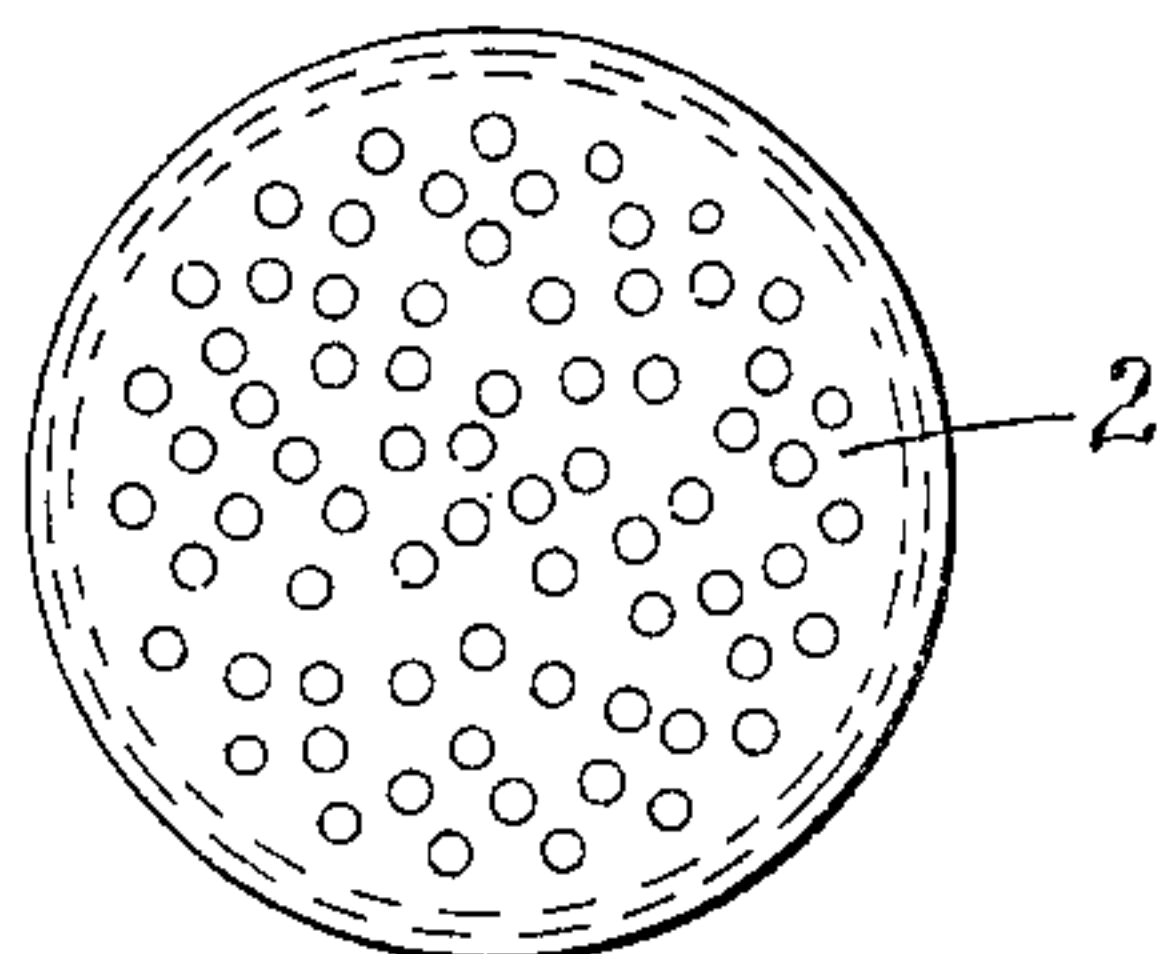
J. A. LAKIN.  
COMPOUND AUDIPHONE.

No. 580,872.

Patented Apr. 20, 1897.



*Fig. 2.*



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JAMES A. LAKIN, OF WESTFIELD, MASSACHUSETTS.

## COMPOUND AUDIPHONE.

SPECIFICATION forming part of Letters Patent No. 580,872, dated April 20, 1897.

Application filed April 4, 1896. Serial No. 586,227. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. LAKIN, a citizen of the United States of America, residing at Westfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Compound Audiphones, of which the following is a specification.

This invention relates to improvements in audiphones or sound-amplifying devices for the deaf, the object being to produce a device constituting an improvement upon that of my patent dated August 20, 1895, and numbered 544,732, which is very efficient in its sound-intensifying action, taking the place of an ear-trumpet, and one which can be made of very small size, so as to be not at all conspicuous in use, and, moreover, shall be simple, practicable, and cheap of construction.

The audiphone of this invention comprises, essentially, a hollow shell or case having a sound-conveying tube of any suitable form or length, according to the use to which the device shall be put, a perforated outer cover and several sound-diaphragms upon which sound communicated thereagainst through said cover acts and is intensified for communication to the ear through said tube; and the invention consists in the peculiar construction and arrangement of the said structural elements of the device, all as hereinafter fully described, and more particularly pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a longitudinal sectional view of an audiphone constructed according to my invention, and Fig. 2 is a plan view of the top or cover of the device.

In the drawings, 8 indicates the main case or shell of the instrument and is shown somewhat larger than it is made in practice, and 7 indicates a sound-conveying tube of the form employed when the device is to be duplicated and used on the opposite ends of a flexible or other tube by two persons. The instrument, however, is particularly adapted for use in or held to the ear, and to that end said tube 7 may be of any suitable length or form to adapt it to such use. Said case 8 and tube 7 are preferably made of hard rubber and may be connected in any suitable manner. A perforated convex cover 2 is secured to the outer

or sound-receiving end of said case, the convexity thereof having for its object the provision of a clear space between the inner side of said cover and the immediately-adjoining large diaphragm 3, whereby the vibratory action of the latter is made perfectly free. Said diaphragm is made of any suitable material, as thin celluloid, wood, or other substance which is sensitive to sound-waves, and is secured in any suitable manner by its borders in the position shown in Fig. 1 across said case under said cover. On the inner wall of said case 8 under said diaphragm 3 are fixed several drums 5, preferably of cylindrical form, having perforated sides, whereby provision is made for free sound effects within the space under the diaphragm 3, both from the inner as well as from the outer surfaces of the below-described diaphragms which are secured on the open ends of said drums. A secondary diaphragm 4, of like material to said diaphragm 3, is suitably secured to the open end of each of said drums 5. The said three diaphragms 3 4 4 are connected at the centers thereof by ligaments 6 6, those extending from the centers of the diaphragms 4 4 being connected to the center of the large diaphragm 3 at 9. Thus the ear or other tube 7 is open into the chamber within case 8 under the main diaphragm 3 on any of the said three diaphragms, and the combined vibratory effects of the latter serve to intensify the sound imparted thereto by a speaker and cause its clear transmission through the tube 7 to the listener.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an audiphone, a suitable shell or frame, a sound-conveying tube attached to its inner or smaller end, and a flexible diaphragm across its outer or larger end, combined with a plurality of smaller diaphragms placed in the shell between the larger diaphragm on the outer end of the case and the conveying-tube, and in proximity to the inner end of the tube, and with suitable connections for uniting the smaller diaphragms to the larger one, substantially as described.

2. An audiphone comprising a suitable case, a main diaphragm secured across the outer end of said case, combined with a sound-con-



veying tube on said case opposite said diaphragm, several cylindrical drums, having perforated sides, fixed on the wall of said case between said main diaphragm and said sound-  
5 conveying tube, a diaphragm secured on the open end of each of said drums, and suitable connections uniting the central portions of said several diaphragms, substantially as set forth.

10 3. An audiphone comprising a suitable case, a main diaphragm secured across the outer end of said case, combined with a perforated convex cover attached to said case and ex-

tending over said diaphragm, a sound-con- 15  
veying tube on said case opposite said diaphragm, several cylindrical drums having perforated sides fixed on the wall of said case between said main diaphragm and said sound-  
conveying tube, a diaphragm secured on the open end of each of said drums, and ligaments 20  
uniting the central portions of said several diaphragms, substantially as set forth.

JAMES A. LAKIN.

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