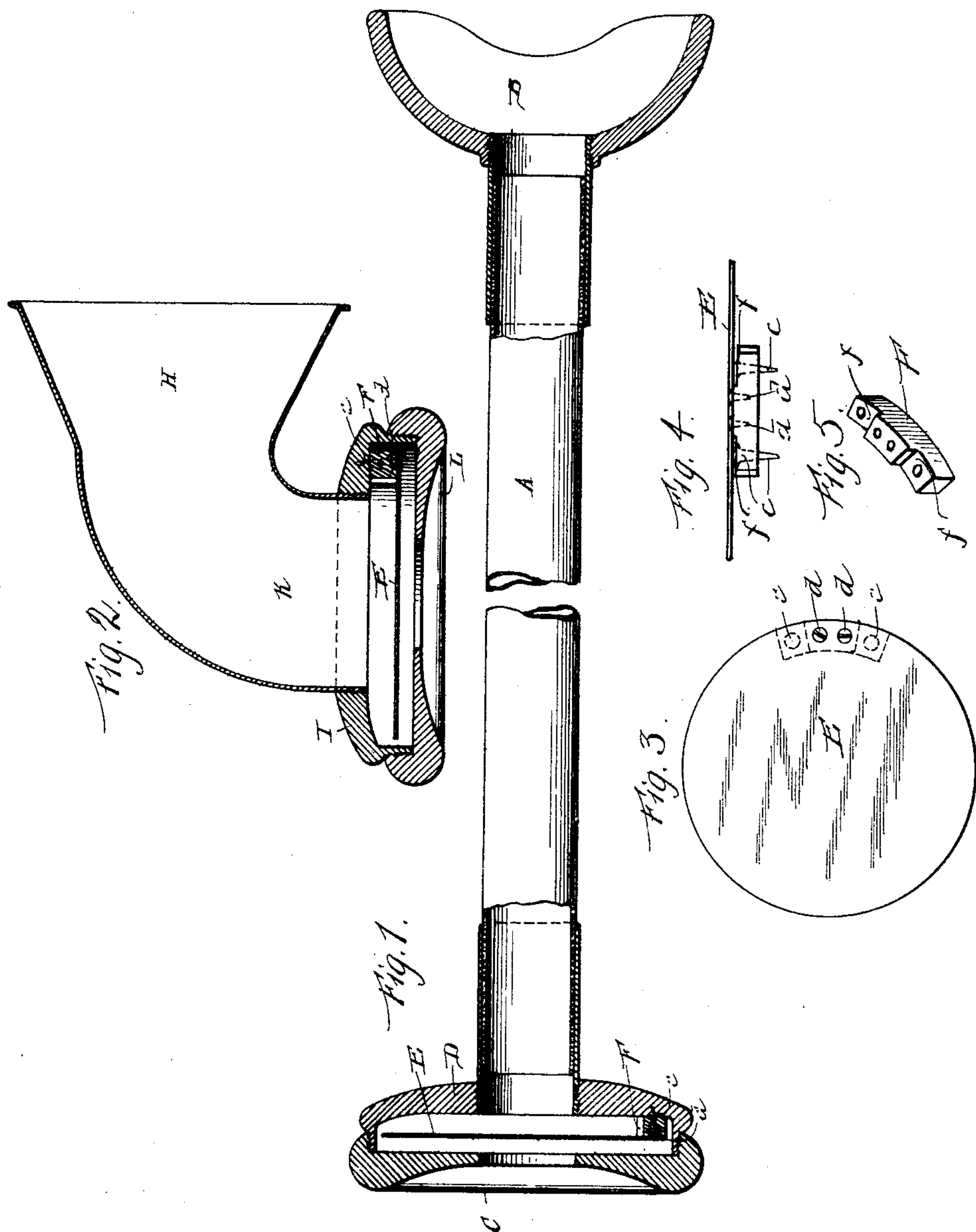


(No Model.)

J. A. MALONEY.
OTOPHONE.

No. 538,378.

Patented Apr. 30, 1895.



WITNESSES

Geo. W. Anderson
Philip Bellasi.

INVENTOR

James A. Maloney
by Geo. W. Anderson
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UNITED STATES PATENT OFFICE.

JAMES A. MALONEY, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR
TO E. FRANCIS RIGGS, OF SAME PLACE.

OTOPHONE.

SPECIFICATION forming part of Letters Patent No. 538,378, dated April 30, 1895.

Application filed July 20, 1894. Serial No. 518,123. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. MALONEY, a citizen of the United States, and a resident of Washington, in the District of Columbia, have
5 invented certain new and useful Improvements in Otophones; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make
10 and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a side view,
15 partly in section, showing the invention applied to one form of instrument. Fig. 2 is a sectional view showing the invention applied to a second form of instrument. Fig. 3 is a plan view of the diaphragm. Fig. 4 is an edge
20 view of the same with the means for supporting it, and Fig. 5 is a perspective view of the supporting-segment.

This invention has relation to certain new and useful improvements in otophones or au-
25 riphones, designed for use by persons of defective hearing, and more particularly to that class of such devices as are set forth and claimed in my patents, dated May 3, 1887, Nos. 362,099 and 362,100.

30 The present invention relates more particularly to the diaphragm which receives the sound impulses and transmits the vibrations thereof to the drum-head, and to the combination of the same with the other essential parts
35 of the instrument, the object being to provide a diaphragm which is exceedingly sensitive to sound vibrations and which, at the same time is free from liability to rupture; and to support the same in such a manner as to give it
40 great freedom of movement while preventing the transmission of its vibrations to adjacent parts of the instrument where they would become lost and of no effect.

Referring to the accompanying drawings,
45 Fig. 1 shows the invention applied to an instrument of the general form shown in my Patent No. 362,100, and consisting of an elongated tube A, a mouth piece B upon one end of said tube, an ear piece C at the opposite

end thereof, a diaphragm case D, and dia- 50
phragm E situated just behind said ear piece, said diaphragm case and diaphragm being constructed in accordance with my present invention.

The diaphragm E is made of a thin, circu- 55
lar, or approximately circular, sheet of some metal possessing great vibratory properties, and of great tenacity and strength. The metal which I prefer to employ is aluminium
60 which I have found to meet the above requirements to a high degree and which gives excellent effects. This diaphragm is supported in the case D by means of a short segment F of some material of non-vibratory
65 character secured to one edge of the diaphragm by means of screws *d, d*. Said segment is secured to the case D usually by means of two screws *c, c*, one near each end of the segment, the surface of the segment being cut away, as indicated at *f, f*, so that the
70 heads of these screws are out of contact with the diaphragm. With the exception of this support against the central portion of the segment, the diaphragm is entirely free and unconfined, which gives it a wide range of vibra- 75
tions from the sound impulses directed against it through the mouth piece and tube. I prefer to form the segment of a small block of lead, but other material possessing the same prop-
80 erties may be employed.

The mouth piece is adapted to the face of the speaker in such a manner that none of the sounds uttered will escape from the tube, and that no external sounds can enter same. The
85 ear piece is also of such form as to fit over the external ear or auricle, excluding external sounds and guarding against the escape of internal sounds, which are communicated to the drum-head through the interposed media.

The non-vibratory supporting segment or 90
block prevents the vibrations of the diaphragm from being transmitted to the casing and lost.

Fig. 2 shows the application of the same dia- 95
phragm and support to the general form of instrument shown in my Patent No. 362,099, and comprising a sound collector H, a case I, a short curved tube K connecting said sound

collector and case, the diaphragm E and an ear piece L.

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

1. An otophone, or similar instrument, having a diaphragm case situated behind the ear piece, and a diaphragm in said case and supported at one edge only, substantially as specified.

2. In an otophone or similar instrument the combination with a diaphragm of a support therefor, said support comprising a short block or segment of non-sound conducting properties, such as lead, substantially as specified.

3. In an otophone the combination with a sound carrying tube having a mouth piece or sound collector, and an ear piece, of a metallic diaphragm situated behind the ear piece, and a short segment or block of poor sound conducting properties securing said diaphragm to its case, said diaphragm being entirely free

except at such short segment or block, substantially as specified.

4. In an otophone, the combination with a thin metallic diaphragm and its case, of a short segment or block of poor sound conducting properties secured to said case and to which the diaphragm is secured at one edge, said block being cut away adjacent to the diaphragm at the points where said block is secured to the casing, substantially as specified.

5. In an otophone the combination with a diaphragm of aluminum, of a short securing and supporting block or segment at one edge thereof, said block or segment being of poor sound conducting material, such as lead, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES A. MALONEY.

Witnesses:

PHILIP C. MASI,
GEO. M. ANDERSON.