

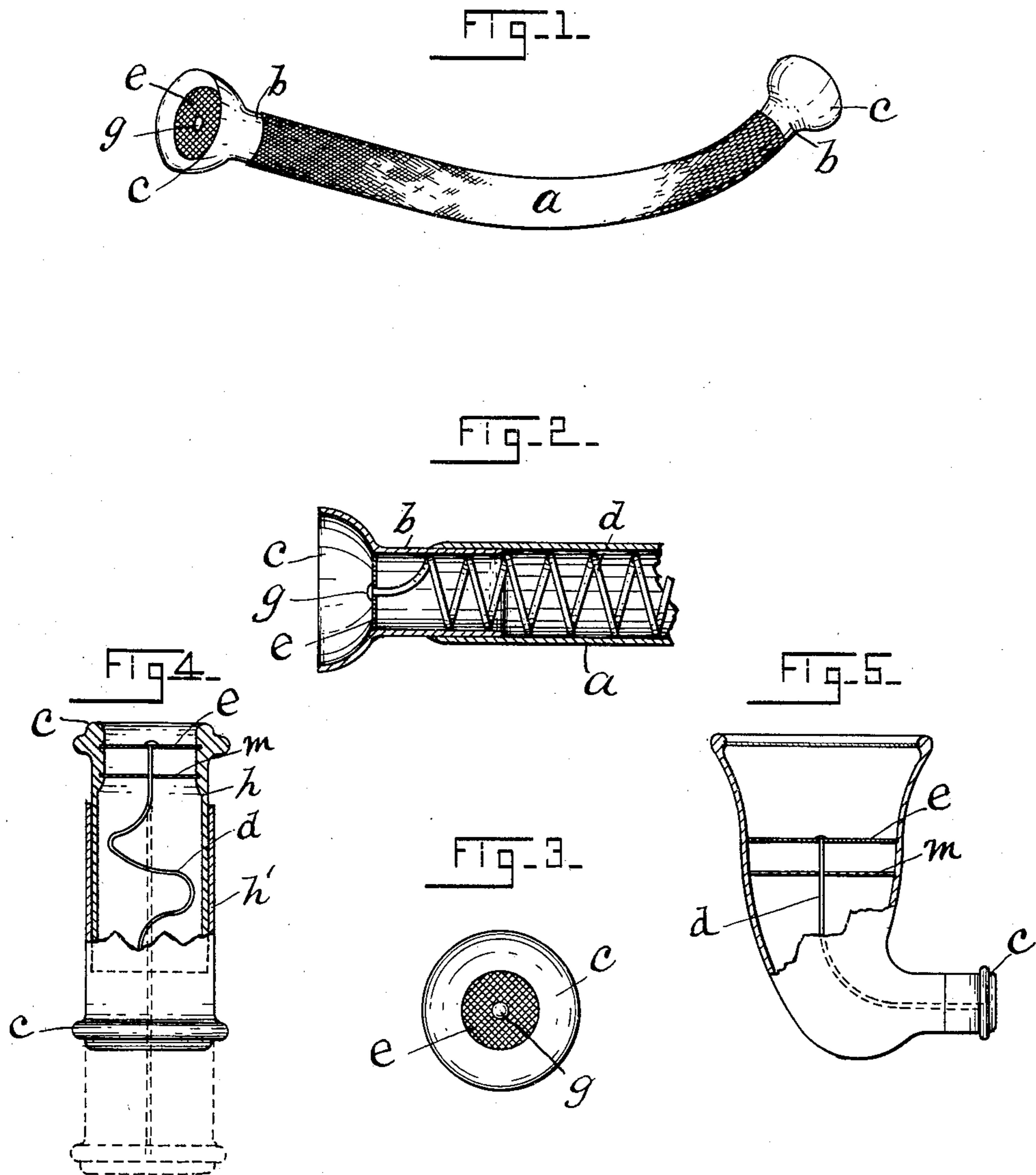
No. 612,761.

Patented Oct. 18, 1898.

A. WIGGIN.
TUBE FOR TRANSMISSION OF SOUND.

(Application filed Dec. 7, 1896.)

(No Model.)



WITNESSES

Oliver M. Luther.
May F. Ritchie.

INVENTOR,

Andrew Wiggin
By ATTORNEY,
Frank H. Allen

UNITED STATES PATENT OFFICE.

ANDREW WIGGIN, OF BOSTON, MASSACHUSETTS.

TUBE FOR TRANSMISSION OF SOUND.

SPECIFICATION forming part of Letters Patent No. 612,761, dated October 18, 1898.

Application filed December 7, 1896. Serial No. 614,859. (No model.)

To all whom it may concern:

Be it known that I, ANDREW WIGGIN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a certain new and useful Improvement in Tubes for the Transmission of Sound, which improvement is fully set forth and described in the following specification, reference being had to the accompanying sheet of drawings, in which—

Figure 1 is a view of a tube embodying my said invention, said view being partly in perspective. Fig. 2 illustrates a portion of one end of said tube considerably enlarged and in central longitudinal section. Fig. 3 is an end view of one of the mouth and ear cups provided at the extreme ends of the said tube. Figs. 4 and 5 illustrate modifications of my invention.

My invention is in tubes for the transmission of sound, and has for its particular object the production of a reasonably cheap, serviceable, and portable device for the use of deaf people, and which by reason of its peculiar acoustic properties will preserve sounds produced at one end of said tube and transmit the same to the opposite end of the tube without appreciable loss.

Heretofore so-called "speaking-tubes" consisting of simple metallic or flexible pipes of considerable length have been utilized for the transmission of sounds between distant points, and so-called "acoustic telephones" have also been used for the same purpose, said telephones being provided with a tightly-stretched wire connected at each end with disks of sheet form, the wire being free to vibrate in unison with the disk or diaphragm that receives the sound, and thus said wire serves to convey said sound to the companion diaphragm in a somewhat reduced or weakened degree, yet sufficiently strong to reproduce clearly articulated sounds, so that they may be heard a considerable distance.

My present invention seeks to provide a comparatively short tube embodying certain of the elementary features of both the simple speaking-tube and the acoustic telephone and combining therewith other features, the whole resulting in a sound-transmitting device which I find in practice not only conveys sounds from end to end of the tube, but ap-

pears to intensify such sounds, it being thus of particular advantage to persons afflicted by partial deafness.

In the accompanying drawings the letter *a* indicates a section of tubing which I prefer to make flexible—as, for example, with a framework for said tubing made of coiled wire covered, first, with soft rubber or elastic cloth and, second, with an outer jacket of woven webbing, the same being of suitable length. Each end of said tubing is attached to a short tube or collar *b*, of metal or other suitable material, that terminates in an open flaring cup *c*, that may serve either as a mouthpiece to receive sound or as an earpiece to deliver said sound, the cups *c* at the opposite ends of the tube being precisely alike in their construction in the device shown in Fig. 1. A mouth or ear piece of any other shape may, however, be attached to the opposite ends of the tube, if desired. Within the flexible tubing *a* is an open-wound spiral wire *d*, one of whose offices may be to provide a skeleton or frame to expand and support said tubing. Within each of the cup-shaped mouth and ear pieces *c* is seated a disk *e*, that is perforated or made of wire screen, and the center of each of said disks is securely attached to the ends of the described spiral wire *d*.

The wire ends may be attached directly to the disks by soldering or may be connected to small buttons *g*. In either case that part of the wire that connects the disks with the spiral wire is preferably centrally located in the collar *b* and is under sufficient tension to draw the disks snugly into their seats and convey vibrations from one disk to the other.

When my described device is in service, sound produced by articulation or otherwise in the mouthpiece *c* at one end passes quite freely through the screen *e* and thence through the tube *a* to the earpiece at the opposite end. At the same time the screen-disk at the mouthpiece end is caused to vibrate and these vibrations are transmitted through the medium of the wire *d* to the disk in the earpiece, thus supplementing and intensifying in some degree the sound conveyed by the tube proper.

Instead of the long flexible tube of Fig. 1 I provide in some instances a tube formed of two telescopic sections *h h'*, that may be slid together when not in use, as seen in full lines

in Fig. 4, thus providing a very compact device that may be carried in the pocket. When the shells *h h'* are extended, the wire (or, if preferred, a piece of catgut) is drawn taut, as indicated in dotted lines in Fig. 4. I also provide in some instances a diaphragm *m*, that is stretched in the mouth and ear pieces *c* in such position that the wire or gut *d* passes snugly through said diaphragm after leaving the perforated disks *e*, this arrangement of parts being particularly desirable when vibrations of the transmitting-wire *d* is relied upon.

In Fig. 5 I have illustrated a form of my invention specially suited for use in public places—as, for example, in lecture-rooms, churches, &c. An earpiece *c* is provided at one end and the opposite end is of bell or other desirable shape, and within the receiver thus provided is located the solid diaphragm *m*, either metal or membrane. In this instance the wire *d* is bent to conform to this curved form of the casing and is connected to a disk of the same material in the earpiece in the same manner as in the device of Figs. 1 and 2.

My described device in all its forms has the

very desirable quality of portability, as it can be made so small as to be readily carried in the pocket of the user.

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

1. In a sound-transmitting device, the combination, with a flexible conduit, of a diaphragm at each end thereof, a spiral connector secured at its ends to the diaphragms, whereby the connector is automatically held at a tension independently of the position of the conduit, substantially as set forth.

2. In a sound-transmitting device, the combination, with a flexible conduit, of a diaphragm at each end thereof, a spiral wire secured at its ends to the diaphragms and having its intermediate portion bearing against and supporting the walls of the conduit, substantially as set forth.

ANDREW WIGGIN.

Witnesses:

JOSEPH BERGIN,
JUSTIN WHITNEY.