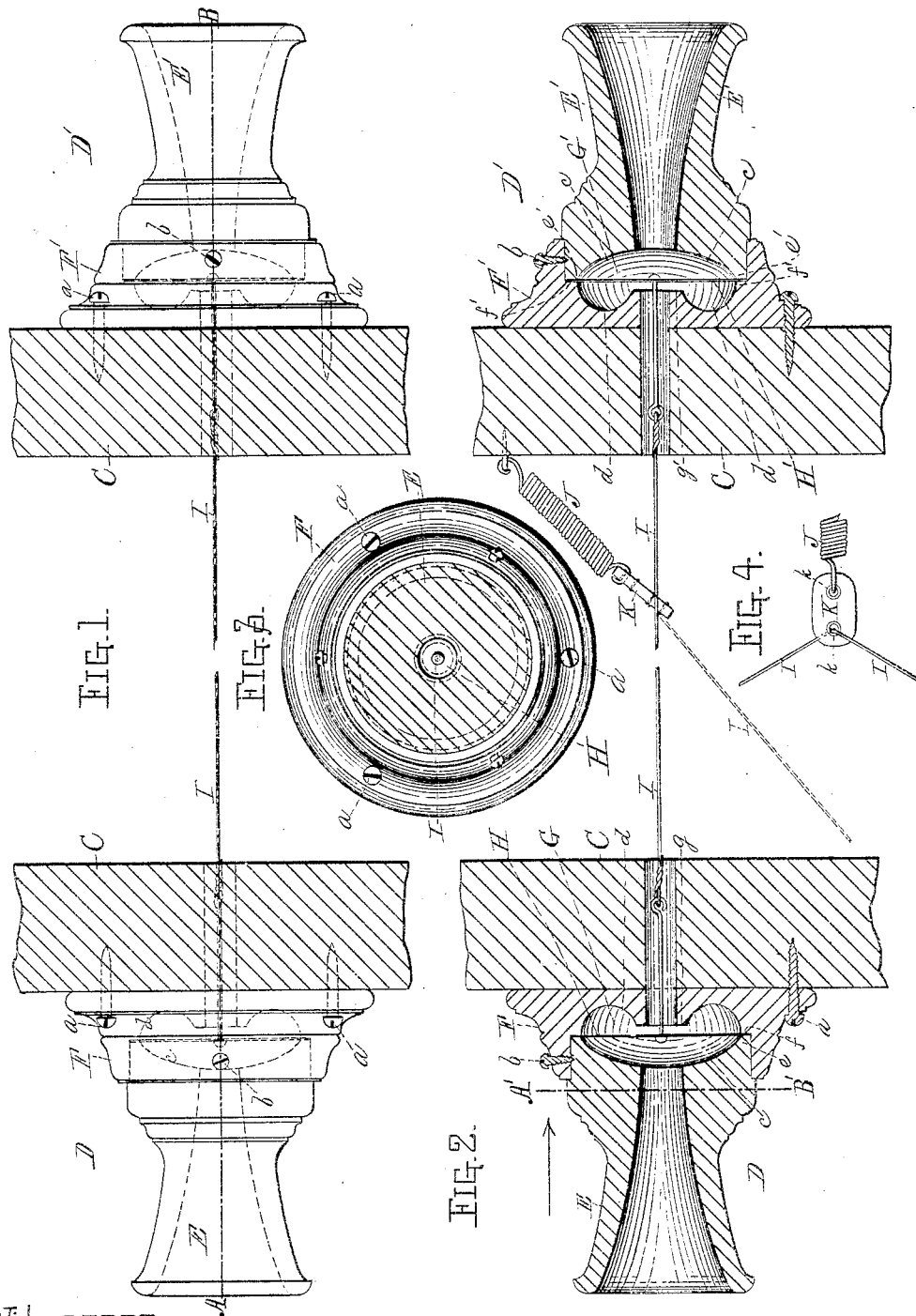


J. DRAPER.  
Acoustic Telephone.

No. 213,813.

Patented April 1, 1879.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN ACOUSTIC TELEPHONES.

Specification forming part of Letters Patent No. **213,813**, dated April 1, 1879; application filed January 16, 1879.

*To all whom it may concern:*

Be it known that I, JAMES DRAPER, of the city and county of Worcester, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Acoustic Telephones; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a side view of a pair of my said improved acoustic telephones secured to their respective walls or partitions, as will be hereinafter more fully described. Fig. 2 represents a central longitudinal section of the parts shown in Fig. 1, taken on line A B of the same figure. Fig. 3 represents a transverse section through one of the telephones, taken on line A' B', Fig. 2, looking in the direction indicated by arrow in the same figure; and Fig. 4 represents a portion of the device, hereinafter more fully described.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

In the drawings, the parts marked C represent sections of walls or partitions upon which the telephones D D' are arranged and secured. Said telephones D D' are constructed with trumpet-shaped mouth-pieces E E' and the parts F F', which are secured to walls or partitions C by means of screws *a*.

The parts F F' are formed with sockets, into which are fitted the ends of mouth-pieces E E', and secured in position by means of set-screws *b* or otherwise, as may be desired.

Both the mouth as well as socket pieces E E' and F F' are cored out, as represented at *c* *d*, for the purpose of forming concentrating sounding-chambers G G', the diaphragms being supported so as to divide said sound-concentrating chambers, as fully indicated in the drawings.

Between flanges *e* *e'* of mouth-pieces E E' and shoulders or bearings *f* *f'* of parts F F' are secured said diaphragms H H', which are composed in this instance of thin metallic plates, although any other suitable vibrative material may be used, if preferred.

To the centers of diaphragms H H' are se-

cured the ends of the conducting wire or line connecting the two telephones, as is also indicated in the drawings.

By forming the mouth-pieces E E' with large outer openings, and tapering them down to small openings at their inner ends, as represented by full and dotted lines in the drawings, sounds entering and passing through the same are concentrated upon the centers of diaphragms H H', where the conducting wires or lines are secured, as before stated, and said sounds transmitted over the latter with such force and distinctness that by speaking into one of the telephones the voice is reproduced upon the diaphragm of the other, when placed or secured at a considerable distance, with such distinctness that each word is clearly and plainly distinguishable.

The peculiar form of chambers G G' contributes to the success of the operation of the device in obtaining the last-before mentioned results, since by making the inner ends of mouth-pieces E E' of spherical form *e* they act as sound-concentrating chambers to deflect the air-vibrations upon the centers of the diaphragms H H'.

The vibrations of the sound or the vibrations of the air occasioned by the voice of the operator, being concentrated upon the centers of the diaphragms, are communicated in a steady and strong manner to the conducting-wire, and are delivered in the same way.

Annular spherical surfaces *d* also serve the same purpose as surfaces *c*, there being spaces left between the projections *g* *g'* and the centers of the diaphragms, as fully indicated in the drawings; and, if preferred, the projections *g* *g'* may be reduced to thin circular edges, instead of being shown blunt, as shown in the drawings.

The mouth-pieces it will be observed, are so fitted as to hold the outer edges of the diaphragms firm, secure, and tight against the shoulders *f* *f'*, thereby preventing the air escaping or passing from one chamber to the other around the outer edges of said diaphragms H H'.

In the use of my acoustic telephones it is important to keep the conducting wire or line I from contact with metal and other rigid surfaces, and it is also important to keep it pretty

taut; and to accomplish the purposes last above described I employ a supporting-spring, J, in combination with a rubber elastic guide-piece, K, through which the wire passes when it is desired to turn the conducting-wire at an angle, as indicated in Figs. 2 and 4 of the drawings, the latter drawing indicating in full lines how the wire can be deflected or turned in either direction.

The elastic rubber piece K prevents the vibration of the conducting-wire I from being disturbed or impaired by the metal spring J, while the latter, contracting and yielding, keeps the conducting-wire in proper tension, and that, too, without endangering its being broken from any overstraining cause.

To prevent conducting-wire I and the end of spring J being torn out of the openings formed in rubber piece K, eyelets *k* are secured in said openings, which also allows the conducting-wire to slip through the same more easily. Said piece K may be made rectangular in shape, as represented in the drawings, or any other desired form. It may also be made of any other material which is a non-conductor of sound-vibrations.

By the use of the eyelet *k* the conducting-wire can slip or move easily; consequently its vibrations are not disturbed nor broken, which would be the case if it were allowed to embed itself in any soft yielding substance, such as rubber or other similar material.

If desired, felting or some other soft material may be placed around the conducting-wire I, where it passes through walls or partitions C, for the purpose of preventing said wire from coming in contact with the former. This precaution is more especially desirable when the conducting-wire is arranged upon an angle, as before stated.

Having described my improved acoustic telephone, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with the diaphragms H H' and conducting-wire I, of sound-concentrating chambers G G', formed by the concavities *c* and *d* in the mouth and socket pieces, of spheroidal and annular shape, as shown, and for the purposes set forth.

2. The combination, with the telephonic conducting-wire I, of a rubber supporting-piece, K, provided with a hard smooth eyelet, *k*, substantially as and for the purposes set forth.

3. The combination, with the telephonic wire I, of a rubber supporting-piece, K, and elastic spring J, substantially as and for the purposes set forth.

JAMES DRAPER.

Witnesses:

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