

(No Model.)

J. P. SUNDERLAND.
MECHANICAL TELEPHONE.

No. 376,923.

Patented Jan. 24, 1888.

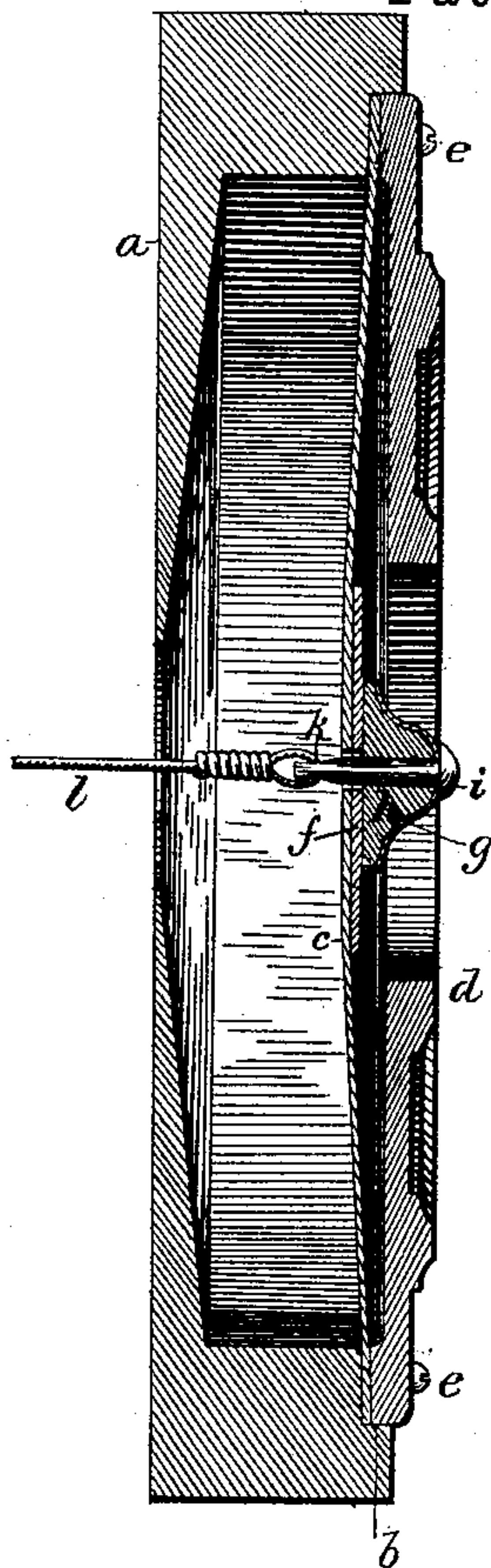


Fig. 1.

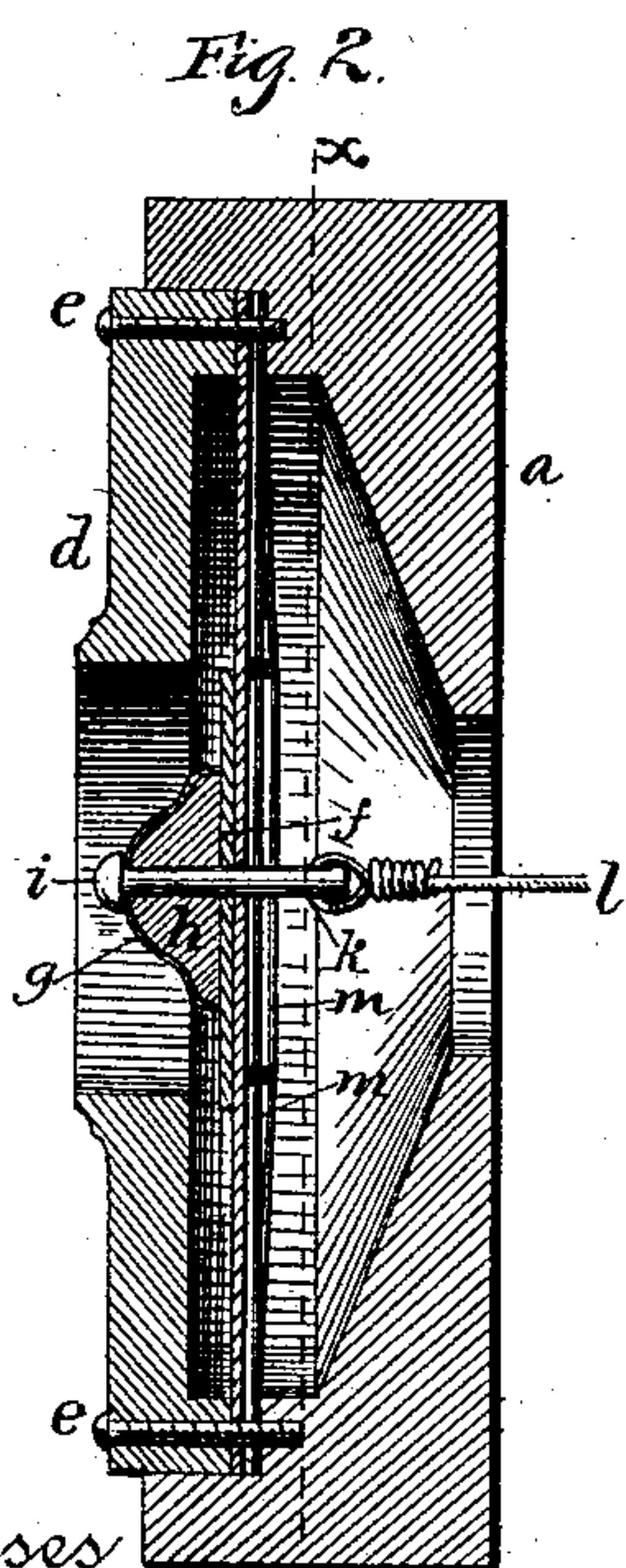


Fig. 2.

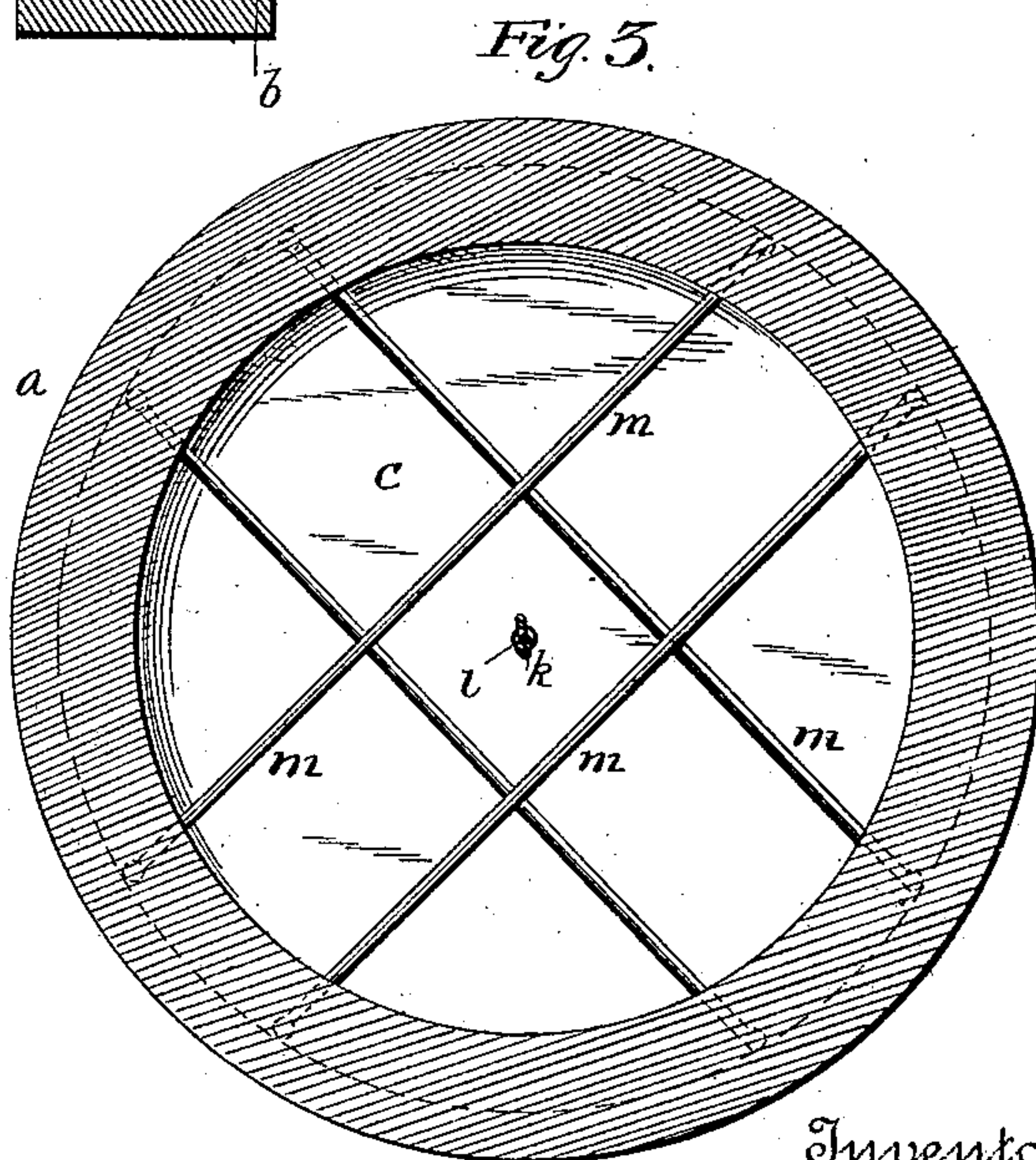


Fig. 3.

Witnesses

C. D. Brock.
L. M. Bartlett.

Inventor

John P. Sunderland
By W. A. Bartlett
Attorney

UNITED STATES PATENT OFFICE.

JOHN P. SUNDERLAND, OF BROOKLYN, NEW YORK.

MECHANICAL TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 376,923, dated January 24, 1888.

Application filed July 21, 1887. Serial No. 244,853. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. SUNDERLAND, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Mechanical Telephones, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to mechanical telephones, or that class of speaking-telephones which communicate sounds without the aid of electric batteries or currents.

The object of this invention is to construct a telephone of the class described in which vibrations due to disturbances of the wires by wind, and similar vibrations from whatever cause, will be eliminated to a great extent from action on the diaphragm, so that spoken words can be transmitted from instrument to instrument with little or no outside disturbance.

To this end the invention consists in the construction, arrangement, and combination of parts, substantially as hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a vertical central section of a telephone made according to my invention, showing the arrangement of the parts. Fig. 2 is a similar section of a modified device, showing the diaphragm sustained by supporting-wires; and Fig. 3 is a section of Fig. 2 on the line *x x* in rear of the diaphragm, looking toward the front.

The reference-letter *a* indicates the casing of the instrument. This casing is preferably of well-seasoned wood turned to the shape of a shallow basin, the bottom being conical and centrally perforated. A rabbet, *b*, around the inner edge of casing *a* receives the diaphragm *c*, and also the face-plate *d*, which face-plate is also preferably of wood in form of a disk with central perforation. The face-plate *d* is held in place by screws *e*, which pass through the face-plate and through the edges of diaphragm *c*, and thus hold the face-plate and diaphragm firmly in place.

A re-enforcing plate or washer, *f*, preferably of a strong resonant metal, as phosphor-bronze, is placed in front of the diaphragm *c*. Still in front of this there is a hollow conical shell, *g*, of brass, nickel, or other thin metal. This cone is filled with plaster-of-paris, papier-maché, or similar material which does not

readily transmit vibrations among its particles. The base of this material inclosed in the cone rests on the re-enforce of the diaphragm, or, if the diaphragm be strong enough, may rest on the diaphragm; but I have found better results produced by interposing the plate *f*.

Through the center of the cone *g* there passes a headed bolt, *i*, the head being in front of the cone. The bolt *i* is perforated at *k* in rear of the diaphragm for the attachment of line-wire *l*, said wire leading away to another telephone, as usual in instruments of this class.

The diaphragm *c* may be strengthened by passing wires *m m* or metallic bars (preferably of phosphor-bronze) across the casing in rear of the diaphragm, the wires or bars being drawn taut and secured in grooves in the casing, so that the diaphragm shall be supported by said wires or bars.

The diaphragm is preferably of the material described in my application Serial No. 228,338, filed February 21, 1887. The cone *g* will extend into the central opening in face-plate *d* if the diaphragm is well forward in the casing.

My theory of the mode of operation is that there are more than one character of vibrations which may be transmitted by the line-wire; that vibrations of the diaphragm *c* are transmitted as pulsations to the wire from end to end, while outside vibrations—for instance, those caused by the swaying of the wire—are not so readily transmitted. Whether this theory be correct or not, I have found that the conical shell *g*, filled with a non-resonant material and having its base resting on the plate *f* or the diaphragm, acts to cut off external sounds, and that the sound of the human voice can be transmitted for several miles from one of my instruments to another, and the articulation will be clear and loud, and this without much regard to atmospheric conditions.

It will be understood that I contemplate the substitution of equivalents wherever desirable in my device.

I claim—

1. In a mechanical telephone, the casing, the diaphragm, a hollow cone filled with non-resonant material in front of the diaphragm, and a rod extending through the cone and diaphragm for connection with the line-wire, all in combination, substantially as described.

2. In a mechanical telephone, the casing, the diaphragm in said casing, a plate resting against the front of the diaphragm, a hollow cone filled with non-conducting material having its base resting against said plate, and a bolt passing through the cone, plate, and diaphragm for the attachment of the line-wire, all in combination, substantially as described.

3. The combination, with the casing of a mechanical telephone, of a diaphragm stretched across the same, a metallic plate resting against the front of the diaphragm, a hollow metallic cone filled with plaster and having its base resting against said plate, and a bolt passing through the cone, plate, and diaphragm and connected to the line-wire, substantially as described.

4. The combination, with the casing of a mechanical telephone, of a diaphragm stretched across and secured to said casing, supporting bars secured to the casing and resting against the back of the diaphragm, a hollow cone filled with non-resonant material at the front of the diaphragm, and a connection to the line-wire extending from this cone through the diaphragm, all combined as stated.

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

JOHN P. SUNDERLAND.

Witnesses:

W. A. BARTLETT,
L. M. BARTLETT.