No. 768,569. PATENTED AUG. 23, 1904.

A. J. MUNDY.

TELEPHONE TRANSMITTER.

APPLICATION FILED APR. 23, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

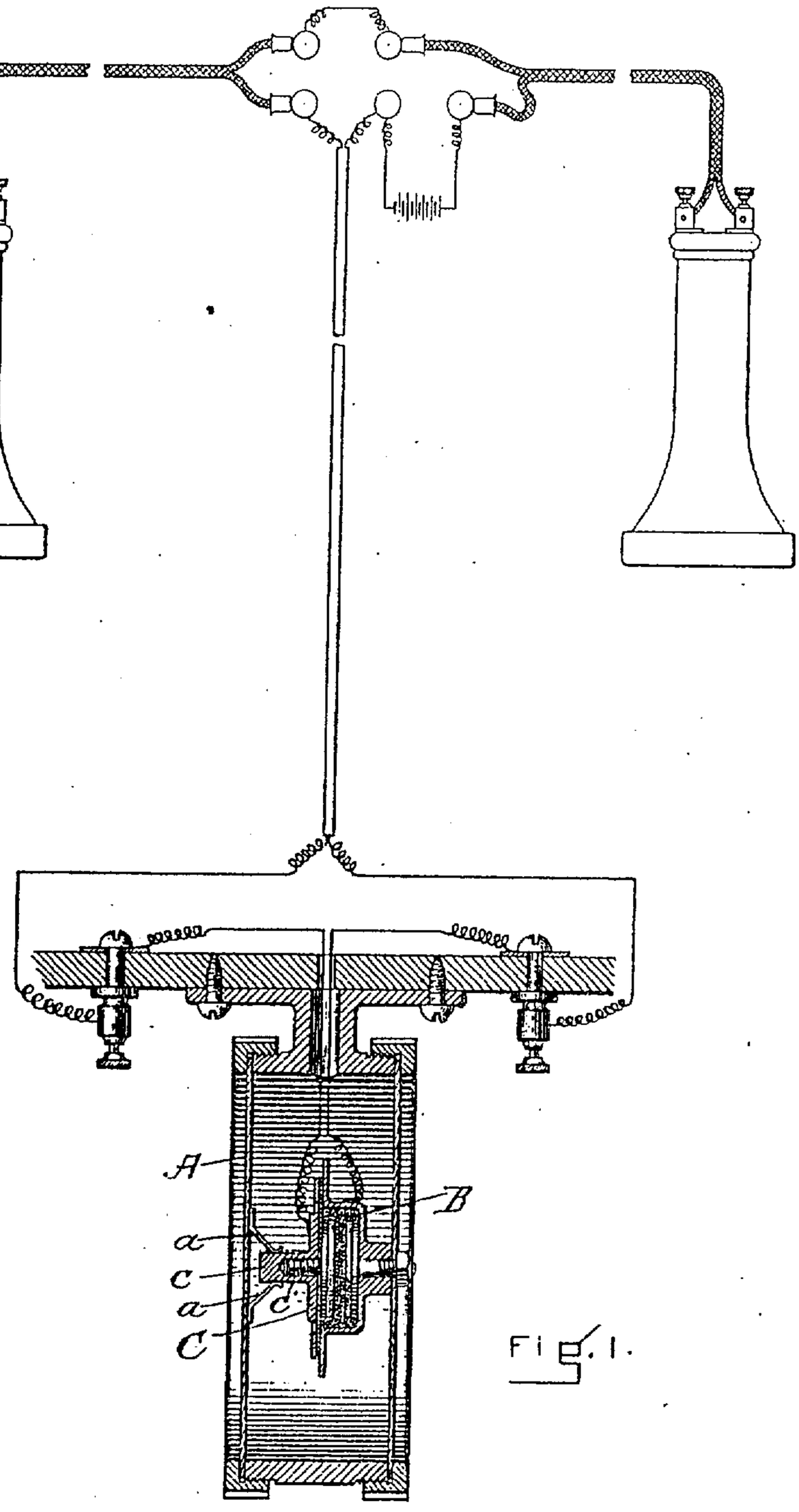

Fig. 1.

WITNESSES:

J. M. Dolan.

Saul Seppenfield.

INVENTOR

Arthur J. Mundy.

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NO MODEL. 3 SHEETS—SHEET 2.

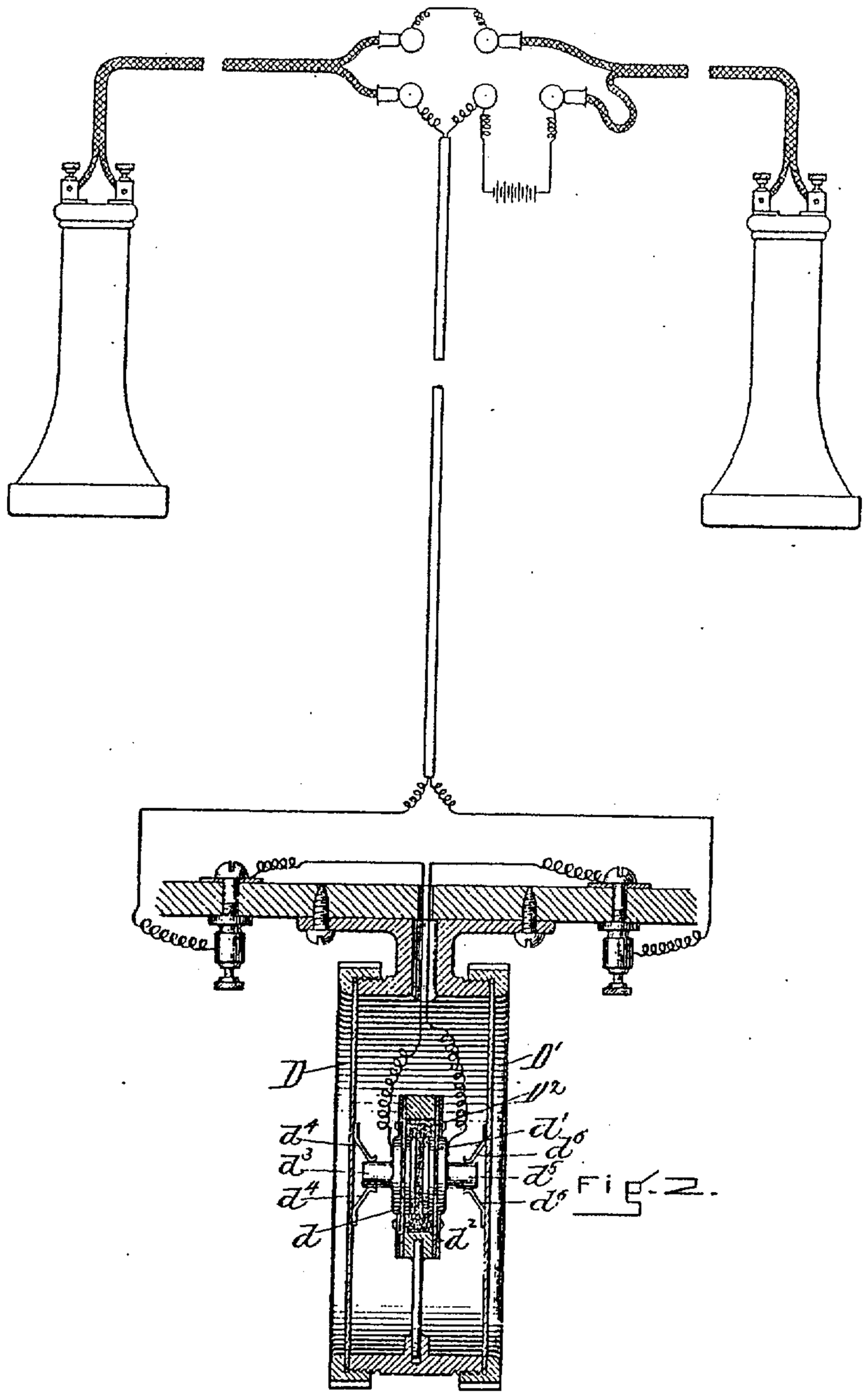

Fig. 2.

WITNESSES:
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INVENTOR:
Arthur J. Mundy.

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NO MODEL. 3 SHEETS—SHEET 3.

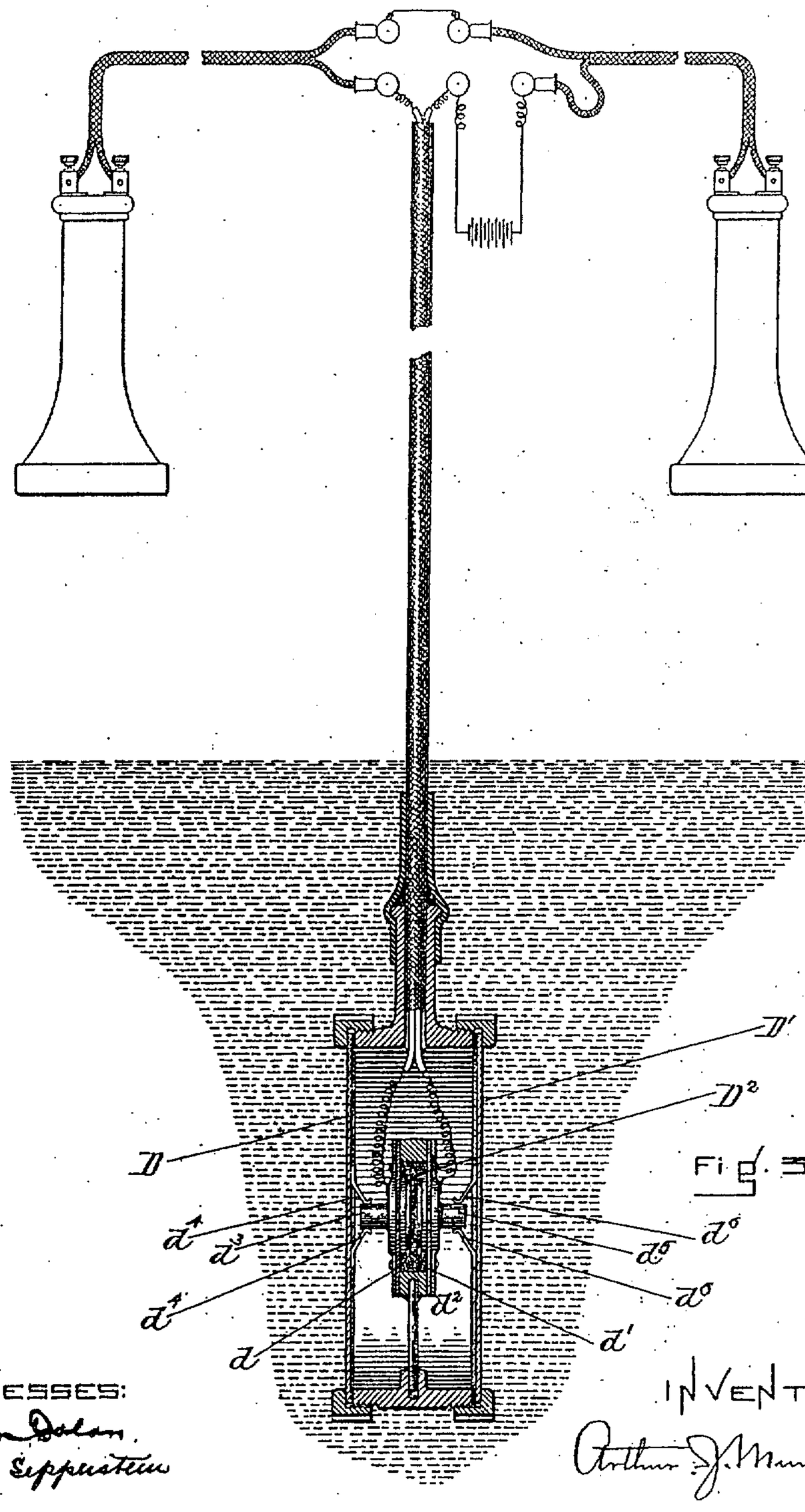

Fig. 5

WITNESSES:

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Paul Seppenstein

INVENTOR:

Arthur J. Mundy.

No. 768,569. Patented August 23, 1904.

UNITED STATES PATENT OFFICE.

ARTHUR J. MUNDY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO SUBMARINE SIGNAL COMPANY, OF WATERVILLE, MAINE, A CORPORATION OF MAINE.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 768,569, dated August 23, 1904.

Application filed April 23, 1902. Serial No. 104,298. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR J. MUNDY, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Telephone-Transmitters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to an electric sound-transmitting device for transmitting sounds or sound-vibrations of any kind or articulate speech, whether communicated to it by air or water.

The invention involves the employment of a sound-receiving diaphragm and means for varying electrical resistance, a movable disk to bear against it, and a yielding but unbroken connection between the disk and the diaphragm which permits of the movement of the disk with the diaphragm or of the diaphragm with respect to the disk, or vice versa.

The invention consists in two or more sound-receiving diaphragms, means for varying electrical resistance common to all the diaphragms, and a connection between each diaphragm and said means for varying electrical resistance comprising disks or surfaces to bear against the same and connected with the diaphragms by a yielding but unbroken connection which permits the disks to be moved with the diaphragms and by them or the movement of the diaphragms independently of the disks or of both movements without breaking the connection between the diaphragms and the disks.

I will now describe the invention in conjunction with the drawings forming a part of this specification, wherein—

Figure 1 represents a transmitter in which my invention is shown as combined with actuating-diaphragms varying in their connection with the means for varying electrical resistance as hereinafter specified. Fig. 2 is a view representing a transmitter in which both diaphragms are combined with the means for varying electrical resistance in the same way. Fig. 3 represents the structure of Fig. 2 when employed as a means for receiving sound-vibrations transmitted by water.

In the drawings, in Fig. 1, A represents a diaphragm adapted to receive sound-vibrations of any kind, including those of articulate speech. B is a means for varying the electrical resistance. Comminuted carbon is represented; but any other suitable means may be employed. C is a disk or other shaped button or presser held in any desired way and having its inner face in contact with the means for varying electrical resistance. This disk is so supported as to be capable of vibratory movement. It is connected with the diaphragm A by means of a short post *c*, extending from its outer side forward and preferably centrally arranged thereon and of uniform size or diameter throughout, and the end of which preferably does not come into contact with the diaphragm A. Upon the inner surface of the diaphragm A are a number of fingers *a*, the outer ends of which are free and yielding and which bear against or upon the surface *c'* of the post *c*. These fingers *a* are of any suitable material having sufficient spring to hold their ends in contact with the sides of the post *c'*, upon which they may move without breaking their contact therewith. As many of these spring fingers or arms may be used as desired. They extend, preferably, from near the center of the sound-receiving diaphragm A and by their engagement with the post permit vibrations of the diaphragm to be transmitted to the means for varying electrical resistance either by the vibratory movement of the disk C with the diaphragm, such as would occur did the arms or fingers *a* not move on the post *c*, or as would be produced by the vibratory movement of said fingers *a* upon the post or by a vibratory action which should be partly produced by the movement of the fingers upon the post and partly by the movement of the post and disk with the fingers, although not necessarily to the same extent.

In Fig. 2 I have represented a means for varying electrical resistance which is common to a number of sound or vibration receiving diaphragms. Two such are shown.

They are lettered D and D'. The means for varying electrical resistance common to both these diaphragms is lettered D^2. It may be comminuted carbon or any other means suitable for the purpose. It is represented as held between the two disks d and d' in a suitable retainer d^2. The disks d d' form side walls to the chamber and are attached to the retainer in a manner to permit them to have vibratory movement imparted to them. Each of these disks is connected with its respective diaphragm in the manner above indicated, the disk d with the diaphragm D by the post d^3 and diaphragm-arms d^4, the disk d' with the diaphragms D' by the post d^5 and the diaphragms-arms d^6.

The electric connection between the transmitter and the receiver, which may be in duplex form, is preferably secured by a primary circuit when the transmitter is employed for the reception of submarine vibrations, and the receiver and transmitter may be connected in series or in multiple. It will be seen that with this structure of transmitter the means for varying electrical resistance is common to a number of sound or vibration transmitting diaphragms and that a magnified effect is obtained because of this, as it brings a number of surfaces of the means for varying electrical resistance into conjunction with independent vibrating diaphragms, thereby not only much increasing the operative effect as compared with an apparatus employing but a single diaphragm, but also obtaining a consistency of operation and uniformity of result as well. The concentrating or focusing or bringing together from a number of different sources upon a means for varying electrical resistance common to them all serves to provide said means for varying electrical resistance with what may be termed a "liveliness" or "life," which is not provided where one of its surfaces only is brought into relation with a single vibratory diaphragm.

In Fig. 3 I have represented the transmitter as submerged in water and as used to take from the water sound-vibrations or signals imparted to it and to transmit them to a receiver.

I would further say that I do not limit the invention to the specific construction of the transmitter which I have shown and described, as I consider that any construction which will produce the result specified and employing substantial equivalents for the devices indicated would be within the scope of my invention.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The improved electric sound-transmitter herein described, the same comprising a number of vibratory diaphragms, a means for varying electrical resistance common to all the diaphragms, and individual interposed connections between it and the diaphragms, each comprising a vibratory disk or plate in contact with said means, connected with the diaphragm in a manner to permit it to be moved therewith or to permit the diaphragm to be independently vibrated with respect to it without breaking their connection.

2. The improved submarine electric sound-transmitter herein described, the same comprising a cylindrical casing, two vibratory diaphragms secured at their peripheries to said casing and maintaining the same watertight, said diaphragms being exposed to receive sound-waves from various directions, a single means for varying electrical resistance common to both diaphragms and arranged between them, interposed connections between the said means for varying electrical resistance and the vibratory diaphragms, each comprising a vibratory disk or plate to bear against the said means for varying electrical resistance from opposite sides and operatively combined with its diaphragm.

3. The improved electric sound-transmitter herein described, the same comprising two vibratory diaphragms, oppositely arranged, a single means for varying electrical resistance common to both diaphragms and arranged between them, interposed connections between the said means for varying electrical resistance, and the vibratory diaphragms, each comprising a vibratory disk or plate to bear against the said means for varying electrical resistance from opposite sides, the said disk or plate and its actuating-diaphragm having a yielding frictional relation with each other.

4. The improved electric sound-transmitter herein described, comprising a vibratory diaphragm, a means for varying electrical resistance, a vibratory disk or surface to bear against said means for varying electrical resistance, and a connection between the disk and the vibratory diaphragm, said connection yielding along a line substantially perpendicular to said disk, whereby the point of the application of pressure on said disk is not shifted.

5. The improved electric sound-transmitter herein described, comprising a vibratory diaphragm, a means for varying electrical resistance, a vibratory disk or surface to bear against said means for varying electrical resistance and a yielding connection between said disk and said diaphragm, said connection engaging said disk at a substantially unchanging or fixed point on said disk.

6. The improved electric sound-transmitter herein described, comprising a vibratory diaphragm, a means for varying electrical resistance, a vibratory disk or surface to bear against said means for varying electrical resistance, and a yielding and grasping connection between it and the vibratory diaphragm.

7. The improved electric sound-transmitter herein described, comprising a vibratory diaphragm, a means for varying electrical resist-

ance, a vibratory disk or surface to bear against said means for varying electrical resistance, and having interposed between it and the vibratory diaphragm a horizontal stud or post upon one, and yielding fingers to constantly bear against the sides of the post upon the other.

8. The improved electric sound-transmitter herein described, comprising a vibratory diaphragm, a means for varying electrical resistance, a vibratory disk or surface to bear against said means for varying electrical resistance, and a yielding connection between said disk and said diaphragm for permitting one to be moved with respect to the other without breaking the connection between them, said connection being between fixed points of the surfaces of said disk and diaphragm.

9. The improved electric sound-transmitter for submarine use herein described, the same comprising two vibratory diaphragms oppositely arranged, each of which has its outer surface in contact with the water or other fluid, a means for varying electrical resistance common to both said diaphragms, a vibratory disk or plate for each diaphragm to bear against said means for varying electrical resistance upon opposite sides thereof, and means for attaching each disk or plate to its diaphragm which permits one to be moved without respect to the other without breaking the connection between them.

ARTHUR J. MUNDY.

Witnesses:
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J. M. DOLAN.