

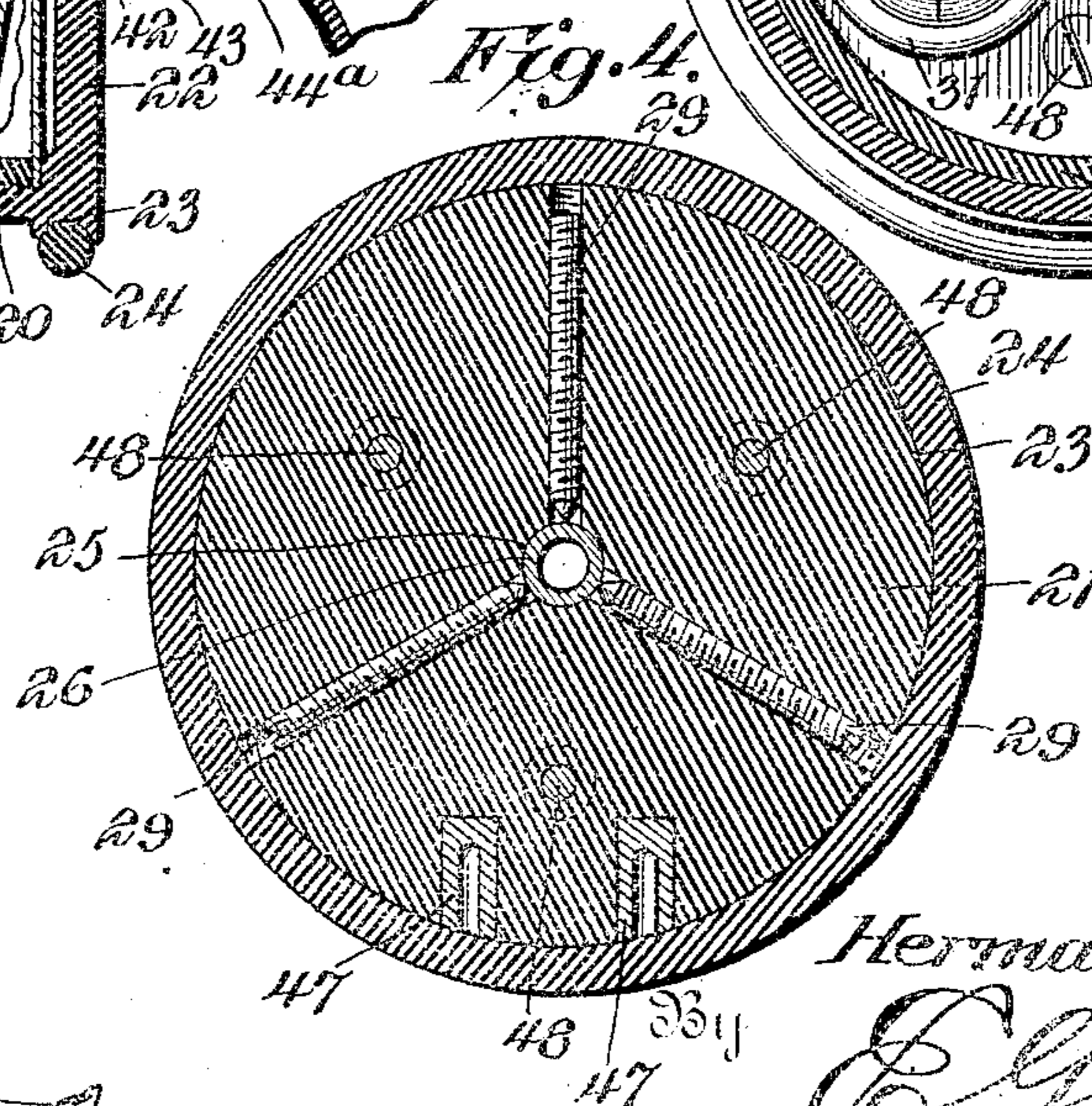
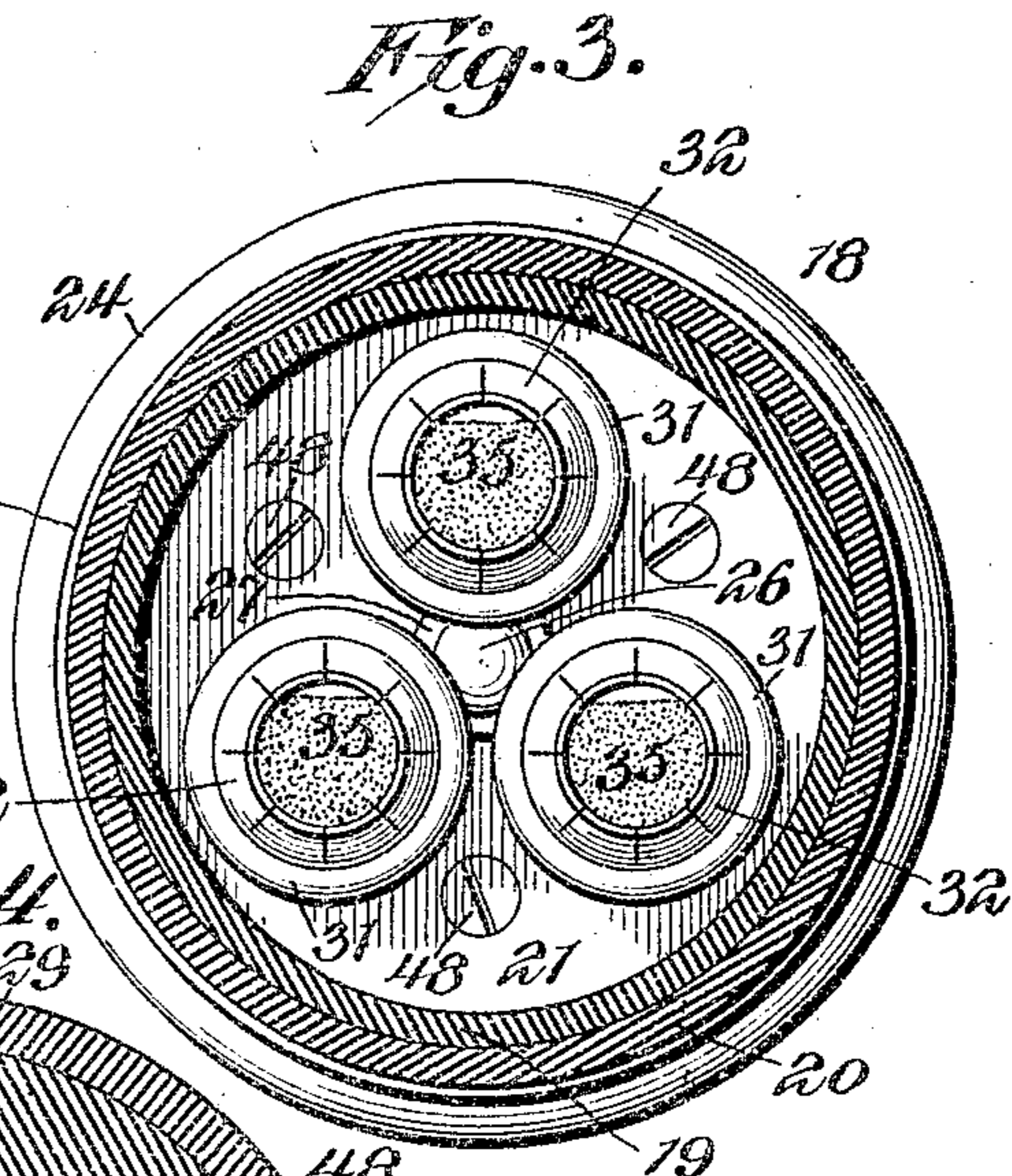
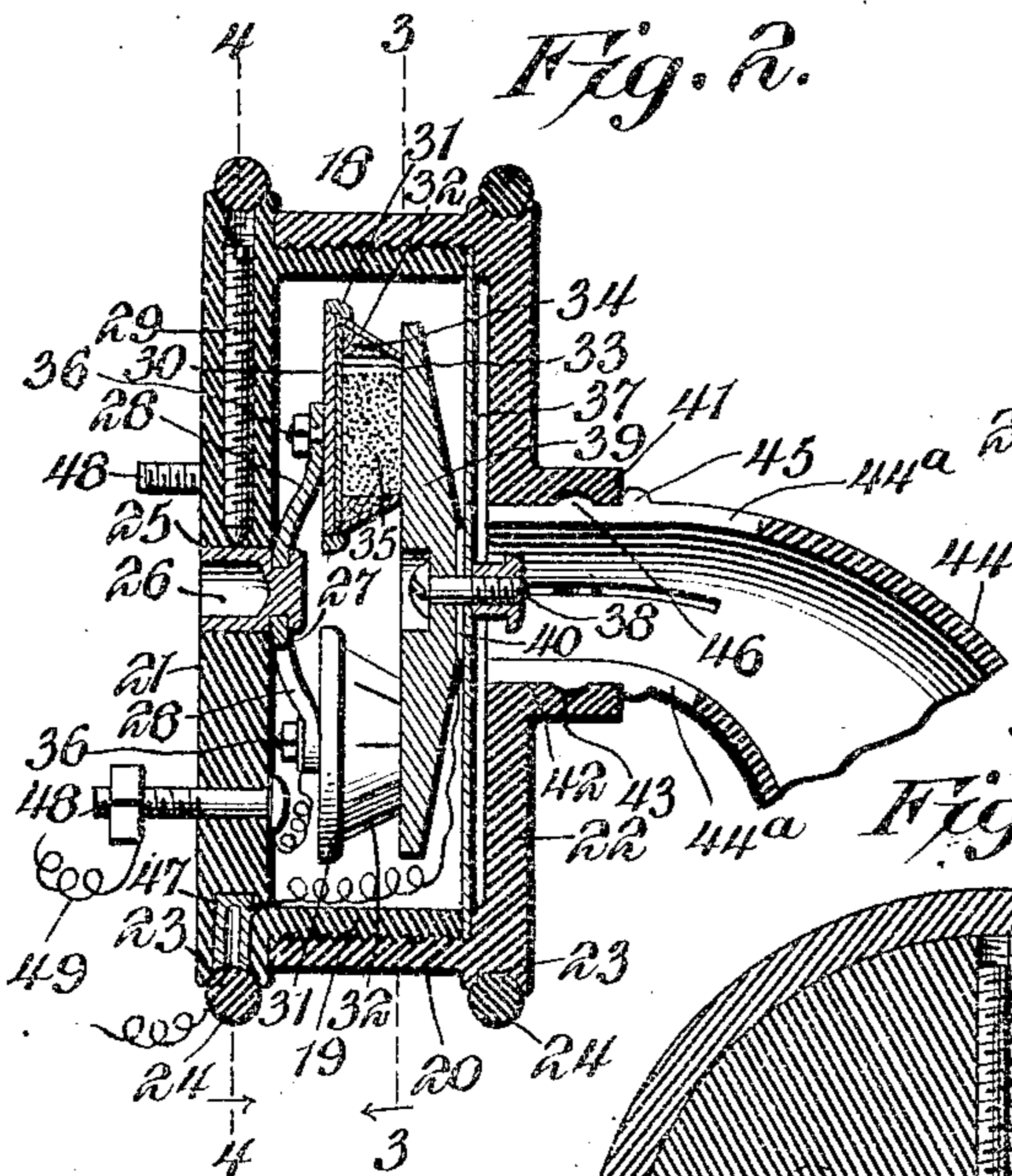
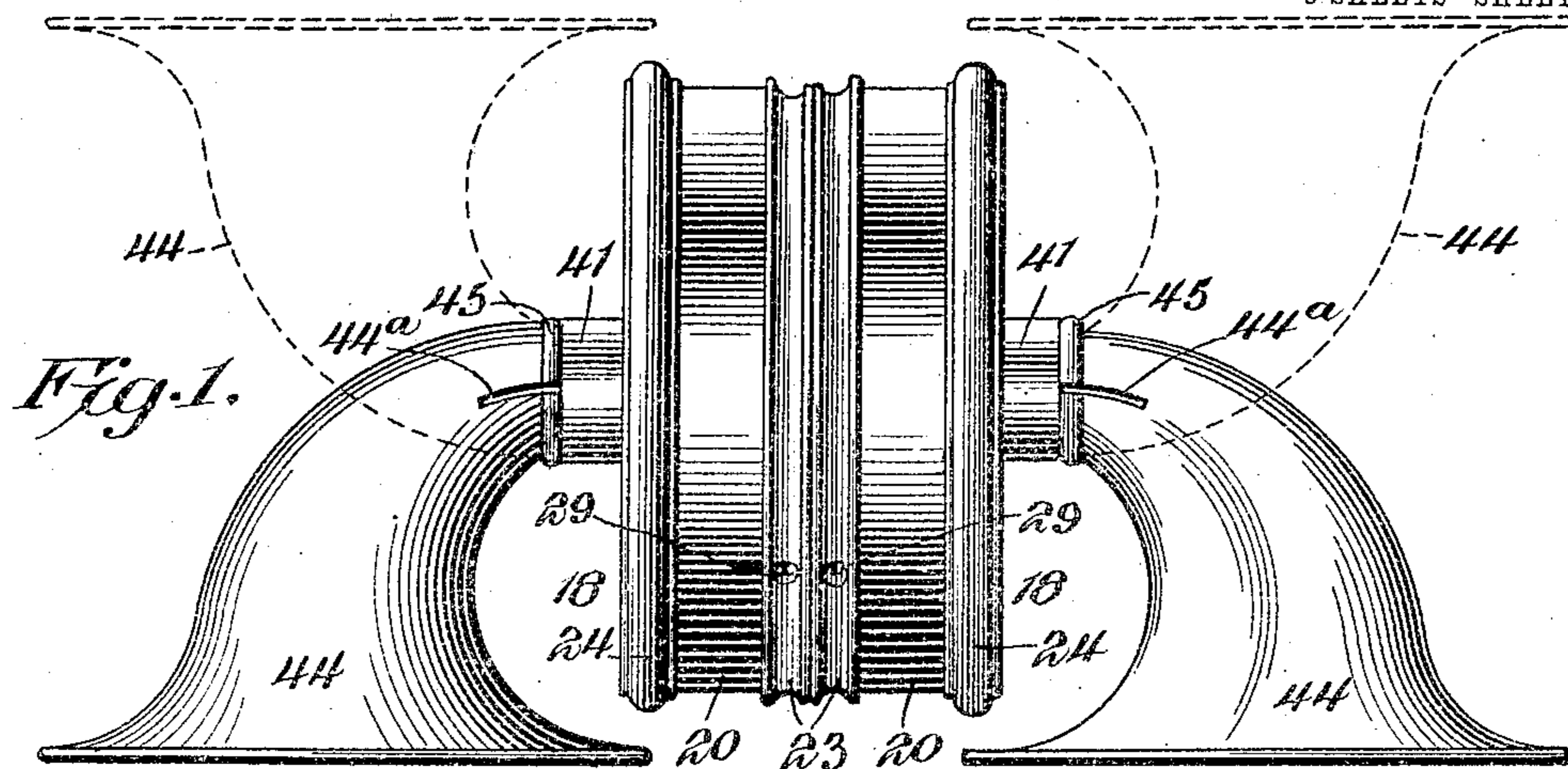
No. 822,470.

PATENTED JUNE 5, 1906.

H. G. PAPE.
TELEPHONE TRANSMITTER OR AUDIPHONE RECEIVER.

APPLICATION FILED JUNE 16, 1904.

3 SHEETS—SHEET 1.



Witnesses
Howard A. Orr.
B. F. Lister

Inventor,
Hermann G. Pape,
C. F. Siggel
Attorney

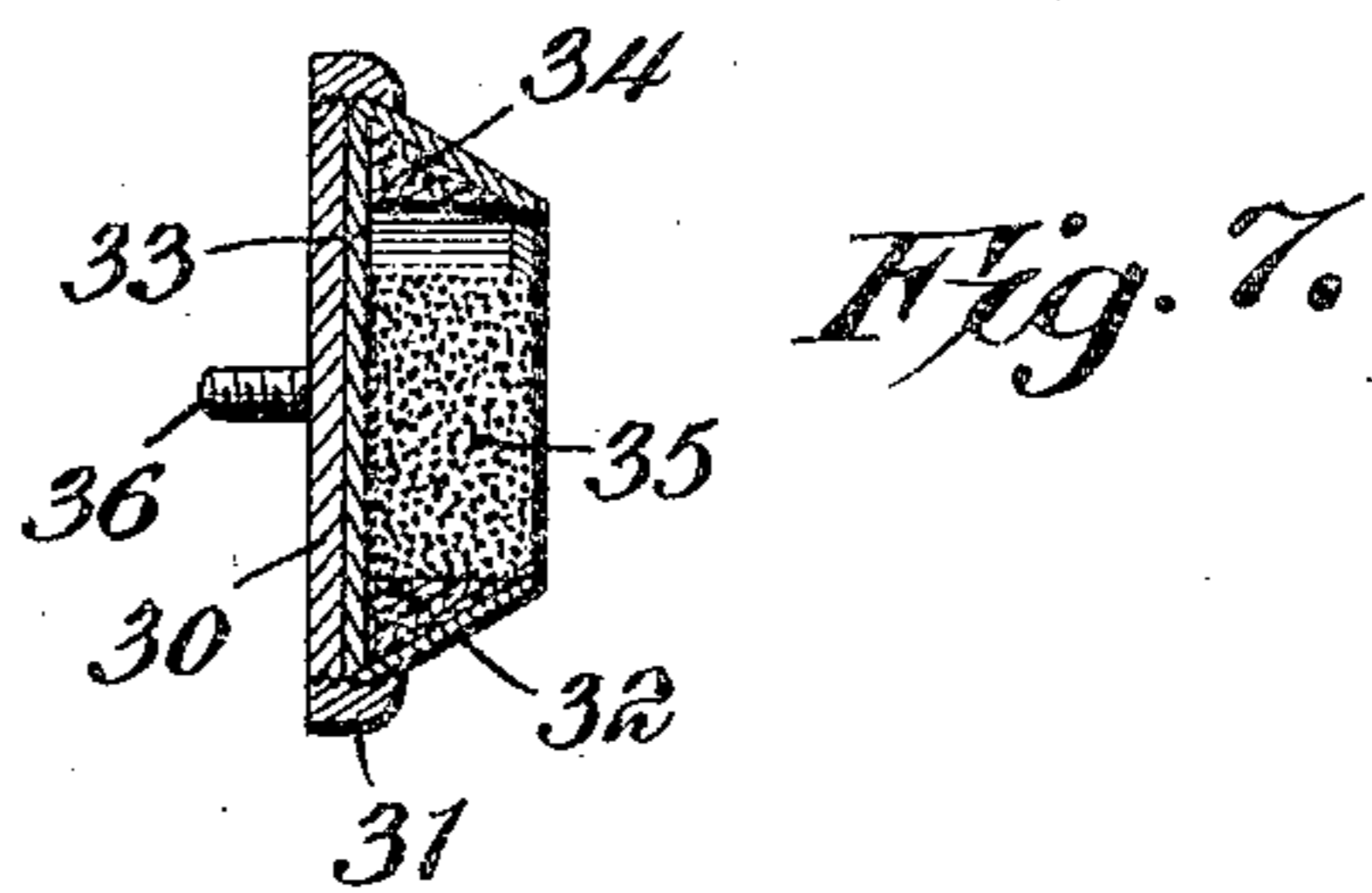
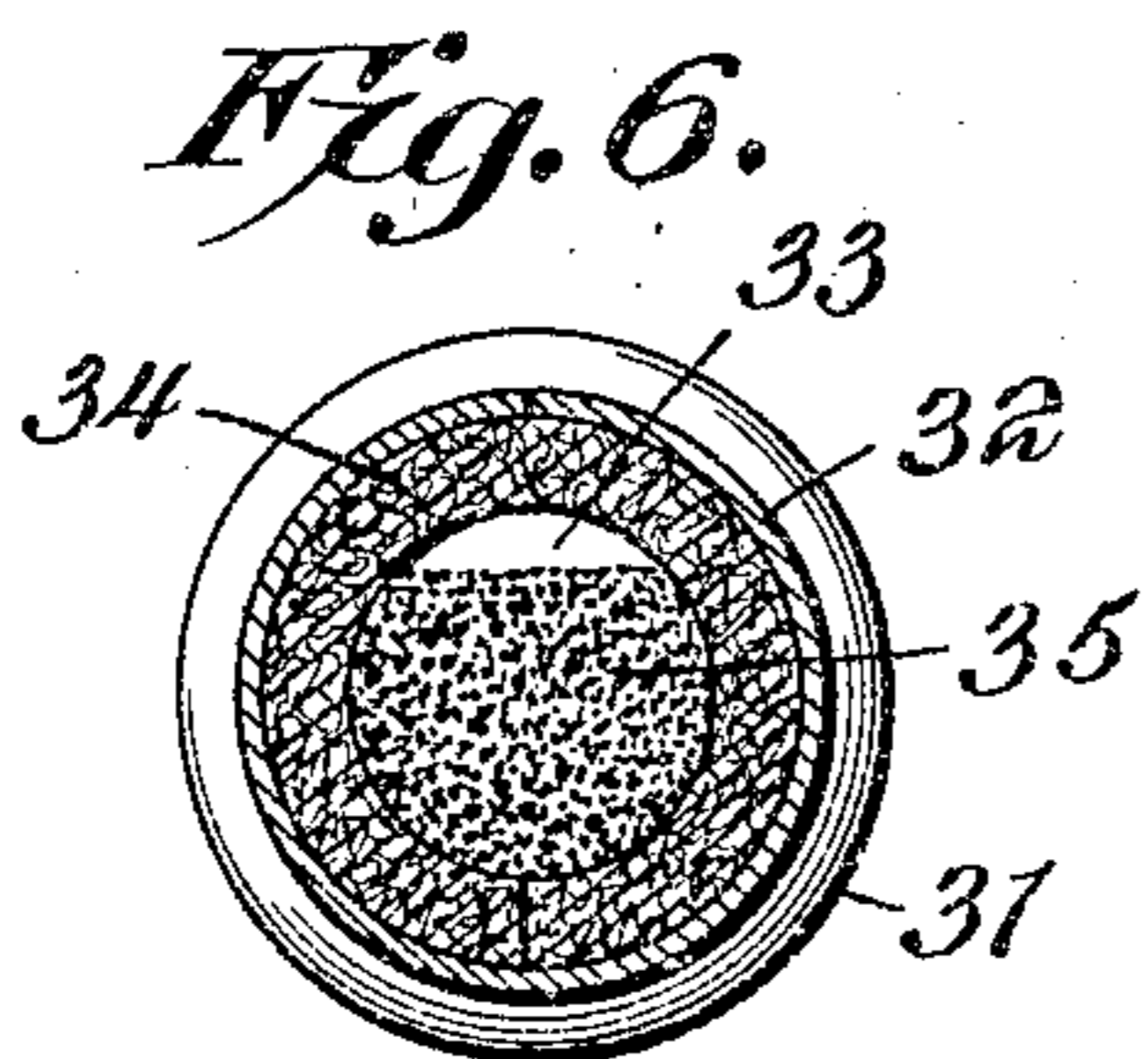
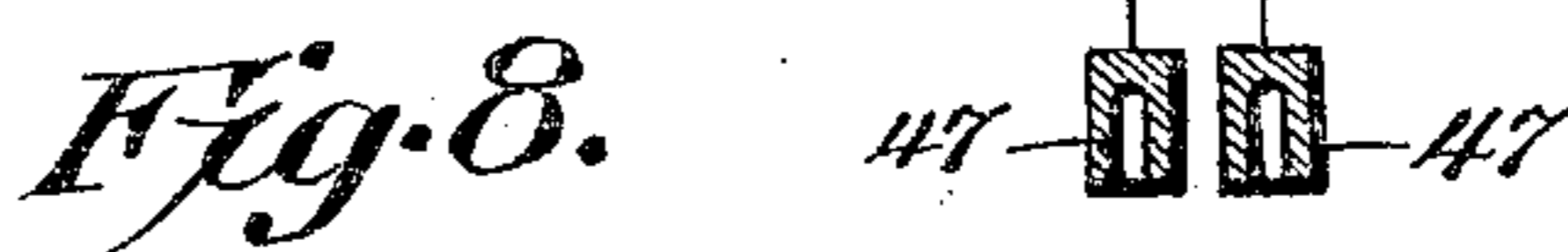
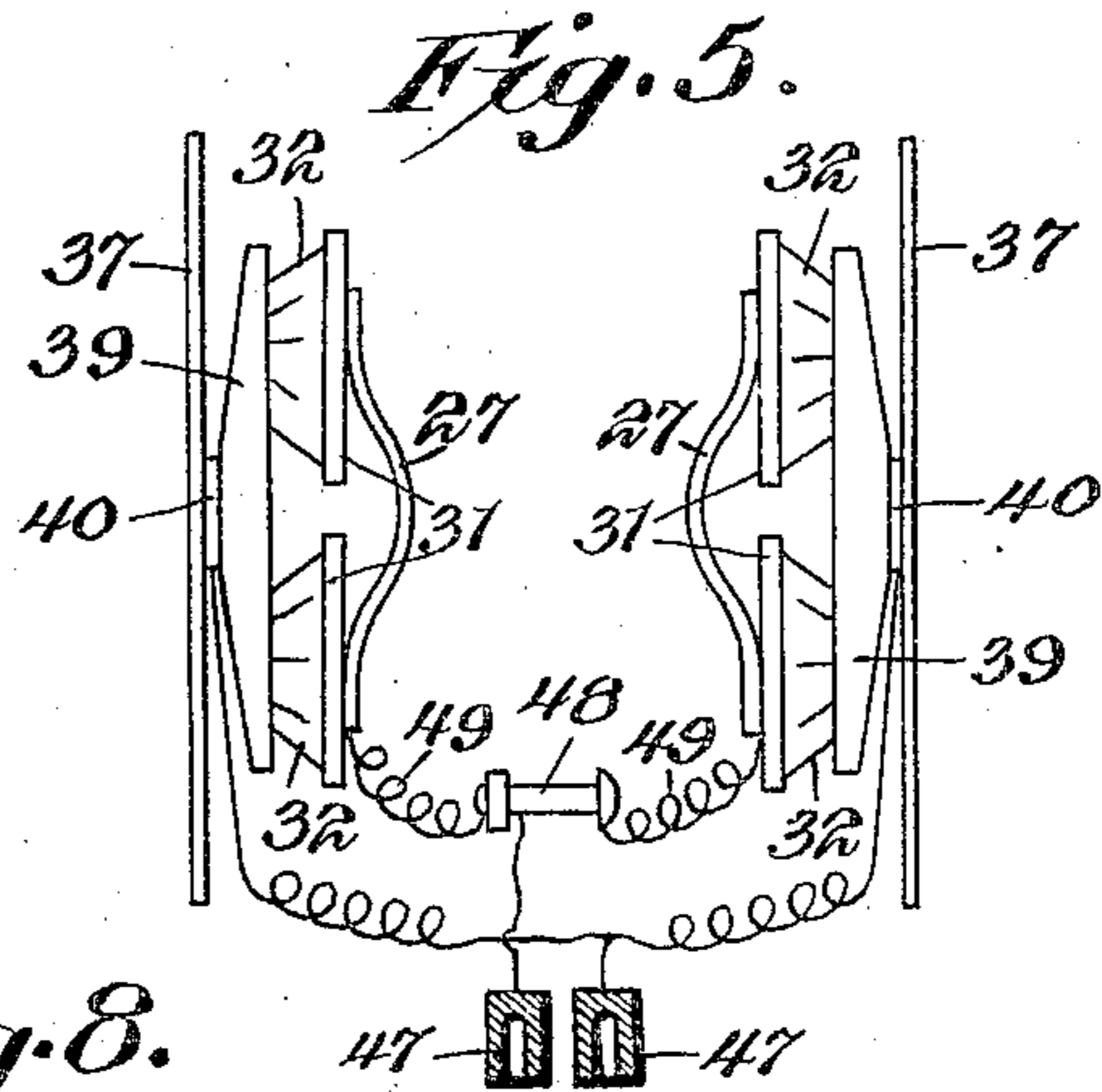
No. 822,470.

PATENTED JUNE 5, 1906.

H. G. PAPE.
TELEPHONE TRANSMITTER OR AUDIPHONE RECEIVER.

APPLICATION FILED JUNE 16, 1904.

3 SHEETS—SHEET 2.



Hermann G. Pape, Inventor,

By

C. G. Siggers

Attorney

Witnesses

Howard W. Orr

B. H. Foster

No. 822,470.

PATENTED JUNE 5, 1906.

H. G. PAPE.
TELEPHONE TRANSMITTER OR AUDIPHONE RECEIVER.

APPLICATION FILED JUNE 16, 1904.

3 SHEETS—SHEET 3.

Fig. 10.

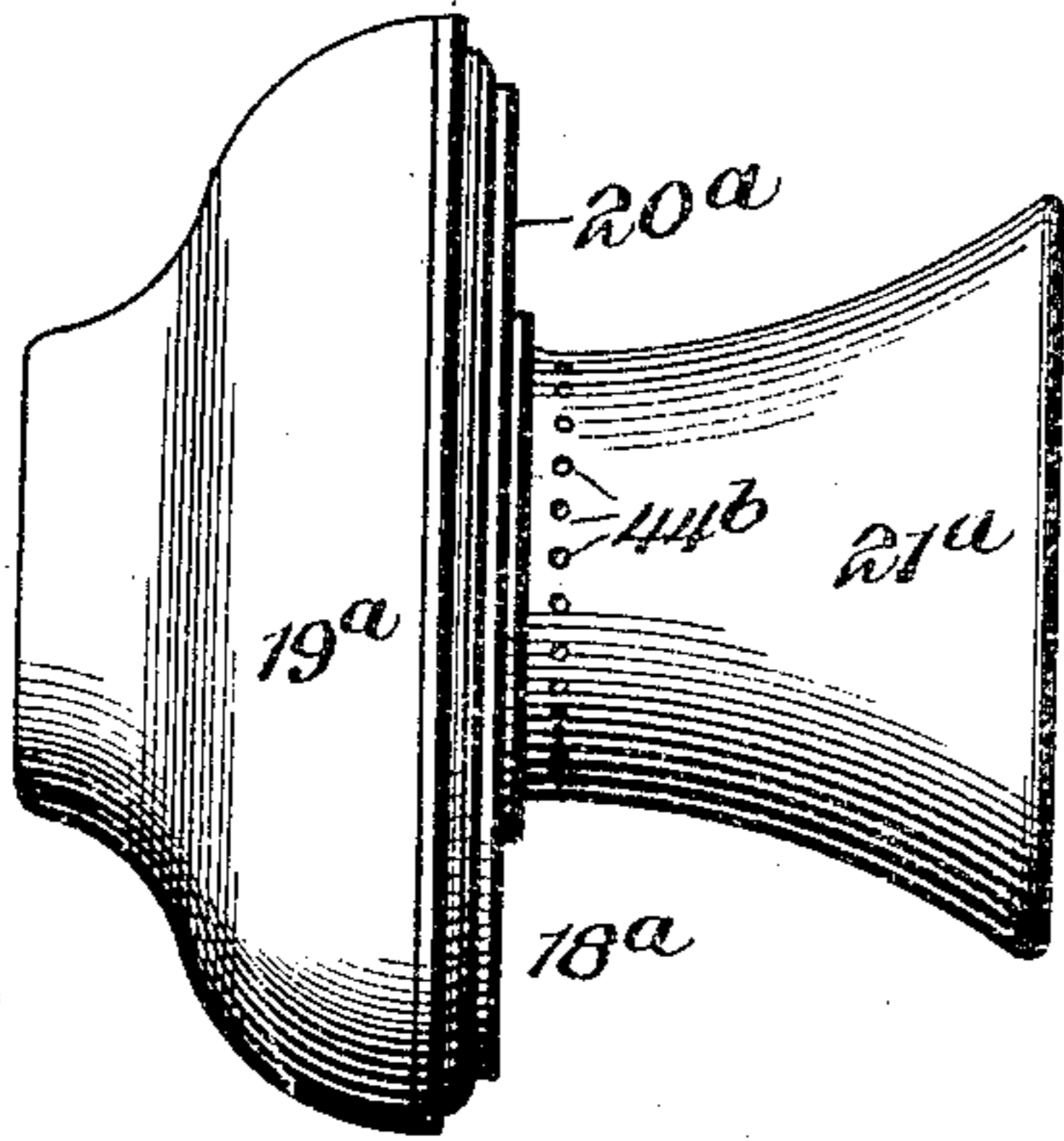


Fig. 11.

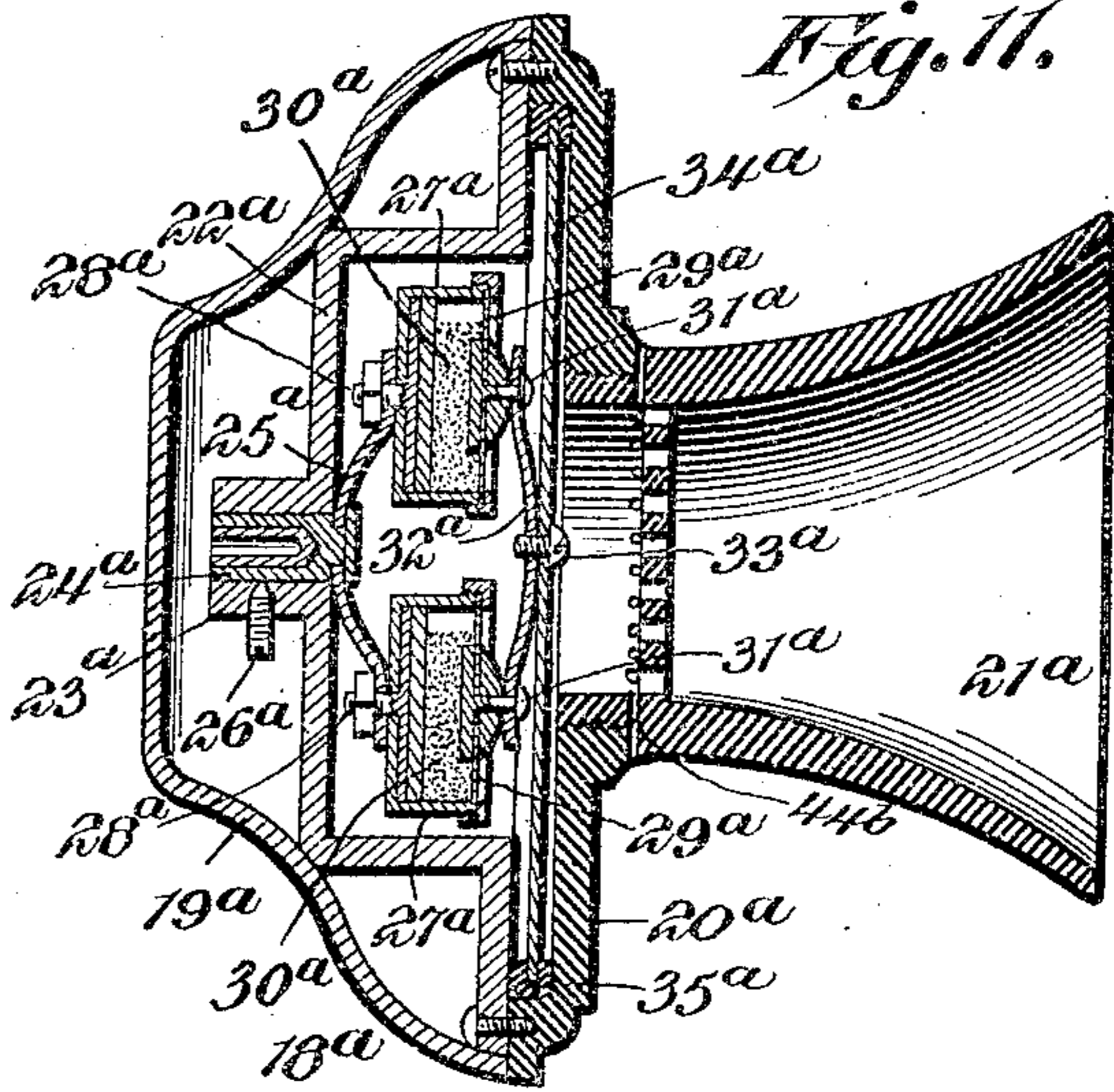


Fig. 12.

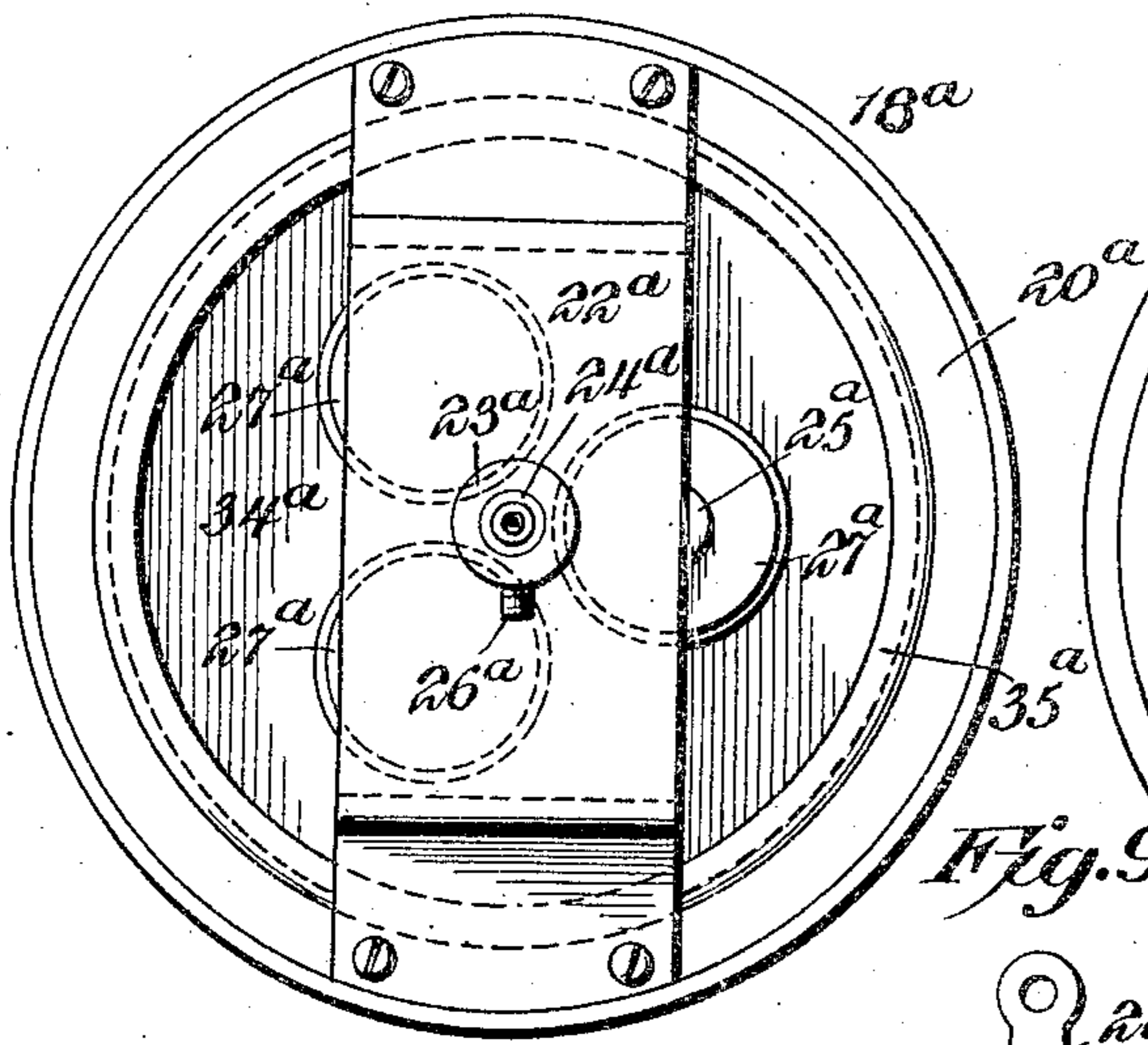


Fig. 13.

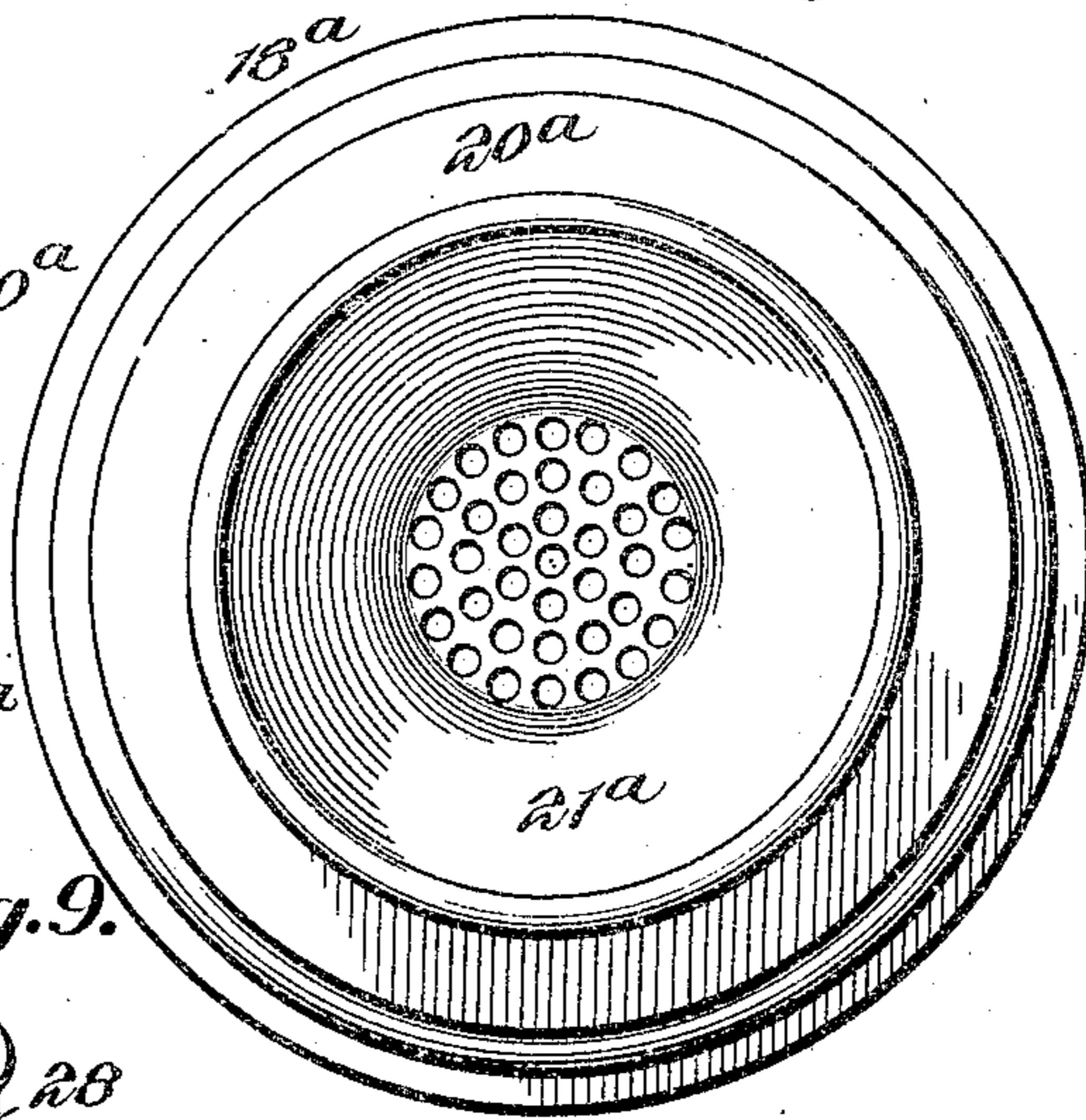
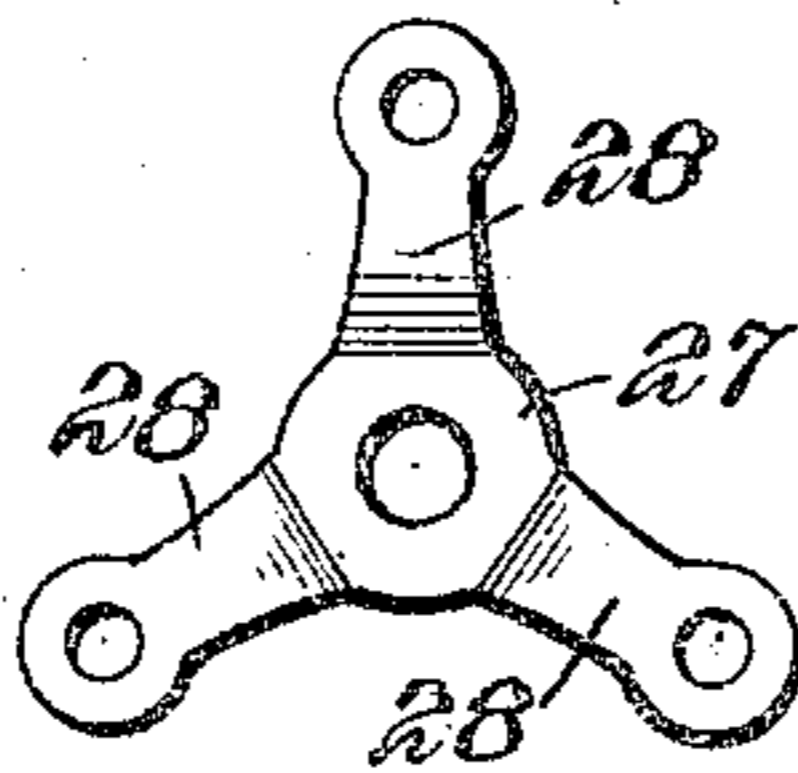


Fig. 9.



Hermann G. Pape, Inventor

By

C. G. Siggel

Attorney

Witnesses

Howard W. Orr

B. L. Foster

UNITED STATES PATENT OFFICE.

HERMANN G. PAPE, OF NEW YORK, N. Y.

TELEPHONE-TRANSMITTER OR AUDIPHONE-RECEIVER.

No. 822,470.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed June 16, 1904. Serial No. 212,821.

To all whom it may concern:

Be it known that I, HERMANN G. PAPE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Telephone-Transmitter or Audiphone-Receiver, of which the following is a specification.

This invention relates to improvements in electrical sound-transmitting means, and more particularly to telephone-transmitters or the sound-receivers of audiphone sets, the latter of which are intended for use by persons having impaired hearing.

The object is to provide a novel structure of a very simple nature which is capable of use with a current of high voltage or amperage, thus especially adapting it for wireless telephony, marine and field-signal service, local and long-distance wire telephony, audiphones, and the like, dispensing in many cases, if desired, with the induction-coil.

The nature of the invention will be made entirely clear by an examination of the accompanying drawings in connection with the following specification.

In said drawings, Figure 1 is a plan view of one embodiment of the invention, showing a double receiver or transmitter. Fig. 2 is a sectional view therethrough. Fig. 3 is a sectional view on the line 3 3 of Fig. 2. Fig. 4 is a similar view on the line 4 4 of Fig. 2. Fig. 5 is a diagrammatic view showing the electrical connections between the two receivers. Fig. 6 is a sectional view through one of the electrode-buttons. Fig. 7 is also a sectional view through one of the buttons at right angles to the section illustrated in Fig. 6. Fig. 8 is a plan view of the blank from which the side walls of said button are formed. Fig. 9 is a detail view of the supporting-spider for the electrode-buttons. Fig. 10 is a side elevation of a modified form of construction. Fig. 11 is a sectional view, on an enlarged scale, therethrough. Fig. 12 is a rear elevation of the structure illustrated in Figs. 10 and 11 with the rear cap removed. Fig. 13 is a front elevation of the same.

Similar reference-numerals indicate corresponding parts in all the figures of the drawings.

In the embodiment illustrated in the first eight figures a double form of structure is shown, wherein two instruments are em-

ployed that are connected in multiple. These instruments, however, are capable of separate use, and as the same are duplicates in all respects but one need be described.

A casing 18 is employed that is cylindrical in cross-section and comprises overlapped sections 19 and 20, threaded together. One of these sections, as 19, has a rear wall 21, the other section 20 carrying a front wall 22. The edges of said walls are provided with annular grooves 23, in which are seated cushioning-rings 24, which eliminate to a material degree the danger of breakage or injury should the instrument come into violent contact with any obstruction.

The rear wall 21 is provided with a centrally-disposed opening 25, that slidably receives a stem 26, to the inner end of which is riveted or otherwise secured a supporting-spider 27, having radiating arms 28. These arms are comparatively thick, as shown in Fig. 2, so that they will be rigid or unyielding, and are arched or curved in the manner shown to eliminate vibration thereof. The stem is ordinarily held against movement by set-screws 29, threaded into the rear wall 21 and bearing against said stem. The sockets which receive the screws 29 have their outer ends covered by the surrounding cushioning-ring 24. The free ends of the radiating arms 28 carry a plurality of electrode-buttons located at equal distances from the center of the casing. These buttons each comprise a backing-wall 30 of electrical conducting material, which has an overhanging rim portion or flange 31, threaded on its peripheral portion. Annular walls 32, formed of mica and located in convergent relation, have their inner ends fitted within the overhanging flange 31 and are thereby secured in place. These walls 32 are preferably formed from a suitable split-ring blank, as shown in Fig. 8, cut in the manner illustrated, so that when the ends are brought together the tapering or truncated-cone configuration is secured. A holding-disk 33, located against the inner face of the backing-wall 30, is arranged within the inner end of the button and constitutes an abutment against which the inner margins of the annular walls 32 strike and are thereby secured. The angle formed by the holding-disk 33 and the walls 32 contains a filling-ring 34, of felt, cotton, or other suitable material, and the interior of the button is partially filled with

carbon granules 35. The preferable manner of securing the buttons to the spider-arms is by means of rearwardly-extending threaded shanks 36, passing through the arms and having nuts screwed upon their rear ends.

Clamped between the sections 19 and 20 of the casing is a flexible diaphragm 37, against the rear side of which is clamped, by means of a bolt 38, a disk 39, preferably of carbon and constituting a bridge-piece that extends across the open sides of the various buttons. The diaphragm 37 is constructed of carbon and plated to secure and preserve its tension, as well as to cut down the resistance if used in circuit with the button-electrodes. The disk 39 is also plated with copper, excepting the surface, at those places making contact with the carbon granules. The bolt 38 preferably passes through the center of the diaphragm, and the buttons are located equidistant therefrom. A washer 40, of yielding material, is preferably interposed between the diaphragm and bridge-piece, constituting a cushion therebetween. The front wall 22 of the casing is provided with an outwardly-extending boss 41, having a socket 42, that extends therethrough to the interior of the casing, the walls of said socket being provided with an annular groove 43, forming a seat. A funnel 44, preferably constructed of yielding material, such as comparatively soft rubber, has its smaller end slotted, as shown at 44^a, and provided with annular ribs or projections 45 and 46. The rib 45 constitutes an abutment that engages the outer end of the boss, while the rib 46 is adapted to detachably engage in the seat 43 when the funnel is in place. Thus said funnel is securely but detachably fastened to the receiver-casing and is capable of revolution in the boss, as indicated in Fig. 1. It will be noted that the slots 44^a extend some distance beyond the boss and are designed for use as sound-dissipating openings that prohibit resonance and reverberation. Each casing is preferably provided in its rear wall with socket-pieces 47, normally covered, however, by the surrounding cushioning-ring 24. These socket-pieces can be electrically connected in any suitable manner, respectively, with the spider and diaphragm. When, however, two of the instruments are joined together, as illustrated in Fig. 1, bolts 48 are employed that pass through the rear wall 21 and constitute the mechanical connections therefor. One of these bolts, furthermore, constitutes the electrical connection between the instruments and is electrically connected, as shown at 49, with the bridge-piece, and consequently the electrode-button.

The instrument illustrated in Fig. 1 is adapted to be placed upon a table, stand, or other support and will receive sounds made in the room or neighborhood and transmit them to any suitable receiver. As the in-

strument is intended to be loosely placed upon each support, it will be evident that the cushioning-rings are important, as they will receive the hard shocks or impacts that would otherwise be transmitted directly to the mechanism contained within the casing. Thus injury and breakage are avoided. By the employment of the sets of electrodes located equidistant from the centers of the diaphragm the instruments are capable of being used in connection with currents of high voltage or amperage. At the same time the buttons may be made comparatively small, so that danger of the granules packing is reduced to a minimum. It is preferable to construct the supporting-spiders of aluminum, as resonance is thereby avoided and metallic sounds are not transmitted therefrom to the button-electrodes. The employment of a flexible funnel is also believed to be advantageous, as the same are less subject to breakage, are more easily handled, and when used as a telephone-transmitter more privacy is obtained, as the funnel will readily adjust itself, so that the mouth of the speaker can be thoroughly covered.

The embodiment illustrated in Figs. 10 to 13 is quite similar to that already described, but is shown in a form particularly useful as a telephone-transmitter. A casing 18^a is employed having a rear cap 19^a and a front wall 20^a, carrying the mouthpiece 21^a, provided with sound-dissipating openings 44^b. The partition 22^a extends across the interior of the casing and has a rearwardly-extending boss 23^a, receiving the stem 24^a, to which the spider 25^a is attached. A set-screw 26^a normally holds the stem against movement, but permits the adjustment so that the button-electrodes can be properly adjusted with respect to the diaphragm. Said electrodes comprise casings 27^a, attached by bolts 28^a to the spider 25^a and having front diaphragm-walls 29^a. Said electrodes contain the usual granular carbon 30^a. The diaphragms are secured as shown at 31^a, with a bridge-piece 32^a attached by a screw 33^a to the center of the diaphragm 34^a, said diaphragm being clamped within a casing 35^a, that is held between the front wall 20^a and the partition 22^a. It is believed that a further extended description of this structure is unnecessary, as it will be obvious that its operation is very similar to the embodiment already described.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In an instrument of the class described, the combination with a casing, of a diaphragm located therein, a supporting-stem mounted in the casing in rear of the diaphragm, a spider secured to the stem and having a plurality of radiating inflexible arms extending continuously outward from the stem and having their free ends in rear of the diaphragm, a plurality of spaced buttons located in advance of the spider, coacting with the diaphragm and each having a rear wall abutted against and secured directly to the free outer extremity of one of the arms, said buttons being thus inflexibly held in rear of the diaphragm.

2. In an instrument of the class described, the combination with separate receivers having electrodes therein, of electric conducting means for securing the receivers together, and connections between the electrodes and the securing means, said means thereby constituting an electrical connection between the electrodes of the receivers.

3. In an instrument of the class described, the combination with separate receivers, each having front and rear walls, of means securing the rear walls together, sound-receiving funnels projecting from the front walls, and contact devices carried respectively by the rear walls and having electrical connections with both receivers.

4. In an instrument of the class described, the combination with separate receivers, each comprising a casing having front and rear walls, a diaphragm located within each casing, and an electrode coacting with each diaphragm, of a funnel projecting from the front wall of each casing, and a bolt connecting the rear walls and constituting an electrical connection between the electrodes.

5. In an instrument of the class described, the combination with a receiver having a cylindrical casing provided with end walls, the peripheries of which project beyond the cylindrical side walls and are provided with spaced annular grooves, of cushioning-rings seated in the grooves and surrounding the same directly at the corners thereof, said cushions projecting beyond the side walls.

6. In an instrument of the class described, the combination with a receiver including sections having overlapped side walls and end walls carried by said side walls, said end walls having annular grooves in their edges, of cushioning-rings seated in the grooves and being located at the corners of the casing.

7. In an instrument of the class described, the combination with a receiver including a casing having a boss projecting from one end and provided with an opening, the walls of said opening having an annular seat, of a funnel having longitudinal slitted walls forming a compressible end that detachably engages

in said seat, said end being provided with spaced annular ribs, one of which engages in the seat of the boss, the other constituting a stop that abuts against the end of the boss.

8. In an instrument of the class described, an electrode-button comprising a backing-wall of conducting material having an annular inturned flange, convergently-disposed side walls engaged within the flange of the backing-wall, and granular conducting material located within the button.

9. In an instrument of the class described, an electrode-button comprising a backing-wall of conducting material having an annular inturned flange, convergently-disposed side walls constructed of mica and engaged within the flange of the backing-wall, a ring of felt arranged within the convergently-disposed walls, and granular carbon partially filling the button.

10. In an instrument of the class described, an electrode-button comprising an end wall, said wall including conducting material, convergently-disposed side walls constructed of slitted mica, and means for securing the side walls to the end wall.

11. In an instrument of the class described, an electrode-button comprising an end wall, convergently-disposed side walls connected to the end wall, an annular wall of non-conducting material located within the button and substantially filling the angle formed between the rear and side walls, and conducting material arranged within the non-conducting wall.

12. In an instrument of the class described, an electrode-button comprising an end wall, convergently-disposed side walls of slitted mica secured to the end wall, and conducting and non-conducting material located within the walls.

13. In an instrument of the class described, an electrode-button comprising an end wall, annular convergent side walls connected to the end wall, a ring of felted material located within the annular walls and substantially filling the angle formed by the same and the end wall, and conducting material arranged within the ring.

14. In an instrument of the class described, the combination with a diaphragm, of a plurality of electrodes coacting therewith, and a yielding washer interposed between the diaphragm and electrode and borne against by the same.

15. In an instrument of the class described, the combination with a diaphragm, of a plurality of electrodes, a bridge-piece coacting with the electrodes and secured to the diaphragm, and a yielding washer interposed between the diaphragm and the bridge-piece and borne against by the same.

16. In an instrument of the class described, the combination with a casing having front and rear walls, of a diaphragm and a button-

electrode located within said casing, a gudgeon interposed between the button-electrode and the diaphragm, and a funnel having one end fitted within the front wall of the casing, said funnel being provided with a series of radial sound-dissipating openings communicating with the chamber of said funnel at points contiguous to the front of the casing.

17. In an instrument of the class described, a funnel having a sound-passage therethrough, and radially-disposed sound-dissipating openings communicating with the sound-passage.

18. In an instrument of the class described, the combination with a casing, of electrically-operated sound-transmitting means located therein, and a funnel having a sound passage-way communicating with the interior of the casing, said funnel having radially-disposed sound-dissipating openings communicating with the sound passage-way contiguous to the casing.

19. In an instrument of the class described, the combination with a diaphragm, of a plurality of electrodes, a bridge-piece coacting with the electrodes, a yielding washer interposed between the bridge-piece and diaphragm, and a bolt connecting the bridge-piece and diaphragm and passing through the washer, said bolt drawing the diaphragm and bridge-piece toward each other and against the opposite sides of the washer.

20. In an instrument of the class described, the combination with a casing having a front wall provided with an opening, of a diaphragm located within the casing, and a funnel member having a contracted end portion that fits within the opening in the casing and is longitudinally slitted from its inner end, forming a plurality of yielding tongues, said tongues and the wall of the opening being provided, one with an annular groove, and the other with an outstanding rib that fits in said groove, the said slits extending beyond the exterior of the casing and entirely through the funnel, forming a plurality of sound-dissipating openings.

21. In an instrument of the class described, the combination with a casing, of a diaphragm located therein, a plurality of electrode-buttons supported in the casing and having open front ends in spaced relation to the diaphragm, and a bridge-piece secured to the diaphragm and having its rear side closing the open front ends of the electrode-buttons.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HERMANN G. PAPE.

Witnesses:

M. J. H. FERRIS,
E. J. HIGGINS.