

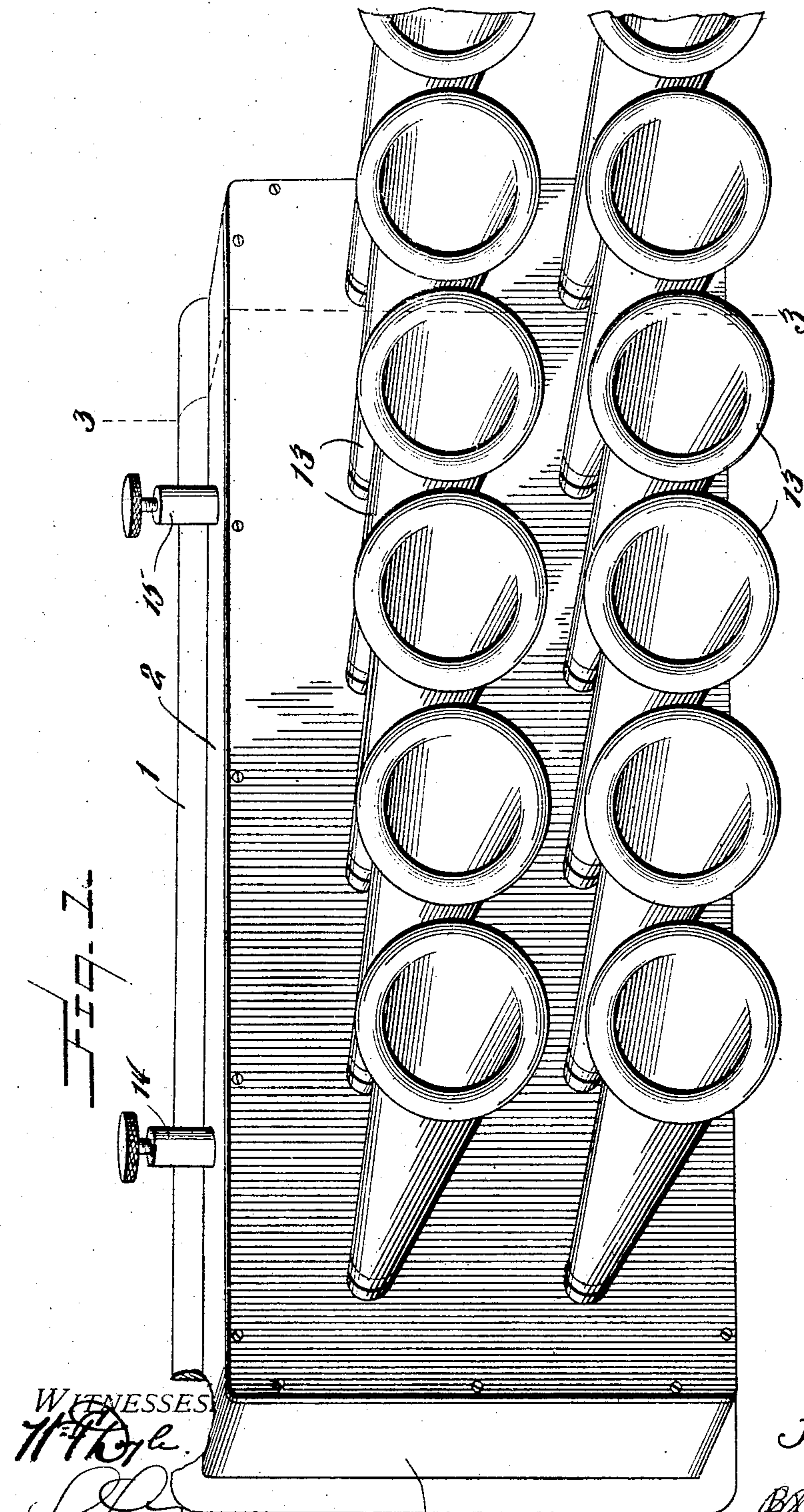
No. 868,245.

PATENTED OCT. 15, 1907.

J. A. BAKER.  
AUDIPHONE.

APPLICATION FILED AUG. 1, 1904.

3 SHEETS—SHEET 1.



WITNESSES  
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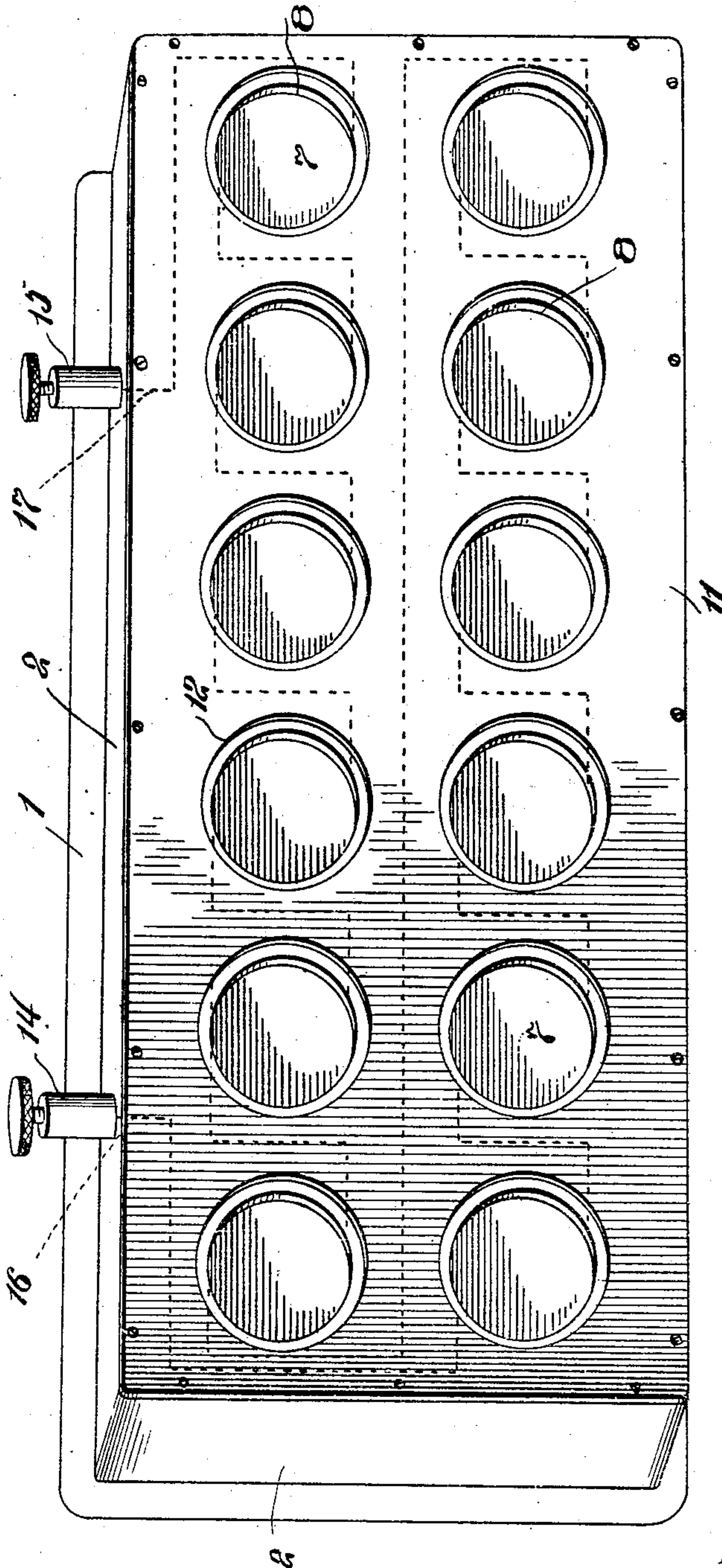
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3 SHEETS—SHEET 2.



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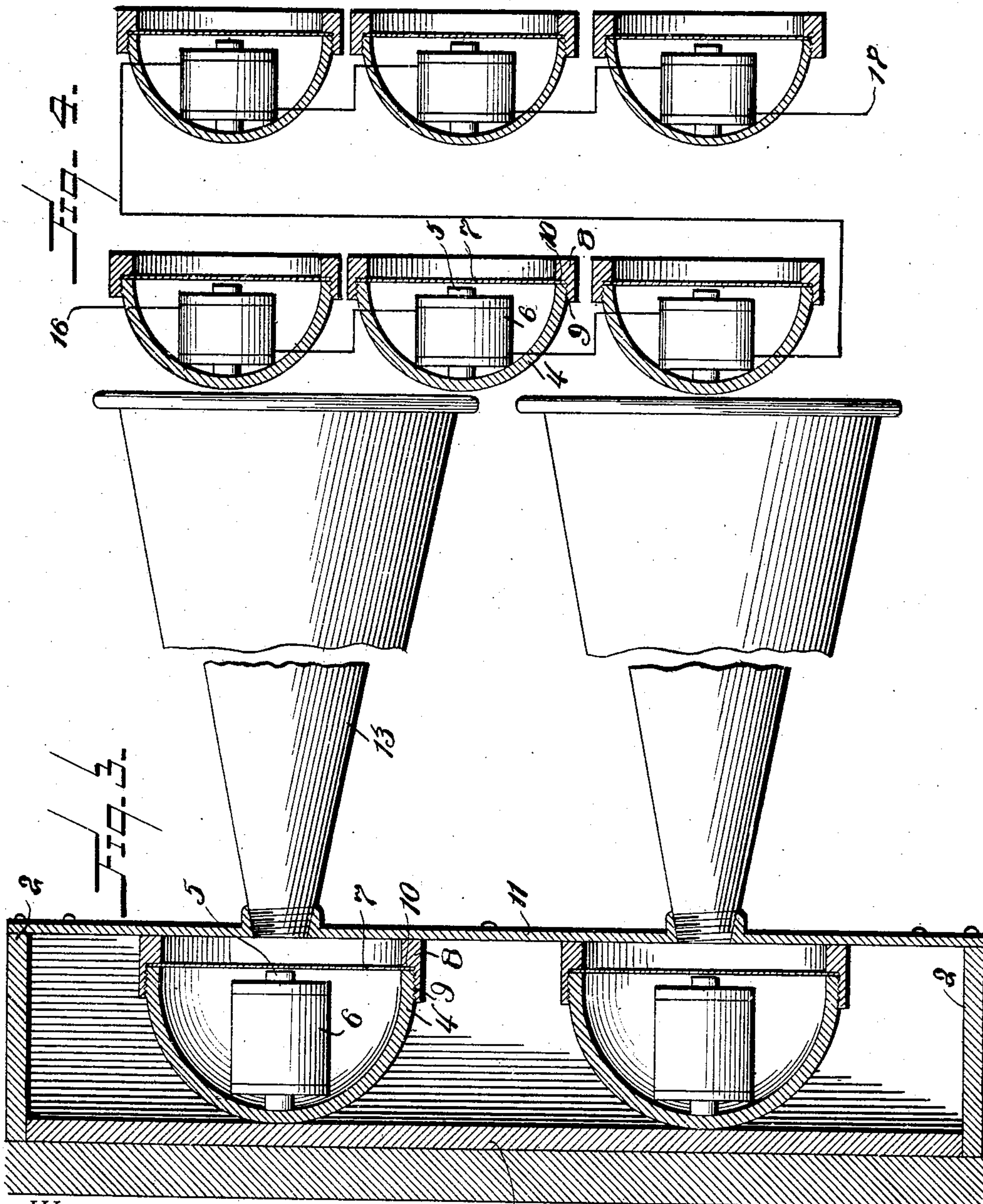
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

JOHN A. BAKER, OF SEGUIN, TEXAS.

## AUDIPHONE.

No. 868,245.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed August 1, 1904. Serial No. 219,045.

*To all whom it may concern:*

Be it known that I, JOHN A. BAKER, a citizen of the United States, residing at Seguin, in the county of Guadalupe and State of Texas, have invented certain new and useful Improvements in Audiphones; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to audiphones and especially to that class wherein a plurality of diaphragms are vibrated simultaneously by a common electrical impulse.

The object of my invention is to produce a receiver of the type known as loud speaking receivers whereby the transmitted tones are reproduced in approximately their original volume and with approximately their original timbre.

With these and other objects in view, the present invention consists in the combination and arrangements of parts, as will be hereinafter more fully described, shown in the accompanying drawings and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size and minor details may be made, within the scope of the claims, without departing from the spirit or sacrificing any of the advantages of the invention.

Figure 1 is a perspective view of my improved audiophone in its preferred and completed form and provided with amplifiers adapted for increasing the volume of sound. Fig. 2 is a perspective view of my audiophone without the amplifiers attached thereto. Fig. 3 is a vertical sectional view on line 3—3 of Fig. 1. Fig. 4 is a diagrammatic view showing the preferred form of electrical connection.

Like characters of reference designate corresponding parts throughout the several views.

In the preferred embodiment of my invention I construct a case 1 in box-like form with sides and ends 2. Within the case 1 are rigidly secured a plurality of concave or cup-shape permanent magnets 4 with the open end thereof disposed towards the open side of the case 1. Axially and rigidly within the cup-shaped magnet I secure an electro-magnet 5 provided with the usual coil 6. The electro-magnet is so proportioned that when secured axially within the cup-shaped magnet it extends to a point slightly short of a straight line drawn diametrically from edge to edge of the cup-shaped magnet. A diaphragm 7 consists of a circular disk of very thin sheet metal of such dimension as to approximate in size the diameter of the external walls of the fixed magnet. The upper external edge of the fixed magnet 4 is screw-threaded and a ring 8 with internal screw-threads 9 and an annular shoulder 10 is provided for engage-

ment therewith. The screw-threads 9 are adapted to engage the external screw-threads upon the fixed magnet and the annular shoulder 10 is adapted to bear upon and retain the diaphragm 7, adjacent to the end of the electro-magnet 5.

A covering member 11 is provided with a plurality of openings equal in number to the fixed magnets and adapted to cover the entire open side of the case, the openings 12 registering with the rings 8. Within the openings 12 may be secured conical shaped amplifiers 13 disposed axially perpendicular to the case and diaphragm 7.

The several electro-magnets 5 are electrically connected either in series or in multiple but I have demonstrated by experiment that the series connection as shown in Fig. 4 is preferable.

In practice I prefer to provide my improved audiophone with binding-posts 14 and 15 to which are electrically connected respectively wires 16 and 17 within the case 1 and to which also may be connected the usual line wire.

The operation of my improved audiophone is as follows: A variation of potential in the line wire connected to wires 16 and 17 will vary the potential in such wires 16 and 17 which energize the electro-magnets 5 and consequently the magnetic influence of the electro magnets 5 upon the diaphragms 7 and will produce a vibration of said diaphragms. It is obvious that a single electrical impulse will produce similar and simultaneous variations of magnetic force in the several electro-magnets 5 and consequent similar and simultaneous vibrations of the diaphragms 7. The operation therefore of a single unit is somewhat similar to the operation of a telephone receiver but the operation of the several units in unison multiplies the intensity of sound vibrations of a single unit by the number of units. The addition to the case of the amplifiers 13 tends to increase the intensity of the sound-waves in accordance with the well known laws of acoustics.

It is obvious that my improved audiophone may be constructed to produce any desired volume of sound by increasing or decreasing the number of vibrating units as well as by increasing or decreasing the size of the amplifiers.

It will be noted that where as in Fig. 2 the covering member 11 is not designed for use in connection with amplifiers the openings 12 are made of a diameter approximating the internal diameter of the ring 8 but where, as in Fig. 2, the cover 11 is designed for use in connection with the amplifiers 13 the openings are smaller in diameter and located centrally of the diaphragm 7. The latter form which is my preferred construction, produces a space between the diaphragm 7 and the covering member 11 adapted for collecting



the sound waves and being opened adjacent to the point of greatest vibration are adapted to produce within such opening and the amplifier the full intensity of pulsation.

- 5 While I have shown my audi-phone with the several diaphragms disposed to occupy a plane, it is evident that in some locations it might be desirable to so mount the diaphragms that they would coincide with a slightly concave surface adapted to converge the sound  
10 waves at a given point or it might be desirable to mount them coincident with the convex surface thus diverging the sound waves. It is also obvious that other minor changes might be made in the construction without departing from the spirit of my invention.  
15 Having thus described my invention, what I claim as novel and desire to secure by Letters Patent, is:

- An audiphone comprising a case provided with a regular surface, a plurality of cup shaped permanent magnets fixed to said regular surface within said case, an equal  
20 number of rings threaded severally upon said magnets adjacent to the edge thereof, said rings having annular

shoulders, an equal number of vibrating diaphragms interposed between the edges of said magnets and the annular shoulders of said rings, all of said diaphragms being parallel to said regular surface, an equal number of electro- 25 magnets fixed severally within said permanent magnets axially thereof and perpendicular to and capable of exerting magnetic influence upon the respective diaphragms adjacent thereto, a single conductor electrically connecting all of said electro-magnets and capable of producing therein, by variations of potential, similar and simultaneous magnetic impulses, a covering member abutting the outer edges of said rings and spaced away thereby from said diaphragms, said covering member being provided with openings equal in number to and adapted to 30 register concentrically with the center of the diaphragms, said openings being of reduced diameter, and an equal number of amplifying cones secured within said openings and extending outwardly from the covering member. 35

In testimony whereof, I affix my signature, in presence of two witnesses. 40

JOHN A. BAKER.

Witnesses:

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EMIL BORCHERS.