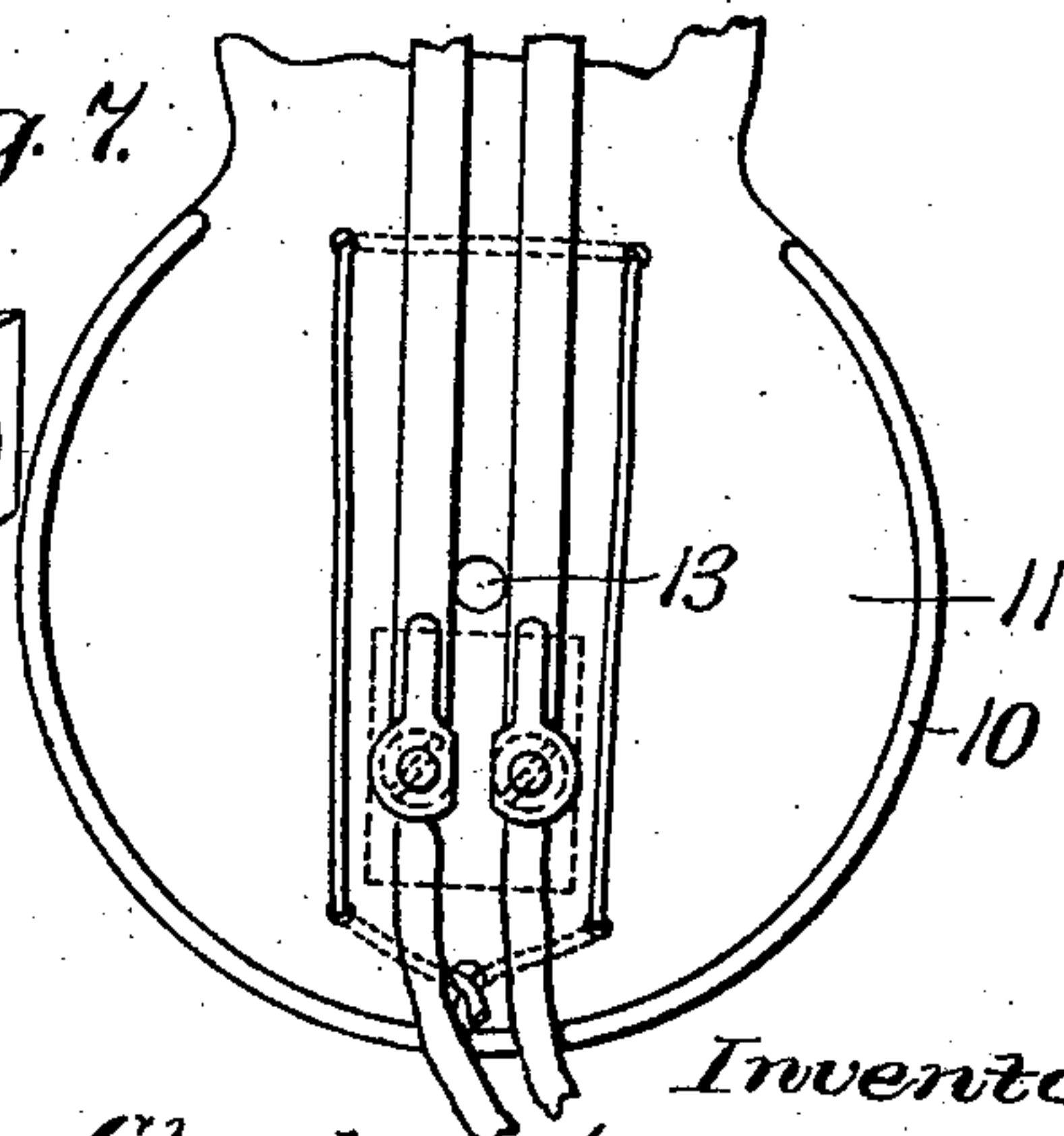
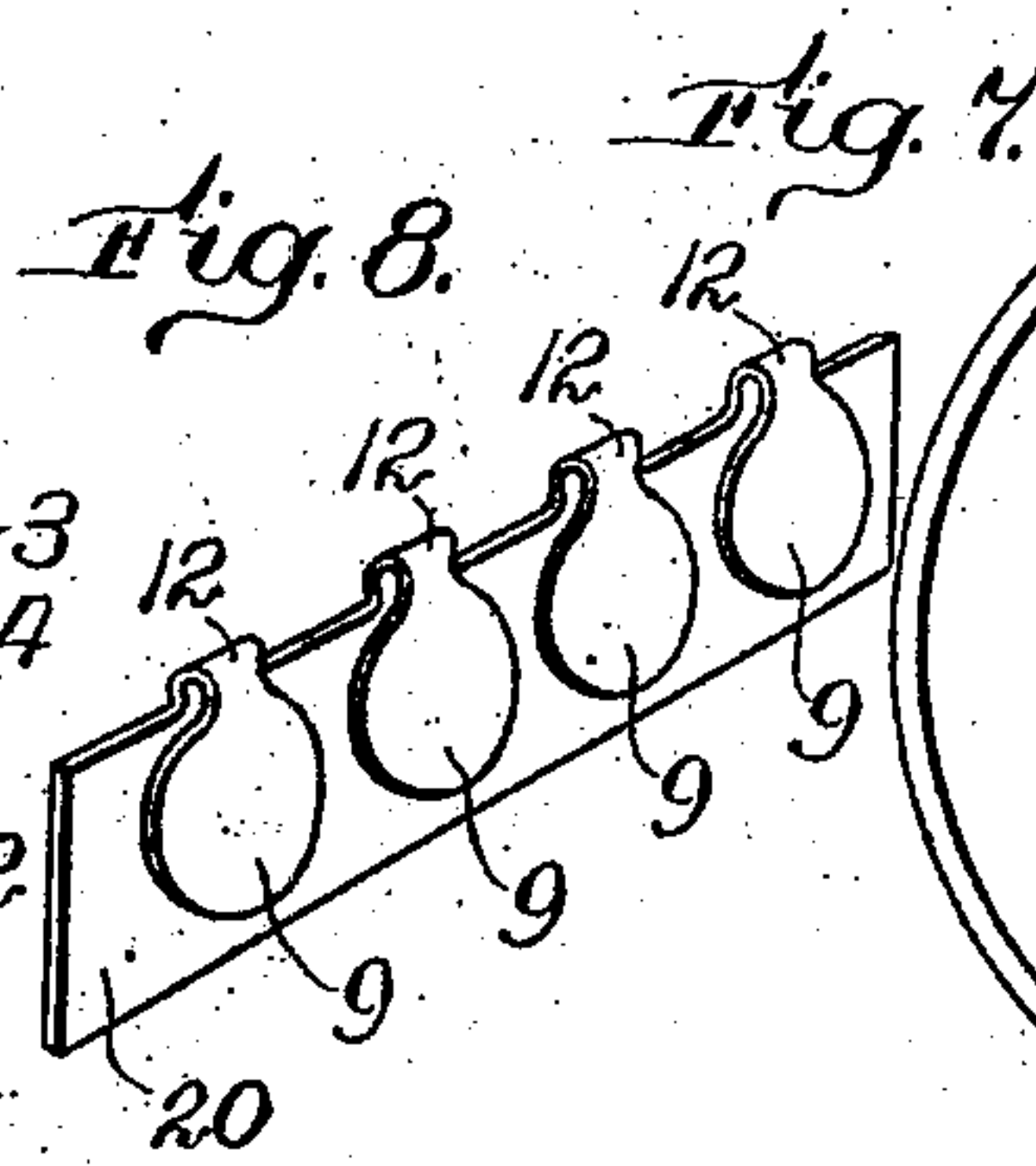
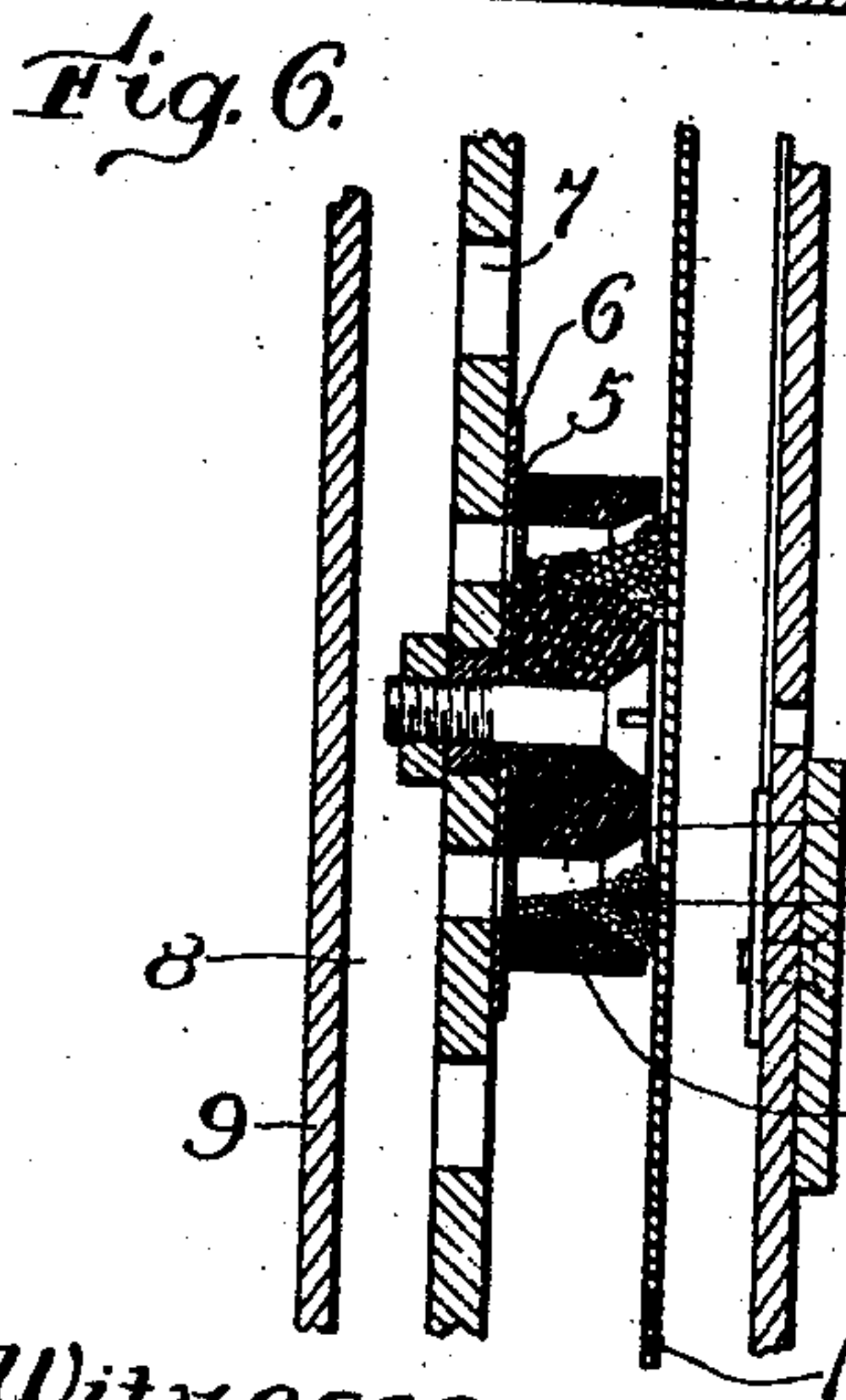
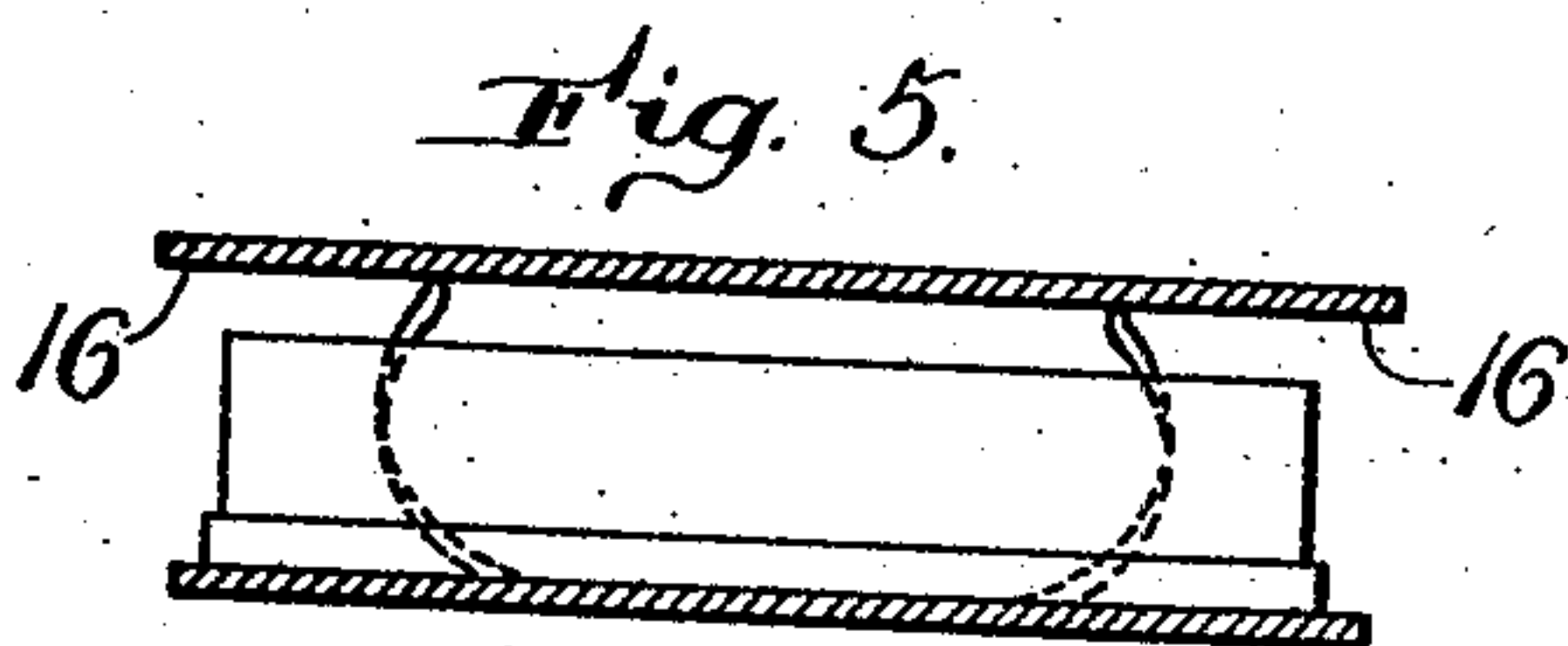
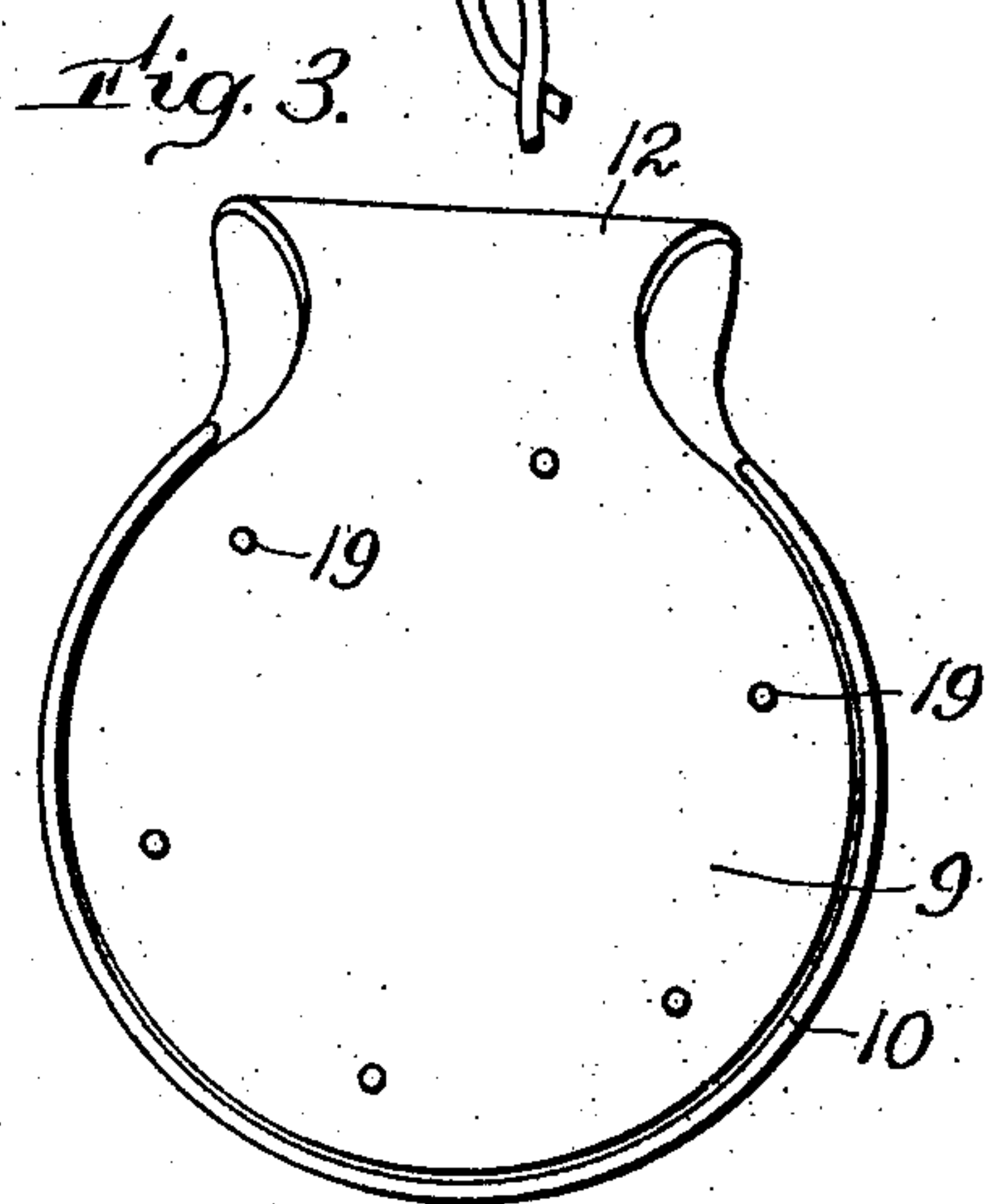
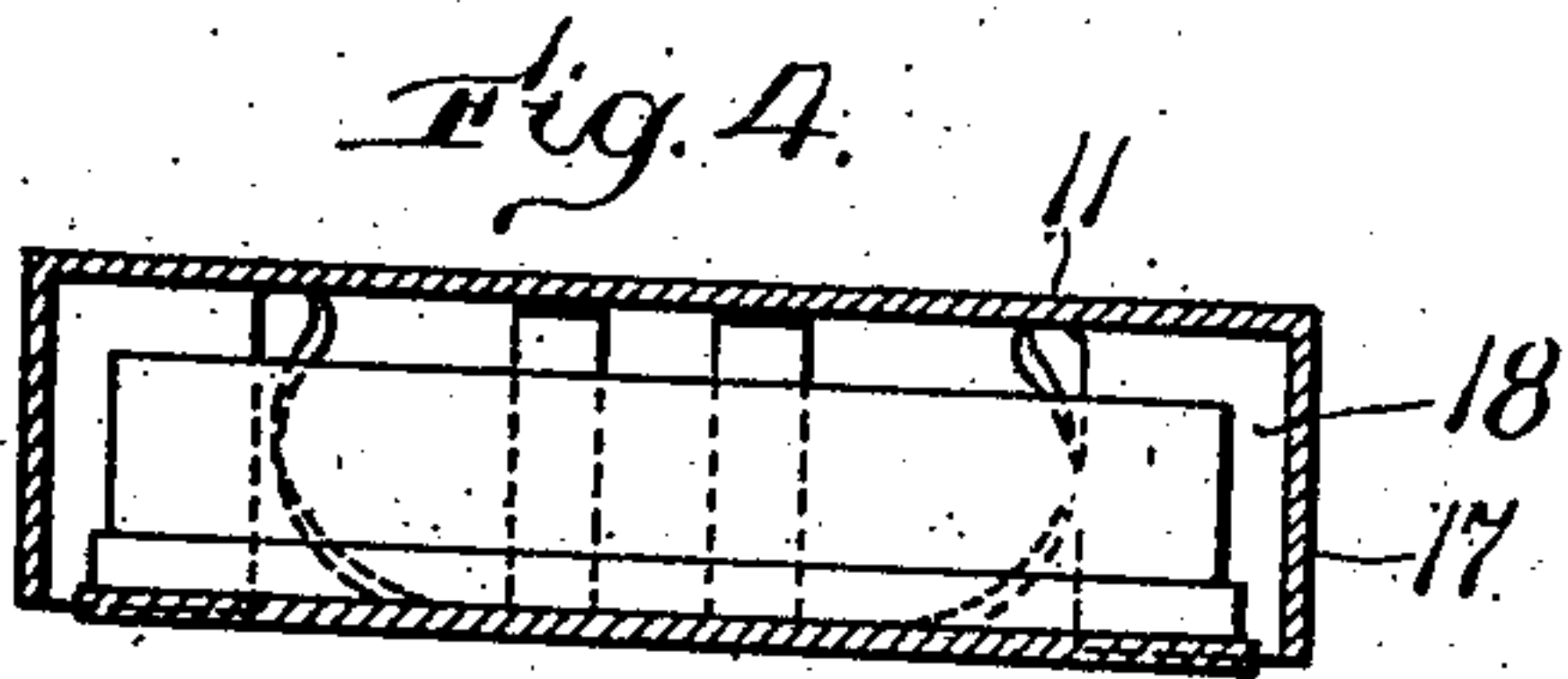
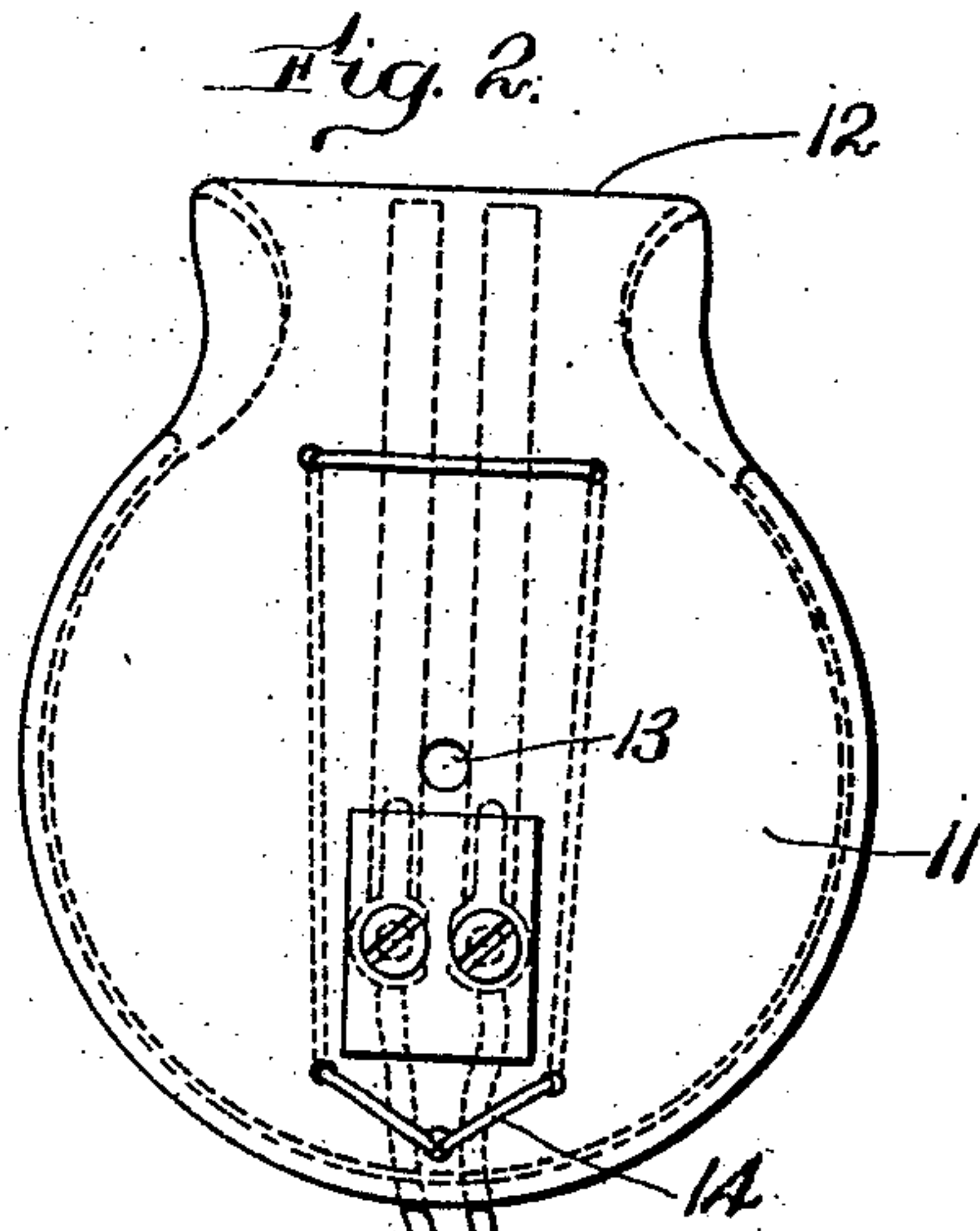
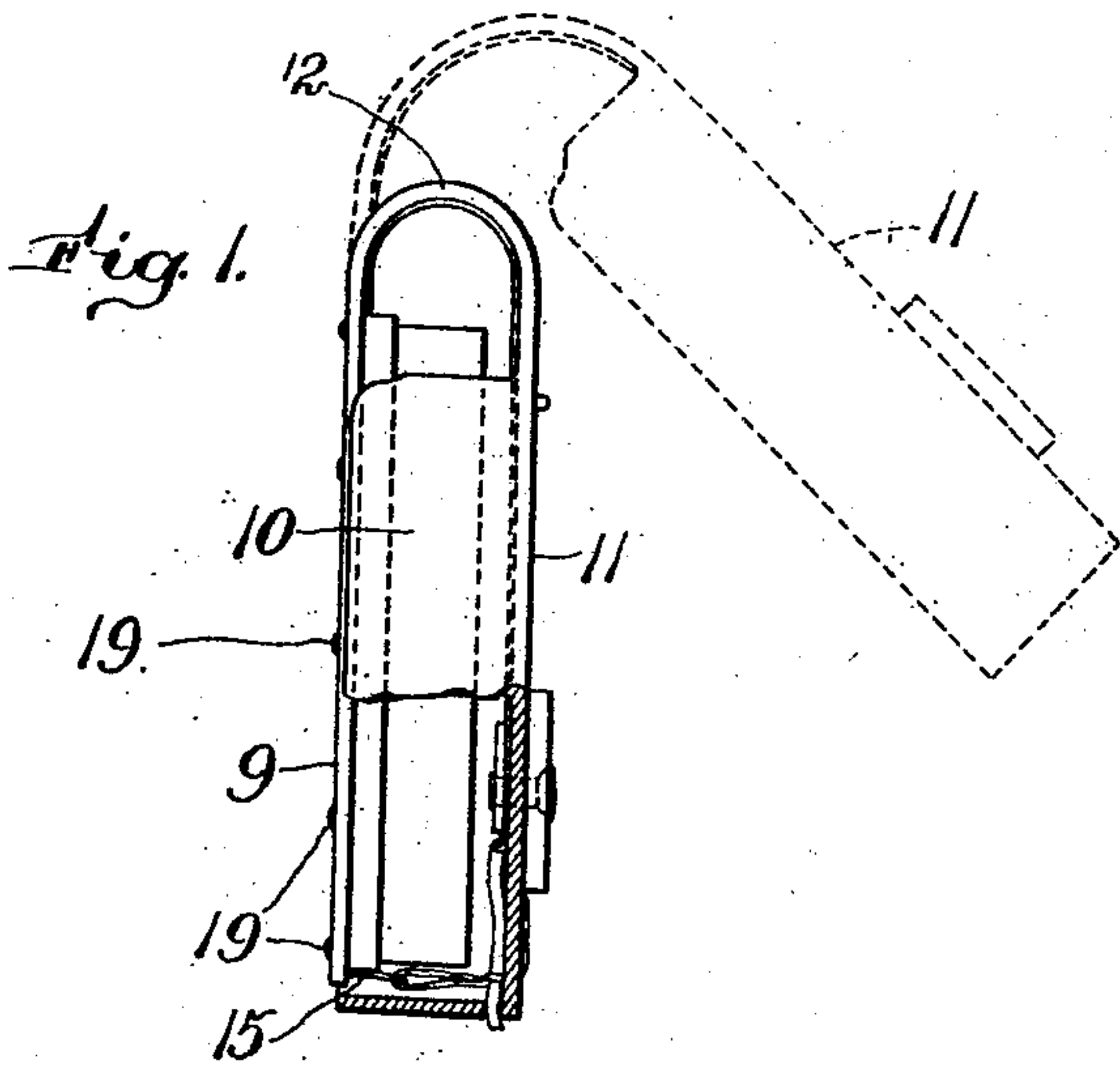


C. E. WILLIAMS.
AUDIPHONE TRANSMITTER.
APPLICATION FILED AUG. 6, 1907.

910,622.

Patented Jan. 26, 1909.



Witnesses:
M. J. Spalding.
Edward Macwell.

Inventor:
Charles E. Williams,
by Geo. H. Maxwell,
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES E. WILLIAMS, OF NATICK, MASSACHUSETTS.

AUDIPHONE-TRANSMITTER.

No. 910,622.

Specification of Letters Patent.

Patented Jan. 26, 1909.

Application filed August 6, 1907. Serial No. 387,317.

To all whom it may concern:

Be it known that I, CHARLES E. WILLIAMS, a citizen of the United States, and resident of Natick, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Audiphone-Transmitters, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its primary object the securing of more pronounced articulation in this class of instruments; also the preferred mechanical embodiment of the invention renders the same comparatively inexpensive to make, and very difficult to get out of order and to be tampered with.

In carrying out my invention, I suspend the instrument proper in front of a sounding board, thereby not only getting rid of the deadening or sound-reducing effect of the clothing of the wearer on the clearness of the sound which results from resting the instrument directly against the clothing as is common, but obtaining an amplifying of the sound by providing a resilient suspension of the instrument. This construction also connects the sounding board in such a manner with the instrument as to still further sharpen the articulation, and also to render it practically impossible for the ordinary user to tamper with the instrument or take it apart.

The constructional details and further advantages of my invention will be more fully understood in the course of the following description, taken with reference to the accompanying drawings, in which I have shown a preferred embodiment of the invention.

In the drawings, Figure 1 represents in side elevation, partly broken away, my complete instrument; Fig. 2 is a back view thereof in elevation; Fig. 3 is a front view thereof; Figs. 4 and 5 are bottom plan views showing parts in section; Fig. 6 is a vertical sectional view; Fig. 7 shows the inside of the back in elevation; and Fig. 8 shows in perspective a modified application of the invention.

In carrying out my invention, it will be understood that most of the features may be applied to various kinds of instruments, but for clearness of illustration I have shown and will describe my invention in all the details of the preferred complete instrument. As the internal constructional details of the instru-

ment are not herein claimed, being elsewhere claimed in my copending application therefor, I will briefly explain that the instrument proper consists of a diaphragm 1, carbon button 2 containing perforations 3 and granular circuit-closers or carbon electrodes 4, held in by a gauze barrier or wall 5 and retaining ring 6 mounted rigidly on an intervening perforated wall 7, in front of which is a reverberatory chamber 8, whose front wall 9 acts to receive the sound waves, as fully explained in my before mentioned application.

The periphery 10 of the front wall 9, with the contained parts, are supported from a sounding board or remote plate-like portion 11, preferably composed of springy material, such as hard rubber. In the preferred form herein shown the sounding board 11, the suspension means 12, and the front 9 of the apparatus are integral with each other, being formed out of a single strip or sheet of hard rubber. The back 11 is herein shown as perforated at 13 to afford means for fastening it to a pocket battery or a support or the like, and at the lower ends I have provided means in the form of cords 14 connected at 15 to the bottom end of the front 9 to hold the more or less springy neck-piece suspension-means 12 and back 11 to the instrument proper, so as to prevent their being broken or snapped in two by an attempted springing of them apart by a curious person. The sounding board projects beyond the instrument proper at its edges 16, so as to receive or collect the sound, as shown in Fig. 5, and, in the more complete form of my invention shown in Fig. 4, sides 17 are provided, forming a cup-shaped sound receiving portion forming an annular air space 18 about the instrument, open at its front for the free admission of the sound waves which strike against the sounding board 11 at the back of the instrument, and are diverted therefrom against the diaphragm 1. By this means I am enabled to collect the sound better and more fully. This feature of my invention may be carried out in a variety of ways, one further species of which is shown in my copending application Serial No. 387,318. In an audiphone transmitter it is desirable to collect all the sound, differing in that respect from a telephone, in which it is desirable to exclude all the sound (except that spoken directly against the diaphragm itself.) By omitting the retaining means 14, 15, it will

be observed that the sounding board may readily be separated sufficiently to allow the battery holding portion (provided the battery be connected as above stated) to be placed in the vest pocket with the sounding board to act merely as a support, in which case I obtain a portion only of the advantages of the invention, viz. the suspension thereof from a somewhat resilient portion 12 whereby the diaphragm of the instrument may be kept in a more vertical position and held away from the deadening influence of the clothing, as would be the case if it rested directly against the clothing. I much prefer, however, to have the sounding board outside of the pocket, so that its flat polished resilient surface may receive and deflect the sound waves directly against the diaphragm. I do not restrict myself to a flat surface, as I have shown in my above mentioned application a concave surface, nor do I restrict myself in all instances to having the instrument front and sounding board integrally connected, as the instrument may be detachably connected to the sounding board as in said application. By having the parts connected integrally by the bent neck 12 I obtain several other definite advantages, one being that the position of the instrument may be varied from a vertical to any other angle by bending the yoke-like connection, thereby conforming to the particular angle required according to the build or form of the user wearing it. It is very essential in ear-phone transmitters that the instrument be maintained at the proper angle so as to keep the granular electrodes in the best working order. Another and principal advantage of the construction shown is that it effectually prevents tampering with the instrument. I secure the front 9 by rivets 19, and by having the sounding board 11 and yoke 12 formed of hard rubber, it is a simple matter to heat the yoke 12, after the instrument has all been assembled and adjusted accurately in the factory, and then bend the sounding board or back 11 to the exact position desired for the best results, and permit the yoke 12 to harden or set in that position. The general user, therefore, even though curious, cannot discover any means for enabling him to get access to the instrument, and hence the latter is left unmolested. This same heating of the vulcanized yoke 12 is the means which I prefer to employ for changing the relative angle or position of the sounding board for the purpose above mentioned.

The area of resilient material exposed to the sound waves adds greatly to the sound-amplifying power of the instrument. By having the exposed side of the diaphragm placed only a short distance from the back section of the sounding board, but not directly secured thereto, the sound is intensified and rendered clearer than would otherwise

be the case, and when the back section or sounding board is made cup-shaped and of slightly greater diameter than the front part, a different tone is produced and an extremely clear articulation.

In Fig. 8 I have shown my invention adapted to use for churches or theaters and the like, having mounted a plurality of instruments on a single large sounding board 20, whereby the sound deflection is greatly increased, thereby adding still further to the clearness of the articulation transmitted by the instrument.

It will be evident to those skilled in the art that the features herein disclosed are capable of a wide application to ear-phone transmitters of different kinds.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In an apparatus of the kind described, a sound-transmitting instrument, and a resilient back and suspension piece connected therewith, said instrument hanging beneath said suspension piece close to said resilient back.

2. In an apparatus of the kind described, a sound-transmitting instrument, a sounding board at the back thereof separated therefrom by an intervening space, and a normally rigid suspension yoke extending from said sounding board and connected rigidly with said instrument.

3. In an apparatus of the kind described, a sound-transmitting instrument, a sounding board at the back thereof separated therefrom by an intervening space, and an adjustable suspension yoke extending from said sounding board and connected rigidly with said instrument.

4. In an apparatus of the kind described, a sound-transmitting instrument opening rearwardly, a separated back piece substantially covering the open rear end of said instrument and sufficiently close thereto to prevent ready access thereto, and a rigid yoke holding the instrument and back in fixed relation.

5. In an apparatus of the kind described, a sound-transmitting instrument opening rearwardly, a separated back piece substantially covering the open rear end of said instrument and sufficiently close thereto to prevent ready access thereto, and a rigid yoke holding the instrument and back in fixed relation, said yoke being composed of material capable of being rendered temporarily pliant for changing the adjustment of said back and instrument with relation to each other.

6. In an apparatus of the kind described, a sound-transmitting instrument, and a separated sounding board therefor at the rear thereof projecting at its edges slightly beyond said instrument to catch and deflect

the sound, said sounding board being capable of freely yielding toward and from the instrument.

7. In an apparatus of the kind described, 5 a sound-transmitting instrument, and a separated sounding board therefor at the rear thereof projecting at its edges slightly beyond said instrument to catch and deflect the sound and having forwardly projecting 10 sides substantially embracing the instrument affording a slight intervening air space about the instrument for receiving the sound to be deflected by the plane surface of said sounding board to the instrument proper, said air 15 space being uninterrupted about the instrument and coextensive with the back and sides thereof and said sounding board being without rigid support excepting at one side.

8. In an instrument of the kind described, a sound-transmitting instrument, and a 20 sounding board therefor at the rear thereof projecting at its edges slightly beyond said instrument to catch and deflect the sound and having supporting connection with said instrument at one side only of the latter, and 25 affording an intervening and uninterrupted air space entirely across the back side of the instrument.

In testimony whereof, I have signed my name to this specification, in the presence of 30 two subscribing witnesses.

CHARLES E. WILLIAMS.

Witnesses:

GEO. H. MAXWELL,
M. J. SPALDING.