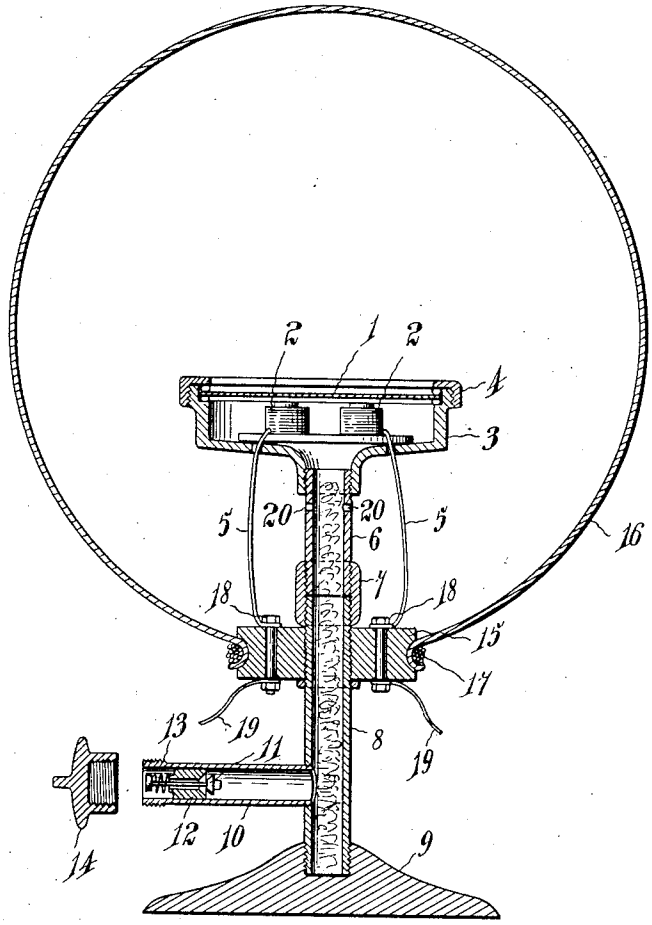
Oct. 8, 1929. P. A. ROBBINS 1,730,532

ACOUSTIC TRANSFORMER

Filed Nov. 30, 1928



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ATTY.

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ACOUSTIC TRANSFORMER

Application filed November 30, 1928. Serial No. 322,899.

This present invention relates to a special form of the invention disclosed in my co-pending application No. 322,897 of even date herewith. In that application there is disclosed a closed chamber containing a gaseous medium having a greater power-transmitting capacity than air at atmospheric pressure in which chamber is totally immersed a vibratable diaphragm from which or to which vibrations pass solely through the gaseous medium to or from a second diaphragm exposed at one side to the atmosphere and at the other side to the pressure within the chamber.

My object in the present invention is to provide a simple form of the invention which is cheaply and easily made, and which gives a maximum area to the second diaphragm obtainable within given over all dimensions of the apparatus.

I attain my object by reducing the rigid part of the chamber to such dimensions as suffice only for the connection and support of the parts, and by utilizing, to complete the chamber and form the diaphragm, a substantially spherical shell formed of a flexible elastic material such as thin rubber.

The invention is hereinafter more specifically described and illustrated in the accompanying drawing which is a vertical section of the device.

Referring to the drawing, 1 is a diaphragm operated by the electro-magnet 2—2. The diaphragm is held in place by the ring 4 and the whole is mounted on the cup 3. This is a usual type of loud speaker unit and I make no claim thereto as any suitable type may be used.

The cup 3 is screwed onto a tube 6, which is screwed into a connecting nipple 7 which is screwed onto a stand tube 8 screwed into the base 9. Electric conductors 5—5 connect the magnet 2—2 with the connecting bolts 18—18 which on their outer ends are connected to electric conductors 19—19 which supply the current for operating the diaphragm 1.

15 is a circular disk of wood or other non-conductor of electricity forming the base of the gas chamber of the device. 16 is a rubber balloon similar to those used for toys but having a somewhat larger neck opening. The balloon neck is stretched over the diaphragm and cup 3, and is then stretched over the disk 15 to engage in a peripheral groove around the latter. A binding string or elastic 17 holds the balloon neck tightly in place making a gas tight joint.

10 is a branch tube fitted into the tube 8 and having the valve seat 12 and the valve 11 mounted internally. 13 is a spring for holding the valve in place. I make no claim for novelty in the construction of tube 10 and the valve, and any arrangement similar to an automobile tire valve will serve the purpose. 14 is the usual cap for closing the end of tube 10.

I wish to surround the diaphragm with a heavy dense gas, and one way to accomplish this is to use the carbon dioxide of the human breath. Respired air is blown in through the tube 10. The tube 8 is packed with any porous absorbent for removing moisture from the stream of air. The density of the air in the balloon 16 may be regulated by the pressure of inflation. If greater pressure is required, more respired air is blown in through the tube 10. If decreased pressure is required, some of the air can be released by pushing on the stem of the valve 11.

20—20 are holes in the tube 6 for allowing the air to flow into the interior of the balloon. The upper end of the tube 6 communicates with the interior of the cup 3 so that the cup is filled with gas under pressure and the diaphragm 1 is in contact with the same pressure and density of gas on both of its sides.

Apparatus constructed as described will satisfactorily attain the objects of my invention as set forth in the specigcation.

What I claim as my invention is:

1. An acoustic transformer comprising a base; a substantially spherical thin shell connected with the base and forming therewith a gas tight chamber; means for admitting a gaseous medium under pressure into said chamber; and a vibratable diaphragm immersed in said gaseous medium and entirely enclosed by said chamber.

2. An acoustic transformer comprising a

base; a substantially spherical shell of elastic material connected with the base and forming therewith a gas tight chamber; means for admitting a gaseous medium under pressure into said chamber; and a vibratable diaphragm immersed in said gaseous medium entirely enclosed by said chamber.

3. An acoustic transformer comprising a base; a substantially spherical thin shell connected with the base and forming therewith a gas tight chamber; means for admitting a gaseous medium under pressure into said chamber extending through said base; and a vibratable diaphragm immersed in said gaseous medium entirely enclosed by said chamber.

4. An acoustic transformer comprising a base; a substantially spherical shell of elastic material connected with the base and forming therewith a gas tight chamber; means for admitting a gaseous medium under pressure into said chamber extending through said base; and a vibratable diaphragm immersed in said gaseous medium entirely enclosed by said chamber.

Signed at Highland Park, Ill., this 15th day of November, 1928.

PERCY A. ROBBINS.