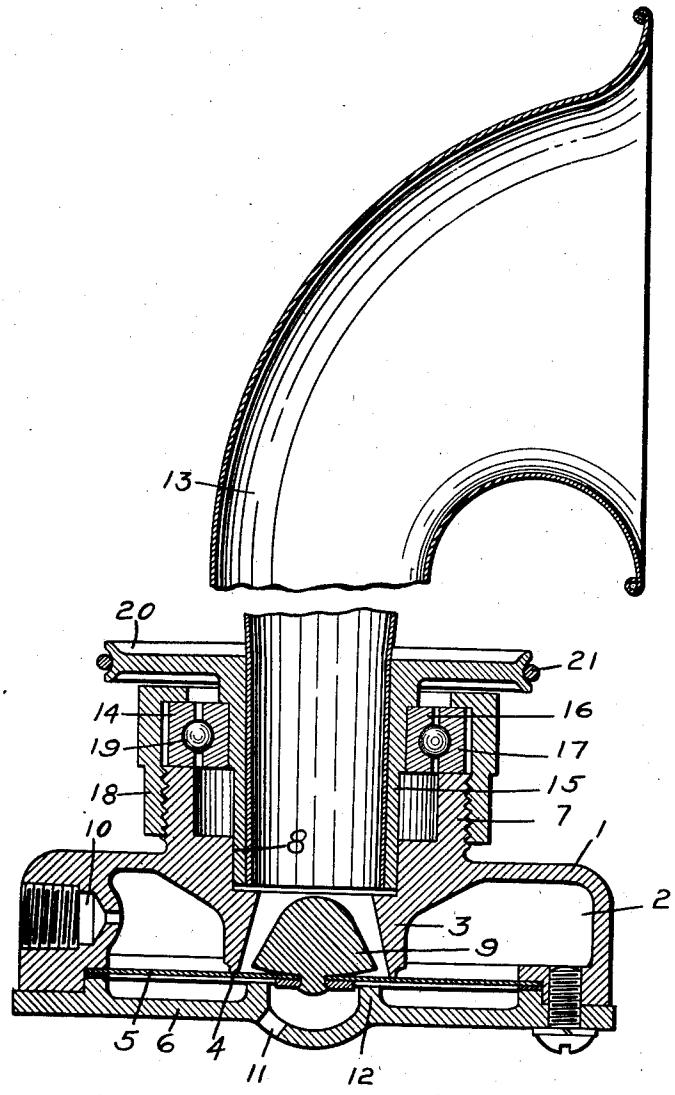
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SOUND AMPLIFYING HORN

Filed April 9, 1928



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SOUND-AMPLIFYING HORN

Application filed April 9, 1928. Serial No. 268,476.

This invention relates to sound producing devices, and more particularly to a sound producer of the type employing a flexible diaphragm operated by fluid pressure, but which is susceptible of use in connection with sound producers of any type embodying an amplifying horn.

One of the primary objects of the invention is to provide novel means for connecting the amplifying horn with the body or casing of the sound producer, whereby the amplifying horn can be turned in any desired direction.

Another principal object of the invention is the provision of a rotatable amplifying horn connected with the body or casing of the sound producer, through the medium of a ball bearing race allowing a full 360° movement, means being provided for controlling the turning movement of the amplifying horn.

In the accompanying drawing, the figure is a central sectional view of a sound producing device embodying my invention.

The sound producing device may comprise a casing 1 having a chamber 2 and a central tube 3. Mounted to engage the annular inlet face 4 of the tube 3 is a flexible diaphragm 5, said diaphragm being secured in the casing by a cap or cover 6.

Extending outwardly from the face of the casing 1, opposite to the cover 6, is an annular externally threaded sleeve 7, which is arranged concentric with the tube 3. The outer end of the tube 3 is preferably provided with an internal seat 8, for a purpose which will be later described.

Secured to the central portion of the diaphragm 5 and extending into the inner open end of the tube 3 is a weight 9 for regulating the vibratory movement of the diaphragm, as in Patent No. 1,679,011 of R. G. Widmyer, issued July 31, 1928. The casing 1 is provided with an inlet opening 10 communicating with the chamber 2 for the reception of a feed pipe, through which fluid under pressure is supplied to the chamber 2.

In operation, when fluid under pressure is supplied to the chamber 2 and builds up pressure therein, the diaphragm moves outwardly away from the tube 3. In moving out, communication is opened from chamber 2 to the space within tube 3. The pressure in said chamber is then quickly reduced and the pressure on the diaphragm 5 is relieved, after which the diaphragm returns to its normal position in engagement with the tube 3. The opening movement is then repeated.

An opening 11 is provided in the cover or cap 6, so that the chamber at the outer face of the diaphragm remains at atmospheric pressure at all times.

If desired an annular rib or collar 12 may be formed on or carried by the inner face of the cap or cover concentric with the tube 3, so as to limit the vibratory movement of the diaphragm 5.

In accordance with this invention, an amplifying horn 13 having an outer flared curved end is provided, and this horn 13 is mounted to revolve relative to the casing 1. By way of illustration, a ball bearing connection 14 is shown between the casing 1 and the horn 13, which is arranged in the following manner. A supporting cuff or sleeve 15 is provided for the inner end of the horn and is secured thereto in any desired way. This cuff or sleeve 15 has secured thereto, the inner ball race 16, of the ball bearing connection 14, while the outer ball race 17 is connected with casing 1. As shown, the outer ball race 17 is clamped between the threaded sleeve 7 and a flanged collar 18, which is threaded on the sleeve 7. The ball bearings 19 are confined between the inner and outer races 16 and 17. This allows free turning of the horn 13. The inner end of the horn 13 and inner end of the supporting cuff or sleeve 15 is received within the seat 8 of the tube 3 in order to allow free flow of the air into the horn.

Any desired means may be provided for rotating the horn, and as shown a pulley 20 is carried by the cuff or sleeve 15 around which is trained a pull cable 21. It is obvious that by pulling, either on one run or the other of the cable, the horn can be turned in any desired direction.

While one illustrative embodiment of the invention has been described in detail, it is not my intention to limit its scope to that

embodiment or otherwise than by the terms of the appended claims.

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

1. In a directional sound producing device, a rotatable horn and means for rotating the horn from a point distant thereto.

2. In a sound producing device, a casing having a chamber, a resonance tube in the casing communicating with the chamber having an internal seat, a flexible diaphragm in the casing normally engaging the tube, and an amplifying horn rotatably carried by the casing and received in said seat.

3. In a sound producing device, a casing having a chamber, a resonance tube in the casing having an internal seat, a flexible diaphragm in the casing for the tube, a sleeve on the casing extending outwardly therefrom concentric with the tube, an amplifying horn, an anti-friction bearing between the horn and casing, a supporting cuff for the horn received in the seat in said tube, said bearing including an inner race connected with the cuff and an outer race fitted on the sleeve, and a flanged collar threaded on said sleeve engaging the outer race and clamping the same on said sleeve.

4. A sound producing device comprising a casing having a chamber, a resonance tube in the casing, a flexible diaphragm in the casing normally resting against the resonance tube subject to the pressure of fluid in said chamber, and an annular seat concentric with the tube and on the opposite side thereof for limiting the movement of the diaphragm.

5. A sound producing device comprising a casing having a chamber, a resonance tube in the casing, a flexible diaphragm in the casing normally resting against the resonance tube subject to the pressure of fluid in said chamber, and a stop arranged in the path of movement of said diaphragm disposed on the opposite side thereof from said resonance tube.

6. A sound producing device comprising a casing having a chamber, a resonance tube in the casing, a flexible diaphragm normally resting against the tube and subject to the pressure of fluid in the chamber, a cover plate for the casing clamping the diaphragm in position, and an annular seat carried by the cover plate and concentric with the tube and on the opposite side of the diaphragm from said tube, said seat being arranged in the path of movement of said diaphragm.

7. A sound producing device comprising a casing having a chamber, a flexible diaphragm subject to the pressure of fluid in said chamber, a vent tube, the end of which is engageable with said diaphragm and controlling communication from said chamber, and means for limiting the movement of said diaphragm away from said tube.

8. A sound producing device comprising a casing having a chamber adapted to be supplied with fluid under pressure, a tube open to the atmosphere and extending into said chamber, a flexible diaphragm engageable with the end of said tube and controlling communication from said chamber to said tube, and means on the outer side of the diaphragm for limiting the movement thereof away from the tube.

9. A sound producing device comprising a casing having a chamber adapted to be supplied with fluid under pressure, a flexible diaphragm subject to the pressure of fluid in said chamber to cause the vibration of said diaphragm, and means for limiting the vibration of said diaphragm.

10. A sound producing device comprising a casing having a chamber adapted to be supplied with fluid under pressure, a flexible diaphragm subject to the pressure of fluid in said chamber to cause the vibration of said diaphragm, and means for limiting the vibration of said diaphragm in both directions.

11. A pneumatically operated horn comprising a casing containing a diaphragm, means for supplying fluid under pressure to the casing for vibrating said diaphragm and means on both sides of the diaphragm for limiting the vibratory movement thereof.

In testimony whereof I have hereunto set my hand.

CLYDE C. FARMER.