

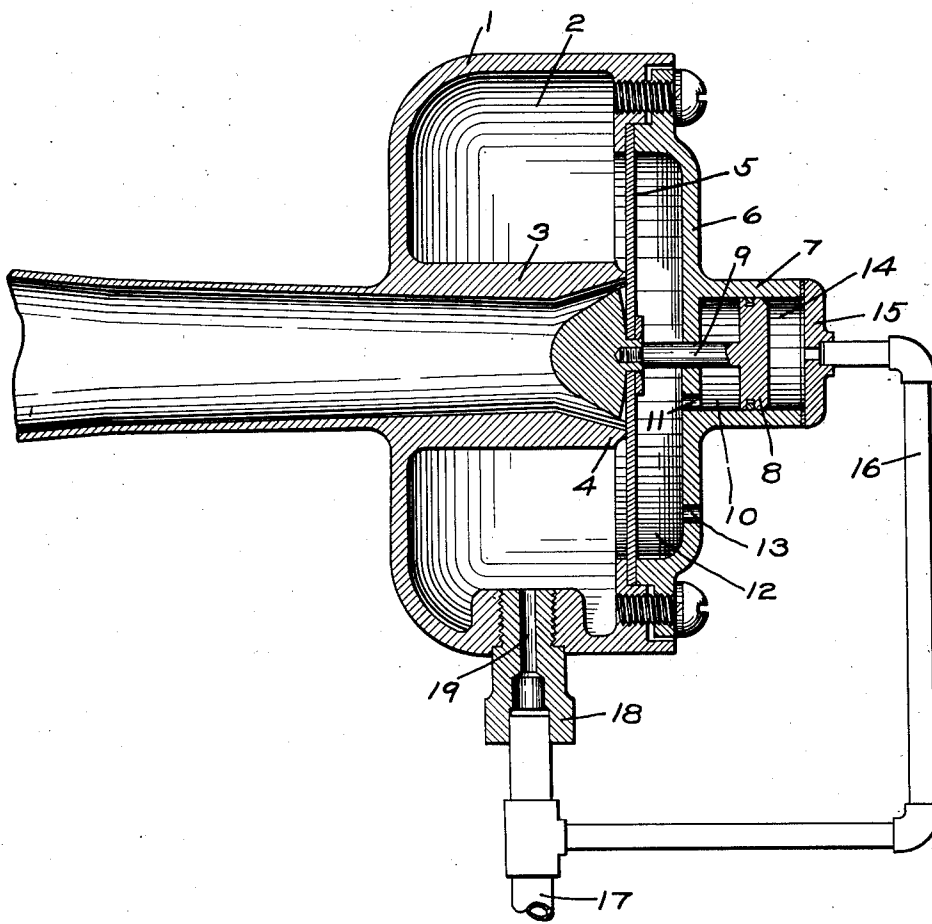
Nov. 6, 1928.

1,690,177

A. F. PETERSON

SOUND PRODUCER

Filed Oct. 4, 1927



INVENTOR  
ANDREW F. PETERSON  
BY *Wm. M. Leady*  
ATTORNEY

# UNITED STATES PATENT OFFICE.

ANDREW F. PETERSON, OF OAKLAND, CALIFORNIA ASSIGNOR TO THE WESTINGHOUSE AIR BRAKE COMPANY, OF WILMERDING, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## SOUND PRODUCER.

Application filed October 4, 1927. Serial No. 223,922.

This invention relates to sound producers, and more particularly to a sound producer of the type employing a flexible diaphragm which is caused to vibrate by the action of pulsating air pressure to which the diaphragm is subject.

The pressure of air supplied to the device may vary, and this will result in causing the volume of sound to vary, and the principal object of my invention is to provide a sound producer of the above type in which means are provided for maintaining the volume of sound constant regardless of the degree of pressure of air supplied to the device.

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

As shown in the drawing, the device may comprise a casing 1 having a chamber 2 and a central tube 3 which extends outwardly to form a horn. Mounted to engage the annular inlet face 4 of the tube is a flexible diaphragm 5, said diaphragm being secured in the casing by a cover or cap member 6.

According to my invention, the member 6 is provided with a centrally disposed cylinder 7, in which is mounted a piston 8.

The piston 8 is provided with a stem 9, the end of which is secured to the diaphragm 5. The chamber 10 at one side of piston 8 is connected through port 11 with chamber 12 at one side of diaphragm 5, and chamber 12 is open to the atmosphere by way of port 13, so that chambers 10 and 12 are subject to atmospheric pressure. The chamber 14 at the other side of the piston 8 is closed by a cover plate 15, and opening to chamber 14 through said plate is a pipe 16 which is connected to a fluid pressure supply pipe 17. Said supply pipe is connected to a plug 18 having screw-threaded engagement in the casing 1 and having a passage 19 which connects pipe 17 with chamber 2.

In operation, when fluid under pressure is supplied through pipe 17 to chamber 2, the increase in pressure in said chamber operates to move the diaphragm 5 out of engagement with the inlet face 4 of the tube 3. The opening of communication from chamber 2 to the tube 3 permits a sudden rush of fluid from said chamber to the tube and the rate of outflow exceeding the rate of inflow through the passage 19, the pressure in chamber 2 reduces and the diaphragm 5 moves back to

engage the inlet face 4. The above cycle is then repeated and thereby the diaphragm is caused to vibrate.

In this action, the piston 8 is subject to the pressure of fluid supplied to pipe 17 and the outward movement of the diaphragm is thus opposed by a pressure which is always proportional to the pressure of fluid supplied to the device.

If the supply pressure is low, the pressure on piston 8 will be correspondingly low, so that less resistance is offered to the movement of the diaphragm when the supply pressure is low. When the supply pressure is high, the resistance to the movement of the diaphragm is likewise high.

As a consequence, the effect of supplying fluid under pressure to chamber 2 at varying pressures is substantially neutralized by the counter effect of the pressure acting on piston 8, and therefore the intensity of the vibratory movement of the diaphragm and consequently the volume of sound is maintained substantially constant, regardless of the pressure of fluid employed.

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. A sound producer comprising a flexible diaphragm subject to the pressure of fluid in a chamber and controlling an outlet opening from said chamber and operated by an increase in pressure in said chamber for connecting said chamber to said outlet opening and a piston subject to the pressure of fluid supplied to said chamber for opposing movement of said diaphragm.

2. A sound producer comprising a flexible diaphragm subject to the pressure of fluid in a chamber and controlling an outlet opening through which fluid is vented from said chamber and a piston carried by said diaphragm and subject to the pressure of fluid supplied to said chamber in a direction to oppose the fluid pressure acting on said diaphragm.

3. A sound producer comprising a flexible diaphragm subject to the pressure of fluid in a chamber and controlling an outlet open-

ing through which fluid is vented from said chamber and a piston movable with said diaphragm and subject on one side to atmospheric pressure and on the opposite side to pressure of fluid supplied to said chamber. 5

4. A sound producer comprising a flexible diaphragm subject to the pressure of fluid in a chamber and controlling an outlet opening through which fluid is vented from said

chamber and a piston carried by said diaphragm and subject on one side to the pressure of fluid supplied to said chamber, the pressure on said piston opposing the movement of the diaphragm by the pressure acting in said chamber. 10 15

In testimony whereof I have hereunto set my hand.

ANDREW F. PETERSON.