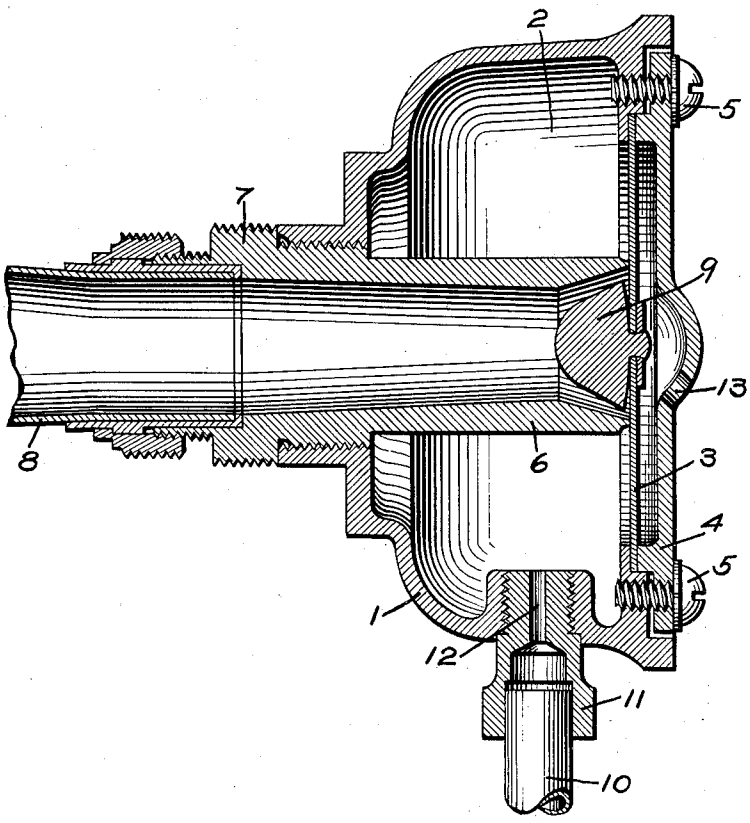
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SIGNAL DEVICE

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SIGNAL DEVICE.

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This invention relates to sound producing devices, and more particularly to the type employing a vibratory diaphragm.

The principal object of my invention is to provide an improved fluid pressure operated sound producing device of the above type.

In the accompanying drawing, the single 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 which is open to a flexible diaphragm 3, said diaphragm being clamped in position by a cover plate 4, which is secured to the casing 1 by screws 5.

The casing 1 is provided with a threaded opening at the side opposite the diaphragm 3, into which is screwed a resonance tube 6. Said tube having an enlarged portion 7 forming a shoulder adapted to engage the end face of the threaded portion of the casing 1. Secured to the tube 6 is a suitable amplifying horn 8.

When the tube 6 is screwed down so that the shoulder thereof engages the end of the threaded portion of the casing, the free end of the tube just engages the diaphragm 3.

Secured to the central portion of the diaphragm 3 and extending into the open end of the tube 6 is a weight 9. The chamber 2 is connected to a pipe 10, through which fluid under pressure is supplied to said chamber, and preferably the pipe 10 is secured to a plug 11 having screw-threaded engagement in the casing 1 and having a restricted port 12 through which fluid is supplied from pipe 10 to chamber 2.

In operation, when fluid under pressure is supplied to pipe 10, fluid flows through the restricted passage 12 into chamber 2 and the pressure of fluid in chamber 2 builds up so that the diaphragm 3 is moved outwardly.

In moving out, communication is opened from chamber 2 to the space within the tube 6. The pressure in said chamber is then quickly reduced, since the rate of flow through the restricted port 12 is considerably less than the rate of flow from chamber 2 to the tube 6. The pressure on the diaphragm 3 being thus relieved, said diaphragm returns to its position engaging the end of the tube 6. The opening movement is then repeated.

The diaphragm 3 is thus caused to vibrate and thereby produces a sound which is amplified by the usual operation of the horn 8.

The addition of the weighted member 9 to the diaphragm 3 makes it necessary for the fluid pressure to be built up to a higher point before the diaphragm will move from engagement with the end of the tube 6, than would be the case with an unweighted diaphragm, but when the diaphragm does move, the higher pressure causes a greater movement of the diaphragm and consequently, a greater amount of potential energy is stored up, so that the return movement of the diaphragm is effected more forcibly and a tighter engagement with the tube 6 is the result. A more positive opening and closing movement of the diaphragm is thus assured. In fact, it has been found that a diaphragm not provided with a weighted portion, tends to remain open and thus fail to vibrate.

An opening 13 is provided in the cover plate 4, so that the chamber at the outer face of the diaphragm 3 remains at atmospheric pressure at all times.

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

1. A sound producing device comprising a casing having a chamber, a flexible diaphragm subject to the pressure of fluid in said chamber, a weighted member carried by said diaphragm for regulating the vibratory movement of said diaphragm, and a vent tube normally in pressureless engagement with said diaphragm and controlling communication from said chamber to said tube.

2. A sound producing device comprising a casing having a chamber, a flexible diaphragm associated with said casing and subject to the pressure of fluid in said chamber, a weight carried by said diaphragm for regulating the vibratory action of said diaphragm, and a vent tube normally adapted to seat on said diaphragm and controlling communication from said chamber to said tube, said diaphragm exerting pressure on said tube only when the diaphragm is vibrating.

3. 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 normally seating without pressure against the end of said tube and controlling communication from said chamber to said tube, and a weight attached to said diaphragm for regulating the vibratory action of the diaphragm.

4. A sound producing device comprising a casing having a chamber adapted to be supplied with fluid under pressure, a flexible diaphragm secured to said casing and subject to the pressure of fluid in said chamber, a vent tube extending into said chamber and having its end normally engaging the central portion of said diaphragm without pressure being exerted by said diaphragm on said tube, and a weight secured to said diaphragm at its central portion and extending into said tube for regulating the vibratory action of said diaphragm.

5. 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, means for varying the fluid pressure in said chamber to cause the vibration of said diaphragm, and means for increasing the amplitude of vibration of said diaphragm.

In testimony whereof I have hereunto set my hand.

ROBERT G. WIDMYER.