

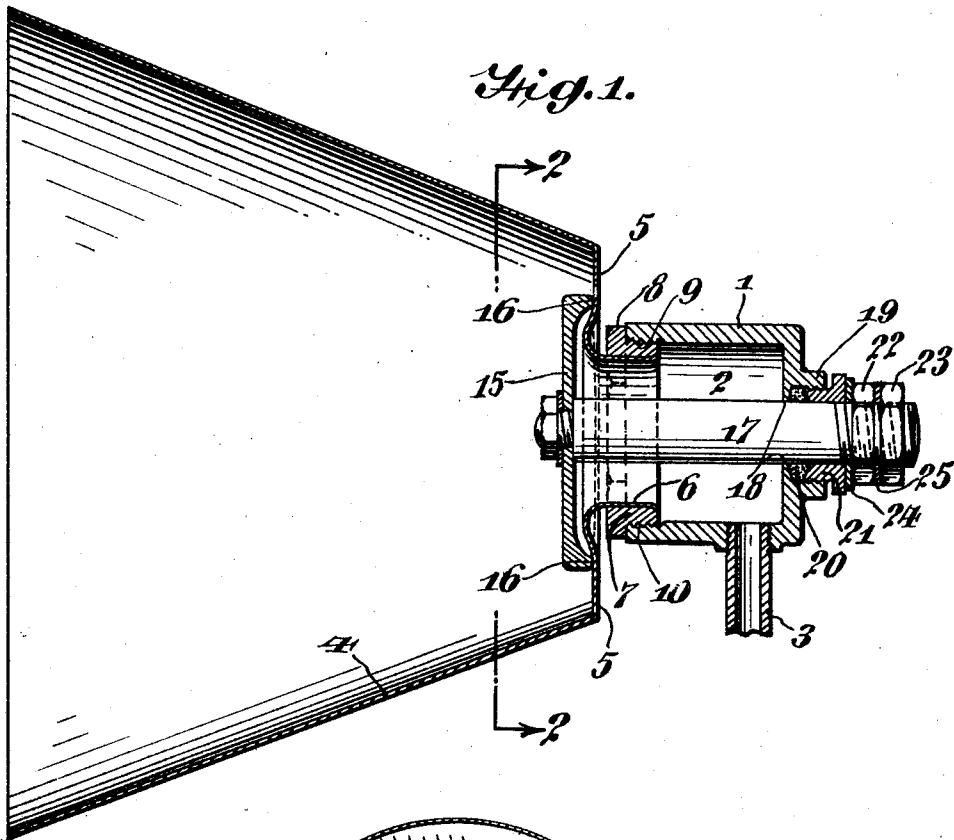
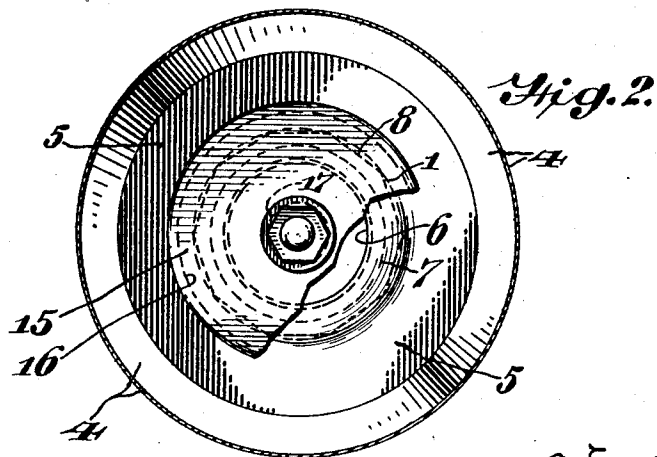
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SOUND GENERATOR

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SOUND GENERATOR

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My invention relates to sound generators and more particularly generators of the character known as horns which are adapted for use upon motor vehicles, such as automobiles, for signaling at crossings or at such other places as signals may be deemed to be necessary.

The general object of the invention is to provide a sound generating instrumentality of novel but simple construction which can be manufactured at a minimum of cost.

It also is an object of the invention to provide a sound generator having means of novel construction by the employment of which the loudness or volume of sound may be controlled.

To the foregoing and other ends my invention comprehends the construction and arrangement of parts as hereinafter described in detail, particularly pointed out in the claims and as illustrated in the drawings wherein I have shown one embodiment of the said invention. However, it is to be understood that the invention may be embodied in other forms of construction than that shown and that changes in the details of construction may be made within the scope of the claims without departing from the said invention or the principle thereof.

In the drawings:

Fig. 1 is a view in central longitudinal section of a sound generating instrumentality embodying the invention; and

Fig. 2 is a transverse sectional view taken on the line 2—2 of Fig. 1.

In the drawings I have shown a receptacle 1 providing a chamber 2 for the reception of air or other gas under pressure. Such air or other gas may be delivered through a pipe a portion of which is shown at 3. Said pipe may have connection with a reservoir of air or other gas under pressure, the said air or other gas being supplied to such reservoir and placed under pressure in any known manner.

The gas may be obtained from the cylinder of the exhaust side of an internal combustion engine or it may be obtained otherwise. It is immaterial insofar as the device of the invention is concerned.

A horn 4 is mounted upon the receptacle 1

and by its vibration and the vibration of parts immediately associated therewith the sound is produced.

In the construction as illustrated the horn is tapered so that it flares outwardly but it will be understood that such tapering is not essential to my invention although it may be desirable. The inner end of the horn 4 is provided with an inwardly extending flexible resilient flange 5 the inner edge portion of which extends outwardly with respect to the horn 4 in a direction substantially at a right angle to the plane of the said flange, forming a tubular portion 6. The outwardly tubular portion 6 extends through a tubular or sleeve-like plug 7 and is brazed thereto or otherwise permanently connected therewith. The inner end of the plug 7 is projected outwardly to form a flange 8 while the outer side of the outer end portion thereof is screw-threaded, as indicated at 9, and is in engagement with screw-threads 10 provided upon the inner side of the open end of the receptacle 1. It will be seen that the inner end of the horn is connected with and supported by the receptacle 1 and that the outer end thereof is free and unsupported.

For the purpose of closing the opening from the receptacle through the passageway formed by the portion 6 of the flange 5 I have provided a valve 15 the outer edge of which is flanged and turned inwardly as indicated at 16. The edge of the flange 16 contacts with and bears against the inner side of the flange 5 a considerable distance from the tubular portion 6 thereof.

In the construction as illustrated the edge of the flange 16 contacts with the flange 5 along a circular line approximately midway between the tubular portion 6 and the line of connection between the outer edge of the flange 5 and the adjoining edge of the horn 4. Also in the construction as illustrated the flange 5 is integral with the horn 4 but it will be understood that the flange 5 may consist of a separate annular member secured in any desired manner to the adjoining end portion of the horn 4. The horn 4 and flange 5 may consist of any material having the requisites for a horn of the character indicated. It may,

for example, consist of brass, but I desire it to be understood that the invention is not limited to a horn or to a flange 5 of any particular material. It should be a material having the qualities which render it vibratable and which during vibration will produce an agreeable sound.

The valve 15 is mounted upon the inner end of a post or stem 17 the opposite or outer end of which extends through an opening 18 provided in the bottom of the receptacle 1. The opening 18 is surrounded by a flange 19 which extends outwardly therefrom, the internal diameter of said flange being greater than the diameter of the opening 18. Packing material 20 is placed in the space between the flange 19 and the post or stem 17 sufficient to partially fill the same, the said packing being compressed and tightened by means of a gland 21 which projects into the space between the flange 19 and the post or stem 17 and which has screw-threaded connection with the said flange. For the purpose of adjusting the post or stem 17 longitudinally or in the direction of its axis I have provided nuts 22 and 23. A washer 24 is located between the nut 22 and the outer end of the gland 21 while a washer 25 is located between the two nuts 22 and 23. The outer nut 23 constitutes a lock nut. By adjusting the nuts 22 and 23 the post or stem 17 may be adjusted lengthwise so as to vary the pressure of the edge of the flange 16 of the valve 15 upon the flange 5. By adjusting the post or stem 17 outwardly to increase the pressure or force exerted by the flange 16 against the flange 5 the volume or loudness of the sound produced may be increased; whereas by adjusting the said post or stem inwardly or toward the outer end of the horn 4 the pressure of the flange 16 upon the flange 5 may be decreased to thereby soften and render less loud the sounds produced by the horn.

In the operation of the horn known means of any kind or character may be employed for admitting air or gas through the pipe 3 to the receptacle 1. The said air or gas is under pressure and by varying the pressure thereof the sound produced by the escape thereof between the edge of the flange 16 and the flange 5 may be varied. The escape of air or gas at high pressure will produce a sound of larger or greater volume than if gas at lower pressure should escape.

The valve 15 is held against outward movement by the post or stem 17. In order that the admission of air or gas under pressure to the chamber 2 shall result in the production of sounds it is necessary that such pressure be sufficient to cause yielding movement of the flange 5 away from the edge of the flange 16. When the pressure of the air or gas is sufficient to deflect the flange 5 air or gas escapes. The escape is in small quantities following each other in rapid succession so

that the flange 5 is placed under rapid vibration. These vibrations are transmitted to the horn 4. The vibration of the flange 5 and of the horn 4 produces sounds, the tonal quality of which will depend upon the shape of the horn, its length and the material of which it may be constructed.

The loudness or volume of the sound produced will depend upon the pressure exerted by the flange 16 upon the flange 5 and also upon the pressure of the air or gas within the chamber 2 of the receptacle 1.

By my invention I am enabled to provide a device of extremely simple construction which is efficient in the generation of sound whereby it is adapted for use as a sound signal upon motor vehicles such as automobiles and the like. By reason of the simplicity of the device embodying the invention it will be seen that such devices may be manufactured and sold at a minimum of cost and expense.

Whenever the word "gas" is employed herein or in the claims it is intended to include not only air but gases of any and all descriptions which may be adapted for use in the operation of the device.

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

1. A sound generator comprising a receptacle having an opening through which gas under pressure is adapted to be discharged, a flexible resilient flange mounted upon the said receptacle, said flange surrounding said opening and extending laterally therefrom, the outer portion of said flange being free to vibrate, a valve having a portion in contact with a side of the said flange along a line intermediate the inner and outer edges thereof, said valve closing the opening from the said receptacle, and means unyielding in one direction for supporting the said valve and holding the said portion thereof in contact with the said flange.

2. A sound generator comprising an open ended conduit from which gas under pressure is adapted to be discharged, a flange of flexible resilient sheet metal surrounding and extending laterally from said opening, said flange having an inwardly extending portion which projects into said opening and which is secured in position therein, a valve for closing said opening, said valve having a portion at its outer edge in contact with the said flange, and means for holding and supporting the said valve with the said outer edge portion in contact with the said flange.

3. A sound generator comprising a conduit having an open end, a flange mounted upon and supported by the open end portion of said conduit, said flange extending laterally from the said opening, a valve for closing said opening, the outer edge of said valve being provided with a flange which is in engagement with the first named flange, and

a support for supporting the said valve, said support being, when in normal position with the outer edge portion of said valve in contact with the first named flange, immovable in one direction but movable in the opposite direction.

4. A sound generator comprising a conduit having an open end from which gas under pressure is adapted to be discharged, an annular flange connected with and supported upon the open end of the said conduit, a horn having connection at one end to the outer edge of the said flange, a valve overlying the open end of said conduit, the outer edge portion of said valve being in contact with the said flange to thereby close the said opening, and means for supporting said valve.

5. A sound generator comprising a conduit having an open end through which gas under pressure is adapted to be discharged, an annular flange of flexible resilient material mounted upon the open end of the said conduit and surrounding the opening from said conduit, a horn having integral connection at one end with the outer edge of the said flange, a valve overlying the open end of the said conduit, said valve having an inwardly extending annular ridge at its outer edge in contact with the outer side of the said flange, and means mounted upon said conduit for supporting the said valve.

6. A sound generator comprising a receptacle for receiving gas under pressure, said receptacle having an opening through one side through which the said gas is adapted to be discharged, an annular flange of flexible resilient sheet metal supported upon said receptacle, said flange encircling said opening and extending laterally in a plane in general right angular relation to the axis of the said opening, a horn having connection at one end with the outer edge of the said flange, a valve overlying said opening and contacting with the said annular flange to close said opening, a support for holding said valve in contact with the said flange, and means for effecting lengthwise adjustment of the said support to vary the pressure of said valve upon the said flange.

7. A sound generator comprising a receptacle for receiving a gas under pressure, said receptacle having an open end, an annular plug having connection with the said open end, a flexible resilient sheet metal annular flange having a tubular portion projecting from its inner edge into said annular plug and being secured thereto, the said flange extending laterally in a plane in general right angular relation to the axis of the said annular plug, a horn having one end secured to the said flange, a valve overlying the opening through the said annular plug, said valve having contact at its outer edge with the said flange, a support for holding the said valve with its outer edge in contact with the said

flange, said support extending through the open end of said receptacle and through an opening provided in a wall in opposed relation to the said open end, and means upon the projecting end portion of the said support for effecting lengthwise adjustments of the latter to vary the pressure of the said valve upon said flange.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 2nd day of October, A. D., 1930.

WALTER L. ECKHARDT.

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