July 2, 1963 J. B. BARRICKS 3,095,669

SOUND EMITTING DEVICE

Original Filed Jan. 8, 1960

FIG. 1

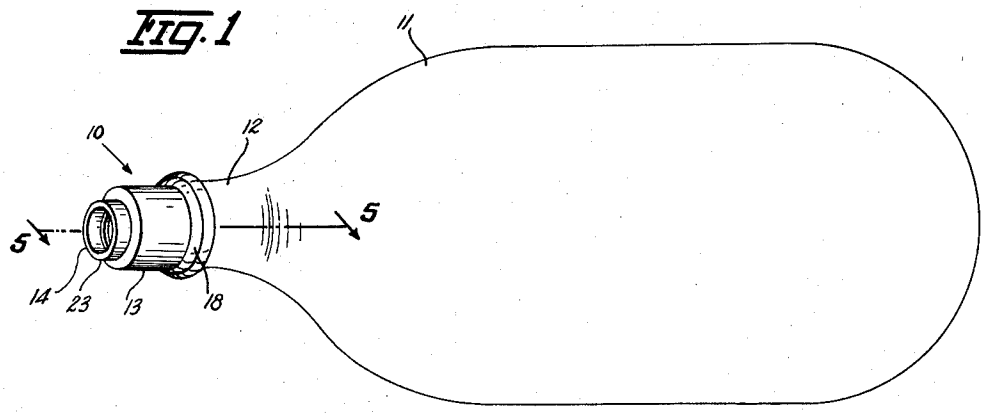


FIG. 2

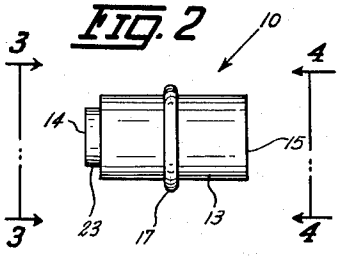


FIG. 3

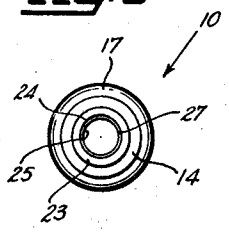


FIG. 4

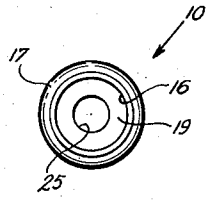
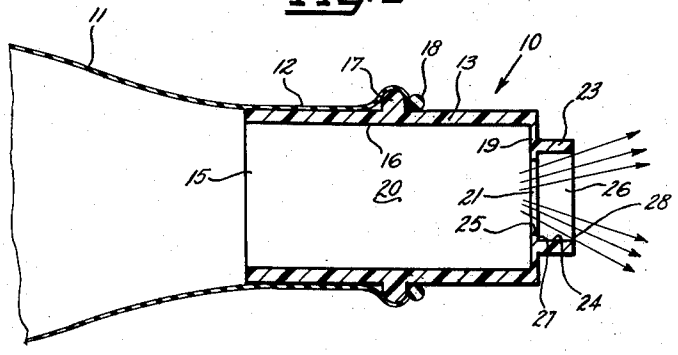


FIG. 5



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United States Patent Office

3,095,669
Patented July 2, 1963

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SOUND EMITTING DEVICE

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Original application Jan. 8, 1960, Ser. No. 1,330, now Patent No. 3,025,634, dated Mar. 20, 1962. Divided and this application Jan. 31, 1962, Ser. No. 170,074

2 Claims. (Cl. 46—179)

This invention relates generally to sound emission means and particularly to an inexpensive and simple air operated whistle.

It is an object of this invention to provide an improved device for emitting sound.

Another object of this invention is to provide an improved construction for air whistles.

Yet another object of this invention is to provide an improved whistle adapted for use as a toy in combination with a balloon.

A further object of this invention is to provide a structure capable of attaining the above designated objectives which is simple, economical, effective and can be of an integral construction.

These objects and other features and advantages of this invention will readily appear from the following description and the accompanying drawings, wherein:

FIG. 1 is a perspective view of the whistle of this invention, shown in assembly relation with an inflated balloon;

FIG. 2 is a side elevational view of the whistle;

FIG. 3 is an end elevational view taken along the line 3—3 in FIG. 2;

FIG. 4 is an end elevational view taken along the line 4—4 in FIG. 2; and

FIG. 5 is an enlarged fragmentary, cross sectional view taken along the line 5—5 in FIG. 1.

This is a divisional application of my co-pending application filed January 8, 1960, Serial No. 1,330.

Referring now to the drawing, the whistle of this invention is indicated generally at **10** in FIG. 1, and is shown assembled with a conventional balloon **11** having a neck portion **12** for gripping the whistle **10**. The balloon **11** shown herein inflates to approximately five inches in diameter, twenty-four inches in length, and has a wall thickness of approximately 0.011 inch.

The whistle **10** is of a hard plastic material and comprises a tubular element **13** (FIG. 2) open at both ends **14** and **15**. The inner surface **16** (FIG. 5) of the element **13** is smooth and forms the wall of an elongated circular chamber **20**.

A circumferential ring **17** is formed externally about the element **13**, and is utilized to help anchor the neck portion **12** of the balloon. Referring to FIG. 5, the bead **18** of the balloon neck portion **12** is shown as properly placed on the side of the ring **17** opposite the side next to the remainder of the balloon. By this arrangement, the neck portion **12** retains a secure grip on the whistle **10** after inflation of the balloon **11** and during deflation thereof.

The end **15** of the whistle **10**, extended within the balloon **11** when assembled, is completely open and devoid of obstacles to the flow of fluid, such as air, under pressure therethrough. Conversely, the opposite end **14** is provided with a wall **19** (FIGS. 4 and 5) both sides of which extend across and at right angles to the longitudinal axis of the tubular element **13**.

Centrally of the wall **19**, an opening **21** (FIG. 5) is formed which is concentric with the longitudinal axis of the element **13**, and the surface **25** of which extends parallel to the longitudinal axis of the element **13**. The opening **21** is depicted as being circular in cross section,

which is the preferred construction. However, it has been found that an opening polygonal in cross section can be utilized at this location. The diameter of the circular opening **21**, or the mean diameter of the polygonal-type opening **21** as the case may be, is less than the diameter of the chamber **20** formed within the tubular element **13**.

Extended outwardly of the wall **19** is a circular enclosure **23** (FIGS. 2 and 3) having a smooth, inner surface **24** which forms a circular opening **26** contiguous to the opening **21**. The inner surface **24** extends in a direction parallel to the longitudinal axis of the element **13** and has a length approximately one-half the diameter of the opening **21**.

Although the opening **26** is depicted as being circular in cross section, and which construction is preferred, it has been found that the opening **26** can be of a polygonal shape in cross section. The diameter of the opening **26**, or the mean diameter of the polygonal-type opening **26**, as the case may be, is slightly more than the diameter of the opening **21**. Due to this dimensional difference, a shoulder **27** is formed between the openings **21** and **26**, the plane of the shoulder extending perpendicular to the longitudinal axis of the opening **26**. Both openings **21** and **26** are concentric with each other and with the circular chamber **20** within the element **13**.

The whistle **10** is of a size such that a child can place his lips about the circular enclosure **23** and against the outer side of the wall **19**. He can then blow air through the opening **26**, the smaller opening **21**, and into the chamber **20**. As the chamber **20** is open at the end **15** (FIG. 5), the air will pass through the chamber **20** and out the open end **15**.

One physical embodiment of the whistle has an over-all length of 1.265 inches, and an outer diameter of 0.667 inch for the tubular element **13**. The diameter of the chamber **20** is 0.567 inch and its length is 1.094 inches. The diameter of the inner opening **21** is 0.280 inch, and the diameter of the outer opening **26** is 0.320 inch–0.040 inch greater than the diameter of the inner opening **21**. The length of the inner surface **24** for the enclosure **23** is 0.140 inch, which is one-half the diameter of 0.280 inch for the opening **21**.

It has been found that the ratio of two to one between the diameter of the opening **21** and the length of the inner surface **24** produces the most effective whistle. A tolerance of plus or minus 0.008 inch can be had for the length of 0.140 inch of the enclosure inner surface **24**. Also, the radius of the outer opening **26** can vary from 0.020 to 0.025 inch more than the radius of the inner opening **21**. Putting it another way, the radial width of the shoulder **27** has a tolerance factor which causes the whistle effect to be reduced in effectiveness if the width is reduced much under 0.020 inch, or increased substantially over 0.025 inch.

In use, the balloon neck portion **12** is stretched about the ring **17** of the whistle **10** as best shown in FIG. 5. The whistle **10** is then placed to the lips as described hereinbefore, and air is blown through the whistle and into the balloon **11**. The balloon then becomes inflated as shown in FIG. 1. So long as the mouth or other object is held over the opening **26**, the air is under pressure within the balloon **11** and also within the chamber **20**. The whistle **10** itself acts as a tank.

Upon withdrawal of the mouth, the air under pressure rushes out of the balloon **11** through the whistle **10**. Should the whistle be held stationary, the balloon will deflate, accompanied by a piercing sound having a whistle effect which decreases in pitch and loudness. If, however, the whistle is not held but is released, the outrushing air in addition to providing a whistle-like sound, also has a sufficient thrust of a jet-like effect to force the balloon-

and-whistle combination into the air in a manner simulating a rocket.

When the air under pressure within the whistle **10** passes through the inner opening **21**, the air diverges, as indicated by the arrows in FIG. 5, due to the increased diameter of the outer opening **26**. In so doing, the diverging air impinges upon the circular inner edge **28** of the outer end of the enclosure **23**, whereupon the air is slit or pierced as by a reed. The result is a shrill sound, the loudness of which depends upon the pressure of the air within the whistle **10** and the balloon **11**.

In summation, an extremely simple and inexpensive sound emitting device is provided, which can be used for example as a toy whistle for use with a balloon or other means for forcing a fluid such as air through the whistle.

Although a preferred embodiment of the invention has been disclosed herein, it is to be remembered that various modifications and alterations can be made thereto within the scope of the invention as defined in the appended claims.

I claim:

1. A whistle comprising:

(*a*) a tubular body member including

(*b*) a pair of tubular sections, with one of said sections having a bore of a reduced diameter and of a shorter length relative to the bore and length of the other of said sections, and

(*c*) an annular shoulder at the junction of said bores projected inwardly of the bore of said one section so as to form an opening at said junction having a diameter smaller than the diameter of the bore of said one section.

2. A whistle comprising:

(*a*) a tubular body member having a bore open at one end thereof, and a wall at the other end thereof formed with an opening in axial alignment with said bore, and

(*b*) a tubular extension secured to said wall and projected outwardly therefrom in axial alignment with said bore, said extension being of a shorter length than said body member and formed with a bore having a diameter smaller than the diameter of the bore of said body member and larger than the diameter of said opening.

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