Nov. 15, 1960 R. L. GAUSEWITZ 2,959,889

TOY EMBODYING WHISTLE OPERATED BY GRAVITATIONAL OUTFLOW OF WATER WHILE THE TOY IS IN THE AIR

Filed March 11, 1960 4 Sheets-Sheet 1

Fig. 1.

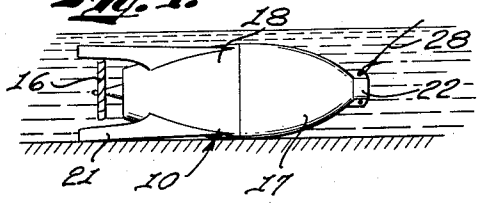


Fig. 2.

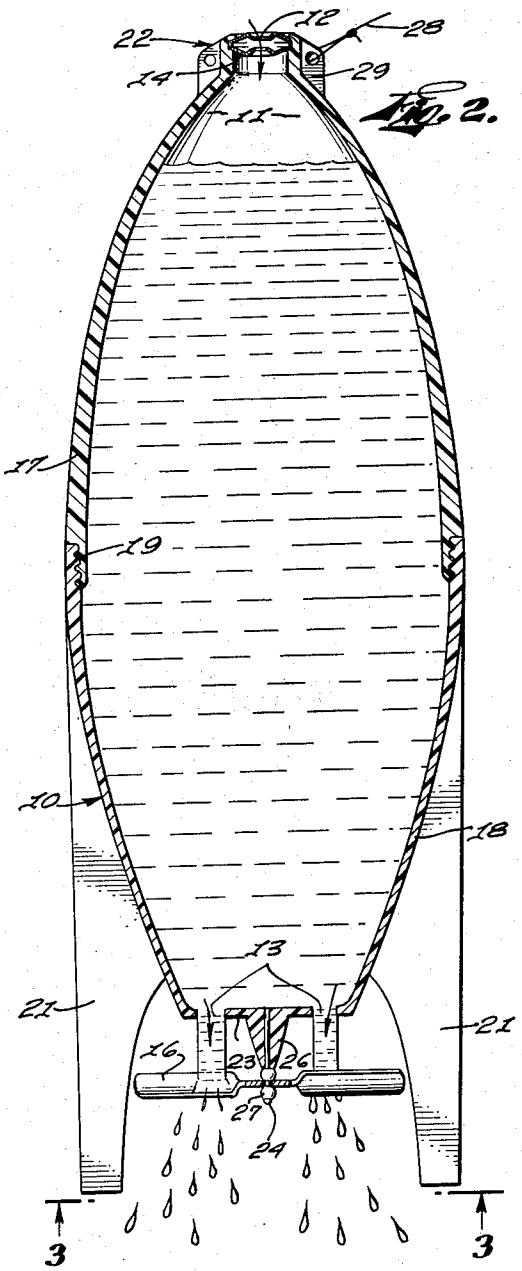


Fig. 3.

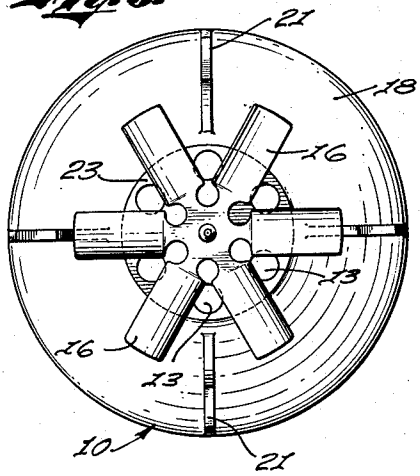
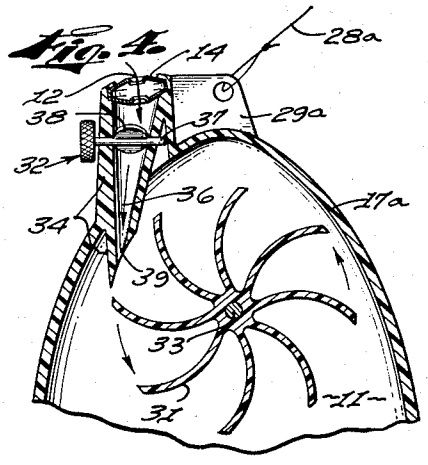


Fig. 4.



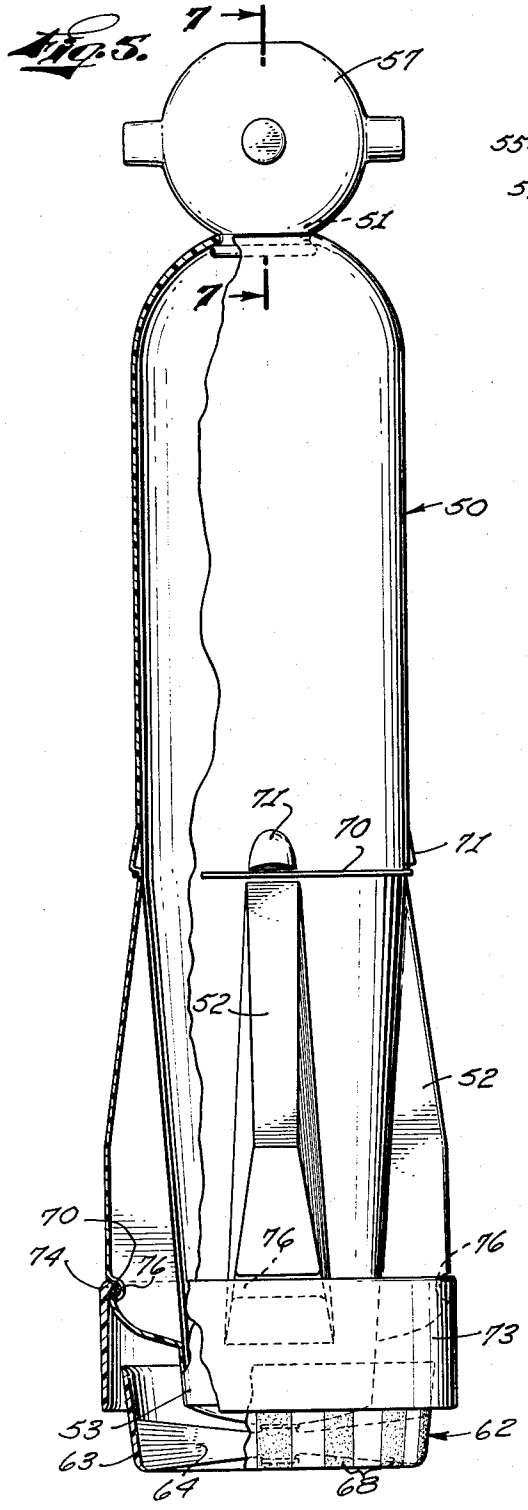
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Fig. 5.



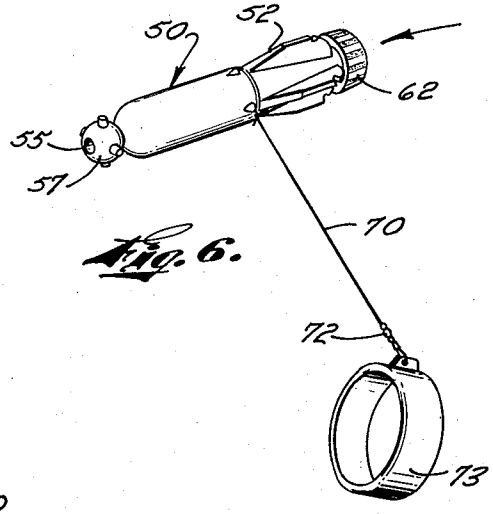


Fig. 6.

Fig. 7.

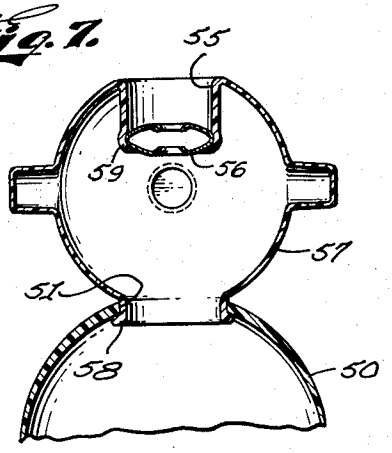
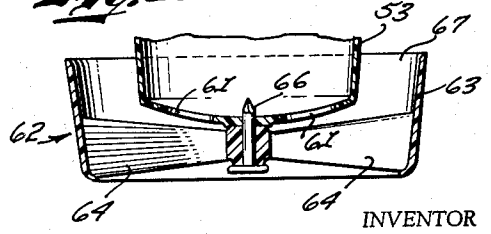


Fig. 8.



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Fig. 9.

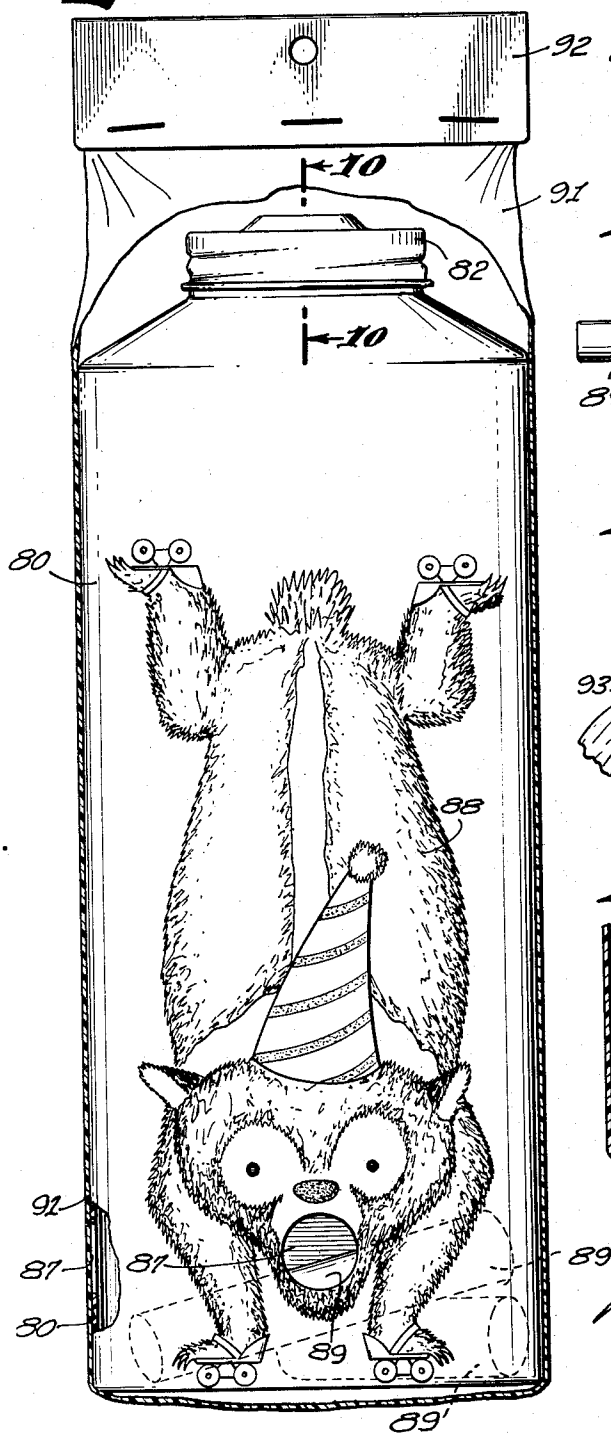


Fig. 10.

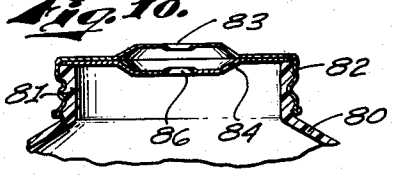


Fig. 11.

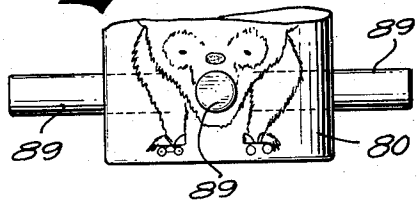


Fig. 12.

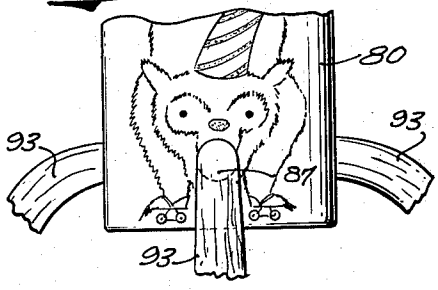
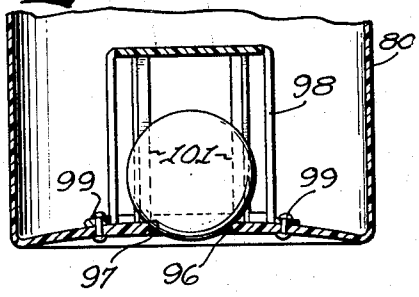


Fig. 13.



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Fig. 14.

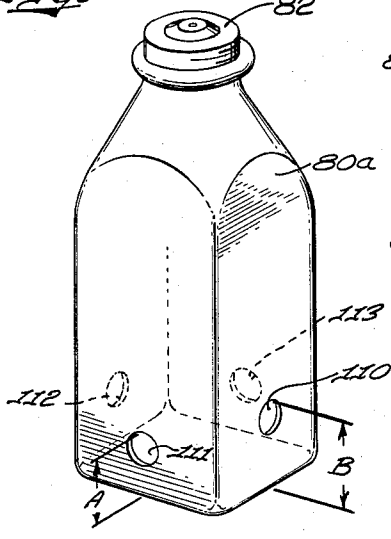


Fig. 15.

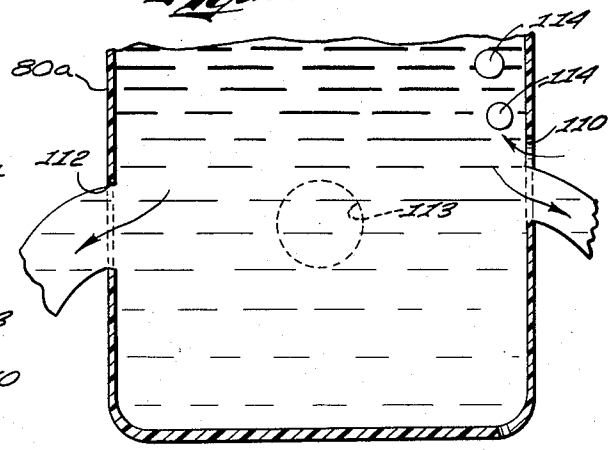


Fig. 16.

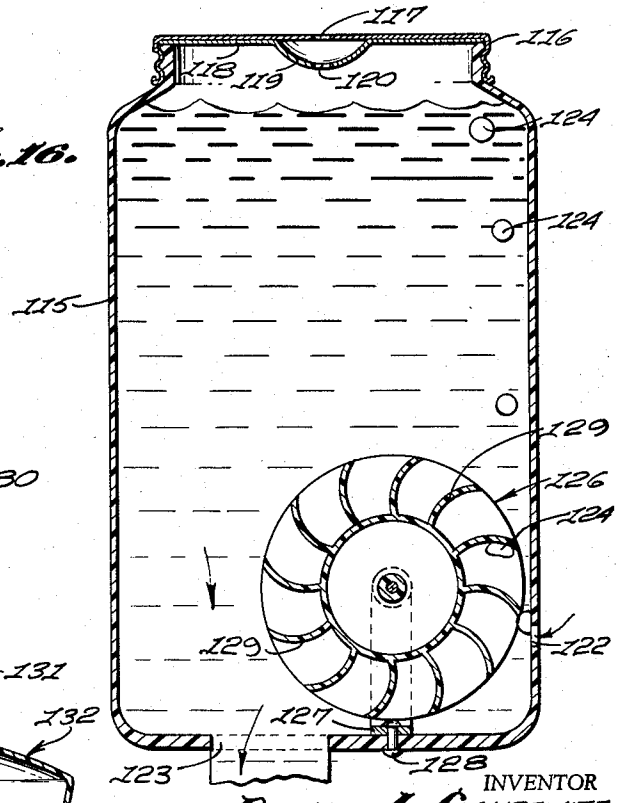
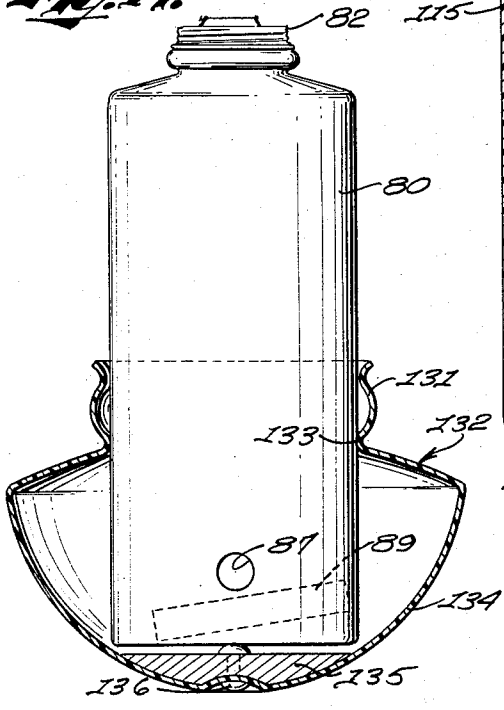


Fig. 17.



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2,959,889

TOY EMBODYING WHISTLE OPERATED BY GRAVITATIONAL OUTFLOW OF WATER WHILE THE TOY IS IN THE AIR

Richard L. Gausewitz, 11832 Halyard Lane, Orange, Calif.

Filed Mar. 11, 1960, Ser. No. 14,481

24 Claims. (Cl. 46—41)

This invention relates to a toy, and more particularly to a whistling toy adapted to be played with by a child in a play pool or bath tub, and also on land and in the air. This application is a continuation-in-part of my co-pending application Serial No. 840,469, filed September 16, 1959 for Toy Embodying Whistle Operated by Gravitational Outflow of Water While the Toy is in the Air, now abandoned. Said application is a continuation-in-part of my co-pending application, Serial No. 755,496, filed August 18, 1958, for a Water Toy, now abandoned.

An object of the invention is to provide a toy incorporating a two-way whistle which operates automatically, and for a substantial period of time, in response to outflow of water from the toy even after the toy has been lifted completely from a body of water.

Another object of the invention is to provide a whistling toy which need have no moving parts yet which will produce a warbling canary-whistle sound.

A further object is to provide a toy having whistle means which sounds in response to water flow, in response to movement of the toy through the air, and in response to squeezing of the toy.

A further object is to provide a whistling toy having movable means which moves in response to travel of the toy beneath or on the surface of a body of water, in response to discharge of water from the toy, and in response to travel of the toy through the air.

Another object is to provide an automatic whistling toy which need have no moving parts and which is highly economical to mass produce, yet which may be played with in a surprisingly large number of ways permitting the child to entertain himself for hours.

A further object is to provide a toy wherein a wheel is caused a rotate by means of a couple consisting of upwardly-moving air bubbles and downwardly-flowing water.

A further object is to provide a combination play bottle and roly poly adapted to whistle upon being assembled or disassembled.

These and other objects and advantages of the invention will be set forth more fully in the following specification and claims, considered in connection with the attached drawings to which they relate.

In the drawings:

Fig. 1 is a side elevation showing a first embodiment of the toy being dragged, as by a string, along the bottom of a play pool or bath tub;

Fig. 2 is a central sectional view illustrating the toy immediately after it has been lifted completely out of the water, nose uppermost, in a rapid "blast-off" operation;

Fig. 3 is an end view taken from station 3—3 indicated in Fig. 2;

Fig. 4 is a fragmentary central sectional view of the nose portion of a second embodiment of the invention, the showing of Fig. 4 being adapted to be substituted for the upper part of the showing of Fig. 2;

Fig. 5 is a view, partly in side elevation and partly in central section, illustrating a third embodiment of the invention wherein means are provided to effect rapid movement of the toy through the air and to effect sounding of the whistle in response to such movement;

Fig. 6 is a schematic view illustrating the toy being whirled in the air at the end of a tether cord or string;

Fig. 7 is a fragmentary sectional view taken on line 7—7 of Fig. 5 and illustrating the air-scoop at the nose portion of the toy;

Fig. 8 is a fragmentary central sectional view taken longitudinally at the tail portion of the toy;

Fig. 9 is a view, primarily in side elevation, illustrating a toy (for babies and pre-school children) constructed in accordance with a fourth embodiment of the invention;

Fig. 10 is a fragmentary vertical sectional view taken on line 10—10 of Fig. 9;

Fig. 11 is a fragmentary elevational view illustrating pegs as partially inserted through the openings in the lower portion of the container;

Fig. 12 is a fragmentary elevational view illustrating water gravitating out through the openings in the lower portion of the container;

Fig. 13 is a fragmentary central sectional view illustrating the lower portion of a fifth embodiment of the invention, wherein means are provided to effect sounding of the whistle due to water flow and also due to squeezing of the container;

Fig. 14 is a perspective view illustrating a sixth embodiment of the invention, wherein one of the openings in the container is disposed at a higher elevation than the others;

Figure 15 is a fragmentary vertical section of the lower portion of the showing of Figure 14;

Figure 16 is a vertical central sectional view of a seventh embodiment, wherein a wheel is turned by a couple consisting of water and air bubbles; and

Figure 17 is a view, partly in vertical section and partly in side elevation, showing an eighth embodiment wherein the play bottle is combined with a roly poly in such manner that the whistle sounds during assembly and disassembly of the toy.

All embodiments described in the present specification incorporate whistles which operate in response to gravitational discharge of water from a substantially sealed chamber and consequent inflow of air through the whistle into such chamber. Such whistle operation occurs not only when the water-outlet openings are submerged but also after the water-filled toy has been lifted completely out of a body of water. The whistle operation continues for a sufficient period of time, after complete removal of a toy from a body of water, to attract and maintain the interest of a child. The embodiments shown in Figs. 1–8 inclusive, incorporate whistles which produce sustained tones after complete lifting of the toy from the body of water. The embodiments shown in Figs. 9–17 relate to whistles which produce warbling or canary-whistling sounds in response to water outflow after complete lifting of the toy out of a body of water. Various embodiments incorporate additional important features making the toy useful elsewhere than in conjunction with a body of water, namely on land and in the air.

Embodiment of Figs. 1–3 inclusive

Proceeding first to a description of the embodiment shown in Figures 1–3, the invention is illustrated as embodied in a science-fiction type toy shaped to resemble a torpedo, missile, rocket or submarine. The embodiment of Figures 1–3 may be constructed entirely of opaque plastic such as polyethylene, or of transparent

plastic such as polystyrene, except for certain small and highly inexpensive elements to be indicated hereinafter.

The apparatus illustrated in Figures 1–3 includes wall means **10** to define an elongated substantially sealed chamber **11** having air-inlet means **12** at one end and water-outlet means **13** at the other. The terms "air-inlet" and "water-outlet" relate to operation of the toy after the chamber **11** has been filled with water, it being understood that during filling the openings **12** and **13** may serve as inlets for water, or as outlets for air, etc. Noise-making means **14** are provided to make a child-entertaining noise in response to flow of air through inlet **12** as the result of flow of water through outlet **13**, and eye-catching movable means **16** are provided for movement in response to outflow of water and also in response to movement of the toy through a body of fluid.

Stated more definitely, the wall means **10** comprises a tapered nose section **17** and a tail section **18** which are suitably connected together at their open ends as by a threaded joint **19** or other suitable joint. Nose section **17** is shown as converging upwardly in Figure 2, whereas tail section **18** converges downwardly. The tail section **18** is provided with four fins **21** which extend downwardly for a substantial distance below the bottom of chamber **11**, so that they may serve as a stand to support the toy in upright or "blast-off" position on the bottom of a play pool or bath tub.

The air-inlet means **12** is shown as comprising the central openings in a whistle element which forms the noise-making means **14**. The whistle **14** is suitably press-fit or otherwise secured in an axial tubular extension **22** of nose **17**, and is illustrated to comprise a pair of opposed frustoconical thin metal discs which are connected at their outer edges (to define a chamber therebetween) and have the air openings **12** at their centers.

The water-outlet means **13** is illustrated in Figures 2 and 3 as comprising a plurality (illustrated as six in number) of circumferentially-spaced circular openings formed in the radial lower-end wall **23** of chamber **11**. The eye-catching movable means **16** is shown as comprising a propeller, rotor or water wheel which may be formed of plastic, sheet metal, etc. The wheel **16** is rotatably mounted beneath wall **23**, and radially inwardly of fins **21**, as by an axle pin **24** which is press-fit, axially of the toy, into a tail extension **26** formed on wall **23**. Suitable means, such as beads **27**, may be provided to reduce friction and permit maximum rotation of the propeller or wheel **16**. A bushing, not shown, may be provided to prevent the wheel from tipping and binding relative to the axle pin.

The propeller **16** is shown as having six circumferentially-spaced blades which are canted in order that rapid rotation of the propeller will be effected as a result of gravitational downflow of water through the openings **13** disposed above the blades. The water gravitates downwardly through the openings **13** in fast-moving solid cylindrical streams which engage the upper surfaces of the blades and effect rapid rotation of the propeller. Such propeller rotation causes the water to be broken up and to fan outwardly in a manner simulating the tail or wake of a rocket.

The illustrated propeller or water wheel **16** has a substantially larger diameter than the lower end portion of wall means **10**, and is preferably spaced a substantial distance below the radial wall **23**. The result is that the propeller **16** will also spin rapidly when the toy is drawn through the water either in a submerged condition as shown in Figure 1, or in a partially floating and partially submerged condition as when there is substantial air in the chamber **11**. Such drawing may be effected by a child pulling on a string **28** which is tied to a fin **29** associated with nose extension **22**. It may also be effected by a child who merely clasps his hands around the wall means **10**. As will be stated in connection with the embodiment of Figures 5–8, propeller **16** also turns when the toy moves rapidly through the air.

When the toy is drawn along the vessel (such as a play pool) in a fully submerged condition as shown in Figure 1, as when chamber **11** is substantially completely filled with water, the fins **21** act as skids and prevent or minimize rotation of the toy about its longitudinal axis. Furthermore, the fins **21** prevent the propeller **16** from engaging the walls of the vessel and thereby being prevented from rotating or being damaged.

It is within the scope of the invention to provide a transparent water (or air) scoop around wheel **16**, thereby making it unnecessary to make propeller **16** of larger diameter than wall **23**.

There is an important correlation between the size of air-inlet means **12**, the size and location of water-outlet means **13**, and the size and general shape of chamber **11**. Such correlation is best discovered by empirical methods, since applicant has not yet been able to discover any mathematical formula for it. The factors entering into the correlation include the following:

(1) The combined area of outlets **13** should be sufficiently greater than the area of inlet **12** that the whistle **14** will blow in response to gravitational outflow of water from chamber **11** through outlets **13**. On the other hand, the combined area of outlets **13** should be sufficiently small, relative to inlet **12** and to the chamber **11**, that whistling will continue for a substantial period of time after complete rapid lifting of the water-filled toy (nose up) out of a surrounding body of water. This sub-paragraph applies to all embodiments of the invention.

(2) The size and shape of chamber **11** should be correlated, relative to inlet **12** and outlets **13**, in such manner that there is sufficient head and volume of water to effect rotation of propeller **16** both while the entire toy is in the air and while the propeller **16** is submerged beneath in water. The size and shape of chamber **11** must be adapted to result in sufficient inflow of air through whistle **14** that the whistle will make a clearly audible whistling noise and thereby entertain the child.

(3) The size of inlet **12** and of outlets **13** should be correlated, relative to each other and to chamber **11**, in such manner that when the toy is lifted (nose-up) completely out of the water, when in filled condition, inflow of air will be through the opening **12** only, and not through openings **13**. Stated otherwise, it is important that water flow out of the outlet openings **13** and that air flow in only through inlet **12**, it being undesirable that the inlet **12** be so small that air must bubble up through the outlets **13** while water is flowing downwardly therethrough. The location of outlets **13** is also highly important in this connection. These outlets should all lie in a single plane, perpendicular to the longitudinal axis of the toy, or else air will tend to be drawn in through the uppermost opening **13** as will be stated relative to Figures 14 and 15. This sub-paragraph applies only to the embodiments of Figures 1–8, inclusive.

(4) The size of inlet **12** and of outlets **13** should be such that the propeller and whistle action may be continuously sustained for a substantial period of time, such as one to fifteen seconds. The water should not dump instantaneously out outlets **13**.

The following is a specific example of a toy which has been extensively tested and found to operate satisfactorily, it being understood that a number of other sizes (for example smaller) may also be employed. The chamber **11** may be generally cylindrical, approximately 11 inches long, and with a diameter of about 3¾ inches. The diameter of air inlet **12**, that is to say of the circular hole in the center of whistle **14**, may be approximately 4 mm. (the over-all whistle diameter being 2 cm.). The water outlet **13** may comprise six circular holes each hav-

ing a diameter of ½ inch, and all lying in a plane perpendicular to the longitudinal axis of the toy.

It is to be understood, particularly relative to subparagraph (3), above, that inflow of air through water outlets **13** is permissible after the water level within the toy has descended until the head of water is small, such as a few inches. As will be described relative to Figures 9–13, the tendency of air to bubble in through openings **13** increases as the head of water decreases.

It is also to be understood that more than one whistle may be employed, with the inlet-opening diameter being adjusted accordingly. For example, whistles or noise-makers having different sounds or pitches may be employed to produce a compound whistling effect.

Let it be assumed that the toy is initially empty of water. The child may then fill it with water in any number of entertaining ways, including the following:

(1) He may rapidly push it downwardly, tail down, into the water to thereby cause rushing of water upwardly through openings **13** and into chamber **11**. This effects blowing of whistle **14** due to the outflow of air therethrough, and also effects spinning of wheel **16** as a result of the rapid downward pushing of the toy into the water. The child may continue such downward pushing until the chamber **11** is substantially completely filled or he may, if desired, alternately push down and pull up to effect alternate inflow of water and outflow of water through openings **13**. The whistle then blows in an in-and-out manner, much like a person whistling, and the propeller **16** spins rapidly in opposite directions.

(2) The child may first let the toy float on the water surface, and gradually sink due to inflow of water through some of the openings **13** and outflow of air through others of the openings **13** and through opening **12**. While the toy is thus floating, the string **28** may be pulled to effect rotation of propeller **16**, it being understood that the tips of some of the blades of the propeller are in the water and that this is sufficient to effect spinning.

After the toy has been completely filled with water in one of the above-mentioned ways, or others, it may rest (or be held) horizontally on the bottom of the play tool or bath tub as shown in Figure 1. A child pulling on the string **28**, or grasping the wall means **10**, may then move the toy forwardly or backwardly and result in spinning of propeller **16** as previously indicated. Of course, the child may also hold the toy off the bottom and move the toy in either direction through the water to result in propeller spinning. The fins **21** provide a stabilizing action when the toy is sliding or skidding on the bottom of the play pool or bath tub, preventing substantial rotation of the toy about its longitudinal axis. Also, as previously indicated, the fins prevent the propeller **16** from engaging the wall of the bath tub, etc. If the plastic is lighter than water, the toy is played with under water by being manually held down.

The toy being substantially filled with water, the child is ready to effect the following types of "blast-off" operations, including what may be termed as (1) "rapid" blast-off and (2) "controlled" blast-off:

(1) For the rapid blast-off operation, the child lifts the top rapidly and completely out of the bath tub, play pool, or other body of water, nose pointed up, so that the propeller **16** is disposed in the air as in Figure 2. This may be accomplished by either lifting on the spring **28** after dragging of the toy along the bottom of the bath tub or play pool, or else by grasping the wall means **10**. As soon as the toy clears the surface of the body of water, the water in chamber **11** gravitates rapidly downwardly through openings **13** in solid tubular streams which impinge against the blades of propeller **16** to effect rapid rotation thereof, such rotation breaking up the water to provide a simulated tail or wake as previously indicated. The rapid gravitational downflow of water causes rapid inflow of air through opening **12** in whistle **14**, causing the whistle to sound a loud noise which decreases progressively in pitch as the amount of water in the chamber **11** diminishes with consequent reduced rate of outflow through openings **13**. This simulates a siren sound or whine to provide entertainment for the child.

(2) For controlled blast-off, the child again lifts the filled toy upwardly, nose pointed up, but this time maintains the openings **13** and propeller **16** beneath the surface of the body of water in the play pool, etc. For example, the lower ends of fins **21** may be set on the bottom of the bath tub or play pool, assuming that the water therein is sufficiently shallow that a major portion of the wall means **10** will be out of the water so that a substantial head of water above the main body of water will be created in the toy. Prior to (or shortly after) standing the toy up in the manner indicated, the child may place his finger over the opening **12** in whistle **14**, thereby preventing outflow of water so that the water level remains constant in chamber **11**. The child may then alternately remove his finger from the opening **12** and place his finger thereon, which effects a controlled starting and stopping both of the whistling noise and of the propeller action, it being understood that the propeller rotation is normally visible beneath the surface of the water.

Embodiment of Figure 4

The embodiment of Figure 4 is identical to the one previously described, except as will be stated, it being understood that the showing of Figure 4 is adapted to be substituted for the upper portion of the showing of Figure 2. In the embodiment of Figure 4, two additional means are provided and include movable means **31** responsive to the inflow of air through opening **12**, and also includes valve means **32** to control such inflow of air. It is to be understood that valve means may also be provided in the embodiment of Figures 1–3 to produce a controlled and stop-and-start action and thus eliminate the necessity for the child to place his finger on and off the opening **12** in whistle **14** during controlled blast-off.

The movable means **31** responsive to inflow of air is illustrated to comprise a low-inertia low-friction air wheel mounted on a shaft **33** for rotation about an axis perpendicular to the longitudinal axis of the toy. The ends of shaft **33** are suitably journalled, in a relatively friction-free manner, in suitable bearing portions (not shown) formed (as by being integrally molded) in the walls of nose section **17***a*. It is pointed out that the nose section **17***a* is formed of a transparent substance, such as polystyrene, in order that rotation of the air wheel **31** will be readily visible.

The vanes or blades of the air wheel **31** are shown as being curved backwardly relatively to the desired direction of rotation of the wheel due to inflow of air through whistle **14**. The whistle is illustrated as mounted in a nozzle section **34** of nose member **17***a*, such section comprising a nozzle passage **36** which converges downwardly from the whistle **14** to a relatively small nozzle opening which is tangential to, and closely adjacent, the tips of the blades or vanes.

The valve means **32** may be of a number of types, and is illustrated to comprise a pin **37** extended through the nozzle section **34** beneath whistle **14**. The pin is adapted to be rotated when a knurled knob at the outer end thereof is turned by the child. A disc **38**, having a diameter corresponding generally to that of nozzle passage **36** at pin **37**, is mounted on the pin in the manner of a damper in a stove pipe. The disc **38** may be formed of resilient plastic material adapted to substantially seal with the walls of the nozzle passage to substantially block air inflow. By turning the knob at the outer end of pin **37**, the child may regulate the air inflow to any rate between full-flow (when the disc **38** is aligned with the axis of nozzle passage **36**) and substantial shut-off

(when the disc is perpendicular to the axis of nozzle passage **36**).

The operation of the embodiment of Figure 4 is identical to that of Figures 1–3, but includes the following additional functions or operations. For either rapid blast-off or controlled blast-off, the air entering through opening **12** flows down nozzle passage **36** and impinges at relatively high velocity against the tip portions of the blades of air wheel **31**, effecting rapid spinning thereof in the direction indicated by the arrows. It is desirable that the passage **36** terminate at the relatively small diameter nozzle opening, numbered **39**, the cross-sectional area of which is on the order of that of opening **12**, so that the air after flowing through the whistle will again increase in velocity and be moving rapidly by the time it impinges against the air wheel. Because the wheel **31** has low inertia and low friction, it will start substantially immediately after air impinges against the same, but its low friction will cause it to continue spinning for a substantial period of time after the air flow ceases.

As previously indicated, the child may control the speed of rotation of air wheel **31**, and start and stop the same, by operating the valve means **32**. The valve means may be omitted, however, and the child instead place his finger on and off the opening **12** in whistle **14** as in the case of the first embodiment. Such regulation of the air wheel **31** is particularly adapted to be effected when the tail portion of the toy is in the water, during "controlled" blast-off.

The embodiment of Figure 4 may also be employed as a whistle, since the child may blow on the whistle **14** to effect spinning of the air wheel **31**.

Embodiment of Figs. 5–8, inclusive

Figs. 5–8 relate to an embodiment which incorporates most of the features of the embodiment of Figs. 1–3 and is, additionally, adapted to result in a whistle noise, and in spinning of the movable tail element, upon rapid movement of the toy through the air.

The toy comprises an elongated body or container **50** having a relatively large-diameter nose opening **51**. The tail portion of body **50** is downwardly convergent and is provided with hollow fins **52**. The lower part of the tail is integral with a relatively small-diameter tail cup **53** which extends downwardly below the fins. The body **50**, fins **52** and tail cup **53** are formed integral, of thin-walled regular polyethylene, by a blow-molding process such as is employed in the manufacture of squeeze bottles. The body is therefore sealed and unbreakable, and is sufficiently light in weight that it will not harm a child struck by the toy while it moves rapidly in the air.

Air-scoop means **55** are provided axially in the nose portion of the toy, and in communication with opening **51**, to result in forced flow of air in through the whistle **56** and thence out through the tail openings when the toy is moved rapidly through the air. The illustrated air-scoop means **55** comprises a generally cylindrical or frustoconical tube which is mounted coaxially with the the nose opening **51** and with the axis of body **50**. More specifically, the tube or air-scoop **55** is formed integral with a generally spherical "satellite" **57** which is formed, by slush molding techniques, of vinyl plastic or latex rubber. Satellite **57** has a neck portion **58** which is provided with a lip and which is adapted to be snapped in through the nose opening **51** to cause the satellite to remain in mounted position. Neck portion **58** and the wall of nose opening **51** cooperate to provide a seal preventing substantial inflow of air except through the whistle **56**. Whistle **56** may be merely pushed into the air-scoop tube **55** and seated on the restricted lower end **59** thereof.

The tail cup portion **53** of body **50** is, as shown in Figure 8, provided with a plurality of water-outlet openings **61** which correspond to openings **13** of the previous embodiment. A movable means, in the form of a generally cup-shaped tail element **62**, is rotatably mounted coaxially of body **50**. The element **62** has a generally cylindrical side wall **63** the rim portion of which is concentric with, but spaced outwardly a substantial distance from, the cylindrical wall of tail cup portion **53** of body **50**.

The bottom of element **62** has a plurality of blades or vanes **64** formed integrally therein as by injection molding. Such blades or vanes may correspond to the previously described blades **16** except that they are preferably formed of plastic and integrally with the side wall **63**. A nail **66** is inserted loosely through the hub for the blades and is press-fit into the axis of tail cup **53**, the relationship being such that the element **62** may rotate freely on the nail **66**. Suitable bushing and friction-reducing means may be provided.

The annulus **67** between the cylindrical wall of body portion **53** and the side wall **63** permits inflow of air or water when the toy is moved forwardly. Such air or water flows through the blades **64** to effect rapid rotation of the element **62**. The rim portion of side wall **63** is disposed beneath the ends of fins **52**, and is located radially-inwardly of the outer edges of the fins.

It is highly desirable that the element **62** be formed of yellow plastic and painted with red vertical stripes **68** (Fig. 5), so that the side wall **63** is alternately red and yellow. With such construction, the color of the tail element changes to orange during rapid rotation thereof. It is also desirable that an oblique or single-turn helix (not shown) be painted in red on the side wall **63** to provide an effect simulating that of a barber pole when the tail element rotates more slowly. When the tail element changes color to orange, it simulates flame emerging from the tail of a rocket.

A string or tether cord **70** is securely attached to body **50** at the balance point of the body, satellite **57** and tail element **62**. In the illustrated form, the string is attached by being tied around the body **50** forwardly of the fins and rearwardly of suitable protuberances **71** molded into the body. By "balance point," it is meant that, when string **70** is extended vertically upwardly, the body **50** (having satellite **57** and tail element **62** mounted thereon, but in the absence of the handle element to be described subsequently) will be horizontal.

The cord **70** may have a length of approximately five feet. It is connected through a swivel **72** (Figure 6) to a short tubular handle **73** having an internal lip or flange **74** (Figure 5) formed integrally at one end. Flange **74** is adapted to seat in grooves, notches or recesses **76** formed on each fin **52** relatively adjacent tail element **62**. Notches **76** are sufficiently deep that the flange **74** may be snapped therein even after the tether cord **70** has been wound therein around the fins, with the fins serving as a reel. The short tubular handle **73** is sufficiently long that it laps over the rim of rotating tail element **62**, as shown in Fig. 5, and hides the annulus **67** from view.

When the toy is operated in water, the tether cord **70** is reeled on tail fins **52** in notches or recesses **76**, after which the handle **73** is snapped into position (Fig. 5) at which it prevents the tether cord **70** from unwinding and also conceals the annulus **67**. The result is an overall tail assembly which is highly attractive in the store and when the toy is used in water, and which makes it possible to make the fins **52** by blow-molding processes. Tail element **62** will spin when the toy is moved beneath the water or on the surface of the water, due to water flow through annulus **67** and through blades **64**. The handle **73** shields rotor **62** from the walls of the bath tub or play pool.

Tail element **62** spins when the child "blasts-off" the toy as described in connection with previous embodiments. The water in the toy then discharges from the interior of body **50** through openings **61** and through blades **64**. It is a feature of this and the previous embodiments that

movement of the toy through the water just prior to "blast-off" starts the element **62** spinning, so that the water discharging through openings **61** need merely maintain the element **62** spinning and does not need to overcome starting friction or inertia. The actions of the toy with the element **62** beneath the water and out of the water are thus complementary.

When the child desires to pull the toy through the water on a string, he merely snaps the handle **73** off the tail fins **52** and unwinds the tether cord **70** from recesses **76**. He may then loop or tie the cord **70** around the toy at the junction between satellite **57** and body **50**. The operation is then the same as that effected with the cord **28** of previous embodiments.

When the child desires to move the toy rapidly through the air, he unties the cord **70** from the junction between satellite **57** and body **50**, holds the handle **73** in one hand over his head, and swings the toy in the manner of a lariat. The toy then moves very rapidly through the air in circles around the relatively stationary handle **73**. The rapid movement of the toy through the air causes forced inflow of air through air scoop **55**, through the holes in whistle **56**, through the body of the toy, and thence out the openings **61**. The whistle **56** thus sounds. If it were not for the presence of openings **61**, the air pressure would build up in body **50** and prevent inflow of air and consequent sounding of the whistle.

Movement of the toy through the air also causes air to flow between fins **52** and through annulus **67** to the blades **64**, causing rapid rotation of the tail element **62** so that the color thereof changes from striped red and yellow to orange. The tying of cord **70** to the balance point of body **50** and connected elements, the elongated shape of the toy, the presence of fins **52**, and the dragging tail element **62** cooperate to cause the toy to align itself tangentially to cord **70** and fly in a forward direction in the manner of an actual rocket ship or the like. Should the rapidly moving toy strike a child, the extremely soft satellite **57** acts as a bumper for the body **50**, which is also light and soft as previously stated.

The correlation between whistle **56**, body **50** and openings **61** is the same as described relative to previous embodiments.

Embodiments of Figs. 9–12, inclusive

Referring next to Figures 9–12, an infant's play bottle is illustrated and has a water-operated whistle incorporated in its cap as will be described in detail subsequently. A play bottle is a standard infant's toy, sometimes sold in transparent polyethylene bags and sometimes sold without bags, comprising a squeeze-bottle polyethylene bottle (usually resembling a milk bottle) containing objects such as pegs, clothes pins, spools, etc. A cap is provided and may be formed of plastic or metal, being either of the snap-on or screw variety. The polyethylene is normally transparent in order that the objects inside may be seen by the prospective purchaser and also by the infant. The infant plays with the bottle by removing the cap, dumping out the contents, refilling the bottle, etc.

The present play bottle assembly comprises a transparent polyethylene squeeze-bottle or container **80** having an elongated configuration. The bottle is formed by conventional blow-molding techniques and has a large-diameter threaded mouth **81** (Fig. 10) at its upper end. A sheet-metal cap **82** is threaded over mouth **81** to seal the same except for air-inlet holes which are provided as will next be described.

The cap **82** is converted into a two-way whistle of the disc type, by bulging the central cap portion upwardly and punching a round hole **83** centrally therein. A rust-proof metal disc **84** (Figure 10) is glued beneath the cap **82** and has a corresponding but oppositely bulged central portion provided with a hole **86**. Disc **84**, and the bulge portion of the cap, define the whistle chamber therebetween. The described whistling cap produces whistle sounds both when air flows out from the bottle and when air enters the bottle.

If there were no openings in container or bottle **80**, the assembly would operate as a squeeze-whistle toy in which whistling is produced by squeezing on the bottle and then releasing. In the present toy, at least one water-outlet opening **87** is provided in the lower portion of the side wall of the bottle. In the illustrated embodiment, a hole **87** is located in each ninety degree segment of the lower portion of the bottle. The holes may be formed by punching after the bottle has been blow-molded.

Referring to Fig. 9, it is pointed out that the bottle **80** is printed or silk-screened with a fanciful representation of a bear, clown, monkey, whale, etc., as indicated at **88**. Such fanciful representation of a living creature is so oriented that at least one of the holes **87** will be in the mouth of the bear or clown, spout opening of a whale, etc. The illustrated representation **88** is of a bear standing on its forepaws.

The assembly further comprises a plurality of colored wooden cylindrical pegs **89** which have shapes and sizes corresponding to the bottle openings **87**, so that the pegs may only be inserted through the openings with light press fits. Stated otherwise, each peg **89** is so constructed that it may be pushed into an opening **87** by an infant but will rub sufficiently that the peg will remain in partially inserted position as shown in Fig. 11. A peg when thus partially inserted effects substantial blocking of air flow through the opening. There should be at least as many pegs **89** as there are openings **87**. If desired, some of the openings **87** and pegs **89** may be correspondingly square or triangular, to make the toy into an educational puzzle.

A transparent bag **91**, formed of polyethylene or similar air-impervious film, is mounted fairly snugly around the bottle **80**. The lower end of bag **91** is preferably sealed, and the upper end is stapled (but not sealed) closed during mounting of the conventional bag top **92** which provides a display function. Bag **91** should fit sufficiently snugly around the bottle **80**, adjacent holes **87**, that squeezing of bottle **80** when in the bag will cause the whistling cap to sound.

When an infant plays with the toy on land, after removal from the bag **91**, he will unscrew the cap **82**, dump the pegs **89** through the mouth of the bottle, and then "feed" the pegs to the bear or other living object represented at **88**. The pegs are sufficiently short that they may be inserted entirely into the bottle, so that they will either drop immediately out of the mouth **81** of the bottle if the bottle is held upside down, or may be emptied out subsequently if the bottle is originally in upright position. This process will be repeated by many infants for long periods of time.

The infant may cause the whistle to sound on land, by introducing a peg **89** partially into each of the openings **87**. As previously stated, the pegs remain in partially inserted position because of the light press-fit relationship with the bottle **80**. After all or substantially all of the holes have been thus blocked, and after cap **82** has been screwed into position, squeezing of the bottle creates a whistling noise.

The infant may also sound the whistle by placing his mouth thereon and blowing. This is to be contrasted with conventional squeeze-operated whistles, which may not be blown by an infant with his mouth.

When the toy is used in the bath tub or play pool, the pegs **89** are normally left in the bottle and the cap **82** is screwed tightly thereon. The lower portion of the bottle is then pushed downwardly into the water, causing water to flow in through openings **87** and effect expulsion of air out the whistling cap to sound the whistle. When the bottle is lifted upwardly in the water, water flows out through openings **87** and draws air in through the whistle to sound the same. When a substantially filled bottle is lifted completely and rapidly out of the water, with the cap **82** uppermost, water streams out the openings **87** in

the streams indicated at **93** in Fig. 12. Such outflow of water causes air to be drawn in through the whistle to sound the same. The pegs **89** float up and down in the bottle, at the water level, and provide an entertaining visual effect.

It is an important feature of the present embodiment that the diameter of the smallest one of the whistle openings **83** and **86** is sufficiently small, in comparison with the combined cross-sectional areas of the openings **87** in the lower portion of the bottle, that the whistling noise generated during at least a substantial portion of the time required for water to drain from the filled bottle (after the bottle has been lifted completely out of the water) will simulate the noise made by a canary. Stated otherwise, the whistle opening is made sufficiently small in cross-sectional area that air is forced to bubble in through one or more of openings **87** while water drains from the bottle when the cap is in uppermost position. When each air bubble enters an opening **87**, the degree of partial vacuum within the bottle, and consequently the rate of inflow of air through the whistle openings, are momentarily reduced, the end result being that a warbling sound is generated.

The warbling sound need not occur during the entire time that water flows out a filled bottle. When the head of water is sufficiently great no air will bubble in through openings **87** and the rate of air flow through the whistle will be constant, so that the whistle note is steady as in previous embodiments.

To summarize and augment the statements made in the preceding paragraphs, the cross-sectional area of the whistle opening must be sufficiently small, and the combined cross-sectional areas of openings must be sufficiently large, that air will commence to bubble in through openings **87** when the water level is a substantial distance thereabove. The warbling noise will thereafter continue until the water level descends to approximately the elevation of the openings. The relationship should be such that warbling continues for at least about a second.

The combined cross-sectional areas of holes **87** should not be so large that water will merely dump therethrough in a fraction of a second, resulting in rapid eruption of air as distinguished from bubbling-in of air. The duration of the operation would then be undesirably short, and the whistle would emit a high-frequency staccato chatter instead of a relatively low-frequency and canary-like sustained warble.

The whistle openings should not be so small that the whistle will be undesirably low in volume, with an excessively high pitch.

The above may best be understood by giving specific examples, which are presented by way of illustration and not limitation. Let it be assumed that both whistle openings **83** and **86** are ⅛ inch in diameter and are round. Let it also be assumed that there are four openings **87** in the lower portion of the side wall of bottle **80** and that each opening is round and has a diameter of 5/16 inch. The bottle may have the shape and size of a one-quart milk bottle.

With such parameters, and assuming that the bottle is initially full of water and is in upright position (completely out of the water) with the cap **82** uppermost, water will initially flow out all of the openings **87** in steady streams and will cause drawing-in of air through the whistle openings **83** and **86** at a steady rate to produce a steady note having a descending pitch. When the water level has descended until it is approximately two or three inches above the holes **87**, air will commence to bubble in through one or more of the holes **87** and thereby produce the above-described warbling sound in the whistle.

By reducing the diameters of the whistle openings substantially, for example to 3/32 inch, the warbling can be made to start when the water level is much higher in the bottle. The pitch of the whistle sound is then higher, and the volume lower.

Not the least of the child-entertaining effects produced by the toy is the oscillatory movement of streams **93** after warbling commences, as distinguished from the steady and "stationary" streams which result when no air is bubbling in through openings **87**. As a striking example of this, let it be assumed that all holes **87** are eliminated and replaced by a single opening, in the bottle side wall near the bottom, shaped as a horizontal ellipse having a 1½ inch major axis (horizontal) and a 1 inch minor axis. With the one quart bottle and 3/32 inch whistle openings, the outflowing stream oscillates markedly in a sinusoidal manner. The same action occurs with other parameters as taught herein. This is thought to result from differences in the velocity of water discharge, the velocity increasing after each bubble enters and decreasing prior to the next bubble.

Embodiment of Fig. 13

Referring to Fig. 13, let it be assumed that all of the openings **87** are eliminated and are replaced by a single round opening **96** in the bottom wall of the bottle. The portion of the bottle encompassing opening **96** is suitably formed or machined in such manner as to form a seat **97** lying in a single plane. A suitable cage **98**, formed of polyethylene or the like, is secured by means of rivets **99** to the bottom wall of the bottle. The cage is sufficiently large to contain a spherical float ball **101** and to permit substantial vertical movement of the float ball. Ball **101** may comprise, for example, a Ping-pong ball. The cage is so shaped and positioned that, when the bottle is in upright position, float ball **101** will be seated by gravity on the seat **97**. The diameter of the seat **97** may be such that the area of opening **96** is equal to the combined areas of openings **87** of the previous embodiment.

In the operation of the embodiment of Fig. 13, let it be assumed that the whistling cap is screwed in position and that the bottle is positioned vertically with the cap uppermost. Since the float ball **101** is seated by gravity on seat **97**, squeezing of the bottle effects outflow of air through the whistle to sound the same. Upon release of the walls of the bottle, so that they spring back into shape and draw in air, the whistle will also sound due to inflow of air therethrough. If the float ball is extremely light, such sounding of the whistle upon release of the squeezed bottle will be reduced substantially due to inflow of air through opening **96**. However, if the float ball is relatively heavy, such as one formed of wood, the whistle will also sound relatively loudly when the bottle is released.

When the bottle is pushed down into the water, in vertical position and with the cap uppermost, water will rush in through opening **96** and cause outflow of air through the cap to sound the whistle. After the bottle has been completely or partially filled, and the infant has lifted it out of the water in vertical position with the cap uppermost, the water in the bottle will cause ball **101** to be spaced from seat **97** and float in contact with the upper part of cage **98**. Water may, therefore, discharge through opening **96** to draw in air through the whistle and effect sounding thereof. As soon as substantially all water has run out of the bottle, the ball **101** will be seated by gravity upon seat **97** to again condition the toy for sounding of the whistle by means of squeezing of the bottle. In summary, therefore, the present embodiment provides a means for automatically conditioning the toy for whistling as a result of squeezing and for whistling as a result of water flow, without the necessity for manually blocking openings as with the pegs **89** or the bag **91**. A small hole may be provided, as will be described relative to Figure 16, to cause a warbling whistle action. Such hole is so small that it does not interfere with sounding of the whistle due to squeezing of the bottle.

Embodiment of Figures 14 and 15

Figures 14 and 15 illustrate an embodiment wherein one of the holes **110** in container **80***a* is disposed at a substantially higher elevation than that of the other holes **111—113** therein. Stated otherwise, each hole **111—113** is spaced from the bottom of the container by a distance "A" which is substantially less than the distance "B" by which hole **110** is separated from the container bottom.

For a one-quart bottle **80***a* having three 5/8 inch holes **111—113** disposed in the same plane, and one 5/8 inch hole **110** disposed at an elevation 1/2 inch higher, the warble action will commence when the bottle is substantially full, instead of being delayed until the water level has descended to a few inches above the openings (as described relative to Figures 9–12). This assumes that the whistle **82** of Figure 14 is identical to the one of Figures 9 and 10, having 1/8 inch round holes.

The reason for the greatly extended warbling period, resulting from raising one of the holes, is not understood. It is clear, however, that all air bubbles in through only one hole, namely the uppermost hole **110**. This is indicated at **114** in Figure 15. The warbling action is so much more readily achieved that the bottle will warble satisfactorily even if the seal around cap **82** is not perfect. Furthermore, a warbling action will result even though the diameters of openings **110—113** are reduced substantially.

The above facts indicate that for a rocket ship or other toy (Figures 1–8) in which warbling is not appropriate, all openings in the container should be disposed at the same elevation. On the other hand, where warbling is desired at least one opening (or portion thereof) should be located at an elevation substantially higher than the others.

Embodiment of Figure 16

Figure 16 illustrates a substantially transparent polyethylene bottle or jar **115**, of about one-quart size, having a wide mouth adapted to threadedly and sealingly receive a metal screw cap **116**. Cap **116** has a small round hole **117** in its center, the diameter of such hole being on the order of 1/8 inch. A metal disc **118** having a hemispherical center portion **119** is glued or otherwise suitably secured to the underside of cap **116**, such center portion having an axial hole **120** also about 1/8 inch in diameter. The result is an economically-constructed whistle which does not require deformation of the cap, and which will readily clean itself of water after being submerged therein. A corresponding but smaller whistle of this type may be employed in place of whistle cap **82** previously described.

A small round hole **122**, having a diameter on the order of 1/4 inch, is provided in the side wall of container **115** in spaced relation above the bottom thereof. A much larger round hole **123** is formed through the container bottom, having a diameter on the order of one inch. The described construction produces a warbling whistle action, and all air bubbles in through hole **122** as indicated at **124**. If desired, a peg may be provided having a diameter corresponding to that of hole **123**. Such peg may be employed to block the hole **123**, so that the whistle will blow when the empty container is squeezed.

A wheel **126** is rotatably mounted on a U-shaped bearing bracket **127**, for substantially frictionless rotation about a horizontal axis. Bearing bracket **127** may be riveted to the container bottom, as indicated at **128**. The wheel **126** comprises a large number of buckets **129** the sides of which are closed by discs glued to opposite sides of the wheel. The wheel is so located that the buckets are inverted when adjacent hole **122**, but are mouth-up when over hole **123**.

The above construction results in a couple, one portion of which is formed by water discharging downwardly through hole **123**. The other portion of the couple is

formed by the air bubbles **124** which act upwardly on the inverted buckets **129**. The wheel **126** thus rotates, and may be suitably decorated or may be employed to drive a child-entertaining object or device. Wheel **126** may be employed in the same toy as the wheel **31** described relative to Figure 4 of the drawings.

Embodiment of Figure 17

Figure 17 shows a cylindrical bottle **80** which may be identical to the one described with reference to Figures 9–12. Such bottle is slidably inserted through the round neck **131** of a blow-molded polyethylene container **132**. Such neck has an annular seal portion **133** adapted to brush against the wall of bottle **80** and form a substantial seal.

The lower portion of container **132** is a hemisphere **134** having a weight **135** mounted at the pole thereof, as by a rivet **136**. The weight **135** is sufficiently heavy that the assembled bottle **80** and container **132** may not tip over, so that a roly-poly action results.

Not only does the toy operate as a roly-poly, but the whistle **82** sounds every time the bottle **80** is inserted into or withdrawn from neck **131**. Such whistling is due to piston action, the displaced air being forced through openings **87** to sound the whistle. The weight **135** additionally serves to hold the container **132** down while the bottle **80** is being lifted therefrom.

The container **132** may be made thin and soft, or formed with soft bulges, so that it will deform and air will be forced through holes **87** to sound whistle **82** each time the toy rocks back and forth during roly-poly operation.

It is to be understood that in all embodiments of the toy, the container is sufficiently light that a child may lift it from the water even when it is filled with water.

In order to prevent the water from merely dumping substantially instantaneously from the rocket ship or play bottle after it has been lifted completely above the surface of the external body of water, the combined cross-sectional areas of the water-outlet openings should be very much less than the average horizontal cross-sectional area of the container. Thus, for example, it would be totally unsatisfactory if the entire bottom wall of play bottle container **80** were removed. There would be no warble whistle action, but only a very brief high-frequency staccato chatter upon rapid lifting of the toy from the water. Even if such a construction did result in a warble action, it would be excessively short and would not satisfy the requirements set forth above.

It is also to be understood that this specification, and all claims, are to be considered as restricted to flow of water due to gravitational forces only. No substantial centrifugal forces, forces due to air pressure, suction, etc., are involved insofar as the water flow out the water-outlet openings is concerned. Such gravitational water flow creates non-gravitational forces which move air in through the whistle, namely a partial vacuum in the upper end of the chamber. Also, when the toy is shoved into the water, tail down, an elevated pressure is created in the upper end of the chamber.

Various embodiments of the present invention, in addition to what has been illustrated and described in detail, may be employed without departing from the scope of the accompanying claims.

I claim:

1. In a noise-making water toy, wall means to define a substantially sealed chamber, said wall means being sufficiently light in weight and small in size to be readily and bodily lifted by a child even when said chamber is full of water, air-inlet means for admitting air into said chamber from the ambient atmosphere, noise-making means responsive to a predetermined rate of inflow of air into said chamber from the ambient atmosphere through said air-inlet means for making a child-entertaining noise, and water-outlet means larger than said air-inlet means for discharging water from said chamber into an external

body of water and thereby creating a partial vacuum resulting in inflow of air into said chamber through said air-inlet means, said water-outlet means being sufficiently larger than said air-inlet means to discharge water from said chamber at a rate at least sufficient to effect said predetermined rate of air inflow through said air-inlet means, said chamber being sufficiently large and said water-outlet means being sufficiently small that a substantial period of time is required to empty said chamber of water after the water-filled toy is lifted rapidly, bodily and completely above the suface of said external body of water, whereby said child-entertaining noise continues for said substantial period of time after said lifting of said toy from said external body of water.

2. The invention as claimed in claim 1, in which said water-outlet means is so located and proportioned relative to said air-inlet means that no air bubbles in through said water-outlet means during at least a major portion of the time required to empty said chamber of water after the water-filled toy is lifted completely out of said external body of water with said water-outlet means beneath said air-inlet means.

3. The invention as claimed in claim 1, in which said water-outlet means is so located and proportioned relative to said air-inlet means that air bubbles into said chamber through at least a portion of said water-outlet means and at relatively low frequency during at least a major portion of the time required to empty said chamber of water after the water-filled toy is lifted completely out of said external body of water with said water-outlet means beneath said air-inlet means, whereby the rate of air inflow through said air-inlet means if varied correspondingly to the bubbles to vary the noise produced by said noise-making means.

4. A water toy adapted to whistle automatically for a substantial period of time after the water-filled toy has been lifted rapidly and completely above the surface of an external body of water such as may be contained in a bath tub or play pool; said toy comprising wall means to define a substantially sealed chamber, said wall means being sufficiently light in weight and small in size to be readily and bodily lifted by a child even when said chamber is full of water, said wall means having air-inlet means in the upper portion thereof for admitting air into said chamber from the ambient atmosphere, said wall means having water-outlet means in the lower portion thereof for discharging water from said chamber into said external body of water due to the force of gravity, said water-outlet means being larger than said air-inlet means, and whistle means responsive to a predetermined rate of inflow of air into said chamber from the ambient atmosphere through said air-inlet means for making a whistling sound, said water-outlet means having an area much smaller than the average cross-sectional area of said chamber whereby a substantial period of time is required to empty said chamber of water through said water-outlet means after the water-filled toy has been lifted rapidly and completely above the surface of said external body of water, said chamber and said water-outlet means being sufficiently large that gravitational discharge of water from said chamber through said water-outlet means and after lifting of the water-filled toy completely above the surface of said external body of water creates a partial vacuum in said chamber effecting drawing in of air through said air-inlet means at least at said predetermined rate resulting in sounding of said whistle means, said water-outlet means having an area sufficiently larger than the area of said air-inlet means to discharge water from said chamber at least at said predetermined rate sufficient to effect sounding of said whistle means.

5. The invention as claimed in claim 4, in which said wall means is vertically elongated and has said air-inlet means in the upper end portion thereof and said water-outlet means in the lower end portion thereof, in which said water-outlet means is disposed substantially in a single plane perpendicular to the longitudinal axis of said wall means, and in which the size of said water-outlet means is such that no air bubbles in through said water-outlet means during at least the major portion of the time required to empty said chamber of water when the water-filled toy is disposed vertically and said water-outlet means is beneath said air-inlet means and above the surface of said external body of water.

6. The invention as claimed in claim 4, in which said wall means is vertically elongated and has said air-inlet means in the upper end portion thereof and said water-outlet means in the lower end portion thereof, in which a minor portion of said water-outlet means is disposed substantially closer to said air-inlet means than is the major portion of said water-outlet means, and in which the size of said water-outlet means is such that air bubbles in at relatively low frequency through said minor portion of said water-outlet means during at least the major portion of the time required to empty said chamber of water when the water-filled toy is disposed vertically and said water-outlet means is beneath said air-inlet means and above the surface of said external body of water, whereby said whistle means is caused to warble.

7. A toy, which comprises wall means to define a substantially sealed chamber, said wall means being sufficiently light to be lifted bodily by a child, air-inlet means provided in said wall means to permit inflow of air into said chamber, water-outlet means provided in said wall means to effect gravitational outflow of water from said chamber and thereby effect drawing-in of air through said air-inlet means, eye-catching movable means responsive to gravitational downflow of water through said toy to effect a movement adapted to entertain a child, and noise-making means responsive to said inflow of air through said air-inlet means to make a child-entertaining noise, said water-outlet means being sufficiently larger than said air-inlet means to result in said inflow of air at a rate sufficient to effect sounding of said noise-making means, said chamber being sufficiently large and said water-outlet means being sufficiently small to result in sounding of said noise-making means for a substantial period of time after complete lifting of the water-filled toy out of a body of water.

8. A water toy, which comprises wall means to define a chamber, said wall means being sufficiently light in weight to be bodily lifted by a child, a two-way sensitive whistle mounted in said wall means at one portion of said chamber, said whistle comprising two thin spaced elements having registered air openings therein and defining a chamber therebetween, said whistle being adapted to make a whistle noise upon inflow of air through said air openings into said chamber, said whistle being also adapted to make a whistle noise upon outflow of air therethrough from said chamber, and water outlet-opening means provided in said wall means at another portion of said chamber beneath said one portion thereof, said water outlet-opening means being sufficiently larger than said air openings that gravitational outflow of water therethrough from said chamber will effect drawing-in of air through said air openings at a sufficient rate to sound said whistle, said water outlet-opening means also being sufficiently large that inflow of water therethrough into said chamber when the toy is immersed in a body of water will expel air from said chamber through said whistle at a rate sufficient to sound said whistle, said water outlet-opening means being sufficiently small that a substantial period of time is required to gravitationally empty said chamber of water therethrough after the water-filled toy has been lifted rapidly and completely above the surface of an external body of water.

9. A water toy, which comprises wall means to define an elongated substantially sealed chamber, a whistle mounted in said wall means at one end portion of said chamber and having an air-inlet opening therein, water outlet-opening means provided in said wall means at

the other end portion of said chamber to effect outflow of water therefrom and thereby draw air through said air-inlet opening into said chamber, said water outlet-opening means being larger than said air-inlet opening by an amount sufficient to effect sounding of said whistle in response to discharge of water through said water outlet-opening means, said chamber and said water outlet-opening means being sufficiently large that a sufficient volume of air will be drawn through said whistle due to gravitational water outflow through said water outlet-opening means to effect sounding of said whistle, said air-inlet opening being sufficiently large that no air will flow in through said water outlet-opening means during at least the major portion of the time required for gravitational downflow of water therethrough from said chamber after the toy has been filled with water and lifted entirely into the air, and a water wheel mounted on said wall means exteriorly adjacent said water outlet-opening means for engagement by the downflowing water after passage through said water outlet-opening means whereby said wheel is rotated.

10. In a water toy, wall means to define a substantially sealed chamber, air-inlet means provided in said wall means to permit inflow of air into said chamber, water-outlet means provided in said wall means to effect gravitational outflow of water from said chamber and thereby effect inflow of air through said air-inlet means into said chamber due to the partial vacuum created in said chamber by said outflow of water therefrom, air-actuated means provided in said chamber adjacent said air-inlet means, said air-actuated means being movable in response to said air inflow, at least a portion of said wall means adjacent said air-actuated means being transparent, and noise-making means responsive to inflow of air through said air-inlet means, said water-outlet means being larger than said air-inlet means by an amount sufficient to effect sounding of said noise-making means in response to gravitational outflow of water from said chamber through said water-outlet means.

11. A children's toy, which comprises wall means to define a substantially sealed elongated chamber, said wall means having at least one transparent portion, a low-friction air wheel mounted rotatably in one end of said chamber adjacent said transparent portion, a water wheel mounted on said wall means and spaced a substantial distance from said air wheel, inlet means to admit air into said one end of said chamber in impinging relationship relative to the blades of said air wheel to thereby effect rotation of said air wheel, water outlet-opening means provided in said wall means at the other end of said chamber to effect outflow of water from said chamber and thereby effect drawing of air in through said inlet means and against said air wheel, the downward flow of water through said chamber effecting rotation of said water wheel, and noise-making means responsive to inflow of air through said inlet means, said water outlet-opening means being larger than said inlet means by an amount sufficient to effect sounding of said noise-making means in response to gravitational outflow of water from said chamber through said water outlet-opening means.

12. A children's toy for use in water and in air, comprising lightweight wall means to define an elongated substantially sealed chamber, whistle means provided in said wall means at one end portion of said chamber and having an air opening therein, water-outlet means provided in said wall means at the other end portion of said chamber, said whistle means being adapted for sounding in response to inflow of air therethrough into said chamber due to gravitational outflow of water from said chamber through said water-outlet means when said wall means is vertical and said whistle means is uppermost, said water-outlet means being sufficiently larger than said air opening to effect sounding of said whistle means due to said gravitational outflow of water, air-scoop means mounted adjacent said whistle means to effect relatively loud sounding of said whistle means when said wall means is moving rapidly through the air with said air-scoop means and whistle means foremost, said air-scoop means effecting substantial flow of air through said whistle means into said chamber and thence through said water-outlet means to the ambient atmosphere, and an elongated tether means connected to said wall means to permit rapid swinging of said wall means in a circular path through the air whereby to effect air inflow through said air-scoop means and whistle means for sounding of the latter.

13. A children's toy for use in water and in air, comprising lightweight wall means to define an elongated substantially sealed chamber, air-inlet means provided in said wall means at one end portion of said chamber, water-outlet means provided in said wall means at the other end portion of said chamber, whistle means mounted adjacent said air-inlet means for sounding in response to inflow of air therethrough into said chamber due to gravitational outflow of water from said chamber through said water-outlet means when said wall means is vertical and said air-inlet means is uppermost, air-scoop means mounted adjacent said whistle means to effect relatively loud sounding of said whistle means when said wall means is moving rapidly through the air with said air-scoop means and whistle means foremost, said air-scoop means effecting substantial flow of air through said whistle means into said chamber and thence through said water-outlet means to the ambient atmosphere, flexible tether means connected to said wall means to permit rapid swinging of said wall means in a circular path through the air whereby to effect air inflow through said air-scoop means and whistle means for sounding of the latter, and movable means movably mounted on said wall means adjacent said water-outlet means, said movable means being movable in response to said gravitational outflow of water through said water-outlet means and also in response to movement of said wall means through the air and through a body of water, said water-outlet means being larger than said air-inlet means by an amount sufficient to effect sounding of said whistle means in response to said inflow of air into said chamber due to said gravitational outflow of water therefrom.

14. A children's toy, which comprises lightweight wall means to define a substantially sealed chamber, air-inlet means provided in said wall means at the upper portion of said chamber to admit air into said chamber, water-outlet means provided in said wall means at the lower portion of said chamber to discharge water from said chamber, said air-inlet and water-outlet means being so related to each other that gravitational outflow of water from said chamber through said water-outlet means will, when said water-outlet means is in the air and at least during the time the water level in said chamber is descending from an elevation substantially above said water-outlet means, result not only in drawing-in of air through said air-inlet means but also in bubbling-in of air bubbles through at least a portion of said water-outlet means, whereby the rate of air inflow through said air-inlet means is varied continuously in accordance with said inflow of air bubbles through said water-outlet means, and means responsive to said variation in air flow through said air-inlet means to create a child-entertaining effect, said water-outlet means being larger than said air-inlet means by an amount sufficient to create said effect in response to said gravitational outflow of water through said water-outlet means.

15. A children's toy, which comprises wall means to define a substantially sealed chamber, air-inlet means provided in said wall means to admit air into said chamber, water-outlet means provided in said wall means to discharge water from said chamber, said air-inlet and water-outlet means being so related to each other that gravitational outflow of water from said chamber through said water-outlet means will, when said water-outlet means and air inlet means are in the air and at least during the time the water level in said chamber is descending

from an elevation substantially above said water-outlet means, result in drawing-in of air through said air-inlet means and also in bubbling-in of air bubbles through at least a portion of said water-outlet means, whereby the rate of air inflow through said air-inlet means is varied in accordance with said inflow of air bubbles through said water-outlet means, and whistle means operated by flow of air through said air-inlet means and responsive to said variation in air flow therethrough to create a warbling whistle sound, said whistle means comprising two thin members mounted in spaced relation relative to each other and having openings therein forming said air-inlet means, said chamber and water-outlet means being so related that said warbling is at a relatively low frequency and continues for at least about a second, said water-outlet means being larger than said air-inlet means by an amount sufficient to effect sounding of said whistle means due to said gravitational outflow of water from said chamber through said water-outlet means.

16. A children's toy, comprising lightweight wall means to define a substantially sealed chamber adapted to contain water, outlet means to effect continued gravitational outflowing of water from said chamber and consequent creation of a partial vacuum in said chamber above the descending water level of the water therein, said outlet means being adapted to permit air to bubble into said chamber through the water therein and thereby effect variation in the degree of said partial vacuum, and whistle means to admit air into said chamber above said water level at a rate determined at least partially by the amount of said vacuum whereby said whistle means is caused to sound in a warbling manner due to said variation in partial vacuum, said outlet means being sufficiently larger than the opening in said whistle means to effect sounding of said whistle means in response to said gravitational outflow of water from said chamber through said outlet means.

17. A children's toy, comprising an elongated sealed upright container adapted to be immersed in a body of water by a child and thereafter lifted bodily and completely from said body of water by the child, said container having a whistle opening at the upper end portion thereof and water-opening means at the lower end portion thereof, a whistle mounted substantially sealingly over said whistle opening and comprising two thin spaced elements defining a chamber therebetween and having registered holes therein through which air may flow, said water-opening means being sufficiently larger than said whistle holes to effect sounding of said whistle in response to outflow of water from said container through said water-opening means, the cross-sectional area of at least one of said whistle holes being so related to the cross-sectional area and location of said water-opening means that gravitational outflow of water from said container will, at least during a substantial period of time commencing when the water level in said chamber is a substantial distance above said water-opening means, result not only in drawing in of air through said whistle but also in drawing in of air bubbles through at least a portion of said water-opening means, whereby the rate of air inflow through said whistle is varied to create a warbling effect.

18. The invention as claimed in claim 17, in which said water-opening means is sufficiently small relative to the volume of said container that a substantial period of time is required to drain said container, and is also sufficiently small that said bubbles enter said chamber at a low frequency resulting in a canary-like warble, and wherein a relatively small part of said water-opening means is disposed at a higher elevation than the major part thereof.

19. A children's toy, comprising a substantially sealed air-impervious container having at least one movable wall portion adapted to be manually pushed inwardly by an infant to reduce the volume of said container and thereafter to move outwardly and increase the volume of said container, said container having water-opening means formed therein to permit inflow of water into said container and outflow of water therefrom, said container also having air-opening means formed therein in spaced relation from said water-opening means, noisemaking means adapted to sound in response to drawing-in of air into said container through said air-opening means as the result of outflow of water from said container through said water-opening means, said water-opening means being larger than said air-opening means by an amount sufficient to effect sounding of said noisemaking means due to said drawing-in of air, and means to substantially block said water-opening means to thus effect sounding of said noise-making means in response to movement of said wall portion.

20. A children's toy, comprising a substantially sealed air-impervious container having at least one deformable and resilient wall portion adapted to be manually pushed inwardly by an infant to reduce the volume of said container and thereafter to spring outwardly and increase the volume of said container, said container having water-opening means formed therein in the lower portion thereof to permit inflow of water into said container and outflow of water therefrom, said container also having air-opening means formed therein in the upper portion thereof, noisemaking means responsive to flow of air into said container through said air-opening means due to outflow of water from said container through said water-opening means, said water-opening means being larger than said air-opening means by an amount sufficient to effect sounding of said noisemaking means due to said outflow of water from said container, said noisemaking means also being responsive to outflow of air from said container through said air-opening means due to deformation of said wall portion, float means disposed in said container and shaped to seat on said water-opening means and substantially block flow of air therethrough, and means to guide said float means and permit substantial movement of said float means away from said water-opening means, whereby said noisemaking means is water operated when there is water in said container and may be operated in response to manual deforming of said wall portion when there is no water in said container.

21. An infant's play bottle, comprising a squeeze bottle having a relatively wide mouth and having a size approximating that of a milk bottle, a cap adapted to be mounted sealingly over said mouth and having a whistle incorporated therein, said whistle comprising two spaced discs having registered holes therein for inflow and outflow of air, a plurality of outlet openings formed in the side wall of said bottle adjacent the bottom thereof, the combined cross-sectional areas of said openings being sufficiently greater than the area of said whistle holes to effect sounding of said whistle due to outflow of water through said openings when the water-filled bottle is disposed in upright position with said cap uppermost, a plurality of pegs adapted to be introduced into said bottle both through said wide mouth thereof and also through at least one of said openings in the lower portion of said bottle, and decoration means provided adjacent at least said one opening to represent a living creature having its mouth coincident with said one opening whereby said pegs may be fed through said mouth of said decoration means and water will discharge therefrom.

22. A children's water toy, comprising wall means to define a substantially sealed chamber, said wall means being sufficiently light and small to be readily and bodily lifted by a child, air-inlet means provided in said wall means at the upper portion of said chamber to admit air therein, whistle means adapted to sound in response to inflow of air through said air-inlet means, water-outlet means provided in said wall means at the lower portion of said chamber to discharge water therefrom, said air-inlet and water-outlet means being so related to each

other and to said wall means that air bubbles enter said chamber through at least a portion of said water-outlet means during outflow of water therethrough to effect warbling of said whistle, said water-outlet means being larger than said air-inlet means by an amount sufficient to effect sounding of said whistle means in response to discharge of water from said chamber, and movable means mounted movably in said chamber for movement in response to said air bubbles and also in response to water flowing outwardly from said chamber to create a child-entertaining effect.

23. The invention as claimed in claim 22, in which said water-outlet means comprises a relatively large opening disposed relatively remote from said air-inlet means, and a relatively small opening disposed relatively adjacent thereto, and in which said movable means comprises a wheel having one side disposed adjacent said large opening and an opposite side disposed adjacent said small opening.

24. A toy rocket ship, which comprises an elongated hollow plastic body sufficiently light to be readily and bodily lifted by a child and having a nose section and a tail section, said tail section having a tail end wall remote from said nose section and transverse to the longitudinal axis of said body, a threaded joint provided between said nose and tail section to permit separation thereof and subsequent re-assembly, said nose section and tail section being adapted when assembled to define a substantially sealed chamber therein, said nose section having an opening therein remote from said tail section, and a whistle provided sealingly in said opening and comprising two thin elements having registered whistle holes and defining a chamber therebetween, said tail end wall having a substantial number of outlet openings therein, the combined area of said outlet openings being larger than that of said whistle holes by an amount sufficient to result in sounding of said whistle due to gravitational outflow of water through said outlet openings from said chamber and consequent drawing-in of air through said whistle holes, the combined area of said outlet openings being sufficiently small and said chamber being sufficiently large to cause said gravitational outflow of water to continue for a substantial period of time after the water-filled toy has been rapidly and completely lifted above the surface of an external body of water.

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