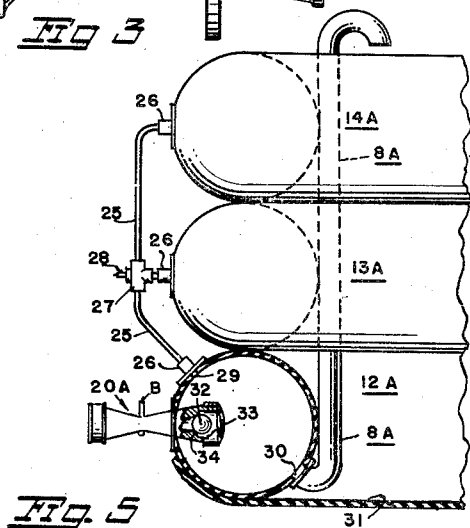
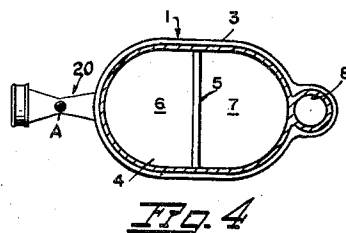
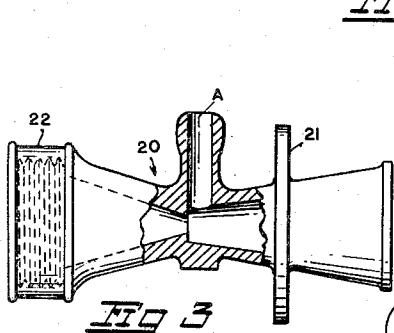
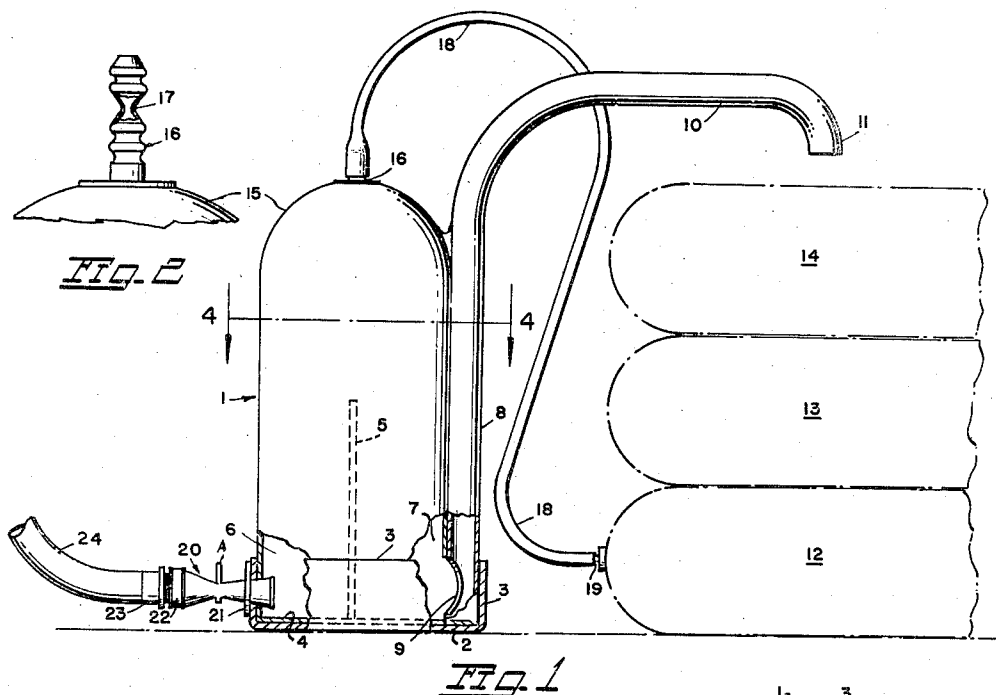


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MEANS OF INFLATING BY AIR SEPARATED FROM
COMBINED AIR AND WATER PRESSURE
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1

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MEANS OF INFLATING BY AIR SEPARATED FROM COMBINED AIR AND WATER PRESSURE

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1 Claim. (Cl. 4—172)

This invention relates to a device for simultaneously delivering water and air under pressure to points of use by directing water only under pressure to the device.

The device is readily adaptable to many uses, one of which, for example, is for inflating the tube or tubes of an inflatable swimming pool while at the same time filling the pool with water.

One of the principal objects of the invention is the provision of a device of this character which is of simple, efficient, durable and inexpensive construction, entirely automatic in operation, readily installable and positive in delivering desired or predetermined amounts of air and water for a given purpose.

The foregoing and other objects which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawing forming a part hereof wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side view of the invention operatively applied to an inflatable swimming pool (shown in broken lines) for inflating the tubes thereof while at the same time filling the pool with water. Fragments of the device have been broken away for convenience of illustration.

Figure 2 is a detail view on an enlarged scale of an air hose connection having a restricted flow opening therein.

Figure 3 is a detail view on an enlarged scale of a Venturi tube with a fragment broken away.

Figure 4 is a sectional top plan view taken along the line 4—4 of Figure 1.

Figure 5 is a fragmentary side view of an inflatable swimming pool showing a modified form of the invention applied thereto.

With continuing reference to the drawing and particularly to Figure 1 thereof, reference numeral 1 indicates a separation tank, preferably of molded plastic or the like, closed at both of its ends and supported within a base 2 flanged upwardly as at 3. Extending upwardly from the center of the bottom wall 4 of the tank and terminating approximately midway between the top and bottom thereof is a baffle plate 5 which divides the bottom half of the tank into two chambers 6 and 7 which for convenience will hereinafter be referred to respectively as water and air intake chamber and water outlet chamber.

Secured to or molded integral with the vertical wall of the tank 1 is a water conduit in the form of a standpipe 8 enclosed at its bottom end within the flanged base 2 and in open communication as at 9 with the interior of the water outlet chamber 7. The top end of the standpipe is extended horizontally as at 10 to any desired length where it terminates in a spout 11 adapted to overhang the top wall or top tube of a swimming pool made up of a plurality of inflatable tubes 12, 13 and 14 or any desired number, more or less, superim-

2

posed one upon the other and in open communication with each other in the conventional manner for inflating purposes.

Secured to the dome-shaped top wall 15 of the tank 1 in any approved manner is a hollow, generally tubular, hose fitting 16 having a constriction 17 intermediate its ends for a purpose to be hereinafter described. Attached to the fitting by a friction fit is one end of an air hose 18 whose opposite end is similarly attached to a suitable valve 19, such as a tire valve or the like, secured to the bottom tube 12 and in communication with the interior thereof.

A Venturi tube generally indicated at 20 (see also Figure 3) provided with a flange 21 is secured thereby to the flanged base 2, extends therethrough and through the wall of the tank 1 into open communication with the interior of the tank. The opposite end of the Venturi tube is provided with a conventional coupling 22 for attachment to a cooperating coupling 23 of a garden hose 24 or any other conduit from a source of water under pressure. The throat of the Venturi tube is of lesser diameter on the water intake side thereof than on the outlet side, as shown, and in open communication with the latter is an air intake A.

In the modified form of the invention shown in Figure 5 the inflatable tubes 12A, 13A and 14A are in communication with each other for inflating purposes by means of a manifold or tube 25, fittings 26 and a T-fitting 27 provided with an air release valve 28. The tube 12A is provided with a Venturi tube 20A having an air intake opening B and the tube 12A thus serves as a separation chamber in a manner similar to the separation tank 1 of Figure 1. The tube 12A is provided with an air outlet opening 29 in open communication with the manifold 25 and a water outlet 30 in communication with the bottom end of a standpipe 8A for supplying water to fill the pool which is provided with a conventional watertight floor 31.

Since it is the object of the invention to simultaneously supply water under pressure to the pool and air compressed by the water pressure to inflate the tubes, this can be readily accomplished by merely attaching the Venturi tube 20 to a garden hose and turning on the water. As a consequence thereof the incoming water functions as a pump by supplying the energy to pull atmospheric air in through the air intake. The air and water combine at this point and flow into the water and air intake chamber 6 where the air will, of course, escape from the water into the space within the tank above the water level. When the water level exceeds the height of the outlet opening 9 into the standpipe 8 the air within the tank will be forced through the air hose 18 and progressively into the inflatable tubes 12, 13 and 14 of the swimming pool. At the same time the water will flow upwardly and out through the standpipe and into the pool to fill the same.

When the inflatable tubes 12, 13 and 14 become filled with air, the resultant back pressure will lower the water level in the water outlet chamber 7 and open the opening 9 in the standpipe 8 to thus allow surplus air and water to escape out through the standpipe.

The ultimate air pressure within the tubes is determined by the height of the water column within the vertical portion of the standpipe which may be varied to provide desired air pressures.

The constriction 17 in the air outlet fitting 16 is designed to work in conjunction with the air intake A of the Venturi and is of such size as to prevent water from escaping through the fitting 16 even when discharging at atmospheric pressure. Thus the water level will be maintained within the tank 1 above the baffle plate 5

3

until back pressure from the inflated tubes will lower the water level in chamber 7 as aforesaid. It is desirable that the standpipe be of greater diameter than that of the water supply hose 24 so as to prevent any appreciable drop in water pressure flowing through the standpipe.

Reverting to the modification shown in Figure 5, the Venturi tube 20A is provided with a ball check valve 32 at its outlet end retained therein by a perforated cap 33 and cooperating with a valve seat 34. Water and air combined within the Venturi tube will enter the inflatable tube 12A. The water will flow out through the outlet opening 30 and standpipe 8A to fill the swimming pool. Air trapped above the water level within the tube 12A will be forced upwardly through the manifold 25 and fittings 26 into the tubes 13A and 14A to inflate the same. The back pressure of air upon full inflation of the last mentioned tubes will cause final inflation of tube 12A as surplus water and air escape through the standpipe and into the pool. When the pool is filled and the water supply turned off the ultimate air pressure will force the check valve to its seat to seal off the Venturi tube and the ultimate air pressure, as in the first form of the invention, will be determined by the height of the water column remaining in the standpipe 8A.

The standpipe 8A acts as a valve more or less and as mentioned determines the final pressure in the air chambers of the swimming pool which in ordinary use is very small. It is obvious that other means might suggest themselves for this purpose such as a spring release valve set to open at a predetermined pressure.

A Venturi of the type shown and properly designed will draw in several times as much volume of air as water passing through the Venturi and consequently fill the tubes 13A and 14A with air when tube 12A becomes only partially filled with water thus preventing any water from entering tubes 13A and 14A.

The bottom tube 12A as shown in Figure 5 for practical reasons is in reality a separation chamber for separating the combined air and water thus rendering the swimming pool completely self-inflatable. It is obvious that other chambers may conceivably be attached to the pool for this purpose without departing from the scope of this invention.

While a swimming pool is shown in which the pool

4

fills with water and the air chambers with air at the same time it is obvious that this invention could also be used in like manner for inflating other objects such as an air mattress for example by simply using the air and diverting the water as waste.

While I have shown and described particular forms of embodiment of my invention I am aware that many minor changes therein will readily suggest themselves to others skilled in the art without departing from the spirit and scope of the invention. Having thus described my invention what I claim as new and desire to protect by Letters Patent is:

A swimming pool comprising a bottom wall secured to the bottom tube of a plurality of inflatable tubes stacked one upon the other and in communication with each other for inflation purposes, said bottom tube having an air outlet opening in communication through a manifold with the interior of the other of said tubes and a water outlet in open communication with the bottom end of a standpipe extending to a height above said pool at a point below said air outlet opening and adapted to deliver water to the interior of the pool, a Venturi tube adapted at one of its ends for connection to a source of water pressure and in communication at its opposite end through a check valve with the interior of said bottom tube and having an atmospheric air intake opening intermediate its ends whereby water and air will combine within the Venturi tube, open said check valve, and flow to the interior of the bottom tube wherein air liberated from the water will be forced into said tubes to inflate the same and the resultant back pressure upon final inflation of said bottom tube surplus air and the water will flow through the standpipe whereby in the absence of water flow into said bottom tube said back pressure will close said check valve and the ultimate air pressure in all of said tubes will be determined by the height of said standpipe and the column of water remaining therein.

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