March 29, 1927. 1,622,570

C. H. BUDDE

AQUATIC TOY

Filed May 10, 1924

Fig. 1.

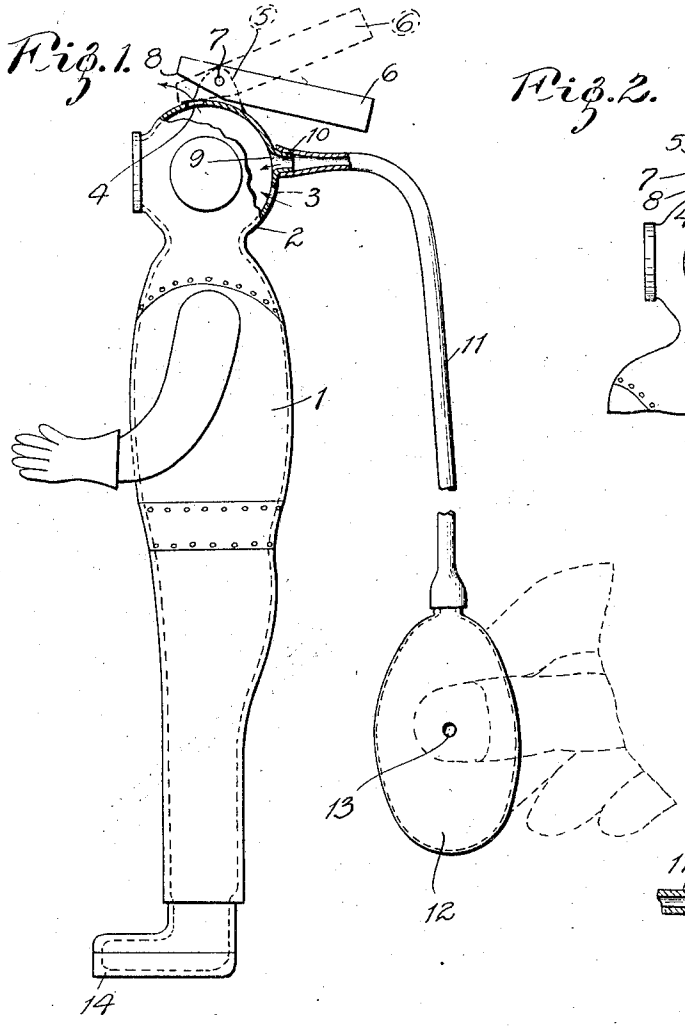


Fig. 2.

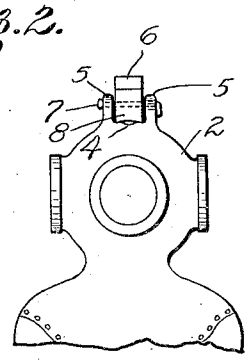


Fig. 4.

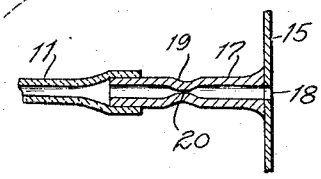
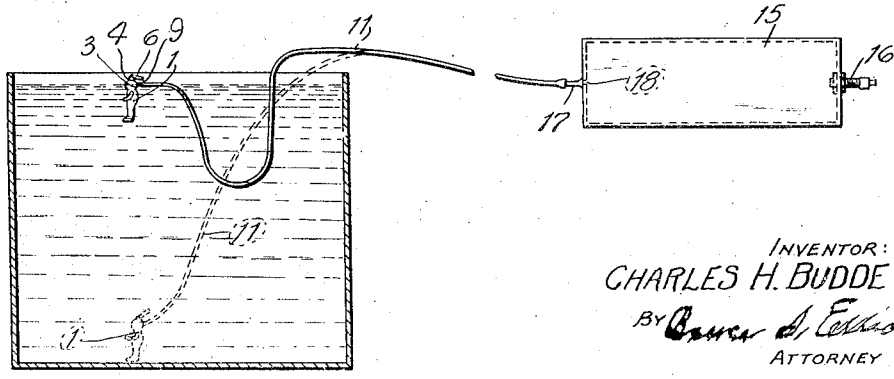


Fig. 3.



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CHARLES H. BUDDE, OF ST. LOUIS, MISSOURI.

AQUATIC TOY.

Application filed May 10, 1924. Serial No. 712,188.

This invention has for its general object to provide a novel aquatic toy, which is designed to alternately sink and rise in water under the action of compressed air acting, in one case, to expel water from the body of the toy to increase its bouyancy, and, in the other, by being permitted to escape from the body of the toy, to permit the entrance of water thereto to an extent to make the weight of the body with its contained water greater than the amount of water it displaces.

The principal object of the invention is to provide a novel valve controlling the air outlet from the body of the toy, said valve being of a substance which will float in water and being so arranged with reference to the air orifice that when submerged in the water it will close the orifice to prevent the escape of air, and when raised above the surface of the water it will automatically open the orifice to permit the escape of air.

In the special embodiment of my invention shown in the drawing, I have illustrated the body of the toy as representing a diver equipped with diving apparatus, with the automatic valve located on the top of the helmet of the apparatus. The invention, however, could be equally well embodied in any one of various other forms, as, for example, a miniature submarine. Or, if preferred, some type of sea life could be adopted, such as a shark, whale, or the like.

The invention is illustrated in the accompanying drawing, in which—

Figure 1 is a view partly in side elevation and partly in section of an aquatic toy constructed according to my invention, and showing the same adapted to be actuated by compressing a rubber bulb;

Figure 2 is a view in front elevation of the upper portion or head of such apparatus;

Figure 3 is a view showing a tank containing water, and illustrating the toy on a reduced scale in full lines at the surface and in dotted lines at the bottom of the tank, and also showing the toy as being controlled from a tank containing compressed air instead of by the bulb of Figure 1; and

Figure 4 is an enlarged sectional view taken at the connection of the rubber pipe, which supplies air to the toy, with the air tank to show the preferred manner of regulating the amount of air to be supplied to the toy.

Referring now to the drawing, the numeral 1 indicates a hollow body in the form of a diver or diving apparatus, said body being hollow and, by preference, being molded out of celluloid. The head or helmet 2 of the diving apparatus is provided preferably at its rear with an opening 3 for permitting the entrance of water to the interior of the body. The top of the helmet is provided with a similar orifice 4 for the escape of air from the body 1. The helmet 2 is provided on opposite sides of the orifice 4 with two apertured lugs 5, between which is inserted my novel valve 6, being pivotally mounted between the lugs near its forward end by a pin 7. The underside of the valve 6 at its forward end is beveled away as indicated at 8 to form a valve seat which, when the rear end of the valve is raised as indicated by dotted lines in Figure 1, will operate to cover the orifice 4.

The rear side of the helmet 2 is provided with a third orifice 9, which is surrounded by a nipple 10, which is adapted to have the end of a rubber tube 11 secured thereon. In one form of the invention, air is forced into the body 1 by means of a rubber bulb 12 secured to the outer end of the tube 11 and having in its side an opening 13 to be covered by the thumb of the operator when air is to be forced into the body of the toy. The body 1 may be weighted in any suitable manner to cause it to maintain an upright position when empty of water, or partially or wholly filled, and this may be done by means of weights 14 applied to the lower end or feet of the body, or one or more small weights, such as shots, could be inserted through either of the orifices and rest in the feet portion of the apparatus.

In operating the toy as thus far described, it is placed in the water, and as soon as sufficient water enters through the orifice 3, the body 1 will sink and cause the valve 6, which is preferably constructed of wood, to rise to the position shown by dotted lines in Figure 1 and close the orifice 4. When the body has sunk to the bottom of the tank or other container, the operator places his thumb over the orifice 13 and compresses the bulb 12 to force in air through the opening 9 and thereby expel a part of the water from the body through the orifice 3. The

body, when filled with water, is very nearly buoyant, and it is only necessary to expel a small amount of water through the orifice 3 to make the body wholly buoyant. The orifice 9 is so located relative to the height of the body that the proper amount of water to render the body buoyant can be expelled without lowering the water level to a point below the orifice 9, which, therefore, is always sealed by the water against back pressure. Having compressed the bulb, he releases his thumb to permit air to enter the bulb through opening 13 for other compressions. In some cases, only a partial compression of the bulb 12 will be required to force sufficient air into the body 1 to expel water therefrom to an extent enabling the body 1 to rise. As the body rises to the surface and the valve 6 emerges, being pivoted near its forward end, it will be overbalanced and fall to the position shown by full lines in Figure 1, opening the orifice 4. Air will escape through this orifice and permit water to enter the opening 3 to again cause submergence of the body 1 in the water. It will be understood, of course, that with the use of the bulb, the operator must maintain the opening 13 of the bulb closed while the toy is rising, as otherwise air would escape through the bulb and destroy the buoyancy of the device, and thus prevent it from rising.

As shown by Figure 3, I may substitute for the bulb 12 a small air tank 15, having an air-inflation valve 16 mounted thereon, and the rubber tube 11 will supply air from the tank to the toy in the manner described above.

When the compressed air tank is employed, the toy may be placed in operation, and will continue automatically to rise and fall for a very considerable period of time, depending, of course, upon the size of the air tank. In actual practice, several thousand trips of the toy have beeen effected by a tank substantially six inches in length and two inches in diameter.

Also, when a tank is employed, it is necessary to govern the quantity of air to be supplied and the rate of such supply, as, otherwise, if the air were supplied too rapidly or in too great quantity, the toy would rise after sinking only a short distance in the water. In actual practice, I mount on the end of the tank a small copper tube 17, which communicates with the outlet orifice 18 from the tank, and to the end of which the rubber tube 11 is secured. I then pinch this tube together, as indicated at 19, and having connected the tube 11 to the body 1, place the latter in the water. I then pinch the compressed portion 19 transversely to make a slight opening 20 to communicate with the bore of the tube and permit the toy to operate. By increasing or decreasing the size of the opening 20, I can adjust such opening to a point that it will permit the body to sink to the bottom of a tank of any given depth and to remain at the bottom for a greater or less length of time before rising.

The compressed tank would ordinarily be used where my improved toy was used as an attraction in show windows, or the like, where a continuous automatic operation would be desirable. The rubber bulb arrangement would be preferable, however, when the device was to be used as a toy to be manipulated by children, owing to the cheaper cost of the toy as a whole, and to the fact that it would be used with different depths of containers, such as bath-tubs, aquariums, and the like, and the air opening 20 can only be adjusted initially for one depth of tank.

I claim:

1. An aquatic toy, comprising a hollow body weighted to have one portion thereof remain uppermost in water and provided in said upper portion with an opening for the ingress and egress of water and with an air inlet and an air outlet, an automatic valve having a buoyant portion operated by gravity when out of water to open and by buoyancy when in water to close the air outlet, and means for supplying air under pressure to the body to expel water therefrom through said opening.

2. An aquatic toy, comprising a hollow body weighted to have one portion thereof remain uppermost in water and provided in said upper portion with an opening for the ingress and egress of water and with an air inlet and an air outlet, means for supplying air under pressure through said air inlet to expel water through said opening, and a valve in the form of a strip of buoyant material pivoted near one end on the upper portion of said body and provided on its underside with a valve seat adapted to control the air outlet from the body.

3. An aquatic toy, comprising a hollow body weighted to have one portion thereof remain uppermost in water and provided in said upper portion with an opening for the ingress and egress of water and with an air inlet and an air outlet, means for supplying air under pressure through said air inlet, and a strip of buoyant material pivotally mounted near one end on the upper portion of the body adjacent said air outlet and having the underside of its forward edge beveled to form a valve seat for controlling said air outlet.

4. An aquatic toy, comprising a hollow body weighted to have one portion thereof remain uppermost in water and provided in said upper portion with an opening for the ingress and egress of water and with an air inlet and an air outlet, an automatic valve having a buoyant portion operated by

gravity when out of water to open and by buoyancy when in water to close said air outlet, a compressed air tank provided with an air outlet, and a rubber tube connecting the outlet of said air tank with the air inlet to said body.

5. An aquatic toy, comprising a hollow body weighted to have one portion thereof remain uppermost in water and provided in said upper portion with an opening for the ingress and egress of water and with an air inlet and an air outlet, an automatic valve having a buoyant portion operated by gravity when out of water to open and by buoyancy when in water to close said air outlet, a compressed air tank having a graduated air outlet, and a rubber tube connecting said outlet of the air tank with the air inlet of said body.

In testimony whereof, I have hereunto set my hand.

CHARLES H. BUDDE.