United States Patent [19]

Brown

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[54] **POOL COVER AND ELEVATING APPARATUS THEREFORE**

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[52] **U.S. Cl.** **4/172.12**

[51] **Int. Cl.** **E04h 3/16,** E04h 3/18

[58] **Field of Search** 4/172, 172.11, 172.12, 4/172.13, 172.14; 52/2, 3

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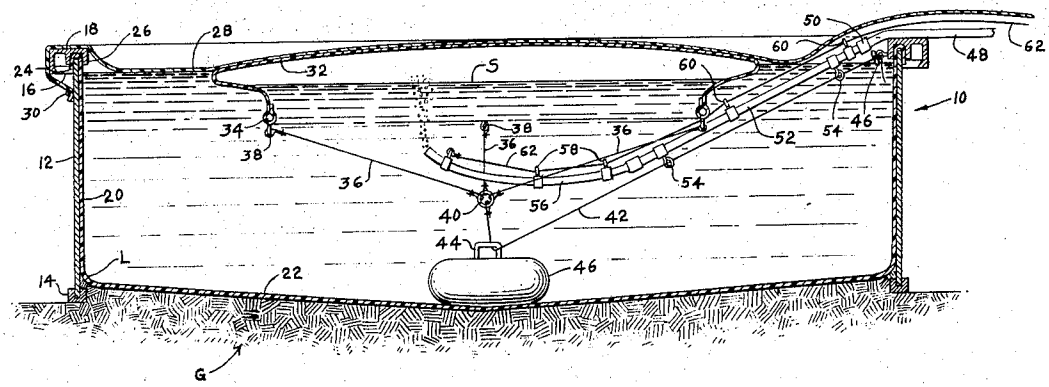
Primary Examiner—Henry K. Artis

Attorney, Agent, or Firm—Harold F. Johnston

[57] **ABSTRACT**

This invention relates to an air inflatable bag or container employed to elevate the covering sheet customarily used for protecting a swimming pool when not in use. The container has an open end held submerged in water and provides a passageway to entrap a quantity of water. Air is then bubbled up through the entrapped water into the bag to inflate the same. Various shapes and constructions are shown all operating on the same principle.

26 Claims, 15 Drawing Figures



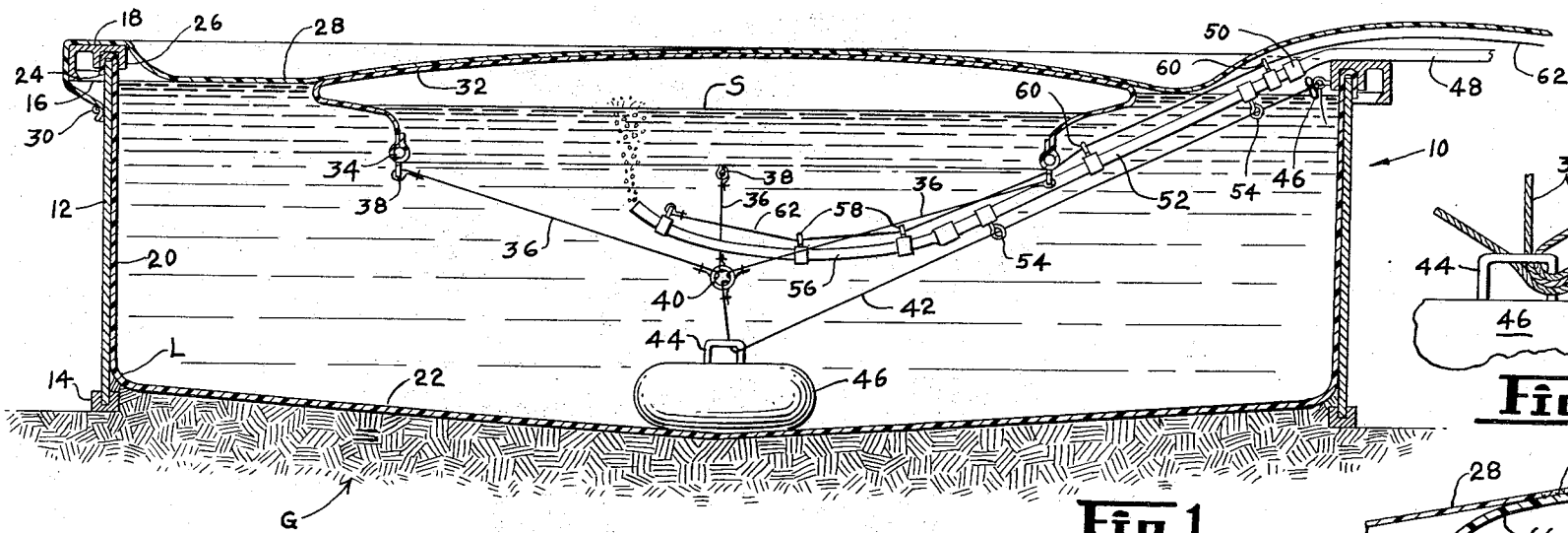


Fig. 1.

Fig. 5.

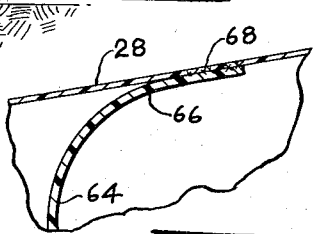


Fig. 3.

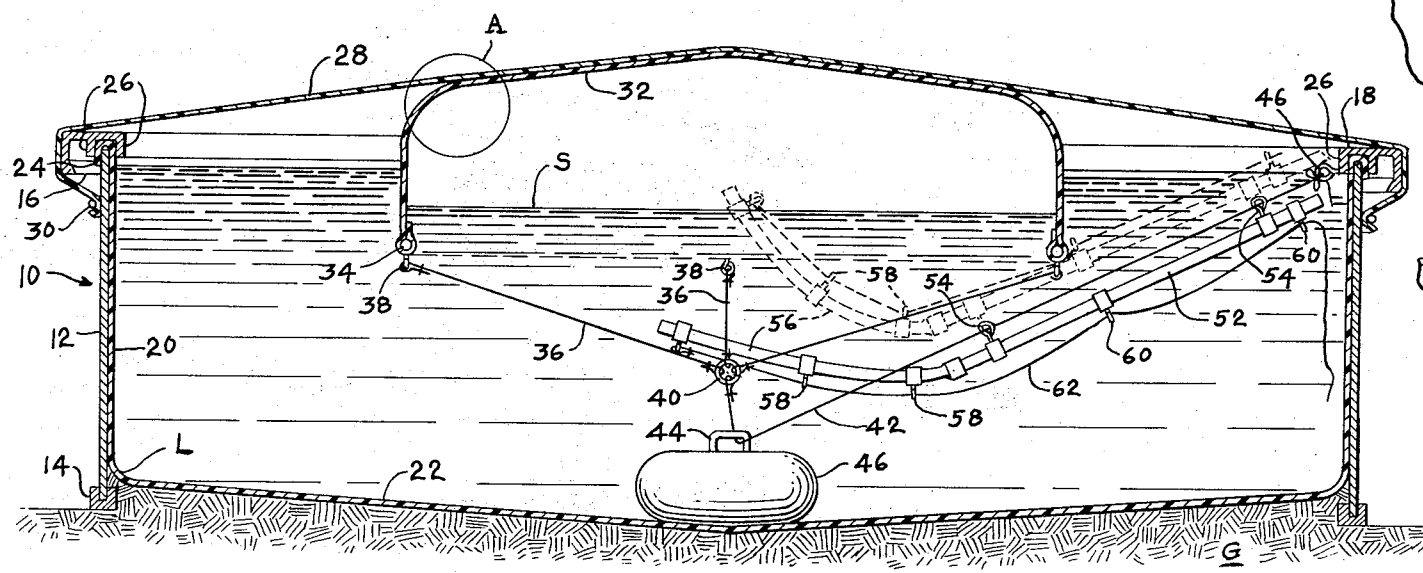


Fig. 2.

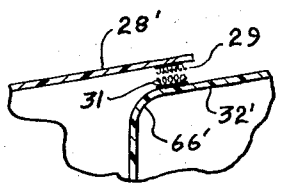


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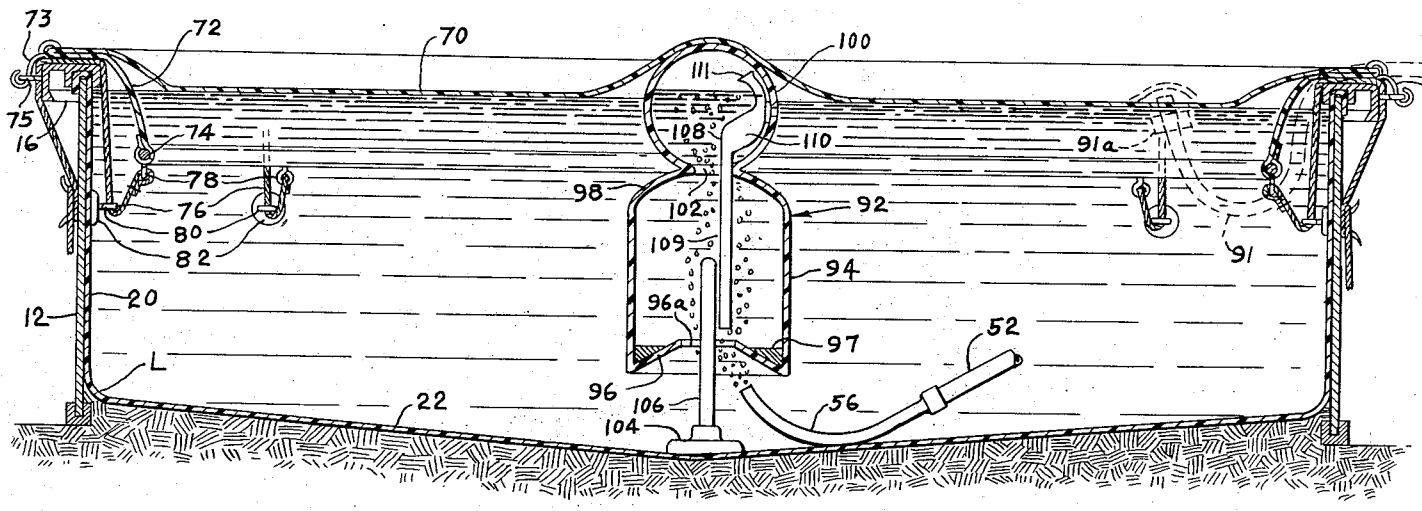


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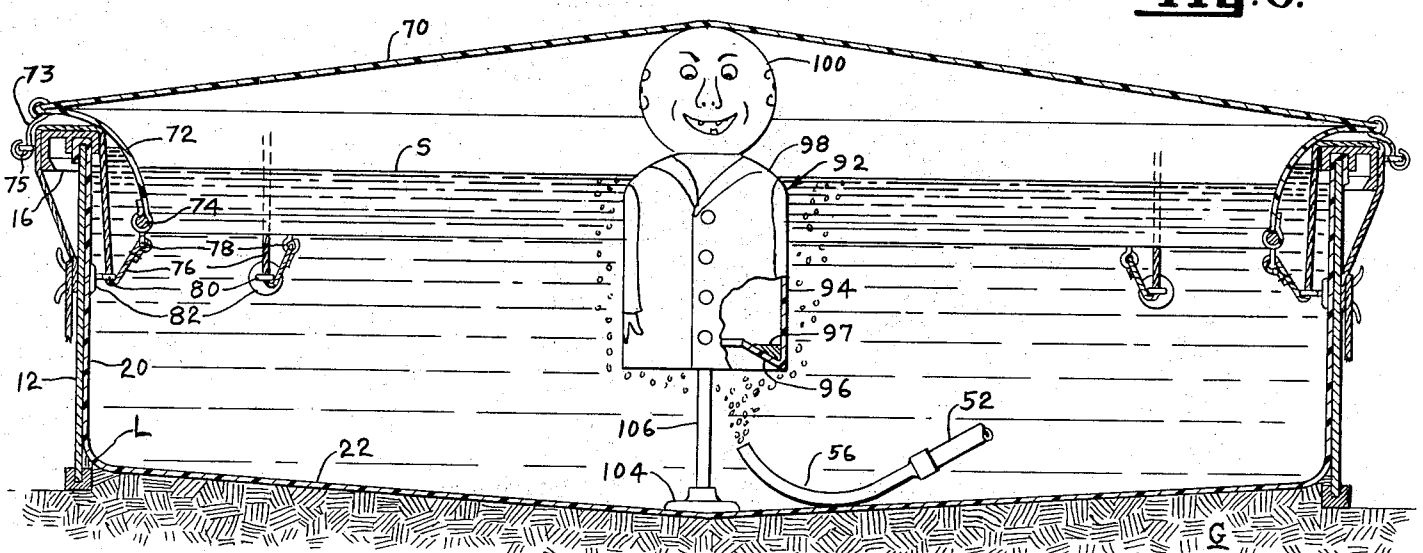


Fig. 7.

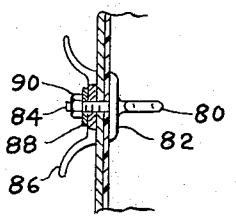


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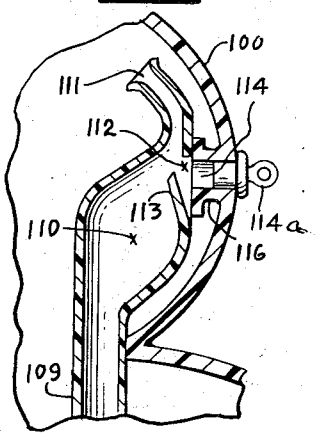


Fig. 9.

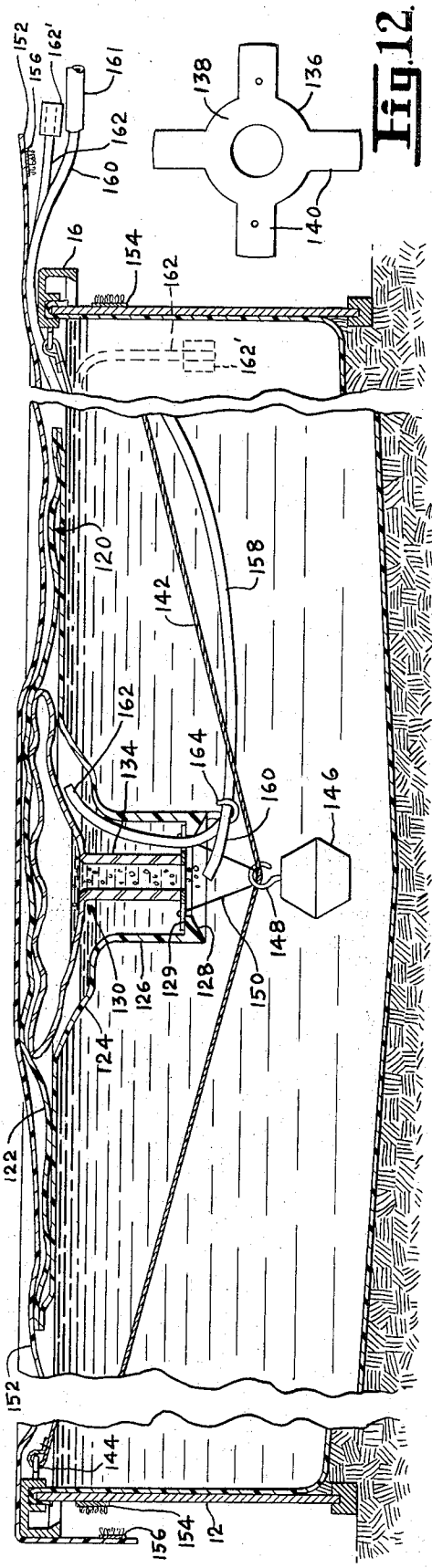


Fig.12.

Fig.10.

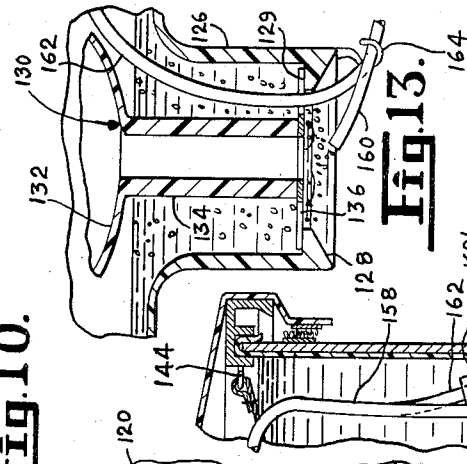


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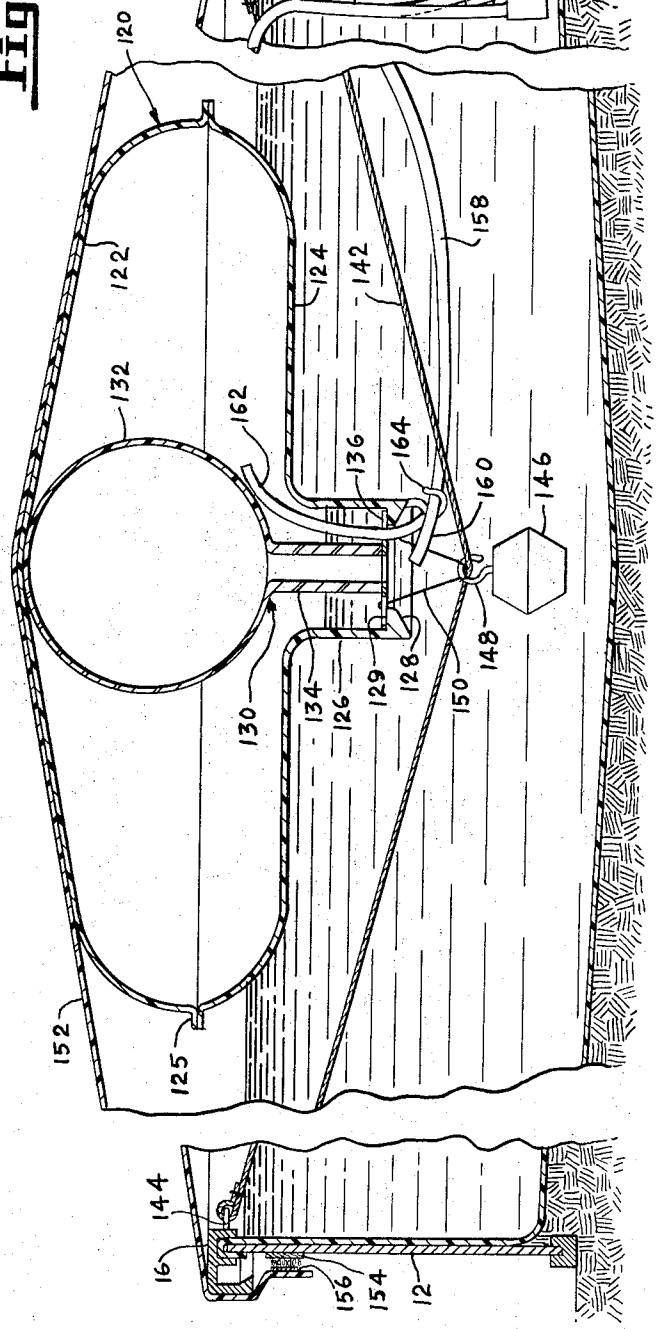


Fig.11.

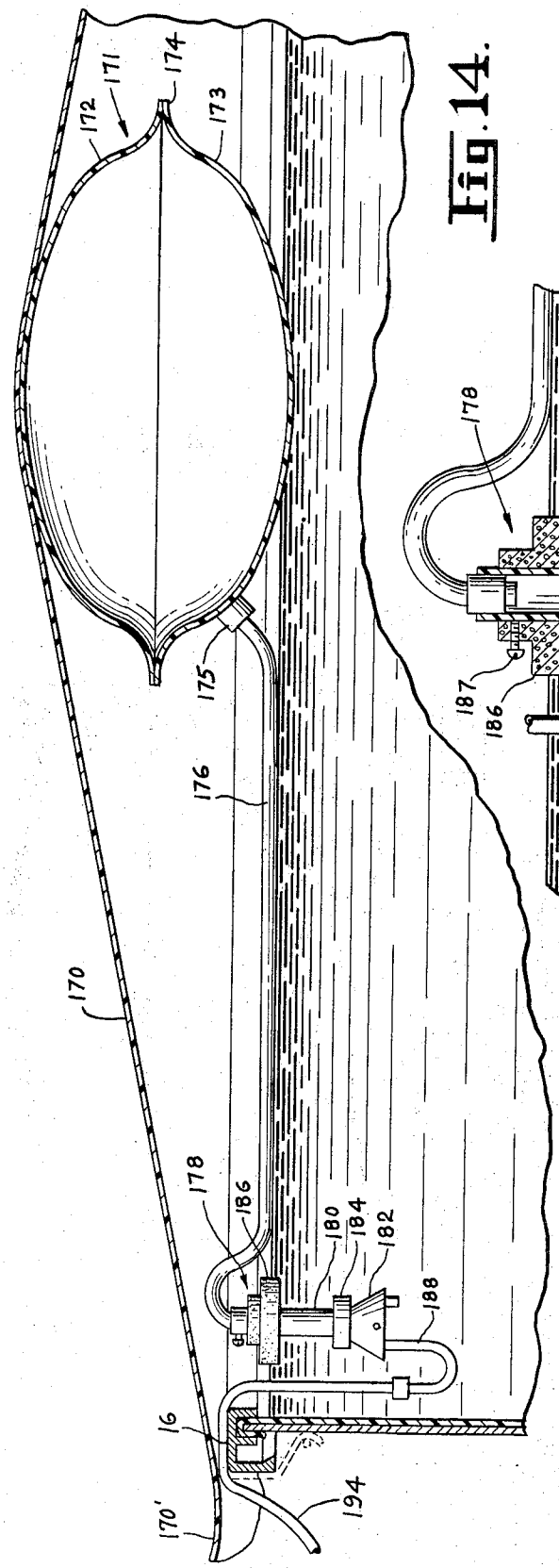

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Fig. 14.

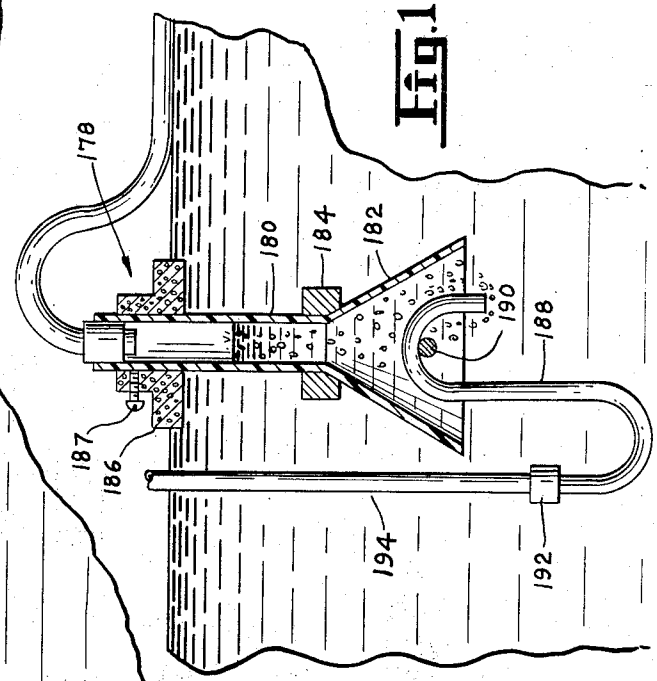

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Fig. 15.

POOL COVER AND ELEVATING APPARATUS THEREFORE

This invention relates to swimming pools and particularly to a method and apparatus for controlling the elevation and inclination or slope of a plastic swimming pool cover commonly used for winterizing a swimming pool and for protecting the pool when not to be used for a period of time. This permits controlling the elevation of the central portion of the cover to give any desired angle of elevation to said cover from the outer edge of the pool to the central area in order to shed water, leaves, etc., after the cover is installed and made secure to the pool's upper rim.

The present means for elevating the central portion of a pool cover is by draining approximately 10 inches of water from the pool, then inflating a plastic pillow or balloon and floating it to the center of the pool and holding it by several ties from the pillow to the pool outer edge. This cover is then spread across the pool surface and draped over the inflated pillow and made secure to the pool edge. Finally by refilling the pool to its original height, the center of the cover will be elevated by the buoyancy of the pillow and impart a taut and downward inclination to the cover.

The problem with this system is that it requires draining the height of the pool water about 10 inches, and then making the installation of the pillow and the cover. To impart an angular inclination to the pool cover, requires replacing the amount of water previously drained. This has several disadvantages. First, the time required for draining and refilling the pool, plus the expense of the wasted and replaced water. Secondly, there is no way of deflating or reinflating the plastic pillow once the cover is installed, without removing the cover and repeating the installation operation as described above.

Therefore, the primary object of the present invention is to provide a novel method and means to raise and lower the central portion of a pool cover which will eliminate all the above enumerated faults and greatly simplify the annual or periodic installation, adjustments and removal of the standard pool cover.

A further object of the present invention is to provide an impervious flexible container or bag into which air can be introduced indirectly by blowing air into the water and allowing the air bubbles to raise up through the water and become entrapped in the container or air bag for inflating the same and raising it within the pool to any desired height for the purpose of elevating the center area of the pool cover to the proper height and inclination to shed rain, snow and other undesirable material that might fall into the pool.

A still further and very novel object is to make use of the water surface itself as the means for entrapping and confining the air within the inflated container thus eliminating the use of a forced air connection directly into the bag such as would produce a progressively increasing back pressure as the bag inflates. This also obviates the use of any and all mechanical shut-off valves.

Other features and advantages of the present invention will appear from the following description when read in connection with the accompanying drawings, wherein

FIG. 1 is a cross section of a conventional swimming pool of the type located above the ground and showing the protective cover attached to the upper part of the wall with my First Form of inflatable container installed and in its initial collapsed state.

FIG. 2 is a similar view showing the pool cover as it will appear when the container is inflated.

FIG. 3 is an enlarged view as defined by the Circle A in FIG. 2 of a modified form of pool cover and air container combined as a single unit.

FIG. 4 is a view similar to FIG. 3 showing a further modified form of a combined pool cover and air container.

FIG. 5 shows a different arrangement of the draw cables attached to the reenforced rim of the container.

FIG. 6 is a cross sectional view of the same type of swimming pool illustrated in FIG. 1, but showing a Second Form of construction in which the pool cover itself is the inflatable container showing the cover in a deflated state.

FIG. 7 is a similar view showing the cover in an inflated and elevated state.

FIG. 8 is a side view of one of the cable anchoring members.

FIG. 9 is an enlarged fragmentary sectional portion of the supplemental air container having a whistle incorporated therein.

FIG. 10 is a Third Form of pool area elevating device making use of two inflatable bags with one inside of the other, shown in a deflated state.

FIG. 11 is a similar view showing the two containers inflated.

FIG. 12 is a plan view of a spider member used for holding the bag necks in concentric spaced position.

FIG. 13 is an enlarged view of the concentric necks.

FIG. 14 is a Fourth Form of the invention showing only a portion of the pool, and

FIG. 15 is an enlarged sectional view of the float unit forming a part of the invention.

FIRST FORM

Referring now to the drawings wherein like referenced numerals designate corresponding parts through the several views and describing the First Form of the invention as depicted in FIGS. 1 and 2, the numeral 10 designates generally a circular swimming pool of the type located above the ground and consisting of a circular sheet metal tank wall 12 having its lower edge resting in a bottom rail 14 that sits upon the ground G and its upper edge or rim is capped by a coping member 16 presenting a top surface 18 of sufficient width to serve as a seat for the swimmers. The pool has the usual liner L having a side wall 20 pressed against the tank wall 12 by the force of the water confined within the tank and a base sheet 22 resting upon the surface of the ground G, the surface of the ground being usually inclined downwardly toward the center of the pool. The upper end of the liner side wall 20 is formed with a fold lip 24 that is adapted to slip over the upper edge of tank wall 12 and held there in place by a pair of flanges 26 depending from the coping top surface 18.

In winterizing a swimming pool, a large cover sheet 28 preferably of air-impervious vinyl material is stretched over the tank 10 and initially having its major expanse laying on the water surface as shown in FIG. 1. The outer area of the cover is draped over the coping 16 and tucked inwardly thereunder and held against

the tank outer wall by a spring-tensioned cable **30** incorporated in the edge of said cover.

The means and method that is employed to elevate the cover **28** to a position as shown in FIG. **2** consists of a large inverted inflatable cup-shaped bag or container **32** made of a relatively thin, flexible material and its lower edge or inlet opening is reenforced by a heavy annular ring **34**, the inlet opening of the bag **32** having a diameter substantially less than the tank size. The purpose of the ring **34** is to give sufficient weight to the open end of the bag to keep it submerged when it is initially placed on the pool surface with some amount of air entrapped within the upper portion of said bag. The neck portion of the bag adjacent the ring **34** forms a passageway for entrapping a quantity of water. The surface of this entrapped water designated by the letter S forms a sealing means for retaining the entrapped air in the upper portion of the bag.

In order to stabilize and centralize the bag **32**, several wire cables **36** are provided having one end attached to eyes **38** depending from the ring **34**, and the opposite end of the cables **36** are made secure to a common ring **40**. An adjusting cable **42** is likewise attached to the ring **40** and is passed down through a handle **44** forming a part of a weight **46** resting on the pool bottom at its center. The cable **42** is thence directed up to and tied to an eye **47** secured to the inner coping flange **26**.

In order to inflate the bag, a flexible air hose **48** is provided that may form a part of a vacuum cleaner or any suitable air supply means, and in operation is passed over the coping and underneath a portion of the pool cover **28** by detaching and raising an adjacent portion thereof. The hose **48** is coupled at **50** to a relatively light rigid tube **52** of metal or plastic and having integral eyes **54** for suspension on the adjusting cable **42**. The other end of the tube is coupled to a piece of flexible hose **56** through which air is discharged into the water and then bubbles up through the entrapped water, escapes from the surface S and is caught within the bag **32**. For the purpose of controlling the elevation of the discharge end of the hose **56**, a series of guide eyes **58** are carried by said hose and another set of guide eyes **60** are carried by the rigid tube **52**. A pull cord **62** is threaded through the eyes **58** and **60** and passed over the coping as shown in FIG. **1** for manipulation purposes.

In the operation of my device, when the bag **32** is first placed within the pool in a limp state and the reenforced end **34** drawn down into the water by the cords **36** and the adjusting cable **42** some air and water will be entrapped within the bag **32** and the latter will take on a shape substantially as shown in FIG. **1**. When the bag reenforced end **34** is adjusted to its desired depth, the adjusting cable **42** may be made secure to eye **47**. To inflate the bag **32**, it is only necessary to force air through the hose **48**, tube **52** and end hose **56** whereupon the air will bubble up through the entrapped water as shown and inflate the bag to the position as shown in FIG. **2**. As long as the bag is held in a stable state by the cables **36**, the air will remain entrapped in the bag and hold the cover **32** in an elevated and downwardly tapering state. It is to be noted that the surfaces of water S within the bag comprises a sealing means for holding the pressurized air within the inflated bag **32**. During the time when air is passing through the supply tube, **52** and end hoses **48** and **56**, because of the air buoyancy these parts will swivel about cable **42** to an upward position as shown in FIG. **1** and when devoid of air will drop to the position as shown in FIG. **2** after the supply hose **48** is removed. Now the loosened portion of the cover **32** may be tied back underneath the coping **16**.

If for some reason or other it is desired to deflate the bag **32** in part or completely, it is only necessary to bend the end hose **56** to a position where its discharge end is elevated above the water surface within said bag as shown in dotted outline in FIG. **2** which is accomplished by merely pulling on the pull cord **62**. Due to the fact that some amount of water may be lodged in the air connected hoses and tube, it is first necessary to exhaust this residual water by blowing inwardly on the outer hose **48**, whereupon the pressurized air in bag **32** will then readily flow outwardly through the connected hoses and tube. The discharge of air may be immediately stopped by dropping the end of the hose **56** below the water level within the bag passageway, the water in fact serving as a shut-off valve. It will now be evident that the depth of the ring **34** effectively controls the maximum pressure which may be developed within the bag to prevent bag rupture. It should be understood that in the manufacture of the bag **32**, it may be molded to the shape as it appears fully inflated in FIG. **2**.

FIG. **3** shows a form where some material may be saved by making the central area of the pool covering **28** serve as the closed end of the inflatable bag **32**. This is accomplished by forming the bag with only a side wall **64** and an arcuate portion **66** the upper end of which is sealed to the pool cover as at **68**.

FIG. **4** shows another type of combined pool cover **28'** and inflatable container **32'**. Here the air container is substantially the same as in FIG. **1**, but the sheet cover **28'** takes the form of a large annulus. The inner area of the cover is provided with a detachable form of fastener **29** on its under surface. A complemental fastener part **31** is attached to the upper surface of the container adjacent the arcuate portion **66'**. The form of fastener elements here used may be the fastener material known as "Velcro." In this form, if desired, the sheet cover need not be made of impervious vinyl material but can be made of the conventional woven mesh polypropylene material such as used in some pool covers.

FIG. **5** shows a modified form of draw cable arrangement wherein the draw cables **36'** are all extended in length and passed through the weight handle **44**, thence up to the pool coping **16**, where they may be attached in the usual manner. In this construction the cables **36'** may be individually manipulated for controlling the position of the reenforced lower rim of the container in the pool. With this arrangement the rim of said container can be tilted for the purpose of exhausting air out of the interior of the chamber if desired.

SECOND FORM

In the second form of invention as shown in FIGS. **6** and **7**, the tank consisting of the wall, liner, upper coping and ground rail are identical to the first form of invention. In this form the pool cover **70** constitutes a part of the inflatable bag or air container and is made just large enough so that its outer edge will be substantially coextensive with the pool coping **16**. The outer end of the pool cover **70** is sealed to an inwardly and downwardly arcuate skirt **72** which defines an inlet passageway. The lower end of the skirt is affixed to an an-

nular ring 74 to give rigidity and weight to the lower or inlet opening end of said skirt.

In order to hold the open end of the skirt 72 downwardly within the pool at a predetermined depth, provision is made of several tie cords 76 attached to eyes 78 depending from the ring 74. The tie cords 76 are then directed downwardly and passed upwardly through other eyes 80 formed as a part of an escutcheon plate 82 seated against the inside surface of the liner wall 20 for sealing purposes. The details of the escutcheon plate are shown in FIG. 8 and shows an integral bolt portion 84 passing through suitable holes in the liner L and tank wall 12 to the exterior thereof. Here the bolt supports a cleat 86, washer 88 and nut 90, the latter serving to tighten all parts together as a unit. After the skirt ring 74 is drawn down to its desired depth, the tie cords 76 are directed over the pool coping 16 and thence down to the cleats 86 and wound thereabout in the usual manner.

Pulling on the several tie cords 76 in their free state, the bottom edge of the skirt can be adjusted to any desirable depth within the pool. Obviously the deeper the open end of the skirt 72 is pulled into the pool, the greater amount of air can be entrapped within the inflatable container which includes combined skirt 72 and cover 70 and vice versa. In the manufacture of the pool cover 70 it is desirable to preform the skirt material so that it will assume generally a conical shape depicted in FIG. 7.

In order to prevent the outer rim of the combined pool cover 70 and skirt 72, from blowing off from the top of the coping 16, several eyelet members (not shown) may be assembled in said outer rim and a like number of hooks 73 provided with their eye portions assembled to said eyelet members and their opposite hook ends may be detachable to a series of eyes 75, projecting outwardly from the coping 16.

As an adjunct to the support of the pool cover 70 and to give it more weight-support ability (in pools of larger diameter), I propose to use a supplemental inflatable container generally indicated by the numeral 92. This container may be made as an effigy of some cartoon character or of a humorous personage or animal, to give entertainment to the young people making use of the pool in the summertime.

As an example, there is shown an inverted hollow, cylindrical body 94, which may be ornamented externally to simulate the dress of the character portrayed. The lower end of said body defines an inlet passageway and is formed integral with an inwardly and upwardly coned base 96 having a relatively large inlet opening 96*a*. The upper end of the container is rounded off at 98 to represent shoulders and above this area is attached a spherical member 100 to represent a head with an inter-communicating passage 102 there between.

As a means of centering the container 92 within the pool, use is made of a conventional sink plunger such as used by plumbers for cleaning out clogged drain traps. As here shown, the bell-like vacuum cup 104 is adhered to the floor part 22 of the pool liner L, and its stick handle 106 is projected upwardly through opening 96a in the container base 96. If desired, a weighted member 97, may be lodged within the angle defined by body 94 and coned base 96 to further stabilize the container 92 in seeking a vertical position.

As a means for inflating the two containers shown in this embodiment, the same type of air supply hose as shown in FIGS. 1 and 2, may be employed, a portion of which is shown in FIGS. 6 and 7. Here the inner hose 56 on end of tube 52, may rest upon the pool floor 22 and have its discharge end located in the water and positioned underneath the supplemental container 92. Air blown through the tube will bubble up through the water and funnel through the conical base 96 into container passageway. As air rises upwardly into the head 100, the water level in the container 92 will gradually be forced downwardly and the buoyancy effect of the entrapped air will cause the container to gradually raise and elevate the cover sheet 70. Since the cover sheet 70 and skirt 77 are hermetically sealed by reason of the entrapped water surface S within said skirt, as this sheet starts to rise, a vacuum will be created within the confines of said sheet 70, skirt 72 and water surface S. To allow air at atmospheric pressure to be drawn into the evacuated space, an air-intake tube 91 is provided as shown in dotted outline in FIG. 6. The inner end of said tube is furnished with a float 91*a* so as to hold the inlet end of the tube above the water surface. Thus air can be drawn into the large container to nullify any vacuum that might otherwise be created.

As pressurized air builds up in the supplemental container 92, the water level therewithin will be lowered. When the water has been almost completely forced outwardly of the supplemental container, the air intake tube 91 should be withdrawn and the rim portion of the cover sheet 70 and skirt 72 anchored back in place by the adjacent hook 73. As more air is directed into the container 92, it will finally exhaust the container of all water and the air will then seep around the lower edge of said container and bubble up through the water to be confined within the combined sheet 70 and skirt bag 72 and increase the air pressure therewithin and give added support to said sheet. (Note the sectional portion of the container 92 in FIG. 7).

As pointed out above the supplemental container can be made in the image of an animal or some humorous personage and make a plaything for the youngsters who may patronize the pool when it has been stripped of all winterizing accoutrements. By emptying most of the water out of the container 92 and then by vertically plunging said container upwardly and downwardly in said pool, the air entrapped within said container will progressively increase the buoyance effect of the container the deeper it is plunged into the pool. Also, if biased out of a vertical position the air entrapped within the container 92 will add to the wrestling effect of the container in seeking a horizontal position and float to the top.

To give added amusement to the container 92, a whistle 108 is provided that is secured to the inside of the head 100, the details as best shown in FIG. 9. The whistle consists of a long tube 109 extended down into the container almost its full extent. The upper end of the tube 109 is joined to a bulbous chamber 110 and terminating in an upwardly restricted inlet port 111. The whistle has an outlet opening 112 restricted by an inwardly biased tongue 113 for creating the whistle sound. Air may be exhausted through a port 114 in the head 100 and conveniently could be placed in the vicinity of the ear of the character represented. The port 114 is defined by a flanged bushing 116 extending inwardly of the head 100 and the surface of the whistle surrounding the opening 112 may be affixed to the

flanged portion of the bushing by a suitable adhesive.

In the operation of the musical container **92,** it will be apparent that as said container is plunged vertically downwardly in the pool water it will rise within said container and compress the air within the head **100** and thence the air will be emitted outwardly through the whistle **108** and ear port **114.** As the container **92** is lowered into the water, the latter will also rise within the whistle tube **109** thus shortening the tube inside area and raising the pitch frequency of the whistle. By intermittently lowering and raising the container, the tonal values of the whistle will change and with practice a simple tune may be played to the amusement of the operator.

To prevent air and water from passing through port **114** when the container is to function only as an elevator, a suitable plug **114***a* (FIG. **9** may be used to seal off the ear opening **114.**

THIRD FORM

The third embodiment of this invention is shown in FIGS. **10** and **11.** Here the pool wall construction may be the same as shown in the previously described two forms. In this form a double bag or two air containers are shown one within the other designated as **120** and **130.** The larger bag **120** includes two halves — an upper half **122** and lower half **124** seamed together at **125,** both halves being of a thin, flexible, air impervious material. The lower half is formed with a depending neck **126** defining a passageway. The neck has sufficient wall thickness to hold its own shape under normal circumstances. The lower end of the neck is reenforced by rim **128** which defines an inlet opening and provides an upwardly facing shoulder **129.** The lower surface of the rim is preferably coned upwardly and inwardly to better guide the air bubbles into the container as will appear later. The inner bag **130** is here shown as a relatively smaller sphere **132** of air impervious material which has a dependent neck or passageway **134** of thicker material sufficient to sustain its own shape.

The two necks **126** and **134** are held concentrically spaced relative to each other by means of a spider member **136** consisting of a central annulus **138** and radial arms **140** (see FIG. **12**). The inner, upper surface of the annulus **138** may be affixed to the lower end of the neck **134** by any suitable adhesive impervious to water. The arms should be of sufficient resiliency so that they can flex downwardly in forcing the inner bag **130** upwardly within the outer bag neck **126,** after which the arms will assume their normal outward position and come to rest upon the upwardly facing shoulder **129** of the reenforcing rim **128.** The central aperture in the spider **136** defines the inlet opening into the inner container **132.**

In order to automatically position the two bags **120** and **130** proximate the center of the pool during installation, a cable **142** is provided which is strung across the pool and anchored to eyes **144** attached to the inner flange of the coping **16,** and left sufficiently slack to assume the form of a catenary. A relatively light weight **146** having a hook **148** is next suspended on the cable **142,** and said hook in turn is connected to the spider member **136** by a lighter cable **150** leading up to and affixed to the arms **140** of said spider member. It will thus be obvious that when the two bags are in very much of a collapsed state (such as shown in FIG. **10**) and are initially thrown upon the pool surface, by hooking the weight upon the cable **142** the weight will tension and ride down said cable and automatically come to rest at a central position in the pool.

With the parts thus assembled and the bags **120** and **130** in a deflated state, a pool cover **152** may be drawn over the top thereof with its outward surface resting upon the coping **16.** The cover material is extended sufficiently to permit it to overhang the coping **16** so that it can be suitably attached to the outer surface of the tank wall **12.** For this purpose I prefer to use the "Velcro" fastener means such as described in connection with FIG. **3.** Specifically a strip of or an intermittant set of strip bases **154** may be attached to the outer surface of the pool tank **12** just below the coping **16.** Another strip or sets of strips **156** having the complemental fastener elements thereon are attached to the underside of the pool cover **152** adjacent its periphery. By merely pressing the peripheral area of the pool cover inwardly the complemental fastener parts **154** and **156** will readily attach to each other without requiring any critical alinement manipulations for holding this pool cover in place. Conversely it will be just as easy to detach the cover by pulling outwardly on its peripheral edge any time it is desired to release a portion of or the entire pool cover.

For the purpose of inflating the two bags **120** and **130,** use is made of a twin hose **158** such as can be purchased on the open market and consists of two individual hoses united together as a single unit. The outer end of said hose **158** is layed over the coping **16** and under a released portion of the pool cover as shown in FIG. **10.** Considering the dual function of this twin hose **158,** one hose serves as a forced air hose **160** and the other a free air-intake hose **162.** The outer end of the twin hose **158** is split and the forced air hose **160** is cut to a longer length and provided with a coupling **161** for attachment to an air supply line. The opposite or inner end of the twin hose **158** is held suspended on a suitable hook **164** depending from the reenforced rim **128** of neck **126.** The inner end of the twin hose is likewise split with the free air-intake hose **162** left considerably longer than the force-air hose and inserted through any one of the spaces between the spider arms **140,** upwardly through the passageway defined by the inner and outer necks **134** and **126** and well up into the air space defined by the outer bag **120.** The forced-air hose **160** is cut to a length where its inner terminal end will align substantially with the inlet opening into the neck **134** of the smaller bag **130,** this end of said hose **160** being always positioned within the pool water so that air has to bubble up through the water to be entrapped within the inner bag.

It is assumed that when the two bags **120** and **130** are first floated upon the pool, water will be entrapped in their respective necks substantially as shown in FIG. **10.** As the intake air is pumped into the hose **160** the inner bag will be inflated and assume its semi-rigid spherical shape. As this smaller inner bag enlarges, the air space within the larger outer bag will likewise enlarge and due to the sealing feature of the water entrapped in neck **126,** the larger bag will tend to create a vacuum which however will be nullified by atmospheric air taken in through intake hose **162.** After the inner bag **130** is completely inflated air will continue to bubble up through the neck **134** until all water is forced out of the neck **134.** Thereafter the continued flow of air from the hose **160** will be directed up into the neck

126 of the larger bag 120 to inflate or pressurize the latter bag. At this time the outer end of the air-intake hose 162 which carries a weight 162' should be dropped into the water in the tank as shown by dotted outline in FIG. 10 to prevent the escape of air from the outer bag 120. As air continues to bubble up through neck 126 the larger bag 120 will be inflated to the state as shown in FIG. 11 and the water level in said neck will drop down approximately to the position as indicated. Here again it is to be observed the water level in the neck 126 serves as the valve or sealing means for retaining the pressurized air in the larger bag 120 as well as the smaller bag 130. After the two bags have been inflated to the desired state, the outer end of the forced-air hose 160 may then be lodged within the tank 12 along with hose 162.

Experimentation has shown that when pressurized air is initially introduced into the large bag 120, there is a tendency for its neck 126 to rise within the pool in spite of the weight 146. Therefore, it is another function of the spider 136 to assure that the reenforced open end of the neck 126 is always held to a required depth within the pool. This is accomplished by the fact that the downward force and weight of the cover 152 in its more or less taut state will be transmitted through the now inflated semi-rigid sphere 132 and its attached neck 134 of thicker material directly to the spider member 126 and impart a downward force to the reenforced rim 128 of the large bag neck 126.

FOURTH FORM

FIGS. 14 and 15 show a further modification of the invention referred to as the Fourth Form and wherein use is made of the conventional pillow-like bag or container 171 used for elevating a protective cover 170 of a swimming pool. Here the bag 171 is shown as made in two halves 172 and 173 sealed together at 174. A bushing 175 is fixed to the underside of the bag to which one end of an air feed hose 176 is secured in any suitable manner. The hose 176 defines a passageway which communicates with the interior of the container 171 and leads to a float unit 178 located adjacent the tank wall 12.

The float unit consists of a tube 180 formed with an inverted funnel 182 at its lower end which further defines the passageway leading to the container 171. An annular weight member 184 supported on the tube rests on the funnel 182. A float ring 186 surrounds the tube 180 at its upper end and may be adjusted up and down on said tube and made secure by a set screw 187 to determine the position of the inlet opening of the funnel 182 relative to the surface of the water in the pool. By controlling the depth of the latter inlet opening the maximum pressure which can be developed within the container 171 may also be controlled to prevent damage to the container.

An S-shaped air discharge nozzle 188 of rigid construction is shown as being hooked over a cross pin 190 supported by the funnel 182 adjacent its lower open end. The reason for this S-shaped nozzle is to direct its discharge end downwardly in the water rather than upwardly. Experience has revealed that if air bubbles are floated directly upwardly from the discharge end of a hose under or within the funnel such action tends to carry some amount of water up into the air feed hose 176. The S-shaped nozzle 188 by first directing the air bubbles downwardly before rising upwardly to be entrapped in the funnel 182 eliminates this fault.

The nozzle 188 is coupled at 192 to a flexible air supply hose 194 that leads up and over the coping 16. During the bag inflating operation one portion of the pool cover 170 will be loosened as indicated at 170' to allow the air supply hose to pass there underneath after which the hose may be removed or disposed within the tank and then the loosened portion of the cover may be clamped to the wall of the tank as indicated in dotted outline in FIG. 14.

While I have illustrated and described herein several forms in which this invention may be conveniently embodied, it is to be understood that other forms and variations may appear to those skilled in the art and fall within the scope of the following claims.

What I claim is:

1. In combination with a swimming pool having a bottom and side walls terminating at an upper edge, means for covering the entire exposed surface of said pool, means for securing said covering means in fixed position relative to said pool with the outer perimeter of said covering means disposed outwardly of said upper edge, means for elevating said covering means above the surface of the water in said pool including at least one inflatable container made from air-impervious material and having means defining a passageway communicating with the interior thereof, said passageway having an inlet opening, means for maintaining said inlet opening and at least a portion of said passageway adjacent thereto in a submerged position to entrap a quantity of water in said passageway, and means for introducing air into the water below the surface of the entrapped quantity of water to bubble upwardly through said entrapped quantity and escape from said surface thereof into said container whereby to inflate same, said surface of said entrapped quantity providing sealing means for maintaining the air in said container.

2. The combination as set forth in claim 1 wherein said container comprises a collapsible bag.

3. The combination as set forth in claim 2 including means for reenforcing said bag at said inlet opening, said reenforcing means comprising said means for maintaining said inlet opening in a submerged position.

4. The combination as set forth in claim 2 wherein said bag includes a reduced neck portion which defines said inlet opening and said passageway.

5. The combination as set forth in claim 2 wherein said bag has a pillow-like configuration and said passageway is at least partially defined by an elongated hose communicating with the interior of said bag.

6. The combination as set forth in claim 1 wherein said elevating means includes another container at least partially disposed within said one container.

7. The combination as set forth in claim 6 wherein said one container comprises a collapsible bag having a reduced neck portion and said other container comprises a collapsible bag having a reduced neck portion, said neck portion of said other container being disposed within said neck portion of said one container, each said neck portion defining said inlet opening and said passageway.

8. The combination as set forth in claim 6 wherein said other container comprises a hollow axially elongated body having a generally cylindrical portion defining said inlet opening, and said elevating means in-

cludes means for maintaining said body in a generally axially vertical condition.

9. The combination as set forth in claim **6** wherein said other container comprises a hollow axially elongated body having a generally cylindrical portion and a spherical portion terminating its upper end, said cylindrical portion defining said inlet opening.

10. The combination as set forth in claim **6** wherein said other container comprises a hollow axially elongated body having a generally cylindrical portion and a spherical portion terminating its upper end, said cylindrical portion defining said inlet opening, a whistle member positioned within said spherical portion and having a port leading to the exterior of said spherical portion, and a sound defining tube forming a part of said whistle and extending downwardly into said cylindrical portion.

11. The combination as set forth in claim **6** wherein said other container comprises a hollow axially elongated body having an upper closed end and an upwardly extending conical base at its opposite lower end, said conical base having a central port defining the inlet opening into said other container.

12. The combination as set forth in claim **6** wherein said other container comprises a hollow axially elongated body having an upper closed end and upwardly extending conical base at its opposite lower end, said conical base having a central port defining the inlet opening into said other container, and a weight member lodged within the angle defined by said conical base with said elongated body.

13. The combination as set forth in claim **6** wherein said one container comprises said covering means.

14. The combination as set forth in claim **6** wherein said means for maintaining said inlet opening of said one container in a submerged position comprises said other container.

15. The combination set forth in claim **1** including means for automatically positioning said inflatable container generally midway between opposite sides of said pool.

16. The combination set forth in claim **15** wherein said means for automatically positioning said container comprises said means for maintaining said inlet opening in a submerged position.

17. The combination as set forth in claim **15** wherein said means for automatically positioning said container comprises a line having the ends thereof secured at opposite sides of said pool and a weight slidably received on said line and connected to said inflatable container.

18. The combination defined in claim **1** wherein said container is releasably secured to said covering means and forms a part thereof.

19. The combination as set forth in claim **18** wherein said container is releasably secured to said covering means by "Velcro."

20. The combination as set forth in claim **1** wherein said covering means comprises an air-impervious sheet and a portion thereof forms a part of said container.

21. The combination as set forth in claim **1** wherein said means for maintaining said inlet opening in a submerged position is adjustable to maintain said inlet opening at a predetermined position below the surface of the water.

22. The combination as set forth in claim **21** wherein said means for maintaining said inlet opening in a submerged position comprises a float adjustably secured to said passageway-defining means, and a weight secured to said passageway-defining means between said inlet opening and said float.

23. The combination as set forth in claim **21** wherein said means for maintaining said inlet opening in a submerged position comprises a weight disposed at the bottom of said pool, and means providing adjustable connection between said weight and the portion of said container defining said inlet opening.

24. The combination as set forth in claim **21** wherein said adjustable connecting means comprises several tie cords, at least one of said tie cords extending through an opening in said weight and upwardly to said upper edge where it may be manually manipulated to adjust said inlet opening to said predetermined position.

25. The combination as set forth in claim **1** wherein said covering means is attached to the outer side walls of said tank by detachable snap fasteners.

26. The combination as set forth in claim **25** wherein the snap fasteners are of the "Velcro" type.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,801,994 Dated April 9, 1974

Inventor(s) George Joseph Brown

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Fig. 1., Fig. 2, Fig. 3., Fig., 4, Fig., 5, Fig., 6, Fig., 7, Fig. 8, Fig. 9., Fig., 14 and Fig. 15 should appear as shown on the attached sheets.

Signed and sealed this 19th day of November 1974.

(SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

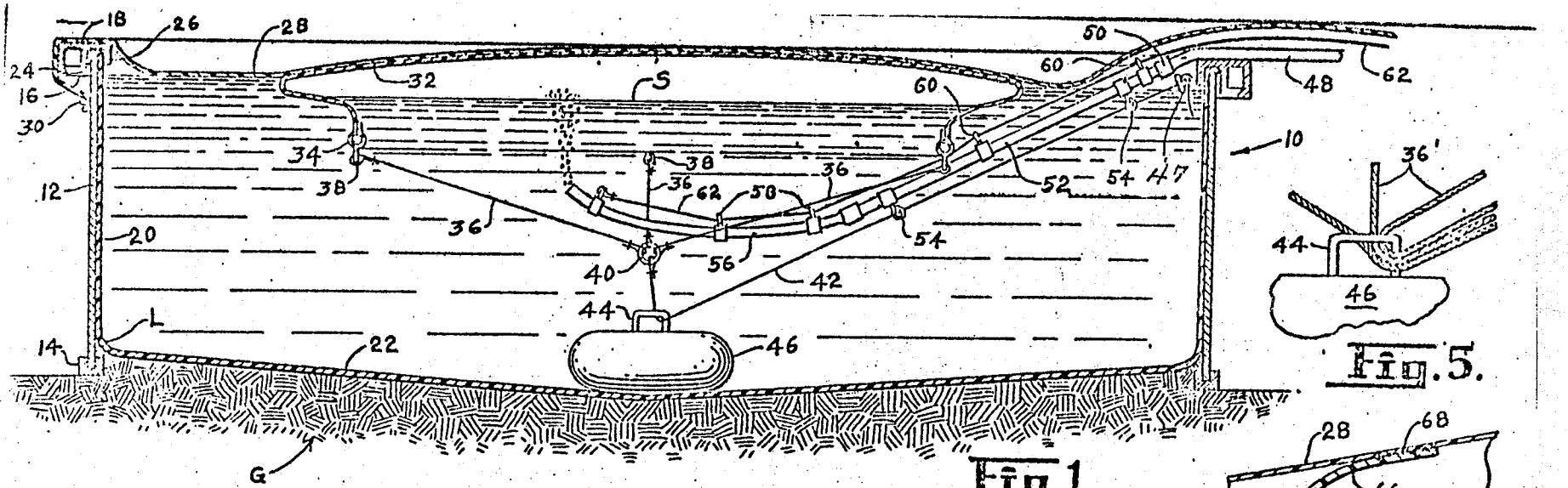


Fig. 1.

Fig. 5.

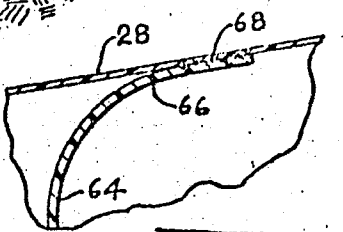


Fig. 3.

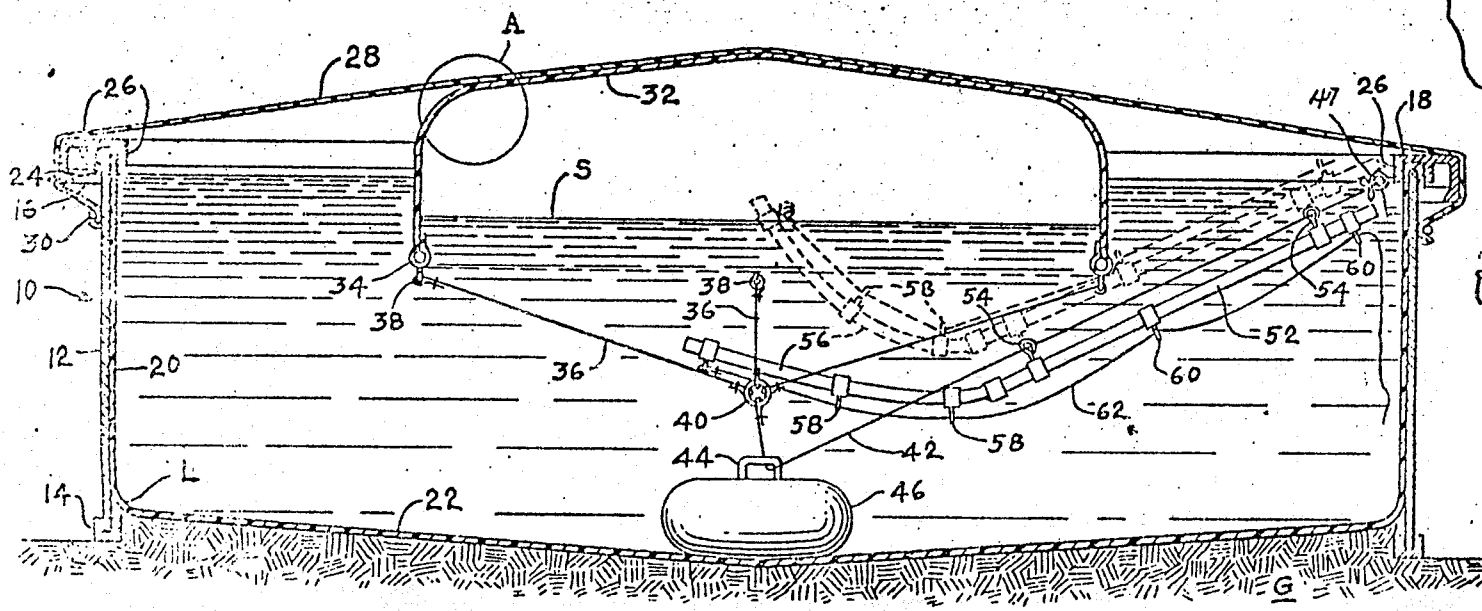


Fig. 2.

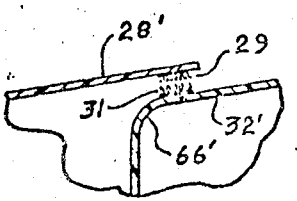


Fig. 4.

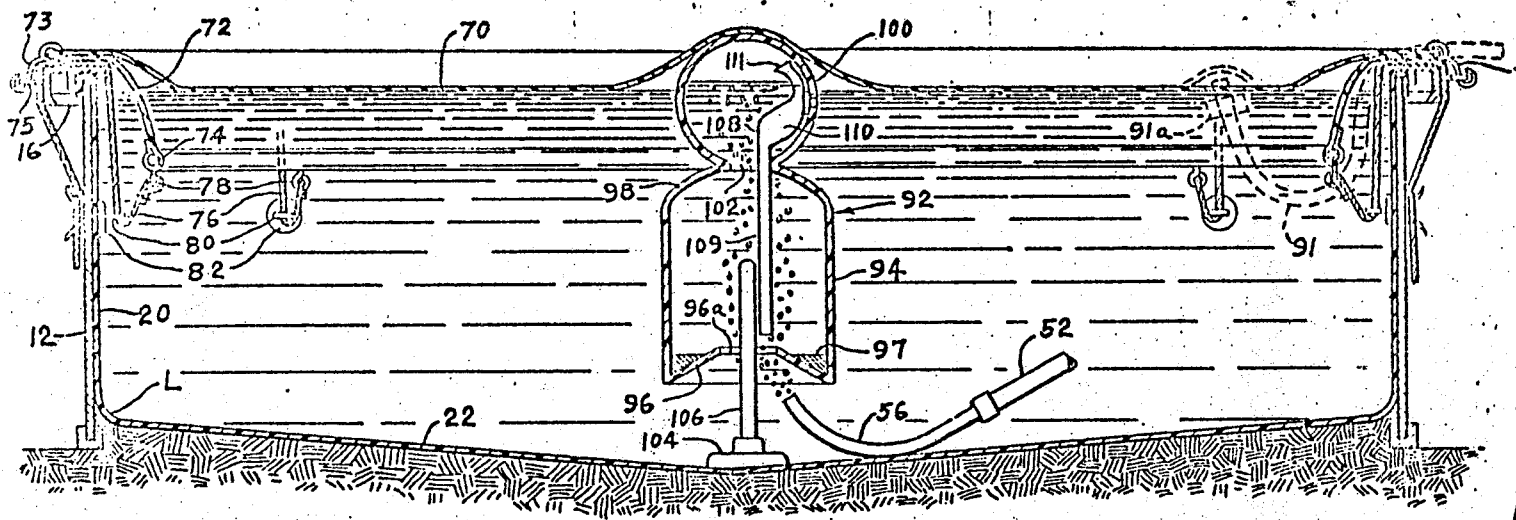


Fig. 6.

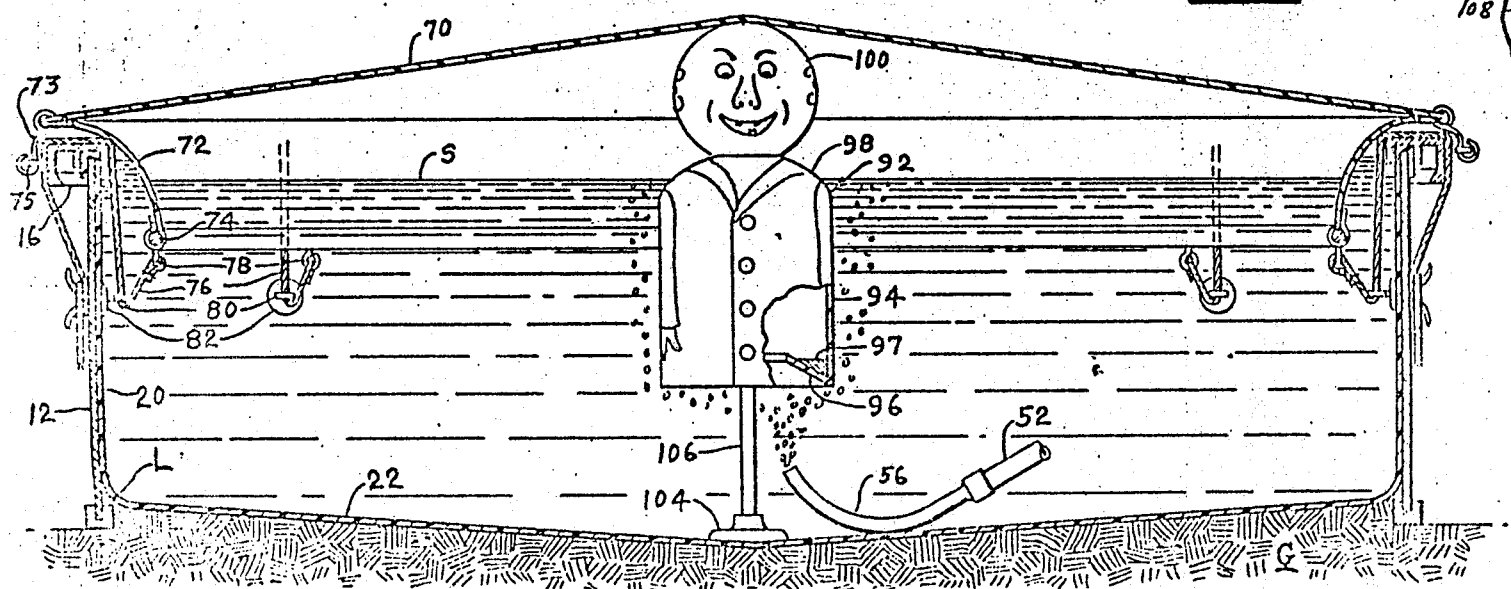


Fig. 7.

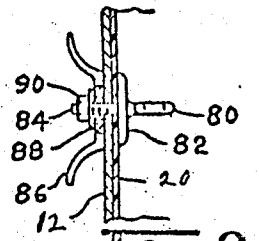


Fig. 8.

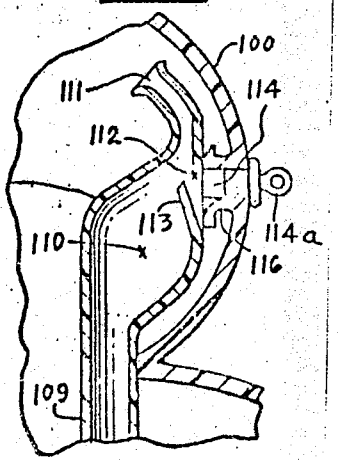


Fig. 9.

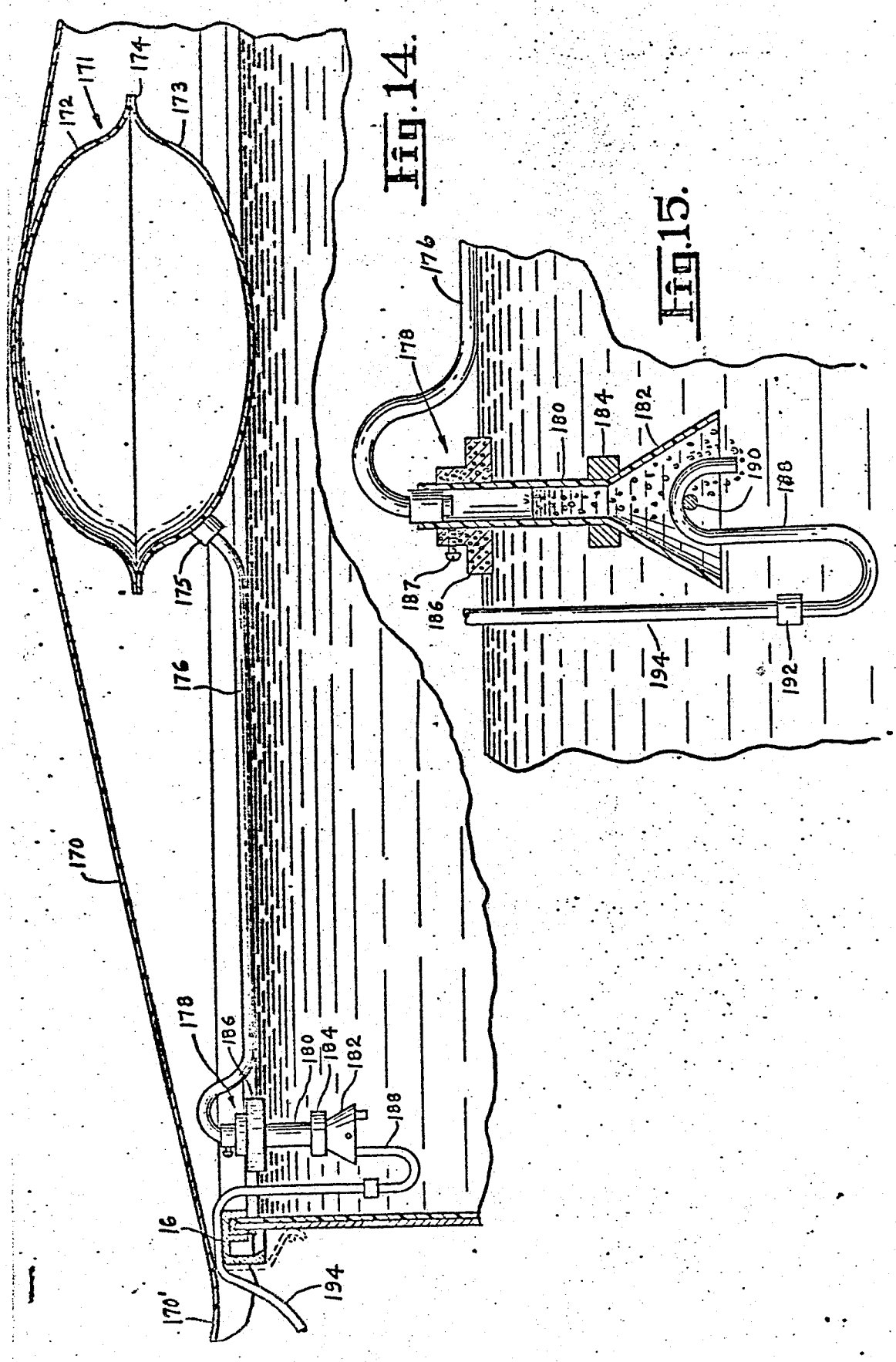

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Fig. 14.

Fig. 15.