

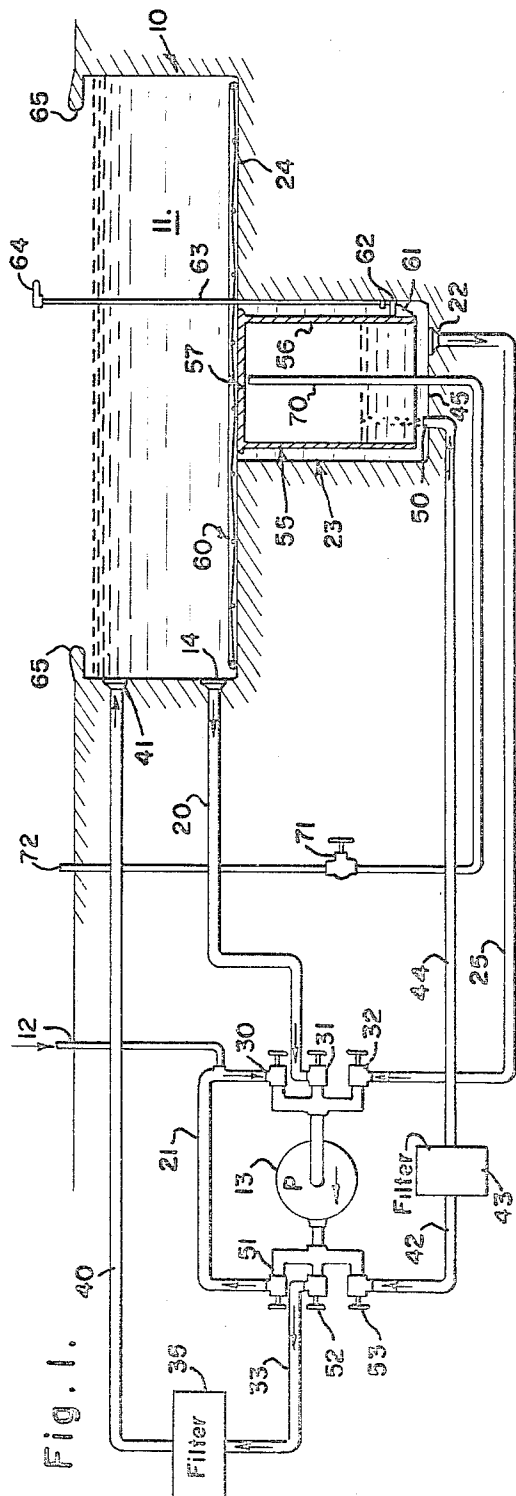
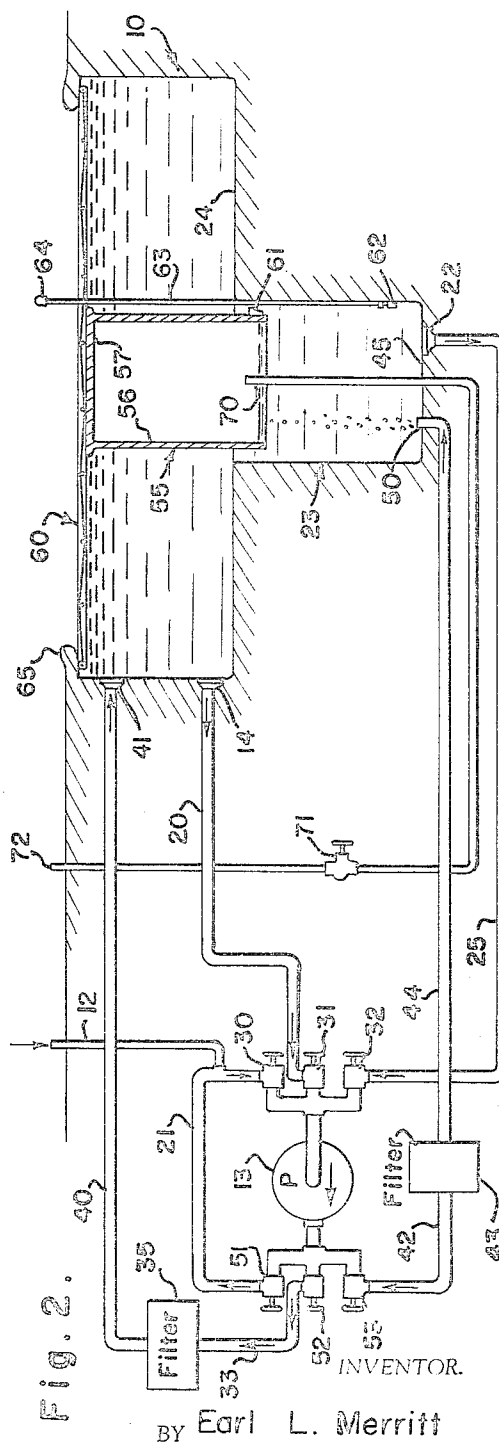
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SWIMMING POOL NET ELEVATOR

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SWIMMING POOL NET ELEVATOR
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This invention relates to a new and improved elevator for a safety net for a swimming pool.

A primary advantage of the present invention is that the protective net can be raised to the surface of the swimming pool by buoyancy of a drum and by remote control. It is not necessary for the operator to handle the net itself in any way or to enter the pool. When the swimming pool is to be used, the net may be lowered to the bottom of the pool by filling the drum with water and the net remains there until the operator actuates the elevating means to raise it to the surface again.

Another feature of the invention is that raising and lowering of the net is accomplished by a cylinder which is alternately filled and emptied with air.

Another advantage of this device is that the safety net can be raised to the surface when a person is in difficulty in the pool, thus providing an automatic rescuing apparatus as well as a protective net which is in place when the pool is not in use.

A further advantage of this invention is the provision of a protective net which extends to all sides and corners of the pool and which is supported by the cylinder filled with air.

A still further feature of this device is that the protective net is strong enough to support anyone who falls onto it or to raise anyone to the surface who is in the pool when the net and cylinder are raised to the surface.

Another advantage of this invention is that the protective net also acts to keep the pool clear of leaves, branches, etc., which would otherwise fall onto the surface of the pool.

Still another advantage of the invention is the fact that the controls for raising and lowering the protective net can be extended a substantial distance away from the swimming pool itself, as for instance, controlled from a house window.

A still further feature of the invention is the fact that the pump used to inflate the drum which provides buoyancy for the net may be the same pump which circulates water through the pool filter.

Other features of the present invention are: rescuing persons can raise the protective net without entering the water; the net operates in any depth of water; controls are easy to operate and can be operated by children; and parts are not complicated and maintenance costs are minimal.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the views.

In the drawings:

FIG. 1 is a vertical sectional view of a swimming pool and associated plumbing, with a protective net embodying the present invention in place at the bottom of the pool.

FIG. 2 is a vertical sectional view of a swimming pool and associated plumbing, with the protective net embodying the present invention in place at the surface of the pool.

The present invention provides means for alternately raising and lowering a safety net from the bottom of a swimming pool to water level. In FIG. 1, a swimming pool 10 is shown in cross-section, filled with water 11.

Air is supplied from line 12 at atmospheric pressure

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and is raised to the desired pressure by means of pump 13. In addition, water from pool 10 flows through drain outlet 14 at the bottom of the pool and is circulated through pump 13 by means of line 20.

Line 21 provides a by-pass circuit around pump 13 if an obstruction in lines 33 or 42 or in filters 35 or 43 causes a back pressure situation. Water from pool 10 is also circulated through pump 13 from drain outlet 22 placed at the bottom of well 23 constructed in floor 24 of pool 10. Water from pool 10 also is circulated through pump 13 from drain outlet 22 placed at the bottom of well 23 constructed in floor 24 of pool 10. Water from drain outlet 22 flows through line 25 to be re-circulated by means of pump 13. Control valves 30, 31 and 32 permit adjustment of the relative amounts of air from source 12 and water from line 20 and line 25.

Water and air from the pressure side of pump 13 flow through line 33, through filter system 35 and then through line 40 to be discharged at the upper portion of pool 10 through inlet port 41. Water and air from the pressure side of pump 13 also flow through line 42, through filter system 43 and then through line 44 to be discharged at bottom floor 45 of well 23 through inlet port 50. Control valves 51, 52 and 53 permit adjustment of the relative amounts of air and water flowing out of pump 13 into lines 33 and 42 and by-pass line 21.

Drum 55 is formed of circular wall 56 enclosed at the upper end by top 57 with an air tight seal. The outer diameter of wall 56 of cylinder 55 is slightly smaller than the diameter of well 23 to permit cylinder 55 to fit easily within well 23. Safety net 60 is attached at its center portion to top 57 of cylinder 55. Safety net 60 is constructed of rope, plastic, tubular metal or other suitable material to form a web which is shaped to extend to all walls and corners of pool 10.

Shoulder 61 is formed at one point on the lower rim of cylinder 55. Detent 62 is rotatably affixed to the wall of well 23 opposite shoulder 61 such that detent 62 will be above and bear against the upper portion of shoulder 61 when cylinder 55 is submerged in well 23. Rod 63 extends from above the upper rim of pool 10 down to detent 62 in well 23 to permit detent 62 to be rotated by rotational movement of rod 63 and handle 64 above the water level of pool 10.

In FIG. 1 cylinder 55 and safety net 60 are shown submerged in pool 10 on pool floor 24. The operator turns handle 64 90° so that detent 62 extends outwardly from the wall of well 23 to prevent upwards movement of shoulder 61, cylinder 55 and net 60. As pump 13 recirculates water 11 from pool 10, a certain amount of air from line 12 is introduced into the system and a mixture of pressurized water and air appears at the pressure end of pump 13. An air and water mixture is ejected from outlet 50 on bottom floor 45 of well 23 and air rises into the interior of cylinder 55. Cylinder 55 gradually fills with air, as shown in FIG. 1. When cylinder 55 is filled with air, any excess air will escape around the lower rim of cylinder 55 and rise to the surface. When drum 55 is substantially filled with air, its buoyancy tends to lift net 60, but this is prevented by latch 61-62.

When it is desired to raise safety net 60 to the surface of pool 10, as when the pool is no longer to be used or when someone is in difficulty in the pool, then the operator turns handle 64 90° to its original position. This action places detent 62 flush with the wall of well 23 and detent 62 no longer blocks the upward path of shoulder 61 and drum 55 is free to float upwards. The buoyant force of the air filling cylinder 55 causes cylinder 55 and net 60 to quickly rise to the water surface in pool 10, as shown in FIG. 2. Net 60 will continue to rise until its

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outer margins contact and are held by extending ledges 65. If anyone falls into the pool after this time, they will be held at water level and will be supported by safety net 60. If anyone was in the water when handle 64 was operated, they would have been raised to the surface by net 60 and held there until they could be aided.

Line 70 extends vertically upwards from floor 45 of well 23 such that the upper end of line 70 clears the inner surface of top 57 of cylinder 55 when cylinder 55 is fully submerged, as shown in FIG. 1. Cut-off valve 71 in line 70 can be opened or closed to permit air under pressure in the interior of cylinder 55 to escape through opening 72 in line 71 which is exposed to the atmosphere. When it is desired to lower safety net 60 to the bottom of the pool 10 prior to use of the pool, the operator opens valve 71, permitting air under pressure in cylinder 55 to escape to the atmosphere. Water from pool 10 fills cylinder 55 and net 60 sinks to floor 24 of pool 10 while cylinder 55 sinks into well 23. When cylinder 55 is fully submerged in well 23, the operator turns handle 64 90° to turn detent 62 in place to prevent cylinder 55 from rising. Pump 13 continues to cause air to flow into cylinder 55, until it is entirely full of air, and net 60 is then ready to be allowed to rise to the surface, when the need should occur.

Thus, this invention provides a controllable safety net which not only can remain in place at the surface of pool 10 to protect those falling into the pool, but also rises to the surface when desired to aid anyone in difficulty in the pool itself.

Although the foregoing invention has been described in some detail, by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention and the scope of the appended claims.

What is claimed is:

1. An automatic swimming pool net system comprising,
 - a safety net shaped to cover the surface area of a swimming pool,
 - a well formed in the floor of a swimming pool,
 - a cylinder having its upper end enclosed, said cylinder shaped to fit into said well, said cylinder attached to said safety net,
 - means for introducing a stream of air into said cylinder when said cylinder is within said well,
 - means for retaining and releasing said cylinder within said well against the buoyant force of air within said cylinder, said cylinder and said safety net rising to the surface of said pool when said retaining means are released, and
 - means for exhausting the air within said cylinder when said net and said cylinder are floating at the surface

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of said pool, to sink said cylinder and said net to the floor of said pool when said supply of air within said cylinder is exhausted.

2. A system according to claim 1 in which said means for introducing a stream of air into said cylinder comprises,
 - a pump used to re-circulate water within said swimming pool,
 - means for introducing a given quantity of air into said pump, whereby pressurized water and air appear at the pressure side of said pump, and
 - means for introducing said pressurized air and water into said cylinder when said cylinder is within said well.
3. A system according to claim 1 in which said means for retaining and releasing said cylinder comprises,
 - a detent rotatable from a position flush with the wall of said well to a position extending outwardly from the wall of said well,
 - means extending upwardly from said detent to above the surface of water in said pool to permit rotation of said detent by an operator above the water surface level of said pool, and
 - a shoulder at the lower rim of said cylinder, said shoulder catching on said detent when said detent extends outwardly from the wall of said well and said shoulder clearing said detent when said detent is flush with the wall of said well.
4. A system according to claim 1, in which said means for exhausting the air within said cylinder comprises,
 - a pipe extending vertically upwards from the floor of said well, said pipe being of a length to clear said upper end of said cylinder when said cylinder is submerged within said well and remaining partially within said cylinder when said net and said cylinder are floating at the surface of said pool, and
 - means for cutting off the flow of air within said pipe, said pipe, at its end other than that extending within said cylinder, being exposed to the atmosphere.

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