April 14, 1964 J. F. BEAL 3,128,478

BUOYANT NET AND SAFETY COVER FOR SWIMMING POOLS

Filed Dec. 2, 1959 2 Sheets-Sheet 1

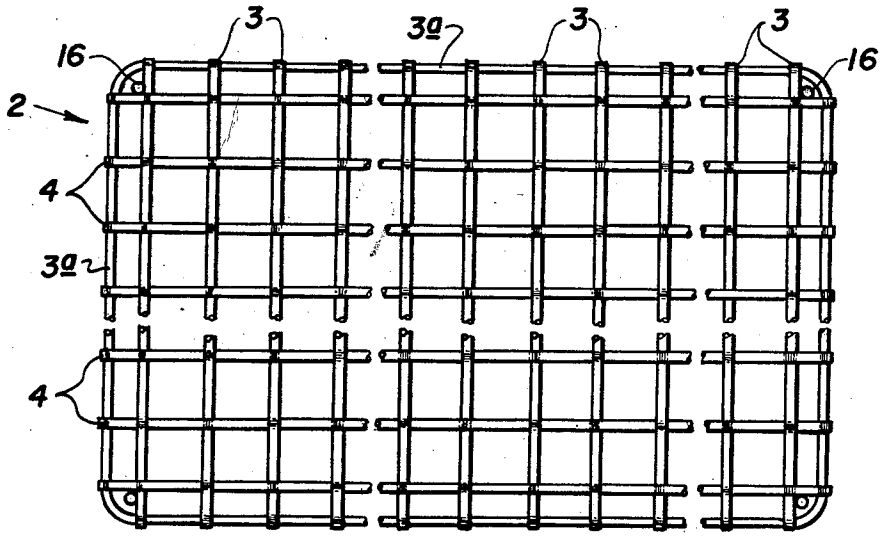


Fig.1.

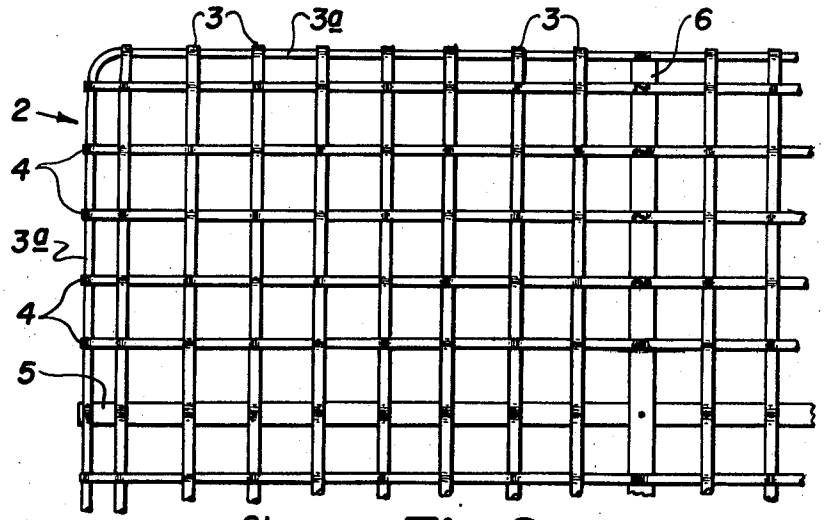


Fig.2.

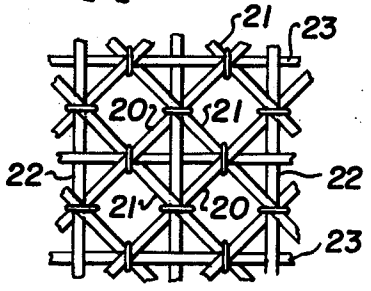


Fig.8.

INVENTOR.
James F. Beal
BY
Christy, Parmelee & Stricklan
his ATTORNEYS

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BUOYANT NET AND SAFETY COVER FOR SWIMMING POOLS

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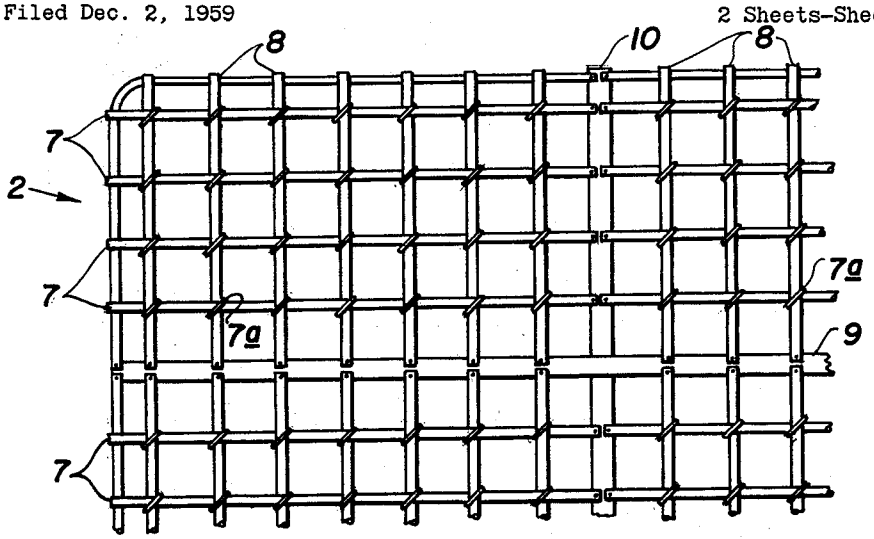


Fig.3.

Fig.4.

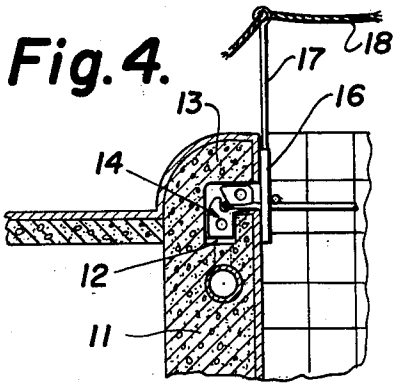


Fig.6.

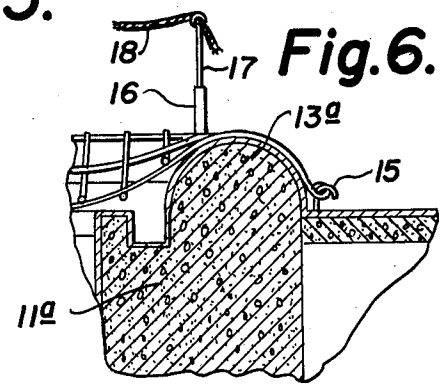


Fig.5.

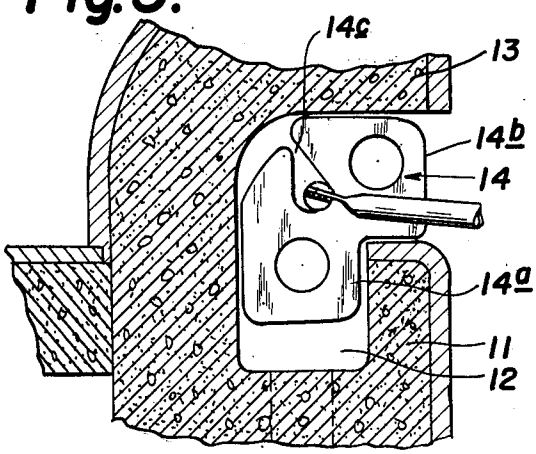
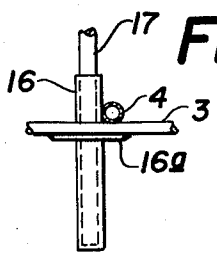


Fig.7.



INVENTOR.
James F. Beal
BY
Christy, Parmelee & Strickland
his ATTORNEYS

United States Patent Office 3,128,478 Patented Apr. 14, 1964

3,128,478
BUOYANT NET AND SAFETY COVER FOR SWIMMING POOLS

James F. Beal, Hempfield Township, Westmoreland County, Pa. (1068 Summit Ave., Greensburg, Pa.)

Filed Dec. 2, 1959, Ser. No. 856,691
13 Claims. (Cl. 4—172)

This invention is for a buoyant net and safety cover for swimming pools, and relates particularly to a buoyant net construction which may be used over swimming pools and in other environments where it may provide protection or function as a life preserver.

The enormous increase in the number of swimming pools throughout the country and their location out-of-doors in and near thickly populated areas, adjacent to motels and in the yards of residences, has given rise to increased danger both to children and adults. While in many cases it is practical to provide a high wire fence about an outdoor pool, it is expensive to do so and not always feasible, and it is even more difficult to be sure that the gate to such an enclosure is always closed and locked, or that persons using the pool will not leave the pool unattended and the enclosure open. Moreover, in most surroundings, such an enclosure is detrimental to landscaping, and when the pool is in use by a number of people the enclosing fence may seriously hamper the freedom of movement about the pool.

In some areas where pools are located on the grounds of motels, regulations impose a substantial burden on the owner to guard against persons falling into the pool, and sometimes he is required to provide a watchman twenty-four hours a day to see that children or adults do not wander or fall into the pool. To motel guests who have imbibed freely of alcoholic beverages, the pool seems to possess a particular challenge and danger.

The present invention has for its principal object to provide a buoyant net that may be placed over a pool, and which may be easily maneuvered into and out of position.

A further object of my invention is to provide a net which is buoyant and will float on the surface of the pool, and by reason of this buoyancy is not only more easily placed in position and removed, but it will also support more or less completely a person or child who might fall onto it. Also, because of its buoyancy, as well as its flexibility, it may be stored when not in use near the pool and tossed into the pool as a life preserver.

A further object of my invention is to provide a unique means for securing the net in position over the pool, which means is substantially concealed, affords no obstacle to one using the pool or walking around it, and which does not alter the pool construction.

These and other objects and advantages are secured by my invention as will be more fully apparent from the detailed description thereof in conjunction with the accompanying drawings.

In the drawings:

FIG. 1 is a plan view of one form of net embodying my invention;

FIG. 2 is a fragmentary plan view of another form of net;

FIG. 3 is a plan view of still another form of net;

FIG. 4 is a vertical section through one side of a pool to which my invention is applied;

FIG. 5 is an enlarged vertical section of the gutter portion of the wall shown in FIG. 4, showing in greater detail the gutter fastening for holding the net;

FIG. 6 is a fragmentary view in vertical section showing another way of anchoring the cover over a pool;

FIG. 7 is a fragmentary section through the net showing a post holder for a guard rope; and

FIG. 8 is a fragmentary plan view of an area of a net wherein more than two sets of intersecting tubes are used.

Referring first to FIGS. 1 and 2, there is provided, according to the present invention, a net **2** formed of longitudinally-extending plastic tubes **3** and similar transversely-extending tubes **4**. These tubes are preferably of an easily-extrudable thin-walled thermoplastic material. At some or all of the areas of intersection they are secured together, either by heat-flattening them and then cementing, or mechanically securing them, and the ends of the tubes are also heat-flattened and sealed. Each tube therefore is divided into a number of individual air-filled buoyant cells, each preferably completely sealed off from the adjoining ones. The tubes are woven in a conventional over-and-under basket weave, with a spacing of several inches, typically four inches, between tubes. The tubes are sufficiently rigid that the spacing between them will be fixed, but they are also sufficiently flexible at the junction points where they are flat, so that the net may be folded. The marginal edge of the net is also formed of similar tubing **3***a* flattened down where the flattened ends of the tubes **4** and **3** are heat-sealed or cemented or otherwise fastened thereto.

To facilitate folding, the net may have incorporated therein at spaced intervals longitudinally-extending non-absorbent plastic ribbons or tapes **5** and transversely-extending similar ribbons or tapes **6**. The tubes, where they intersect these tapes, are flattened as where they intersect each other, and are secured at the points of intersection to the tapes by fusion, cementing or mechanical fastening.

Such a plastic netting, being inherently buoyant, can be easily handled by an individual. In being put into place, it will float on the surface of the water, so that one person has little difficulty in positioning it over the length or breadth of the pool, and in removing it he has only to deal with any unbuoyed portion of its weight. By having tapes at intervals crosswise and lengthwise, fold lines are provided along which folding will occur more easily. When it is folded, it may be stacked on the pool edge, and it can, in emergency, be tossed into the pool in folded condition for a buoy which can be easily grasped.

As an alternate structure, the arrangement shown in FIG. 3 may be used, in which the tubes, woven in over-and-under basket weave design, are discontinuous and are secured at intervals to flat tapes. In this figure, **7** are relatively short tubes extending in one direction, and **8** are short-length tubes passing alternately over and under tubes **7**. They may be cemented or tied at the junctures, the ties being indicated at **7***a*, but their ends are flattened or sealed and secured to continuous flexible non-absorbent tapes **9** and **10** similar to tapes **5** and **6**, extending continuously of the length and breadth, respectively, of the net. The short sections of tubes **7** and **8** may be aligned, as shown, or may be staggered.

This structure provides a net having the effect of continuous tubes extending the length and breadth of the net and divided into a number of separate cells, and it can be more easily folded, since the actual physical continuity of the tubes is interrupted at the tapes.

For the ordinary private pool of small size, the net may be large enough to cover the entire pool, but for larger pools, it may be made in sections, and preferably sections which are tied or fastened to each other. Also, it may be made in strips for use alongside docks for small boats.

The net may be anchored in various ways. Assuming it to be used over a conventional pool as shown in FIGS. 4 and 5, where the walls **11** of the pool have an overflow gutter **12** extending therealong at the water line with an overhang and curb **13** over the gutter, I may use a special

holding block 14 which may be made of metal, plastic, canvas-reinforced rubber, or other material suitable for the purpose. It is in the form of a right-angle having a vertical leg 14*a* and a horizontal leg 14*b*. The outer edge of the angle is rounded and has a notch 14*c* therein extending toward but not to the inner corner of the block. The blocks are positioned at intervals around the pool.

The margin of the net at a point where the marginal tube is flattened is forced into the notch before the block is put in place. Then the block is turned sideways and moved in over the gutter and then turned upright to bring the leg 14*a* to the position shown, with the horizontal leg 14*b* on the ledge of the gutter. The block when thus positioned will hold the net against any outward pull. The vertical leg 14*a* does not extend to the bottom of the gutter, and hence does not impair the function of the gutter in carrying off excess water.

If the pool is not constructed with a gutter as above described, but the wall 11*a* is formed with an open gutter, then the edge of the net is curved over the curb 13*a* and engaged in hooks 15 set at intervals around the pool, as shown in FIG. 6.

Since it is desirable to provide a warning rope around the pool, the net may have tubular sockets 16 secured therein at the corners and, if necessary, along the edges between the corners. Posts 17 for a warning rope 18 may be placed in these sockets. In FIG. 7 the tubular socket 16 has a flange 16*a* for securing it by cementing or fastening to the corner or marginal areas of the net.

While the net is intended primarily as a covering for pools and other places where persons, especially children, or perhaps intoxicated persons, are likely to go over the edge, it may be kept folded on boats or ships to be thrown overboard in an emergency for a person or persons to cling to. It may be used over empty pools, as well as those filled with water. Before a pool is emptied for the winter or for repair, the net may be easily floated into position and secured before the water is drained away. By so doing it is possible for one person to easily install the net and then drain the pool. Since the plastic is substantially non-absorbent, the net does not lose buoyancy or become heavy to handle by reason of its becoming saturated with water. Hence it is not appreciably heavier to handle when being removed or lifted out of the water than when it is put into place. Because of its stiffness, it will not bunch or fold when being floated into position, and because it is somewhat soft, resilient and pliable, it will not hurt one who falls onto it.

The amount of buoyancy will depend of course upon the diameter of the tubes, the wall thickness, the mesh of the net, and the specific gravity of the plastic. It has adequate strength to accept the impact of a person falling onto it. Any one, even a child, falling upon it, would quickly find support to which he would instinctively cling as he might thrash about, even though he might be partially immersed. I have shown the tubes as all being of the same diameter, but dimensions may vary. Usually, however, for compactness when folded, tubes of uniform diameter will be found preferable.

Some materials suitable for this purpose are nylon, vinyl copolymer, natural or synthetic rubber, polyethylene, or like materials which are sufficiently flexible, and non-absorbent. Good tensile strength is important and slight elasticity is desirable to absorb sudden shock if a person falls onto it. Nylon, because of its superior strength, resistance to weathering and exposure to light, is presently deemed preferable for nets intended for long service. A typical net for a pool 18′ by 28′ might be formed of tubing ½″ in diameter with a wall thickness of approximately .003″. Constructed on four inch centers, it would require about 3200 feet of tubing, including the periphery which might be heavier or reinforced. It would weigh between 10 and 15 lbs. and have a buoyancy of approximately 250 lbs. A four-inch spacing is sufficiently open to enable a person who unexpectedly falls on it to find ready hand holds, but will not permit one's body or head to pass through it, particularly where the tubes are secured together at the intersections.

The net need not be woven with the tubes intersecting at right angles, or with only two sets of tubes. In FIG. 8 I have disclosed a fragment of a net having intersecting diagonal tubes 20 and 21 which may be used alone, or in conjunction with other sets of tubes, as for example, tubes 22 and 23 that intersect at right angles. With diagonal tubes, or with more than two sets of tubes, there would be a marginal strand, as in the other figures, and tapes might be employed at intervals as described in FIGS. 1 to 3. The tubes will be woven in an over-and-under arrangement and may be tied or secured together at all or some of the intersections.

An incidental advantage of this net over a pool is that on windy days it will break up wave formation and hence reduce the outflow of water into the gutters resulting from waves on the pool surface.

For clarity of illustration in FIG. 6 I have shown the hooks 15 exposed at the back of the curb, but safety considerations would make it desirable to recess these into the walkway or rear face of the curb, or to have them retractable when the pool is in use.

While I have shown and described certain specific embodiments of and uses for my invention, it will be understood that the construction of the net may be varied and that it may be used in various ways within the scope of the following claims.

I claim:

1. A buoyant safety net of the class described comprising air-filled flexible plastic tubes having sealed ends arranged in fixed intersecting relation to form a net, the tubes being spaced sufficiently to provide hand holds should one fall onto the net.

2. A buoyant safety net of the class described comprised of at least two sets of parallel air-filled flexible plastic tubes having sealed ends, the tubes of one set intersecting those of the other, with the tubes of one set passing over and under the tubes of the other set in basket-weave fashion, the tubes being spaced sufficiently to provide hand holds should one fall onto the net.

3. A buoyant safety net of the class described comprised of at least two sets of parallel air-filled flexible plastic tubes having sealed ends, the tubes of one set intersecting those of the other, with the tubes of one set passing over and under the tubes of the other set in basket-weave fashion, and a tubular margin around the periphery of the net to which the ends of the tubes are secured, the points of intersection of the two sets of tubing being of the order of about four inches.

4. A buoyant safety net comprised of a series of air-filled flexible plastic tubes extending lengthwise of the net and another series of tubes extending crosswise, the tubes of the two series being interwoven in basket-weave fashion and joined together at at least some of the intersections, the tubes between intersections providing hand holds.

5. A buoyant net comprised of at least two series of spaced parallel air-filled flexible plastic tubes, the tubes of the two series being interwoven in basket-weave fashion, and flexible tapes extending lengthwise and crosswise of the net in the plane of the tubes and the net at intervals along its length and width, the tubes being secured to the tapes and the tapes constituting fold lines.

6. A buoyant net comprised of a series of flexible plastic tubes extending lengthwise of the net and another series of tubes extending crosswise, the tubes of the two series being interwoven in basket-weave fashion, and flexible tapes extending lengthwise and crosswise of the net in the general plane of the tubes and the net at intervals along its length and width, the tubes being secured to the tapes, the tubes terminating at the tapes and having their ends sealed where they terminate, the tapes constituting fold areas, the tubes being filled with air.

7. A buoyant net as defined in claim 5 in which the periphery of the net is also a tube to which the mar-

ginal extremities of the interwoven tubes of the two sets are connected.

8. A buoyant net as defined in claim 5 in which the tubes are flattened and sealed at the points of intersection, the flattened areas of the tubes at the intersections are secured together, the tubes being air-filled between the flattened areas at the intersections.

9. A buoyant net as defined in claim 5 in which the tubes are flattened and sealed at the points of intersection and the intersecting flattened areas are secured together, the net having a tubular margin to which the marginal ends of the interwoven tubes are joined, the marginal tubing and the ends of the tubes being flattened and sealed where they are joined.

10. The combination with a swimming pool having an overflow gutter around the edge thereof with a curb overhanging the gutter, of a net-like cover over the pool having a peripheral strand, and anchoring means for the net comprising angle-shaped members each having a vertical leg extending downwardly into the gutter but terminating above the bottom of the gutter and a horizontal leg that extends between the overhanging curb and the water side of the gutter, said members each having a diagonal notch in the outside of the corner formed by the two arms into which the marginal strand of the net is hooked.

11. A safety net anchor for swimming pools comprisprising an angular member having a horizontal leg and a vertical leg, the width of each leg being greater than the thickness of each leg, said member having a notch in the outer corner edge formed by the intersecting of the two legs, said notch extending from said outer corner edge toward but only partially to the inner corner edge.

12. A buoyant safety net of the class described comprising a plurality of sets of flexible plastic air-filled tubes with the tubes in each set intersecting those of the other sets and interwoven at the points of intersection to pass over and under one another, the tubes of the several sets being secured together at at least some points of intersection, the intersections of the tubes being spaced sufficiently to provide hand holds between them.

13. A buoyant net for swimming pools comprised of at least two series of parallel spaced air-filled flexible plastic tubes with the tubes of one series intersecting those of the other and being secured together at the points of intersection, the tubes being more rigid in the direction of their lengths but yieldable transversely whereby the net may be pushed over the surface of water but will be relatively soft if a person falls on it, said net having a marginal strand to which the marginal ends of the tubes are secured, and anchoring means in which the marginal strand is confined, said anchoring means comprising an angle-shaped fixture having a horizontal leg and a vertical leg and having a notch in the outside corner formed by the two legs in which the marginal strand of the net is engaged.

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