PREFABRICATED ABOVE-GROUND SWIMMING POOL

FIG. 1

INVENTOR
WILLIAM J. McBRIDE

BY

Agent
ABSTRACT OF THE DISCLOSURE

A prefabricated above-ground swimming pool structure having a continuous wall with connected upper and lower peripheral rails, a plurality of uprights extending between said peripheral rails and a water-tight flexible liner detachably secured along the upper rail. In horizontal plan, the wall and peripheral rails define an elongated U-shaped section and an interconnected partially circular section with a diameter greater than the width of the U-section so that inwardly projecting vertices are defined at the intersection of the U-section and the partially circular section. Support means for resisting the pressures exerted by water within the pool include buttresses adjacent the legs of the U-section, transverse tension members connected between the legs of the U-section at the base thereof and anchoring means disposed at each of the vertices to hold the lower rail thereat in ground engagement.

The present invention relates to swimming pool structures for erection essentially above ground. It is well known that the most effective distribution of the pressure in an above-ground pool structure is obtained by the use of a structure having a circular horizontal section. It is, however, frequently desired to provide a larger pool without increasing the width of the pool or simply to provide a pool with a more unusual shape. It is accordingly an object of the present invention to provide a pool structure having an irregular configuration and yet capable of withstanding the asymmetrical pressures which exist therein.

More particularly, it is an object of the present invention to provide a pool structure having in horizontal plan an elongated section and an adjacent and interconnected partially circular section which has a diameter greater than the transverse width of the elongated section. In such a pool structure, substantial outwardly directed forces exist along the elongated section and it is a further object of the present invention to provide a relatively simple structure for reinforcing the pool so that it will accommodate such forces. Upwardly directed forces also exist in pool structures of the aforementioned type at the points where the elongated sections meet the partially circular sections and it is yet another object of the present invention to provide a pool structure comprising anchoring means for the purpose of providing pool stability under the influence of such unstabilizing forces.

A further object of the present invention is to provide a pool structure of the aforementioned type which structure can readily be erected and dismantled without the use of special tools.

These and other objects are achieved in accordance with the present invention by the provision of a pool structure for erection essentially above ground and having in horizontal plan an elongated section and an adjacent and interconnected partially circular section which has a diameter greater than the transverse width of said elongated section, said pool structure comprising (a) a peripheral base rail having a ground-engaging undersurface, (b) a corresponding peripheral upper rail, (c) an endless wall having its lower and upper edges detachably securable to said base rail and said upper rail respectively, (d) tension members disposed transversely across said elongated section of said pool structure, said tension members being detachably engageable at each of their extremities with said base rail, (e) vertical members detachably interconnecting said base rail and said upper rail, (f) a pool liner having an upper edge detachably securable along said upper rail, (g) buttress members detachably securable to said base rail and adapted to brace said wall and said upper rail along said elongated section of said pool structure, and (h) anchoring means disposed at each of the intersections of said elongated section and said partially circular section and adapted to maintain said undersurface of said base rail thereat in ground engagement. Although a pool structure in accordance with the present invention may comprise any number of elongated sections and partially circular sections, a relatively simple and useful configuration for a pool structure of the invention comprises a single elongated section closed at one of its ends by a partially circular section and at its other end by a substantially semicircular section.

In a preferred construction, one of the buttress members is advantageously disposed at each of the intersections of the elongated section and the partially circular section and, in such a construction, the anchoring means may be detachable securable to the buttress member disposed at each such intersection.

The anchoring means are advantageously provided with at least one substantially horizontal member adapted to be buried within the ground below the pool structure so that the anchoring means is at least partly held in place by virtue of the weight of the water contained within the pool structure.

Although the pool structures of the present invention are essentially designed for above-ground erection, parts of the pools may be disposed below ground level so as to provide an increased depth of water in at least part of the pool. In a relatively simple construction, greater pool depth may be provided in a partially circular section adjacent to an elongated section.

The aforementioned buttress members are preferably each provided with a ground-engaging member extending inwardly beneath said peripheral base rail and terminating in an upwardly projecting flange adapted to engage said inner surface of said peripheral base rail. It is further preferred to provide an opening in each extremity of each of said tension members to permit upwardly projecting flange of one of said buttress members to pass therethrough so as to engage said inner surface of said peripheral base rail.

In accordance with a particularly useful feature of the invention, the peripheral base rail and the peripheral upper rail are each formed from a plurality of section lengths terminally interconnected by connectors securable to receive the extremities of said section lengths. Such connector sections can also be adapted as explained hereinafter to receive the extremities of the aforementioned vertical members.

A further advantage of certain pool structures constructed in accordance with the present invention is that they permit improved circulation of water between their various component sections. It has, for instance, been found that, if the inlet and the outlet of a recirculating pump are provided within the elongated section of a pool structure in accordance with the invention, adequate circulation of the water is obtained not only in the elongated section but frequently also in the adjacent partially circular section. This is particularly surprising since it is known that, in the previously proposed figure-eight type
pool structures having two intersecting circular sections, isolation of one section from another frequently occurs during attempts to provide adequate water circulation.

Other objects and advantages of the present invention will become apparent from the following description of preferred embodiments of the manner in which the invention can be carried into practice.

The invention will now be described merely by way of illustration with reference to the accompanying drawings in which:

FIG. 1 is a perspective view of a pool structure in accordance with the invention;

FIG. 2 is a fragmentary vertical section along the line 2—2 of FIG. 1;

FIG. 3 is an enlarged, fragmentary, perspective view showing how, in accordance with a preferred feature of the invention, the several component parts of the pool structure are interconnected at the peripheral rim of the elongated section;

FIG. 4 is an enlarged and exploded, fragmentary, perspective view showing how, in accordance with a preferred feature of the invention, the peripheral base rail sections, tension members, and vertical members are interconnected along the elongated section of the pool structure;

FIG. 5 is a fragmentary vertical section along the line 5—5 of FIG. 1;

FIG. 6 is an enlarged and exploded, fragmentary, perspective view showing how, in accordance with a preferred feature of the invention, the peripheral base rail sections, tension members, vertical members, buttress members, and anchoring means are interconnected at the intersection of the elongated section and the partially circular section of the pool structure;

FIG. 7 is a schematic plan view of an alternative configuration for a pool structure according to the present invention; and

FIG. 8 is a schematic plan view of yet another alternative configuration for a pool structure according to the present invention.

The pool structure generally indicated at 10 in FIG. 1 has in horizontal plan an elongated section 11, a partially circular section 12 and a generally semicircular end section 14. It should be noted that the diameter of the partially circular section 12 is greater than the transverse width of the elongated section 11. Although the pool structures of the present invention are intended for erection essentially above ground level, it is possible for certain sections of the pool to extend downward to below ground level. For instance, the partially circular section 12 of the pool structure 10 shown in FIG. 1 has a greater depth in its central area than the elongated section 11 and the semi-circular end section 14.

The pool section 10 has a peripheral base rail 18 and a peripheral upper rail 20 between which an endless wall 22 is secured in a manner which will be explained in greater detail hereinafter. Vertical members 24 interconnect the base rail 18 and the upper rail 20 and buttress members generally indicated at 26 are provided to bracing the structure along the sides of the elongated section 11. It will further be seen from FIG. 1 that wooden seats 28 may optionally be secured on top of the buttresses 26. In accordance with a preferred feature of the invention, one of these buttresses, buttress 26', is provided at each of the intersections of the elongated section 11 and the partially circular section 12. As will be explained in greater detail hereinafter with reference to FIGS. 5 and 6, anchoring means are also provided in the pool structures of the invention. Such anchoring means are disposed at each of the intersections of the elongated section 11 and the partially circular section 12.

Further essential structural components of a pool structure according to the invention are tension members indicated at 29 which are disposed transversely across the elongated section 11 of the pool structure 10. These tension members 29 are detachably engageable as will be more fully explained hereinafter at each of their ends with the peripheral base rail 18. The pool structure 10 as shown in FIG. 1 is completed by a water-impermeable liner 58 having its upper edge clampably secured as will also be explained in greater detail hereinafter between the upper edge of the wall 22 and the peripheral upper rail 20.

As previously indicated, the peripheral base rail 18 and the peripheral upper rail 20 can be used in general from a plurality of section lengths terminaly interconnected by connector sections adapted to receive the extremities of such section lengths. Such a preferred construction is illustrated in FIGS. 2 to 6.

Referring to FIGS. 2 and 4, it will be seen that the peripheral base rail generally indicated at 18 is made up from a plurality of section lengths generally indicated at 30 and interconnected at their adjacent extremities by connector sections generally indicated at 32. It will be noted that the section lengths 30 are in the form of arcuate sections, each of which has a ground-engaging undersurface 34, a top surface 36, an inner surface 38 and an outer surface 40. An upwardly directed and continuous recess 42 is provided in the top surface 36 of the section lengths 30. The connector sections 32 have a similar sectional shape to the section lengths 30 but are formed with larger sectional dimensions so as to receive the extremities of adjacent section lengths 30 telescopically therein. For a reason which will become apparent as the description proceeds, the connector sections 32 are formed with an open top surface.

In a similar manner, the peripheral upper rail 20 (FIGS. 2 and 3) is preferably formed from a plurality of section lengths 44 interconnected at their adjacent ends by connector sections 46 which telescopically receive the aforementioned adjacent extremities of the section lengths 44. The peripheral upper rail 20 is provided in its undersurface with a downwardly directed and continuous recess 50. The section lengths 44 of the peripheral upper rail 20 may usefully be identical to and interchangeable with the section lengths 30 of the peripheral base rail 18. Similarly, the connector sections 46 used in the peripheral base rail 18 may be identical to and interchangeable with the connector sections 46 used in the peripheral upper rail 20. The upper and lower edges of the endless wall 22 are seatable in the recesses 50 and 42 respectively.

If, as is preferred, a connector section is provided in each of the peripheral base rail 18 and the peripheral upper rail 20 at each of the intersections of the elongated section 11 and the partially circular section 12, such connector sections will need to be slightly modified to accommodate the non-adjacency of the adjacent extremities of the respective rail sections 30 and 44. One suitable configuration for such a connector section 47 is shown in FIG. 6, from which it will be seen that the connector section 47 is provided with two non-aligned arms 49 and 51. It will also be appreciated that the corresponding connector section for the upper rail 20 will be similarly constructed except that it will be a mirror-image of the section 47.

The tension members 29 which are disposed transversely across the elongated section 11 of the pool structure 10 can usefully be in the form of straps 52 which have generally upwardly directed flanges 54 at their extremities (FIGS. 2 and 4). These flanges 54 are so disposed that they engage the outer surface 40 of the base rail 18 along the sides of the elongated section 11 of the pool structure 10. In the construction shown in the drawings, the flanges 54 engage the peripheral base rail 18 through the connector sections 32 below but it will be appreciated that, in accordance with a less preferred construction, the tension straps 52 may be disposed between the connector sections 32. In accordance with another preferred feature of the invention, as shown in the drawings, the flanges 54 are shaped to conform with the outer surface of the connector sections 32.
In order to provide improved structural stability to the pool structure 10, the flanges 54 are usefully provided with a width greater than that of the tension straps 52. As a practical matter, this may be affected by securing, for example by welding, the ends of the tension straps 52 to ground-engaging plates 56 which in turn are provided with the flanges 54. It will be appreciated that in FIG. 4 the various component parts are shown in exploded positions and that the connector section 32 will be moved in the direction of the arrow A until it houses the ends of both the adjacent base rail sections 30. The tension strap 52 will be moved in the direction of the arrow B until the flange 54 engages the outer surface of the connector section 32. The final positions of the several component parts are as shown in FIG. 2.

In the construction shown in the drawings, the water-impermeable liner 58 has its peripheral upper edge 60 clamplably separable between the upper edge of the wall 22 and the recess 50 of the peripheral upper rail 20. Referring to FIG. 2, it will be noted that the upper edge 60 of the liner 58 is folded over the upper edge of the wall 22 and that an inverted generally U-shaped plastic cupping 62 is then disposed over the folded upper edge 60 of the liner 58.

The buttresses 26 form another essential component part of the pool structure 10 of the invention. These buttresses 26 are detachably separable to the base rail 18 and are adapted to brace the wall 22 and the upper rail 30 along the sides of the elongated section 11 against outward movement. In the preferred construction shown in the drawings, each of the buttresses 26 is provided with a ground-engaging member 64 which extends inwardly beneath the base rail 18 to terminate in an upwardly projecting flange 66 which engages the inner surface of the base rail 18. If such buttresses 26 are to be provided at the ends of the tension straps 52, an opening 68 is then provided in each of the plates 56 to permit the corresponding flange 66 to pass therethrough so as to engage the inner surface of the base rail 18. It will be appreciated that, in the embodiment illustrated, the flange 66 engages the inner surface of the connector section 32.

The number of tension straps 52 and the number of buttresses 26 will depend on the dimensions of the elongated section 11 of the pool structure 10 but it frequently will be advantageous to provide a buttress 26 at each end of each tension strap 52. In such a case, the pool structure 10 of FIG. 1 would be provided with four tension members.

Reference will now be made to a preferred system for interconnecting the base rail 18 to the upper rail 20 by means of the vertical members 24. In accordance with the preferred system, the ends of the section lengths 30 and 44 of the base rail 18 and the upper rail 20 respectively are cut away as at 70 to permit the lower and upper ends of the vertical members 24 to be received into such rails. The reason for forming the connector sections 32 of the base rail 18 with open top surfaces and the connector sections 46 of the upper rail 20 with open undersurfaces will now be understood. Referring to FIG. 4, it will be seen that the vertical member 24 which has a generally rectangular horizontal section can be moved in the direction of the arrow C so that its lower extremity is received into the opening 72 defined by the cut-away ends 70. It will further be noted that the connector section 32 is free to move in the direction of the arrow A as previously described. Similar considerations apply to the upper end of each vertical member 24 (see FIG. 3). The outer face 74 of each vertical member 24 can usefully be provided with cutout ends each with an outwardly projecting lip 76 which is received within the inwardly directed lips 78 of adjacent sections 32 and 46 and which is so disposed within the inwardly directed lips 80 of the connector sections 32 and 46. It will readily be understood that, when the connector sections 32 and 46 have been moved in the directions of the arrows A and D so as to overlap the ends of each of the adjacent section lengths 30 and 44 respectively, there will be no danger of the pool structure being accidentally disassembled.

It will also be recalled that it is essential in accordance with the present invention to provide anchoring means at each of the intersections of the partially circular section 12 and the elongated section 11 for the purpose of maintaining the undersurface 34 of the peripheral base rail 18 therein. An engaged section 11 for such anchoring means is shown in FIGS. 5 and 6.

The anchoring means generally indicated at 90 in FIGS. 5 and 6 comprises a generally horizontal plate 92 secured to the pool structure 10 in such a way that, when the pool structure is erected and filled with water, the plate 92 is buried within the ground below the pool structure. In this manner, the pool structure 10 is firmly anchored to the ground by the weight of the water contained within the pool structure acting on the plate 92. In the construction shown in the drawings, a plate 92 is secured to each of the buttresses 26 by means of an I-beam 94 having an upper flange 96, a lower flange 98 and an interconnecting web 100. The lower flange 98 is secured to the plate 92 by four bolts 102 and nuts 110. The upper flange 96 is secured to the lower horizontal arm 106 of the buttress 26 by U-bolts 108 and nuts 110. It should be noted that the I-beam 94 may usefully be cut obliquely so that the lower flange 98 is disposed inwardly of the upper flange 96.

With further reference to FIG. 6, it should be noted that the ground-engaging plate 56 on the tension strap 52 is slightly different from the corresponding plate 56 shown in FIG. 4. In particular, the plate 56 is provided with an upwardly directed flange 24 having two arms 112 and 114 adapted to engage the outer surfaces of the arms 49 and 51 respectively of the connector section 47. It should also be noted that the opening 68 is offset to one side of the plate 56. In order to prevent twisting of the strap 52, the latter may usefully be wider than the other tension straps 52. As in the case of FIG. 4, it will be appreciated that the component parts in FIG. 5 are shown in exploded positions and that, in the assembled pool structure, the buttress member 26 and the associated anchoring means 90 including plate 92 will be displaced in the direction of the arrow E so that the flange 66 projects upwardly through the openings 68, the peripheral base rail 18 is next laid out on the ground 82 with the flanges 66 of the buttresses 26 being disposed inwardly of the inner surface of the base rail 18. This laying out of the base rail 18 will involve placing the section lengths 30 in end abutment with each other and with each pair of adjacent ends received in a connector section 32 or 47. The tension members 52 will then be disposed across the ground 82 with the outer edges thereof being beneath the base rail 18 and the flanges 54 engaging the outer surfaces of the connector sections 32. The buttresses 26 will then be placed in position with their flanges 66 passing upwardly through the openings 68 in the plates 56 to engage the inner surfaces of the connector sections 32. The endless wall 22 is then placed in the recess 42. It will be appreciated that the endless wall 22 may be provided in the form of a finite length of material, provision being made for joining the two ends in any suitable manner. To improve the structural rigidity of the wall 22, it may usefully have a corrugated section. After the wall 22 has been placed in position, a shallow layer 84 of earth may be provided above the wall 22.
be placed over the tension members 52 and 52' and against the inner edges of the base rail 18 to provide a smooth seating. After the tension members 52 and 52' have been placed in position, its upper peripheral edge 60 is folded over the upper edge of the wall 22 and the capping 62 is then placed over the folded edge of the liner 58. The vertical members 24 will next have their lower ends inserted into the cornering 72 in the base rail 18 so that the lips 76 on the lower ends of the members 24 are received within the section lengths 30 and the connector sections 32. After all the vertical members 24 have been inserted, the peripheral upper rail 20 is attached in the manner previously described. Apart from fitting optional features such as seats 28, the erection of the pool structure is now complete. The pool may be dismantled with the aforementioned operational steps in the reverse order.

The several component parts of the pool structure can be made from any suitable material. The base rail 18, the upper rail 20, the vertical members 24, the buttresses 26 and 26' and anchoring means 90 may all be rigid, non-corroding metal structures. The wall 22 may be of a flexible metal structure which, as previously indicated, may usefully be corrugated. The tension members 52 and 52' may be of flexible metal or, in the case of very large pool structures, they may be of rigid metal construction. The pool liner 58 may be made, for example, of a vinyl plastic material.

As previously indicated, the pool structures of the present invention have many useful advantages. The ease of erection and of dismantling will be obvious from the foregoing description. In particular, it should be noted that the outer periphery of the pool structure is not required to be operated.

The alternative configurations shown in FIGS. 7 and 8 are given merely by way of illustration and it should be understood that many other configurations for pool structures are possible in accordance with the invention.

The example, in particular, illustrated at 210 in FIG. 7 comprises a central elongated section 211 and two partially circular sections 212 and 214, each having a diameter greater than the transverse width of the elongated section 211. In the construction shown in FIG. 7, five tension straps 252 identical to straps 52 are provided and each of these straps is associated with a pair of buttresses 226 identical with buttresses 26. The structure of FIG. 7 is also provided with two tension straps 252' identical to straps 52 and associated buttresses 226' identical to buttresses 26' with associated anchoring plates 292 identical to plates 92.

The pool structure generally indicated at 310 in FIG. 8 comprises said elongated section 312 and said intermediate partially circular section 312 and closed at their outer ends by semicircular sections 314 and 314'. Each elongated section is provided with four tension straps 352 and one tension strap 352' identical with straps 52 and 52' respectively. The straps 352 are associated with buttresses 326 identical to buttresses 26 while the straps 352' are associated with buttresses 326' and plates 392 identical to buttresses 26' and plates 92 respectively.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. A pool structure for erection essentially above ground, in horizontal plan, an elongated section and an adjacent and interconnected partially circular section which has a diameter greater than the transverse width of said elongated section whereby said elongated section is adapted for erection essentially above ground and said partially circular section is adapted to extend below ground, said pool structure having a peripheral base rail having a ground-engaging undersurface, (b) a corresponding peripheral upper rail, (c) an endless wall having its lower and upper edges detachably securable to said base rail and said upper rail respectively, (d) tension members disposed transversely across said elongated section of said pool structure, said tension members being detachably engageable at each of their extremities, (e) vertical members detachably interconnecting said base rail and said upper rail, (f) a water-impermeable pool liner formed of flexible material and having an upper edge detachably secured along said upper rail, a side wall portion extending around the inner surface of said endless wall and a bottom wall formed with a portion adapted to extend below said base rail within said partially circular section when said upper edge is secured along said upper rail such as to provide a greater pool depth within said partially circular section than within said elongated section, (g) buttress members detachably securable to said base rail and adapted to brace said wall and said upper rail along said elongated section of said pool structure, and (h) anchoring means disposed at each of said extremities of said sectioned section and said partially circular section and adapted to maintain said undersurface of said base rail thereat in ground engagement.

2. A pool structure as claimed in claim 1 in which said elongated section is completed, at its end remote from said partially circular section, by a substantially semicircular section.

3. A pool structure as claimed in claim 1 in which one of said buttress members is disposed at each of said intersections of said elongated section and said partially circular section.

4. A pool structure as claimed in claim 3 in which each of said anchoring means is detachably securable to the respective buttress member disposed at each of said intersections of said elongated section and said partially circular section.

5. A pool structure as claimed in claim 4 in which each of said anchoring means is provided with at least one substantially horizontal member adapted to be buried within the ground below said pool structure.

6. A pool structure as claimed in claim 1 in which said endless wall has its lower edge securable in an upwardly directed and continuous recess provided in the top surface of said base rail and its upper edge securable in a downwardly directed and continuous recess provided in the undersurface of said upper rail.

7. A pool structure as claimed in claim 5 in which one of said tension members is disposed transversely across said pool structure between said intersections of said elongated section and said partially circular section.

8. A pool structure as claimed in claim 6 in which said tension members have generally upwardly directed flanges at each of their extremities, said flanges being so disposed as to engage the outer surface of said base rail and said upper rail, said said elongated section and said partially circular section.

9. A pool structure as claimed in claim 8 in which each of said buttress members comprises a ground-engaging member extending inwardly beneath said peripheral base rail and terminating in an upwardly projecting flange adapted to engage the inner surface of said peripheral base rail.

10. A pool structure as claimed in claim 9 in which an opening is provided in each extremity of each of said tension members to permit said upwardly projecting flange of one of said buttress members to pass therethrough so as to engage said inner surface of said peripheral base rail.

11. A pool structure as claimed in claim 8 in which said peripheral base rail and said peripheral upper rail are each formed from a plurality of section lengths terminally interconnected by connector sections adapted to receive the extremities of said section lengths without leaving a gap, having (a) a peripheral base rail having a ground-engaging undersurface, (b) a corresponding peripheral upper rail, (c) an endless wall having its lower and upper edges detachably securable to said base rail and said upper rail respectively, (d) tension members disposed transversely across said elongated section of said pool structure, said tension members being detachably engageable at each of their extremities, (e) vertical members detachably interconnecting said base rail and said upper rail, (f) a water-impermeable pool liner formed of flexible material and having an upper edge detachably secured along said upper rail, a side wall portion extending around the inner surface of said endless wall and a bottom wall formed with a portion adapted to extend below said base rail within said partially circular section when said upper edge is secured along said upper rail such as to provide a greater pool depth within said partially circular section than within said elongated section, (g) buttress members detachably securable to said base rail and adapted to brace said wall and said upper rail along said elongated section of said pool structure, and (h) anchoring means disposed at each of said extremities of said sectioned section and said partially circular section and adapted to maintain said undersurface of said base rail thereat in ground engagement.

12. A pool structure as claimed in claim 11 in which said connector sections are also adapted to receive the extremities of said vertical members.

13. A pool structure as claimed in claim 12 in which said connector sections are adapted to receive said extremities of said section lengths in end-abutment with each other and in which said extremities of said section lengths are cut away to permit said extremities of said
vertical members to be received within said connector sections.

14. A pool structure as claimed in claim 13 in which each of said vertical members is provided at each of its upper and lower ends with an outwardly projecting lip adapted to engage an inwardly projecting lip on an associated one of said connector sections so as to prevent accidental disassembly of said pool structure.

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U.S. Cl. X.R.

52—169

LAVERNE D. GEIGER, Primary Examiner
H. K. ARTIS, Assistant Examiner