

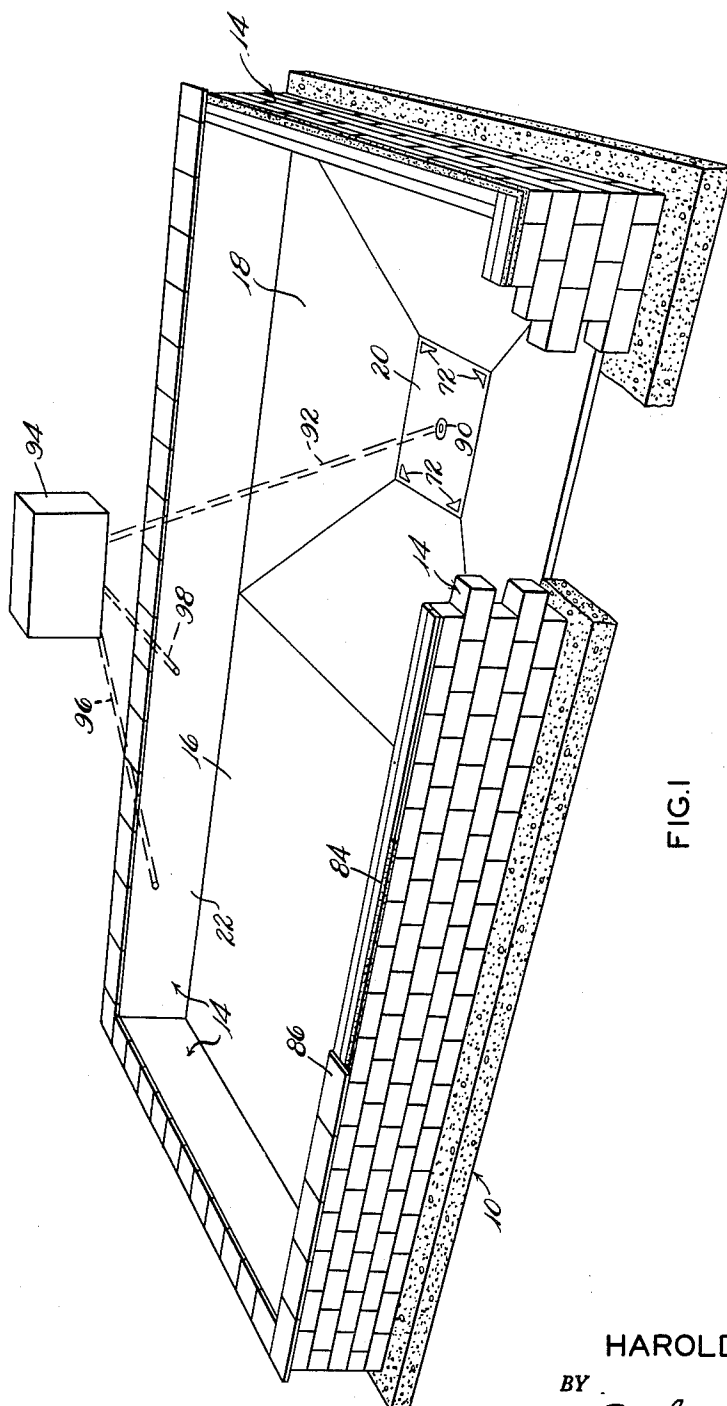
March 13, 1962

H. J. BAKER
SWIMMING POOL

3,024,470

Filed April 27, 1960

4 Sheets-Sheet 1



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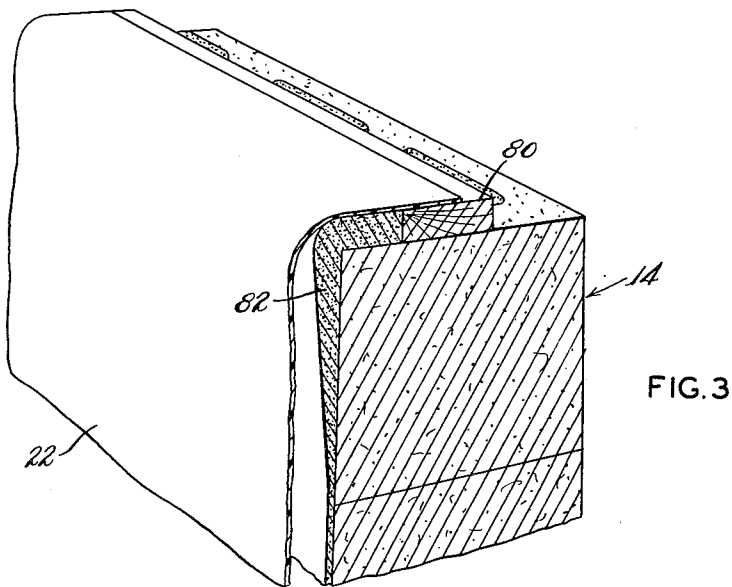
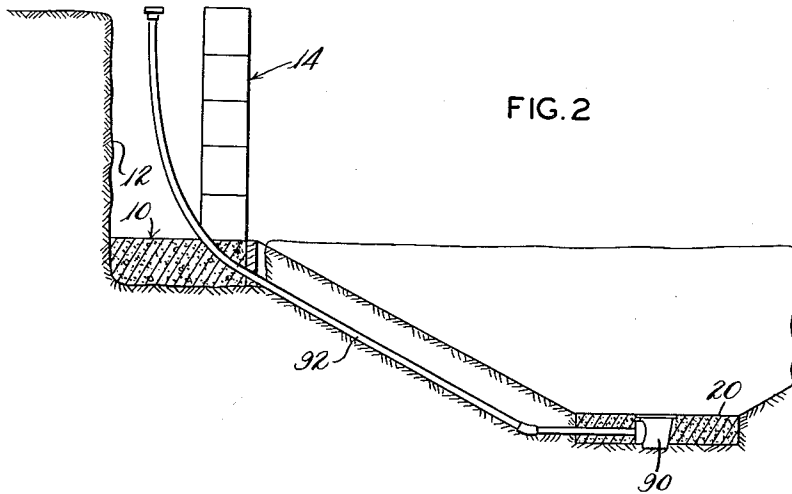
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FIG. 5

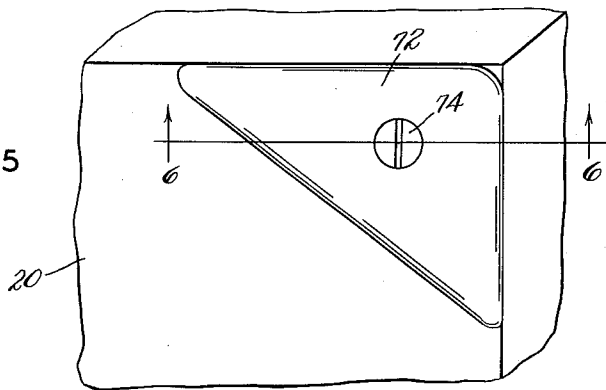


FIG. 6

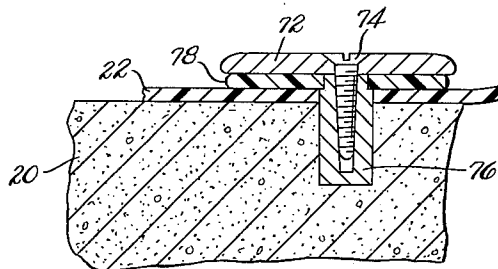


FIG. 7

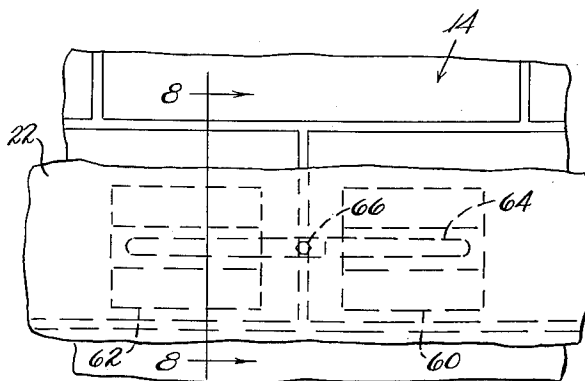


FIG. 8

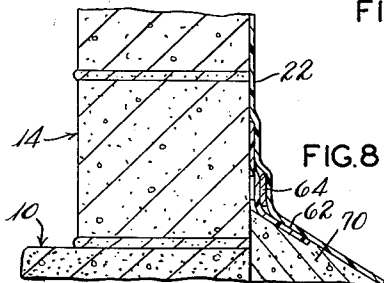
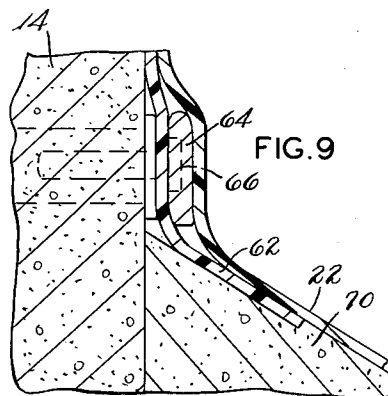


FIG. 9



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SWIMMING POOL

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This invention relates to swimming pools of the type having a support structure carrying a waterproof plastic liner.

Heretofore various types of swimming pools having a support structure receiving a waterproof plastic liner have been proposed and constructed. However, in the actual use and operation of pools of this type the plastic liners, for example made of polyvinyl chloride materials and other similar plastics, have been subject to distortion, wear, tearing, and the like with the result that the pools after some use are not watertight and much customer dissatisfaction results.

It is the general object of the present invention to avoid and overcome the foregoing and other difficulties of and objections to known swimming pool constructions by the provision of an improved relatively inexpensive, practical, easily installed swimming pool of the type having a supporting structure removably receiving a plastic liner and wherein the liner is secured to the supporting structure in a plurality of areas, and particularly at corners, by means fastened to the outside of the plastic liner so that displacement and tearing of the liner is greatly reduced, if not eliminated, and the useful, watertight life of the pool is materially enhanced.

Another object of the invention is to provide a swimming pool wherein the bottom of the supporting structure is of earth or sand, the sides of the supporting structure are of concrete block built on an endless hollow concrete footer, the concrete block having vertical and horizontal corners defining the pool shape, and a plastic liner contoured to the internal shape of the supporting structure, and with means secured to the outside of the plastic liner for securing the liner to the vertical and horizontal corners of the supporting structure at least at periodic points therealong.

Another object of the invention is the provision of a swimming pool of the character described having a diving portion of funnel shape with inclined sidewalls of earth or sand terminating near the bottom of the funnel in a concrete slab, and with means being provided for securing the plastic liner in watertight relation to the outer edges of the concrete slab, and with a drain being connected through the concrete slab and plastic liner.

Another object of the invention is to provide a swimming pool having metal means secured to the outside of the plastic liner and in turn fastened to the supporting structure with said metal means forming smoothly rounded, fillet-like support for the portions of the liner engaging the metal means when the pool is full of water.

The foregoing objects of the invention, and other objects which will become apparent as the description proceeds, are achieved by the provision of a support structure defining the desired shape and contour of the pool, said support structure having vertically and horizontally extending corners, a plastic liner contoured to and positioned in the support structure for rendering the sides and bottom of the pool watertight, means secured to the outside of the plastic liner for securing the liner to the vertical and horizontal corners of the support structure at least at periodic points therealong, and means securing the upper edge of the liner to the support structure.

For a better understanding of the invention reference should be had to the accompanying drawings wherein FIG. 1 is a perspective view, partially broken away, of a swimming pool incorporating the principles of the invention;

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FIG. 2 is a fragmentary vertical cross-sectional view illustrating the construction of the swimming pool of FIG. 1 at the diving end area thereof;

FIG. 3 is an enlarged fragmentary cross-sectional and perspective view illustrating one typical manner of securing the upper edge of the plastic liner to the supporting structure;

FIG. 4 is an exploded perspective view, partially broken away, of the manner of securing the vertical corners of the liner to the supporting structure;

FIG. 5 is a plan view partially broken away of the manner of securing the plastic liner to the cement slab at the deepest portion of the diving area of the pool;

FIG. 6 is a cross-sectional view taken on line 6-6 of FIG. 5;

FIG. 7 is a side elevation, partially broken away, of the manner of securing the horizontal corners of the plastic liner to the supporting structure;

FIG. 8 is a fragmentary cross-sectional view taken substantially on line 8-8 of FIG. 7; and

FIG. 9 is an enlarged view of a portion of FIG. 8 to better illustrate the details thereof.

In the drawings, the numeral 10 indicates generally a concrete footer of endless hollow shape, for example rectangular, which is normally poured in suitable forms in an excavation 12 in the earth in which the pool is located. The portion of the excavation 12 lying to the outside of the walls of the pool is later filled, as will be understood. It is possible to place the footer 10 on or near the surface of the ground, and to build the pool so that all or a considerable portion of it is above ground, but this is generally not the preferred construction.

Built on the footer 10, in the manner shown in several of the figures of the drawings, are vertical walls 14 of concrete block, for example five blocks high, with these block walls being tied down into the footer 10 by the use of iron reinforcing rods extending up through the holes in the concrete blocks, all in a manner which is well known and which forms no part of the present invention.

One portion of the pool, for example one-half of the pool area approximately, may be formed as a wading or relatively shallow area 16, with the pool bottom being level between the footer 10, this normally being accomplished by packing or tamping a layer of sand on top of the earth between the footer, with the layer of sand extending just slightly above the upper edge of the footer and into rounded or inclined engagement with the lower course of concrete blocks forming the walls 14.

Another portion of the pool comprising a diving area 18 has the earth between the footer 10 dug deeper in funnel shape terminating at its lowermost portion in a concrete slab 20, and with a tamped sand floor covering the inclined earth surfaces from the cement slab 20 up to the lower course of cement blocks in the wall 14. Most particularly, the diving area 18 is preferably formed as an inverted square pyramid having its lower end truncated by and terminating in the concrete slab 20.

In the manner described, the supporting structure usually in the form, but not necessarily so, of a rectangle having vertically extending walls 14 providing vertically extending corners and also horizontally extending corners is produced for receiving and supporting a plastic liner indicated as a whole by the numeral 22. The plastic liner 22 is made of any suitable tough and durable waterproof material, and in one typical example may be made of polyvinyl chloride. The plastic liner 22 is constructed of a shape and in proper dimensions to fit snugly, but without wrinkling, within the supporting structures, and, in accord with the present invention is secured to the supporting structure at a plurality of points and areas so that during the use of the pool displacement and wear or tearing of the liner in relation to the pool is materially

reduced or substantially eliminated to thereby greatly enhance the life of the liner and the successful operation of the pool.

Having reference to FIG. 4, the vertically extending corners of the liner 22 have a saddle-like strip of material 24, usually of the same material as the liner 22, adhesively secured, as at 26 along its vertical edges to the liner 22. The arrangement is such that the saddle-like strip 24 has pocket portions slidably receiving in a vertical direction a quarter-round strip of metal 28, for example aluminum. The upper end of the aluminum strip 28 is adapted to be engaged by a flange 30 on a gripper member 32 which is adapted to be secured by screws 34 to the top of the walls 14 or to the wood strip on top of the walls as hereinafter described. Note that the flange 30 and gripper member 32 is contoured to make a smooth rounded fit with the top of the metal strip 28 so that no sharp corners of any kind are in engagement with the liner 22.

The lower end of the quarter-round metal strip 28 is adapted to be engaged by a fitting 36 having horizontally extending flanges 38 which are received and anchored in the cement layer between the footer 10 and the first course of concrete blocks forming the walls 14. The fitting 36 may have a hollow center 40 to reduce the weight and cost thereof, and is formed with an upwardly extending quarter-round projection 42 behind which the lower end of the quarter-round metal strip 28 fits. The face 44 of the projection 42 is made concave to smoothly engage with the plastic liner 22, again so that no sharp corners of any metal parts engage with the liner 22.

FIG. 4 also illustrates that a second saddle-like strip of material 46, for example of the same material as the plastic liner 22, is provided to extend angularly beneath each corner of the liner 22. The strip 46 is adhesively secured, as at 48, to the liner 22 to provide pocket spaces which slidably receive the ends of a metal bar 50, usually aluminum, bent to right angle shape. The bar 50 is contoured to fit down over the projection 42 and to engage with a shoulder 52 on the fitting 36, being held in this position by the lower end of the quarter-round metal strip 28.

In the manner described the corners of the plastic liner 22 are very firmly held in the supporting structure for the liner by means engaging only with the outer surface of the plastic liner. It will be understood that the same construction can be utilized, but with only slight modification to secure a plastic liner into a corner of other than 90 degrees, for example a corner of 120 degrees, 135 degrees, or the like, should it be considered advisable to produce a pool having a hexagonal end shape or some shape other than a rectangle. It might also be noted that in accord with the invention there is preferably a small amount of play between the metal fastening means and the pockets in which they are received so that some adjustment of the liner with respect to the supporting means may occur when water is placed in the pool.

Looking now at FIGS. 7, 8 and 9, these illustrate the manner in which the horizontal corners of the plastic liner 22 are secured to the liner supporting structure. More specifically, at periodic points along the horizontal corners of the plastic liner, for example at 2 to 6-foot intervals, a pair of saddle-like strips 60 and 62 are provided which are adhesively secured at their upper and lower edges to the outside of the plastic liner 22 so as to provide pockets or slots for receiving the ends of a metal bar 64, usually of aluminum which is adapted to be secured at its center in the space between the strips 60 and 62 to the lower course of cement blocks of the wall 14, as by a cap screw 66 threaded into a lead or an expansion socket set into a concrete block or molded into the cement layer between the ends of a pair of concrete blocks. The center of the bar 64 in the area receiving the cap screw 66 may be slightly offset towards the wall 14 so that the ends of the bar 64 do not pinch clamp against the strip 60 and 62 but allow some movement between the bar 64

and the liner 22 when the pool is filled with water. Note in FIGS. 8 and 9 that the sand fill 70 for the bottom of the pool extends vertically above the top edge of the footer 10 and blends with a curve or at an angle into the lower course of the cement blocks forming the wall 14 so that no sharp corner is provided.

Looking now at FIGS. 1, 5 and 6, it has been found advisable to anchor the plastic liner 22 to the corners of the cement slab 20 by anchor plates 72, conveniently of triangular shape as illustrated. Each plate 72 is secured by a countersunk head screw 74 to a lead or expansion type socket 76 embedded in the concrete at the corners of the slab 20 and with a sealing washer 78 being positioned between the plate 72 and the top surface of the vinyl liner 22 to thereby effect a water-tight positive anchoring of the plastic liner 22 to the cement slab 20.

Once the plastic liner 22 has been secured in the manner described to the vertical and horizontal corners and to the cement slab 20 of the supporting structure the upper edges of the plastic liner 22 are secured to the upper edges of the walls 14, and one of the manners of achieving this is illustrated in FIG. 3. In this figure is shown a structure wherein a wooden board 80 having a cross-sectional shape, for example, one inch by three inches is secured in known manner along the top edge of the wall 14 parallel to the side thereof. A plaster or cement nosing 82 of the contour illustrated is utilized to blend the edge of the board 80 into the top corner and vertical inner side of the top course of concrete blocks forming the wall 14. It will be understood that the nosing 82 and the boards 80 have been built onto the supporting structure at a previous time and before the liner 22 is brought in for positioning in and securing it to the supporting structure. Optionally, the board 80 may be of a width to extend out to the inner edge of the top of the wall 14, and is provided with a rounded inner corner, so that the nosing 82 does not have to be utilized.

In any event, the upper edge of the plastic liner 22 is then nailed at several inch intervals, for example with roofing nails, to the boards 80 entirely around the pool to complete the securing of the liner to the supporting structure.

Having reference to FIG. 1, the top edge of the pool is now completed by laying a strip 84 of cement along the outer edge of the boards 80, and coping blocks 86 of cement or stone are cemented into place end to end and on top of the board 80 and concrete strip 84 with or without additional anchoring means being utilized to tie the individual coping blocks into the walls.

Completing the piping for the pool, a drain 90 has previously been provided in the center of the cement slabs 20, and this is connected by a pipe 92 to a filtering unit 94, from which an inlet pipe 96 extends into the pool. A vacuum conduit 98 may likewise extend from the filtering unit 94 to provide a connection for cleaning the pool.

While a certain representative embodiment and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in this art that various changes and modifications may be made therein without departing from the spirit or scope of the invention.

What is claimed is:

1. The combination in a swimming pool of a concrete footer of hollow rectangular shape, a cement block wall built on the footer, an earth-like substantially flat fill over about one-half of the pool area between the footer, the remaining area between the footer being excavated below the level of the footer to provide a diving area of inverted truncated substantially square pyramid shape, a cement slab covering the truncated portion forming the lowermost portion of the diving area, an earth-like fill extending on an incline from the cement slab to the footer in the diving area, a plastic liner shaped to the inside contour of the complete pool, means for mechanically and re-

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movably securing the liner to the corners of the cement slab in water-tight relation, means for mechanically gripping the outside of the liner for removably securing the vertical corners of the liner to the inside corners of the cement block walls over the entire vertical length thereof, means secured to the outside of the liner for mechanically and removably securing the horizontal corners of the liner at periodic points to the lower edge of the wall adjacent the footer, means including wood strip means for securing the upper edge of the liner to the top of the wall, and a coping around the top of the wall covering the secured edge of the liner.

2. The combination in a swimming pool of a concrete footer of endless, hollow shape, a cement block wall built on the footer, an earth-like substantially flat fill over a large portion of the pool area between the footer, the remaining area between the footer being excavated below the level of the footer to provide a diving area of funnel-like shape, a cement slab covering the lowermost portion of the diving area, an earth-like fill extending on an incline from the cement slab to the footer in the diving area, a plastic liner shaped to the inside contour of the complete pool, metallic plate gripping means securing the liner to the corners of the cement slab in watertight relation, metallic gripping means secured to the outside of the liner for protectively and removably securing the vertical corners of the liner to the inside corners of the cement block walls over the entire vertical length thereof, metallic gripping means secured to the outside of the liner for removably securing the horizontal corners of the liner at periodic points to the lower edge of the wall adjacent the footer, means including non-abrasive strip means for securing the upper edge of the liner to the top of the wall, and a coping around the top of the wall covering the secured edge of the liner.

3. The combination in a swimming pool of a concrete footer of endless, hollow shape, a cement block wall built on the footer, an earth-like substantially flat fill over a large portion of the pool area between the footer, the remaining area between the footer being excavated below the level of the footer to provide a diving area of funnel-like shape, a cement slab covering the lowermost portion of the diving area, an earth-like fill extending on an incline from the cement slab to the footer in the diving area, a plastic liner shaped to the inside contour of the complete pool, metallic plate means for securing the liner to the cement slab in watertight relation, metallic mechanically actuated means secured to the outside of the liner for securing the vertical corners of the liner to the inside corners of the cement block walls, metallic mechanically actuated means secured to the outside of the liner for securing the horizontal corners of the liner at periodic points to the lower edge of the wall adjacent the footer, and means for securing the upper edge of the liner to the top of the wall.

4. The combination in a swimming pool of a support structure defining the desired shape and contour of the pool, said support structure having vertically and horizontally extending corners, a plastic liner contoured to and positioned in the support structure for rendering the sides and bottom of the pool watertight, mechanically actuated liner protection means secured to the outside of the plastic liner for securing the liner to the vertical corners of the support structure, and mechanically actuated liner protection means secured to the outside of the plastic liner for securing the liner to the horizontal corners

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of the support structure at least at periodic points therealong.

5. The combination in a swimming pool of a support structure defining the desired shape and contour of the pool, said support structure having vertically and horizontally extending corners, a plastic liner contoured to and positioned in the support structure for rendering the sides and bottom of the pool watertight, mechanically actuated means secured to the outside of the plastic liner for removably securing the liner to the vertical and horizontal corners of the support structure at least at periodic points therealong, and means securing the upper edge of the liner to the support structure.

6. The combination in a swimming pool of a supporting structure having corners, a watertight plastic liner having corners fitting into the corners of the supporting structure, saddle-like strips of flexible material secured along their edges to the outer surface of the liner and bridging the corners thereof to provide pocket-like areas between the strips and the corners of the liner in the direction of the corners, metal strip means slidably received in the pocket-like areas, and means securing the metal strip means to the supporting structure.

7. The combination in a swimming pool of a supporting structure having corners, a watertight plastic liner having corners fitting into the corners of the supporting structure, saddle-like strips of flexible material secured along their edges of the outer surface of the liner and bridging the corners thereof to provide pocket-like areas between the strips and the corners of the liner in the direction of the corners, metal strip means slidably received in the pocket-like areas, said metal strip means having a cross-sectional shape of smoothly rounded contour providing a rounded fillet-like support for the corner of the liner when the liner is filled with water, means outside the liner for engaging with opposite ends of the metal strip means for securing the metal strip means to the supporting structure, said engaging means being smoothly contoured to provide fillet-like rounded support for the portions of the liner engaging said means when the liner is filled with water.

8. The combination in a swimming pool for a supporting structure having corners, a watertight plastic liner having corners fitting into the corners of the supporting structure, saddle-like strips of flexible material secured along their edges to the outer surface of the liner and bridging the corners thereof to provide pocket-like areas between the strips and the corners of the liner in the direction of the corners, metal strip means slidably received in the pocket-like areas, said metal strip means having a cross-sectional shape of smoothly rounded contour providing a rounded fillet-like support for the corner of the liner when the liner is filled with water, and means outside the liner for engaging with opposite ends of the metal strip means for securing the metal strip means to the supporting structure.

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