United States Patent [19]

Chichester, Sr.

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[45] **July 17, 1973**

[54] **SWIMMING POOL, STRUCTURE**

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[52] **U.S. Cl.** **52/169,** 52/102, 4/172.19

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

[58] **Field of Search** 52/102, 169, 477; 4/172.19, 172.21

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[57] **ABSTRACT**

Discloses a swimming pool structure disposed in an excavation comprising a plurality of pool panels, joined together in side by side relationship, disposed vertically in the excavation and defining the pool perimeter. The pool panels have a bottom angle or concrete lock and vertical reinforcing guide sleeves on the rear of the pool panels which are interlocked by a horizontal reversed reinforcing angle. Stakes or concrete reinforcing rods are driven into the ground through the bottom angle and guide sleeves. Coping perimeter concrete reinforcing rods are fixed to long legs of L-shaped coping reinforcing rods whose short legs are disposed in the vertical guide sleeves. The lower portion of the pool panels, the bottom angles or concrete locks and the stake or concrete reinforcing rods are imbeded in the concrete pool bottom. The coping perimeter rods and coping reinforcing rods are imbedded in the concrete coping.

Discloses a fabricated pool panel having front and rear walls, right and left side bolting flanges, bottom angle or concrete lock, vertical reinforcingguide sleeves on the rear wall of the pool panel interlocked by a horizontal reversed reinforcing angle.

Discloses bull nose coping, of integral, one-piece construction, extruded from polyvinyl chloride. The coping has a rounded vertical profile, reversed lip, web, reversed clip, depending leg and depending flange. By means of the reversed clip and depending leg, the coping is disposed on the top of the pool panel, and as disposed is wedgingly held in place by the angled depending leg and flange.

Discloses a process of fabricating a colored pool panel whose surface has a high gloss, is non-porous, has structural flexibility and is resistant to cracking and chipping, comprising the steps of applying a layer consituting a uniform mixture of colored gel-coat, catalyst and thinner to a plate glass mold whose casting surface has been prepared to have a greater degree of polish and smoothness than originally existing, allowing the applied layer to cure and successively applying shock-resistant, flexible, polyester resin alternating with layers of fiberglass glass fiber.

Discloses a process of fabricating a metal-flake pool panel whose surface has a high gloss, is non-porous, has structural flexibility and is resistant to cracking and chipping, comprising the steps of applying a layer constituting a uniform mixture of clear gel-coat, catalyst and thinner to a plate glass mold whose casting surface has been prepared to have a greater degree of polish and smoothness than originally existing, allowing the applied layer to cure, applying a layer constituting a uniform mixture of clear gel-coat, catalyst and thinner to which colored metal flake has been added in quantity depending upon the color desired in terms of hue, value and intensity, allowing same to cure and successively applying shock-resistant, flexible, polyester resin alternating with layers of glass fiber matting.

Discloses the method of installing a swimming pool in an excavated hole comprising the steps of disposing 103 vertically in the excavation, to define the pool perimeter, a plurality of pool panels having integral bottom angles or concrete locks on the front sides of the pool panels and vertical reinforcing guide sleeves on the rear sides of the pool panels, joining together the pool panels in side-by-side, watertight relationship, driving into the ground stakes or concrete reinforcing rods through the bottom angles and guide sleeves, disposing in the excavated hole, at the pool panel joints, jack posts operatively connected to jack posts screws, operatively connecting the jack post screws to the pool panel joints and raising the pool panels, forming the pool bottom by pouring cement mixture to a depth sufficient to imbed the lower portions of the pool panels, the bottom angles and stakes, and for strength , removing the jack posts and screws, disposing the short legs of L-shaped coping reinforcing rods in the vertical guide sleeves and disposing the long legs thereof outwardly, backfilling the region of the excavated hole to the rear of the pool panels, joining in fixed relationship coping perimeter concrete reinforcing rods to the long legs of the L-shaped rods, forming the coping by pouring cement mixture to a depth for strength and sufficient to imbed the long legs and coping perimeter reinforcing rods.

5 Claims, 9 Drawing Figures

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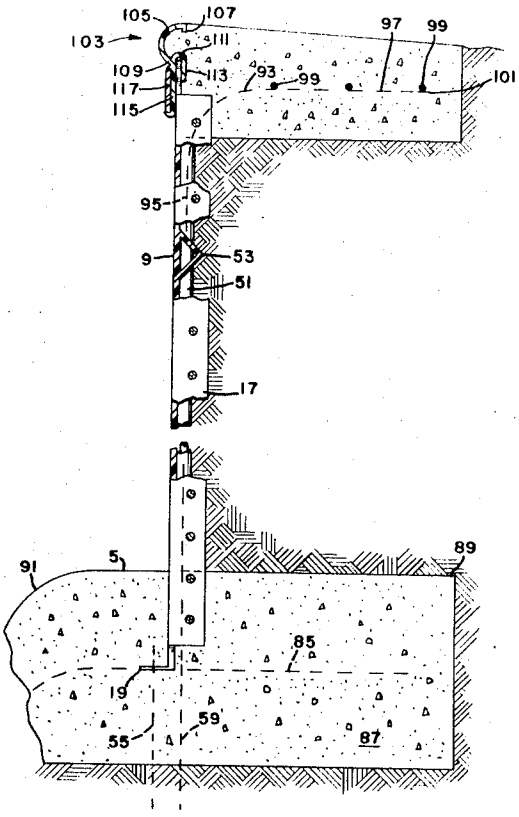

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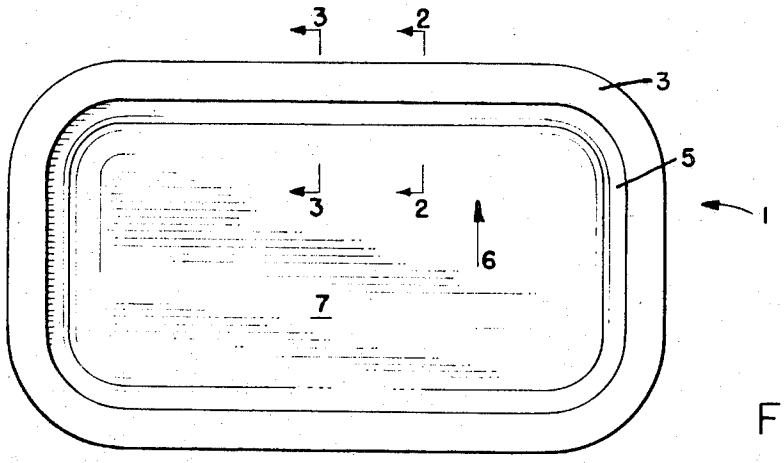


FIG. 1.

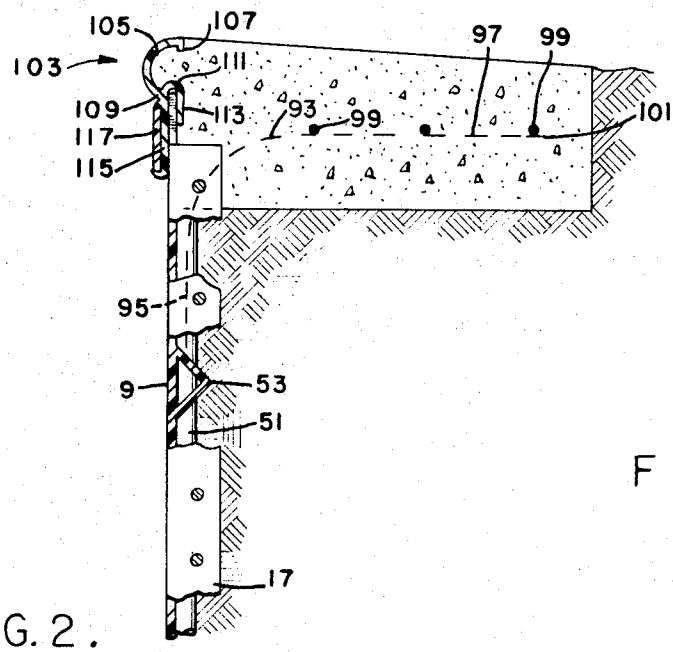
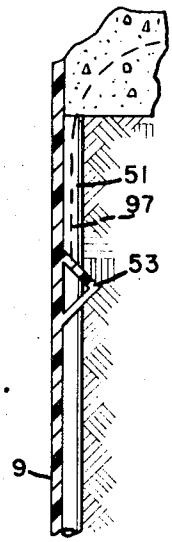


FIG. 2.



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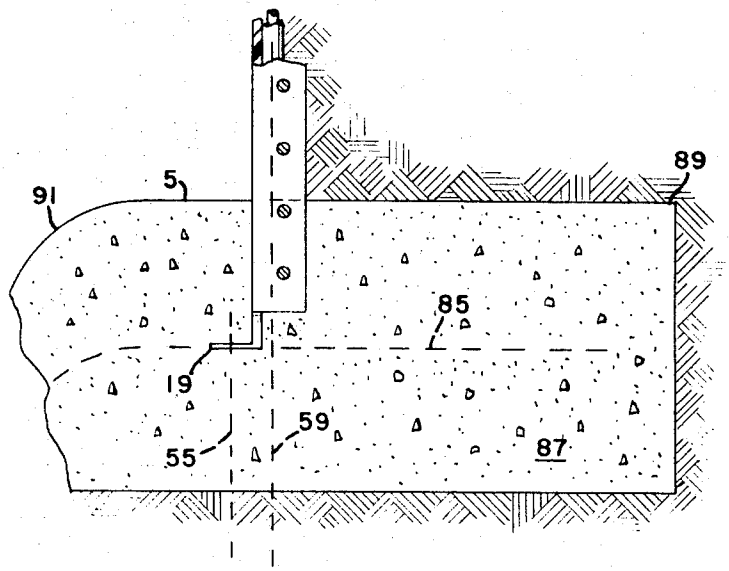

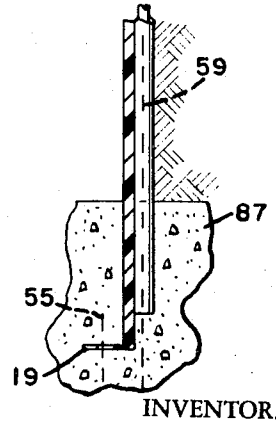

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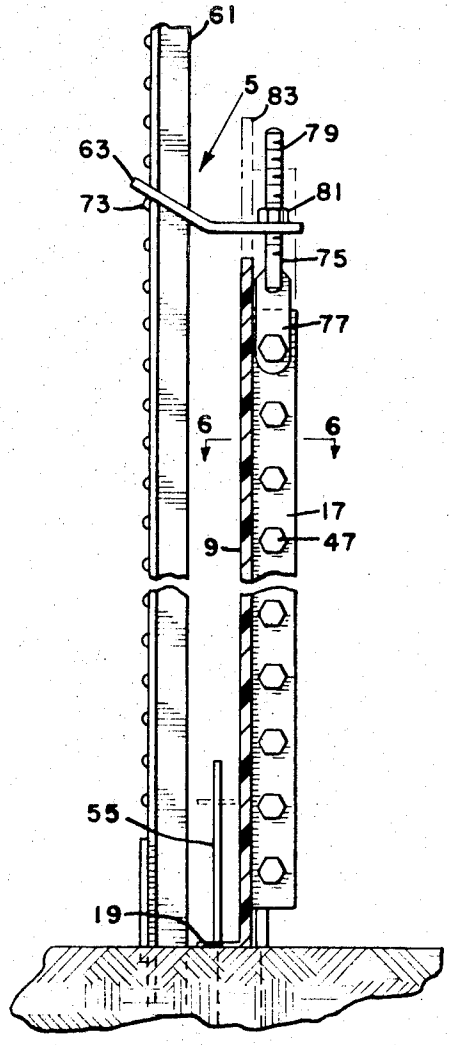


FIG. 4.

FIG. 5.

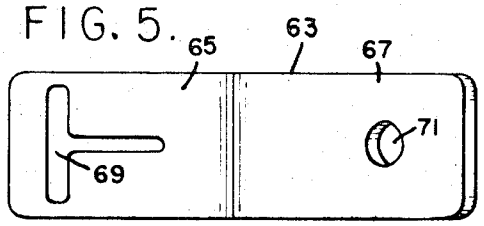
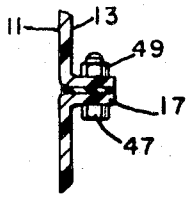


FIG. 6.



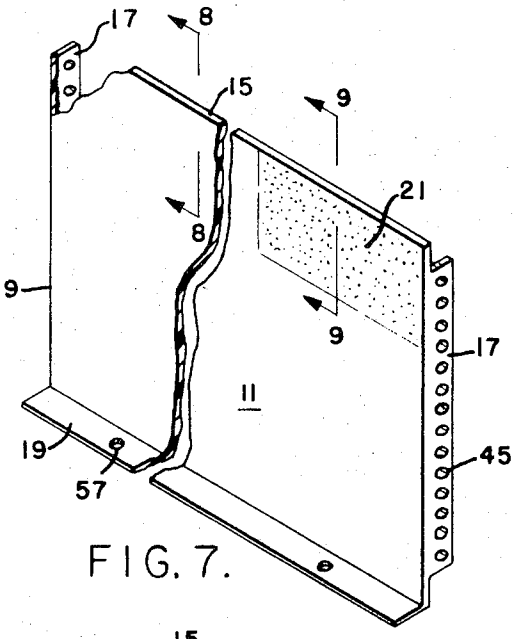


FIG. 7.

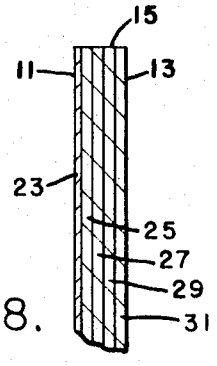


FIG. 8.

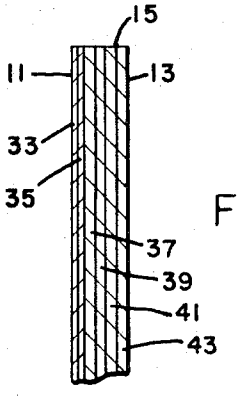


FIG. 9.

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SWIMMING POOL, STRUCTURE

The problem in the art is the need for a swimming pool structure having a concrete bottom and a perimeter wall of joined together pool panels to provide thereby a swimming pool which is relatively inexpensive, has structural strength, is of simple but long-lasting, durable construction, and is simple and easy to erect. The object of the invention is to solve the problem of the art. Pool panels are disposed in the excavation and define the pool perimeter. The pool panels are joined together in watertight, side-by-side relationship. The pool panels have integral bottom angles or concrete locks and vertical guide sleeves on the rear sides, interlocked by integral horizontal reversed reinforcing angles, with concrete reinforcing rods driven into the ground through the bottom angles and guide sleeves. The concrete pool bottom imbeds the bottom portions of the pool panels, the bottom angles and the concrete reinforcing rods. Coping perimeter reinforcing rods welded to coping perimeter rods disposed in the vertical guide sleeves are imbedded in the concrete coping.

The problem in the art is the need for a fabricated pool panel of integral construction that is flexible but has strength and structural rigidity in its bottom region, and in its vertical and horizontal wall regions. The need for a fabricated pool panel that can be joined together in watertight, side-by-side relationship with similar pool panels, that can have its bottom or lower portion stabilized in the course of pool perimeter erection and that can be structurally joined to the concrete coping. The object of the invention is to solve the problem of the art. The flexible pool panel is of integral construction, is fabricated of layers of glass fiber matting, has a bottom angle or concrete lock fabricated therewith for strength and structural rigidity, and has vertical reinforcing guide sleeves fixed to the rear wall of the pool panel and which guide sleeves are interlocked by a horizontal reversed reinforcing angle fixed therewith, thereby imparting strength and structural rigidity to the vertical and horizontal wall regions of the pool panel. The bottom or lower portion of the pool panel is stabilized in erection by concrete reinforcing rods driven into the ground through the bottom angle and vertical guide sleeves. Coping perimeter reinforcing rods welded to coping perimter rods disposed in the vertical guide sleeves and imbedded in the concrete coping structurally joins the pool panel to the concrete coping.

The problem in the art is the need for a bull nose coping, of integral, one-piece construction that can be disposed on the top of a pool panel, that, as so disposed, is wedgingly held in place and that can be joined to the concrete coping. The object of the invention is to solve the problem of the art. The bull nose coping is of integral, one-piece construction, extruded from suitable plastic such as polyvinyl chloride. The coping has a rounded vertical profile, reversed lip, web, reversed clip, depending leg and depending flange both depending in the same direction. The coping is disposed on the top of the pool panel by the reversed clip and depending leg. The depending leg and flange, which are angled to converge, wedgingly hold the coping in place as disposed on the pool panel. The rounded vertical profile permits the poured coping cement mixture to be received therein and to fill the space therein, and the reversed lip at the terminal portion of the rounded vertical profile engages the poured coping cement mixture, thereby the rounded vertical profile and its reversed lip

structurally join the bull nose coping to the resulting concrete coping.

The problem in the art is the need for a colored pool panel whose front wall surface has a high degree of gloss, is non-porous, has structural flexibility and is resistant to cracking and chipping. In the prior art the front wall surfaces of pool panels are porous thereby consequently allowing algae buildup and brown spotting with subsequent deterioration of the pool panel. And for reasons of the chemical substances in the water and the exposure to the elements, in time, such deterioration will result in the pool panel being eaten away and through. The object of the invention is to solve the problem of the art. In the colored pool panel process, a plate glass mold is utilized to fabricate the pool panel. The plate glass casting surface is prepared to have a greater degree of polish and smoothness than existing on the original clean, polished and smooth plate glass surface. A layer constituting a uniform mixture of colored gel-coat, catalyst and thinner is applied to the plate glass casting surface and allowed to cure, then, successively, shock-resistant, flexible, polyester resin is applied alternating with layers of glass fiber matting. Before such application of the polyester resin, it is mixed with a catalyst.

The problem in the art respecting the front wall surface of the metal-flake pool panel is similar to the discussed problem of the art regarding the front wall surface of the colored pool panel, and the object of the invention is to solve the problem of the art. In the metal-flake pool panel process, clear gel-coat is used in place of the colored gel-coat for the first layer; and before application of the successive glass fiber matting layers, another layer is applied, constituting a uniform mixture of clear gel-coat, catalyst and thinner, and allowed to cure, and prior to such application of this uniform mixture, colored metal flake is added in quantity depending upon the color desired in terms of hue, value and intensity.

One of the problems in the art is the number of man hours required to install in an excavated hole a swimming pool whose pool bottom is concrete, whose perimeter wall consists of joined together pool panels and whose coping is concrete. Another problem in such installation is stabilizing the bottom portions of the pool panels preparatory to pouring the pool bottom; another problem is reinforcing the coping and structurally joining the pool panels to the concrete coping. The object of the invention is to solve the discussed problems of the art by a method for such installation. Pool panels defining the pool perimeter are disposed vertically in the excavation and are joined together in watertight, side-by-side relationship. Concrete reinforcing rods are driven into the ground through bottom angles and rear vertical guide sleeves forming integral parts of the pool panels to thereby stabilize the bottom portions of the pool panels. A jack post and jack post screw operatively connected to each other and at its pool panel joint is utilized to raise the pool panels. Cement mixture is poured to form the pool bottom and imbed the bottom portion of the pool panels. The jack posts and screws are removed and the excavated rear region of the pool panels is backfilled. Coping perimeter reinforcing rods are welded to coping perimeter rods disposed in the vertical guide sleeves and cement mixture is poured to form the coping and imbed the coping rods

to structurally join the pool panels to the concrete coping.

These objects and other objects of the invention should be discerned and appreciated from the detailed specification taken in conjunction with the drawings, wherein like reference numerals refer to similar parts throughout the several views, in which:

FIG. 1 is a view showing a rectangular shaped swimming pool;

FIG. 2 is a partial sectional view, taken along the line 2 — 2 in FIG. 1;

FIG. 3 is a partial sectional view, taken along the line 3 — 3 in FIG. 1;

FIG. 4 is a partial sectional view showing the disposition and erection of a pool panel in the excavation by means of the jack post and jack post screw;

FIG. 5 is a view in the direction of the arrow 5 in FIG. 4 and shows the jack post adapter;

FIG. 6 is a fragmentary sectional view, taken along the line 6 — 6 in FIG. 4;

FIG. 7 is a partial perspective view of the colored pool panel of the invention and shows, for purposes of description, a portion of the front side or wall of the pool panel of metal-flake construction;

FIG. 8 is a fragmentary sectional view, taken along the line 8 — 8 in FIG. 7; and

FIG. 9 is a fragmentary sectional view, taken along the line 9 — 9 in FIG. 7.

In FIG. 1 of the drawings, reference numeral 1 generally refers to the invention showing a swimming pool of rectangular configuration and shows the coping 3, safety ledge 5 and pool bottom 7. It should be clearly understood that the swimming pool of rectangular configuration shown and the description which follows with reference thereto are merely for purposes of explaining the invention; and, as such, are not intended in any way to limit and circumscribe the invention and patent protection sought to swimming pools of rectangular configuration only. It should therefore be appreciated that for purposes of example, a swimming pool whose configuration is oval shape, kidney shape, piano shape, etc. could be shown and described without departing from the invention or the patent protection sought herein.

FIGS. 2, 3, 4, 7, 8 and 9 show the structure of the pool panel 9 of glass fiber construction. The pool panel 9 is of rectangular configuration; and has a front side or wall 11, a rear side or wall 13, top 15, right and left side bolting flanges 17 and a bottom angle or concrete lock 19. FIG. 8 shows a fragmentary sectional view of a colored pool panel. FIG. 9 shows a fragmentary sectional view of a pool panel having colored metal flake imbedded therein.

The front wall 11 of pool panel 9 can be colored or have colored metal flake imbedded therein as will be discerned and appreciated by the processes to be described. The colored metal flake portion of the front wall 11 of pool panel 9, as shown in FIG. 7, and which has reference numeral 21 applied thereto, is for purposes of description only. The front wall 11 of pool panel 9 is either completely colored or is completely colored by colored metal flake imbedded therein.

In the colored pool panel process, a clean, smooth and polished, flat plate glass mold of one-half inch minimum thickness is disposed on carpet foam underlay. The carpet foam underlay prevents quick heat dissipation of the heat from the exothermic reaction of the process and, accordingly, prevents the plate glass mold from cracking or breaking. A suitable releasing substance or compound is applied to the exposed top area of the plate glass constituting the casting surface and is substantially removed, such as by hand rubbing. Several successive applications of the releasing substance alternating with substantial removal of same are resorted to for purposes of rendering the plate glass casting surface to a greater degree of polish and smoothness than that which originally existed on the clean, smooth and polished plate glass casting surface and such that this prepared plate glass casting surface will be impervious to any adhesion whatsoever by the first layer to be applied thereto.

This first layer 23, ranging from 14 to 18 mil thickness, is directly applied to the prepared plate glass casting surface. To assure application of a uniform mixture, a three-nozzle spray gun is used with two nozzles spraying colored gel-coat or any other suitable, effective equivalent converging with the third nozzle spraying a premixed solution of one part MEKP-60 or any other suitable, effective equivalent catalyst and three parts of a suitable, effective thinner equivalent to ethyl-acetate of suitable purity. Ethyl-acetate of 99 percent purity is an ideal thinner for manufacturing conditions. One gallon of gel-coat is used with 5 to 50 cubic centimeters of the premixed solution. The resulting catalytic reaction produces exothermic heat with layer 23 having a curing time of 7 to 15 minutes.

The critical factor is that the mixture of the gel-coat, catalyst and thinner as applied be uniform. For this reason a three-nozzle spray gun is used. A single-nozzle gun could be used to spray a pot mix of the gel-coat and the premixed solution. The quantity of the premixed solution used depends upon the nozzle size and air pressure employed, and the quantity of the premixed solution which should be used is determined by the room temperature. The lower the temperature, the greater the quantity of premixed solution used.

The MEKP-60 is 60 percent methyl ethyl ketone peroxide in dimethyl phthalate manufactured or distributed by the Lucidol Division of Pennwalt Corp., 1740 Military Road, Buffalo, New York 14240 with the registered trademark of Lupersol DDM and its label listing U.S. Pat. No. 3,330,871.

Next a shock-resistant, flexible, polyester resin, effective and equivalent to GR-625 is applied by means of a lamb's wool roller to cured layer 23 in quantity sufficient to permit adhesion to gel-coat layer 23 and to effect wet saturation of the one and one-half ounze fiberglass matting to be subsequently applied thereto. Before such application of the GR-625, it is mixed and catalyzed with MEKP-60. By volume, 20 to 100 cubic centimeters of MEKP-60 is used with 5 gallons of GR-625. The lamb's wool roller is used because lamb's wool has a greater saturation point than other existing materials and lamb's wool resists deterioration and being eaten away by the catalyzed GR-625.

The GR-625 is a shock-resistant, flexible, polyester resin having a Barcol hardness of 35 to 40. GR-625 is manufactured or distributed by Marco Chemical, a division of W.R. Grace & Co., 1711 Elizabeth Avenue West, Linden, New Jersey 07036.

Next the one and one-half ounze glass fiber matting is applied to form layer 25 and then by means of a lamb's wool roller the same mixture of GR-625 and MEKP-60 is applied to the exposed top area of the glass

fiber matting in quantity sufficient only to achieve and result in dry saturation by the mixture of the glass fiber matting. A ridged or nylon roller is used to compress and remove all air bubbles from the applied mixture.

This described step of the process involving the application of the glass fiber matting and followed by the dry-saturation application of the mixture of GR-625 and MEKP-60 is repeated three successive times to laminate three additional layers **27, 29** and **31** of glass fiber matting for a total of four laminated layers of the glass fiber matting.

After a curing time of 45 to 60 minutes depending upon the preferred room temperature ranging from 65° to 80° Fahrenheit, the colored pool panel **9** is ready for removal from the plate glass mold.

In the metal-flake pool panel process, a clean, smooth and polished, flat plate glass mold of one-half inch minimum thickness is disposed on carpet foam underlay. The carpet foam underlay prevents quick heat dissipation of the heat from the exothermic reaction of the process and, accordingly, prevents the plate glass mold from cracking or breaking. A suitable releasing substance or compound is applied to the exposed top area of the plate glass constituting the casting surface and is substantially removed, such as by hand rubbing. Several successive applications of the releasing substance alternating with substantial removal of same are resorted to for purposes of rendering the plate glass casting surface to a greater degree of polish and smoothness than that which originally existed on the clean, smooth and polished plate glass casting surface and such that this prepared plate glass casting surface will be impervious to any adhesion whatsoever by the first layer to be applied thereto.

This first layer **33**, ranging from 3 to 5 mil thickness, is directly applied to the prepared plate glass casting surface. To assure application of a uniform mixture, a three-nozzle spray gun is used with two nozzles spraying clear gel-coat or any other suitable, effective equivalent converging with the third nozzle spraying a premixed solution of one part MEKP-60 or any other suitable, effective equivalent catalyst and three parts of a suitable, effective thinner equivalent to ethyl-acetate of suitable purity. Ethyl-acetate of 99 percent purity is an ideal thinner for manufacturing conditions. One gallon of clear gel-coat is used with 30 to 60 cubic centimeters of the premixed solution under guage pressure of 30 to 60 lbs. The resulting catalytic reaction produces exothermic heat with layer **33** having a curing time of 7 to 15 minutes.

Next a layer **35**, ranging from 11 to 13 mil thickness, is applied to the first layer **33**. This layer **35** is spray-applied by utilizing a three-nozzle gun with two nozzles spraying a clear gel-coat mixture converging with the third nozzle spraying a premixed solution of one part MEKP-60 and three parts ethyl-acetate. This clear gel-coat mixture consists of clear-gel coat to which has been added colored metal flake. The quantity of colored metal flake that is added to the clear gel-coat depends upon the color desired in terms of hue, value and intensity. Diamond dust or sparkle (ground up mirror glass) can be added also to this clear gel-coat mixture. The resulting catalytic reaction produces exothermic heat with layer **35** having a curing time of 7 to 15 minutes.

In order to give a three-dimensional effect to the metal flake and diamond dust or sparkle, a color backup can be applied thereafter by spray or roller. This color backup consists of concentrated color added to the same mixture of MEKP-60 and GR-625 used for wet saturation in the colored pool panel process described. This mixture of GR-625 and MEKP-60 is applied by means of a lamb's wool roller to the cured gel-coat layer **35** in sufficient quantity to permit adhesion to layer **35** and wet saturation of the one and one-half ounze glass fiber matting to be subsequently applied thereto. If the color backup is not desired, the concentrated color is omitted from this mixture.

Next the 1½ ounze glass fiber matting is applied to form layer **37** and then by means of a lamb's wool roller the same mixture of GR-625 and MEKP-60 utilized in the colored pool panel process is applied to the exposed top area of the glass fiber matting in quantity sufficient only to achieve and result in dry saturation by the mixture of the glass fiber matting. A ridged or nylon roller is used to compress and remove all air bubbles from the applied mixture.

This described step of the process involving the application of the glass fiber matting and followed by the dry-saturation application of the mixture of GR-625 and MEKP-60 is repeated three successive times to laminate three additional layers **39, 41** and **43** of glass fiber matting for a total of four laminated layers of the glass fiber matting.

After a curing time of 45 to 60 minutes depending upon the preferred room temperature ranging from 65° to 80° Fahrenheit, the metal flake pool panel is ready for removal from the plate glass mold.

The pool panel **9** shown is 42 inches in height and 96 inches in length. However, some of the pool panels used for the swimming pools are either or both greater than or/and less than 96 inches in length.

In both described processes for the pool panels, the dimensions of the rectangular flat plate glass are similar to the height and length dimensions of the resulting pool panels to be fabricated. The plate glass mold is disposed on a flat table with the carpet underlay disposed therebetween.

The right and left side bolting flanges **17** are normal to the front wall **11** of pool panel **9** and extend rearwardly 2½ inches from front wall **11**. These flanges **17** are fabricated at the same time and in the same manner as the pool panel itself by means of flat steel side plates disposed normal to and upstanding from the lateral sides of the flat table. These steel side plates are 39 inches long and in their upstanding disposition from the lateral sides of the flat table are centered thereon and with reference to the 42 inch height of the pool panel. Such contemporaneous fabrication of flanges **17** results in flanges **17** and pool panel **9** being of integral, one-piece construction. It should further be obvious that flanges **17** as fabricated are 39 inches in height. Equidistant along the center line of flanges **17** are 14 aligned holes drilled therethrough of twenty-five sixty-fourths inch diameter for disposition therethrough of bolts three-eighths inch diameter. The 3/8 inch bolts **47** disposed through aligned holes **45** are engaged by nuts **49**.

The bottom angle or concrete lock **19** extends the full length of the pool panel **9** with one leg of bottom angle **19** disposed normal to the front wall **11** of pool panel **9** and extending outwardly from front wall **11**, as shown. Bottom angle **19** consists of two successive layers of 1½ ounze glass fiber matting prefabricated on a

steel angle mold having 2 inch legs. After pool panel **9** has been fabricated, bottom angle **19** is fixed in secured relationship to the immediate bottom region of the rear wall of pool panel **9**, as follows: First this bottom rear wall region of pool panel **9** to which one of the legs of angle **19** is to be secured is wet-saturated by appropriate application of the same mixture of GR-625 and MEKP-60 utilized in the pool panel process for wet saturation of the glass fiber matting in that process. Then a layer of 1½ ounze glass fiber matting is applied to the wet-saturated bottom rear wall region, followed by wet saturation of the glass fiber matting by the mixture of GR-625 and MEKP-60. The leg of angle **19** to be thusly secured is disposed in abutting relationship with the wet-staturated bottom rear wall region. Next the exposed top area of this leg of angle **19** is wet-saturated by appropriate application of the mixture of GR-625 and MEKP-60, followed by successive alternating applications of two more layers of the 1½ ounze glass fiber matting and wet saturation by means of the mixture of GR-625 and MEKP-60.

Fixed in secured relationship to the rear wall **13** of pool panel **9** are four vertical reinforcing guide sleeves **51.** Guide sleeves are steel conduits of three-fourths inch diameter and 3 feet in length. Guide sleeves **51** are disposed in a vertical upright position on rear wall **13** of pool lanel **9** such that each of the guide sleeves **51** will lie 2 inches from the bottom of rear wall **13** and 4 inches from the top **15.** In preferred disposition on the pool panel **9** that is 42 inches in length, one of the guide sleeves **51** will be parallel to and one foot adjacent to its immediate side of pool panel **9**, the other of the guide sleeves **51** will be parallel to and one foot adjacent to its immediate side of the pool panel **9**; and each of the two remaining guide sleeves **51** will be parallel to and spaced apart two feet from each of the preceding guide sleeves **51**, and parallel to and spaced apart two feet from each other.

These four guide sleeves **51** as thusly disposed on the rear wall **13** are fixed thereto by wet saturation by the mixture of GR-625 and MEKP-60, followed by successive alternating applications of two layers of 1½ ounze glass fiber matting and wet saturation by means of the mixture of GR-625 and MEKP-60.

Fixed in secured relationship to the rear wall **13** of pool panel **9** is a glass fiber, horizontal, reversed reinforcing angle **53** that is 90 inches in length. Angle **53** is prefabricated in the same manner as bottom angle **19** on steel angle of 2 inch legs. In its preferred disposition, angle **53** is parallel to the top **15** with the center of reversed angle **53** being 9 inches from the top **15**, and the remote ends of angle **53** are 3 inches from their respective immediately adjacent sides of pool panel **9.** Prior to such described disposition of angle **53** on the rear wall **13**, it is suitably notched out in places corresponding to the four vertically upright guide sleeves **51** fixed as described on the rear wall **13** and for complemental fit over these four guide sleeves **51.** Next angle **53** and its immediate horizontal region on the rear wall **13** of pool panel **9** are wet-saturated by means of the mixture of GR-625 and MEKP-60, followed by successive alternating applications of two layers of the one and one-half ounze glass fiber matting and wet saturation by means of the mixture of Gr-625 and MEKP-60.

The guide sleeves **51** impart structural rigidity and strength vertically to the pool panel **9.** The reversed horizontal angle **53**, interlocked as it is with the guide sleeves **51**, imparts structural rigidity and strength to the upper horizontal region of pool panel **9.** The bottom angle or concrete lock **19** imparts strength and structural rigidity to the bottom region of pool panel **9.**

FIG. **1** shows the corners of the rectangular shaped pool **1** as being curved. To allow the pool panels which are to be installed and bent to form the corners of the rectangular shaped pool **1**, those pool panels are fabricated without the bottom angle or concrete lock **19** and without the reversed horizontal angle **53.**

In the method of installing the swimming pool, a hole is excavated conformable to the swimming pole to be erected and installed, and with such excavation having an overdig or ledge region 18 inches wide from the perimeter of the proposed pool and 44 inches deep from ground level.

The pool panels are vertically disposed in upright position in the excavation such that their bottom angles **19** rest on the bottom of the 18 inch over-dig or ledge. Mastic is suitably applied to the common adjacent flanges **17** of the pool panels to be bolted together. These adjacent flanges are aligned so that their bolt holes **45** correspond. The 3/8 inch bolts **47** are disposed through each of the corresponding bolt holes **45**, with the exception of the top bolt holes **45**; and nuts **49** are engaged with the threaded portions of bolts **47** and suitably tightened to thereby provide a watertight seal for the joints formed by the common adjacent flanges **17** bolted together. The pool panels disposed, as described, in the excavation and bolted together include those pool panels suitably bent to form the corners of swimming pool **1.**

Next, front stakes **55** which are 18-inch long, 1/2 inch diameter concrete reinforcing rods are disposed through complemental holes **57** suitably formed in bottom angle **19** and driven 10 inches into the ground. The front stakes **55** are spaced apart approximately 2 feet; however, depending upon the soil conditions, more front stakes may be utilized and disposed through holes **57** spaced apart less than 2 feet.

Rear stakes which are 3 foot long, 5/8 inch diameter concrete reinforcing rods **59** disposed within the vertical reinforcing guide sleeves **51** and driven 18 inches into the ground provide stability for the bottom rear portions of the bolted together pool panels.

The bottom angles or concrete locks **19** with their front stakes **55** disposed therethrough and driven into the ground provide stability for the front bottom portions of the pool panels bolted together.

Next jack posts **61** of T-shaped configuration in cross section are disposed in the ground on the front or inside perimeter of the pool, with a jack post at each pool panel joint. As shown, a jack post adapted **63** has angled legs **65** and **67.** Leg **65** has a T slot **69** therethrough and leg **67** has a bolt hole **71** therethrough. Each jack post **61** has protruding nubs **73**, as shown, such that T slot **69** will be able to be disposed and slide on the T-shaped configured cross section of jack post **61** but the nubs **73** can engage the bottom of leg **65** and retain where disposed the jack post adapter **63** in the position desired on jack post **61.**

An articulated jack post screw **75** is freely but retainably mounted with a bracket **77** which has a hole therethrough for alignment and correspondence with the top holes **45** of common flanges **17** and through which holes described a bolt **47** is disposed with its threaded portion engaged by nut **49.** The threaded portion **79** of

jack post screw **75** is disposed through hole **71** of jack post adapter **63** and threaded portion **79** is suitably engaged by nut **81.** By means of the jack posts **61,** their respective adapters **63,** screws **75** and engaged nuts **81,** the entire perimeter of the pool panels bolted together are raised 6 inches to the position indicated by reference numeral **83** in FIG. **4.** With the bolted together pool panels thusly raised to position **83,** the front stakes **55** will be about 2 inches above the bottom angle or concrete lock **19** and the rear stakes **59** about 1 foot above but within guide sleeves **51.**

Heretofore, some 64 man-hours were required merely to set up in vertical upright position and bolt together the pool panels forming the pool perimeter in the excavation for a 16 by 32 foot rectangular shaped swimming pool. By the method described, this time factor has been reduced to merely 16 man-hours with consequent savings.

Next both the front and rear bottom portions of the pool panels are suitably coated with tar or asphalt roof coating to a vertical height of 4 inches from the bottom of the pool panels. 8-guage wire mesh **85,** 6 by 6 inches, is suitably disposed within and on the bottom of the excavation and is further disposed to extend to and on the 18 inch overdig or ledge circumscribing the bolted together pool panels forming the pool perimeter. A New York State C-1, 3500 lb., 7 bag, air-entraining, cement mixture, with reference numeral **87** indicating such cement mixture and resulting concrete — not exceeding a 3 inch slump — is suitably poured in the excavation to a 6 inch depth thus creating a pool bottom having a floor thickness of 6 inches; is poured to a 1 foot depth within 8 inches of the inside perimeter of the pool thereby forming the safety ledge **3;** and is poured to a 1 foot depth 18 inches outside the pool perimeter as indicated by reference numeral **89** thereby filling partially the 18 inch overdig region circumscribing the pool perimeter. The cement mixture **87** is further suitably poured to form the 6 inch radius curve **91** which joins the 6 inch depth of the cement mixture **87** poured in the excavation. Nuts **49** are disengaged from bolts **47** disposed through the top holes **45** of common flanges **17,** and bolts **47** are removed to permit the removal of brackets **77** and jack posts **61** from the inside perimeter of the pool. Then bolts are disposed through the top holes **45** of common flanges **17** and nuts **49** are suitably engaged with the threaded portions of bolts **47.**

The rear stakes **59** disposed within the vertical reinforcing guide sleeves and the front stakes **55** disposed through the bottom angles or concrete locks **19** provide stability for both the front and rear bottom portions of the pool panels in the cement pouring operation. Bottom angle **19** further functions as a slip-proof concrete lock. Slip-proof means that when pouring the cement mixture **87,** the working of the cement mixture in such pouring will not raise the pool panels. Frost heave is prevented for the reason that the concrete pool bottom is below the frost line and bottom angle **19** is joined with and tied into the resulting homogeneous concrete pool bottom.

In pouring the cement mixture **87,** the wire mesh **85** is suitably hooked and raised such that the wire mesh **85** will be disposed in the mid position of the various depths described of the cement mixture **87** so poured.

Twelve hours later, a thin top sealer coat is troweled on the set cement mixture **87** or concrete by means of either a cork or rubber float. This top sealer coat is marcite or equivalent white silica sand and white atlas cement in a 3 to 1 mixture of three parts sand to 1 part cement. Afer approximately 4 hours when this top sealer coat is dry to the touch, water coverage to a 2 inch depth is effected and resorted to for purposes of allowing uniform curing of the sealer coat and concrete.

With the safety ledge **5** poured to a depth of 1 foot of cement mixture **87,** the top of safety ledge **5** will be 6 inches above the bottom angle or cement lock **19.**

What are not described are conventional such as the installation of the main drain and piping before pouring the pool bottom, the subsequent installation of the hydrostatic relief valve, installation of the filter system, plumbing installation and electrical installation.

Coping rod **93** is a 1/2 inch diameter concrete reinforcing rod having a length of 28 inches. Coping rod **93** is bent L-shaped on a 6 inch radius to form thereby approximately a 12 inch short leg and a 16 inch long leg, **95** and **97,** respectively. In each guide sleeve **51,** short leg **95** of coping rod **93** is disposed so as to be received in guide sleeve **51.**

Alternately, the swimming pool is filled with water and the 18 inch over-dig region circumscribing the pool perimeter is backfilled with washed gravel or number one crushed stone to prevent lateral displacement of the pool panels bolted together. The washed gravel or crushed stone backfill also serves to allow drainage. This overdig or ledge region is backfilled to the top of the vertical guide sleeves **51.**

The long legs **97** of the coping rods **93** are disposed substantially normal to their respective pool panels to extend outwardly with reference to the over-dig or ledge region. Spaced apart approximately 6 inches from each other and welded as a continuous perimeter to the long legs **97** of the coping rods **93** are three 1/2 inch diameter concrete reinforcing perimeter rods **99** with one of the perimeter rods **99** welded to the remote ends **101** of long legs **97.**

2 by 6 inch wood concrete forms are suitably disposed 18 inches away from the pool perimeter and hence, as so disposed, are in the 18 inch over-dig or ledge region from the pool perimeter, which has not been backfilled.

Bull nose coping, generally referred to by reference numeral **103** and shown disposed in assembly on the top **15** of the pool panel in FIG. **2,** is extruded from suitable plastic such as polyvinyl chloride (PVC). As extruded, coping **103** is of integral, one-piece construction, has a rounded vertical profile **105** whose upper end terminates as a reversed lip **107** and whose lower end terminates in a web **109.** Upstanding from web **109** is a reversed clip **111** having a depending leg **113** therefrom. Clip **111** and depending leg **113** retainably receive therein the top **15** of the pool panel. Depending from web **109** is a flange **115** having upper and lower protruding lips thereon to thereby form a trough to which ceramic tile **117** is attached by PVC bonding epoxy.

As extruded, depending leg **113** is angled away from the front wall **11** and depending flange **115** is angled slightly toward the front wall **11** in a converging relationship. Accordingly, when the coping **103** is disposed on the pool panel as described, depending leg **113** will wedge against the rear wall **13** and depending flange **115** will wedge against the front wall **11,** and depending flange **115** thusly will be maintained in contact with the

front wall 11 of the pool panel notwithstanding any frost heaving.

The same cement mixture as heretofore described is poured to a depth of 6 inches in the overdig or ledge region, with a one-inch slope away from the pool perimeter for water drainage purposes, to complete the perimeter coping 3 around the pool. The rounded vertical profile 105 permits the poured coping cement mixture to be received therein and to fill the space therein, and the reversed lip 107 engages the poured coping cement mixture, thereby the rounded vertical profile 105 and its reversed lip 107 structurally join the bull nose coping 103 to the resulting concrete coping 3. Inasmuch as the concrete perimeter rods 99 are welded to the long legs 97 of the coping rods 93 whose short legs 95 are received within and carried by the guide sleeves 51, the concrete coping 3 imbedding, as shown, the concrete perimeter rods 99 and the long legs 97 thereby unites and joins the upper portions of the pool panels to the concrete coping 3. Approximately 4 hours after pouring the coping cement mixture, two successive coats of the top sealer heretofore described are brushed on to provide a non-skid coping surface.

Having thusly described my invention, I claim:

1. In a swimming pool structure disposed in an excavation, said pool structure comprising a concrete bottom and coping, a plurality of pool panels; said pool panels being of rectangular configuration and being of integral, one-piece construction fabricated of layers of glass fiber matting, said pool panels having front and rear walls, tops and bottoms, right and left sides having bolting flanges, said pool panels having bottom angles, vertical reinforcing guide sleeves and horizontal reversed reinforcing angles, said bolting flanges of each of said pool panels being normal to said pool panel front wall and extending rearwardly therefrom, said bolting flanges having holes formed therethrough and disposition therethrough of bolts engaged by nuts, said pool panels being vertically disposed in upright position in said excavation and being joined together in side-by-side relationship at their bolting flanges disposed in common abutting relationship, said pool panels as thusly disposed and joined together thereby defining the periphery of said swimming pool, each front wall of said pool panels being flat and having a smooth surface, and being the facing wall disposed inwardly in said swimming pool structure, said pool panel bottom angle having two legs, one of said bottom angle legs being fixed to said pool panel rear wall and the other bottom angle leg being disposed normal to said pool panel front wall and extending outwardly from said pool panel front wall at said pool panel bottom, said bottom angle imparting and providing strength and structural rigidity to its said pool panel in its bottom region, said vertical reinforcing guide sleeves being disposed in upright position on said pool panel rear wall and being in fixed relationship with said pool panel rear wall, said vertical reinforcing guide sleeves imparting and providing strength and structural rigidity to said pool panel in its vertical wall regions, said horizontal reversed reinforcing angle of each said pool panel having legs whose remote ends are disposed in abutting relationship with said pool panel rear wall in its upper horizontal wall region, said horizontal reversed reinforcing angle being fixed to said pool panel rear wall, said horizontal reversed reinforcing angle being suitably notched out in places corresponding to said disposed and fixed vertical reinforcing guide sleeves for interlocked relationship with said vertical reinforcing guide sleeves, said horizontal reversed reinforcing angle imparting and providing strength and structural rigidity for said pool panel in its upper horizontal wall region, said pool panel bottom angle through its leg disposed normal to said pool panel front wall and extending outwardly from said pool panel front wall further functioning as a slipproof concrete lock to prevent said pool panel from rising when pouring said concrete pool bottom, said outwardly extending pool panel bottom angle further joining said pool panel bottom with said concrete pool bottom and tying said pool panel bottom into said concrete pool bottom, means cooperating with said bottom angles and vertical reinforcing guide sleeves to provide stability for both the front and rear bottom portions of said pool panels, and means cooperating with said vertical reinforcing guide sleeves to structurally join said pool panels to said concrete coping .

2. A swimming pool structure in accordance with claim 1, wherein said means cooperating with said bottom angles and vertical reinforcing guide sleeves to provide stability for both the front and rear bottom portions of said pool panels comprise front stakes disposed through said outwardly extending pool panel bottom angle legs and driven into the ground, and rear stakes disposed within said vertical reinforcing guide sleeves and driven into the ground.

3. A swimming pool structure in accordance with claim 1, wherein said bottoms of said pool panels are disposed in the mid position of the depth of said concrete bottom.

4. A swimming pool structure in accordance with claim 1, wherein said means cooperating with said vertical reinforcing guide sleeves to structurally join said pool panels to said concrete coping comprise coping concrete reinforcing rods and concrete reinforcing perimeter rods, wherein each of said coping concrete reinforcing rods is L-shaped and has two legs, wherein each vertical reinforcing guide sleeve receives one leg of an L-shaped coping concrete reinforcing rod associated therewith and the other leg of said L-shaped coping concrete reinforcing rod extends normal to its associated pool panel in a direction outwardly from said pool panel rear wall, wherein said concrete reinforcing perimeter rods join, in spaced apart relationship, said outwardly extending legs of said L-shaped coping concrete reinforcing rods, and wherein said coping concrete reinforcing rods and concrete reinforcing perimeter rods are imbedded in said concrete coping .

5. A pool panel for use with a swimming pool structure having a concrete bottom, said pool panel being of integral, one-piece construction fabricated of layers of glass fiber matting, said pool panel being of rectangular configuration, said pool panel having a front and rear wall, top and bottom, right and left sides having bolting flanges, said pool panel having a bottom angle, vertical reinforcing guide sleeves and a horizontal reversed reinforcing angle, said bolting flanges being normal to said pool panel front wall and extending rearwardly therefrom, said bolting flanges having holes formed therethrough for disposition therethrough of bolts engaged by nuts and for adaptation of like pool panels being vertically disposed in upright position and being joined together in side-by-side relationship at their bolting flanges disposed in common abutting relationship, and as thusly joined together thereby defining the

periphery of the swimming pool, said pool panel front wall being flat and having a smooth surface, and being the facing wall disposed inwardly in the structure of the swimming pool, said pool panel bottom angle having two legs, one of said bottom angle legs being fixed to said pool panel rear wall and the other bottom angle leg being disposed normal to said pool panel front wall and extending outwardly from said pool panel front wall at said pool panel bottom, said bottom angle imparting and providing strength and structural rigidity to said pool panel in its bottom region, said vertical reinforcing guide sleeves being disposed in upright position on said pool panel rear wall and being in fixed relationship with said pool panel rear wall, said vertical reinforcing guide sleeves imparting and providing strength and structural rigidity to said pool panel in its vertical wall regions, said horizontal reversed reinforcing angle having legs whose remote ends are disposed in abutting relationship with said pool panel rear wall in its upper horizontal wall region, said horizontal reversed reinforcing angle being fixed to said pool panel rear wall, said horizontal reversed reinforcing angle being suitably notched out in places corresponding to said disposed and fixed vertical reinforcing guide sleeves for interlocked relationship with said vertical reinforcing guide sleeves and complemental fit therewith, said horizontal reversed reinforcing angle imparting and providing strength and structural rigidity for said pool panel in its upper horizontal wall region, said outwardly extending bottom angle leg being adapted to function as a slip-proof concrete lock to prevent said pool panel from rising when pouring said concrete pool bottom, to join said pool panel bottom with said concrete pool bottom and to tie said pool panel bottom into said concrete pool bottom .

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