Aug. 15, 1967

J. D. SCHWARZ ETAL

3,335,430

SWIMMING POOL ASSEMBLY AND MEANS FOR SUPPORTING SIDEWALLS OF THE POOL

Filed June 7, 1965

9 Sheets-Sheet 1

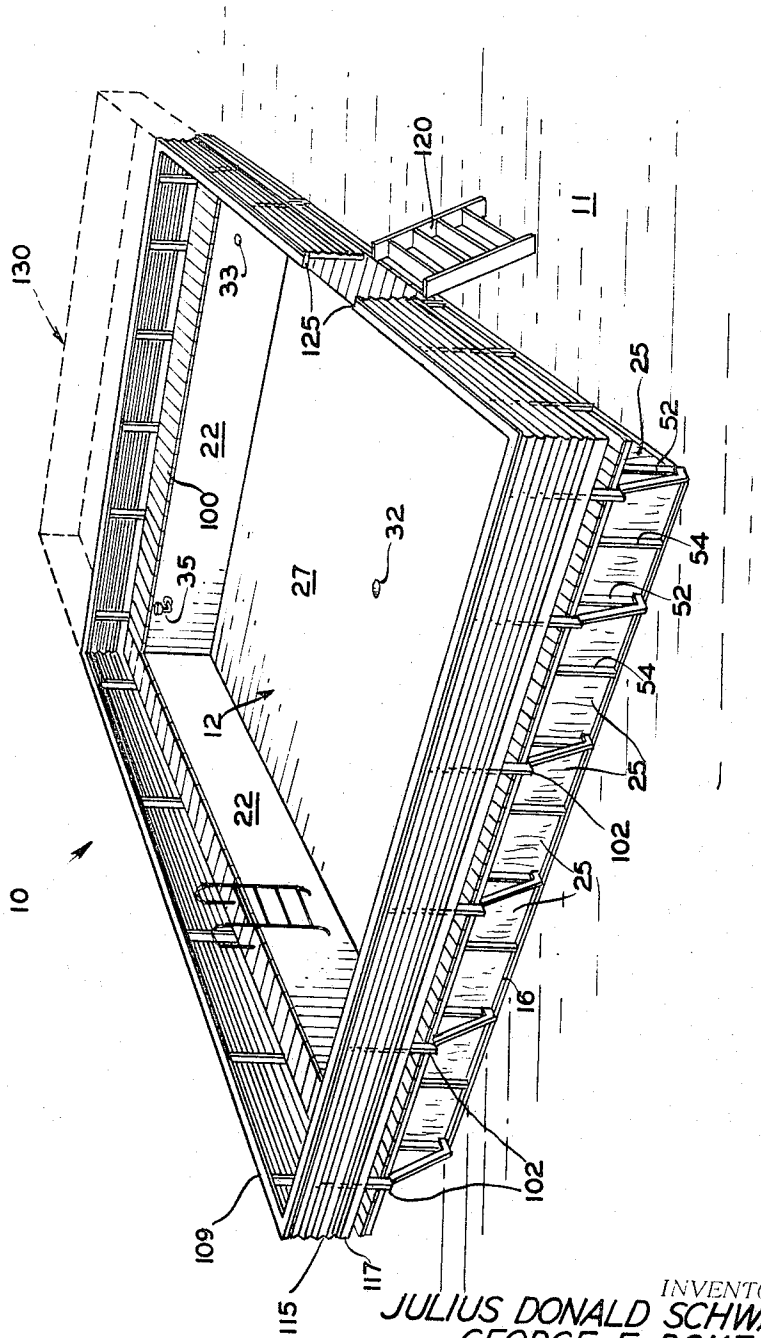


FIG. 1

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SWIMMING POOL ASSEMBLY AND MEANS FOR SUPPORTING SIDEWALLS OF THE POOL

Filed June 7, 1965 9 Sheets-Sheet 2

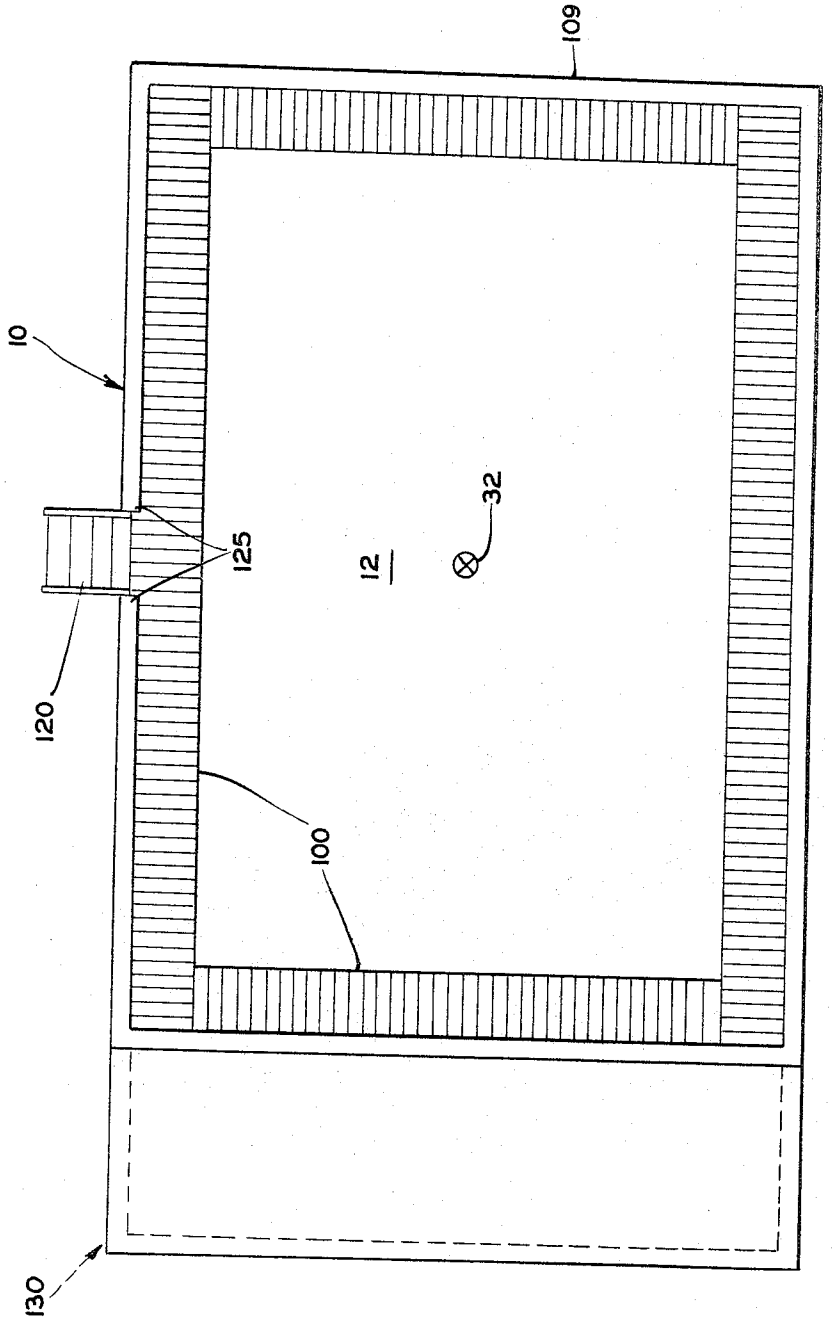


FIG. 2

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SWIMMING POOL ASSEMBLY AND MEANS FOR SUPPORTING SIDEWALLS OF THE POOL

Filed June 7, 1965 9 Sheets-Sheet 3

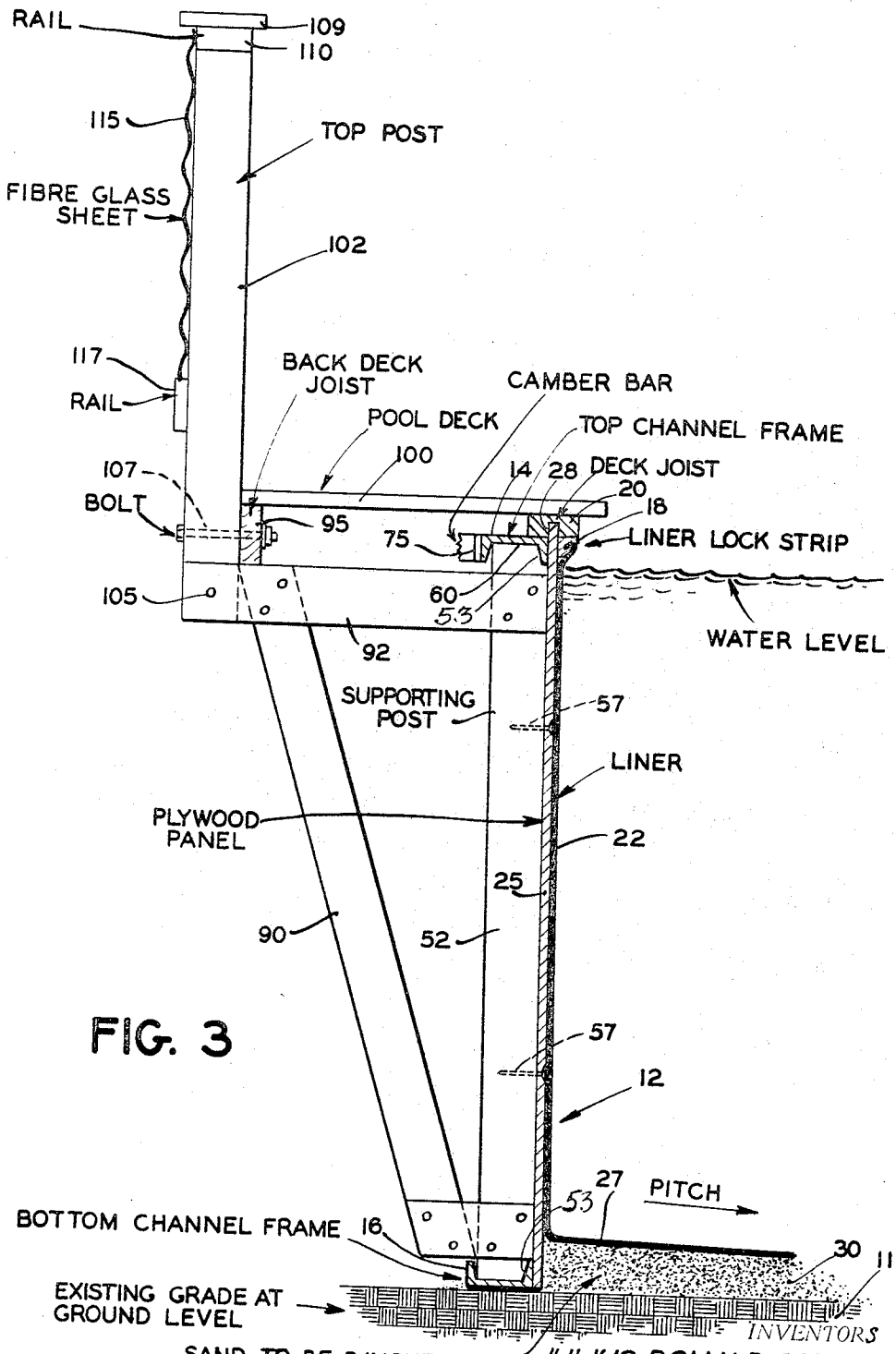


FIG. 3

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SWIMMING POOL ASSEMBLY AND MEANS FOR SUPPORTING SIDEWALLS OF THE POOL

3,335,430

Filed June 7, 1965

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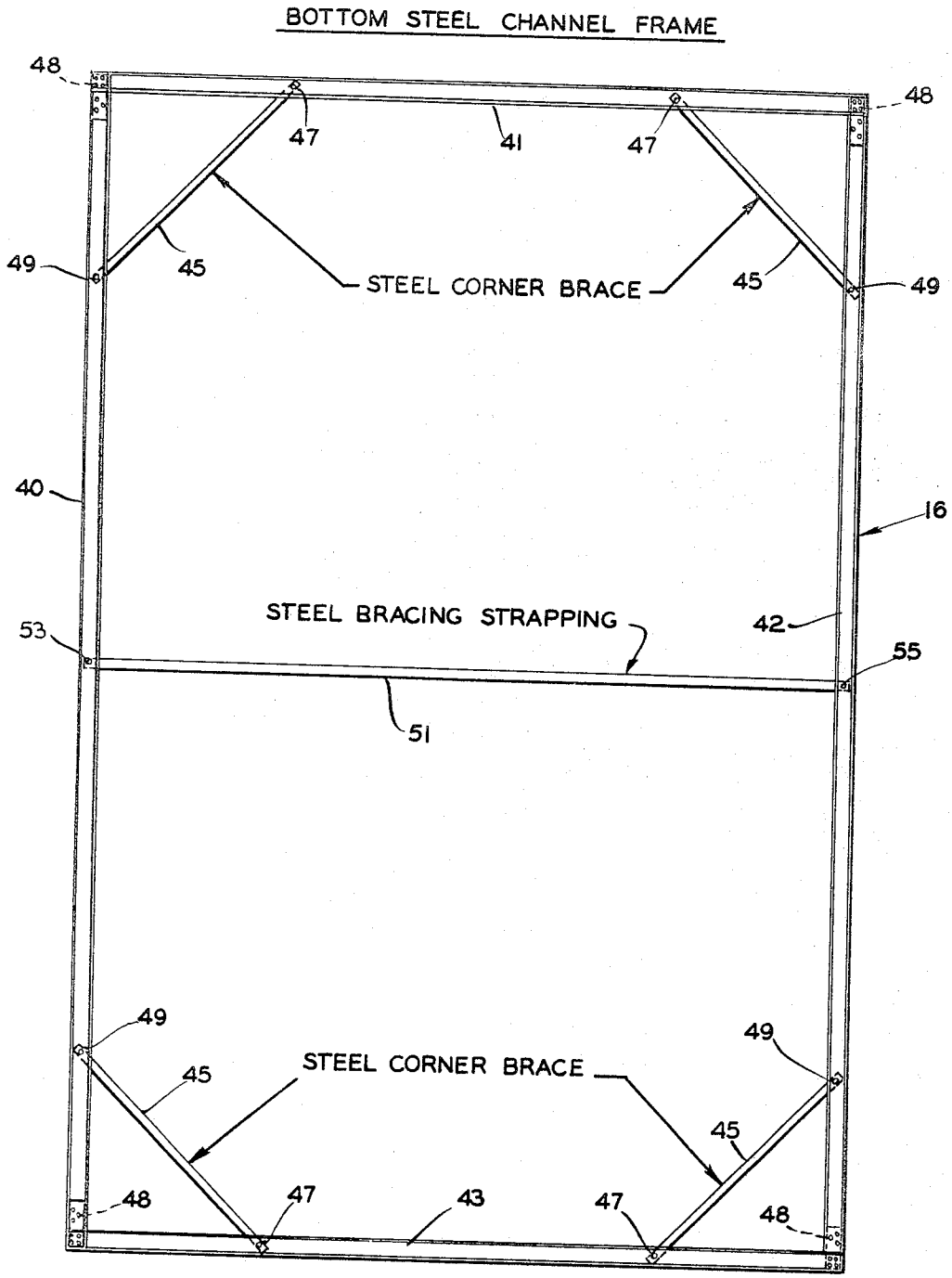


FIG. 4

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Aug. 15, 1967 J. D. SCHWARZ ETAL 3,335,430
SWIMMING POOL ASSEMBLY AND MEANS FOR SUPPORTING SIDEWALLS OF THE POOL
Filed June 7, 1965 9 Sheets-Sheet 5

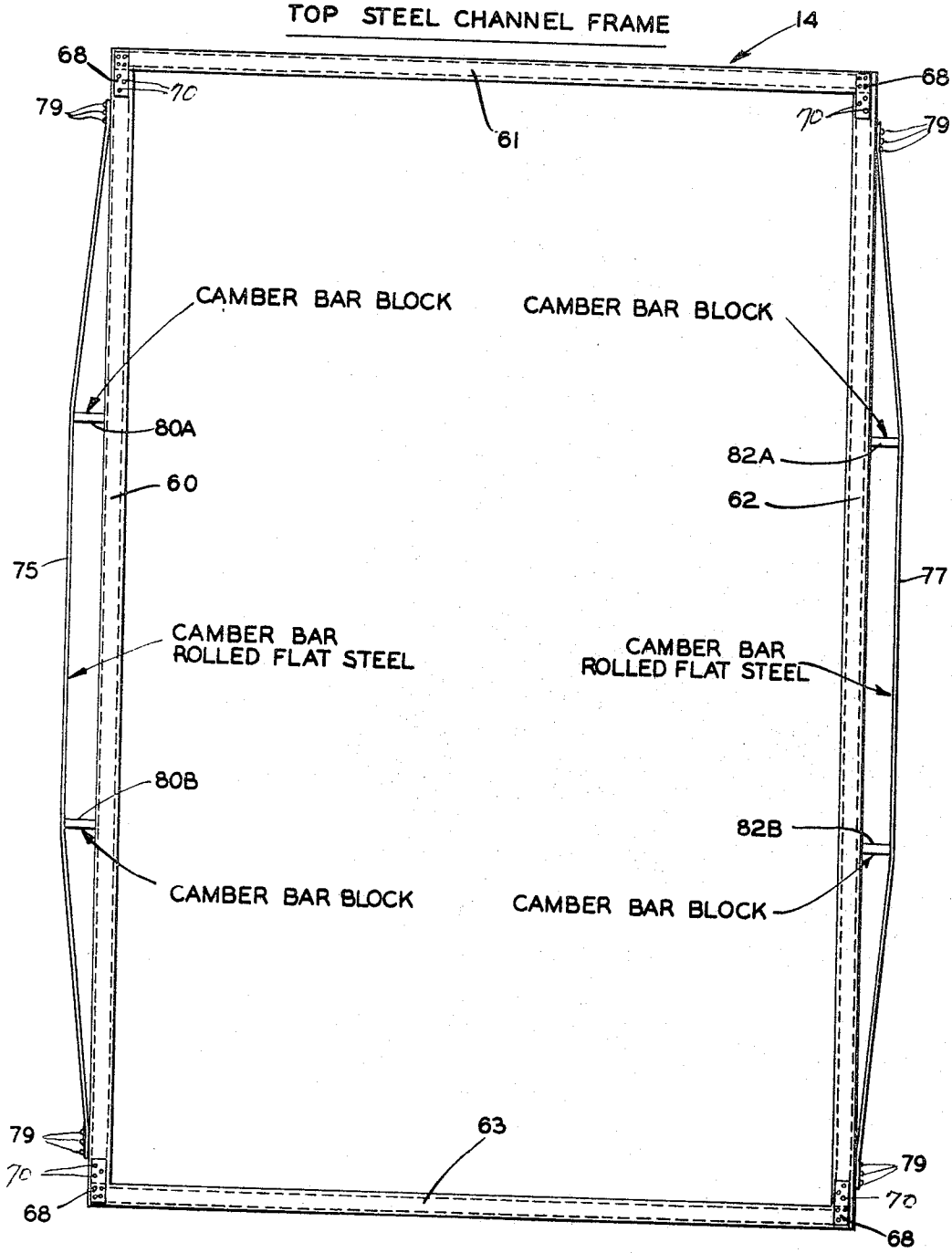


FIG. 5

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SWIMMING POOL ASSEMBLY AND MEANS FOR SUPPORTING SIDEWALLS OF THE POOL

Filed June 7, 1965 9 Sheets-Sheet 6

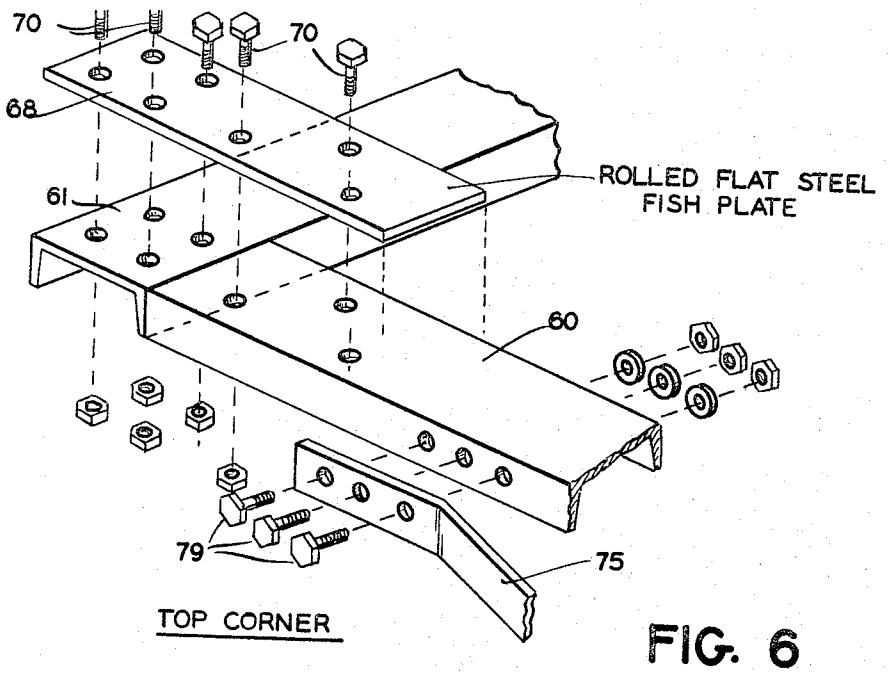


FIG. 6

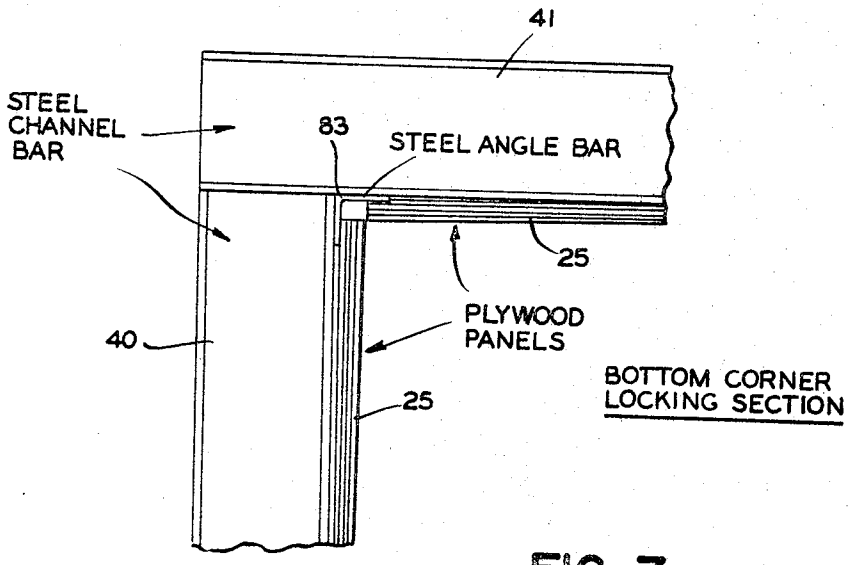


FIG. 7

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SWIMMING POOL ASSEMBLY AND MEANS FOR SUPPORTING SIDEWALLS OF THE POOL

Filed June 7, 1965 9 Sheets-Sheet 7

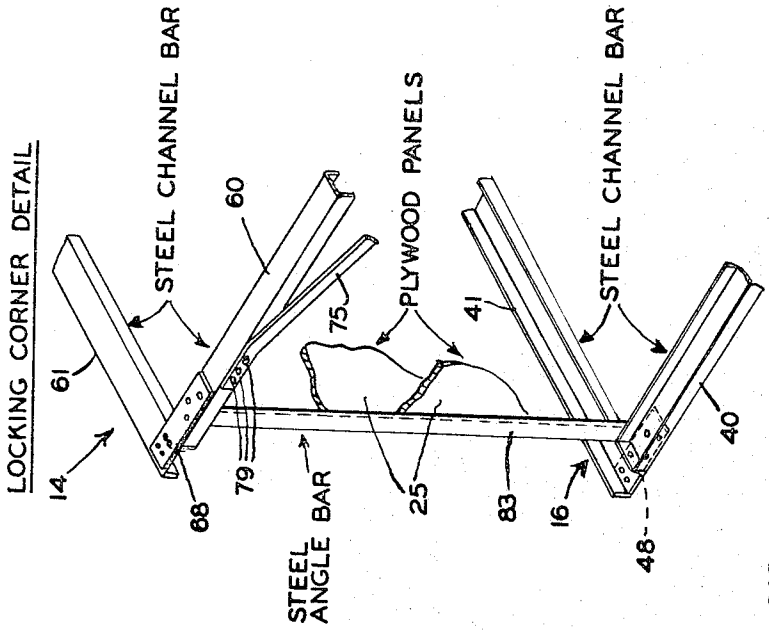


FIG. 9

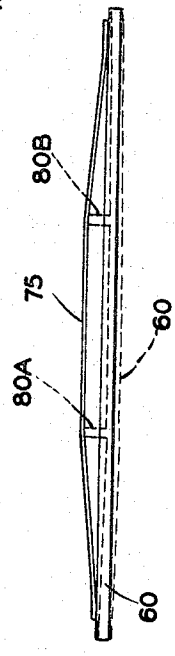


FIG. 10

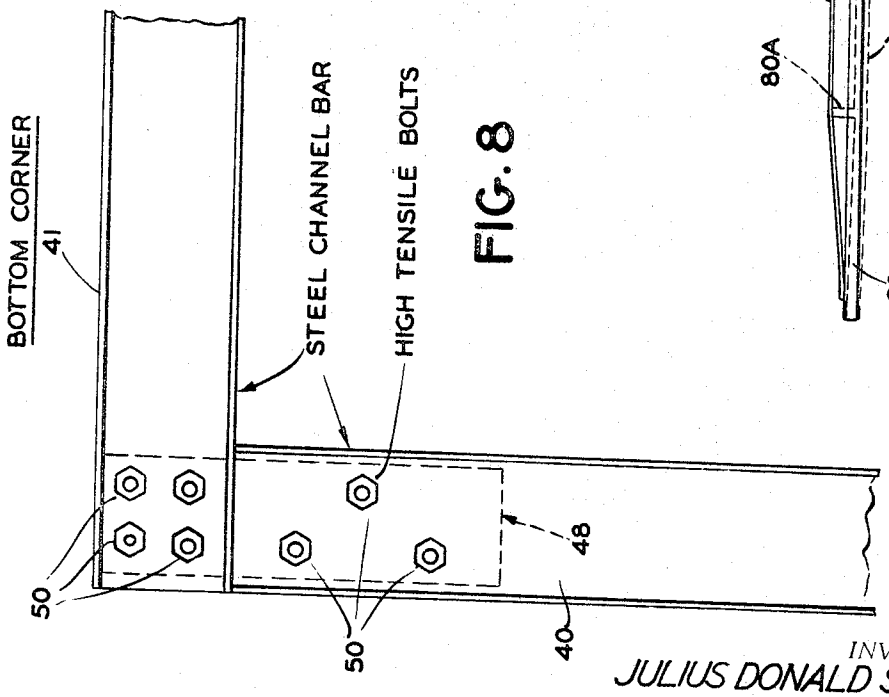


FIG. 8

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SWIMMING POOL ASSEMBLY AND MEANS FOR SUPPORTING SIDEWALLS OF THE POOL

Filed June 7, 1965 9 Sheets-Sheet 5

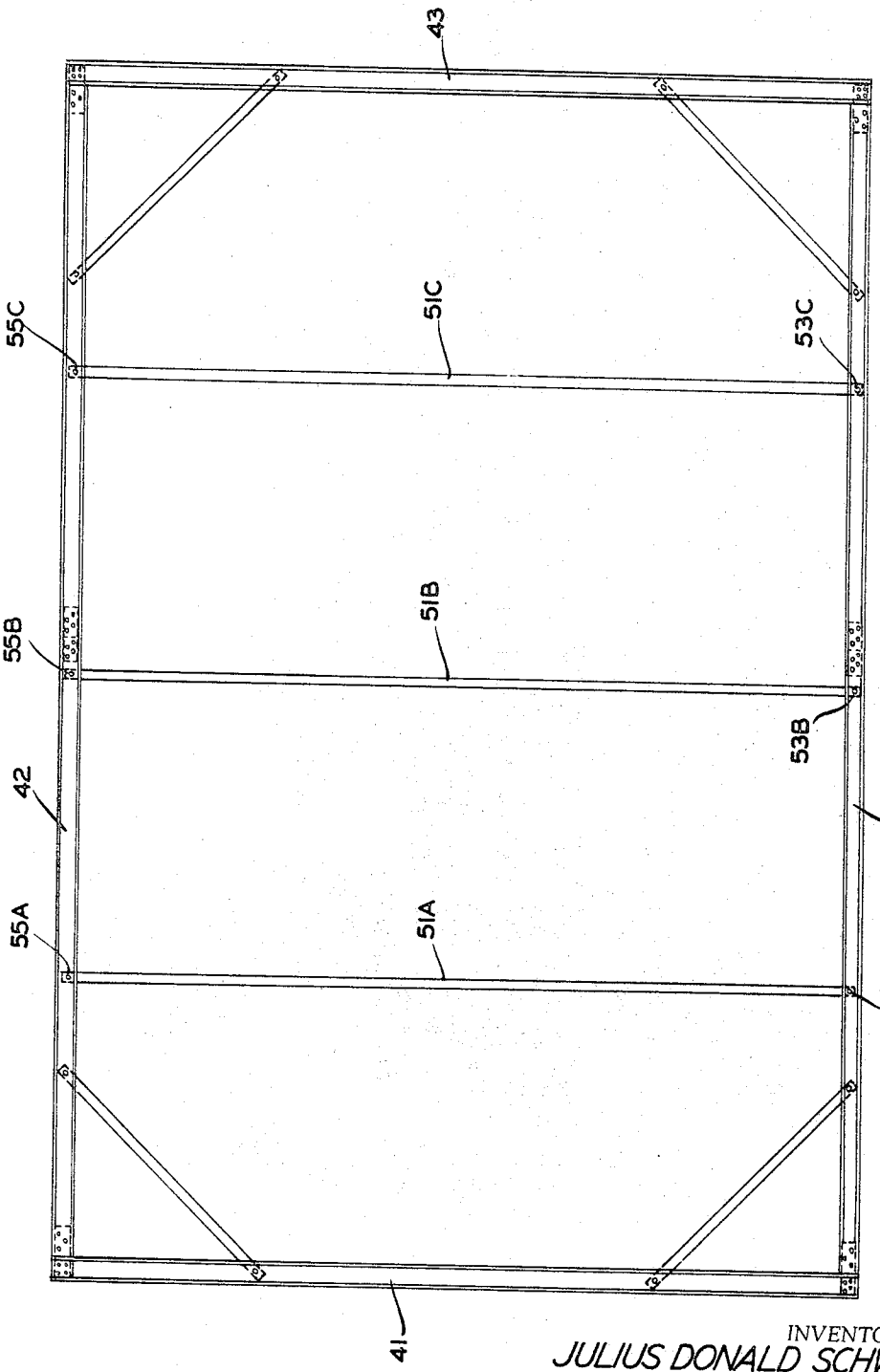


FIG. 11

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SWIMMING POOL ASSEMBLY AND MEANS FOR SUPPORTING SIDEWALLS OF THE POOL

Filed June 7, 1965 9 Sheets-Sheet 9

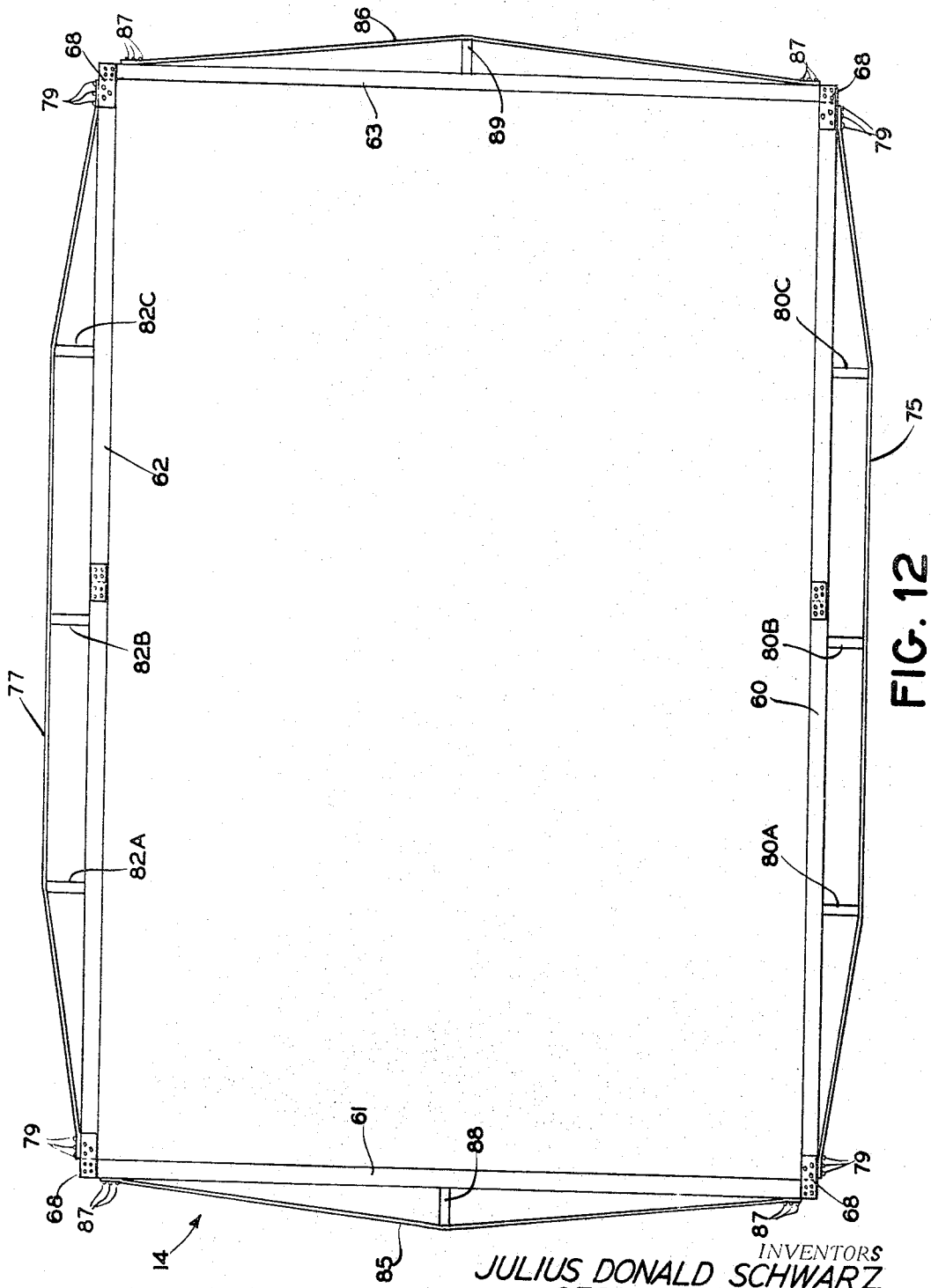


FIG. 12

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United States Patent Office 3,335,430 Patented Aug. 15, 1967

3,335,430

SWIMMING POOL ASSEMBLY AND MEANS FOR SUPPORTING SIDEWALLS OF THE POOL

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Filed June 7, 1965, Ser. No. 461,920
19 Claims. (Cl. 4—172)

ABSTRACT OF THE DISCLOSURE

An above ground swimming pool assembly, including top and bottom frames for supporting in a locking relation opposite ends of suitable supporting posts extending between the top and bottom frames and in a contacting supporting relation with outer surfaces of sidewall means for the pool, a liner for carrying the water of the pool above the ground level, together with means carried by the top frame for securing an upper edge of the liner adjacent the top frame, camber bar supporting means for the top frame to permit a pool construction of greater size and water capacity, and an outrigger means carried by the supporting posts extending between the top and bottom frames for supporting a pool deck and a safety fence extending around the pool and deck above the ground level, and a hinged ladder means leading from the ground level to the deck and which ladder means may be raised to prevent non-permissive access to the deck and pool, as by small children so as to protect them from accidentally falling into the pool.

This invention relates generally to a swimming pool assembly and means for supporting sidewalls of the pool and more particularly to a novel swimming pool assembly that may be erected above ground and including novel camber bar supporting means for the sidewalls of the pool providing greater sidewall strength to prevent distortion and bursting of the sidewalls and permit a construction of a pool of greater size and water capacity.

Heretofore, above ground swimming pools have been limited to pools of relatively small size and water capacity due to limitations in the strength of the sidewalls and extremely high pressures exerted by the water within the pool on the sidewalls of the pool with increase in the size and volumetric water content of the pool.

An object of the invention is to provide an above ground swimming pool of a simple construction that may be readily assembled with no special tools or skills and with novel sidewall supporting camber bars providing superior strength and support to prevent distortion and bursting of the sidewalls of the pool under the pressure of the water contained therein.

Another object of the invention is to provide an improved swimming pool construction including novel top and bottom frames of steel channel bars for supporting a liner for the pool above ground level.

Another object of the invention is to provide in combination with such novel bottom and top frames of steel channel bars, a novel steel strap arrangement for supporting the corners and intermediate portions of the bottom channel bar frame, and a novel flat steel camber bar arrangement for flexing or arching the channel bars of the top frame inwardly so as to provide a flexural top channel bar frame for supporting in cooperative relation with the bottom channel bar frame a liner for the pool above ground level and under pressure of the water carried within the liner of the swimming pool.

Another object of the invention is to provide a novel steel frame for supporting a swimming pool liner which may be readily assembled by merely bolting the several elements of the frame together so that the structure of

the pool may be rapidly erected above ground by other than skilled workman.

Another object of the invention is to provide a novel supporting frame for a liner of a swimming pool in the provision of top and bottom steel channel bar frames interconnected by steel angle bars to effect automatic alignment and squaring of all components in the ready assembly thereof.

Another object of the invention is to provide in such a novel supporting frame for a liner of a swimming pool a series of supporting posts assembled between the top and bottom steel channel bar frames for supporting a pool deck and safety fence extending around the pool deck.

These and other objects and features of the invention are pointed out in the following description in terms of the embodiments thereof which are shown in the accompanying drawings. It is to be understood, however, that the drawings are for the purpose of illustration only and are not a definition of the limits of the invention, reference being had to the appended claims for this purpose.

In the drawings:

FIGURE 1 is a perspective plan view of a swimming pool assembly embodying the present invention;

FIGURE 2 is a top plan view of the swimming pool of FIGURE 1;

FIGURE 3 is an enlarged fragmentary sectional view of a side of the swimming pool assembly of FIGURE 1;

FIGURE 4 is an enlarged top plan view of a bottom steel channel frame to be used in the assembly of a swimming pool of the type shown in FIGURE 1;

FIGURE 5 is an enlarged top plan view of a top steel channel frame to be used with the frame of FIGURE 4 in the assembly of a swimming pool of the type shown in FIGURE 1;

FIGURE 6 is an enlarged exploded view of a corner detail of the top channel frame of FIGURE 5;

FIGURE 7 is an enlarged corner section of the bottom steel channel frame of FIGURE 4;

FIGURE 8 is an enlarged view of the bolting arrangement of a corner of the bottom steel channel frame of FIGURE 4;

FIGURE 9 is an enlarged fragmentary view of the locking corner detail of the assembled top and bottom channel frames of the swimming pool assembly of FIGURE 1;

FIGURE 10 is a view illustrating the inward flexing or arching effect of the camber bar on the channel bar of the top channel frame. The camber bar in FIGURE 10 has been shown in solid lines in relation to the channel bar which is also shown in solid lines to illustrate the relative position thereof before the spacer blocks have been inserted, while dotted lines illustrate a bow in the channel bar of approximately five degrees and the inward flexing or arching effect of the camber bar on the channel bar upon wooden spacer blocks being inserted between the camber bar and the channel bar as shown;

FIGURE 11 is a top plan view of a modified form of the bottom steel channel bar frame of FIGURE 4 to be used in the assembly of a pool structure of the type shown in FIGURE 1 of a greater water capacity; and

FIGURE 12 is a top plan view of a modified form of the top steel channel bar frame of FIGURE 5 to be used with the frame of FIGURE 11 in the assembly of a pool structure of the type shown in FIGURE 1 of a greater water capacity.

Referring to the drawings and particularly FIGURES 1 and 2, there is shown a swimming pool construction **10** embodying the present invention and mounted above ground level **11**. The pool **10** includes a fluid tight liner indicated generally by the numeral **12** and carried above the level of the ground by a novel assembly of a rectangular top frame **14** of steel channel bars supported

by a corresponding rectangular bottom frame **16** of steel channel bars resting on the ground level, as shown in FIGURE 3.

The liner **12** may be of any suitable flexible sheet material that is somewhat stretchable, and a vinyl plastic material such as polyvinyl chloride has been found to be very satisfactory. Along the upper or top free edge of the liner **12** there is provided an extruded bead that is snapped into a liner lock strip **18** and wedged therein in a conventional manner. The lock strip **18** is fastened by suitable means to the underside of an inner joist **20** supporting a pool deck, as shown in FIGURE 3 and explained in greater detail hereinafter. This construction permits the replacement of a worn or damaged liner **12** without any disassembly of the supporting structures of the pool **10**.

The liner **12** has a vertical portion **22** which is adapted to be pressed against the inner surfaces of sidewalls or plywood panels **25**. Each of the panels **25** has an upper edge mounted in a suitable channel **28** provided in joists **20**. The panels **25** are positioned between the joists **20** and the ground level, as shown in FIGURES 1 and 3, and serve not only to lock the plywood panels **25** in a vertical position but also to automatically align and prevent any shifting of the pool deck.

The portion **22** of the liner **12** may be spaced somewhat from the inner surface of the panel **25** when installed prior to the filling of the pool with water. When the pool is filled with water this portion **22** of the liner **12** will be stretched somewhat and pressed tightly and smoothly against the inner surface of the sidewalls **25** without wrinkling under the pressure of the water.

The bottom portion **27** of the liner **12** will also be stretched and pressed tightly under the pressure of the water filling the pool against a sand bottom **30** suitably formed so that the bottom portion **27** of the liner **12** is pitched at an incline from the vertical wall portions **22** of the liner **12** toward a suitable drain opening **32** provided therein and connected through suitable plumbing means to drain the water from the pool, as desired.

Further, as shown in FIGURE 1, there is provided a water inlet fixture **33** which opens through the wall portion **22** of the liner **12** and is connected to suitable water supply means for filling the pool, while a water outlet skimmer fixture **35** of conventional type also projects through the wall portion **22** and is connected through suitable plumbing means to drain the water from the pool so as to maintain the water in the pool at a predetermined level.

A feature of the invention is the provision of the novel means for supporting the water filled pool liner **12** above ground level under pressure of the water, particularly in the assemblage of the bottom steel channel frame **16** of FIGURE 4 and the top steel channel frame **14** of FIGURE 5, as hereinafter explained.

Assembly of pool structure

On assembling the pool structure of FIGURE 1, a stake may be placed in the ground at each corner where the pool structure is to be placed. The ground is then scraped level in all directions in the staked out area. The steel channel bars for the bottom frame **16** are then placed as shown in FIGURE 4, on the scraped level area with U of the channel bars **40**, **41**, **42** and **43** laying with the open side up.

The drain pitch for the bottom **27** of the pool liner **12** may be effected by scraping the ground so as to pitch the level gradually from each of the four sides, making the depth approximately six inches lower at the center drain **32** while the bottom of the U channel bars will be about six inches above the center of the pool and thereafter placing sand within the confines of the bottom frame **16** so formed as to effectively pitch the level of the sand bottom from the sides to the pool drain **32**, to the desired incline, as best shown in FIG. 3.

In assembling the bottom frame **16**, a steel corner brace strap **45** is placed under the U channel bar at each corner, as shown in FIGURE 4, and suitably bolted at **47** and **49** to the end channel bars **41** or **43** and side channel bars **40** or **42**, as the case may be, with high tensile bolts having hand tightening nuts on top. A steel bracing strap or straps **51** are placed under the side channel bars **40** and **42** and bolted thereto by high tensile bolts **53** and **55**.

The end channel bars **41** and **43** are now back fastened to the side channel bars **40** and **42** by a suitably flat steel fish plaate **48** fastened thereto by suitable high tensile bolts **50**, having hand tightening nuts on top as best shown in detail in FIGURE 8.

The assembled bottom channel frame **16** is leveled and then the plywood panels **25**, shown in FIGURES 1, 3 and 7, are set edgewise in the ground inside the bottom channel frame **16** and against the U channel bar of the frame **16** with the smooth side of the plywood panel **25** facing out.

A series of wooden supporting posts **52** and **54**, as shown in FIGURES 1 and 3, extend vertically from the channel bars of the bottom frame **16** with the lower ends of the posts **52** and **54** standing in the U channel of the bars of the bottom frame **16**. The bottoms and tops of the supporting posts **52** and **54** are suitably chamfered, as indicated at **53** in FIGURE 3, to fit the channels of the U bar of the top frame **14** and bottom frame **16** so as to render full bearing surface for the plywood panels **25**.

Care should be taken that the plywood panels **25** are flush with the bottom of the channel bars of the bottom frame **16**, as shown in FIGURE 3. The plywood panel **25** is then secured by nails or suitable wood screws **57** to the posts **52** and **54**.

Channel bars **60**, **61**, **62** and **63** of the upper channel bar frame **14** are next assembled on the top end of the supporting posts **52** and **54** with the U of the channel bars **60**, **61**, **62** and **63** of the upper frame **14**, laying with the open side down on the top of the posts **52** and **54**, as shown by FIGURE 3.

The end channel bars **61** and **63** are set at right angles to the side channel bars **60** and **62** as shown in FIGURE 5, with the end channel bars being fastened to the side channel bars at the corners of the upper frame **14** by a suitable flat steel fish plate **68** fastened thereto by suitable high tensile bolts **70**, as shown in detail by FIGURE 6. The fish plate **68** is thus bolted to the top of the corner with the heads of the bolts **70** on top. All corners of the upper frame **14** are similarly connected.

Camber bars **75** and **77** are next fastened at opposite ends to the outer flanges of the U side channel bars **60** and **62**, respectively, by bolts **79**, as shown by FIGURES 5 and 6. The camber bars **75** and **77** are formed of hot rolled flat steel which is bowed, as shown in FIGURES 5 and 10, in relation to the U steel channel bars. The initial position of the camber bar **75** in relation to the U steel channel bar **60** is shown by solid lines in FIGURE 10.

Wooden camber blocks or wedging means **80A** and **80B** are inserted between the bowed camber bar **75** and the U steel channel bar **60** so that there is effected an approximate five degree inward bow or arch in the middle of the U steel channel bar **60**, as shown by dotted lines in FIGURE 10.

Similarly wooden camber blocks or wedging means **82A** and **82B** are inserted between the bowed camber bar **77** and the U steel channel bar **62** so that there is effected a similar inward bow or arch of approximately five degrees in the middle of the U steel channel bar **62**, as shown in FIGURES 5 and 10.

The camber bars **75** and **77** thus serve to flex or arch the steel channel bars **60** and **62** inwardly so as to provide a flexural top channel bar frame **14** of greater strength for supporting, in cooperative relation with the bottom channel bar frame **16**, the pool liner **12** above the

ground level and under pressure of the water carried within the liner 12, as will be hereinafter explained.

A steel angle bar 83, as shown by FIGURE 9, is then set vertically in each corner of the upper and lower channel bar frames 14 and 16 inside the respective frames and between the plywood walls 25 and the inside flange of the U channel bars of the upper and lower frames 14 and 16. It may be necessary to shift the existing plywood wall 25 to cause the inside corners of the plywood to just meet, while the vertical steel angle bar 83 is positioned so as to be flush to the upper edge of the top of the U channel bar of the upper frame 14, as shown by FIGURES 7 and 9.

The plywood panels 25 are nailed to the wooden supporting posts 52 and 54 before they are set in the steel corners of the frame structures, as shown by FIGURES 1 and 3. An important feature of the corner steel angle is that it prevents the adjacent corner of the plywood panel 25 and the liner 12 resting against it from moving out of position or bursting.

Each of the supporting posts 52 has fastened thereto a supporting beam 90 and a cross bar 92 to provide an outrigger means which, in turn, carries an outer deck joist 95 arranged in spaced relation to the inner deck joist 20 carried by the top channel frame 14 for supporting a pool deck.

The pool deck includes suitable planks 100 which are nailed to the joists 20 and 95, while top posts 102, shown in FIGURE 1 and in detail in FIGURE 3, are each secured to the cross bar 92 of the outrigger means by suitable bolts 105 and to the back deck joist 95 by a second bolt 107.

The rail 110 is pre-slotted or dadoed to receive the top of the posts 102, thereby automatically aligning them vertically and making them structurally stronger.

When the tops of the posts 102 have been fitted within the dado slots, the top rail 109 and the rail 110 may be nailed together and to said posts. The sill or top rail 109 on the rail 110 are offset with respect of the joists 20, which provides a very important safety feature of reinforcing the superstructure or fence.

The fibre glass panel 115 may now be nailed to the posts 102 around the entire fence perimeter of the pool, as shown in FIGURE 1, with the rail 110 abutting the top edge of the fibre glass panel 115 while the bottom edge of the fibre glass panel 115 abuts an upper edge of a rail 117 fastened to a lower portion of each of the fence posts 102.

A pool entry ladder 120 provides a convenient access to the pool through an opening 125 in the pool fence, and the ladder 120 may be conveniently hinged so as to permit the same to be readily raised or lowered.

With the pool thus assembled a garden hose may be used to start the filling of the liner 12 with water. Should any small wrinkles appear in the liner 12, the same may be removed by gently pulling the liner 12. After the initial filling of the pool, further filling and draining of the pool may be effected by the conventional plumbing equipment heretofore described, including the water inlet fixture 33, pool drain 32 and the skimmer 35.

The assembled pool may be modified so as to include a sun deck 130, shown by dotted lines in FIGURES 1 and 2.

It will also be obvious that by making other appropriate modifications of the top and bottom channel frames 14 and 16, the pool may be constructed in many other shapes from the rectangular shape illustrated in the drawings. For example, the principles of the invention may easily and readily be incorporated in a pool of square shape, triangular shape, T-shape, U-shape as well as many other distinctive shapes.

The size and water capacity of the above ground pool embodying the principle of the invention are practically unlimited without danger of distortion or breakage of the liner 12 due to an improved construction of the supporting top and bottom channel frames 14 and 16, as shown by FIGURES 11 and 12, in which corresponding numerals indicate corresponding parts to those indicated and described with reference to FIGURES 3, 4 and 5. It will, of course, be obvious that as the size of the pool is increased the size of the channel frames, supporting posts, joists, etc. must be correspondingly increased in accordance with accepted standards for maintaining the same safety ratio.

In such improved construction, there is provided an improved rectangular bottom U channel bar frame 16 in which there is utilized a plurality of steel bracing straps 51A, 51B and 51C bolted to the underside of the channel bars 40 and 42 by high tensile bolts 53A, 53B and 53C and 55A, 55B and 55C, as shown by FIGURE 11.

Furthermore, arranged in cooperative relation with the bottom U channel bar frame 16 of FIGURE 11, there may be provided a corresponding rectangular improved top U channel bar frame 14, as shown by FIGURE 12.

In the improved frame 14, of FIGURE 12, there are provided the camber bars 75 and 77 fastened at opposite ends to the outer flanges of the side U channel bars 60 and 62 by high tensile bolts 79.

Wooden camber blocks 80A, 80B and 80C are inserted between the bowed camber bar 75 and the U steel channel bar 60 so that there is effected an inward bow or arch in the middle of the U steel channel bar 60 while similar wooden camber blocks 82A, 82B and 82C are inserted between the bowed camber bar 77 and the U steel channel bar 62 so that there is effected a similar inward arch or bow in the middle of the U steel channel bar 62, as shown by FIGURE 12.

There are also provided camber bars 85 and 86 which, like the camber bars 75 and 77, are formed of hot rolled flat steel and bowed, as shown in FIGURE 11, in relation to the end U steel channel bars 61 and 63, respectively, provided at the ends of the rectangular top frame 14. The camber bars 85 and 86 are fastened at opposite ends to the outer flanges of the U channel bars 61 and 63 by high tensile bolts 87.

A wooden camber block or wedging means 88 is inserted between the bowed camber bar 85 and the U steel channel bar 61 so that there is effected an inward arch or bow in the middle of the U steel channel bar 61. A similar wooden camber block or wedging means 89 is inesrted between the bowed camber bar 86 and the U steel channel bar 63 so that there is effected a similar inward bow or arch in the middle of the U steel channel bar 63.

The four U steel channel bars 60, 61, 62 and 63 of the top frame 14 are thereby arched or bowed inwardly under tension of the respective camber bars 75, 85, 77 and 86 so as to provide a substantial increase in the strength of the structural support provided for the liner 12 by the top frame 14 of FIGURE 12 in cooperation with the bottom frame 16 of FIGURE 11. Thus the water capacity of the liner 12 supported above ground level may be substantially increased without danger of distortion or bursting of the sidewalls of the assembled pool under the pressure of the water contained therein.

Although several embodiments of the invention have been illustrated and described, various changes in the form and relative arrangements of the parts, which will now appear to those skilled in the art, may be made without departing from the scope of the invention. Reference is therefore, to be had to the appended claims for a definition of the limits of the invention.

What we claim is:

1. A swimming pool comprising upright sidewalls, a bottom channel bar frame supporting the sidewalls at lower portions thereof, a top channel bar frame supporting the sidewalls at upper portions thereof, supporting posts having ends positioned in the channels of said top and bottom frames, said supporting posts extending between the bottom channel bar frame and the top channel

ber frame and along outer surfaces of said sidewalls, a liner having a vertical portion and a bottom portion, means carried by the top frame for supporting an upper free edge of the liner, the vertical portion of the liner being pressed against inner surfaces of the upright sidewalls under pressure of the water carried in the liner, and the bottom portion of the liner being pressed against a bottom of the pool under pressure of the water in the liner, outriggers supported by said posts extending along the outer surface of at least one of said upright sidewalls, and a deck carried by said outriggers in an overhanging relation to at least the outer surface of said one upright sidewall.

2. A swimming pool comprising upright sidewall means, a bottom frame supporting the sidewall means, a top frame supporting the sidewall means, supporting posts positioned between the bottom frame and along outer surfaces of said sidewall means in a supporting relation thereto and the top frame, outrigger means carried by the supporting post, a liner for carrying the water of the pool above a ground level, said liner having a vertical portion, a bottom portion and an upper free edge, the vertical portion of the liner extending adjacent inner surfaces of the sidewall means, the bottom portion of the liner being positioned adjacent the surfaces of the ground, means carried by the top frame for securing the upper free edge of the liner adjacent the top frame, and a deck carried by the outrigger means in an overhanging relation to the outer surfaces of said sidewall means and adjacent the upper free edge of the liner.

3. A swimming pool comprising upright sidewall means, a bottom frame supporting the sidewall means, a top frame supporting the sidewall means, supporting posts positioned between the bottom frame and the top frame, a liner for carrying the water of the pool above a ground level, said liner having a vertical portion, a bottom portion and an upper free edge, the vertical portion of the liner extending adjacent the inner surfaces of the sidewall means, the bottom portion of the liner being positioned adjacent the surfaces of the ground, means carried by the top frame for securing the upper free edge of the liner adjacent the top frame, said bottom frame including a rectangular channel bar frame, said top frame including a corresponding rectangular channel bar frame, said supporting posts having end portions positioned in a channel bar of each of the top and bottom frames, and said supporting posts extending between the channel bars of said bottom and top frames for supporting the top frame in spaced relation to the bottom frame, a plurality of outriggers, each of said outriggers including a cross bar connected to an upper portion of a corresponding support post and projecting outwardly at a right angle to the corresponding supporting post, a supporting beam, means connecting the supporting beam between an outer portion of the cross bar and a lower portion of the supporting post corresponding thereto, other means interconnecting outer portions of the cross bars of the outriggers so as to secure the outriggers and thereby the supporting posts corresponding thereto in spaced relation along the outer surfaces of the sidewall means, and said supporting posts extending vertically adjacent outer surfaces of the sidewall means in supporting relation thereto.

4. The combination defined by claim 3 including a deck adjacent said top frame, and said deck being carried by said outriggers and supporting posts in an overhanging relation to the outer surfaces of said upright sidewall means.

5. The combination defined by claim 3 including a deck adjacent said top frame and extending outwardly from said supporting posts, said deck being carried by said outriggers and supporting posts, and a fence surrounding said deck and supported by said outriggers and said deck.

6. The combination defined by claim 3 including a deck adjacent said top frame and extending outwardly from said supporting posts, mounting means for said deck carried by said outriggers and supporting posts, said mounting means including inner and outer joists and means for securing the deck to the joists, the inner joists including channel means for retaining an upper edge of the upright sidewall means, a fence surrounding said deck, said fence including other posts for supporting said fence, means for securing said other posts to said outriggers and said outer joists, said fence having an opening therein, and ladder means operably positioned in said opening, said ladder means being adjustably lowered to a first position to permit access to the deck from the ground level through said opening in the fence, and said ladder means being adjustably raised to a second position to prevent access to the deck from the ground level.

7. A swimming pool comprising upright sidewall means, a bottom frame supporting the sidewall means, a top frame supporting the sidewall means, supporting posts positioned between the bottom frame and the top frame, a liner for carrying the water of the pool above a ground level, said liner having a vertical portion, a bottom portion and an upper free edge, the vertical portion of the liner extending adjacent the inner surfaces of the sidewall means, the bottom portion of the liner being positioned adjacent the surfaces of the ground, means carried by the top frame for securing the upper free edge of the liner adjacent the top frame, said bottom frame including a rectangular channel bar frame, said top frame including a corresponding rectangular channel bar frame, said supporting posts having end portions positioned in a channel bar of each of the top and bottom frames, and said supporting posts extending between the channel bars of said bottom and top frames for supporting the top frame in spaced relation to the bottom frame, said top frame including bowed camber bars affixed at opposite ends to outer flange portions of the side channel bars of the top channel bar frame, camber blocks positioned between the bowed camber bars and the side channel bars to effect an inward arching of the side channel bars to provide a flexural top channel bar frame for supporting in cooperative relation with the bottom channel bar frame the liner for carrying the water of the pool.

8. A swimming pool comprising upright sidewall means, a bottom frame supporting the sidewall means, a top frame supporting the sidewall means, supporting posts positioned between the bottom frame and the top frame, a liner for carrying the water of the pool above a ground level, said liner having a vertical portion, a bottom portion and an upper free edge, the vertical portion of the liner extending adjacent the inner surfaces of the sidewall means, the bottom portion of the liner being positioned adjacent the surfaces of the ground, means carried by the top frame for securing the upper free edge of the liner adjacent the top frame, said bottom frame including a corresponding rectangular channel bar frame, said top frame including a corresponding rectangular channel bar frame, said supporting posts having end portions positioned in the channel bar frames, said supporting posts extending between said bottom and top frames for supporting the top frame in spaced relation to the bottom frame, bowed camber bars affixed at opposite ends to the outer flange portions of the side channel bars of the top channel bar frame, camber blocks positioned between the bowed camber bars and the side channel bars to effect an inward arching of the side channel bars to provide a flexural top channel bar frame for supporting in cooperative relation with the bottom channel bar frame the liner for carrying the water of the pool.

9. The combination defined by claim 8 including bowed camber bars affixed at opposite ends to the outer flange portions of the end channel bars of the top channel bar frame, camber blocks positioned between the bowed camber bars and the end channel bars to effect an inward

arching of the end channel bars to provide with the arched side channel bars a flexural top channel bar frame for supporting in cooperative relation with the bottom channel bar frame the liner for carrying the water of the pool.

10. A swimming pool comprising plywood sidewall panels having substantially vertical inner surfaces, a first rectangular steel channel bar frame for supporting said sidewall panels at lower portions thereof, a second corresponding rectangular steel channel bar frame for supporting said sidewall panels at the upper portions thereof, said sidewall panels being set edgewise within the first and second frames and adjacent the channel bars of the first and second frames, wooden supporting posts having end portions positioned in the channels of said first and second frames and extending vertically between said frames so as to support said second frame in spaced relation to said first frame, means for fastening said panels to the supporting posts, a plastic liner of a flexible sheet material, said liner having a vertical portion, a bottom portion and an upper free edge of said vertical portion, means carried by said second frame for securing the upper free edge of the vertical portion of the liner adjacent to the second frame, the vertical portion of said liner being adapted to be pressed against the vertical inner surfaces of said plywood sidewall panels, the bottom portion of said plastic liner being adapted to be pressed against a ground surface, and means for supplying water into the liner to press the vertical and bottom portions of the liner against the sidewall panels and ground surface in providing the liner with water for said pool, outrigger means carried by said supporting posts, a deck carried by said outrigger means and supporting posts, a fence surrounding said deck and supported by said outrigger means and said deck, said fence having an opening therein, and ladder means operably positioned in said opening, said ladder means being adjustably lowered to a first position to permit access to the deck from the ground level through said opening in the fence, and said ladder means being adjustably raised to a second position to prevent access to the deck from the ground level.

11. A swimming pool assembly comprising, in combination, plywood sidewall panels having substantially vertical inner surfaces, a bottom rectangular steel channel bar frame for supporting said sidewall panels at the lower portions thereof, a top rectangular steel channel bar frame for supporting said sidewall panels at the upper portions thereof, said sidewall panels being set edgewise within the bottom and top frames and adjacent the channel bars thereof, wooden supporting posts having end portions positioned in channel portions of said bottom and top frames and extending vertically between said frames so as to support said top frame in spaced relation to said bottom frame, a deck adjacent said top frame and extending outwardly from said supporting posts, mounting means for said deck carried by said supporting posts, said mounting means including inner and outer joists and means for securing the deck to the joists, the inner joists including channel means for retaining an upper edge of the sidewall panels, means for fastening said panels to the supporting joists, a fence surrounding said deck, said fence including other posts for supporting said fence, means for securing said other posts to said mounting means and said outer joists, a plastic liner of a flexible sheet material, said liner having a vertical portion, a bottom portion and a bead along an upper free edge of said vertical portion, means carried by said inner joist for securing the bead along the upper free edge of said vertical portion of said liner adjacent the top frame, the vertical portion of said liner being adapted to be pressed against the vertical inner surfaces of said plywood sidewall panels, the bottom portion of said plastic liner being adapted to be pressed against a ground surface, and means for supplying water into the liner to press the vertical and bottom portions of the liner against the sidewall panels and ground surfaces in providing the interior of the liner with water for said pool.

12. The combination defined by claim 11 in which the top rectangular steel channel bar frame includes bowed steel camber bars secured at opposite ends to outer flange portions of the steel side channel bars of the top channel bar frame, wooden camber blocks positioned between the bowed camber bars and the side channel bars to inwardly arch the side channel bars so as to provide a flexural top channel bar frame for supporting in cooperative relation with the bottom channel bar frame of the liner for carrying the water of the pool.

13. The combination defined by claim 11 in which the top rectangular steel channel bar frame includes first bowed steel camber bars secured at opposite ends to the outer flange portions of steel side channel bars of the top channel bar frame, wooden camber blocks positioned between the first bowed camber bars and the side channel bars to inwardly arch the side channel bars, second bowed steel camber bars secured at opposite ends to the outer flange portions of the steel end channel bars of the top channel bar frame, other wooden camber blocks positioned between the second bowed camber bars and the end channel bars to inwardly arch the end channel bars, the arched side and end channel bars providing a flexural top channel bar frame for supporting in cooperative relation with the bottom channel bar frame the plastic liner for carrying the water of the pool.

14. A swimming pool assembly comprising, in combination, upright sidewall panels, a first rectangular channel bar frame for supporting lower portions of the sidewall panels, a second rectangular channel bar frame for supporting upper portions of the sidewall panels, means for supporting the sidewall panels mounted in channel portions of the first and second channel bar frames, the second channel bar frame including camber bars secured at opposite ends to side channel bars of the second rectangular channel bar frame, wedging means between the camber bars and the side channel bars to cause an inward arching of the side channel bars to substantially increase the supporting strength of the second frame, a liner having a vertical portion and a bottom portion, means carried by the second frame for supporting an upper free edge of the liner, the vertical position of the liner being pressed against the inner surfaces of the upright sidewall panels under pressure of the water carried in the liner, and the bottom portion of the liner being pressed against a bottom of the pool under pressure of the water in the liner.

15. A swimming pool assembly comprising, in combination, upright sidewall panels, a bottom channel bar frame of rectangular shape, said bottom frame supporting lower portions of the sidewall panels, a top channel bar frame of rectangular shape, said top frame supporting upper portions of the sidewall panels, means for supporting the sidewall panels, said supporting means being mounted in channel portions of the bottom and top frames and extending vertically to position the top frame in spaced relation to the bottom frame, vertically extending angle bars, one of said angle bars being positioned in each corner of the rectangular shaped top and bottom frames and between the sidewall panels and the inside flanges of the channel bars of the bottom and top frames to vertically align the top frame and the bottom frame, a liner having a vertical portion and a bottom portion, means carried by the top frame for supporting an upper free edge of the liner, the vertical portion of the liner being pressed against inner surfaces of the upright sidewall panels under pressure of the water carried in the liner, and the bottom portion of the liner being pressed against the bottom of the pool under pressure of the water in the liner, outriggers supported by said posts, a deck carried by said outriggers and supporting posts, a fence about said deck and supported by said outriggers, said fence having an opening therein, and ladder means operably positioned in said opening, said ladder means being

adjustably lowered to a first position to permit access to the deck from the ground level through said opening in the fence, and said ladder means being adjustably raised to a second position to prevent access to the deck from the ground level.

16. A swimming pool assembly comprising, in combination, upright sidewall panels, a bottom channel bar frame of rectangular shape, said bottom frame supporting lower portions of the sidewall panels, a top channel bar frame of rectangular shape, said top frame supporting upper portions of the sidewall panels, means for supporting the sidewall panels, said supporting means being mounted in channel portions of the bottom and top frames and extending vertically to position the top frame in spaced relation to the bottom frame, vertically extending angle bars, one of said angle bars being positioned in each corner of the rectangular shaped top and bottom frames and between the sidewall panels and the inside flanges of the channel bars of the bottom and top frames to vertically align the top frame with the bottom frame, a liner having a vertical portion and a bottom portion, means carried by the top frame for supporting an upper free edge of the liner, the vertical portion of the liner being pressed against inner surfaces of the upright sidewall panels under pressure of the water carried in the liner, and the bottom portion of the liner being pressed against the bottom of the pool under pressure of the water in the liner, said top channel bar frame including camber bars secured at opposite ends to side channel bars of the top frame, first wedging means between the camber bars and the top side channel bars to cause an inward arching of the side channel bars, other camber bars secured at opposite ends to end channel bars of the top frame, second wedging means between the other camber bars and the end channel bars to cause an inward arching of the end channel bars, and the inward arching of the side and end channel bars of the top frame effecting a substantial increase in the supporting strength of the top frame.

17. A swimming pool assembly comprising, in combination, upright sidewall panels, a bottom channel bar frame of rectangular shape for supporting the lower portions of the sidewall panels, a top channel bar frame of a corresponding rectangular shape for supporting upper portions of the sidewall panels, supporting posts mounted in the channel portions of the bottom and top frames to position the top frame in spaced relation to the bottom frame, a liner having a vertical portion and a bottom portion, means carried by the top frame for securing an upper edge of the vertical portion of the liner, the vertical portion of the liner being pressed against inner surfaces of the upright sidewall panels under pressure of the water carried in the liner, and the bottom portion of the liner being pressed against a bottom of the pool under pressure of the water in the pool, outriggers carried by said posts, a deck supported by the outriggers and said supporting posts, a fence about said deck and supported by said outriggers, said fence having an opening therein, and ladder means operably positioned in said opening, said ladder means being adjustably lowered to a first position to permit access to the deck from the ground level through said opening in the fence, and said ladder means being adjustably raised to a second position to prevent access to the deck from the ground level.

18. A swimming pool assembly comprising, in combination, upright sidewall panels, a bottom channel bar frame of rectangular shape for supporting the lower portions of the sidewall panels, a top channel bar frame of a corresponding rectangular shape for supporting upper portions of the sidewall panels, supporting posts mounted in the channel portions of the bottom and top frames to position the top frame in spaced relation to the bottom frame, a liner having a vertical portion and a bottom portion, means carried by the top frame for securing an upper edge of the vertical portion of the liner, the vertical portion of the liner being pressed against inner surfaces of the upright sidewall panels under pressure of the water carried in the liner, and the bottom portion of the liner being pressed against a bottom of the pool under pressure of the water in the pool, said top channel bar frame including camber bars secured at opposite ends to side channel bars of the top frame, wedging means between the camber bars and the side channel bars to cause an inward arching of the side channel bars.

19. A swimming pool assembly comprising, in combination, upright sidewall panels, a bottom channel bar frame of rectangular shape for supporting the lower portions of the sidewall panels, a top channel bar frame of a corresponding rectangular shape for supporting upper portions of the sidewall panels, supporting posts mounted in the channel portions of the bottom and top frames to position the top frame in spaced relation to the bottom frame, a liner having a vertical portion and a bottom portion, means carried by the top frame for securing an upper edge of the vertical portion of the liner, the vertical portion of the liner being pressed against inner surfaces of the upright sidewall panels under pressure of the water carried in the liner, and the bottom portion of the liner being pressed against the bottom of the pool under pressure of the water in the pool, said top channel bar frame including camber bars secured at opposite ends to side channel bars of the top frame, first wedging means between the camber bars and the side channel bars to cause an inward arching of the side channel bars, other camber bars secured at opposite ends to the end channel bars of the top frame, and second wedging means between the other camber bars and the end channel bars to cause an inward arching of the end channel bars.

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