

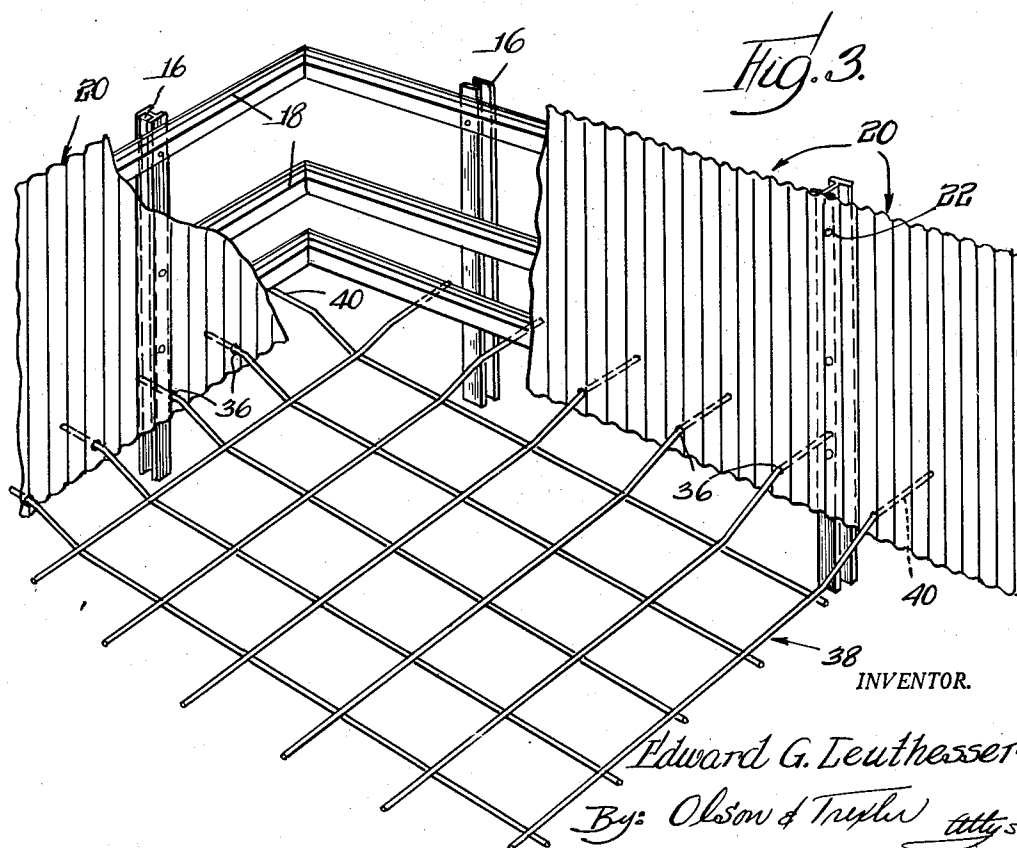
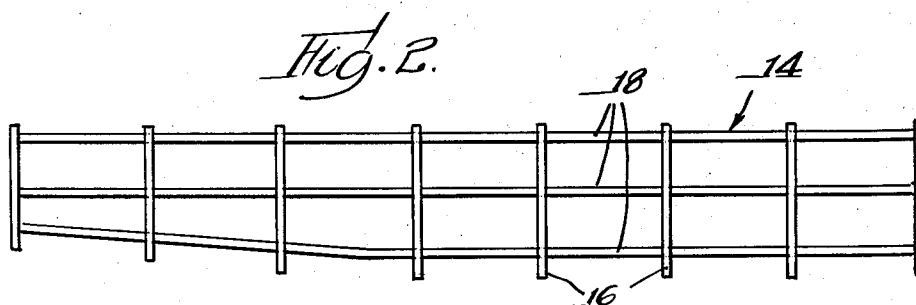
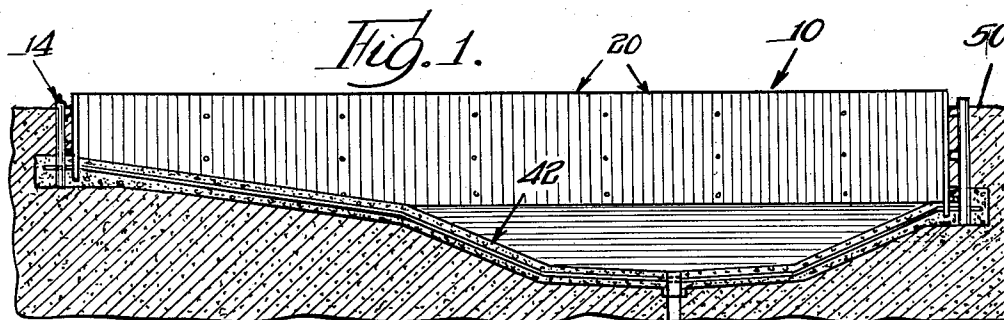
June 2, 1959

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SWIMMING POOL STRUCTURE

2,888,818

Filed March 1, 1956

2 Sheets-Sheet 1



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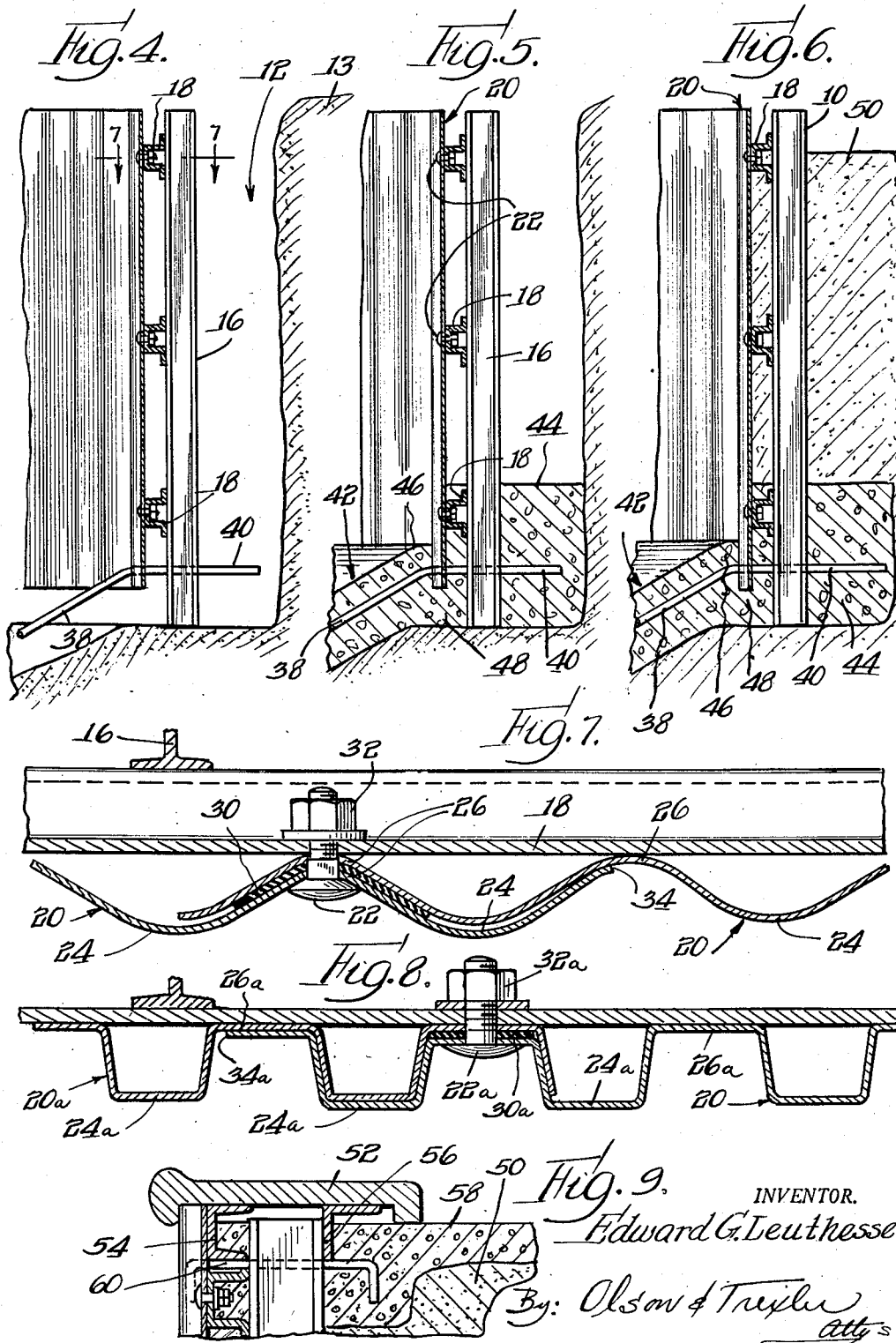
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SWIMMING POOL STRUCTURE

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Application March 1, 1956, Serial No. 568,723

14 Claims. (Cl. 72-13)

The present invention relates to a novel pool structure, and more particularly to a novel structure especially suitable for use as an outdoor swimming pool.

Outdoor swimming pools having bottoms and walls constructed from concrete are subject to cracking or the like as a result of winter time freezes and therefore often require considerable expenditures of time and money for maintenance. All steel pool structures have been provided in order to obtain improved resistance to the effects of freezing, and in order to reduce the relatively high initial cost of an all steel pool, it has been suggested to construct a pool having a concrete bottom and steel side walls. Considerable difficulty has been encountered in sealing steel side walls to a concrete bottom and heretofore suggested procedures have been costly and have been incapable frequently of providing a substantially leak proof and enduring sealed connection between the side walls and concrete bottom. Pool structures having steel side walls and concrete bottoms usually should be kept full of water in order to take full advantage of the design by preventing frost from reaching and possibly injuring the concrete bottom, but this practice has heretofore required the use of relatively heavy and costly sheet steel side walls in order to withstand the forces created by ice formed on the water.

An important object of the present invention is to provide a novel pool structure having a concrete bottom and sheet material side walls, which structure may be more economically installed and maintained than somewhat similar heretofore proposed pool structures.

Another object of the present invention is to provide a novel pool structure wherein sheet material side walls are joined and sealed to a concrete bottom in a simple, economical and enduring manner so that substantial reductions in installation and maintenance costs may be effected.

A more specific object of the present invention is to provide a novel pool structure as set forth in the preceding paragraph wherein the side walls and concrete bottom are connected so as to prevent substantially any vertical or horizontal movement of the side walls with respect to the bottom as a result of ground or water pressures and of a difference in the coefficients of thermal expansion of the side walls and concrete bottom, whereby substantially to reduce any possibility of a break in the seal between the side walls and the concrete bottom.

A further object of the present invention is to provide a novel pool structure of the above described type wherein the bottom is formed so as to reduce any tendency of the pool structure to float when it is empty.

Still another object of the present invention is to provide a novel pool structure having a plurality of relatively light weight and economical sheet material side wall panels which, when joined together, provide a structure that can be stretched, racked or otherwise distorted to a relatively great degree in response to forces created, for example, by freezing of water within the pool or

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ground pressures, which structure is capable of returning to its normal condition without injury when the forces applied thereto return to their normal conditions.

Another object of the present invention is to provide a novel pool structure having sheet material side wall panels which may be easily assembled and sealed together in an enduring manner.

Still another object of the present invention is to provide a novel pool structure having relatively light weight sheet material side wall panels constructed so as to interlock with any ice formed on the water within the pool so as to resist undue lateral movement of the side walls in response to pressures provided by the ice.

Other objects and advantages of the present invention will become apparent from the following description and the accompanying drawings wherein:

Fig. 1 is a simplified sectional view showing a pool structure incorporating the features of the present invention installed within an excavation;

Fig. 2 is a side elevational view of a side wall frame structure for the pool;

Fig. 3 is an enlarged fragmentary perspective view partially broken away showing certain features of the pool structure in greater detail;

Fig. 4 is an enlarged fragmentary sectional view showing how the side wall frame and panels and bottom reinforcing rods are installed within an excavation prior to pouring of the concrete bottom;

Fig. 5 is similar to Fig. 4 but additionally showing the manner in which the concrete bottom is poured and joined to the side wall panels;

Fig. 6 is similar to Fig. 5 and further showing how the excavation is back filled along the outer surface of the side wall and over an outer marginal portion of the concrete bottom;

Fig. 7 is an enlarged fragmentary horizontal sectional view taken along line 7-7 in Fig. 4;

Fig. 8 is a sectional view similar to Fig. 7 but showing a modified form of the present invention; and

Fig. 9 is a fragmentary vertical sectional view showing one form of coping which may be applied to the upper edges of the pool side walls.

Referring now more specifically to the drawings wherein like parts are designated by the same numerals throughout the various figures, a pool structure 10 incorporating the features of the present invention is shown, which pool structure is adapted to be installed within a previously prepared excavation 12 in the ground 13. The pool comprises a side wall frame structure 14 having a plurality of spaced upstanding I-beams or posts 16 and a plurality of horizontal and vertically spaced frame members 18 extending between and welded, bolted or otherwise secured to the upstanding beams. During installation of the pool, the upstanding posts or beams are positioned so that their lower ends rest on the bottom of the excavation and so that they are spaced inwardly from the side wall of the excavation. Then after the horizontal frame members have been secured to the upstanding posts, the frame structure 14 is self supporting. In the embodiment illustrated, the frame structure is provided with four sides for a rectangular pool, but it is understood that the configuration of the pool and also the shape of the pool bottom may be modified as desired.

The side walls of the pool are provided by a plurality of sheet material panels 20 which are secured to the horizontal frame members 18 preferably by bolts 22 or the like. As shown best in Figs. 3 and 7 each of the side panels 20 is formed with vertically extending and alternate inwardly and outwardly projecting ribs or corrugations 24 and 26. By corrugating the side panels in this manner they are greatly strengthened so that they may

be formed from relatively light weight sheet steel, or they may be formed from other sheet materials such as aluminum, plastic, or fibre glass. Furthermore, this construction of the side panels facilitates rapid and accurate assembly of the panels since the panels may be easily positioned with respect to each other merely by placing them in overlapping relationship with marginal corrugations thereof in registration. In order to seal the joint between adjacent side panels, a strip 30 of rubber, plastic, or other suitable sealing material is placed between a pair of mating corrugations of the panels, which corrugations are then clamped together preferably by the bolts 22 and cooperating nut members 32 which also serve to secure the panels to the frame structure. As shown in Fig. 7, the sealing strip and bolts are preferably associated with a pair of mating outwardly projecting ribs or corrugations 26 of adjacent panels so that the heads of the bolts are recessed between inwardly projecting ribs or corrugations 24. It should also be noted that the adjacent side panels are overlapped so that at least one pair of inwardly projecting ribs or corrugations 24 is disposed in mating relationship as well as one pair of outwardly projecting ribs and so that a free vertical edge 34 of the panel marginal portion disposed inwardly from the overlapping panel marginal portion is located in the depression between adjacent inwardly extending ribs and abuts the outer panel. Thus, the edge 34 is located so as substantially to eliminate any possibility of a swimmer being snagged thereby.

Each of the side panels 20 extends vertically for substantially the full depth of the pool at its particular location and has its lower marginal edge spaced above the bottom of the excavation or in other words above the lower end of an adjacent upstanding beam or post 16. It should be particularly noted that lower marginal portions of each of the side wall panels are provided with horizontally spaced apertures 36 therethrough for the purpose set forth below. After the side panels have been mounted on the frame structure, the pool is provided with a grid of reinforcing rods 38 along the bottom thereof, each of which rods has an end portion 40 extending through an aperture 36 in a side panel and substantially outwardly of the associated side panel. After the reinforcing rods have been assembled, a concrete bottom 42 for the pool is poured onto the bottom of the excavation so that the rods 38 are embedded in and reinforce the concrete bottom. It should be particularly noted that, as shown best in Figs. 5 and 6, the concrete bottom is provided with an outer marginal portion 44 disposed outwardly of and against the outer surfaces of the side wall panels. Furthermore, inner marginal portions 46 of the bottom are sufficiently thick so that they extend above the apertures in the side panels and against the inner surfaces of the side panels, and the inner and outer marginal portions of the concrete bottom are integrally joined by portion 48 which extends beneath the lower edges of the side panels. It should be appreciated that the inner and outer marginal portions of the concrete bottom are tied together by the reinforcing rods 38 and extensions 40 thereof as well as by the integral connecting portion 48 so as to restrain any tendency of the bottom portions 46 and 44 to pull away from the inner and outer surfaces of the side panels and break the seal which is inherently formed when the concrete bottom is poured. Preferably, the outer marginal bottom portion 44 is substantially thicker than the inner marginal portion, as shown, so as further to resist any tendency of this portion to break away from the side panels.

It is also important to note that the reinforcing rods fit loosely within the panel apertures and are sealed tightly therein by concrete which enters the apertures when the bottom is poured. Thus, the rods effectively interlock the side panels with the concrete bottom so as positively to prevent any vertical relative movement of the side panels with respect to the bottom which might break the seal.

Furthermore, the ribs or corrugations of the side panels provide vertically extending and laterally projecting elements which interlock with the concrete bottom to restrain any horizontal movement of the side panels with respect to the concrete bottom which might break the seal. These ribs or corrugations also serve to interlock with any ice which may be formed on the water in the pool to resist lateral movement of the side panels as a result of pressures provided by the ice.

When the pool structure described above is completed, the excavation is back filled around the side walls and above the bottom portion 44 as indicated at 50 in Figs. 1 and 6. It should be noted that in addition to the functions described above, the outer marginal portion 44 of the bottom provides a substantial flange surrounding the pool structure and underlying the back fill and thereby serves to anchor the pool structure and restrain any tendency of the pool to float when it is empty.

The upper margin of the pool structure may be finished in any desired manner. For example, Fig. 9 shows how coping tiles 52 may be positioned over upper edges of the side walls and supported by horizontal members 54 and 56 secured to the side wall panels and the upstanding beams or posts. In addition, a concrete side walk 58 or the like is generally provided around the pool structure and locks the uprights or posts to form a concrete beam around the entire top edge of the pool. The walk 58 is interconnected with the pool frame by a plurality of inverted U-shaped reinforcing rods 60 embedded in the concrete at spaced intervals and hooked over certain of the horizontal frame members.

In Fig. 8 there is shown a slightly modified form of the present invention as indicated by the application of identical reference numerals with the suffix *a* added to corresponding elements. This embodiment differs only in that the corrugations or ribs 24a, 26a of the side panel sections are provided with substantially straight sides rather than being curved as are the corrugations shown in Fig. 7. This embodiment has an advantage in that opposite sides or legs of each corrugation are disposed more nearly perpendicularly to the plane of the side wall so as to provide for an even more positive interlock between the side panels and the concrete bottom or a sheet of ice formed on water in the pool structure.

While the preferred embodiments of the present invention have been shown and described herein it is obvious that many structural details may be changed without departing from the spirit and scope of the appended claims.

The invention is claimed as follows:

1. A swimming pool structure and the like comprising a concrete bottom, an upstanding vertically corrugated sheet material wall panel having a lower marginal portion thereof imbedded in the concrete bottom and inwardly of the outer peripheral margin of said concrete bottom which provides inner and outer integrally connected portions embracing, respectively, the inner and outer surfaces of the lower marginal portion of said wall panel, and reinforcing network means connected with the lower marginal portion of the concrete bottom for locking the panel against displacement relative to the concrete bottom.
2. A swimming pool structure as claimed in claim 1, wherein the network means projects through the lower marginal portion of the wall portion for additional embedment in the outer connected portion of the concrete bottom.
3. A swimming pool structure as claimed in claim 1, wherein there are provided spaced vertically extending post means connected to the wall panel with the lower portions thereof embedded in the outer connected portion of the concrete bottom.
4. A swimming pool structure as claimed in claim 1, wherein there are provided vertically spaced horizontally disposed connecting elements secured around the wall

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panel with at least the lower horizontal connecting elements embedded in the outer connected portion of the concrete bottom.

5. A swimming pool structure as claimed in claim 4, wherein there are provided spaced vertical post means with the lower portions thereof embedded in the outer connected portion of the concrete bottom and secured to at least the lowermost embedded horizontal connecting element.

6. A swimming pool structure as claimed in claim 1, wherein the vertically corrugated wall panel comprises a plurality of vertically corrugated wall sections having adjacent edges in mating lapped position, and wherein sealing means are provided between the mating and lapped portions of the wall sections.

7. A swimming pool structure as claimed in claim 1, wherein the lower marginal portion of the wall panel projects substantially in the plane of said wall panel into the concrete bottom between the inner and outer connected portions thereof and terminates above the bottom of the said concrete bottom.

8. A swimming pool structure and the like comprising a concrete bottom, an upstanding sheet material wall panel having a lower marginal portion thereof embedded in the concrete bottom and inwardly of the outer peripheral margin of said concrete bottom which provides inner and outer integrally connected portions embracing, respectively, the inner and outer surfaces of the lower marginal portion of said wall panel, and reinforcing network means connected with the lower marginal portion of said wall panel and projecting outwardly therebeyond and embedded in the inner and outer connected portion of the concrete bottom for locking the panel against displacement relative to the concrete bottom.

9. A swimming pool structure as claimed in claim 8, wherein there are provided vertically extending spaced post means connected to said wall panel and having lower portions thereof embedded in the concrete bottom.

10. A swimming pool structure as claimed in claim 8, wherein there are provided substantially horizontally disposed connecting elements extending around the wall panel and secured thereto and to said post means and being also embedded in the concrete bottom.

11. A swimming pool structure as claimed in claim 8, wherein the wall panel comprises a vertically corrugated

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sheet having the corrugations along the lower marginal portion thereof embedded in the concrete bottom.

12. A swimming pool structure as claimed in claim 11, wherein the reinforcing network means project through the lower corrugated marginal portion of the wall panel and embedded in the outer connected portion of the concrete bottom.

13. A swimming pool structure and the like comprising a plurality of upstanding post means, a plurality of substantially horizontally extending frame means secured to said post means, a sheet material substantially vertical wall panel connected to said frame means with the lower marginal portion thereof disposed above the lower ends of said post means and below the lowermost frame means, a poured concrete bottom disposed below the lower edge of said wall panel and having inner and outer portions embracing the inner and outer surfaces of said wall panel and the adjacent frame means and post means for effectively interlocking the same with the concrete bottom, the lower marginal portions of said wall panel being provided with apertures, and reinforcing rod-like members embedded in the concrete bottom and projecting outwardly of the wall panel through the said apertures for embedment in the outer marginal portion of the concrete bottom.

14. A swimming pool structure as claimed in claim 13, wherein the wall panel comprises vertically corrugated sections with adjacent vertical edges in lapped and sealed relationship and with the lower corrugated margins embedded in the concrete bottom between the inner and outer connected portions thereof.

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