

Aug. 27, 1946.

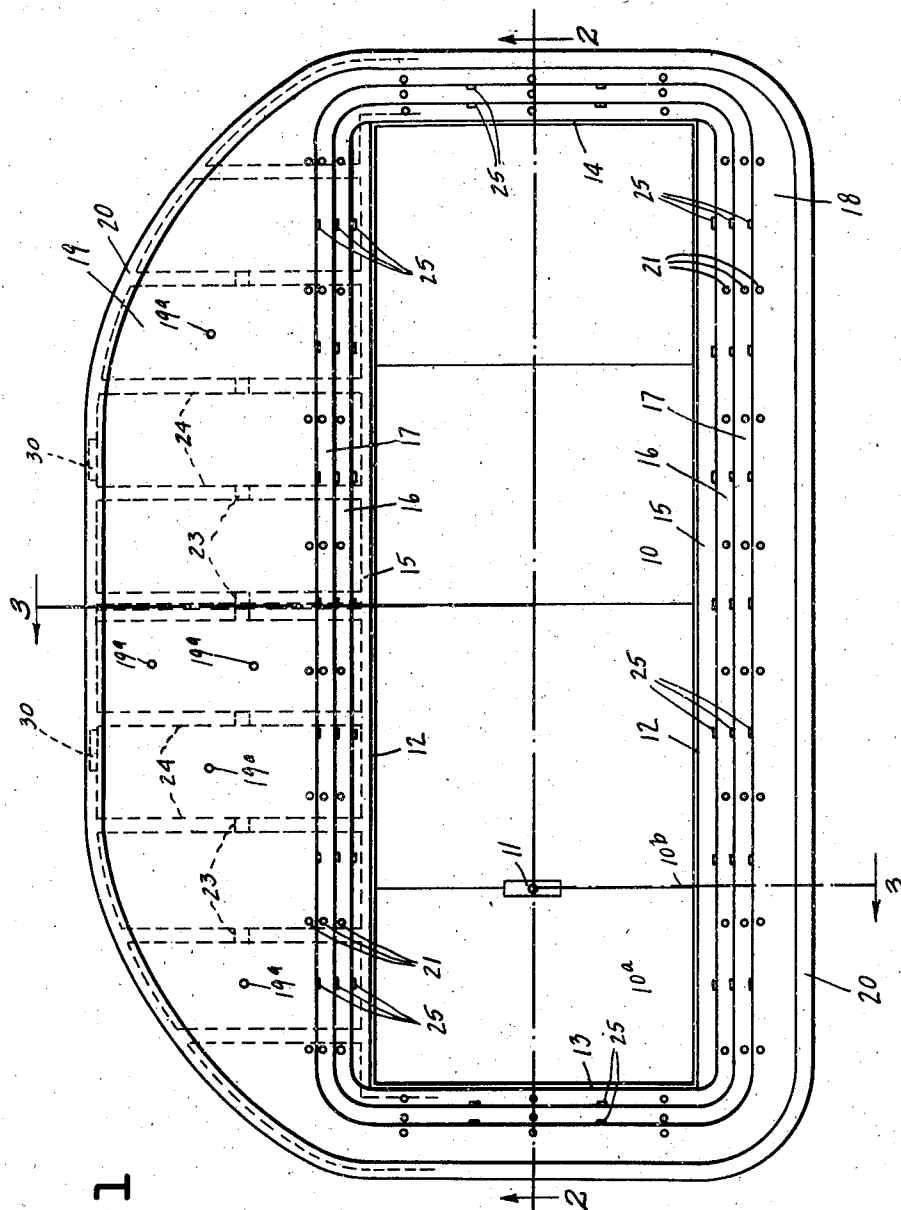
S. E. TEST

2,406,413

TERRACED COMBINATION POOL AND RESERVOIR

Filed Nov. 29, 1941

2 Sheets-Sheet 1



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FIG. 2

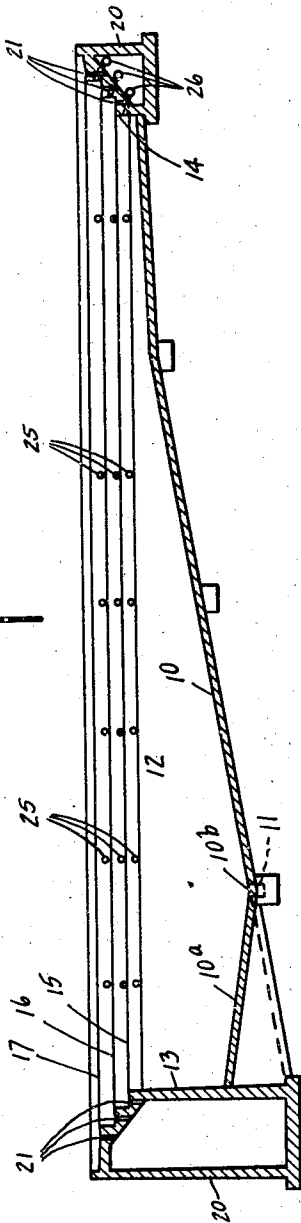


FIG. 3

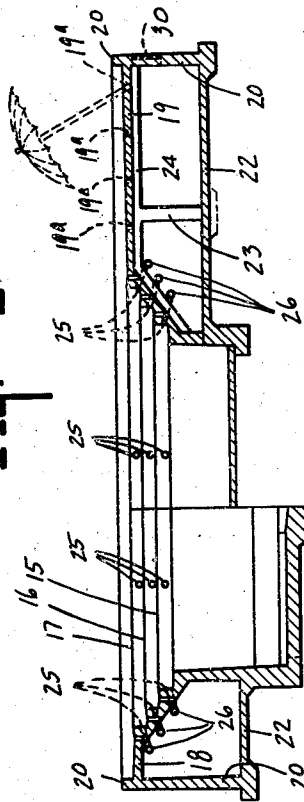


FIG. 5

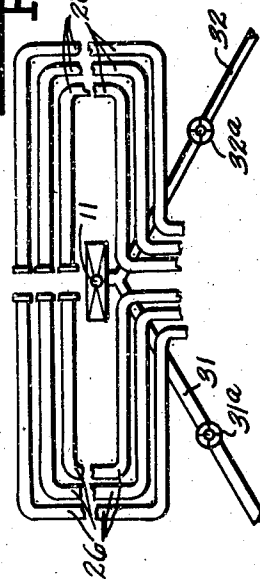
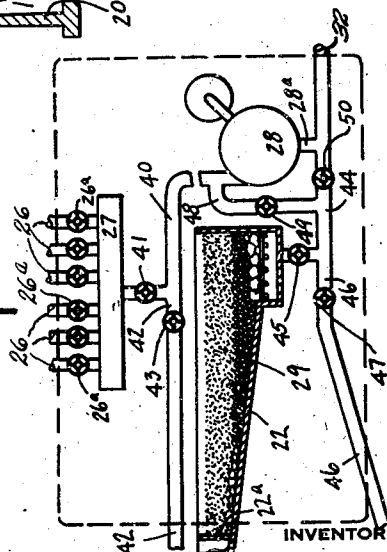


FIG. 4



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TERRACED COMBINATION POOL AND RESERVOIR

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9 Claims. (Cl. 210-11)

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This invention relates to a swimming pool and like structure.

One chief object of this invention is to provide a pool structure of the water cycling type with all of its attendant advantages.

Another chief object of this invention is to provide a pool structure of the conservation type as will appear more fully hereinafter.

A further chief object of this invention is to provide a pool structure capable of having a plurality of water levels therein and associated ledges or terraces as hereinafter described.

A still further chief object of this invention is to provide a pool structure which is naturally self-cleaning, regardless of wind direction and in which the water is solar heated.

Another chief object of this invention is to provide a pool structure wherein chemical addition to the residual water can be made and other than in the pool proper.

A still further chief object of this invention is to provide a "beach" representation as a unitary part of the pool structure.

The chief feature of the invention consists in forming a pool structure wherein each of the aforesaid objects is accomplished, as well as others as set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

In the drawings,

Fig. 1 is a top plan view of a pool structure embodying the invention.

Fig. 2 is a longitudinal central sectional view through the same and is taken on line 2-2 of Fig. 1 and in the direction of the arrows.

Fig. 3 is a broken transverse sectional view through the structure and is taken on line 3-3 of Fig. 1 and in the direction of the arrows.

Fig. 4 is a diagrammatic elevational view of a portion of the water cycling, filtering and draining system, the filter being shown in transverse vertical section.

Fig. 5 is a diagrammatic plan view of the pool supply conduits and the pool bottom drain lines.

In Figs. 1 to 3 of the drawings, the basic features of the invention are illustrated. In said figures, 10 indicates the long sloping bottom of the pool proper and 10a a shorter oppositely inclined extension thereof both draining to the junction line 10b and herein centrally thereof is the main drain 11 of the pool proper. Two opposite side walls 12 and two end walls 13 and 14 complete the tank for low level purposes. Each of the sides

is provided with a terrace 15 about eighteen inches wide.

Thereabove and at an elevation of above twelve inches is a peripheral terrace 16. Thereabove and at a similar distance is a similar terrace 17. Thereabove and at a similar distance is another terrace. The latter terrace is indicated generally by numeral 18 and same is preferably extended at one side as at 19 and all may be defined by a side wall 20, if desired.

The portion 19 constitutes a platform or "beach" equivalent and may receive beach chairs, tables, umbrellas and the like. For the latter purpose, tapered sockets 19a of "draining" character may be provided and these have different inclinations relative to the plane of beach 19 so the beach umbrellas can be mounted at different angles.

Preferably these sockets 19a extend through the portion 19 so that water collecting therein will drain therefrom. This prevents freezing of water and the possibility of cracking the concrete of which material the pool structure is constructed.

Each terrace includes near its pool edge a spaced series of drain openings 21 which may be in the form of pipes set in the concrete in leak-proof arrangement and which project some distance below the bottom or under surface of that terrace. Plugs of suitable character are provided for all drains, although normally the drains 21 of terrace 18 will be open at all times. Whenever high water level or deep pool use is desired, all lower terrace drains 21 are closed. When shallow pool or low level use is desired, all terrace drains 21 are open. It is noted that, as illustrated herein, side ledges or terraces 15 contain no drains.

The wall 20 is extended downwardly and in most places to the level of the pool bottom or therebeneath. The space between this wall 20 and the pool proper is bridged by a floor 22 which slopes from end 14 toward end 13, as shown in Figs. 2 and 3. The terrace or "beach" 19 is supported by columns 23 and beam formations 24, see right-hand portion of Fig. 3.

The resulting arrangement is a covered reservoir or storage chamber into which all of drains 21, if not plugged, drain the overflow, dirty water and the like. As shown in Figs. 2 and 3, each terrace slightly pitches or inclines from opposite sides toward the drain openings therein. The capacity of this reservoir preferably is equal to or greater than that of the pool when full.

Whenever the pool is filled, wind blowing from

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any direction will blow the sun warmed surface water including surface scum, etc., over the terrace edge at the pool level and thus the warm and dirty surface water will flow from the pool to the reservoir.

Water is supplied to the pool by laterally directed outlets 25 which communicate with lateral supply lines 26, see Figs. 2, 3 and 5, connected to a header structure 27, see Fig. 4, in turn connected to a large volume low head pump 28. These laterals are valve controlled so that make-up water may be supplied from any side of the pool. Hence, if the wind be blowing from one direction, the supply can be introduced from the side opposite where drainage is being effected. This not only accelerates drainage but emphasizes such wave action incident to the wind effect producing a highly pleasant appearance.

The resulting structure, floor 22, wall 20, cover 18-19 and pool walls, forms a reservoir about the pool and of a capacity at least equal to that of the pool when full. The drain plugs at the several terrace levels may be opened or closed to provide different pool levels. Thus, with side ledges 15, a low level pool use can be obtained. Since the pool is about seventy feet long, the high or shallow end will be only about eighteen inches deep, thus permitting young children to use that end with safety. When the pool is full the shallow end is about three and one-half feet deep. The terracing permits the omission of customary guard lines, life lines, ladders, etc. Inexperienced swimmers have readily available for support at least one terrace only a foot under water in all instances.

No matter what pool level is desired, any or all supply outlets 25 may discharge water to the pool. Low level pool operation is especially convenient for shallow pool use by children.

The reservoir permits constant cycling of the water from the pool by way of the drains to the reservoir and from the reservoir to the outlets 25. The warm surface water can thus be displaced by using colder water and as the same is displaced, it discharges to the reservoir for clarification and sterilization. This continuous circulation of water and exposure of new water films to the sunlight helps to keep the water properly disinfected without requiring the addition of large quantities of disinfectant, such as chlorine, which is especially irritant to the eyes and mucous membranes.

It has been ascertained by actual test for private family use (and that of guests) of the pool, no disinfectant, other than copper sulphate for fungus growth destruction, has been required during a summer season and only evaporation make-up addition water is required.

The inlet 28a to the pump 28 is at the lowest part of reservoir. The latter preferably includes a sand filter arrangement 29. Since the water always present in the reservoir is in excess of that required to change from low to high level it is apparent that the reservoir serves as a catch and settling basin. Since the floor is inclined as shown, it can be readily cleaned mechanically or by hose whenever desired. For such purpose, sealed access doors 30 may be provided in wall 20. Such cleaning does not interfere with pool use.

The main drain 11 has two branches 31 and 32 each controlled by a valve. Branch 31 is the main waste line. When opened, all the pool water will waste to a sewer, ravine, etc. Branch 32 is arranged to discharge to the reservoir with or

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without the assistance of a pump and the piping may be provided and suitably valve controlled so that the pump 28 would discharge the low level pool contents to the reservoir.

When substantially all the pool contents are transferred to the reservoir, the pool can be cleaned, scrubbed, washed and rinsed, the waste, etc., passing from the system by way of branch 31. Following such cleaning, pump 28 draws the reservoir water through the filter and supplies clean water to the pool.

In such sections where there is a limited water supply it is not only uneconomical but sometimes physically impossible to obtain very quickly sufficient water for pool replacement purposes, if all were wasted for pool cleaning. The present invention, therefore, provides for the conservation of the pool water incident to pool cleaning.

Another instance of value is where there is available only a very small but steady water supply. In such instances, the new water may be accumulated in the reservoir against contingent water loss incident to evaporation, pool use and the like.

The reservoir is of value in that chemicals for water purification can be added to the water in the reservoir and this chemically treated water supplied to the pool without danger of pool discoloration. Copper sulphate, alum and like chemicals may be added to the water for treatment thereof.

From the foregoing, it is quite obvious that the terrace formation eliminates the requirement for ladders, which if of iron, would cause rust discoloration of the pool. The terrace formation, also, when full or high level tank use is desired gives the pool the appearance of a pool greatly larger than the same actually is yet the additional water content required for such visual effect is negligible. The terracing, also, in effect, is a continuous ladder about the pool, all without affecting use of the pool or detracting from its aesthetic appearance, such terracing, in fact increasing both. Such terracing, also for pool level change facilitates same, because water can be rapidly drained from the pool for level lowering and rapidly added for level raising.

The type of construction employed is preferably reinforced concrete. It is monolithic in construction relative to the reservoir. It may, if desired, be formed in two pieces, the deep end and the shallow end, and these ends joined by expansion joints of leakproof character such as a copper sheet V-shaped in cross-section and seated in mastic and with the sheet ends seated in adjacent concrete sections.

Such construction provides a much stronger structure than is customary for pools and same is more resistant to cracking due to weight, freezing, thawing or the like. Also, all operative controls except the drains are localized at the deep end or adjacent thereto. All piping and plumbing is concealed by being included within the reservoir and is, of course, protected thereby.

Reference is had to Figs. 4 and 5 wherein there is diagrammatically illustrated the piping arrangement which may be employed. In said figure, the previous numerals are utilized to designate the same parts. Main drain 11 has branch 31 controlled by waste valve 31a. The other branch drain line 32 is controlled by valve 32a and connects to pump intake 28a.

Each lateral 26 connected to header 27 is controlled by a valve 26a. The header 27 connects to pump 28 by line 40 and a valve 41 is included

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therein adjacent the header. A branch 42 leads to the reservoir and is controlled by valve 43. A line 44 connects to the pump intake 28a and to the base of filter 29 and is controlled by valve 45. A branch 46 is controlled by valve 47. A bypass 48 connects lines 44 and 40, and includes valve 49 therein. A valve 50 in line 44 is also provided.

Normal operation is with valves 45 and 41 open and with valves 47, 49, 43, 31a and 32a closed. This insures filtered water circulation for the pool overflows discharge to the reservoir and filter. The selected valves 26a are also open. Pump 28 then draws filtered water through lines 46—44 and 28a and supplies same by lines 40—42 to laterals 26 and thence to the pool at 25. When all water is to be wasted and by gravity flow, valves 47 and 31a are opened. When it is required to quickly empty the pool for emergency purposes and the water is not to be wasted, valve 43 is opened as well as valve 32a and valves 49, 45, 47 and 41 are closed. The pump 28 then draws pool water from drain 11 and discharges said water into the reservoir by line 42.

In normal pool use, the filter requires washing at infrequent intervals. To accomplish same, the pump 28 draws water by way of line 32 and drain 11 from the pool and discharges through bypass 48 to the low end of filter 29. This reverse flow of water washes the filter and the debris collects adjacent partition 22a and on the reservoir floor from which it may later be removed. In this arrangement, valves 31a, 41, 43, 47 and 50 are closed and valves 45, 49 and 32a are opened.

All of the aforesaid valves, header, pumps, motor M, etc., are included in a pump house that may be included in the combination reservoir and pool, or in a house that is adjacent thereto or abuts the same as desired. The first mentioned is preferred.

Illumination for the reservoir may be provided and carried by the ceiling thereof (the underface of portions 18 and 19). Same is not illustrated herein.

In localities where prolonged freezing weather is not encountered, the water can be stored in the reservoir and held therein for use as desired. Also, for short freezes, the pool level can be lowered and ice permitted to form in the pool for skating purposes, all without danger of pool failure, because while the ice may form to a sufficient depth in the surface the remainder in the pool will not freeze solid.

Other advantages and features mentioned herein, while not particularly stressed, are comprehended, fully within this disclosure.

While the embodiment selected for illustration has been fully illustrated and described in great detail, same is to be considered by way of example only, since many modifications thereof, including those mentioned herein will readily suggest themselves to persons skilled in this art.

The invention claimed is:

1. A combination pool and reservoir structure including an elongated pool, a reservoir in juxtaposition thereto, the major portion of the reservoir lying to the outside of the pool, a common wall between the reservoir and the pool, a cover for the reservoir, said cover comprising a lateral continuation of the adjacent upper edge of the pool common sidewall, the reservoir peripherally enveloping the pool, the pool defining peripheral wall arrangement forming the inner wall of the reservoir, the pool proper including successively

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superposed terracing arrangements extending outwardly and upwardly from the top of the pool walls for pool enlargement only at the upper periphery of the pool proper.

2. A combination pool and reservoir structure including an elongated pool, a reservoir in juxtaposition thereto, the major portion of the reservoir lying to the outside of the pool, a common wall between the reservoir and the pool, a cover for the reservoir, said cover comprising a lateral continuation of the adjacent upper edge of the pool common sidewall, the reservoir peripherally enveloping the pool, the pool defining peripheral wall arrangement forming the inner wall of the reservoir, the pool proper including successively superposed terracing arrangements extending outwardly and upwardly from the top of the pool walls for pool enlargement only at the upper periphery of the pool proper, the uppermost terracing arrangement forming said cover for the reservoir.

3. A combination pool and reservoir structure including an elongated pool, a reservoir in juxtaposition thereto, the major portion of the reservoir lying to the outside of the pool, a common wall between the reservoir and the pool, a cover for the reservoir, said cover comprising a lateral continuation of the adjacent upper edge of the pool common sidewall, the reservoir peripherally enveloping the pool, the pool defining peripheral wall arrangement forming the inner wall of the reservoir, the pool proper including successively superposed terracing arrangements extending outwardly and upwardly from the top of the pool walls for pool enlargement only at the upper periphery of the pool proper, and drain arrangements for certain of the terracing arrangements and discharging directly to the reservoir.

4. A combination pool and reservoir including a pool of elongated character and having a bottom inclined from one end toward the other, a drain at the low end of the aforesaid bottom, a closed reservoir about the pool and having a common wall with said pool and of a capacity at least equal to pool capacity, said reservoir having a bottom inclined in the same direction as the pool bottom, drain connections from the upper level of said pool to said reservoir, and means for supplying reservoir fluid from the low end thereof to the pool, the said means and drain connections with said reservoir forming a closed cycle communication for the pool.

5. A combination pool and reservoir including a pool of elongated character and having a bottom inclined from one end toward the other, a drain at the low end of the aforesaid bottom, a closed reservoir about the pool and having a common wall with said pool and of a capacity at least equal to pool capacity, said reservoir having a bottom inclined in the same direction as the pool bottom, drain communications from the upper level of said pool to said reservoir, and means for supplying reservoir fluid from the low end of the reservoir to the pool, and about the periphery thereof at the upper level, the said means and drain connections with said reservoir forming a closed cycle communication for the pool.

6. A combination pool and reservoir including a pool of elongated character and having a bottom inclined from one end toward the other, a drain at the low end of the aforesaid bottom, a closed reservoir about the pool and having a common wall with said pool and of a capacity at least equal to pool capacity, said reservoir

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having a bottom inclined in the same direction as the pool bottom, drain connections from the upper level of said pool to said reservoir, and means for supplying reservoir fluid from the low end thereof to the pool, the said means and drain connections with said reservoir forming a closed cycle communication for the pool, the pool being of successively superposed terraced type near its uppermost levels, the uppermost terrace being extended to form a cover for the reservoir.

7. A combination pool and reservoir including a pool of elongated character and having a bottom inclined from one end toward the other, a drain at the low end of the aforesaid bottom, a reservoir about the pool and arranged for closed cycle communication therewith and having a common wall with said pool, said reservoir having a bottom inclined in the same direction as the pool bottom, drain connections from the upper level of said pool to said reservoir, and means for supplying reservoir fluid from the low end of the reservoir to the pool, the pool being of successively superposed terraced type near its uppermost portions, the uppermost terrace being extended to form a cover for the reservoir, the water supply and drain connections being included in a plurality of said terracing arrangements, each terrace including a spaced series of water supplies and drains, the drains and water supplies being alternated relative to each other in the same terrace.

8. A pool for swimming and like purposes in-

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cluding an elongated pool having side and end walls and a bottom, the bottom draining by gravity, successively superposed terraces extending upwardly and outwardly near the top of at least a plurality of said walls for enlargement of the pool only at the upper periphery, a plurality of closable drains at different levels and in the terraces, and a plurality of water supplies to the pool at the same terraces for selectively supplying water to the pool at different levels and in accordance with selective drain overflow drainage determination for pool surface cleansing at different pool levels.

9. A combination pool, reservoir and filter structure including a pool, a closed reservoir at least coextensive with the pool and beside same, said reservoir having a side wall common to the pool, a floor and a cover, an open filter within the reservoir and resting upon the floor of the reservoir, a sump to which the filter drains, the reservoir draining to and through the filter to the sump, the reservoir and pool having substantially equal volumetric capacities, overflow drains at the upper portion of the pool and having free discharge to the upper portion of the reservoir, and water circulating means connected for pumping water from said sump and to the pool and from the pool to said reservoir, the reservoir cover comprising a pool terrace and covering the open filter.

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