United States Patent

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[54] TRUSS BEAM SWIMMING POOL

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[52] **U.S. Cl.** **4/172.19**

[51] **Int. Cl.** **E04h 3/16,** E04h 3/18

[58] **Field of Search** 4/172.15, 172.19, 172; 52/169

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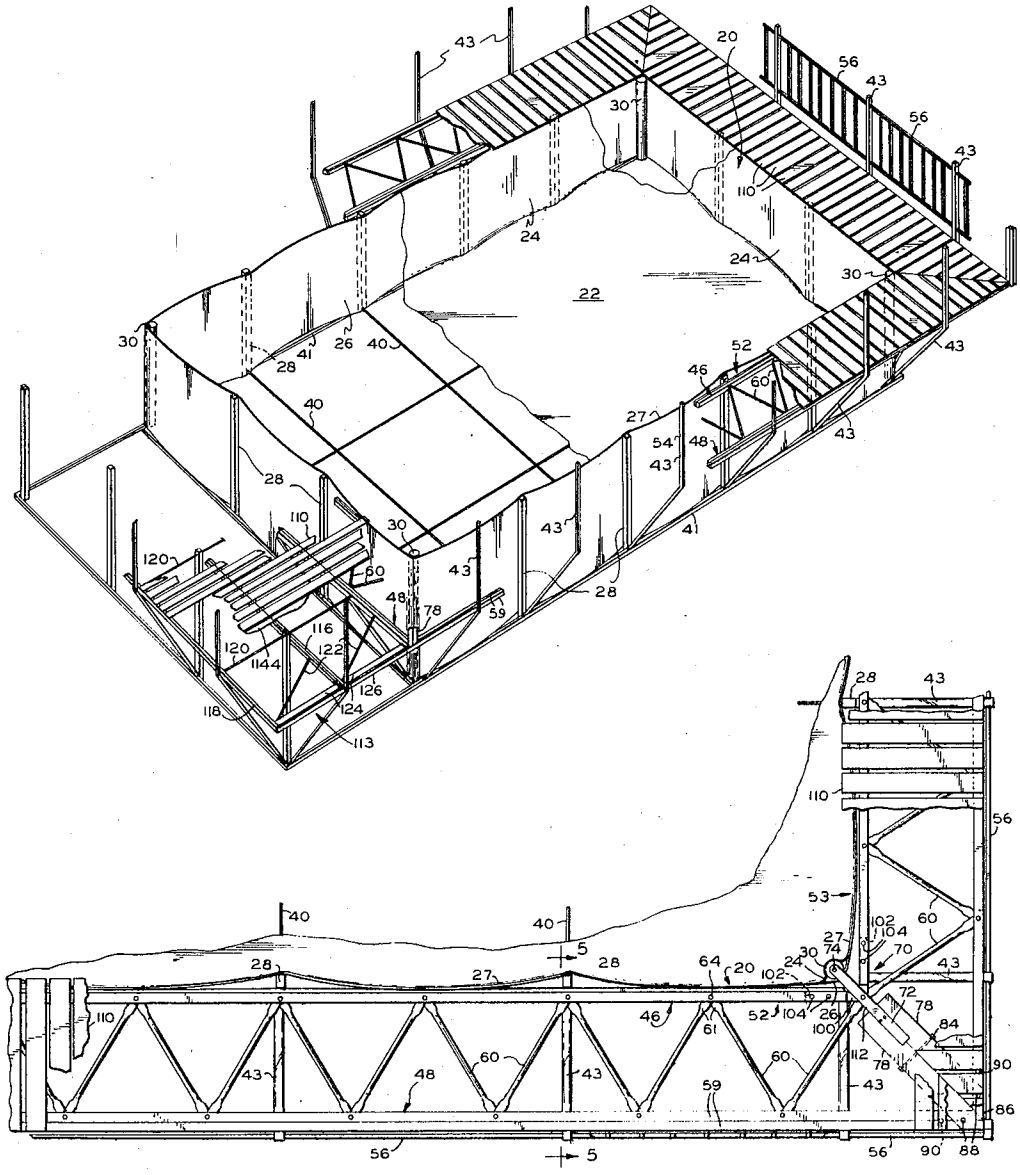
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[57] **ABSTRACT**

A truss-beam swimming pool includes slightly bowed truss beams 52 and 53 secured together at their ends by joints 70 and forming a self-restraining rectangle. The beams take lateral thrust from tops of posts 28, which support continuous sidewalls 26 which support sidewalls 24 of a plastic pool member 20. The joints 70 rest on corner posts 30 and tie together inner chords 46 and end webs 60 of the beam. The joints also support the inner ends of corner beam members 78. The beams are supported by posts 28, 30 and 43 and have duckboards nailed to the chords thereof to form a deck. The lower ends of the posts are secured together by tierods and by bottom frame members 41.

12 Claims, 6 Drawing Figures



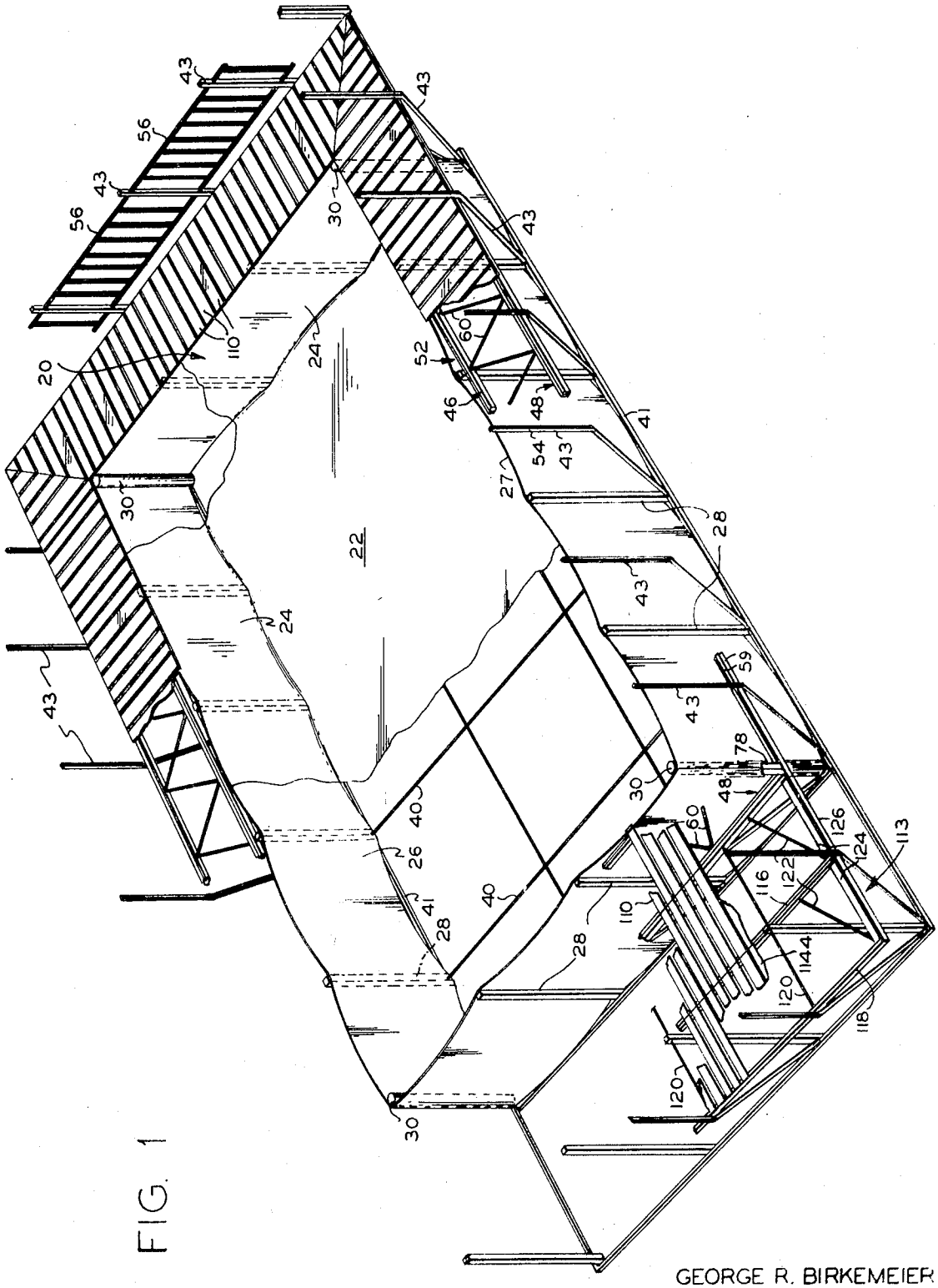


FIG. 1

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FIG. 2

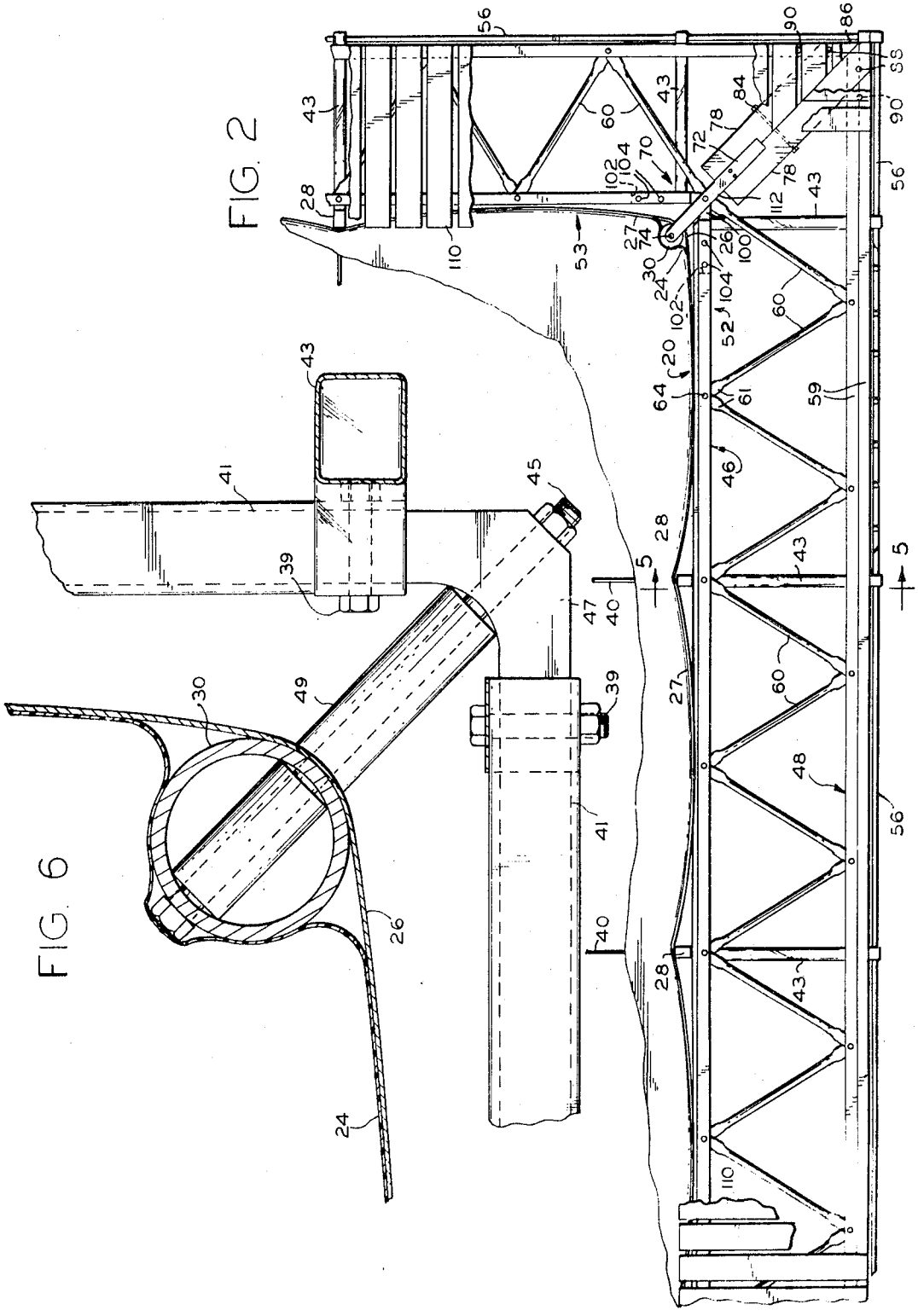


FIG. 6

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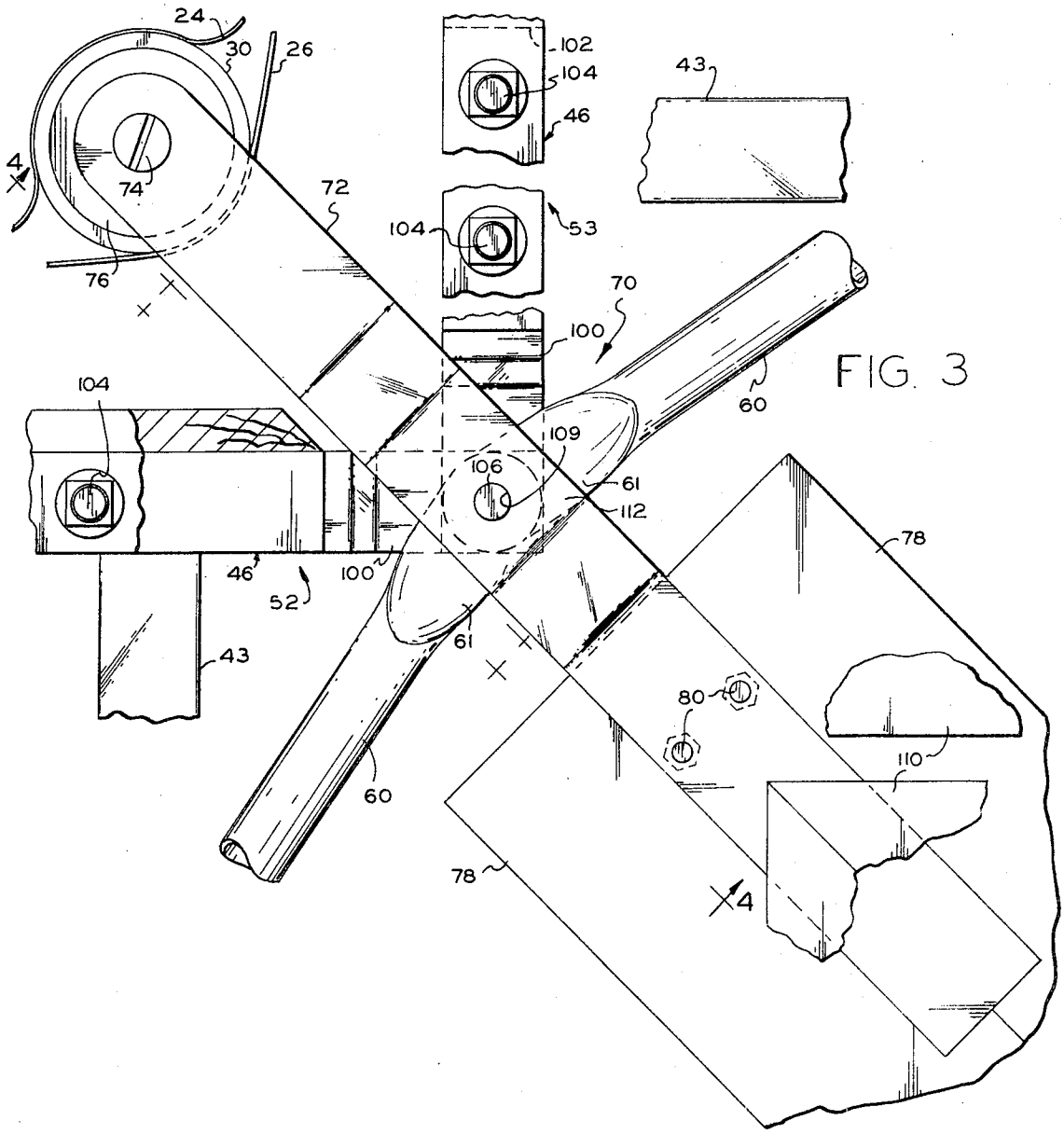
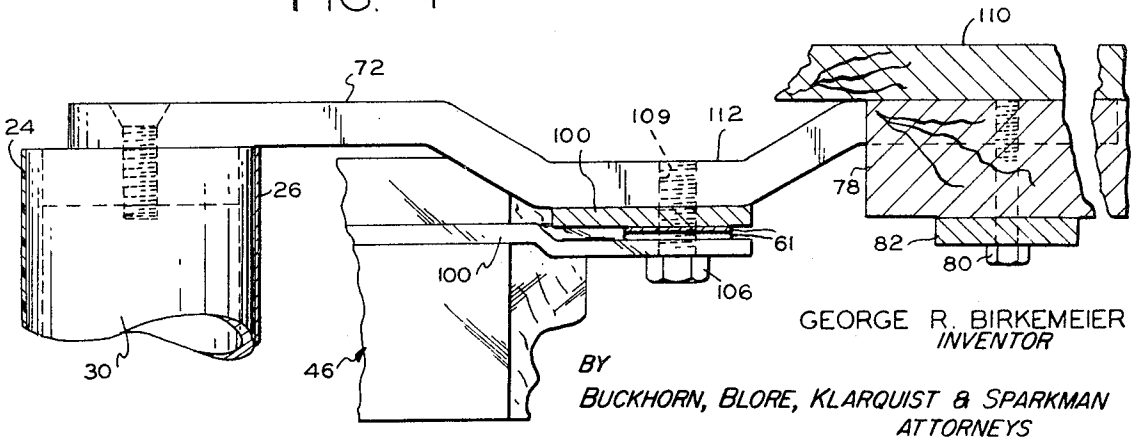


FIG. 3

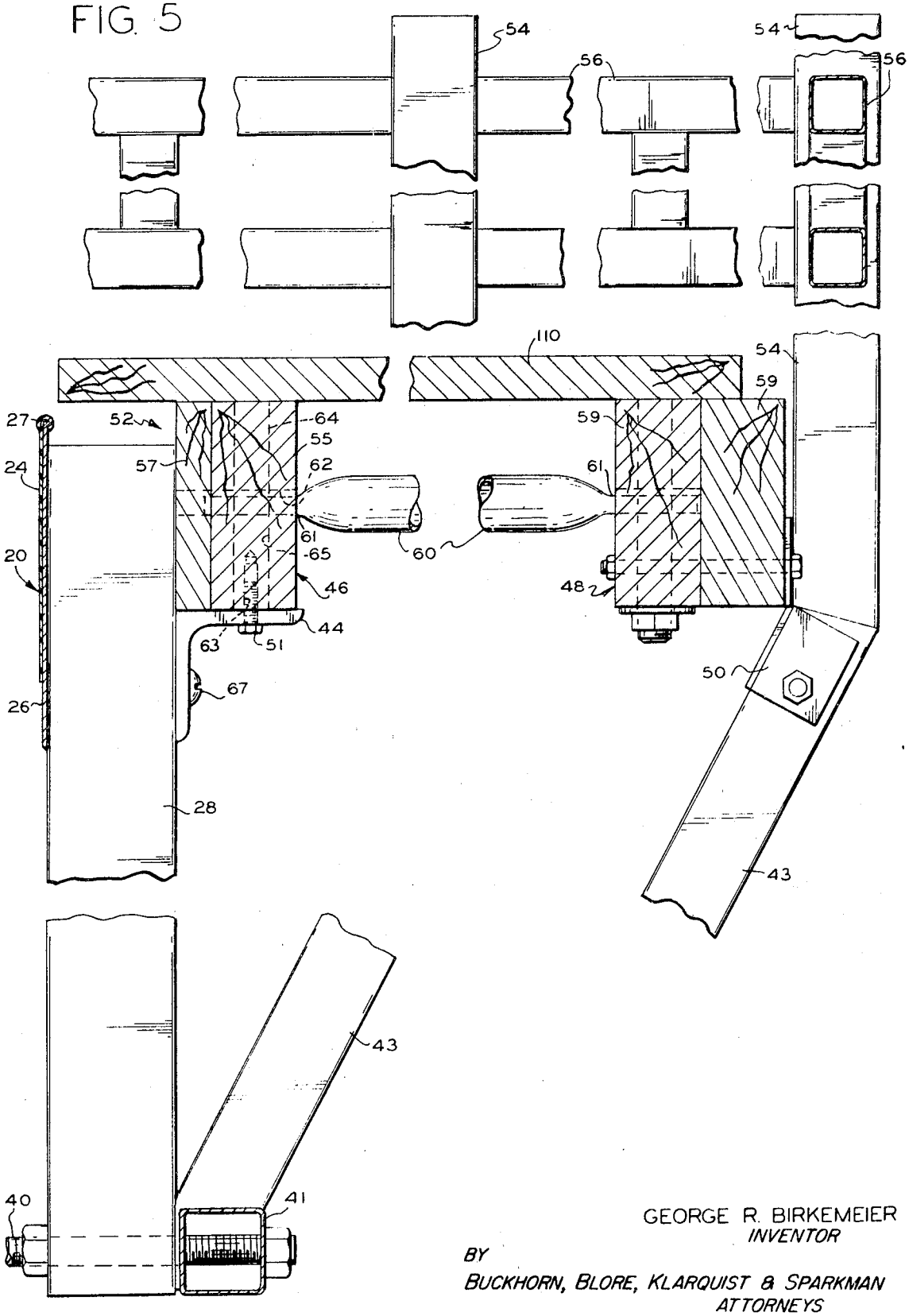
FIG. 4



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FIG. 5



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TRUSS BEAM SWIMMING POOL

DESCRIPTION

This invention relates to a truss-beam swimming pool, and more particularly to an improved rectangular swimming pool.

An object of the invention is to provide a truss-beam swimming pool.

Another object of the invention is to provide an improved rectangular swimming pool.

A further object of the invention is to provide a swimming pool in which truss beams secured together in a rectangle laterally support the upper periphery of a flexible pool construction.

Another object of the invention is to provide a swimming pool in which truss beams lying in a single plane and forming a rectangle peripherally support the sidewalls of a flexible pool construction and also form the stringers for a peripheral deck.

Another object of the invention is to provide a corner joint for truss beams to secure inner chords and end webs of the truss beams together, support the ends of the truss beam on a corner post, provide lateral support to the top of the corner post and support end pieces of the truss beams.

The invention provides a truss-beam swimming pool in which truss beams are secured together by end joints in a polygonal shape to form a self-restraining polygonal frame which provides lateral support to the upper ends of post means supporting the flexible sides of a pool member. Preferably the beams have wooden chords which may serve as stringers or joists for duckboards to form a deck therewith, and preferably the corner joints include a tie strap resting on and secured to the top of a corner post and secured to the inner ends of end-pieces of the beams and to straps secured to the ends of the inner chords and to end tension webs of the beams.

In the drawings:

FIG. 1 is a fragmentary, exploded, perspective view of a truss-beam swimming pool forming one embodiment of the invention;

FIG. 2 is an enlarged, fragmentary, top plan view of a truss beam forming a part of the swimming pool of FIG. 1;

FIG. 3 is an enlarged, fragmentary, top plan view of a portion of the swimming pool of FIG. 1;

FIG. 4 is a vertical sectional view taken along line 4—4 of FIG. 3;

FIG. 5 is a fragmentary, vertical sectional view taken along line 5—5 of FIG. 1; and

FIG. 6 is a fragmentary, horizontal sectional view of a lower corner portion of the pool of FIG. 1.

Referring now in detail to the drawings, there is shown therein a truss-beam swimming pool forming one embodiment of the invention including a rectangular, flexible plastic pool member 20 (FIG. 1) having a bottom 22 supported on the ground and having sidewalls 24 joined at their ends to each other and bearing against somewhat flexible sidewalls 26 formed from a continuous, rectangular, aluminum-backing sheet. Top bead 27 (FIGS. 1 and 5) of the sidewalls 24 fits over the top of the sidewalls 26. The sidewalls 26 bear against the inner sides of tubular, rectangular posts 28, and the vertical corner portions of the sidewalls 26 extend around and bear against the outwardly facing portions of tubular, cylindrical corner posts 30, and the corner portions of the sidewalls 24 bearing against the inwardly facing portions of the posts 30.

To support the posts 28 against the high lateral pressures applied thereto when the pool is filled with water, the bottom end of each post 28 is tied to the bottom end of the post 28 directly across the pool therefrom by a tie rod 40 secured to the bottom ends of these two posts, to tubular, bottom peripheral frame members 41 and to flattened bottom portions of tubular outer posts 43. The ends of the members 41 are rigidly secured to the bottom ends of the posts 28 and also are tied by bolts 43 and 45 and corner members 47 to the posts 30 to tie the bottom ends of the posts together. Tubular spacers 49 space the corner posts 30 inwardly from the corner members 47. The upper end portions of the posts 28 bear

against the inner edge of truss beams 42, 52 and 53, four truss beams being provided and being connected together at the ends thereof to form a rectangular continuous beam support for the upper ends of the posts, the truss beams 52 being at the sides and the truss beams 53 being at the ends of the pool 20. Angular brackets 44 secured by bolts 67 to the posts 28 are secured to wooden inner chords 46 of the truss beams by cap-screws 51 (FIG. 5) screwed into tapped bores 63 in pins 64 in the chords 46 to provide vertical support to the chords 46. Wooden outer chords 48 of the beams are supported vertically at the same level as the inner chords by the tubular outer posts or braces 43 bolted at their flattened lower end portions to the lower end portions of the posts 28 and the frame members 41. Clips 50 are bolted to the outer faces of the outer chords 48 to support the outer chords and are bolted to the posts 43. Upper post portions 54 of the posts 43 support a guard rail 56.

There are two slightly bowed or cambered side truss beams 52 and two end truss beams 53. The chords 46 of the side truss beams 52 are composed of a two-by-four 55 and an outer, reinforcing board 67, and each chord 48 of the truss beam 42 has two two-by-fours 59 nailed together. The chords 46 and 48 of the end truss beams 53 are only single two-by-fours, the beams 53 being shorter than the truss beams 52 and therefore receiving lighter loads than the longer beams 52. Each truss beam includes the inner chord 46, the outer chord 48 and tubular metal webs 60 having flattened end portions 61 extending into centrally located slots 62 in the chords and joined together by the pins 64, which fit closely in holes 65 in the chords and projecting through drive fit holes in the flattened end portions of the webs and preferably keyed to the webs by knurlings on the central portions of the pins. The outer chords 48 are longer than the inner chords 46 so that the inner chords almost form a rectangle and the outer chords form a larger rectangle. Alternate webs are tension members and the other webs are compression members, each end web being a tension member. The beams are adapted to take bending loads and take about one-third of the load from lateral pressure of the water in the plastic pool member 20, and each beam is formed to have a slight bow inwardly in its central portion of such a magnitude that the beam straightens when under the load of the water.

The beams 52 and 53 are tied together at their ends by corner joints 70 (FIG. 3) so that each beam also acts as a tension member. Each corner joint includes a rigid tie strap 72 having its inner end portion secured to the upper end of the adjacent corner post 30 by a capscrew 74 screwed into a tapped bore in a threaded plug 76 screwed into the upper end portion of the corner post 30. The outer end portion of each tie strap is dapped into inner end portions of corner beam members 78, which preferably are two-by-fours, and is secured to the corner board members by capscrews 80 (FIG. 4) extending through a bottom tie plate 82 and screwed into tapped bores in the tie strap. This, plus a bolt 84 (FIG. 2) extending through the members 78, secures the members 78 together. Dap joints 86 are formed by the outer end portions of the members 78 and the end portions of the outer chords 48, screws 88 securing the members 78 to the chords 48 and screws 90 preventing splitting of the end portions of the chords from the dapping.

Each corner joint 70 (FIGS. 2, 3 and 4) includes two straps 100 fitting in slots 102 in the adjacent end portions of the chords 46 of the beams 52 and 53 and secured thereto by bolts 104, and also includes the flattened end portions 61 of the end ones of the webs 60 of the beams. These end webs are tension members. A capscrew 106 extends through aligned holes in oppositely offset, outer end portions of the straps 100, and through the holes in the end portions 61 of the webs 60 and is screwed into a tapped bore 109 in an offset or depressed central portion 112 of the tie strap 72, the central portion 112 being depressed and the end portions of the straps 100 being oppositely offset so that the end webs 60, the inner chords 46 and the members 78 are not deflected laterally in the joint 70. Each joint 70 ties the adjacent beams 52 and 53 very strongly

together for tension, compression, bending and shear and also rigidly supports the upper end of each corner post **30**. The corner joints tie the beams **52** and **53** together for tension so that the four beams form a continuous or closed, boxlike frame with beamed sides to take the bending.

In addition to the beams **52** and **53** taking the entire lateral load from the upper ends of the posts **28** and the corner posts **30**, the chords **46** and **48** of the beams serve as stringers to support edge-grained duckboards or slats **110** nailed thereto in spaced-apart positions to permit easy draining. If desired, rectangular frames **113** like the beams **52** and **53** but including less webs may be bolted to one of the beams **43** and carry duckboards **114** to form a patio. Preferably each frame **113** is supported independently by posts. Each frame **113** includes an inner chord **116** and an outer chord **118** secured together by tubular webs **120** and **122**. The webs **120** have flattened end portions fitting into central slots in the chords and held therein by pins in positions perpendicular to the chords. The webs **122** are similarly secured but in angular positions and connected to the outer corners of the frames to provide diagonal bracing. Inner wooden end members **124**, which are preferably two-by-fours, are nailed between the chords and outer, capping, wooden end members **126**, which preferably are two-by-fours, are nailed to the ends of the chords.

The above-described truss-beam swimming pool is effectively maintained in its desired rectangular shape and the beams **52** and **53** are self-restraining and provide simple, strong, lightweight beaming which maintains the top of the pool in a substantially true rectangle and also provides a strong, self-draining deck structure. The pool can be easily assembled and disassembled and can be compactly packaged for shipping.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

I claim:

1. In a swimming pool construction,

at least three corner posts,

a plurality of intermediate posts between the corner posts,

pool means including an inner flexible pool member and an endless tension sheet forming outer sidewalls and bearing against the inside portion of the intermediate posts and extending around the outer portions of the corner posts,

tension means holding the bottom ends of the posts together,

at least three truss beams including inner chords and end webs,

a plurality of supports including the intermediate posts supporting the truss beams at the level of the upper portions of the sidewalls and engaging the upper outer portions of the intermediate posts,

and at least three corner joints joining the corner posts, the inner chords and the end webs,

each corner joint including a tie strap connected to the adjacent corner post and also including pin means connecting the strap, the end webs and the inner chords.

2. The swimming pool construction of claim **1** wherein the chords of each truss beam are of wood and the webs are of metal,

each corner joint also including straps connected to the ends of the inner chords and to the pin.

3. The swimming pool construction of claim **1** wherein the lower lateral support means includes tie rods connecting the bottom end portions of the post means at opposite sides of the pool means and peripheral tension means tying the bottom end portions of adjacent post means together.

4. The swimming pool construction of claim **1** wherein the leg means includes vertical inner members laterally supporting the sidewalls of the pool means and supporting inner chords of the truss beams and also includes outer members supporting outer chords of the truss beams.

5. The swimming pool construction of claim **2** wherein the beams include endpieces attached to the ends of the outer chords and to the tie straps.

6. The swimming pool construction of claim **2** wherein the inner chords have slots receiving the straps, the straps have oppositely offset end portions secured to the tie straps and bracketing the inner end portions of the end webs and the portions of the tie straps secured to the straps and webs are offset from the portions of the tie straps secured to the corner posts.

7. The swimming pool construction of claim **6** wherein the pin means of each joint comprises a capscrew extending through holes in the straps and webs and screwed into a tapped bore in the tie strap.

8. The swimming pool construction of claim **2** wherein the pin means of each joint comprises a capscrew extending through holes in the straps and webs and screwed into a tapped bore in the tie strap.

9. The swimming pool construction of claim **4** wherein the outer members are inclined and are secured to the bottom end portions of the inner members to form triangles with the inner members and the truss beams.

10. The swimming pool construction of claim **9** wherein the outer members have upper post portions positioned above the truss beams,

and rail means carried by the upper post portions.

11. The swimming pool construction of claim **10** including deck surface means supported by the truss beams.

12. The swimming pool construction of claim **11** wherein the chords of the truss beams are of wood and the deck surface means comprise wooden slats secured to the chords.

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