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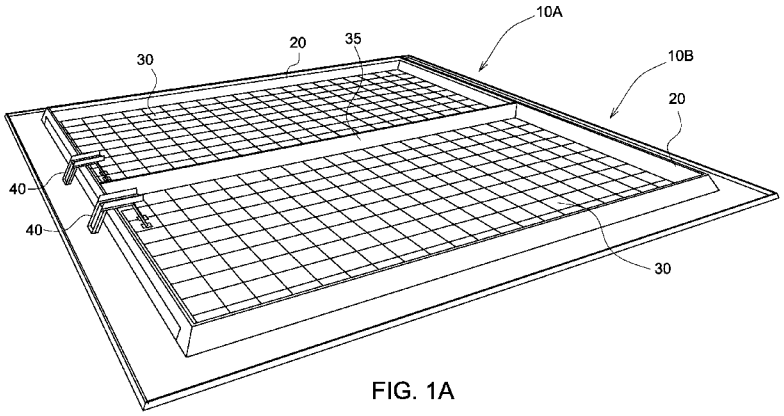

FIG. 1A

(57) Abstract: What is disclosed is a portable, modular, and dynamically sized and shaped, above-ground, industrial liquid-containment system. Typically, the system has an outer-containment perimeter and an inner-containment perimeter (a reservoir), thus providing two barriers for environmental protection. A reservoir is comprised of a plurality of substantially A-framed segments that are hinged at the top and allows for folding together when the center and bottom braces are removed. A key feature for the A-frame segments is in their lack of steel cladding on the water side of most A-frames segments. Instead, fabric and/or cargo netting is used because it reduces weight and grips the A-frame purlins as the weight of contained liquids exert stabilizing downward force on A-frames. In addition, a steel grid system can run along the reservoir floor to compensate for expansion forces due to both temperature and water-weight.

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MODULAR, DYNAMICALLY SIZED AND SHAPED, INDUSTRIAL-LIQUID CONTAINMENT SYSTEM AND METHODS OF USE

CROSS-REFERENCE TO RELATED APPLICATIONS

The present patent application is related to, and has common inventorship and ownership with, U.S. Patent Application No. 61/381,168, filed on September 9, 2010, for "Liquid Containment System", and hereby incorporates by reference U.S. Patent Application No. 61/381,168 in its entirety for all purposes.

The present patent application also claims the benefit of, and has common inventorship and ownership with, U.S. Patent Application No. 61/445,653, filed on February 23, 2011, for "Modular, Dynamically Sized and Shaped, Industrial-Liquid-Containment System and Methods of Use", and hereby incorporates by reference U.S. Patent Application No. 61/445,653 in its entirety for all purposes.

The present patent application also claims the benefit of, and has common inventorship and ownership with, U.S. Patent Application No. 61/569,070, filed on December 9, 2011, for "Modular, Dynamically Sized and Shaped, Industrial-Liquid-Containment System and Methods of Use", and hereby incorporates by reference U.S. Patent Application No. 61/569,070 in its entirety for all purposes.

The present patent application also claims the benefit of, and has common inventorship and ownership with, U.S. Patent Application No. 61/600,640, filed on February 18, 2012, for "Modular, Dynamically Sized and Shaped, Industrial-Liquid-Containment System and Methods of Use", and hereby incorporates by reference U.S. Patent Application No. 61/600,640 in its entirety for all purposes.

Further, the present patent application also claims the benefit of, and has common inventorship and ownership with, Patent Cooperation Treaty (PCT) Application No. PCT/US11/50834, filed on September 8, 2011, for "Modular, Dynamically Sized and Shaped, Industrial-Liquid-Containment System and Methods of Use", and hereby incorporates by reference PCT Application No. PCT/US11/50834 in its entirety for all purposes.

BACKGROUND

Liquid-containment systems are required in myriad industrial settings, particularly when there is a significant potential for the inadvertent and uncontrolled release of industrial waste to the environment. Typically, the currently available systems, such as Frac Tanks and in-ground pits, have proven to be overly difficult and time-consuming to erect, resulting in undesirable high costs and system unreliability.

Many industries, such as the oil & gas industry, require water storage facilities — both clean and potentially contaminated — with minimal impact on local resources. Such undesirable impacts include degradation of small watersheds and streams, particularly with industrial waste water. In addition, many surface owner requirements include multiple land uses, including oil and gas development, and need minimal ground disturbance and resultant ground reclamation. A system that successfully addresses these issues will lead to faster regulatory permitting, completion, and reclamation. Moreover, such an above-ground, modular solution can enhance post-production land use.

What is needed is an easily portable industrial liquid-containment system that can easily be modified in the field for specific applications.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1A depicts one embodiment of a simplified overview of a modular industrial-liquid-containment system, showing both two internal modular liquid-containment pools, each with expansion compensation grid systems installed on the pool floors, but not showing the pools' liquid-impermeable covering. In addition, embodiments of two equipment bridges are depicted straddling over the internal liquid-containment walls. Surrounding the entire internal liquid-containment pools is a secondary, backup liquid-containment system designed to capture any leakage from either of the two internal pools. The liquid-impermeable covering used for this backup containment system, which also underlies the two internal pools, is not shown for simplicity.

Figure 1B depicts one embodiment of a top view of the general layout of the two internal modular liquid-containment pools depicted in **Figure 1A**. This top view shows a plurality of modular pool-wall segments, as well as an internal grid-system layout.

Figures 2A-2C depict several embodiments of two adjacent, substantially A-frame shaped segments used in some embodiments of pool-containment walls. **Figure 2A** shows such segments without additional cladding or other material used to cover the frame.

However, **Figures 2B-2C** depict the same segments with various optional coverings; fabric sheets, cargo netting, and/or variable-sized welded wire mesh, respectively; that help stabilize the segments as liquid fills the pool (after the liquid-impermeable layer is applied), and the weight of the contained liquid provides downward stabilizing forces on the segments' purlins.

Figures 3A-3E depict one embodiment of various views of a modular industrial-liquid containment system being assembled. The assembly shows both two internal modular liquid-containment pool frameworks, each with expansion compensation grid systems installed on the pool floors, but not with the pools' liquid-impermeable covering installed. In addition, surrounding the entire internal liquid-containment pools is a secondary, backup liquid-containment system designed to capture any leakage from either of the two internal pools. The liquid-impermeable covering used for this backup containment system, which also underlies the two internal pools, is shown.

Figures 4A-4C depict three different embodiments of an equipment-support bridge used to straddle over the walls of an industrial-liquid-containment pool without touching the wall of the pool and while preventing support equipment, such as suction hoses/piping, from contacting the wall of the industrial-liquid-containment pool.

Figures 5A-5C depict one embodiment of the top views of corner structures used in the assembly of a segmented wall of a modular industrial-liquid-containment system. The structures include the use of specially angle-clipped, hinged A-frame segments and a ground-level ballast member to which the corner segments are coupled.

Figures 6A-6C depict one embodiment of more top views of corner structures used in the assembly of a segmented wall of a modular industrial-liquid-containment system, plus a top view of one embodiment of a ground-level set of pads, webs, and cross bars used to secure the plurality of wall segments for the industrial-liquid-containment pool(s) in place.

Figures 7A-7B depict other embodiments of corner base frame structures in support of a segmented industrial-liquid-containment wall.

Figures 8A-8C depict another embodiment of a specialized substantially A-frame-shaped, hinged segment that is angle clipped on one side to facilitate a corner installation for a perimeter boundary for an industrial-liquid-containment system.

Figures 9A-9I depict one embodiment of a substantially A-frame-shaped segment used in the perimeter boundary of a modular industrial-liquid-containment system. The segment is hinged at the top to facilitate easy collapsibility, storage, and transport. In addition, the figures depict a variation of in-field installation and mounting details, as well as

depict an embodiment of the purlins that are important to use on the liquid-containment side in conjunction with panels of fabric, pluralities of strapping, cargo netting, or variable-sized welded wire mesh in order to create a stabilizing ballast-type effect as the reservoir fills with liquid.

Figures 10A-10G depict one embodiment of the ground-foundation details for installing a plurality of modular, industrial-liquid-containment wall segments, with details including slide-bearing footing plans, various mounting/slide-support pad/bearing details, spreader-bar details, and various connection details that define the interface to the pool-based grid network system, which is designed to spread .

Figures 11A-11F depict one embodiment of the installation details of one embodiment of a grid network disposed under an industrial-liquid-containment reservoir, said grid network anchored at its edges to the perimeter-wall segments and designed to transfer expansion forces realized by the reservoir as liquid fills the reservoir and/or temperature changes. Included in these details are the hub-pad assemblies, which are key to allowing the intersecting plurality of lines of ties bars to move freely with respect to other intersecting tie-bar lines. Other details, such as tie-bar support pad placements are also shown.

Figures 12A-12B depict one embodiment of an end A-frame segment support pad.

Figures 13A-13B depict one embodiment of a center A-frame segment support pad.

Figures 14A-14B depict one embodiment of an end A-frame segment support pad for the exterior-wall side of an A-frame-shaped segment.

Figures 15A-15B depict another embodiment of an end A-frame segment support pad for the exterior-wall side of an A-frame-shaped segment.

Figures 16A-16B depict one embodiment of a slotted hub-support pad used in some grid networks in an industrial-liquid-containment pond.

Figures 17A-17B depict one embodiment of a tie-bar-support pad used in some grid networks in an industrial-liquid-containment pond.

Figure 18 depicts one embodiment of an alternate substantially A-frame segment, wherein the A-frame segment is comprised of two main components: a substantially A-framed top member and a bottom member configured to detachably couple with the top member to form a larger overall substantially A-framed segment. The top member can be used by itself to form part of a curb for an outer-perimeter boundary for a liquid-containment system, and is small enough such that a plurality (e.g., three) of such top members can be

storably fit inside of the bottom member. In addition, the bottom members can be used without the top member to help form a shorter perimeter segment for a modular liquid-containment reservoir, or to erect a portable dam for flood control. These bottom members are also adapted to be nestably stored upon each other.

Figures 19A-19C depict one embodiment of an alternate intra-reservoir grid network, wherein instead of a network of rigid metal bars/straps/cables that intersect at grid-hub assemblies, a network of intersecting long cables, anchored at each cable end to the perimeter-wall segments and designed to transfer expansion forces realized by the reservoir as liquid fills the reservoir and/or temperature changes.

DETAILED DESCRIPTION

I. Overview

The present inventive concept is generally directed to a portable, modular, and dynamically sized and shaped, above-ground, industrial liquid-containment system, which, for ease of reference, will be hereafter referred to as the "Quick-Pit System".

In a typical embodiment, the Quick-Pit System has an outer-containment perimeter and an inner-containment perimeter. The outer-containment perimeter is comprised of many removably coupled curb segments, each of which has a cross-section that has a substantially A-frame shape. The floor of the outer containment perimeter is continuously covered by liquid-impermeable sheeting; for example, HDPE liner systems. In some embodiments, the perimeter wall can be extended in height by installing curb-height extender segments on top of the ground-level curb segments, where the curb-height extender segments have a smaller angle than the ground-level curb segments. This outer perimeter containment system is described in great detail in Patent Cooperation Treaty (PCT) Application No. PCT/US11/50834, upon which the present patent application both claims the benefit of and incorporates by reference the entirety of.

The inner-containment perimeter is a liquid-containment pond or reservoir, sometimes referred to in the industry as a "swimming pool" in that it is designed to actually contain a substantial pool of water or other industrial liquid. A typical "swimming pool" is comprised of a plurality of substantially A-framed segments that are significantly taller than the outer-perimeter curb segments. In one embodiment, each A-frame is 7.5' wide, 9.5' deep, and 10' high, though the components can be scaled up or down to better suit a particular application. In a variation, a hinge at the top of an A-frame segment allows the frame to fold together when the center and bottom braces are removed. In other embodiments, the "A"-frame

segment wall frames are not hinged together and must be assembled together in the field. When the A-frame segment is in use, the center and bottom braces are held in place with pins. Once the frames are in compact/disassembled form, they can be easily transported and stored. Once assembled, the entire reservoir is continuously covered with liquid-impermeable sheeting; for example, HDPE liner systems.

In both the outer and inner perimeters, are embodiments of various specialized perimeter-corner designs. One corner design of particular significance depicts how two specially clipped segments come together and are anchored by a ground-level, T-shaped ballast member, wherein the ballast member can be filled with weighting material such as heavy metal, concrete, or even dirt. Other shapes of ballast members can also be used, such as a corner base frame and a ballast mid-wall member.

Another key point of novelty for the A-frame segments used for the "swimming pool" is in its lack of steel cladding up the water side of the A-frame, though in some variations, such rigid metal cladding can be used. Instead, proprietary fabric, plurality of straps, variable-sized welded wire mesh, and/or cargo netting is used (over which the liquid-impermeable sheeting is disposed). The fabric/straps/netting serves a dual purpose: It is not only light-weight, but it also grips the horizontal steel bars as the weight of the contained liquids exert downward force on the A-frame. As a result, the downward pressure of the contained liquid serves as ballast, holding down the A-frames.

In many embodiments, further holding the plurality of A-frame walls in place as more liquids are contained in the reservoir is a steel grid system/network running along the floor of the reservoir. The design of this system accommodates and spreads around expansion forces due to both temperature and water-weight. As the liquids push out against the reservoir walls, the grid system transfers tension to the adjacent wall. The tension causes the network of metal bars/rods/straps/strand tendons/cables/ties (in one embodiment, a plurality of 3/4" x 5" steel straps) to expand over the length and width of the pit. Although the expansion is minimal (typically 2" over 400'), the system allows the pit/swimming pool to expand and contract safely as it is emptied and filled, minimizing the chances of breaches into the environment. In addition, a plurality of specially designed "hub" members are installed at every point where grid strapping intersects each other, and allow for expansion by letting the perpendicular steel straps slide past each other with minimal or no friction. In a typical installation, the grid system is assembled using pins to connect grid bars/straps/cables with the hub assemblies. At the perimeter of the reservoir, grid bars connect to the bottom brace of an A-frame member with pins in the same manner in which they connect to the hubs.

In other embodiments, the grid network uses strapping in lieu of the metal grid rods in order to better compensate for stretching stresses felt as the liquid levels go up. The network of strapping can be comprised of many different materials to this end; for example, among the candidate materials that can be used are Zylon®, Dyneema®, Williams® strand cable, or a similar substitute strand cable. In some embodiments, epoxy is also used in conjunction with the strapping to enhance the structural characteristics.

In still more embodiments, a plurality of adjacent reservoirs can be set up wherein the grid work in some cases extends on both sides of a substantially A-framed segment that happens to form the boundary of two separate reservoirs.

However, it should be noted by those ordinarily skilled in the art that in some alternate embodiments, a reservoir boundary need not be defined by substantially A-framed segments to enjoy the benefits of the pool-floor grid network. Rather, the grid network can be coupled to the base of basically any modular industrial-liquid reservoir's elongated perimeter-boundary segments (e.g., rigid straight wall, rectangular box-shaped, etc.) for to aid in compensating for the forces associated with increased reservoir liquid levels and/or temperature.

In another embodiment, a utility platform, substantially A-framed and much larger than the A-frame segments the define the perimeter of the pool/pit, is erected over a point of the pool/pit perimeter in order to provide a path for running suction hoses and other equipment into the reservoir without such equipment laying on the A-framed perimeter, possibly causing a breach in the liquid-impermeable sheeting draped over the A-frame segments.

The Quick Pits System can be configured in the field to form industrial-liquid-containment ponds of varying shapes and sizes. In some embodiments, the capacity of the ponds range from 100,000 barrels to 1 million barrels. By being able to quickly and reliably assemble industrial-liquid-containment systems at user-defined sites, many of the typical costs and risks realized by operators of industrial sites that create waste water or other industrial liquids are minimized. By creating large modifiable containment ponds in the field at central locations, expenses associated with trucking, tank rentals, pumping, excavation, reclamation, and other equipment and operating costs are lowered and in some cases eliminated (for example, by having above-ground containment ponds, the need for permitting is eliminated in many jurisdictions. The Quick-Pits System can be readily adapted for use with frac fluids, fresh water, flow-back water, produced water, hydrocarbon liquids, mining

waste water, water and sewage treatment plants, agriculture waste ponds, and aqua-culture.

In a typical embodiment of the Quick-Pit System, the components employed use 40% less space than that required for frac tanks and other similar alternative systems in the art, and thus the Quick-Pit System requires less transportation overhead. The Quick-Pit System eliminates the need for perimeter fencing, eliminates the need for pit excavation, and in general significantly reduces the environmental footprint required to set up and use as compared to the systems currently used in the art. For example, there is no need for holding tank cleaning, less buildup of H_2S and other undesirable substances is realized, fewer personnel are required to setup and manage the system, the components are fully reusable and easily stack and store together, and the overall operating cost is typically 50% to 70% less than current industrial-liquid containment systems already in the art.

II. Terminology

The terms and phrases as indicated in quotes (" ") in this section are intended to have the meaning ascribed to them in this Terminology section applied to them throughout this document, including the claims, unless clearly indicated otherwise in context. Further, as applicable, the stated definitions are to apply, regardless of the word or phrase's case, to the singular and plural variations of the defined word or phrase.

The term "or", as used in this specification and the appended claims, is not meant to be exclusive; rather, the term is inclusive, meaning "either or both".

References in the specification to "one embodiment", "an embodiment", "a preferred embodiment", "an alternative embodiment", "a variation", "one variation", and similar phrases mean that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least an embodiment of the invention. The appearances of the phrase "in one embodiment" and/or "in one variation" in various places in the specification are not necessarily all meant to refer to the same embodiment.

The term "couple" or "coupled", as used in this specification and the appended claims, refers to either an indirect or a direct connection between the identified elements, components, or objects. Often the manner of the coupling will be related specifically to the manner in which the two coupled elements interact.

The term "removable", "removably coupled", "readily removable", "readily detachable", and similar terms, as used in this patent application specification (including the claims and drawings), refer to structures that can be uncoupled from an adjoining structure

with relative ease (i.e., non-destructively and without a complicated or time-consuming process) and that can also be readily reattached or coupled to the previously adjoining structure.

Directional and/or relational terms such as, but not limited to, left, right, nadir, apex, top, bottom, vertical, horizontal, back, front, and lateral are relative to each other, are dependent on the specific orientation of an applicable element or article, are used accordingly to aid in the description of the various embodiments, and are not necessarily intended to be construed as limiting.

As applicable, the terms "about" or "generally", as used herein unless otherwise indicated, means a margin of ± 20%. Also, as applicable, the term "substantially" as used herein unless otherwise indicated means a margin of ± 10%. It is to be appreciated that not all uses of the above terms are quantifiable such that the referenced ranges can be applied.

The term "substantially A-frame shaped" and similar terms, as used herein unless otherwise indicated, means any structure with two main walls or frame-like structures that are oriented/angled such that the tops of the main walls/frames approach the other at or near an apex, while the bottoms edges of those main walls/frames are farther apart, causing the formation of the arch of an "A" as viewed from the end of the structure. It should be noted that in some cases there can be space located between the top edges of the two main walls/frames and still be considered "substantially A-frame shaped", so long as the angles of the main walls/frames, if extended, would still intersect. Similarly, there may be a planar surface disposed between the two main walls/frames and the structure would still be considered "substantially A-frame shaped".

The terms "pool", "pond", "reservoir", and "pit", as used herein unless otherwise indicated, refer to a man-made repository for industrial liquids or water, and are often used interchangeably herein, unless otherwise indicated.

The terms "tie-bar", "rods", "straps", "strand tendons", and "cables", and similar terms, when used in discussions about a grid network disposed about the enclosed reservoir floor, serve largely the same function in said grid networks and are often used interchangeably herein, unless otherwise indicated.

The terms "restorably collapsible", "resettably stackable", and similar terms, as used herein unless otherwise indicated, refers to a property of an industrial-liquid-containment perimeter structure member that can be collapsed into a smaller storable and transportable member without having to completely disassemble said structure member. An example is a

substantially A-framed segment that comprised much of a perimeter boundary in one embodiment of a liquid-containment reservoir, wherein the substantially A-framed segments are hinged near or at the apex of the segments to facilitate their collapsibility into a flat profile once the interior structural bracing between the two main walls is removed. However, other forms of restorable collapsibility are intended to be included in this definition, so long as the "restorable collapsibility" ensures that a given member can be reduced in storage volume without requiring complete disassembly of the member. See, for example, the alternate A-framed embodiment shown in **Figure 18**.

III. General Description of Embodiments of a Portable, Modifiable Industrial-Liquid-Containment System

Refer to **Figures 1A-1B**, which provide an exemplary overview of the Quick-Pit System. In an embodiment, a Quick-Pit System can employ one or more industrial-liquid-containment ponds/pools **10A, 10B**, which comprise a plurality of modular pool-wall segments **20** that are positioned together to form a perimeter boundary to define an industrial-liquid holding pool. In another variation, disposed within the perimeter boundary walls is a grid network **30** of tie-bars/rods/straps/strand tendons/cables the span the length and width of the pool/pond, connecting complimentary side of the pool/pond with each other to help maintain the structural integrity of the pool/pond by dispersing the forces realized on the pool/pond walls as the pond/pool is filled with liquid and/or temperature changes are realized. In a variation, for implementations that involve adjacent pools/ponds **10A, 10B**, a common wall structure **35** is used between such adjacent pools/ponds **10A, 10B**. In more variations, an industrial-liquid-containment pond/pool **10A, 10B** is equipped with an equipment bridge **40** that straddles a portion of the pool/pond wall **20** without making direct contact with the pool/pond wall **20** such that piping and/or hoses for pumping in or out liquids can be used without stressing or breaching the pool/pond wall **20**. (Also see **Figures 4A-4C**.) In general, most embodiments employ a liquid-impermeable sheeting over the entire industrial-liquid-containment pool/pond **10A, 10B**, secured on the exterior side of the pool/pond walls, and which is not shown in the drawings for clarity. In still more embodiments, to provide added environmental protection, the entire industrial-liquid-containment pool/pond **10A, 10B** resides within (or "floats" on) a secondary, outer industrial-liquid containment system **50, 50A, 55**, which has its own smaller elevated wall system **50, 50A**, and its own liquid-impermeable sheeting that is disposed underneath the first industrial-liquid-containment pools/ponds **10A, 10**B, and extends to cover the entire outer perimeter boundary **50, 50A**. In some variations, the liquid-impermeable liner **55** is used in conjunction with a geotextile pad

later on top of the liner **55**.

Refer to **Figures 2A-3E, 5A-9I, and 18**. In one embodiment, the Quick-Pit System allows for quick and easy assembly by employing a modular design that uses a plurality of substantially A-framed segments **20, 20A, 20B, 20C, 20D** that easily assemble and detachably fit/couple together to form the perimeter of a liquid-retention pond that is sized and shaped in the field to conform to the requirements of the end user. In an embodiment, the Quick-Pit System is engineered so that the end user is given a variety of options, the system can be easily implemented, and that forces of nature are given room to expand and contract. In one embodiment, the Quick-Pit System is engineered to withstand 120% of the projected dynamic load of liquids in motion. The heavy-gauge steel often used within the containment wall framework in the form of webs, trusses, ties, purlins, footing frameworks, and other similar/related structures **21, 22, 23, 24, 25, 26** is designed to withstand any stress it will be met with in the field, including earthquakes, rainfall, extreme temperatures, etc.

In some embodiments, the segments are about 7.5 ft. wide, 9.5 ft. deep, and 10 ft. high with ground rails adapted to allow for the locking of segments **20, 20A, 20B, 20C, 20D** together, though the segment sizes and associated hardware can be scaled up or down to better suit any given industrial application. While in many embodiments, the segments are substantially A-framed, often in a hinged **25** collapsible design, in other embodiments of the Quick-Pits System, the plurality of segments need not be substantially A-frame-shaped to enjoy all of the novel benefits of the Quick-Pits System, such as the grid network **30** disposed within the pool/pond, and which is discussed more in detail *infra*. In still other embodiments, the segments **20, 20A, 20B, 20C, 20D** are provided in five-ft. increments to better support an effective modular design for transport and assembly in the field. While the angles for the generally A-framed structure of the perimeter segments **20, 20A, 20B, 20C, 20D** can vary while still allowing the system to be effective, in a typical embodiment, the two primary load-bearing sides of the substantially A-framed segments **20, 20A, 20B, 20C, 20D** (which also can have a narrow, flat upper surface in some variations) are angled at an approximately 60-degrees relative to each other.

In an embodiment, a secondary (outer) liquid-containment reservoir perimeter **50, 50A, 55** is set up to provide an extra level of environmental security, wherein the liquid-retention pond **10A, 10B** is constructed within the secondary (outer) liquid-containment perimeter **50, 50A**. This secondary (outer) liquid-containment boundary **50, 50A** comprises a plurality of formed substantially A-framed (or inverted-V) curb segments (which can be formed or stamped from light-weight metal, such as aluminum, steel, plastic, rubber, wood

products, or fiberglass) defines a vertical boundary to provide liquid containment. A layer or membrane (sheet(s)) of liquid-impermeable material is disposed over the intended first reservoir surface and extends over all of the first-perimeter A-framed segments. An example of a suitable liquid-impermeable material that can be used for this purpose is XR-3® PW by Seaman Corporation or other comparable polymeric sheet material that is liquid impermeable and stable in an outdoor environment; e.g., chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), or polypropylene). In many embodiments, sheets of liquid-impermeable material are thermoplastic-welded in the field to create a large covering for the entire first (outer) industrial-liquid-containment system. Often, in this basic configuration, the height of the containment segments is relatively low; e.g., two feet or less. This first (outer) industrial-liquid-containment system is described in great detail in Patent Cooperation Treaty (PCT) Application No. PCT/US11/50834, upon which the present patent application both claims the benefit of and incorporates by reference the entirety of. This double-perimeter configuration provides greatly enhanced system reliability for containing the industrial liquids.

In other embodiments, a primary liquid-holding reservoir **10A, 10B** is disposed within the secondary liquid-containment boundary **50, 50A**, in effect making the secondary liquid-holding reservoir into a backup containment for the primary liquid-holding reservoir **10A, 10B**. In some variations, the substantially A-framed containment segments **20, 20A, 20B, 20C, 20D** are significantly higher than those of the outer secondary perimeter segments **50, 50A**, and are constructed at the worksite in the field, where the basic A-frames, inter-A-frame struts, base rails and trusses, and outer load-bearing panels and such are put together. Spanning the across the intended primary containment pool **10A, 10B** area, is a network of grid members **30** to help that ultimately help relieve the stresses imposed on the primary liquid-holding reservoir containment segments, thus enhancing wall integrity. (See, e.g., **Figures 11A-11F, and 16A-17B**.)

The A-frame walls **20** are held in place by a steel grid system **30** running along the floor of the pit. In embodiments, Quick-Pit Systems are engineered to accommodate expansion due to both temperature and water-weight. As the liquids push out against the pit walls **20**, the grid system **30** transfers tension to the adjacent wall. The tension causes the grid bars/rods/straps/strand tendons/cables **32A, 32B, 33** (typically 3/4"x5" steel straps, in some variations) to expand over the length and/or width of the pit **10A, 10B**. Although the expansion is minimal (2 in. over 400 ft.), the Quick-Pit System allows the pit to expand and contract safely as it is emptied and filled.

In variations, the hub members **31** used in the grid network **30** (see **Figures 11A-11F, and 16A-17B**) allow for expansion by letting the perpendicular bars/rods/straps/strand tendons/cables slide past each other without friction, or at least minimal friction. In some variations, the hub members **31** are comprised of a slide pad **31** (in some embodiments, made of wood, plastic, UHMW, and/or other relatively light-weight and low-friction material), coated with a low-friction material; e.g., PTFE, polyurethane, etc.; and a cross-tie member. In a variation, the hub slide pad **31** has four guide slots **31B** adapted to slidably receive pins disposed in the cross-tie members **31A**. In an embodiment, the metal cross-tie member (also sometimes called a "hub assembly") **31A** is disposed to be slidably engaged with a slide pad **31** (comprised of wood, plastic, UHMW, and/or other relatively low-friction material) via four slots adapted to receive pins disposed on the slide pad **31**, and has four attachment points for grid tie-bars/rods/straps/strand tendons/cables. The metal cross-tie member **31A** is designed to have two pairs of tie-bars/rods/straps/strand tendons/cables, each pair oriented substantially orthogonally relative to each other, wherein the cross-tie member **31A** allows slidable movement of each of the bars of the cross-tie member **31A** relative to the other. Basically, the middle section of one of the cross-tie bars is a planar thru-bar adapted to fit within the two spaced-apart pass-thru plates that comprise the middle section of the other cross-tie bar.

In many variations, the grid system **30** is assembled using pins to connect grid bars/rods/straps/strand tendons/cables **32A, 32B** with hubs **31**. At the perimeter of the pit **20**, grid tie-bars/rods/straps/strand tendons/cables **32A, 32B** connect to the bottom brace of the perimeter segments **20** with pins in the same manner in which they connect to the hubs **31**. In still more variations, one or more tie-bar slide pads **33**, may be used to provide underlying vertical support of each tie-bar/rod/strap/strand tendon/cable **32A, 32B**.

In some embodiments, this grid work **30** is installed using a plurality of interlocking steel rods or bars **32A, 32B**. In other embodiments, strapping and/or cabling is used in lieu of metal grid rods/bars **32A, 32B** in order to better compensate for stretching stresses felt as the liquid levels go up. The network of strapping/cabling **30** can be comprised of many different materials to this end; for example, among the candidate materials that can be used are Zylon®, Dyneema®, Williams® strand cable, or a similar substitute strand cable. In some embodiments, epoxy is also used in conjunction with the strapping/cabling to enhance the structural characteristics. In still more embodiments, a plurality of adjacent liquid-containment ponds **10A, 10B** can be set up wherein the grid work **30** in some cases extends on both sides of a substantially A-framed segment **20** that happens to form the boundary **35**

of two separate liquid-containment ponds.

However, it should be noted by those ordinarily skilled in the art that in some alternate embodiments, a reservoir boundary need not be defined by substantially A-framed segments **20, 20A, 20B, 20C, 20D** to enjoy the benefits of the pool-floor grid network **30**. Rather, the grid network **30** can be coupled to the base of basically any modular industrial-liquid reservoir's elongated perimeter-boundary segments (e.g., rigid straight wall, rectangular box-shaped, etc.) for to aid in compensating for the forces associated with increased reservoir liquid levels and/or temperature. See, e.g., **Figures 10A-10G**.

Over the grid network of tie-bars/rods/strapping/cabling is placed a layer or membrane (sheet(s)) of liquid-impermeable material is disposed over the intended first reservoir surface and extends over the primary perimeter A-framed segments **20, 20A, 20B, 20C, 20D**, and the intervening first containment pool area. An example of a suitable liquid-impermeable material that can be used for this purpose is XR-3® PW by Seaman Corporation or other comparable polymeric sheet material that is liquid impermeable and stable in an outdoor environment; e.g., chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), or polypropylene.

In an alternate embodiment of the grid-network system, the plurality of relatively short tie-rod/bar/strap/cables and hub-assemblies (comprised of pads and cross-tie members) is completely replaced with a plurality of intersecting cables, each cable anchored on each end to an opposing point on the segmented reservoir perimeter wall. See **Figures 19A-19C**.

Refer to **Figures 2A-2C, and 8A-9I**. In an embodiment, the A-frame segments **20, 20A, 20B, 20C** can be hinged **25** at the top so as to allow its two sides to be folded together to facilitate easier storage and transport. A hinge **25** at the top of the frame **20, 20A, 20B, 20C** allows the frame to fold together when the center and bottom braces are removed. Referring also to **Figure 18**, when the frame **20, 20A, 20B, 20C, 20D** is in use, the center and bottom braces **21, 23, 24** are held in place with pins. Once the frames **20, 20A, 20B, 20C, 20D** are in compact/collapsed form, they can be easily transported and stored.

In some embodiments, the A-frame segments **20, 20A, 20B, 20C, 20D** are clad in with structurally rigid and planar material **(see, e.g., Figures 2A-2C, and 3E: 26, 26A**), such as, for example, steel cladding or rigid plastic sheeting before being covered by the layer of liquid-impermeable material. However, in still another embodiment, such rigid cladding is not used on the water side of most of the A-frame segments **20**, and instead what is applied over at least the water side of the A-frame segments **20** are sheets of fabric, cargo netting,

and/or variable-sized welded wire mesh. (See, e.g., **Figures 2B-2C; 27, 28**, respectively.) In such a variation, the fabric/netting serves a dual purpose: It is not only light-weight and takes up relatively little storage space, but the fabric also "grips" the horizontal steel bars or purlins **22** as the weight of the liquids exert downward force on the A-frame segments **20**. As a result, the downward pressure of the containment liquids serves as ballast, holding down the A-frames segments **20**. In one embodiment, substantially contiguous sheets of high-strength fabric **27** (e.g., nylon webbing, polypropylene webbing, polyester webbing, etc.) are used to cover at least the water-side of the A-frame segments **20**. In another embodiment, a form of cargo netting **28,** a lattice of high-strength webbing **28** (e.g., nylon webbing, polypropylene webbing, polyester webbing, etc.), or a variable-sized welded wire mesh is used to cover at least the water-side of the A-frame segments **20**. In a variation, a lattice of 2-in. polyester webbing **28**, rated at 6000-lbs break strength, is installed over at least the water-side of the A-frame members **20**. In a further variation, this webbing lattice includes a plurality of vertically oriented narrow web straps (for example 2-in. polyester webbing, rated at 6000-lbs break strength), that are sewn to a plurality of wider, horizontally oriented web material, wherein each of these horizontal web sections **28** is positioned to rest over an associated A-frame-segment **20** purlin **22**, and is wider than the associated purlin **22**.

In a variation, a plurality of substantially A-frame segments **20** are positioned substantially end-to-end, although corners are formed as necessary such that the ends of said substantially A-frame segments **20** used to form a corner are proximal to each other (as opposed to end-to-end), in order to define a perimeter boundary for the industrial-liquid-containment pool **10A, 10B**.

Referring to **Figures 3D, 5A-5C, 6A-6C, 7A-7B, 8A-8C, and 18**, in another alternative variation on corner construction, a plurality of pairs of mated, substantially rigid, substantially A-frame segments **20A, 20B, 20C, 20D** are adapted to substantially form a predetermined angle at the point where the substantially A-frame segments **20A, 20B, 20C, 20D** of each of the mated pairs is substantially buttressed to the other at the predetermined angled mating edges. Like the regular substantially A-frame segments **20**, corner A-frame segments **20A, 20B, 20C, 20D** can be shaped to form a substantially A-framed channel when resting on the ground, and can have a top flat surface at the apex of the segment. In addition, in many embodiments, substantially A-frame segments **20A, 20B, 20C, 20D** are clad substantially on their liquid-load-bearing side with a substantially rigid sheet material selected from a group comprised of aluminum, precast concrete, aluminum alloy, steel, plastic, rubber, wood products, and/or fiberglass. Similarly, in variations, corner

substantially A-frame segments **20A, 20B, 20C, 20D** are hinged at their apex to allow for their convenient collapsibility and stacking, which reduces the storage area required for the components, and which makes transport to a worksite easier.

In some embodiments, the corner substantially A-frame segments **20A, 20B, 20C, 20D** are adapted to be detachably coupled to a ground-level rigid ballast member **15A, 15B, 15C**, wherein the ballast member **15A, 15B, 15C** is adapted to hold each of the corner substantially A-frame segments **20A, 20B, 20C, 20D** of a mated pair of corner curb members **55B** in position at said predetermined angle, depending on the designed shape and size of a perimeter boundary of an industrial-liquid-containment system. On the non-angled end of each corner substantially A-frame segments **20A, 20B, 20C, 20D**, the corner substantially A-frame segments **20A, 20B, 20C, 20D** is positioned substantially end-to-end with an adjacent said elongated substantially A-frame segment **20** in order to help define a perimeter boundary around a user-defined industrial-liquid-containment pool. In still more variations, a ballast member **15A, 15B, 15C** can is substantially made of a material selected from a group comprised of aluminum, precast concrete, aluminum alloy, steel, hard plastic, wood products, and/or fiberglass. Moreover, in still another embodiment, each ballast member **15A, 15B, 15C** contains a weighting material to help anchor each ballast member **15A, 15B, 15C** and its associated corner substantially A-frame segments **20A, 20B, 20C, 20D** in place on the ground, and each ballast member **15A, 15B, 15C** is weighted with a material selected from a group comprised of concrete, dirt, water, and/or metal. In still other variations, the ballast member **15A, 15B, 15C** is a substantially solid member made of heavy metal, such as steel.

In some embodiments, the generally hollow A-framed containment segments **20, 20A, 20B, 20C** (see, e.g., **Figures 3A-3E, and 18**), which are coupled together to form the liquid-containment barrier, can be adapted to facilitate equipment storage and/or the heating of the entire assembled liquid-containment barrier. In an embodiment, such heating can be by way of forced air, while in still other embodiments, heat-conducting members such as heat-tracing tape may be used. In addition, in some variations, electronic sensing and monitoring equipment can be housed; e.g., level detectors, temperature monitoring, alarms, leak-detection systems, etc.

Refer to **Figures 4A-4C**. In another variation, a suction system **62** can be installed that poses no threat of breaching the integrity of the liquid-impermeable membrane **45** covering the entire retention pond **10A, 10B**. In such a case, suction pipes/hoses **62** running over the walls do not come into contact with the liner, as the pipes **62** are attached to a bridge **40** (**60A-60C, 63, 64**) straddling the pit wall. Fluids can either be drawn off the top of the

water or extracted from the bottom, depending on the operator's needs. The bridges **40** can be placed anywhere along the walls and any number of bridges can be added. For ease of transport, the bridges fold up to fit on flat-beds. Because the Quick-Pit System has the ability to fit any configuration and meet any water needs, the end user is given a wide verity of options.

Typical applications for the Quick-Pit System includes the oil & gas exploration industry, the mining industry, the water & sewage treatment industry, and the arigicultural industry, including holding systems for frac water and other waste water as a result of industrial operations, though it would be appreciated by anyone skilled in the art of managing industrial effluents and/or waste that the inventive disclosures provided herein provide a good option for managing industrial liquids. In other applications of the Quick-Pit System, portable, customizable ponds that can be used in support of fish-farming systems can be erected and used.

In other variations, the system described *supra* is embodied as a kit comprised of the specialized components described *supra*, wherein the kit is transported to a user-defined project site and the kit's components are used to assemble a customized industrial-liquid-containment system.

Moreover, methods of making said kits and industrial-liquid-containment systems by providing and using said specialized components and/or combination of components described herein are considered part of the inventive disclosure.

IV. Methods of Use of an Industrial-Liquid-Containment System

The uses for the myriad embodiments and variations described in **Section III** are many. All are intended to be encompassed by the disclosure herein. This section describes several exemplary methods of use of systems based on the embodiments and variations discussed in **Section III**.

In one method of using at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to **Section III**, the method comprises the steps of:

- Obtaining at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to an embodiment and/or variation described in **Section III**;
- Installing at least two adjacent industrial-liquid-containment reservoirs, including an outer secondary containment system, using the at least one kit (see, e.g., **Figure 1A:**

10A, 10B);

- Designating one of the industrial-liquid-containment reservoirs **10A, 10B** as a repository for clean for industrial use;
- Designating one of the industrial-liquid-containment reservoirs **10A, 10B** as a repository for potentially contaminated industrial-waste water for industrial use and/or reclamation processes;
- Installing at least one substantially A-framed auxiliary equipment-support member **40** (also see **Figures 4A-4C: 40A-40C**) for each of the industrial-liquid-containment reservoirs, sized to be positioned to straddle over its respective first perimeter boundary without making direct contact with its respective first perimeter boundary comprised of said plurality of elongated perimeter wall segments (e.g., **20, 20A, 20B, 20C, 20D**), wherein:
    - at least one said auxiliary equipment-support member has an equipment-support platform disposed at the top of the auxiliary equipment support member **40, 40A, 40B**;
- Installing via said at least one substantially A-framed auxiliary equipment-support member **40, 40A, 40B** at least one pipe or hose **62** dedicated to facilitating the introduction of liquids into said associated liquid-containment reservoir **10A, 10B**;
- Installing via said at least one substantially A-framed auxiliary equipment-support member **40, 40A, 40B** at least one pipe or hose **62** dedicated to the removal of liquids from said associated liquid-containment reservoir **10A, 10B**; and
- Installing for each said hose or pipe, at least one in-line control valve and pumping device to facilitate the transfer of liquids.

This embodiment can be extended wherein the in-line control valves and pumping devices can be electrically controlled form a remote location relative to said industrial-liquid-containment reservoirs. Such remote electro-mechanical controls are well known in the art and are not shown in the figures.

Further still, this embodiment can be enhanced wherein the industrial-liquid-containment reservoirs **10a, 10B** are centrally located relative to a plurality of satellite industrial complexes (not shown in the figures) that use clean water and/or generate potentially -contaminated industrial liquid waste, and wherein each of the plurality of satellite

industrial complexes has at least one industrial-liquid storage system that is communicatively coupled to the at least one liquid-containment reservoirs **10A, 10B** via a network of hoses and/or piping systems **62**, including the in-line control valves and pumping devices. In such an enhancement, the method further comprises the steps of:

- As needed, transferring clean water from the centrally located industrial-liquid-containment reservoir **10A, 10B** to a satellite industrial complex via the network of hoses and/or piping systems **62**; and
- As needed, transferring industrial-waste liquids from a satellite industrial complex to the centrally located industrial-liquid-containment reservoir **10A, 10B** via said network of hoses and/or piping systems **62**.

Another extension of this embodiment can be realized, wherein the industrial-liquid-containment reservoirs **10A, 10B** are centrally located relative to a industrial-liquids truck load and offload station (not shown in the figures), the station communicatively coupled to the hoses and/or pipes **62** dedicated to removal and/or introduction of industrial liquids, and wherein the industrial-liquids truck load and offload station is adapted to receive an industrial truck for loading or offloading industrial liquids. The method in this extension further comprises the steps of:

- As needed, transferring clean water from the centrally located industrial-liquid-containment reservoir to an industrial truck;
- As needed, transferring industrial liquids from the centrally located industrial-liquid-containment reservoir to an industrial truck;
- As needed, transferring clean water from and industrial truck to the centrally located industrial-liquid-containment reservoir; and
- As needed, transferring industrial-waste liquids from an industrial truck to the centrally located industrial-liquid-containment reservoir.

In another extension of the above methods of using at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to **Section III**, the industrial-liquid-containment reservoirs **10A, 10B** are centrally located relative to a industrial-liquids purification system (not shown in the figures), the purification system communicatively coupled to each of a dedicated reservoir for clean-water and a reservoir dedicated for potentially contaminated industrial-waste water, the method further comprising the steps of:

- Aligning the purification system to draw potentially contaminated industrial waste water from the dedicated reservoir;
- Aligning the purification system to discharge purified or "clean" water to the dedicated reservoir for clean water;
- Purifying drawn potentially contaminated industrial-waste water; and
- Discharging purified (clean) water into the reservoir dedicated to the clean water.

In another method of using at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to **Section III**, the method comprises the steps of:

- Obtaining at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to **Section** III, described *supra*;
- Transporting the kit, in its collapsed, stowed mode, to a user-defined location;
- Installing at least one industrial-liquid-containment reservoir **10A, 10B** using the kit at the user-defined location;
- When no longer needed, draining, then disassembling the industrial-liquid-containment reservoir **10A, 10B**, wherein the reservoir components from the kit are placed in a collapsed and stowed mode; and
- Transporting the collapsed and stowed kit to a user-designated location.

This method can be further enhanced, by further comprising the step of leasing the kit to an end-user for a period of time. Similarly, in another enhancement, the method further comprises the step of selling the kit to an end-user.

Other methods of use of the Quick-Pits System can include the erection of one or more reservoirs for use in the oil & gas exploration industry for frac water, and the holding and management of effluent waste in the mining industry, though it would be appreciated by anyone skilled in the art of managing industrial effluents and/or waste that the inventive disclosures provided herein provide a good option for managing industrial liquids. In other applications of the Quick-Pit System, portable, customizable ponds that can be used in support of fish-farming systems can be erected and used. Moreover, the Quick-Pits System can be used by water & sewage treatment plants, agriculture-waste ponds, and in aqua-culture.

V. Alternative Embodiments and Other Variations

The various embodiments and variations thereof described herein, including the appended claims, and/or illustrated in the accompanying Figures are merely exemplary and are not meant to limit the scope of the inventive disclosure. It should be appreciated that numerous variations of the invention have been contemplated as would be obvious to one of ordinary skill in the art with the benefit of this disclosure.

Hence, those ordinarily skilled in the art will have no difficulty devising myriad obvious variations and improvements to the invention, all of which are intended to be encompassed within the scope of the description, claims, and figures herein.

CLAIMS

What is claimed is:

1. A kit for a portable, modular, in-field modifiable, liquid-containment system, comprising:

a plurality of elongated, substantially A-framed segments, wherein:

each side of each said substantially A-framed segments making up said A-frame has at least one purlin disposed substantially along the length of said purlin's associated A-frame segment,

each of said substantially A-framed segments is configured to have a plurality of structural supports to be installed between internal sides of substantially A-framed segment sides such that said substantially A-frame shape can be maintained as loads are exerted upon said substantially A-framed segment,

each of said substantially A-framed segments is restorably collapsible in order to facilitate the stacking of said segments, to make storage and transport easier, and

said plurality of substantially A-framed segments are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said substantially A-framed segments used to form a corner are proximal to each other, in order to be able to define a first perimeter boundary around a user-defined pool for industrial liquid;

a plurality of pliable load-bearing panels, each adapted to be installed on an intended liquid-containing side of an A-framed segment; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the bottom surface for a user-defined pool for liquid, said sheeting adapted to be extended over all of a user-defined first perimeter boundary,

wherein said liquid-impermeable sheeting is adapted to be secured at intervals on the non-liquid-side of said plurality of substantially A-framed segments.

2. The liquid-containment system kit of claim 1, wherein:

each of said plurality of load-bearing panels is selected from the group consisting of fabric, cargo netting, and variable-sized welded wire mesh; and

each said pliable load-bearing panel is adapted to transfer the weight of contained liquid

via said liquid-impermeable sheeting into a downward force exerted on said at least one purlin, thereby providing a stabilizing ballast for the associated substantially A-framed segment.

3. The liquid-containment system kit of claim 1, wherein each of said substantially A-framed segments is substantially comprised of a material selected from the group consisting of wood, vulcanized rubber, fiberglass, UHMW, aluminum, steel, galvanized steel, and other high-tensile-strength, corrosion-resistant metal.

4. The liquid-containment system kit of claim 1, wherein said restorable collapsibility of each of said substantially A-framed segments is accomplished with hinges disposed at or near the apex of each of said substantially A-framed segments.

5. The liquid-containment system kit of claim 1, wherein each of said plurality of substantially A-framed segments is adapted to be detachably coupled on each end to an adjacent substantially A-framed segment.

6. The liquid-containment system kit of claim 1, wherein said liquid-impermeable sheeting is substantially comprised of a material selected from the group consisting of chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), and polypropylene.

7. The liquid-containment system kit of claim 1, wherein said liquid-impermeable sheeting is resistant to damage from ultra-violet rays.

8. The liquid-containment system kit of claim 1, wherein the two main sides of each of said substantially A-framed segments form an angle of 60° ±5° at the intersection of said sides.

9. The liquid-containment system kit of claim 1, further comprising a plurality of pairs of mated substantially rigid corner A-framed segments adapted to substantially form a predetermined angle at the point where the corner A-framed segment of each of said mated pairs is substantially buttressed to the other at the predetermined angled mating edges, wherein:

each of said corner A-framed segments is has substantially rigid cladding over said at least one purlin on said intended liquid-containing side of said corner A-framed segment;

said shape of each of said corner A-framed segments is restorably collapsible in order to facilitate the stacking of A-framed segments, to make storage and transport easier; and

the non-angled end of each of said plurality of said corner A-framed segments is adapted to be positioned substantially end-to-end with an adjacent said A-framed segment in order to help define a perimeter boundary around a user-defined pool for industrial liquid.

10. The liquid-containment system kit of claim 9, wherein each of said mated pairs of corner A-framed segments is adapted to be detachably coupled to a ground-level rigid ballast member, said ballast member adapted to hold each of the corner A-framed segments of a mated pair of corner A-framed segments in position at said predetermined angle.

11. The liquid-containment system kit of claim 10, wherein each said ballast member is substantially made of a material selected from the group consisting of aluminum, precast concrete, aluminum alloy, steel, hard plastic, wood products, and fiberglass.

12. The liquid-containment system kit of claim 10, wherein:

each said ballast member contains a weighting material to help anchor each said ballast member and its associated corner A-framed segments in place on the ground; and

each said ballast member is weighted with a material selected from the group consisting of concrete, dirt, water, and metal.

13. The liquid-containment system kit of claim 1, further comprising components for a backup portable, modular, liquid-containment system kit, said backup liquid-containment system kit adapted to provide a second liquid-impermeable layer under said user-defined pool for industrial liquid and to provide a second elevated perimeter boundary outside of said user-defined first perimeter boundary; the backup liquid-containment system kit comprising:

a plurality of elongated, substantially rigid curb members, wherein:

each of said curb members is comprised of sheet material,

each of said curb members is shaped to form a substantially inverted “V” channel when resting on the ground,

said shape of each of said curb members is adapted to facilitate the nestable

stacking of one or more of said curb members in order to make storage and transport easier, and

said plurality of said curb members are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said curb members used to form a corner are proximal to each other, in order to be able to define a perimeter boundary around a target storage container of liquid; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the surface under and around a target storage container of liquid, said sheeting adapted to be extended over all of a second elevated perimeter boundary.

14. A method of making a kit for a portable, modular, in-field modifiable, liquid-containment system, comprising:

providing a plurality of elongated, substantially A-framed segments, wherein:

each side of each said substantially A-framed segments making up said A-frame has at least one purlin disposed substantially along the length of said purlin's associated A-frame segment,

each of said substantially A-framed segments is configured to have a plurality of structural supports to be installed between internal sides of substantially A-framed segment sides such that said substantially A-frame shape can be maintained as loads are exerted upon said substantially A-framed segment,

each of said substantially A-framed segments is restorably collapsible in order to facilitate the stacking of said segments, to make storage and transport easier, and

said plurality of substantially A-framed segments are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said substantially A-framed segments used to form a corner are proximal to each other, in order to be able to define a first perimeter boundary around a user-defined pool for industrial liquid;

providing a plurality of pliable load-bearing panels, each adapted to be installed on an intended liquid-containing side of an A-framed segment; and

providing a continuous layer of liquid-impermeable sheeting adapted to be disposed over the bottom surface for a user-defined pool for liquid, said sheeting adapted to be extended over all of a user-defined first perimeter boundary,

wherein said liquid-impermeable sheeting is adapted to be secured at intervals on the non-liquid-side of said plurality of substantially A-framed segments.

15. The method of claim 14, wherein:

each of said plurality of load-bearing panels is selected from the group consisting of fabric, cargo netting, and variable-sized welded wire mesh; and

each said pliable load-bearing panel is adapted to transfer the weight of contained liquid via said liquid-impermeable sheeting into a downward force exerted on said at least one purlin, thereby providing a stabilizing ballast for the associated substantially A-framed segment.

16. The method of claim 14, wherein each of said substantially A-framed segments is substantially comprised of a material selected from the group consisting of wood, vulcanized rubber, fiberglass, UHMW, aluminum, steel, galvanized steel, and other high-tensile-strength, corrosion-resistant metal.

17. The method of claim 14, wherein said restorable collapsibility of each of said substantially A-framed segments is accomplished with hinges disposed at or near the apex of each of said substantially A-framed segments.

18. The method of claim 14, wherein each of said plurality of substantially A-framed segments is adapted to be detachably coupled on each end to an adjacent substantially A-framed segment.

19. The method of claim 14, wherein said liquid-impermeable sheeting is substantially comprised of a material selected from the group consisting of chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), and polypropylene.

20. The method of claim 14, wherein said liquid-impermeable sheeting is resistant to damage from ultra-violet rays.

21. The method of claim 14, wherein the two main sides of each of said substantially A-framed segments form an angle of 60° ±5° at the intersection of said sides.

22. The method of claim 14, further comprising the step of providing a plurality of pairs of mated substantially rigid corner A-framed segments adapted to substantially form a predetermined angle at the point where the corner A-framed segment of each of said

mated pairs is substantially buttressed to the other at the predetermined angled mating edges, wherein:

each of said corner A-framed segments is has substantially rigid cladding over said at least one purlin on said intended liquid-containing side of said corner A-framed segment;

said shape of each of said corner A-framed segments restorably collapsible in order to facilitate the stacking of A-framed segments, to make storage and transport easier; and

the non-angled end of each of said plurality of said corner A-framed segments is adapted to be positioned substantially end-to-end with an adjacent said A-framed segment in order to help define a perimeter boundary around a user-defined pool for industrial liquid.

23. The method of claim 22, wherein each of said mated pairs of corner A-framed segments is adapted to be detachably coupled to a ground-level rigid ballast member, said ballast member adapted to hold each of the corner A-framed segments of a mated pair of corner A-framed segments in position at said predetermined angle.

24. The method of claim 23, wherein each said ballast member is substantially made of a material selected from the group consisting of aluminum, precast concrete, aluminum alloy, steel, hard plastic, wood products, and fiberglass.

25. The method of claim 23, wherein:

each said ballast member contains a weighting material to help anchor each said ballast member and its associated corner A-framed segments in place on the ground; and

each said ballast member is weighted with a material selected from the group consisting of concrete, dirt, water, and metal.

26. The method of claim 14, further comprising the step of providing components for a backup portable, modular, liquid-containment system kit, said backup liquid-containment system kit adapted to provide a second liquid-impermeable layer under said user-defined pool for industrial liquid and to provide a second elevated perimeter boundary outside of said user-defined first perimeter boundary; the backup liquid-containment system kit comprising:

a plurality of elongated, substantially rigid curb members, wherein:

each of said curb members is comprised of sheet material,

each of said curb members is shaped to form a substantially inverted "V" channel when resting on the ground,

said shape of each of said curb members is adapted to facilitate the nestable stacking of one or more of said curb members in order to make storage and transport easier, and

said plurality of said curb members are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said curb members used to form a corner are proximal to each other, in order to be able to define a perimeter boundary around a target storage container of liquid; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the surface under and around a target storage container of liquid, said sheeting adapted to be extended over all of a second elevated perimeter boundary.

27. A portable, modular, in-field modifiable, liquid-containment system, comprising:

a plurality of elongated, substantially A-framed segments, wherein:

each side of each said substantially A-framed segments making up said A-frame has at least one purlin disposed substantially along the length of said purlin's associated A-frame segment,

each of said substantially A-framed segments is configured to have a plurality of structural supports to be installed between internal sides of substantially A-framed segment sides such that said substantially A-frame shape can be maintained as loads are exerted upon said substantially A-framed segment,

each of said substantially A-framed segments is restorably collapsible in order to facilitate the stacking said segments, to make storage and transport easier, and

said plurality of substantially A-framed segments are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said substantially A-framed segments used to form a corner are proximal to each other, in order to be able to define a first perimeter boundary around a user-defined pool for industrial liquid;

a plurality of pliable load-bearing panels, each adapted to be installed on an intended liquid-containing side of an A-framed segment; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the bottom surface for a user-defined pool for liquid, said sheeting adapted to be extended over all of a user-defined first perimeter boundary,

wherein said liquid-impermeable sheeting is adapted to be secured at intervals on the non-liquid-side of said plurality of substantially A-framed segments.

28. The liquid-containment system of claim 27, wherein:

each of said plurality of load-bearing panels is selected from the group consisting of fabric, cargo netting, and variable-sized welded wire mesh; and

each said pliable load-bearing panel is adapted to transfer the weight of contained liquid via said liquid-impermeable sheeting into a downward force exerted on said at least one purlin, thereby providing a stabilizing ballast for the associated substantially A-framed segment.

29. The liquid-containment system of claim 27, wherein each of said substantially A-framed segments is substantially comprised of a material selected from the group consisting of wood, vulcanized rubber, fiberglass, UHMW, aluminum, steel, galvanized steel, and other high-tensile-strength, corrosion-resistant metal.

30. The liquid-containment system of claim 27, wherein each of said plurality of substantially A-framed segments is adapted to be detachably coupled on each end to an adjacent substantially A-framed segment.

31. The liquid-containment system of claim 30, wherein said restorable collapsibility of each of said substantially A-framed segments is accomplished with hinges disposed at or near the apex of each of said substantially A-framed segments.

32. The liquid-containment system of claim 27, wherein said liquid-impermeable sheeting is substantially comprised of a material selected from the group consisting of chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), and polypropylene.

33. The liquid-containment system of claim 27, wherein said liquid-impermeable sheeting is resistant to damage from ultra-violet rays.

34. The liquid-containment system of claim 27, wherein the two main sides of each of said substantially A-framed segments form an angle of 60° ±5° at the intersection of said

sides.

35. The liquid-containment system of claim 27, further comprising a plurality of pairs of mated substantially rigid corner A-framed segments adapted to substantially form a predetermined angle at the point where the corner A-framed segment of each of said mated pairs is substantially buttressed to the other at the predetermined angled mating edges, wherein:

each of said corner A-framed segments is has substantially rigid cladding over said at least one purlin on said intended liquid-containing side of said corner A-framed segment;

said shape of each of said corner A-framed segments is restorably collapsible in order to facilitate the stacking of A-framed segments, to make storage and transport easier; and

the non-angled end of each of said plurality of said corner A-framed segments is adapted to be positioned substantially end-to-end with an adjacent said A-framed segment in order to help define a perimeter boundary around a user-defined pool for industrial liquid.

36. The liquid-containment system of claim 35, wherein each of said mated pairs of corner A-framed segments is adapted to be detachably coupled to a ground-level rigid ballast member, said ballast member adapted to hold each of the corner A-framed segments of a mated pair of corner A-framed segments in position at said predetermined angle.

37. The liquid-containment system of claim 36, wherein each said ballast member is substantially made of a material selected from the group consisting of aluminum, precast concrete, aluminum alloy, steel, hard plastic, wood products, and fiberglass.

38. The liquid-containment system of claim 36, wherein:

each said ballast member contains a weighting material to help anchor each said ballast member and its associated corner A-framed segments in place on the ground; and

each said ballast member is weighted with a material selected from the group consisting of concrete, dirt, water, and metal.

39. The liquid-containment system of claim 27, further comprising components for a backup portable, modular, liquid-containment system, said backup liquid-containment system adapted to provide a second liquid-impermeable layer under said user-defined

pool for industrial liquid and to provide a second elevated perimeter boundary outside of said user-defined first perimeter boundary; the backup liquid-containment system comprising:

a plurality of elongated, substantially rigid curb members, wherein:

each of said curb members is comprised of sheet material,

each of said curb members is shaped to form a substantially inverted "V" channel when resting on the ground,

said shape of each of said curb members is adapted to facilitate the nestable stacking of one or more of said curb members in order to make storage and transport easier, and

said plurality of said curb members are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said curb members used to form a corner are proximal to each other, in order to be able to define a perimeter boundary around a target storage container of liquid; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the surface under and around a target storage container of liquid, said sheeting adapted to be extended over all of a second elevated perimeter boundary.

40. A kit for a portable, modular, in-field modifiable, liquid-containment system, comprising:

a plurality of elongated perimeter-boundary segments, wherein:

said plurality of perimeter-boundary segments are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said perimeter-boundary segments used to form a corner are proximal to each other, in order to be able to define a first perimeter boundary around a user-defined pool for industrial liquid, and

each of said plurality of perimeter-boundary segments is adapted to be coupled to a ground-level base structure;

a subkit for a liquid-containment pool expansion compensation grid network, comprised of a plurality of tie-bars and hub-pad assemblies, wherein

said grid network is adapted to couple opposing sides of said user-defined pool for industrial liquid, at the footing of opposing said perimeter-boundary segments,

such that outward expansion forces due to the increase of contained industrial liquids and/or increases in liquid temperature are effectively resisted,

said plurality of tie-bars is disposed across the base of said user-defined pool for industrial liquid in a crisscross pattern,

each pair of in-line tie-bars are coupled via an intervening hub-pad assembly, and

each hub-pad assembly comprises a thru-bar and a pass-through plate, hereinafter referred to as a cross-tie member, in order to facilitate the free movement of intersecting tie-bar lines so that intersecting tie-bar line do not interfere with each other; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the bottom surface, including said grid network, for a user-defined pool for liquid, said sheeting adapted to be extended over all of a user-defined first perimeter boundary,

wherein said liquid-impermeable sheeting is adapted to be secured at intervals on the non-liquid-side of said plurality of perimeter-boundary segments.

41. The liquid-containment system kit of claim 40, wherein each of said perimeter-boundary segments is substantially comprised of a material selected from the group consisting of wood, vulcanized rubber, fiberglass, UHMW, aluminum, steel, galvanized steel, and other high-tensile-strength, corrosion-resistant metal.

42. The liquid-containment system kit of claim 40 wherein each of said plurality of perimeter-boundary segments is adapted to be detachably coupled on each end to an adjacent perimeter-boundary segment.

43. The liquid-containment system kit of claim 40, wherein said liquid-impermeable sheeting is substantially comprised of a material selected from the group consisting of chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), and polypropylene.

44. The liquid-containment system kit of claim 40, wherein said liquid-impermeable sheeting is resistant to damage from ultra-violet rays.

45. The liquid-containment system kit of claim 40, further comprising components for a backup portable, modular, liquid-containment system kit, said backup liquid-containment system kit adapted to provide a second liquid-impermeable layer under

said user-defined pool for industrial liquid and to provide a second elevated perimeter boundary outside of said user-defined first perimeter boundary; the backup liquid-containment system kit comprising:

a plurality of elongated, substantially rigid curb members, wherein:

each of said curb members is comprised of sheet material,

each of said curb members is shaped to form a substantially inverted "V" channel when resting on the ground,

said shape of each of said curb members is adapted to facilitate the nestable stacking of one or more of said curb members in order to make storage and transport easier, and

said plurality of said curb members are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said curb members used to form a corner are proximal to each other, in order to be able to define a perimeter boundary around a target storage container of liquid; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the surface under and around a target storage container of liquid, said sheeting adapted to be extended over all of a second elevated perimeter boundary.

46. The liquid-containment system kit of claim 40, wherein said plurality of tie-bars for said liquid-containment pool expansion compensation grid network are straps or bars substantially comprised of material selected from the group consisting of steel, Zylon®, Dyneema®, and Williams® strand cable.

47. The liquid-containment system kit of claim 40, wherein said plurality of hub-pad assemblies for said liquid-containment pool expansion compensation grid network are comprised of:

a cross-tie member substantially made of a material selected from the group consisting of metal, UHMW, or other relatively low-friction material,

wherein each of the four ends of each said cross-tie member has an attachment point for a tie-bar attachment; and

a slide pad substantially made of a material selected from the group consisting of wood, plastic, UHMW, and other relatively low-friction material,

wherein said slide pad has four guide slots adapted to slidably receive pins

disposed in the cross-tie members.

48. The liquid-containment system kit of claim 47, wherein said slide pad is substantially coated with a low-friction material.

49. The liquid-containment system kit of claim 48, wherein said low-friction coating material is selected from the group consisting of PTFE, HDPE, and polyurethane.

50. A method of making a kit for a portable, modular, in-field modifiable, liquid-containment system, comprising:

providing a plurality of elongated perimeter-boundary segments, wherein:

said plurality of perimeter-boundary segments are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said perimeter-boundary segments used to form a corner are proximal to each other, in order to be able to define a first perimeter boundary around a user-defined pool for industrial liquid, and

each of said plurality of perimeter-boundary segments is adapted to be coupled to a ground-level base structure;

providing a subkit for a liquid-containment pool expansion compensation grid network, comprised of a plurality of tie-bars and hub-pad assemblies, wherein

said grid network is adapted to couple opposing sides of said user-defined pool for industrial liquid, at the footing of opposing said perimeter-boundary segments, such that outward expansion forces due to the increase of contained industrial liquids and/or increases in liquid temperature are effectively resisted,

said plurality of tie-bars is disposed across the base of said user-defined pool for industrial liquid in a crisscross pattern,

each pair of in-line tie-bars are coupled via an intervening hub-pad assembly, and

each hub-pad assembly comprises a thru-bar and a pass-through plate in order to facilitate the free movement of intersecting tie-bar lines so that intersecting tie-bar line do not interfere with each other; and

providing a continuous layer of liquid-impermeable sheeting adapted to be disposed over the bottom surface, including said grid network, for a user-defined pool for liquid, said sheeting adapted to be extended over all of a user-defined first perimeter boundary,

wherein said liquid-impermeable sheeting is adapted to be secured at intervals on the non-liquid-side of said plurality of perimeter-boundary segments.

51. The method of claim 50, wherein each of said perimeter-boundary segments is substantially comprised of a material selected from the group consisting of wood, vulcanized rubber, fiberglass, UHMW, aluminum, steel, galvanized steel, and other high-tensile-strength, corrosion-resistant metal.

52. The method of claim 50, wherein each of said plurality of perimeter-boundary segments is adapted to be detachably coupled on each end to an adjacent perimeter-boundary segment.

53. The method of claim 50, wherein said liquid-impermeable sheeting is substantially comprised of a material selected from the group consisting of chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), and polypropylene.

54. The method of claim 50, wherein said liquid-impermeable sheeting is resistant to damage from ultra-violet rays.

55. The method of claim 50, further comprising the step of providing components for a backup portable, modular, liquid-containment system kit, said backup liquid-containment system kit adapted to provide a second liquid-impermeable layer under said user-defined pool for industrial liquid and to provide a second elevated perimeter boundary outside of said user-defined first perimeter boundary; the backup liquid-containment system kit comprising:

a plurality of elongated, substantially rigid curb members, wherein:

each of said curb members is comprised of sheet material,

each of said curb members is shaped to form a substantially inverted "V" channel when resting on the ground,

said shape of each of said curb members is adapted to facilitate the nestable stacking of one or more of said curb members in order to make storage and transport easier, and

said plurality of said curb members are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said curb members used to form a corner are proximal to each other, in order to be able to define a

perimeter boundary around a target storage container of liquid; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the surface under and around a target storage container of liquid, said sheeting adapted to be extended over all of a second elevated perimeter boundary.

56. The method of claim 50, wherein said plurality of tie-bars for said liquid-containment pool expansion compensation grid network are straps or bars substantially comprised of material selected from the group consisting of steel, Zylon Zylon®, Dyneema®, and Williams® strand cable.

57. The method of claim 50, wherein said plurality of hub-pad assemblies for said liquid-containment pool expansion compensation grid network are comprised of:

a cross-tie member substantially made of a material selected from the group consisting of metal, UHMW, or other relatively low-friction material,

wherein each of the four ends of each said cross-tie member has an attachment point for a tie-bar attachment; and

a slide pad substantially made of a material selected from the group consisting of wood, plastic, UHMW, and other relatively low-friction material,

wherein said slide pad has four guide slots adapted to slidably receive pins disposed in the cross-tie members.

58. The method of claim 57, wherein said slide pad is substantially coated with a low-friction material.

59. The method of claim 58, wherein said low-friction coating material is selected from the group consisting of PTFE, HDPE, and polyurethane.

60. A portable, modular, in-field modifiable, liquid-containment system, comprising:

a plurality of elongated perimeter-boundary segments, wherein:

said plurality of perimeter-boundary segments are positioned substantially end-to-end, forming corners as necessary such that the ends of said perimeter-boundary segments used to form a corner are proximal to each other, in order to be able to define a first perimeter boundary around a user-defined pool for industrial liquid, and

each of said plurality of perimeter-boundary segments is adapted to be coupled to a ground-level base structure;

a liquid-containment pool expansion compensation grid network, comprised of a plurality of tie-bars and hub-pad assemblies, wherein

said grid network is adapted to couple opposing sides of said user-defined pool for industrial liquid, at the footing of opposing said perimeter-boundary segments, such that outward expansion forces due to the increase of contained industrial liquids and/or increases in liquid temperature are effectively resisted,

said plurality of tie-bars is disposed across the base of said user-defined pool for industrial liquid in a crisscross pattern,

each pair of in-line tie-bars are coupled via an intervening hub-pad assembly, and

each hub-pad assembly comprises a thru-bar and a pass-through plate, hereinafter referred to as a cross-tie member, in order to facilitate the free movement of intersecting tie-bar lines so that intersecting tie-bar line do not interfere with each other; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the bottom surface, including said grid network, for a user-defined pool for liquid, said sheeting adapted to be extended over all of a user-defined first perimeter boundary,

wherein said liquid-impermeable sheeting is adapted to be secured at intervals on the non-liquid-side of said plurality of perimeter-boundary segments.

61. The liquid-containment system of claim 60, wherein each of said perimeter-boundary segments is substantially comprised of a material selected from the group consisting of wood, vulcanized rubber, fiberglass, UHMW, aluminum, steel, galvanized steel, and other high-tensile-strength, corrosion-resistant metal.

62. The liquid-containment system of claim 60 wherein each of said plurality of perimeter-boundary segments is adapted to be detachably coupled on each end to an adjacent perimeter-boundary segment.

63. The liquid-containment system of claim 60, wherein said liquid-impermeable sheeting is substantially comprised of a material selected from the group consisting of chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), and polypropylene.

64. The liquid-containment system kit of claim 60, wherein said liquid-impermeable sheeting is resistant to damage from ultra-violet rays.

65. The liquid-containment system of claim 60, further comprising components for a backup portable, modular, liquid-containment system, said backup liquid-containment system adapted to provide a second liquid-impermeable layer under said user-defined pool for industrial liquid and to provide a second elevated perimeter boundary outside of said user-defined first perimeter boundary; the backup liquid-containment system comprising:

a plurality of elongated, substantially rigid curb members, wherein:

each of said curb members is comprised of sheet material,

each of said curb members is shaped to form a substantially inverted "V" channel when resting on the ground,

said shape of each of said curb members is adapted to facilitate the nestable stacking of one or more of said curb members in order to make storage and transport easier, and

said plurality of said curb members are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said curb members used to form a corner are proximal to each other, in order to be able to define a perimeter boundary around a target storage container of liquid; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the surface under and around a target storage container of liquid, said sheeting adapted to be extended over all of a second elevated perimeter boundary.

66. The liquid-containment system of claim 60, wherein said plurality of tie-bars for said liquid-containment pool expansion compensation grid network are straps or bars substantially comprised of material selected from the group consisting of steel, Zylon®, Dyneema®, and Williams® strand cable.

67. The liquid-containment system of claim 60, wherein said plurality of hub-pad assemblies for said liquid-containment pool expansion compensation grid network are comprised of:

a cross-tie member substantially made of a material selected from the group consisting of metal, UHMW, or other relatively low-friction material,

wherein each of the four ends of each said cross-tie member has an attachment point for a tie-bar attachment; and

a slide pad substantially made of a material selected from the group consisting of wood, plastic, UHMW, and other relatively low-friction material,

wherein said slide pad has four guide slots adapted to slidably receive pins disposed in the cross-tie members.

68. The liquid-containment system of claim 67, wherein said slide pad is substantially coated with a low-friction material.

69. The liquid-containment system of claim 68, wherein said low-friction coating material is selected from the group consisting of PTFE, HDPE, and polyurethane.

70. A kit for a portable, modular, in-field modifiable, liquid-containment system, comprising:

a plurality of elongated, substantially A-framed segments, wherein:

each side of each said substantially A-framed segments making up said A-frame has at least one purlin disposed substantially along the length of said purlin's associated A-frame segment,

each of said substantially A-framed segments is configured to have a plurality of structural supports to be installed between internal sides of substantially A-framed segment sides such that said substantially A-frame shape can be maintained as loads are exerted upon said substantially A-framed segment,

each of said substantially A-framed segments is restorably collapsible in order to facilitate the stacking of said segments, to make storage and transport easier, and

said plurality of substantially A-framed segments are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said substantially A-framed segments used to form a corner are proximal to each other, in order to be able to define a first perimeter boundary around a user-defined pool for industrial liquid;

a plurality of pliable load-bearing panels, each adapted to be installed on an intended liquid-containing side of an A-framed segment;

a subkit for a liquid-containment pool expansion compensation grid network, comprised

of a plurality of tie-bars and hub-pad assemblies, wherein

said grid network is adapted to couple opposing sides of said user-defined pool for industrial liquid, at the footing of opposing said substantially A-framed segments, such that outward expansion forces due to the increase of contained industrial liquids and/or increases in liquid temperature are effectively resisted,

said plurality of tie-bars is disposed across the base of said user-defined pool for industrial liquid in a crisscross pattern,

each pair of in-line tie-bars are coupled via an intervening hub-pad assembly, and

each hub-pad assembly comprises a thru-bar and a pass-through plate, hereinafter referred to as a cross-tie member, in order to facilitate the free movement of intersecting tie-bar lines so that intersecting tie-bar line do not interfere with each other; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the bottom surface for a user-defined pool for liquid, said sheeting adapted to be extended over all of a user-defined first perimeter boundary,

wherein said liquid-impermeable sheeting is adapted to be secured at intervals on the non-liquid-side of said plurality of substantially A-framed segments.

71. The liquid-containment system kit of claim 70, wherein:

each of said plurality of load-bearing panels is selected from the group consisting of fabric, cargo netting, and variable-sized welded wire mesh; and

each said pliable load-bearing panel is adapted to transfer the weight of contained liquid via said liquid-impermeable sheeting into a downward force exerted on said at least one purlin, thereby providing a stabilizing ballast for the associated substantially A-framed segment.

72. The liquid-containment system kit of claim 70, wherein each of said substantially A-framed segments is substantially comprised of a material selected from the group consisting of wood, vulcanized rubber, fiberglass, UHMW, aluminum, steel, galvanized steel, and other high-tensile-strength, corrosion-resistant metal.

73. The liquid-containment system kit of claim 70, wherein said restorable collapsibility of each of said substantially A-framed segments is accomplished with hinges disposed at or near the apex of each of said substantially A-framed segments.

74. The liquid-containment system kit of claim 70, wherein each of said plurality of substantially A-framed segments is adapted to be detachably coupled on each end to an adjacent substantially A-framed segment.

75. The liquid-containment system kit of claim 70, wherein said liquid-impermeable sheeting is substantially comprised of a material selected from the group consisting of chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), and polypropylene.

76. The liquid-containment system kit of claim 70, wherein said liquid-impermeable sheeting is resistant to damage from ultra-violet rays.

77. The liquid-containment system kit of claim 70, wherein the two main sides of each of said substantially A-framed segments form an angle of 60° ±5° at the intersection of said sides.

78. The liquid-containment system kit of claim 70, further comprising a plurality of pairs of mated substantially rigid corner A-framed segments adapted to substantially form a predetermined angle at the point where the corner A-framed segment of each of said mated pairs is substantially buttressed to the other at the predetermined angled mating edges, wherein:

each of said corner A-framed segments is has substantially rigid cladding over said at least one purlin on said intended liquid-containing side of said corner A-framed segment;

said shape of each of said corner A-framed segments is restorably collapsible in order to facilitate the stacking of A-framed segments, to make storage and transport easier; and

the non-angled end of each of said plurality of said corner A-framed segments is adapted to be positioned substantially end-to-end with an adjacent said A-framed segment in order to help define a perimeter boundary around a user-defined pool for industrial liquid.

79. The liquid-containment system kit of claim 78, wherein each of said mated pairs of corner A-framed segments is adapted to be detachably coupled to a ground-level rigid ballast member, said ballast member adapted to hold each of the corner A-framed segments of a mated pair of corner A-framed segments in position at said predetermined angle.

80. The liquid-containment system kit of claim 79, wherein each said ballast member is substantially made of a material selected from the group consisting of aluminum, precast concrete, aluminum alloy, steel, hard plastic, wood products, and fiberglass.

81. The liquid-containment system kit of claim 79, wherein:

each said ballast member contains a weighting material to help anchor each said ballast member and its associated corner A-framed segments in place on the ground; and

each said ballast member is weighted with a material selected from the group consisting of concrete, dirt, water, and metal.

82. The liquid-containment system kit of claim 70, further comprising components for a backup portable, modular, liquid-containment system kit, said backup liquid-containment system kit adapted to provide a second liquid-impermeable layer under said user-defined pool for industrial liquid and to provide a second elevated perimeter boundary outside of said user-defined first perimeter boundary; the backup liquid-containment system kit comprising:

a plurality of elongated, substantially rigid curb members, wherein:

each of said curb members is comprised of sheet material,

each of said curb members is shaped to form a substantially inverted "V" channel when resting on the ground,

said shape of each of said curb members is adapted to facilitate the nestable stacking of one or more of said curb members in order to make storage and transport easier, and

said plurality of said curb members are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said curb members used to form a corner are proximal to each other, in order to be able to define a perimeter boundary around a target storage container of liquid; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the surface under and around a target storage container of liquid, said sheeting adapted to be extended over all of a second elevated perimeter boundary.

83. The liquid-containment system kit of claim 70, wherein said plurality of tie-bars for said liquid-containment pool expansion compensation grid network are straps or bars substantially comprised of material selected from the group consisting of steel, Zylon®,

Dyneema®, and Williams® strand cable.

84. The liquid-containment system kit of claim 70, wherein said plurality of hub-pad assemblies for said liquid-containment pool expansion compensation grid network are comprised of:

a cross-tie member substantially made of a material selected from the group consisting of metal, UHMW, or other relatively low-friction material,

wherein each of the four ends of each said cross-tie member has an attachment point for a tie-bar attachment; and

a slide pad substantially made of a material selected from the group consisting of wood, plastic, UHMW, and other relatively low-friction material,

wherein said slide pad has four guide slots adapted to slidably receive pins disposed in the cross-tie members.

85. The liquid-containment system kit of claim 84, wherein said slide pad is substantially coated with a low-friction material.

86. The liquid-containment system kit of claim 85, wherein said low-friction coating material is selected from the group consisting of PTFE, HDPE, and polyurethane.

87. A method of making a kit for a portable, modular, in-field modifiable, liquid-containment system, comprising:

providing a plurality of elongated, substantially A-framed segments, wherein:

each side of each said substantially A-framed segments making up said A-frame has at least one purlin disposed substantially along the length of said purlin's associated A-frame segment,

each of said substantially A-framed segments is configured to have a plurality of structural supports to be installed between internal sides of substantially A-framed segment sides such that said substantially A-frame shape can be maintained as loads are exerted upon said substantially A-framed segment,

each of said substantially A-framed segments is restorably collapsible in order to facilitate the stacking of said segments, to make storage and transport easier, and

said plurality of substantially A-framed segments are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said

substantially A-framed segments used to form a corner are proximal to each other, in order to be able to define a first perimeter boundary around a user-defined pool for industrial liquid;

providing a plurality of pliable load-bearing panels, each adapted to be installed on an intended liquid-containing side of an A-framed segment;

providing a subkit for a liquid-containment pool expansion compensation grid network, comprised of a plurality of tie-bars and hub-pad assemblies, wherein

said grid network is adapted to couple opposing sides of said user-defined pool for industrial liquid, at the footing of opposing said substantially A-framed segments, such that outward expansion forces due to the increase of contained industrial liquids and/or increases in liquid temperature are effectively resisted,

said plurality of tie-bars is disposed across the base of said user-defined pool for industrial liquid in a crisscross pattern,

each pair of in-line tie-bars are coupled via an intervening hub-pad assembly, and

each hub-pad assembly comprises a thru-bar and a pass-through plate, hereinafter referred to as a cross-tie member, in order to facilitate the free movement of intersecting tie-bar lines so that intersecting tie-bar line do not interfere with each other; and

providing a continuous layer of liquid-impermeable sheeting adapted to be disposed over the bottom surface for a user-defined pool for liquid, said sheeting adapted to be extended over all of a user-defined first perimeter boundary,

wherein said liquid-impermeable sheeting is adapted to be secured at intervals on the non-liquid-side of said plurality of substantially A-framed segments.

88. The method of claim 87, wherein:

each of said plurality of load-bearing panels is selected from the group consisting of fabric, cargo netting, and variable-sized welded wire mesh; and

each said pliable load-bearing panel is adapted to transfer the weight of contained liquid via said liquid-impermeable sheeting into a downward force exerted on said at least one purlin, thereby providing a stabilizing ballast for the associated substantially A-framed segment.

89. The method of claim 87, wherein each of said substantially A-framed segments is

substantially comprised of a material selected from the group consisting of wood, vulcanized rubber, fiberglass, UHMW, aluminum, steel, galvanized steel, and other high-tensile-strength, corrosion-resistant metal.

90. The method claim 87, wherein said restorable collapsibility of each of said substantially A-framed segments is accomplished with hinges disposed at or near the apex of each of said substantially A-framed segments.

91. The method of claim 87, wherein each of said plurality of substantially A-framed segments is adapted to be detachably coupled on each end to an adjacent substantially A-framed segment.

92. The method of claim 87, wherein said liquid-impermeable sheeting is substantially comprised of a material selected from the group consisting of chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), and polypropylene.

93. The method of claim 87, wherein said liquid-impermeable sheeting is resistant to damage from ultra-violet rays.

94. The method of claim 87, wherein the two main sides of each of said substantially A-framed segments form an angle of 60° ±5° at the intersection of said sides.

95. The method of claim 87, further comprising a providing a plurality of pairs of mated substantially rigid corner A-framed segments adapted to substantially form a predetermined angle at the point where the corner A-framed segment of each of said mated pairs is substantially buttressed to the other at the predetermined angled mating edges, wherein:

each of said corner A-framed segments is has substantially rigid cladding over said at least one purlin on said intended liquid-containing side of said corner A-framed segment;

said shape of each of said corner A-framed segments is restorably collapsible in order to facilitate the stacking of A-framed segments, to make storage and transport easier; and

the non-angled end of each of said plurality of said corner A-framed segments is adapted to be positioned substantially end-to-end with an adjacent said A-framed segment in order to help define a perimeter boundary around a user-defined pool for industrial liquid.

96. The method of claim 95, wherein each of said mated pairs of corner A-framed segments is adapted to be detachably coupled to a ground-level rigid ballast member, said ballast member adapted to hold each of the corner A-framed segments of a mated pair of corner A-framed segments in position at said predetermined angle.

97. The method of claim 96, wherein each said ballast member is substantially made of a material selected from the group consisting of aluminum, precast concrete, aluminum alloy, steel, hard plastic, wood products, and fiberglass.

98. The method of claim 96, wherein:

each said ballast member contains a weighting material to help anchor each said ballast member and its associated corner A-framed segments in place on the ground; and

each said ballast member is weighted with a material selected from the group consisting of concrete, dirt, water and metal.

99. The method of claim 87, further comprising providing components for a backup portable, modular, liquid-containment system kit, said backup liquid-containment system kit adapted to provide a second liquid-impermeable layer under said user-defined pool for industrial liquid and to provide a second elevated perimeter boundary outside of said user-defined first perimeter boundary; the backup liquid-containment system kit comprising:

a plurality of elongated, substantially rigid curb members, wherein:

each of said curb members is comprised of sheet material,

each of said curb members is shaped to form a substantially inverted "V" channel when resting on the ground,

said shape of each of said curb members is adapted to facilitate the nestable stacking of one or more of said curb members in order to make storage and transport easier, and

said plurality of said curb members are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said curb members used to form a corner are proximal to each other, in order to be able to define a perimeter boundary around a target storage container of liquid; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the surface under and around a target storage container of liquid, said sheeting adapted to

be extended over all of a second elevated perimeter boundary.

100. The method of claim 87, wherein said plurality of tie-bars for said liquid-containment pool expansion compensation grid network are straps or bars substantially comprised of material selected from the group consisting of steel, Zylon®, Dyneema®, and Williams® strand cable.

101. The method of claim 87, wherein said plurality of hub-pad assemblies for said liquid-containment pool expansion compensation grid network are comprised of:

a cross-tie member substantially made of a material selected from the group consisting of metal, UHMW, or other relatively low-friction material,

wherein each of the four ends of each said cross-tie member has an attachment point for a tie-bar attachment; and

a slide pad substantially made of a material selected from the group consisting of wood, plastic, UHMW, and other relatively low-friction material,

wherein said slide pad has four guide slots adapted to slidably receive pins disposed in the cross-tie members.

102. The liquid-containment system kit of claim 101, wherein said slide pad is substantially coated with a low-friction material.

103. The method of claim 102, wherein said low-friction coating material is selected from the group consisting of PTFE, HDPE, and polyurethane.

104. A portable, modular, in-field modifiable, liquid-containment system, comprising:

a plurality of elongated, substantially A-framed segments, wherein:

each side of each said substantially A-framed segments making up said A-frame has at least one purlin disposed substantially along the length of said purlin's associated A-frame segment,

each of said substantially A-framed segments is configured to have a plurality of structural supports to be installed between internal sides of substantially A-framed segment sides such that said substantially A-frame shape can be maintained as loads are exerted upon said substantially A-framed segment,

each of said substantially A-framed segments is restorably collapsible in order to

facilitate the stacking of said segments, to make storage and transport easier, and

said plurality of substantially A-framed segments are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said substantially A-framed segments used to form a corner are proximal to each other, in order to be able to define a first perimeter boundary around a user-defined pool for industrial liquid;

a plurality of pliable load-bearing panels, each adapted to be installed on an intended liquid-containing side of an A-framed segment;

a liquid-containment pool expansion compensation grid network, comprised of a plurality of tie-bars and hub-pad assemblies, wherein

said grid network is adapted to couple opposing sides of said user-defined pool for industrial liquid, at the footing of opposing said substantially A-framed segments, such that outward expansion forces due to the increase of contained industrial liquids and/or increases in liquid temperature are effectively resisted,

said plurality of tie-bars is disposed across the base of said user-defined pool for industrial liquid in a crisscross pattern,

each pair of in-line tie-bars are coupled via an intervening hub-pad assembly, and

each hub-pad assembly comprises a thru-bar and a pass-through plate, hereinafter referred to as a cross-tie member, in order to facilitate the free movement of intersecting tie-bar lines so that intersecting tie-bar line do not interfere with each other; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the bottom surface for a user-defined pool for liquid, said sheeting adapted to be extended over all of a user-defined first perimeter boundary,

wherein said liquid-impermeable sheeting is adapted to be secured at intervals on the non-liquid-side of said plurality of substantially A-framed segments.

105. The liquid-containment system of claim 104, wherein:

each of said plurality of load-bearing panels is selected from the group consisting of fabric, cargo netting, and variable-sized welded wire mesh; and

each said pliable load-bearing panel is adapted to transfer the weight of contained liquid via said liquid-impermeable sheeting into a downward force exerted on said at least one

purlin, thereby providing a stabilizing ballast for the associated substantially A-framed segment.

106. The liquid-containment system of claim 104, wherein each of said substantially A-framed segments is substantially comprised of a material selected from the group consisting of wood, vulcanized rubber, fiberglass, UHMW, aluminum, steel, galvanized steel, and other high-tensile-strength, corrosion-resistant metal.

107. The liquid-containment system of claim 104, wherein said restorable collapsibility of each of said substantially A-framed segments is accomplished with hinges disposed at or near the apex of each of said substantially A-framed segments.

108. The liquid-containment system of claim 104, wherein each of said plurality of substantially A-framed segments is adapted to be detachably coupled on each end to an adjacent substantially A-framed segment.

109. The liquid-containment system of claim 104, wherein said liquid-impermeable sheeting is substantially comprised of a material selected from the group consisting of chlorosulfonated polyethelene (CSPE), high-density polyethylene (HDPE), and polypropylene.

110. The liquid-containment system of claim 104, wherein said liquid-impermeable sheeting is resistant to damage from ultra-violet rays.

111. The liquid-containment system of claim 104, wherein the two main sides of each of said substantially A-framed segments form an angle of 60° ±5° at the intersection of said sides.

112. The liquid-containment system of claim 104, further comprising a plurality of pairs of mated substantially rigid corner A-framed segments adapted to substantially form a predetermined angle at the point where the corner A-framed segment of each of said mated pairs is substantially buttressed to the other at the predetermined angled mating edges, wherein:

each of said corner A-framed segments is has substantially rigid cladding over said at least one purlin on said intended liquid-containing side of said corner A-framed segment;

said shape of each of said corner A-framed segments is resorably collapsible in order to

facilitate the stacking of A-framed segments, to make storage and transport easier; and

the non-angled end of each of said plurality of said corner A-framed segments is adapted to be positioned substantially end-to-end with an adjacent said A-framed segment in order to help define a perimeter boundary around a user-defined pool for industrial liquid.

113. The liquid-containment system of claim 112, wherein each of said mated pairs of corner A-framed segments is adapted to be detachably coupled to a ground-level rigid ballast member, said ballast member adapted to hold each of the corner A-framed segments of a mated pair of corner A-framed segments in position at said predetermined angle.

114. The liquid-containment system of claim 113, wherein each said ballast member is substantially made of a material selected from the group consisting of aluminum, precast concrete, aluminum alloy, steel, hard plastic, wood products, and fiberglass.

115. The liquid-containment system of claim 113, wherein:

each said ballast member contains a weighting material to help anchor each said ballast member and its associated corner A-framed segments in place on the ground; and

each said ballast member is weighted with a material selected from the group consisting of concrete, dirt, water, and metal.

116. The liquid-containment system of claim 104, further comprising components for a backup portable, modular, liquid-containment system kit, said backup liquid-containment system kit adapted to provide a second liquid-impermeable layer under said user-defined pool for industrial liquid and to provide a second elevated perimeter boundary outside of said user-defined first perimeter boundary; the backup liquid-containment system kit comprising:

a plurality of elongated, substantially rigid curb members, wherein:

each of said curb members is comprised of sheet material,

each of said curb members is shaped to form a substantially inverted “V” channel when resting on the ground,

said shape of each of said curb members is adapted to facilitate the nestable stacking of one or more of said curb members in order to make storage and transport easier, and

said plurality of said curb members are adapted to be positioned substantially end-to-end, forming corners as necessary such that the ends of said curb members used to form a corner are proximal to each other, in order to be able to define a perimeter boundary around a target storage container of liquid; and

a continuous layer of liquid-impermeable sheeting adapted to be disposed over the surface under and around a target storage container of liquid, said sheeting adapted to be extended over all of a second elevated perimeter boundary.

117. The liquid-containment system of claim 104, wherein said plurality of tie-bars for said liquid-containment pool expansion compensation grid network are straps or bars substantially comprised of material selected from the group consisting of steel, Zylon®, Dyneema®, and Williams® strand cable.

118. The liquid-containment system of claim 104, wherein said plurality of hub-pad assemblies for said liquid-containment pool expansion compensation grid network are comprised of:

a cross-tie member substantially made of a material selected from the group consisting of metal, UHMW, or other relatively low-friction material,

wherein each of the four ends of each said cross-tie member has an attachment point for a tie-bar attachment; and

a slide pad substantially made of a material selected from the group consisting of wood, plastic, UHMW, and other relatively low-friction material,

wherein said slide pad has four guide slots adapted to slidably receive pins disposed in the cross-tie members.

119. The liquid-containment system of claim 118, wherein said slide pad is substantially coated with a low-friction material.

120. The liquid-containment system of claim 119, wherein said low-friction coating material is selected from the group consisting of PTFE, HDPE, and polyurethane.

121. The liquid-containment system of claim 27, wherein said plurality of coupled substantially A-framed segments form an elongated cavity within said first perimeter boundary structure, further comprising heating equipment to prevent the formation of ice along said first perimeter boundary.

122. The liquid-containment system of claim 121, wherein said heating equipment is selected from the group comprising forced-air heating and heat-tracing tape.

123. The liquid-containment system of claim 104, wherein said plurality of coupled substantially A-framed segments form an elongated cavity within said first perimeter boundary structure, further comprising heating equipment to prevent the formation of ice along said first perimeter boundary.

124. The liquid-containment system of claim 123, wherein said heating equipment is selected from the group comprising forced-air heating and heat-tracing tape.

125. The liquid-containment system of claim 27, further comprising at least one substantially A-framed auxiliary equipment support member, sized to be positioned to straddle over said first perimeter boundary without making direct contact with said first perimeter boundary comprised of said plurality of substantially A-framed segments, wherein:

said auxiliary equipment support member has an equipment-support platform disposed at the top of said auxiliary equipment support member; and

said auxiliary equipment support member has a ladder or set of stair steps for personnel access to said equipment-support platform.

126. The liquid-containment system of claim 60, further comprising at least one substantially A-framed auxiliary equipment-support member, sized to be positioned to straddle over said first perimeter boundary without making direct contact with said first perimeter boundary comprised of said plurality of perimeter-boundary segments, wherein:

said auxiliary equipment support member has an equipment-support platform disposed at the top of said auxiliary equipment support member; and

said auxiliary equipment support member has a ladder or set of stair steps for personnel access to said equipment-support platform.

127. The liquid-containment system of claim 104, further comprising at least one substantially A-framed auxiliary equipment support member, sized to be positioned to straddle over said first perimeter boundary without making direct contact with said first perimeter boundary comprised of said plurality of substantially A-framed segments, wherein:

said auxiliary equipment support member has an equipment-support platform disposed

at the top of said auxiliary equipment support member; and

said auxiliary equipment support member has a ladder or set of stair steps for personnel access to said equipment-support platform.

128. A method of using at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 13, comprising the steps of:

obtaining at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 13;

installing at least two adjacent industrial-liquid-containment reservoirs, including an outer secondary containment system, using said at least one kit;

designating one of said industrial-liquid-containment reservoirs as a repository for clean for industrial use;

designating one of said industrial-liquid-containment reservoirs as a repository for potentially contaminated industrial-waste water for industrial use and/or reclamation processes;

installing at least one substantially A-framed auxiliary equipment-support member for each said industrial-liquid-containment reservoirs, sized to be positioned to straddle over its respective first perimeter boundary without making direct contact with its respective first perimeter boundary comprised of said plurality of substantially A-framed segments, wherein:

at least one said auxiliary equipment-support member has an equipment-support platform disposed at the top of said auxiliary equipment support member;

installing via said at least one substantially A-framed auxiliary equipment-support member at least one pipe or hose dedicated to facilitating the introduction of liquids into said associated liquid-containment reservoir;

installing via said at least one substantially A-framed auxiliary equipment-support member at least one pipe or hose dedicated to the removal of liquids from said associated liquid-containment reservoir; and

installing for each said hose or pipe, at least one in-line control valve and pumping device to facilitate the transfer of liquids.

129. The method of claim 128, wherein said in-line control valves and pumping devices can be electrically controlled form a remote location relative to said industrial-liquid-

containment reservoirs.

130. The method of claim 129, wherein:

said industrial-liquid-containment reservoirs are centrally located relative to a plurality of satellite industrial complexes that use clean water and/or generate potentially - contaminated industrial liquid waste; and

each of said plurality of satellite industrial complexes has at least one industrial-liquid storage system that is communicatively coupled to said at least one liquid-containment reservoirs via a network of hoses and/or piping systems, including said in-line control valves and pumping devices;

said method further comprising the steps of:

as needed, transferring clean water from said centrally located industrial-liquid-containment reservoir to a satellite industrial complex via said network of hoses and/or piping systems; and

as needed, transferring industrial-waste liquids from a satellite industrial complex to said centrally located industrial-liquid-containment reservoir via said network of hoses and/or piping systems.

131. The method of claim 128, wherein:

said industrial-liquid-containment reservoirs are centrally located relative to a industrial-liquids truck load and offload station, said station communicatively coupled to said hoses and/or pipes dedicated to removal and/or introduction of said industrial liquids; and

said industrial-liquids truck load and offload station is adapted to receive an industrial truck for loading or offloading industrial liquids;

said method further comprising the steps of:

as needed, transferring clean water from said centrally located industrial-liquid-containment reservoir to an industrial truck;

as needed, transferring industrial liquids from said centrally located industrial-liquid-containment reservoir to an industrial truck;

as needed, transferring clean water from and industrial truck to said centrally located industrial-liquid-containment reservoir; and

as needed, transferring industrial-waste liquids from an industrial truck to said centrally located industrial-liquid-containment reservoir.

132. The method of claim 128, wherein:

said industrial-liquid-containment reservoirs are centrally located relative to a industrial-liquids purification system, said purification system communicatively coupled to each of said dedicated reservoir for clean-water and said reservoir dedicated for potentially contaminated industrial-waste water;

the method further comprising the steps of:

aligning said purification system to draw potentially contaminated industrial waste water from said dedicated reservoir;

aligning said purification system to discharge purified or "clean" water to said dedicated reservoir for said clean water;

purifying drawn potentially contaminated industrial-waste water; and

discharging purified (clean) water into said reservoir dedicated to said clean water.

133. A method of using at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 1, comprising the steps of:

obtaining at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 1;

transporting said kit, in its collapsed, stowed mode, to a user-defined location;

installing at least one industrial-liquid-containment reservoir using said kit at said user-defined location;

when no longer needed, draining, then disassembling said industrial-liquid-containment reservoir,

wherein said reservoir components from said kit are placed in a collapsed and stowed mode;

transporting said collapsed and stowed kit to a user-designated location.

134. The method of claim 133, further comprising the step of leasing said kit to an end-user for a period of time.

135. The method of claim 133, further comprising the step of selling said kit to an end-user.

136. A method of using at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 45, comprising the steps of:

obtaining at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 45;

installing at least two adjacent industrial-liquid-containment reservoirs, including an outer secondary containment system, using said at least one kit;

designating one of said industrial-liquid-containment reservoirs as a repository for clean for industrial use;

designating one of said industrial-liquid-containment reservoirs as a repository for potentially contaminated industrial-waste water for industrial use and/or reclamation processes;

installing at least one substantially A-framed auxiliary equipment-support member for each said industrial-liquid-containment reservoirs, sized to be positioned to straddle over its respective first perimeter boundary without making direct contact with its respective first perimeter boundary comprised of said plurality of elongated perimeter segments, wherein:

at least one said auxiliary equipment-support member has an equipment-support platform disposed at the top of said auxiliary equipment support member;

installing via said at least one substantially A-framed auxiliary equipment-support member at least one pipe or hose dedicated to facilitating the introduction of liquids into said associated liquid-containment reservoir;

installing via said at least one substantially A-framed auxiliary equipment-support member at least one pipe or hose dedicated to the removal of liquids from said associated liquid-containment reservoir; and

installing for each said hose or pipe, at least one in-line control valve and pumping device to facilitate the transfer of liquids.

137. The method of claim 136, wherein said in-line control valves and pumping devices can be electrically controlled form a remote location relative to said industrial-liquid-containment reservoirs.

138. The method of claim 137, wherein:

said industrial-liquid-containment reservoirs are centrally located relative to a plurality

of satellite industrial complexes that use clean water and/or generate potentially - contaminated industrial liquid waste; and

each of said plurality of satellite industrial complexes has at least one industrial-liquid storage system that is communicatively coupled to said at least one liquid-containment reservoirs via a network of hoses and/or piping systems, including said in-line control valves and pumping devices;

said method further comprising the steps of:

as needed, transferring clean water from said centrally located industrial-liquid-containment reservoir to a satellite industrial complex via said network of hoses and/or piping systems; and

as needed, transferring industrial-waste liquids from a satellite industrial complex to said centrally located industrial-liquid-containment reservoir via said network of hoses and/or piping systems.

139. The method of claim 136, wherein:

said industrial-liquid-containment reservoirs are centrally located relative to a industrial-liquids truck load and offload station, said station communicatively coupled to said hoses and/or pipes dedicated to removal and/or introduction of said industrial liquids; and

said industrial-liquids truck load and offload station is adapted to receive an industrial truck for loading or offloading industrial liquids;

said method further comprising the steps of:

as needed, transferring clean water from said centrally located industrial-liquid-containment reservoir to an industrial truck;

as needed, transferring industrial liquids from said centrally located industrial-liquid-containment reservoir to an industrial truck;

as needed, transferring clean water from and industrial truck to said centrally located industrial-liquid-containment reservoir; and

as needed, transferring industrial-waste liquids from an industrial truck to said centrally located industrial-liquid-containment reservoir.

140. The method of claim 136, wherein:

said industrial-liquid-containment reservoirs are centrally located relative to a industrial-liquids purification system, said purification system communicatively coupled to each of said dedicated reservoir for clean-water and said reservoir dedicated for potentially contaminated industrial-waste water;

the method further comprising the steps of:

aligning said purification system to draw potentially contaminated industrial waste water from said dedicated reservoir;

aligning said purification system to discharge purified or "clean" water to said dedicated reservoir for said clean water;

purifying drawn potentially contaminated industrial-waste water; and

discharging purified (clean) water into reservoir dedicated to said clean water.

141. A method of using at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 40, comprising the steps of:

obtaining at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 40;

transporting said kit, in its collapsed, stowed mode, to a user-defined location;

installing at least one industrial-liquid-containment reservoir using said kit at said user-defined location;

when no longer needed, draining, then disassembling said industrial-liquid-containment reservoir,

wherein said reservoir components from said kit are placed in a collapsed and stowed mode;

transporting said collapsed and stowed kit to a user-designated location.

142. The method of claim 141, further comprising the step of leasing said kit to an end-user for a period of time.

143. The method of claim 141, further comprising the step of selling said kit to an end-user.

144. A method of using at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 70, comprising the steps of:

obtaining at least one kit for a portable, modular, in-field modifiable, liquid-

containment system according to claim 70;

installing at least two adjacent industrial-liquid-containment reservoirs, including an outer secondary containment system, using said at least one kit;

designating one of said industrial-liquid-containment reservoirs as a repository for clean for industrial use;

designating one of said industrial-liquid-containment reservoirs as a repository for potentially contaminated industrial-waste water for industrial use and/or reclamation processes;

installing at least one substantially A-framed auxiliary equipment-support member for each said industrial-liquid-containment reservoirs, sized to be positioned to straddle over its respective first perimeter boundary without making direct contact with its respective first perimeter boundary comprised of said plurality of substantially A-framed segments, wherein:

at least one said auxiliary equipment-support member has an equipment-support platform disposed at the top of said auxiliary equipment support member;

installing via said at least one substantially A-framed auxiliary equipment-support member at least one pipe or hose dedicated to facilitating the introduction of liquids into said associated liquid-containment reservoir;

installing via said at least one substantially A-framed auxiliary equipment-support member at least one pipe or hose dedicated to the removal of liquids from said associated liquid-containment reservoir; and

installing for each said hose or pipe, at least one in-line control valve and pumping device to facilitate the transfer of liquids.

145. The method of claim 144, wherein said in-line control valves and pumping devices can be electrically controlled form a remote location relative to said industrial-liquid-containment reservoirs.

146. The method of claim 145, wherein:

said industrial-liquid-containment reservoirs are centrally located relative to a plurality of satellite industrial complexes that use clean water and/or generate potentially - contaminated industrial liquid waste; and

each of said plurality of satellite industrial complexes has at least one industrial-liquid

storage system that is communicatively coupled to said at least one liquid-containment reservoirs via a network of hoses and/or piping systems, including said in-line control valves and pumping devices;

said method further comprising the steps of:

as needed, transferring clean water from said centrally located industrial-liquid-containment reservoir to a satellite industrial complex via said network of hoses and/or piping systems; and

as needed, transferring industrial-waste liquids from a satellite industrial complex to said centrally located industrial-liquid-containment reservoir via said network of hoses and/or piping systems.

147. The method of claim 144, wherein:

said industrial-liquid-containment reservoirs are centrally located relative to a industrial-liquids truck load and offload station, said station communicatively coupled to said hoses and/or pipes dedicated to removal and/or introduction of said industrial liquids; and

said industrial-liquids truck load and offload station is adapted to receive an industrial truck for loading or offloading industrial liquids;

said method further comprising the steps of:

as needed, transferring clean water from said centrally located industrial-liquid-containment reservoir to an industrial truck;

as needed, transferring industrial liquids from said centrally located industrial-liquid-containment reservoir to an industrial truck;

as needed, transferring clean water from and industrial truck to said centrally located industrial-liquid-containment reservoir; and

as needed, transferring industrial-waste liquids from an industrial truck to said centrally located industrial-liquid-containment reservoir.

148. The method of claim 144, wherein:

said industrial-liquid-containment reservoirs are centrally located relative to a industrial-liquids purification system, said purification system communicatively coupled to each of said dedicated reservoir for clean-water and said reservoir dedicated

for potentially contaminated industrial-waste water;

the method further comprising the steps of:

aligning said purification system to draw potentially contaminated industrial waste water from said dedicated reservoir;

aligning said purification system to discharge purified or "clean" water to said dedicated reservoir for said clean water;

purifying drawn potentially contaminated industrial-waste water; and

discharging purified (clean) water into said reservoir dedicated to said clean water.

149. A method of using at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 70, comprising the steps of:

obtaining at least one kit for a portable, modular, in-field modifiable, liquid-containment system according to claim 70;

transporting said kit, in its collapsed, stowed mode, to a user-defined location;

installing at least one industrial-liquid-containment reservoir using said kit at said user-defined location;

when no longer needed, draining, then disassembling said industrial-liquid-containment reservoir,

wherein said reservoir components from said kit are placed in a collapsed and stowed mode;

transporting said collapsed and stowed kit to a user-designated location.

150. The method of claim 149, further comprising the step of leasing said kit to an end-user for a period of time.

151. The method of claim 149, further comprising the step of selling said kit to an end-user.

152. A method of using a portable, modular, in-field modifiable, liquid-containment system according to claim 27, comprising the step of adapting said liquid-containment system for use to include one or more reservoirs for use to collect and manage industrial liquids in an industry selected from the list consisting of the oil & gas exploration industry, the mining industry, the fish-farming industry, water & sewage treatment industry, the agriculture-waste pond industry, and the aqua-culture industry.

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153. A method of using a portable, modular, in-field modifiable, liquid-containment system according to claim 60, comprising the step of adapting said liquid-containment system for use to include one or more reservoirs for use to collect and manage industrial liquids in an industry selected from the list consisting of the oil & gas exploration industry, the mining industry, the fish-farming industry, water & sewage treatment industry, the agriculture-waste pond industry, and the aqua-culture industry.

154. A method of using a portable, modular, in-field modifiable, liquid-containment system according to claim 104, comprising the step of adapting said liquid-containment system for use to include one or more reservoirs for use to collect and manage industrial liquids in an industry selected from the list consisting of the oil & gas exploration industry, the mining industry, the fish-farming industry, water & sewage treatment industry, the agriculture-waste pond industry, and the aqua-culture industry.

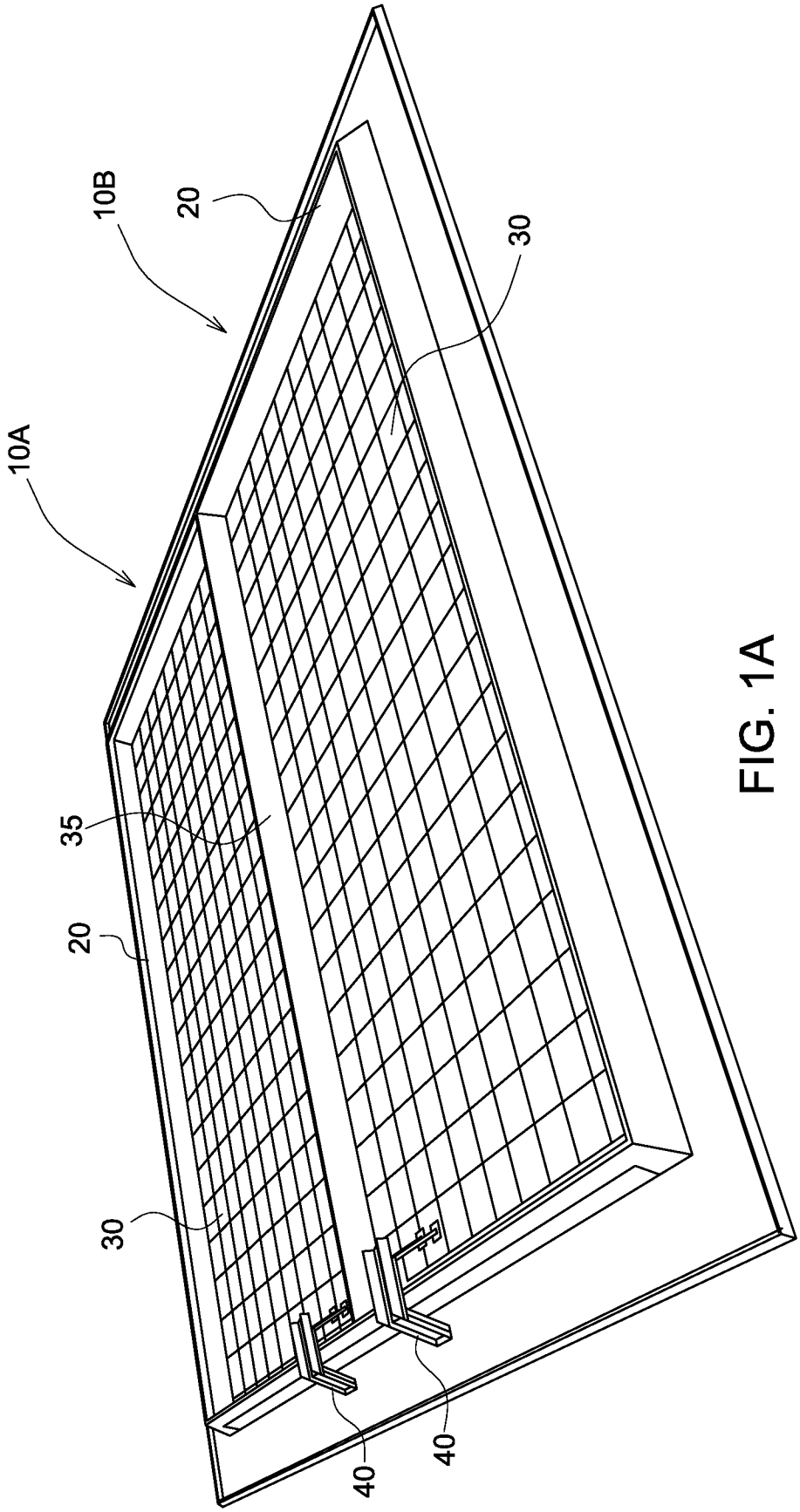


FIG. 1A

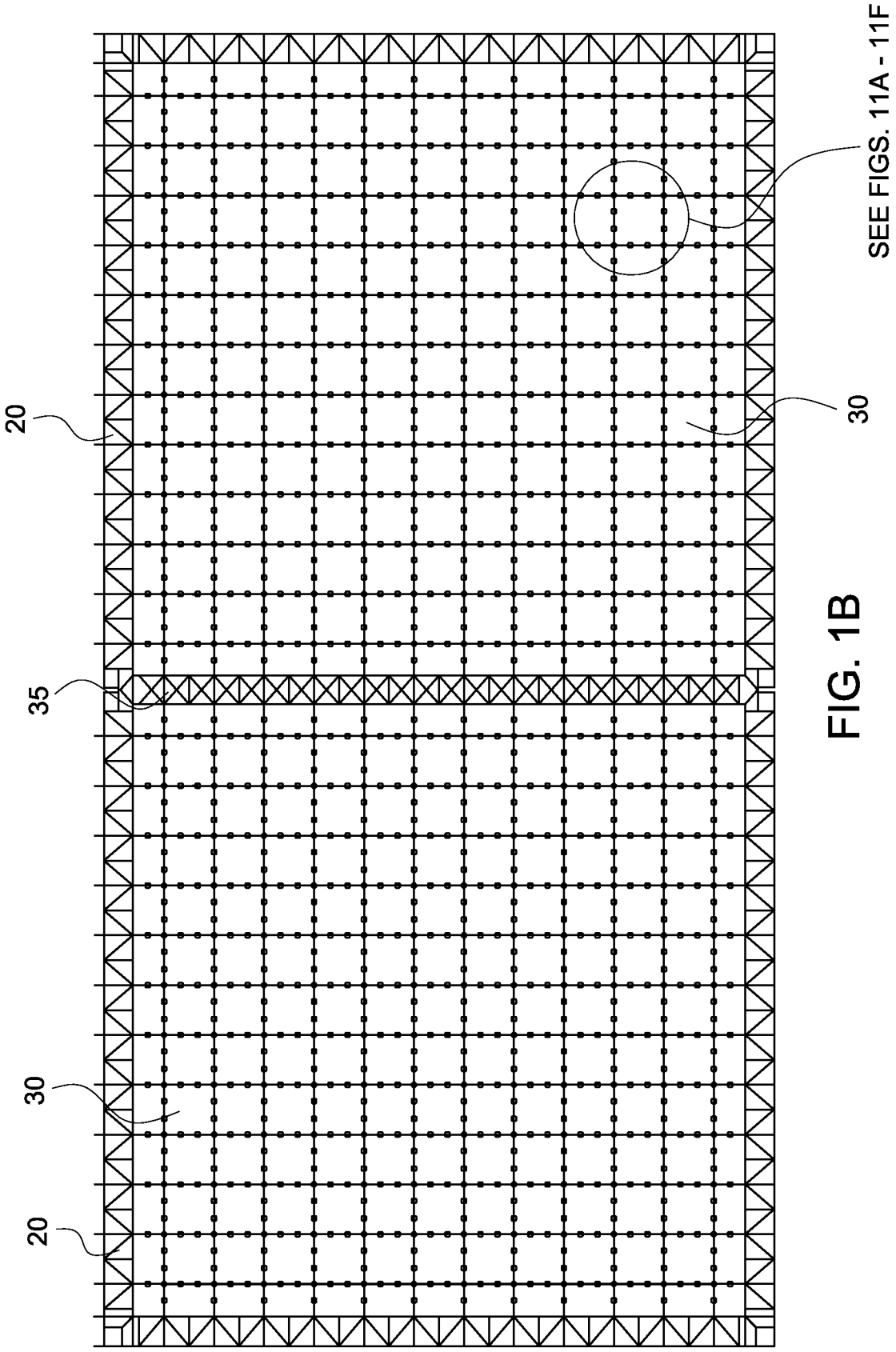


FIG. 1B

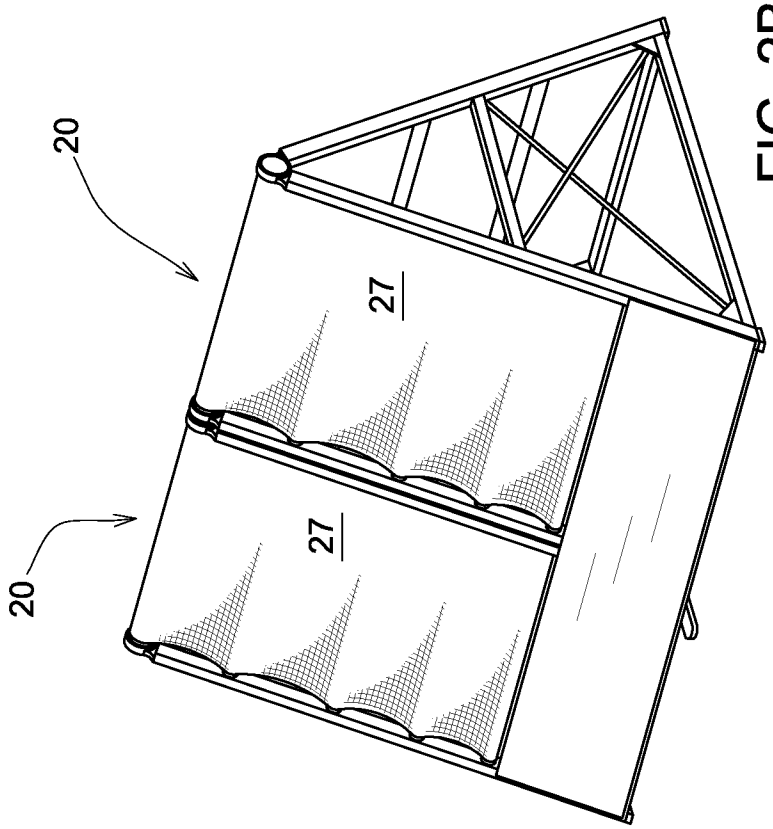


FIG. 2B

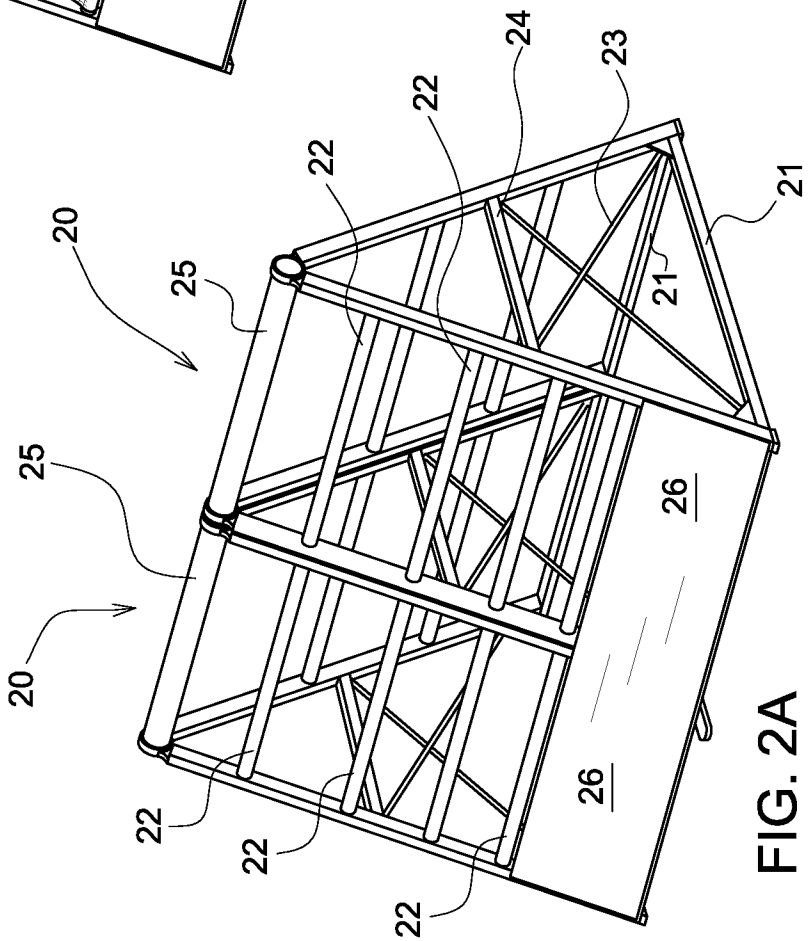


FIG. 2A

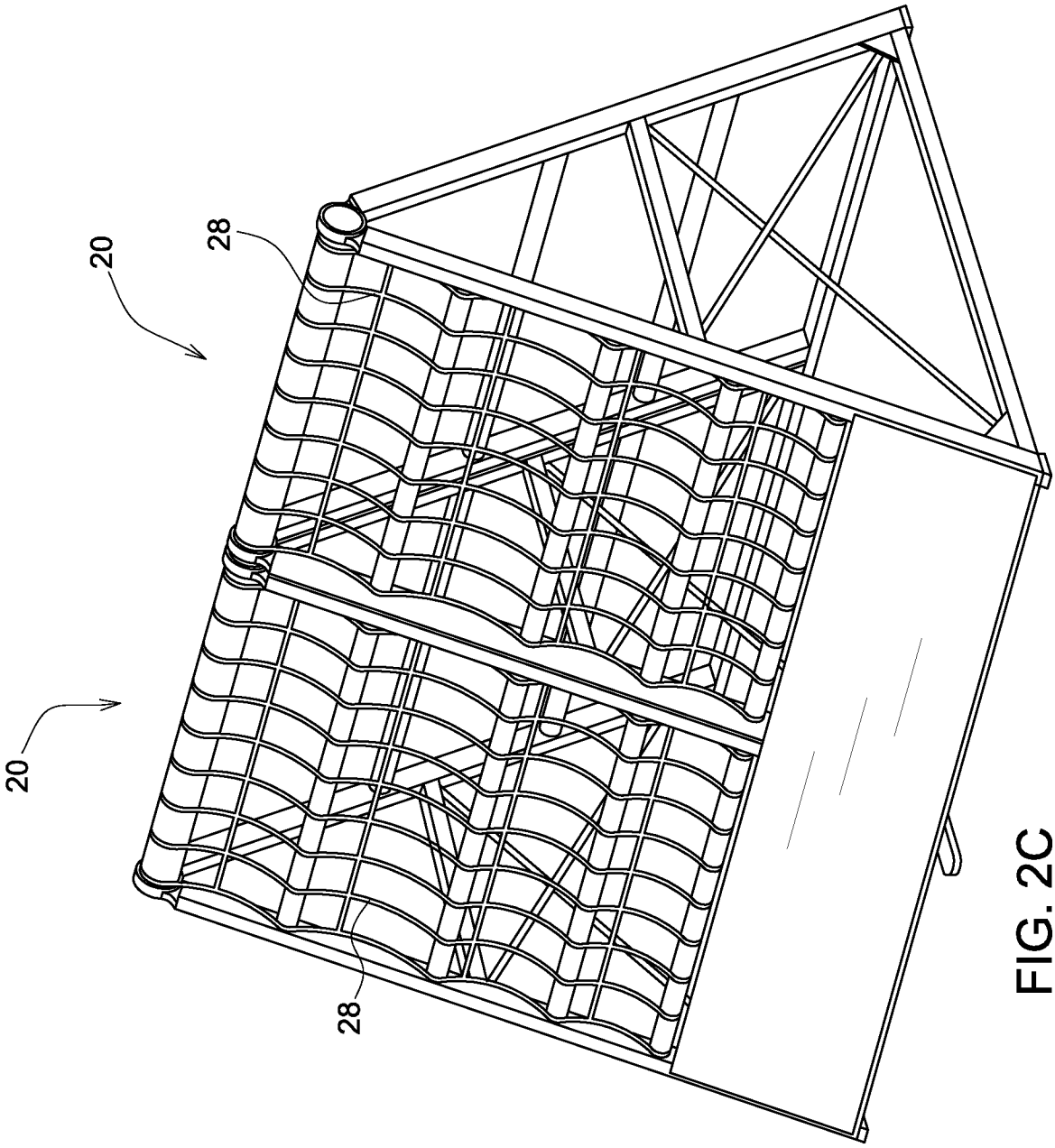


FIG. 2C

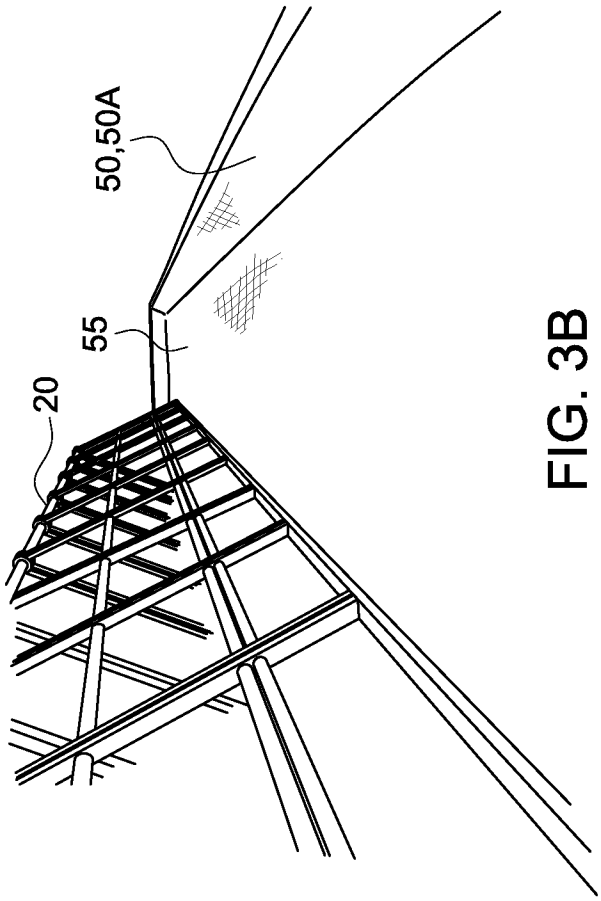


FIG. 3B

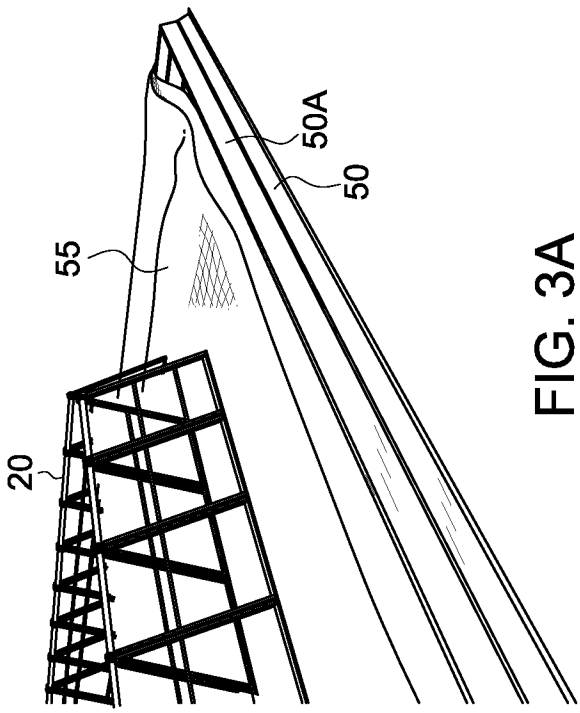


FIG. 3A

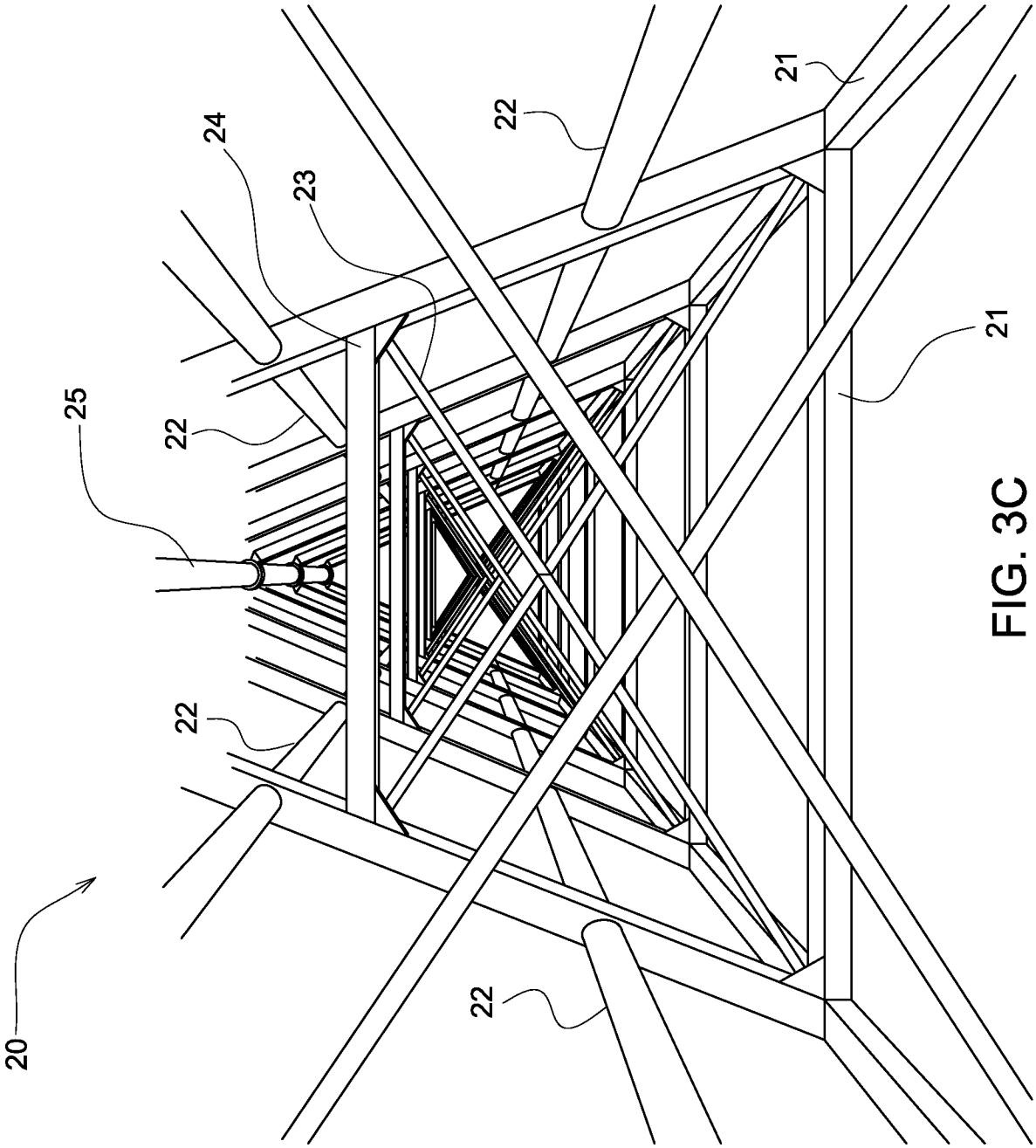


FIG. 3C

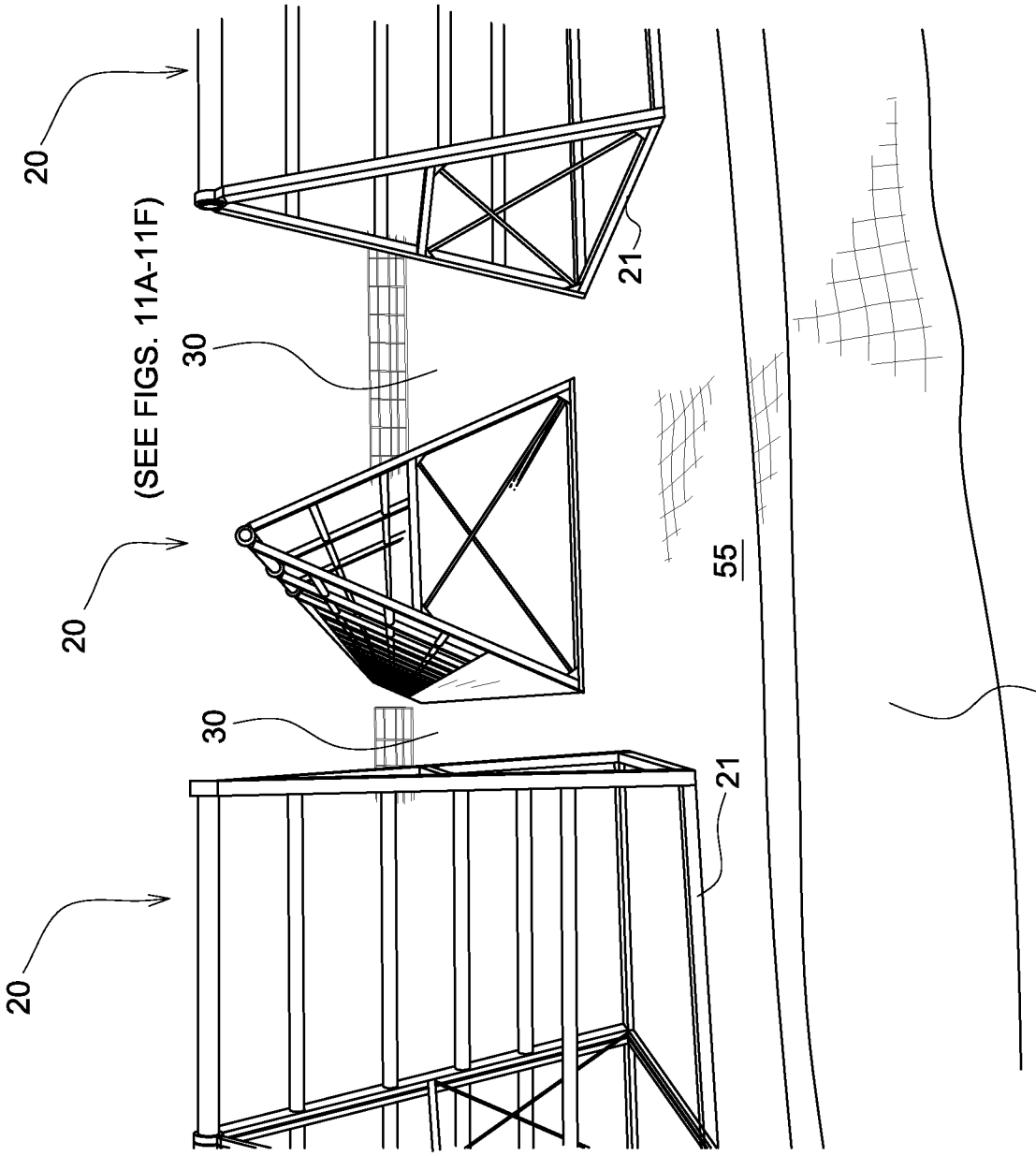


FIG. 3D

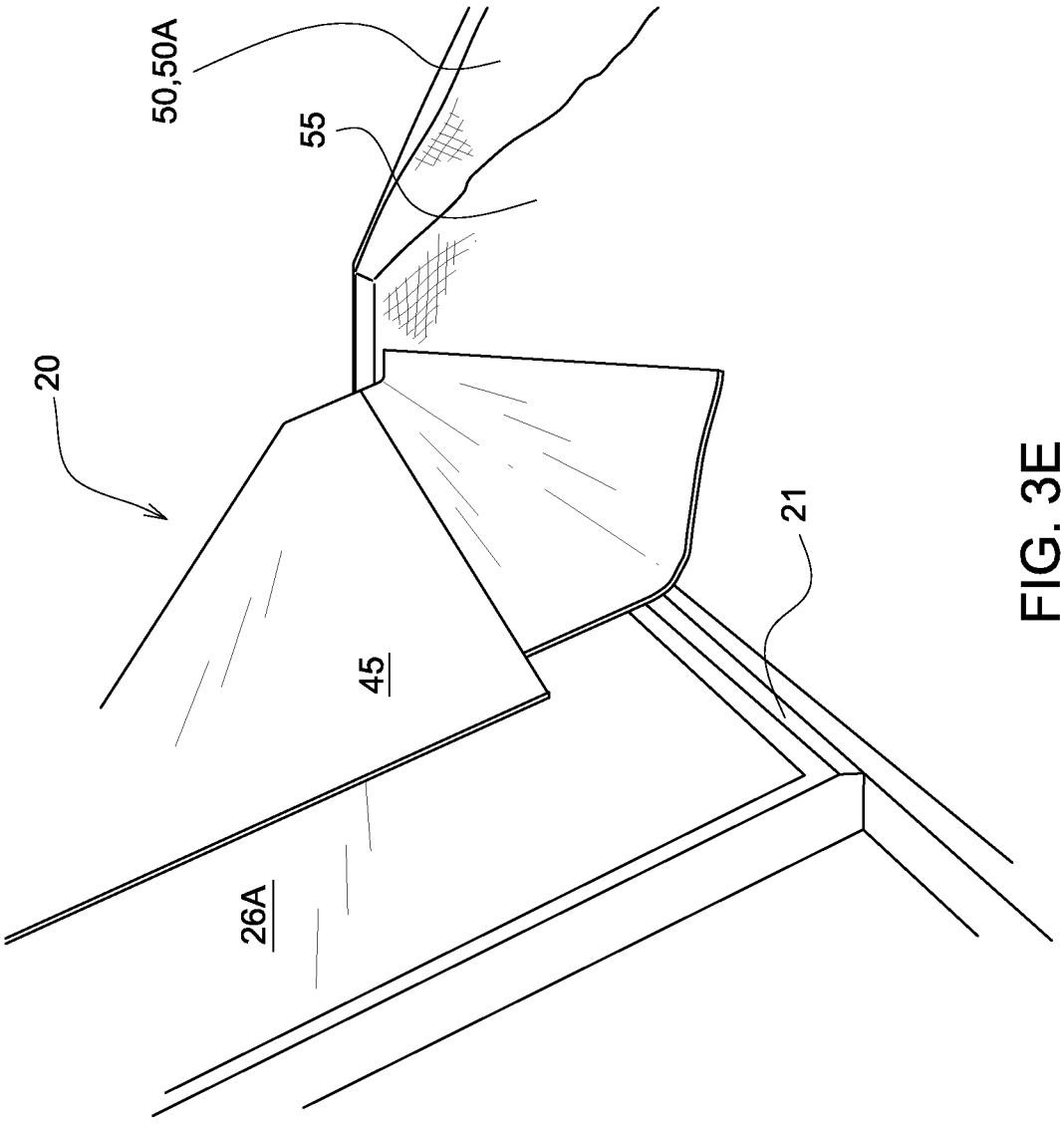


FIG. 3E

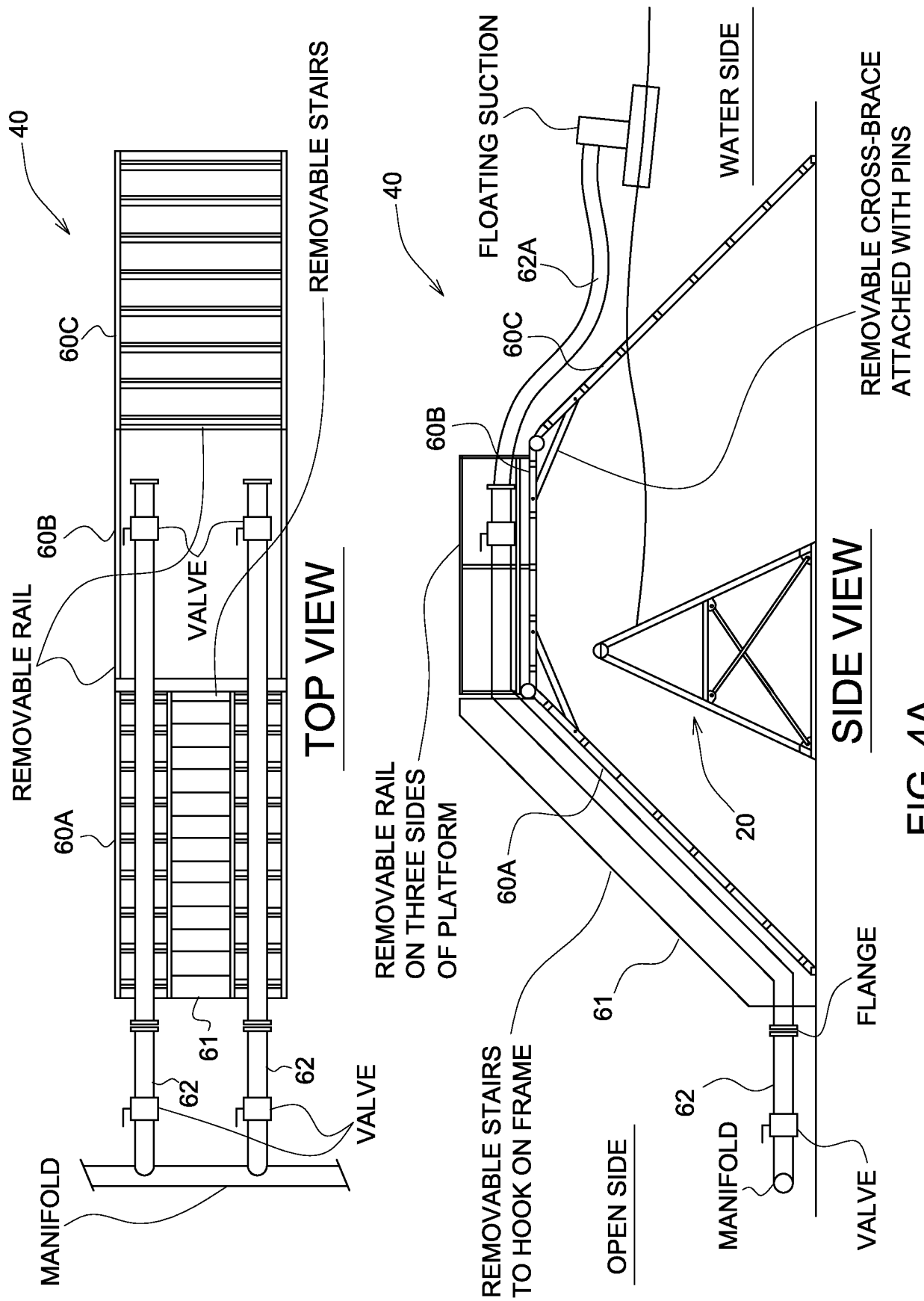

40
60C
REMOVABLE STAIRS
60B
REMOVABLE RAIL
VALVE
TOP VIEW
60A
61
62
62
VALVE
MANIFOLD
40
FLOATING SUCTION
62A
60C
WATER SIDE
60B
REMOVABLE CROSS-BRACE
ATTACHED WITH PINS
REMOVABLE RAIL
ON THREE SIDES
OF PLATFORM
SIDE VIEW
20
60A
61
FLANGE
REMOVABLE STAIRS
TO HOOK ON FRAME
OPEN SIDE
62
MANIFOLD
VALVE

FIG. 4A

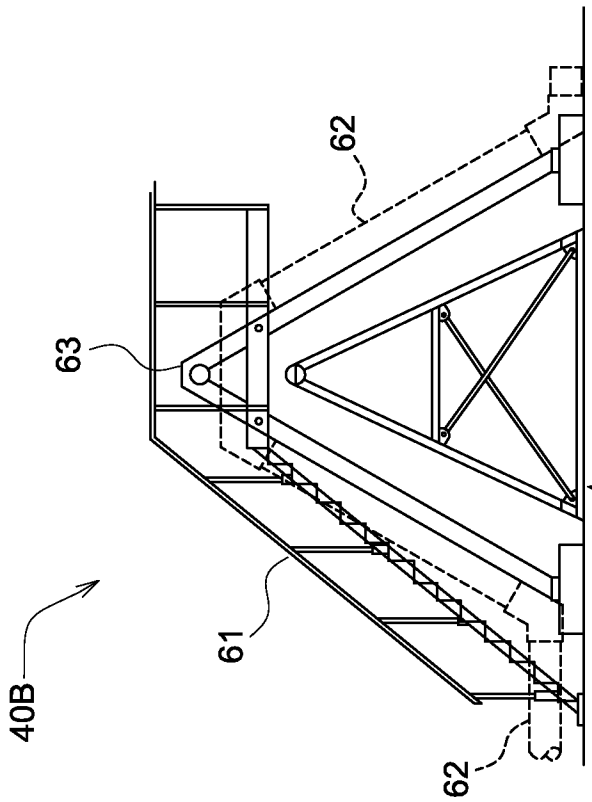


FIG. 4C

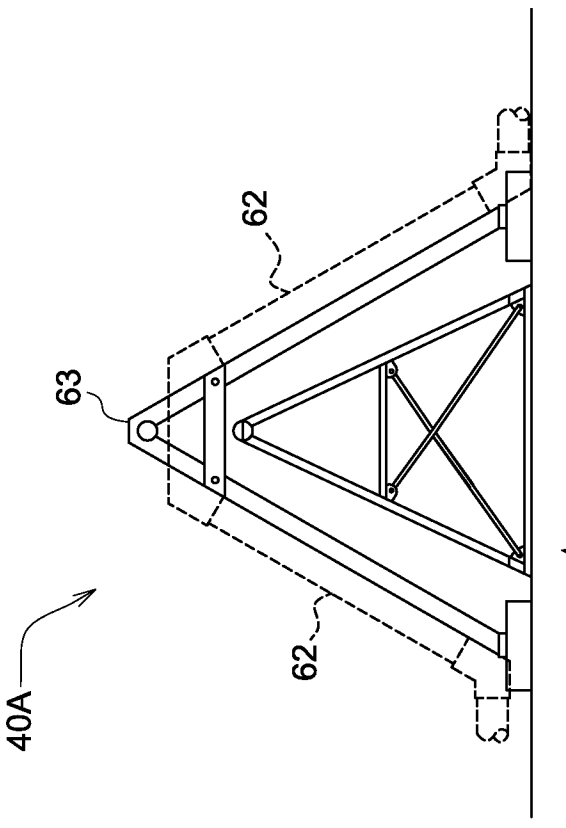


FIG. 4B

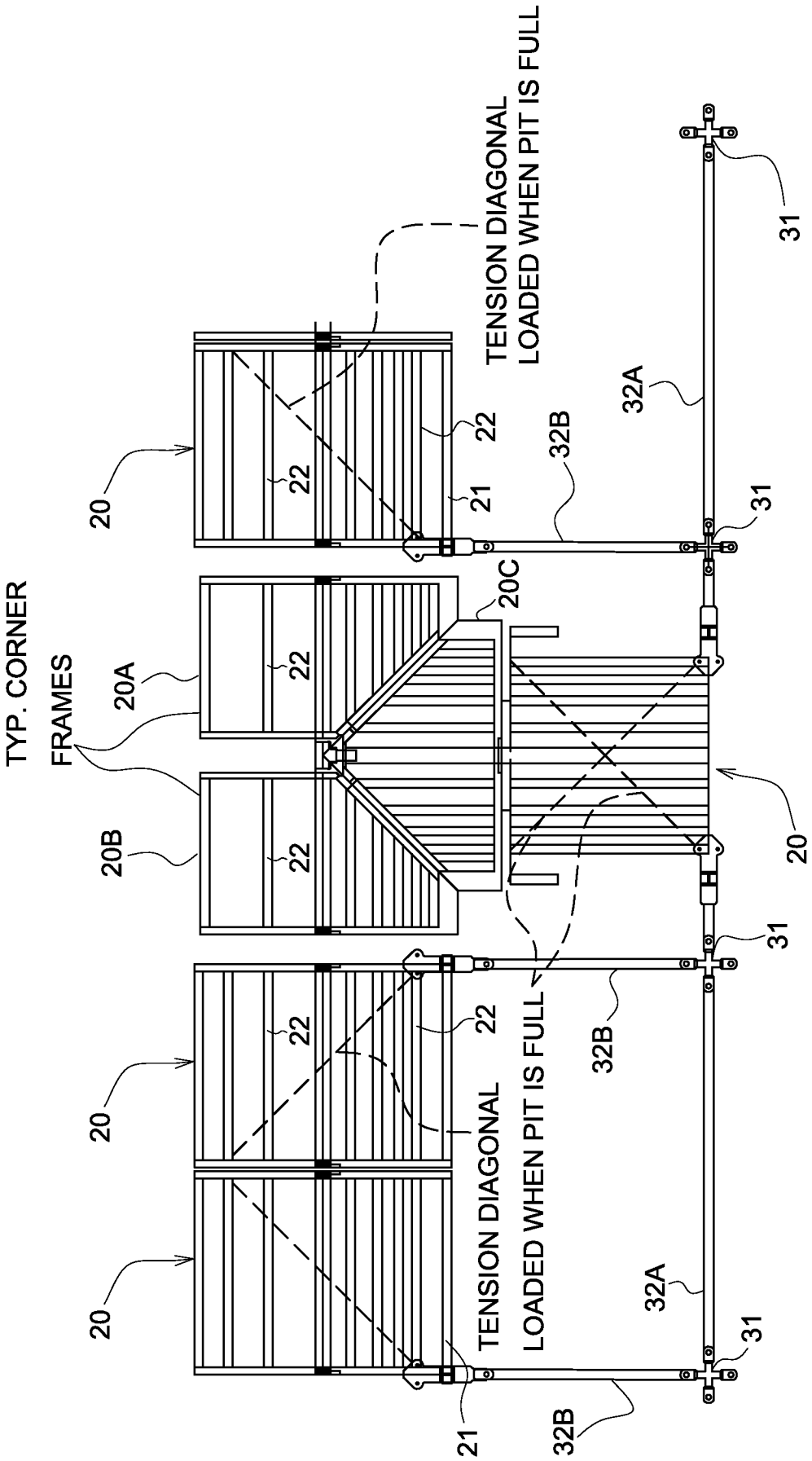

TYP. CORNER FRAMES
20
20A
20B
20C
22
21
31
32A
32B
TENSION DIAGONAL LOADED WHEN PIT IS FULL

FIG. 5A

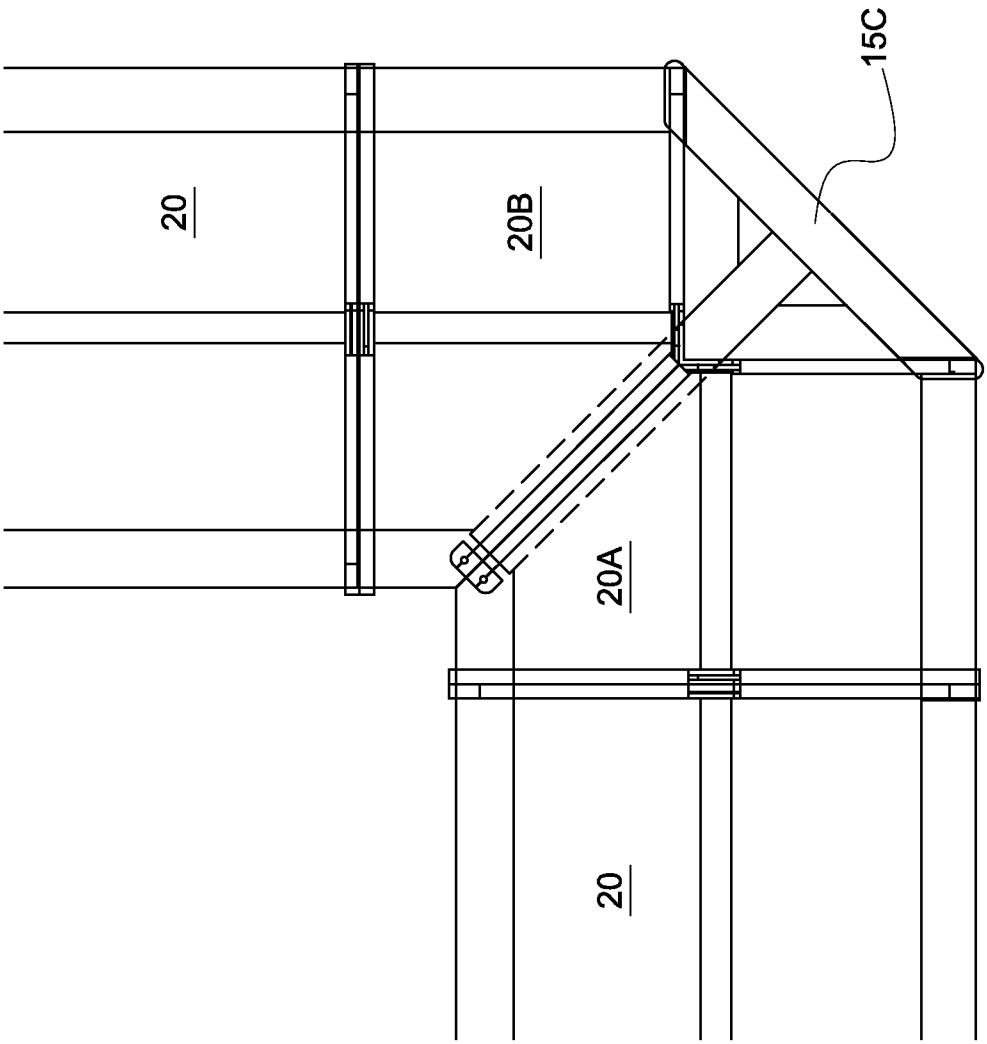


FIG. 5B

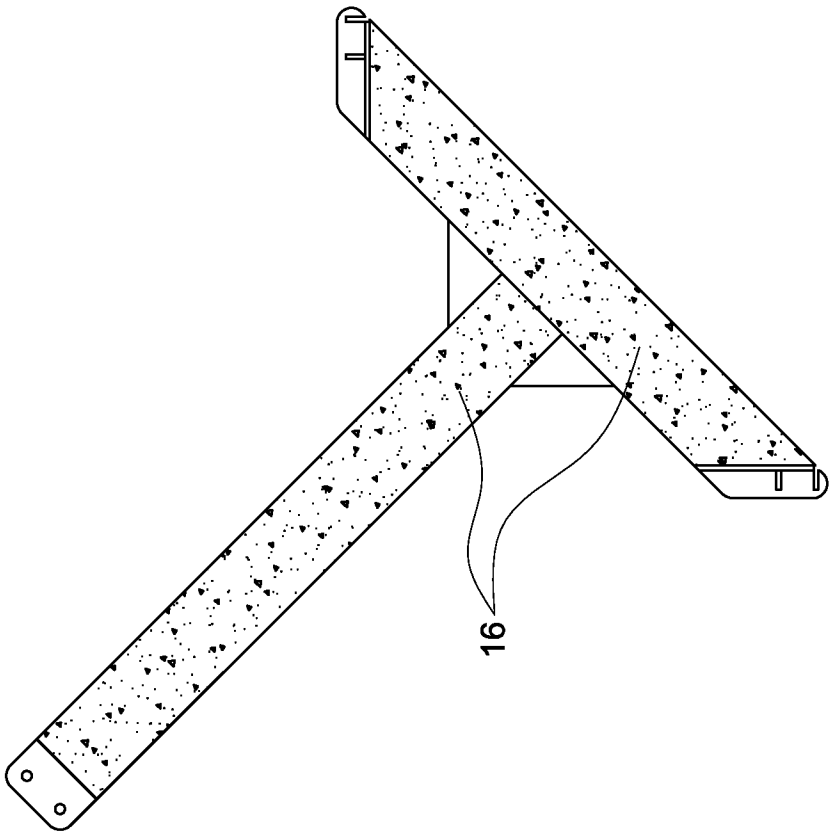


FIG. 5C

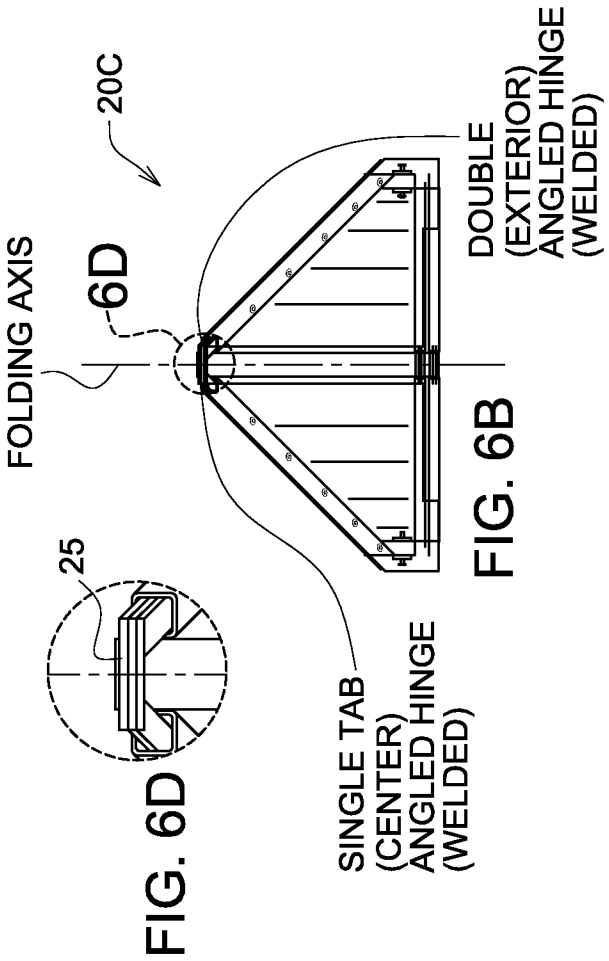


FIG. 6D

FIG. 6B

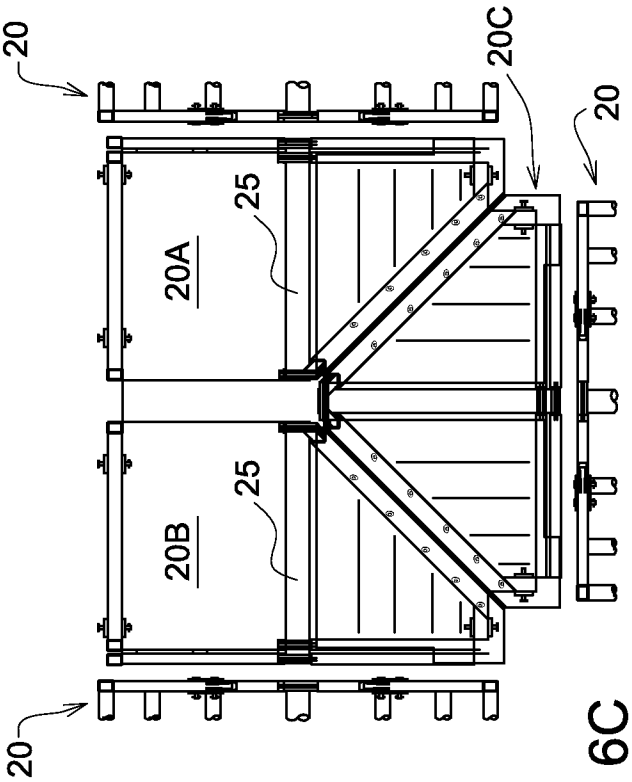


FIG. 6C

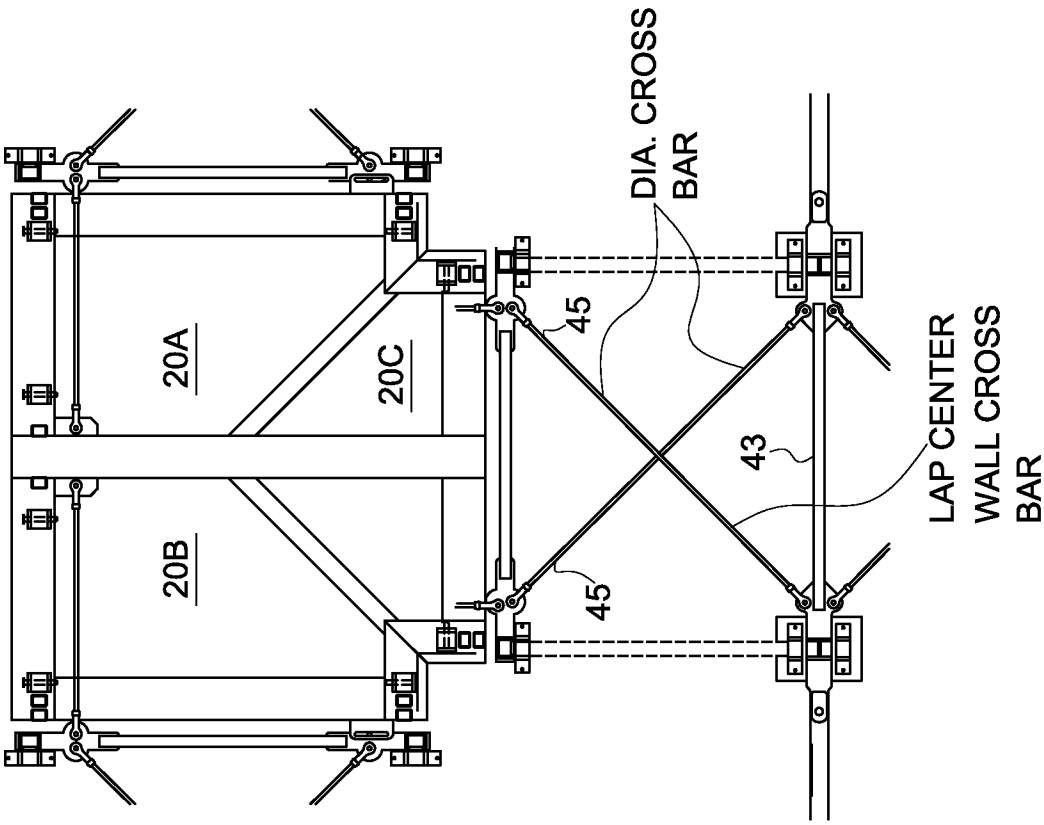
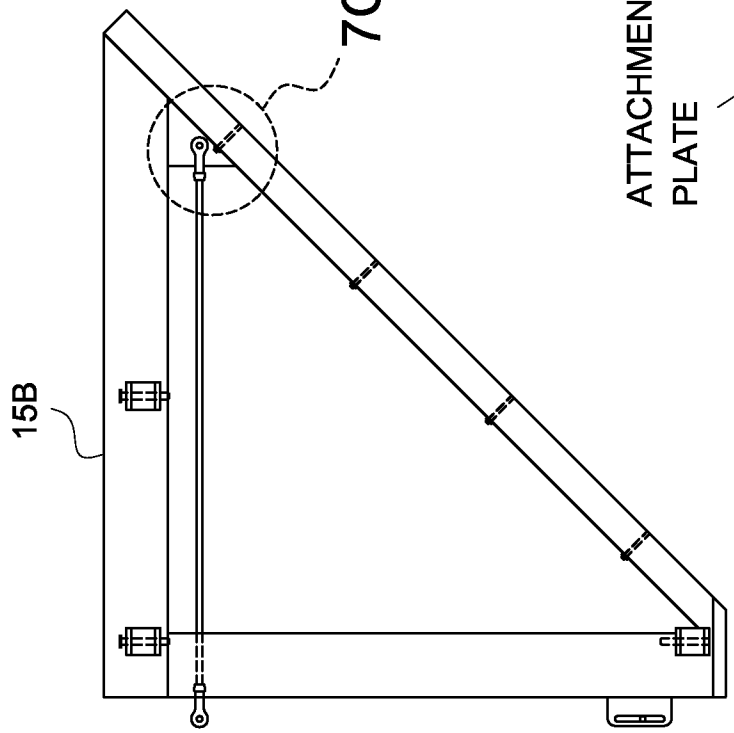


FIG. 6A



ATTACHMENT PLATE

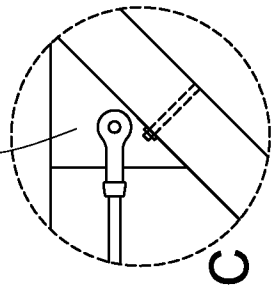


FIG. 7C

CORNER BASE FRAME

ALL BASE MEMBERS SHALL BE FILLED WITH SOLID HEAVY MATERIAL

FIG. 7B

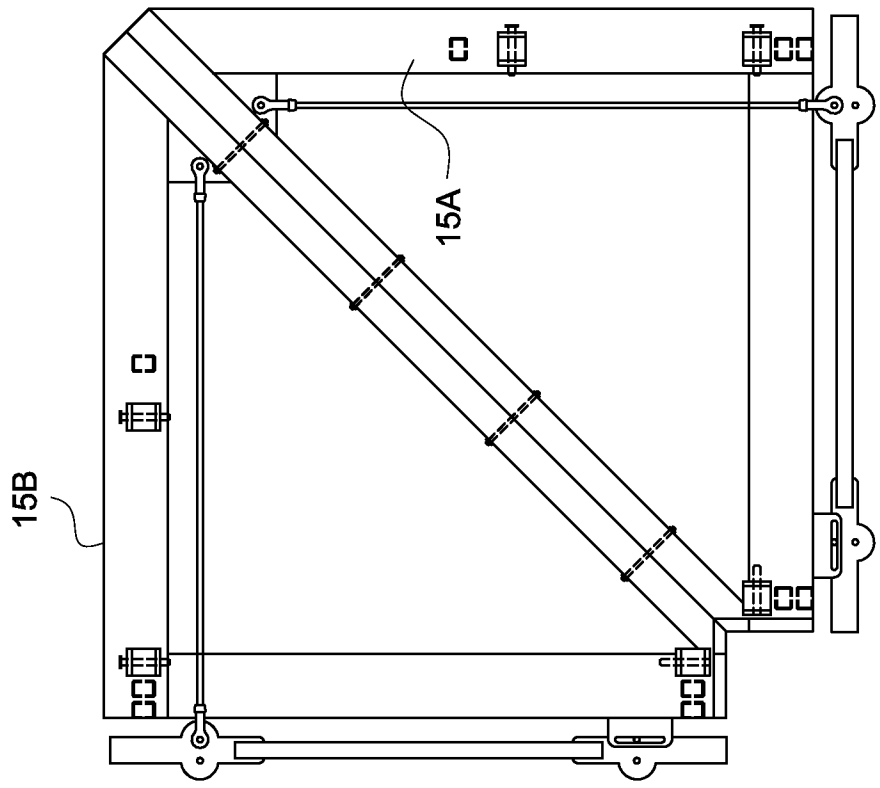


FIG. 7A

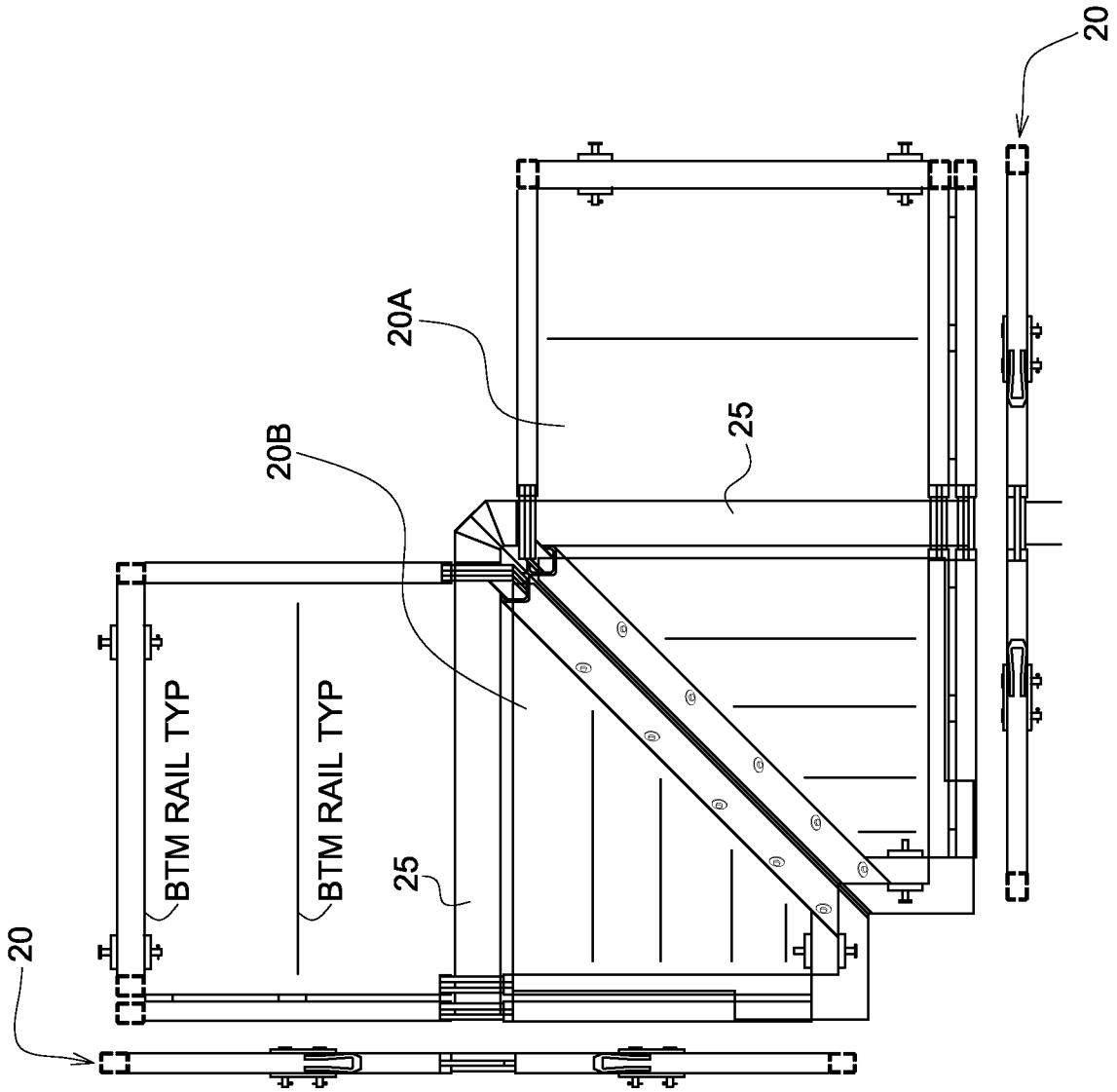
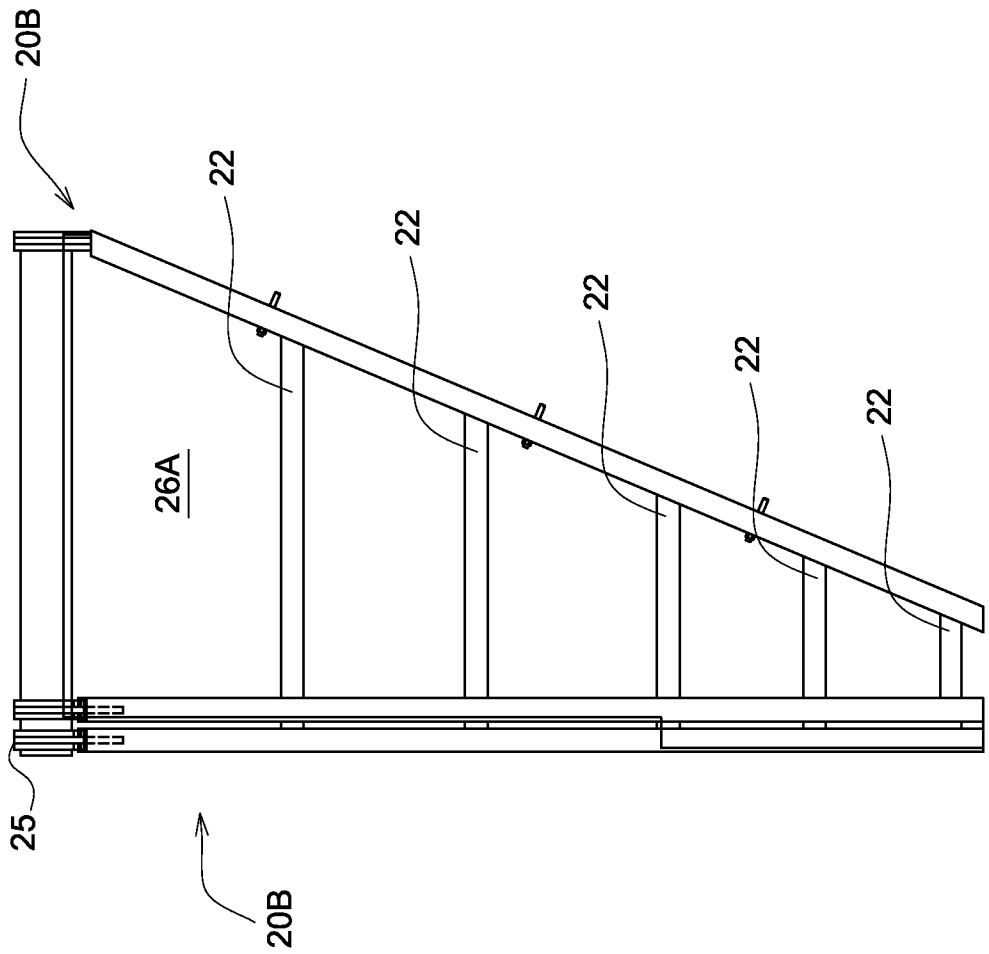
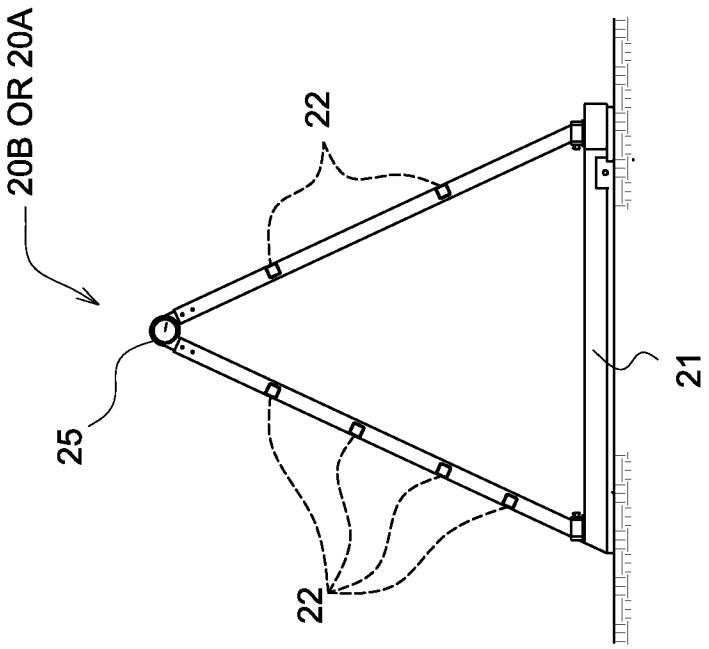


FIG. 8A



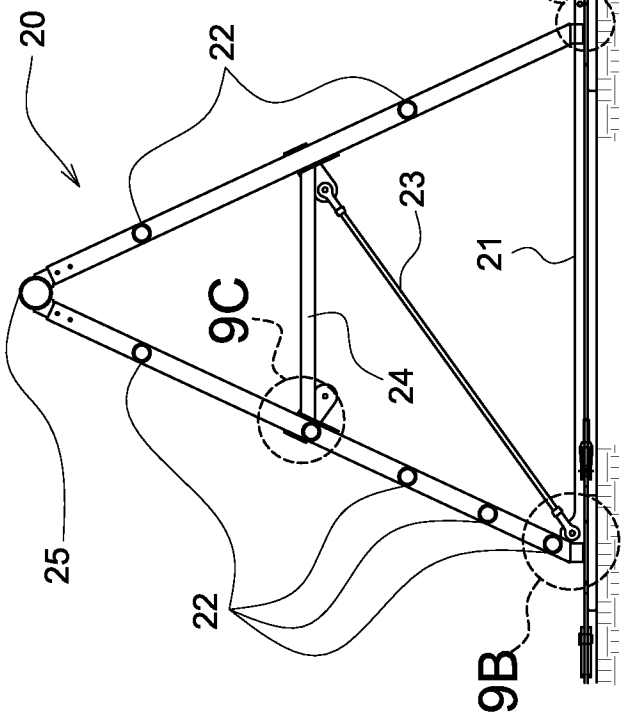
FRONT FACE PROJECTED ELEV.

FIG. 8C



CORNER A-FRAME SECTION

FIG. 8B



EXTERIOR WALL A-FRAME SECTION

PROVIDE 1/4" WEEB HOLES IN ALL FULLY ENCLOSED SHAPES. TYP. U.N.O.

FIG. 9A

FIG. 9B

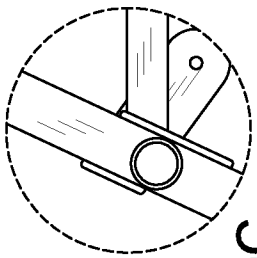


FIG. 9C

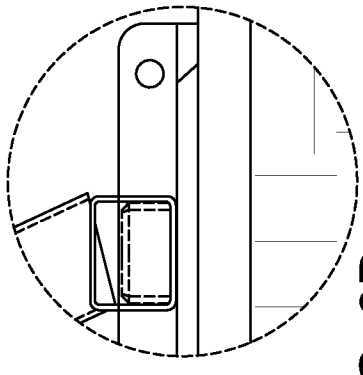
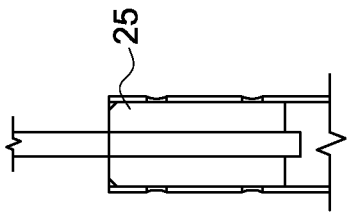
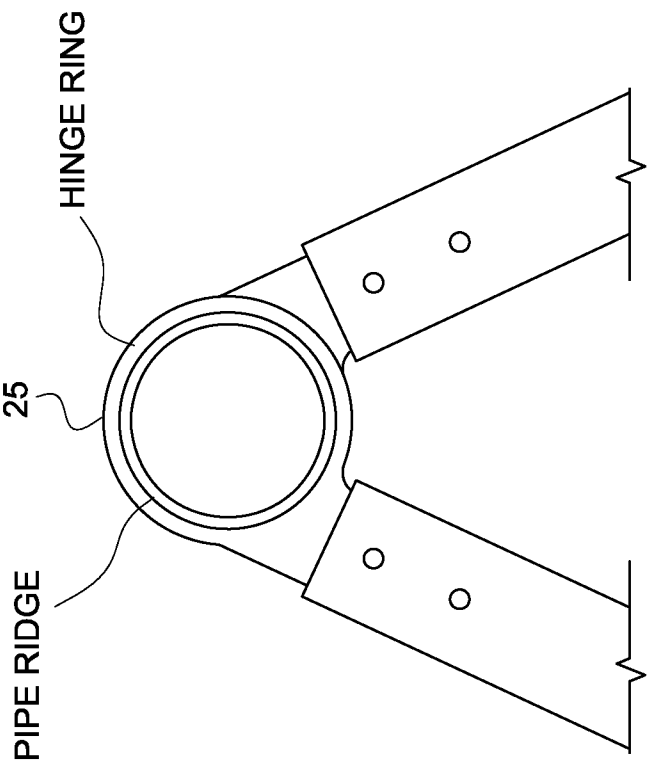


FIG. 9D



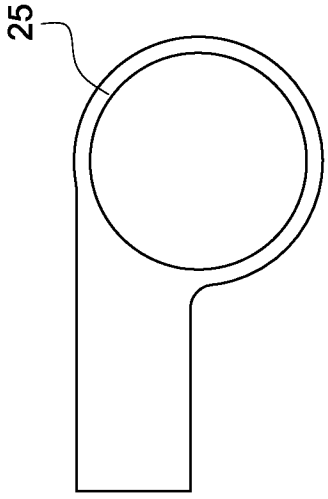
HINGE END VIEW

FIG. 9G



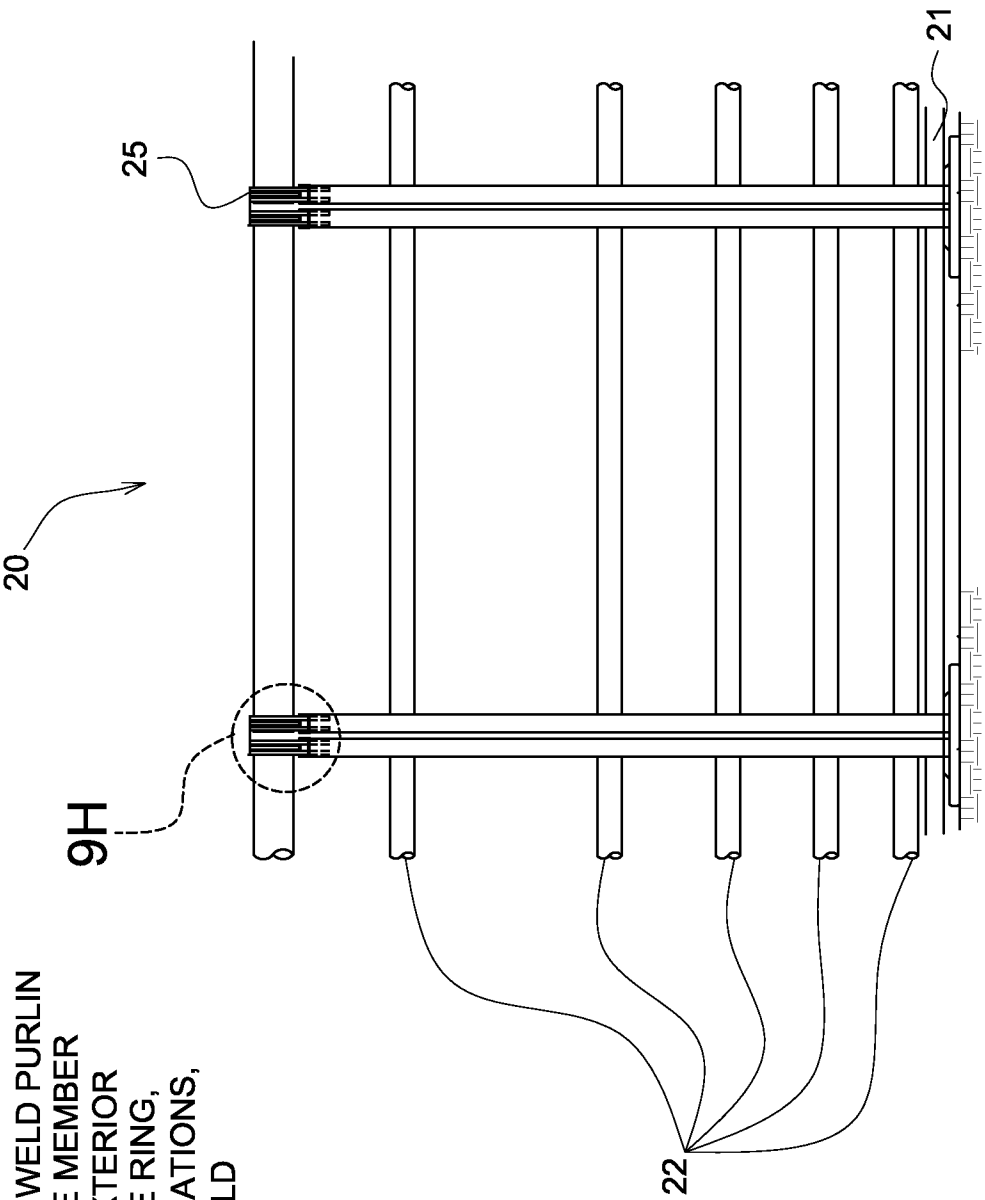
HINGE SECTION

FIG. 9F



HINGE RING DETAIL

FIG. 9E



A-FRAME ASSEMBLY ELEV.

FIG. 9I

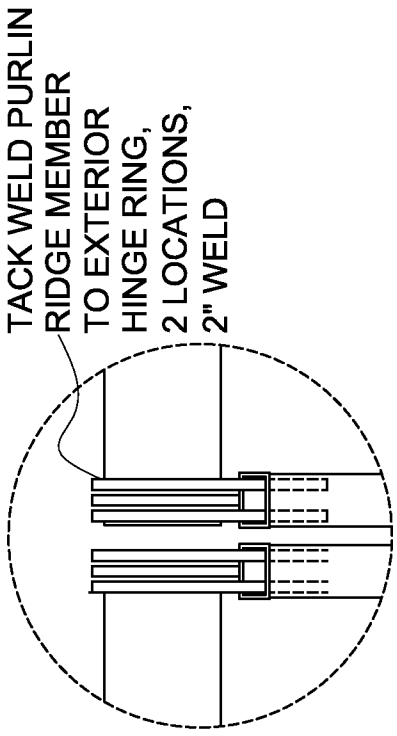


FIG. 9H

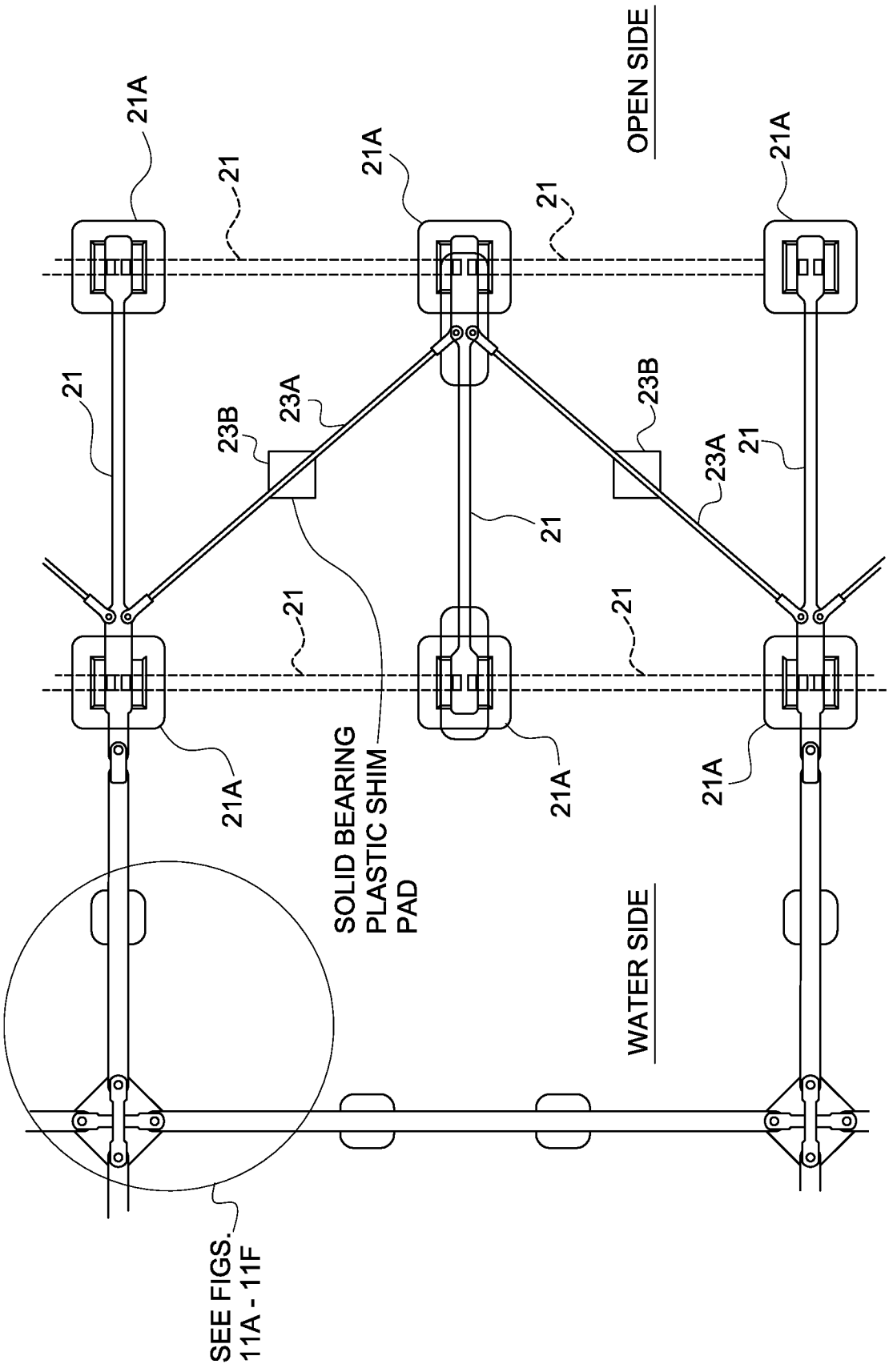
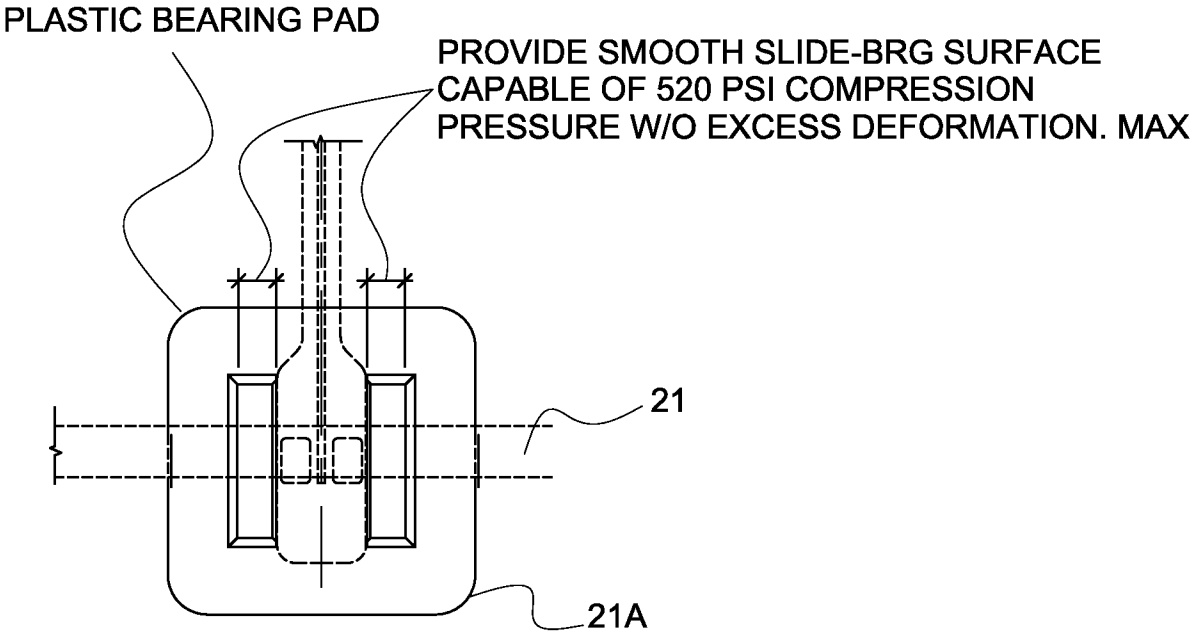


FIG. 10A

EXTERIOR WALL BASE PLAN



SLIDE-BEARING FOOTING PLAN

FOOTING SHOWN IN OFFSET, UNLOADED CONDITION
OFFSET DIMENSION IS ALSO
AFFECTED BY TEMP. AT THE TIME OF CONST.

FIG. 10B

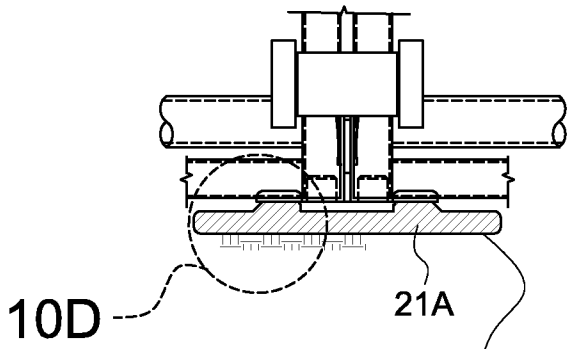
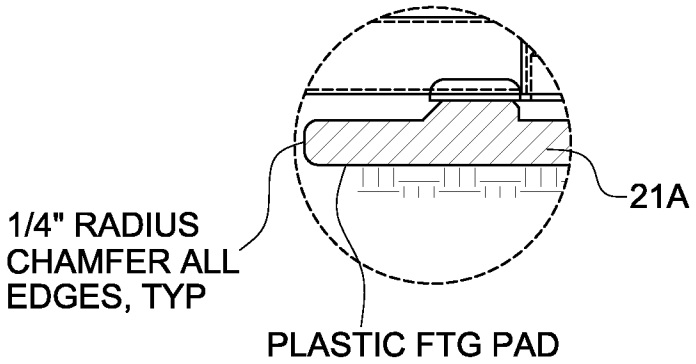
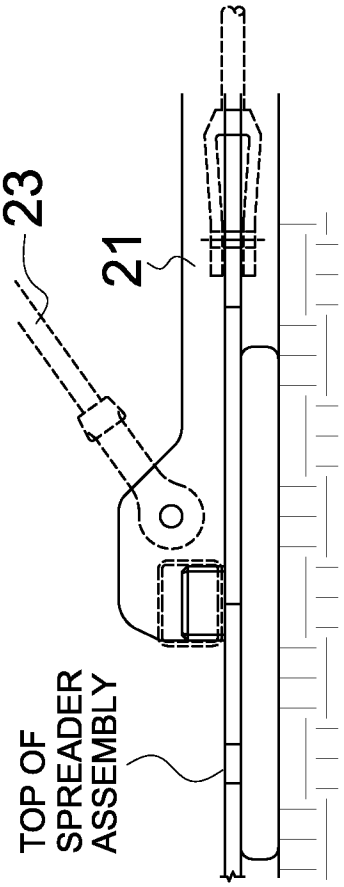


FIG. 10C



SLIDE-BEARING DETAIL

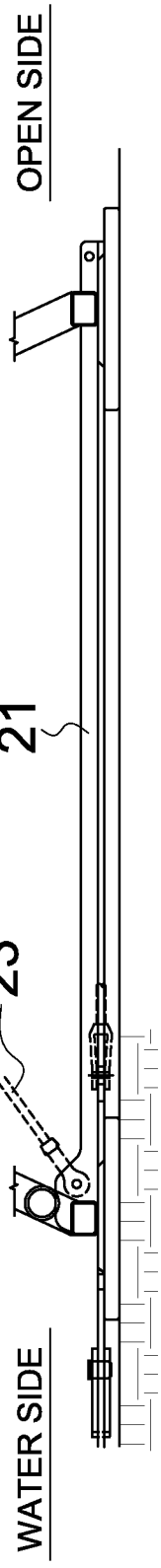
FIG. 10D



WATER-SIDE SPREADER BAR END

BEARING RAIL NOT SHOWN FOR CLARITY

FIG. 10E



SPREADER ASSEMBLY ELEVATION

FIG. 10F

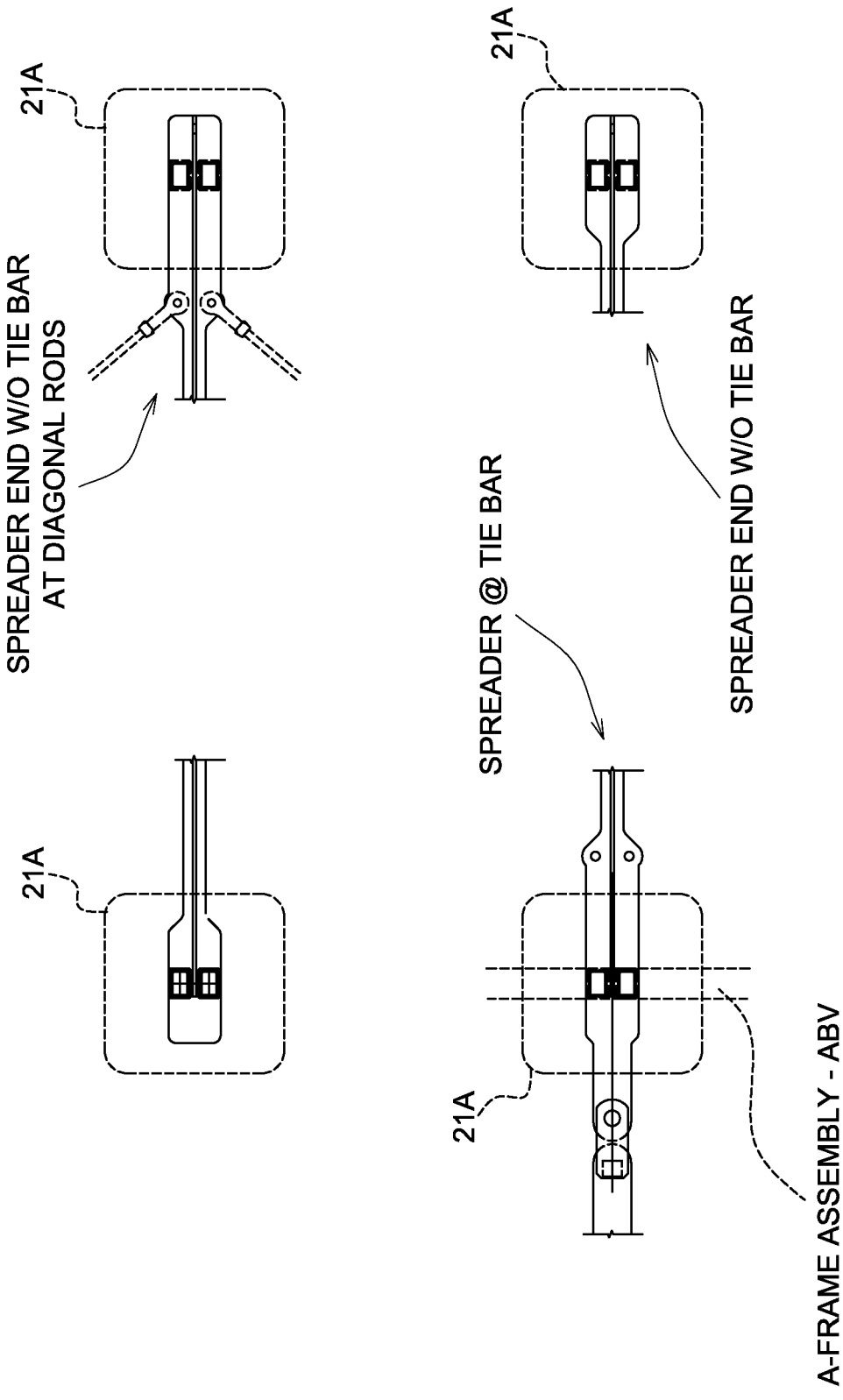
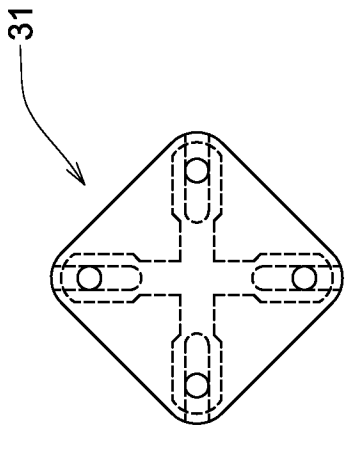
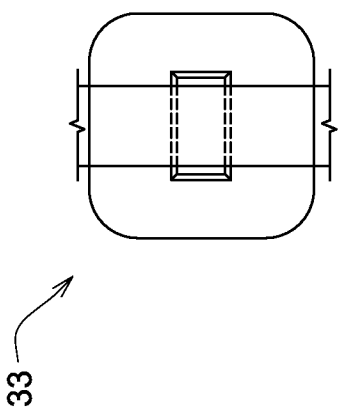

21A
SPREADER END W/O TIE BAR
AT DIAGONAL RODS
21A
21A
SPREADER @ TIE BAR
21A
SPREADER END W/O TIE BAR
A-FRAME ASSEMBLY - ABV

FIG. 10G



TYP. HUB PAD ASSEMBLY

FIG. 11B



TIE BAR SUPPORT PAD

FIG. 11C

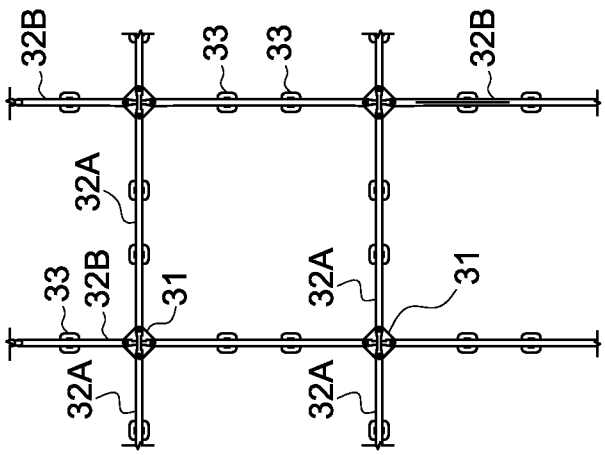
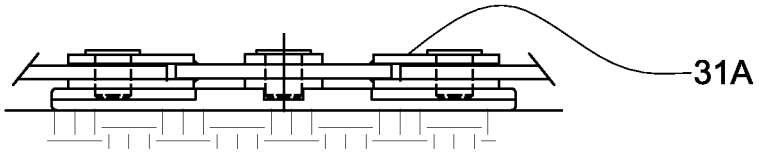
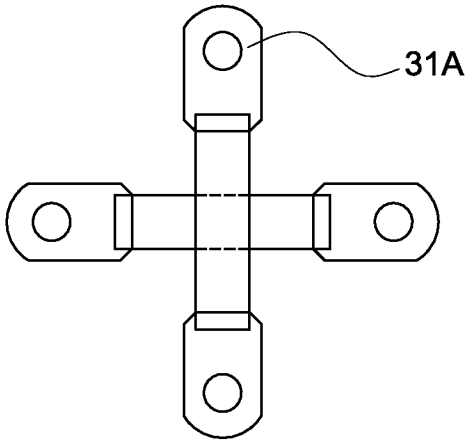


FIG. 11A



TYP. HUB ASSEMBLY SECTION

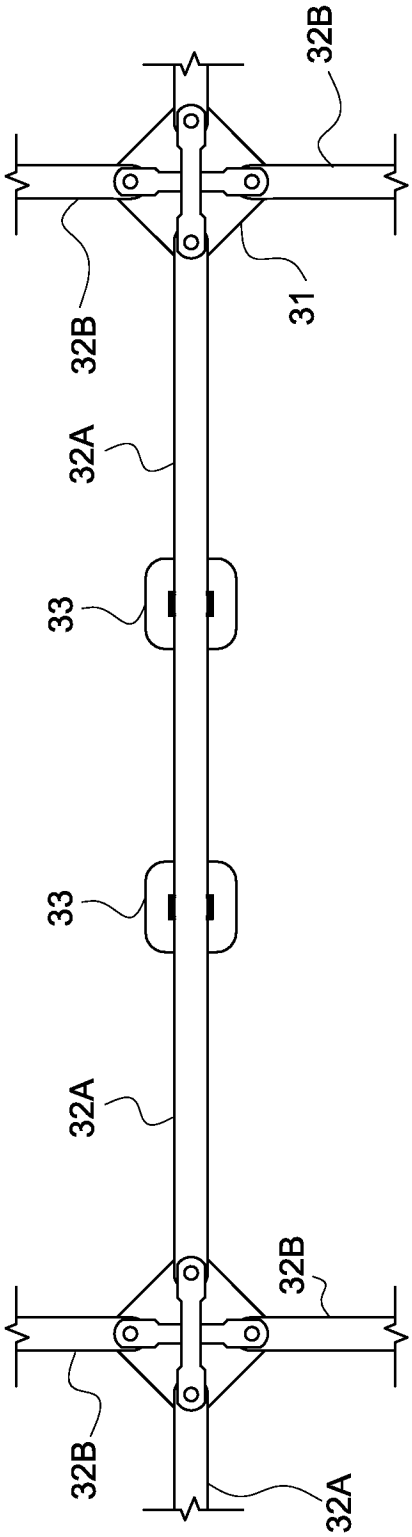
FIG. 11D



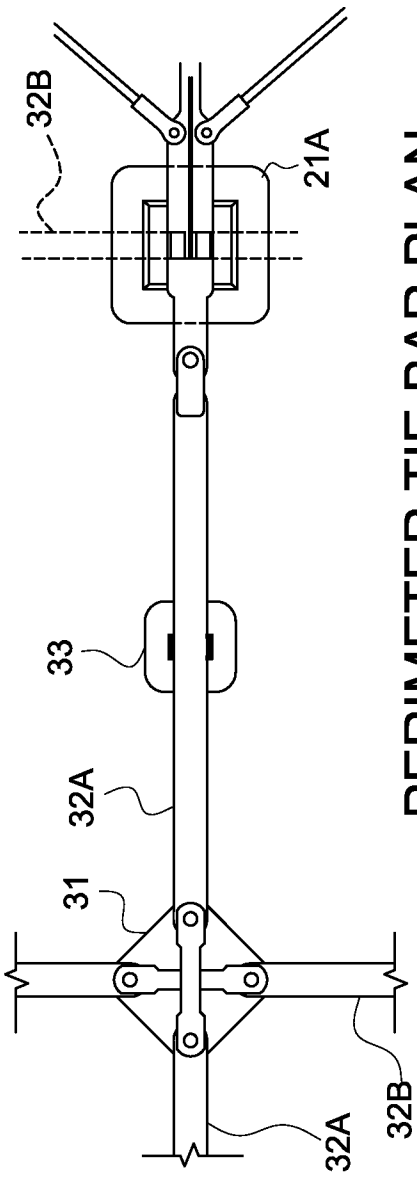
TYP. HUB ASSEMBLY

1. THRU BARS AND PASS-THRU PLATES SHALL BE FREE TO SLIDE RELATIVE TO EACH OTHER.
2. HOLES FOR PIN FITTINGS SHALL BE CUT TO PROVIDE SMOOTH BEARINGS AT LOAD CONTACT SURFACES (OUTBOARD HALF CIRCLE OF PIN HOLE).

FIG. 11E

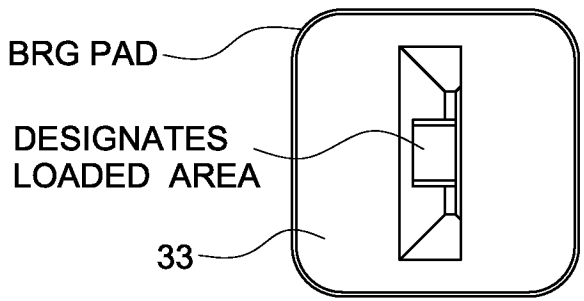


INTERIOR BAR PLAN

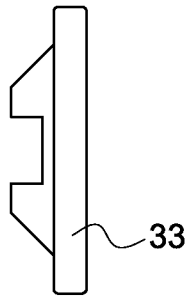


PERIMETER TIE BAR PLAN

FIG. 11F

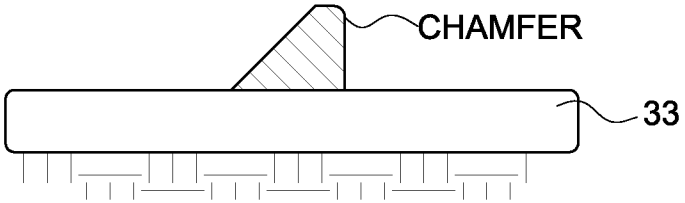


PLAN VIEW



SIDE ELEVATION

FIG. 12A

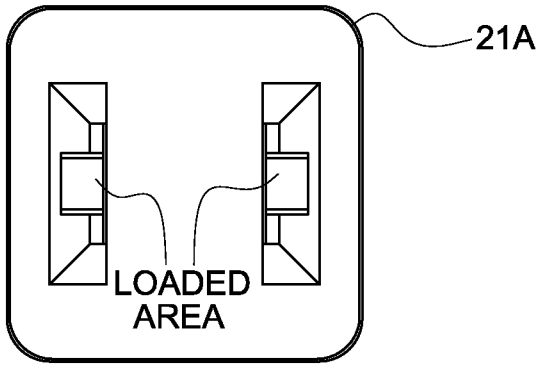


FRONT ELEVATION

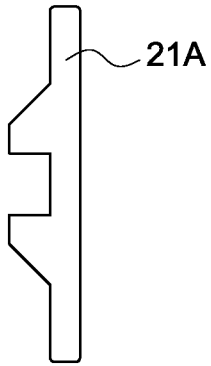
END A-FRAME SUPPORT PAD

1. MAX VERT. LOAD= 5.0 KIPS (SERVICE) APPLIED EQUALLY OVER HATCHED AREA SHOW ABOVE (520PSI)
2. COEFFICIENT OF STATIC FRICTION SHALL BE LESS THEN 0.22 TOP OF BRG RAIL TO SLIDE "SHOE" ON A-FRAME
3. MANUF. SHALL SUBMIT PLASTIC SPECIFICATIONS TO ENGINEER PRIOR TO CONST.
4. BEARING CLEAT FABRICATION ATTACHMENT METHOD PER MANUF.

FIG. 12B

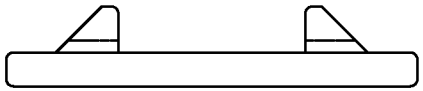


PLAN VIEW



SIDE ELEVATION

FIG. 13A

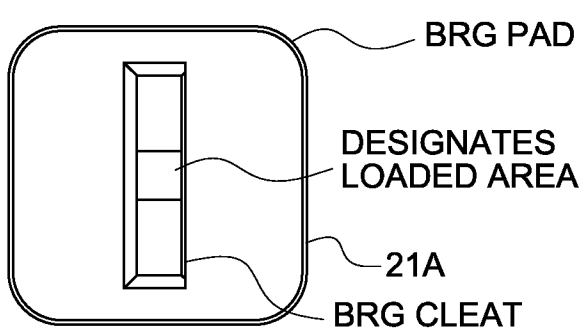


FRONT ELEVATION

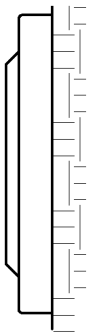
CENTER A-FRAME SUPPORT PADS

1. MAX VERT. LOAD= 5.0 Kip EA. BRG RAIL
2. BRG AREA = 9.63in^2 EA. BRG RAIL (520psi)
3. COEFFICIENT OF STATIC FRICTION 0.20 TOP OF BRG RAIL TO SLIDE "SHOE" ON A-FRAME

FIG. 13B

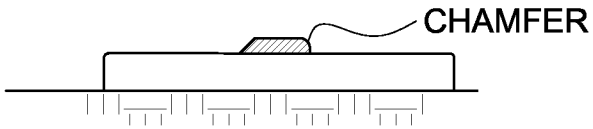


PLAN VIEW



SIDE ELEVATION

FIG. 14A

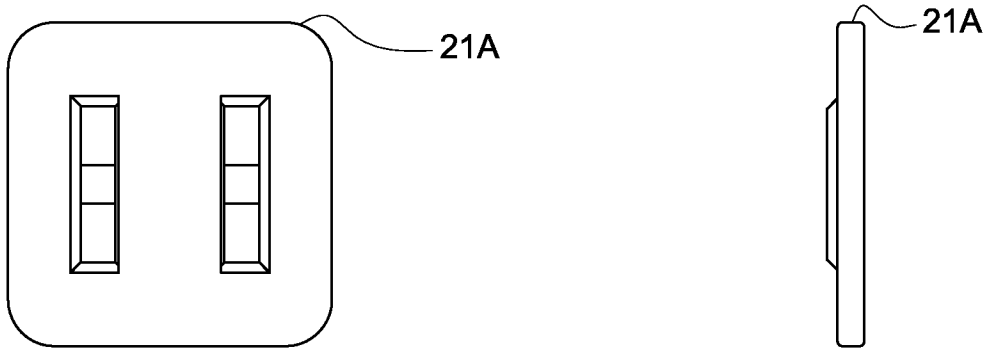


FRONT ELEVATION

EXTERIOR WALL END A-FRAME SUPPORT PAD

1. MAX VERT. LOAD= 5.0 KIPS (SERVICE) APPLIED EQUALLY OVER HATCHED AREA SHOWN ABOVE (606 PSI)
2. COEFFICIENT OF STATIC FRICTION SHALL BE LESS THEN 0.20 TOP OF BRG RAIL TO SLIDE "SHOE" ON A-FRAME
3. MANU.SHALL SUBMIT PLASTIC SPECIFICATIONS TO ENGINEER PRIOR TO CONST.
4. BEARING CLEAT FABRICATION ATTACHMENT METHOD PER MANUF.

FIG. 14B



EXTERIOR WALL END A-FRAME SUPPORT PAD

(276 REQ'D PER 100,000 BBL PIT)
MAX VERT. POINT LOAD + 5.0kip EA BRG RAIL (EMAX = ±3.0)
BRG AREA = 9.63in^2 EA BRG RAIL (520psi)
COEFFIENT OF STATIC FRICTION < 0.2 TOP OF BRG RAIL TO SLIDE "SHOE" ON A-FRAME

FIG. 15A

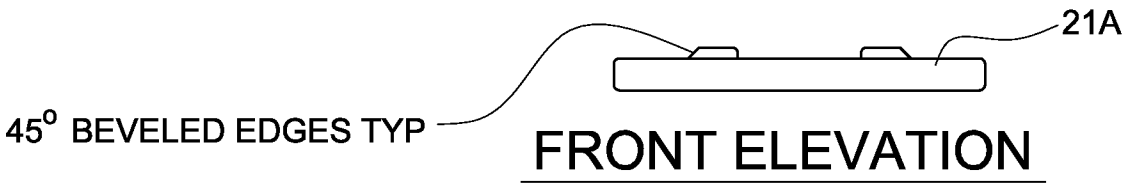
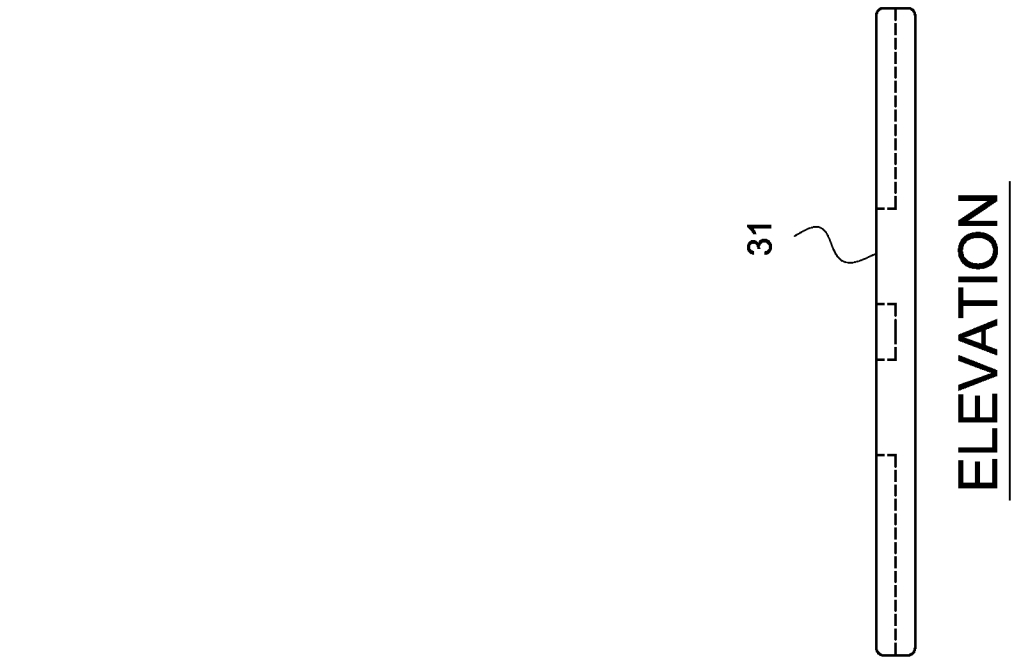
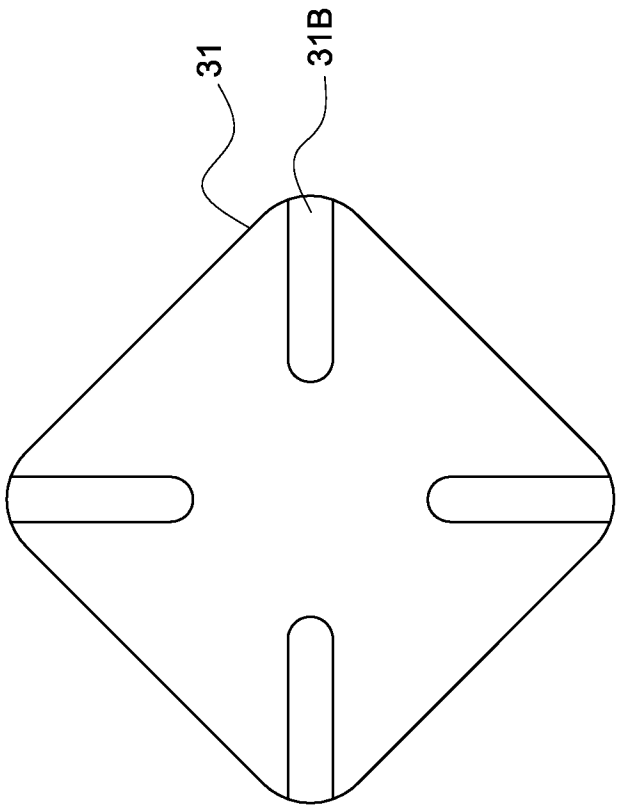


FIG. 15B



ELEVATION

FIG. 16B

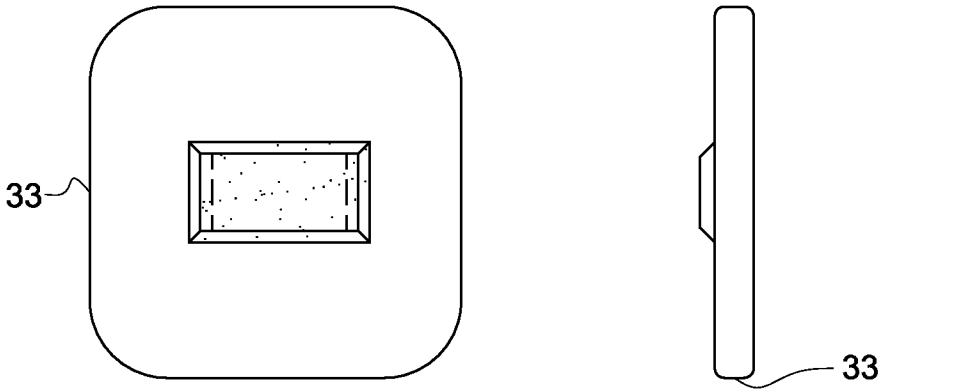


PLAN VIEW

HUB SUPPORT PAD

(288 REQ'D PER 100,000 BBL PIT)
MAX VERT LOAD = 6.0psi (e=0")
COEFFIENT OF STATIC FRICTION <0.4
TOP OF PAD TO PAINTED STEEL

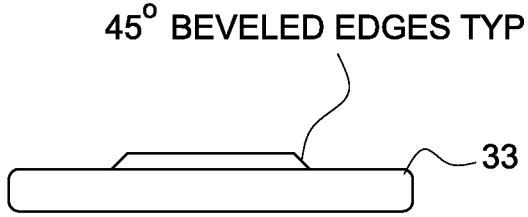
FIG. 16A



THE BAR SUPPORT PAD

(1320 REQ'D PER 100,000 BBL PIT)
MAX VERT POINT LOAD = 2.4KIPS (e=0")
BEARING AREA = 15in^2 (136psi)
COEFFIENT OF STATIC FRICTION < 0.4
TOP OF PAD TO PAINTED STEEL

FIG. 17A



FRONT ELEVATION

FIG. 17B

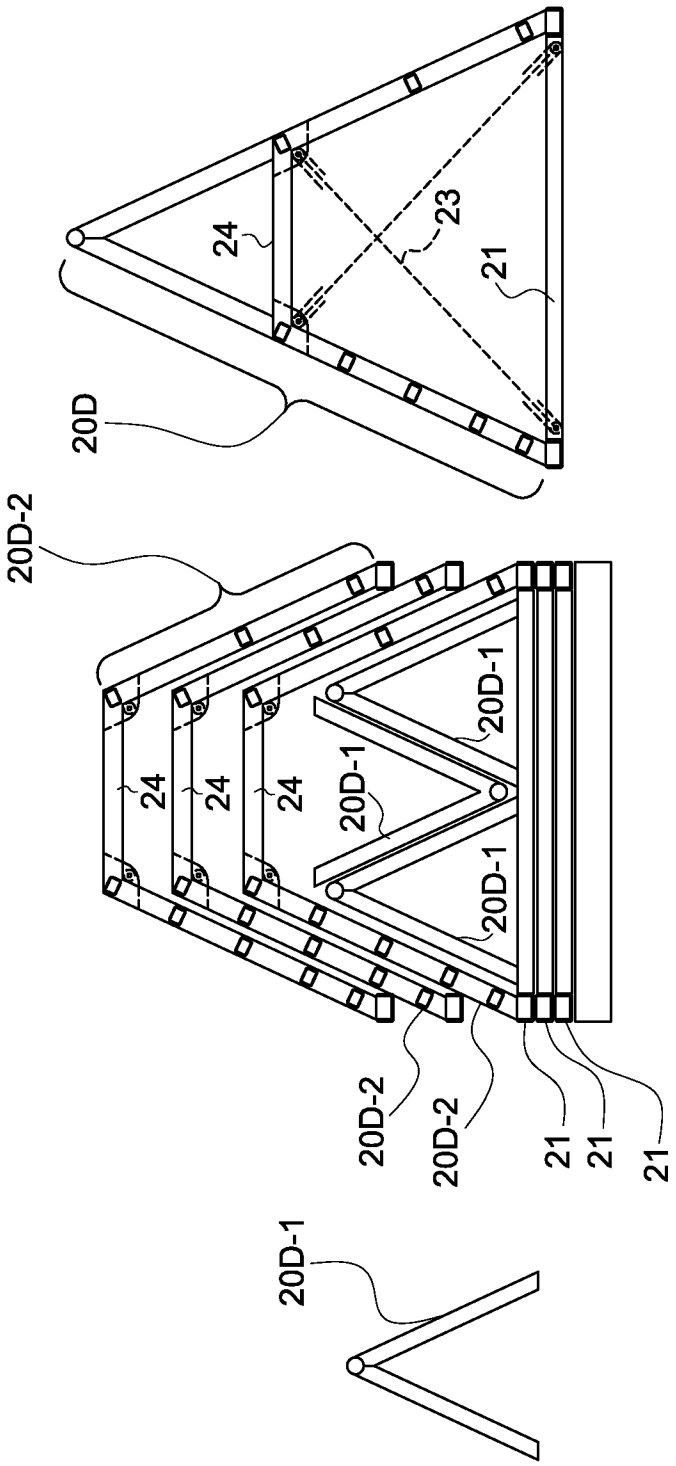


FIG. 18

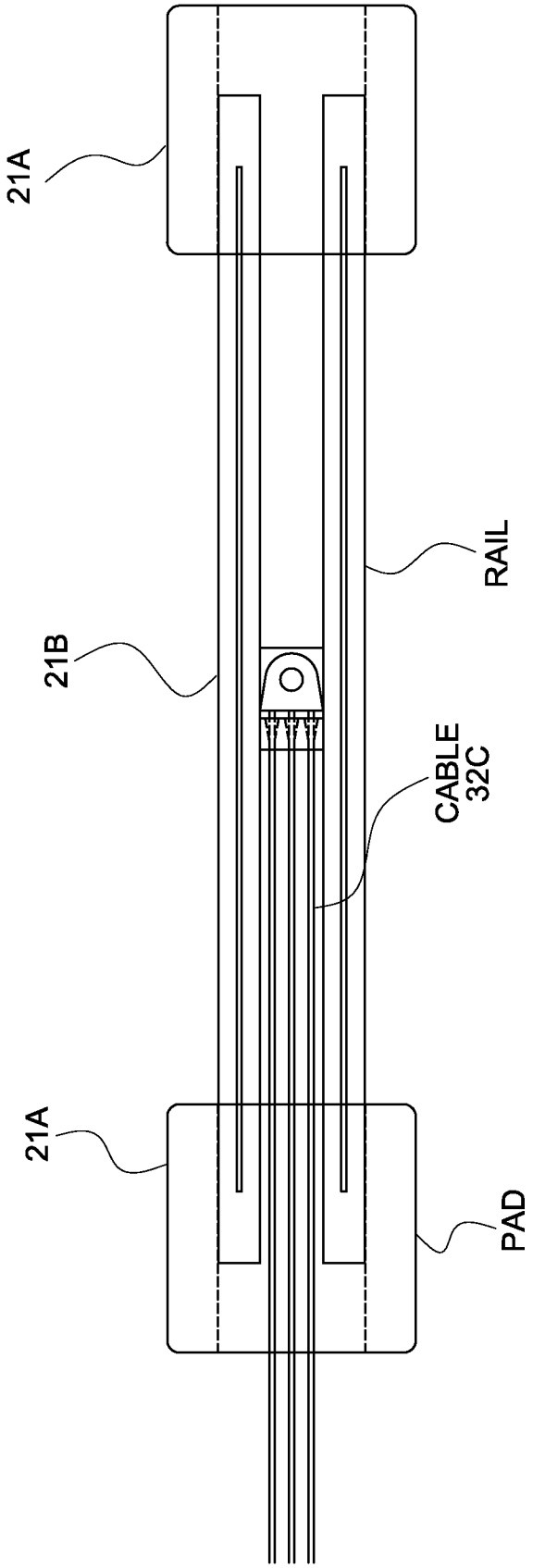


FIG. 19A

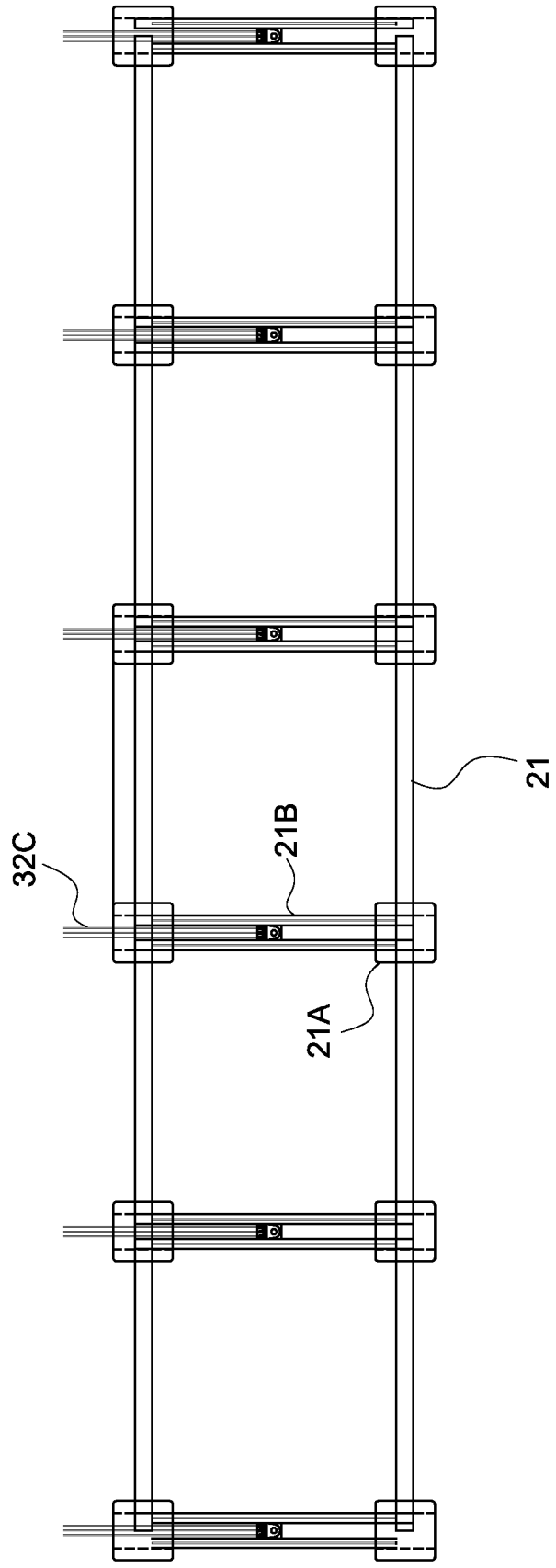


FIG. 19B

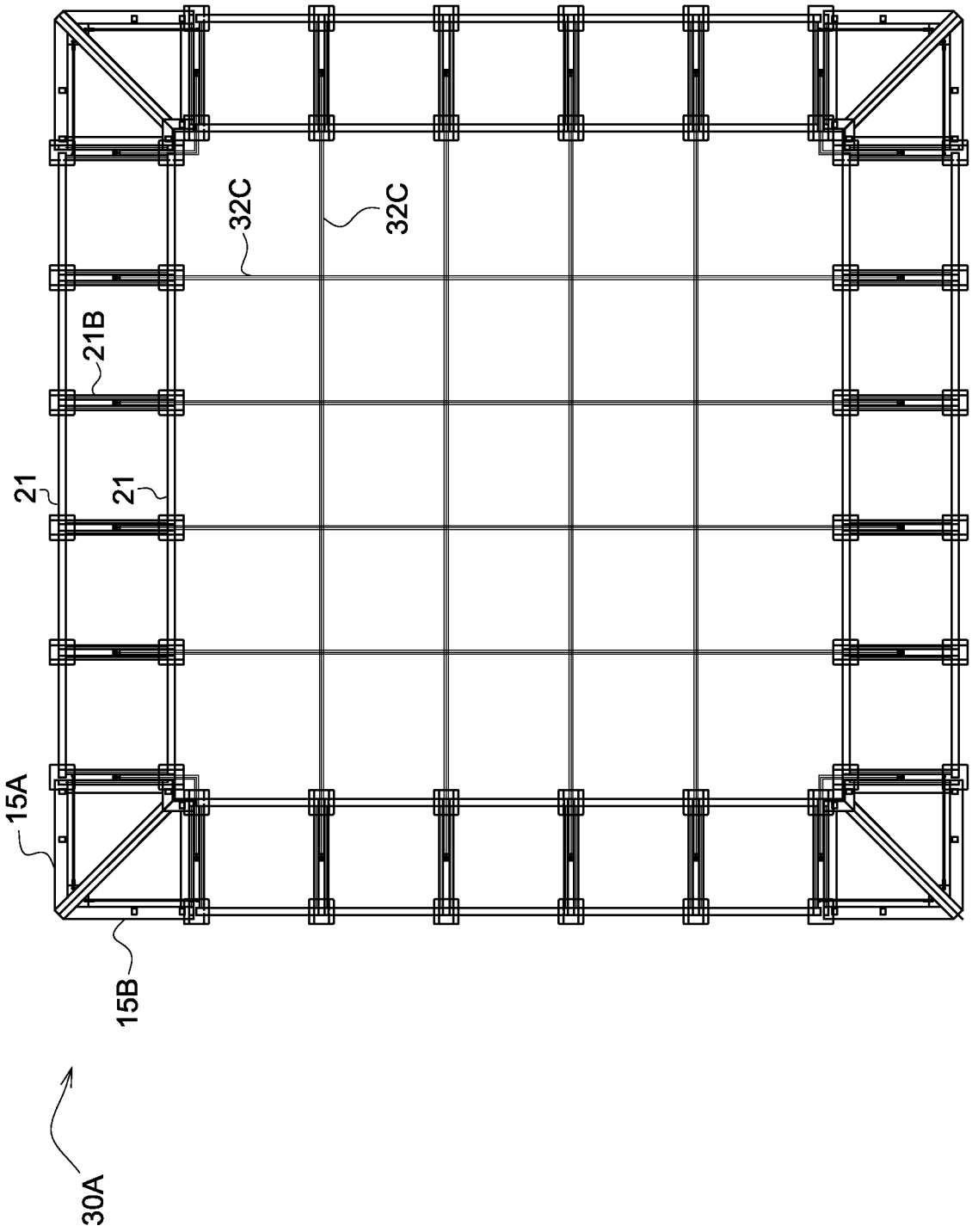


FIG. 19C