

Feb. 8, 1944.

H. C. GLITSCH

2,341,091

BUBBLE TRAY

Filed May 5, 1941

2 Sheets-Sheet 1

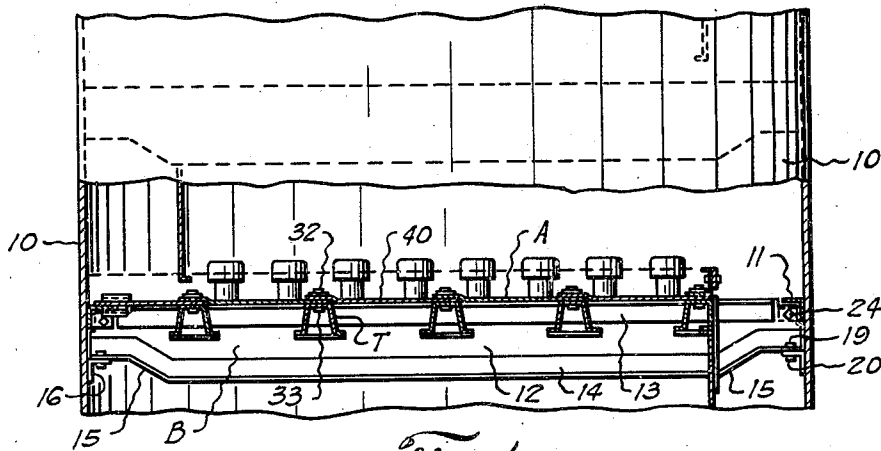


Fig. 1.

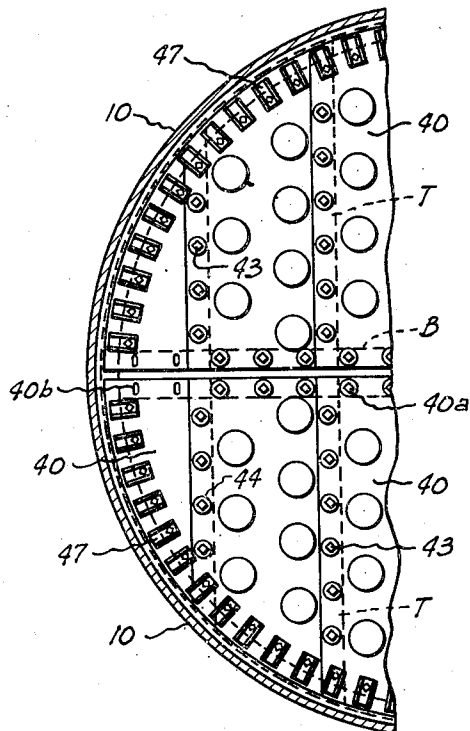


Fig. 2.

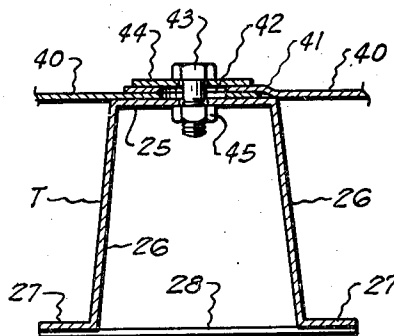


Fig. 3.

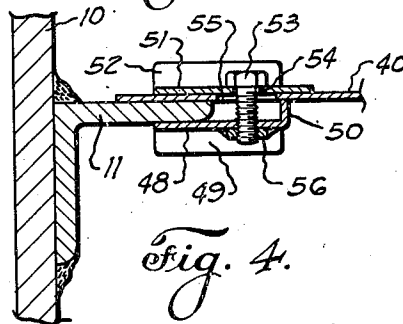


Fig. 4.

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2 Sheets-Sheet 2

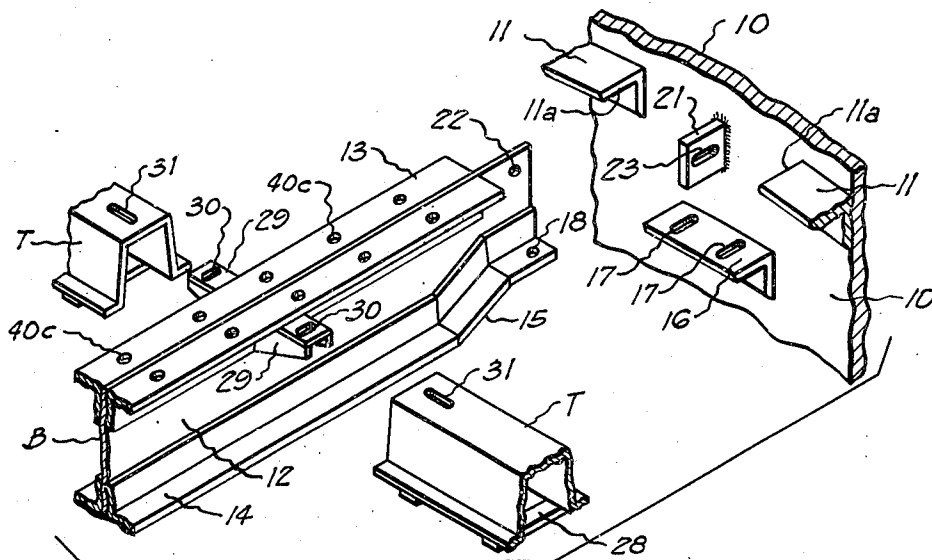


Fig. 6.

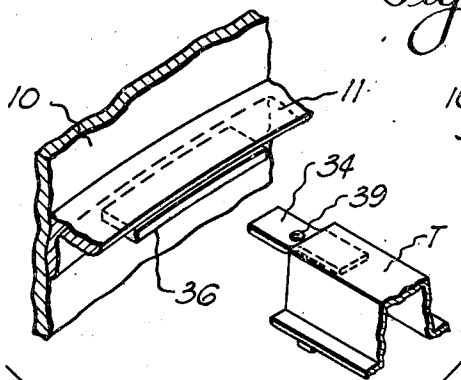


Fig. 7.

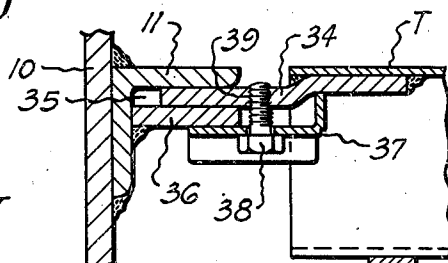


Fig. 8.

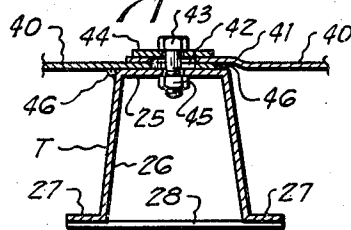


Fig. 9.

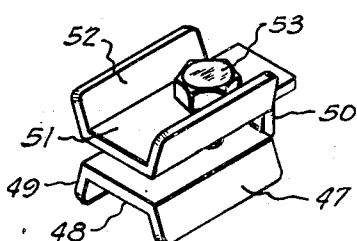


Fig. 5.

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2,341,091

BUBBLE TRAY

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Application May 5, 1941, Serial No. 391,950

2 Claims. (Cl. 261—114)

This invention relates to new and useful improvements in bubble trays.

One object of the invention is to provide an improved bubble tray which is so arranged that the parts thereof, that is, the floor and supporting structure therefor, may be constructed of a relatively thin material, whereby the cost of manufacture is materially reduced and also whereby a lighter structure which facilitates handling and assembly, is produced.

An important object of the invention is to provide an improved bubble tray which is constructed of a plurality of supporting trusses which extend across the interior of the tank and which support the deck plates or floor sections of the tray; each truss being formed of a single piece of relatively thin material and being constructed to provide maximum strength, while presenting a flat surface on which the deck plates or floor sections may rest and also being shaped to permit inexpensive fabrication and to allow free access to the fastening means which extends therethrough for securing the deck plates in position thereon.

A particular object of the invention is to provide an improved bubble tray having a diametrically extending supporting beam and a plurality of transversely extending trusses disposed at substantially a right angle to the beam, each truss having one end secured to the beam and its opposite end fastened to the tank wall, together with a plurality of deck plates supported on the trusses and beam, and secured to these supports by improved fastening and clamping means; the arrangement making it possible to construct all of the parts of the tray of relatively thin, light material, whereby the use of cast iron for the tray, as has been the practice, is eliminated.

Another object of the invention is to provide a bubble tray, of the character described, wherein an improved fastening means or connection between the trusses and the angle ring within tank or between the trusses and the central beam, is employed, such connection being arranged to compensate for any structural errors or misalignments, whereby the parts may be accurately fastened in proper or desired positions.

A further object of the invention is to provide a bubble tray, of the character described, wherein an improved clamp is adapted to fasten the peripheral or marginal edges of the deck plates or floor sections to their supports without the necessity of drilling bolt holes in the supports or plates, whereby the plates are held against distortion; the clamp being constructed to permit thermal

expansion or contraction of the plates, while maintaining a tight seal between the plates and supports.

Still another object of the invention is to provide an improved truss for bubble tray which has a general trapezoidal shape in cross-section, whereby maximum value of moment of inertia in cross-section is obtained and neutral axis is maintained at a location, which will allow greater unit fiber stress in extreme fibers in the tension side of the truss than in the compression side of said truss.

The construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, as an example of the invention is shown, and wherein:

Figure 1 is a view, partly in elevation and partly in section of a bubble tray, constructed in accordance with the invention, mounted with a tank,

Figure 2 is a partial, plan view of the tray, Figure 3 is an enlarged, vertical, sectional view of one of the trusses,

Figure 4 is an enlarged, vertical, sectional view of the clamp which fastens the marginal portion of the deck plate to its support,

Figure 5 is an isometric view of said clamp, Figure 6 is an isometric view of one end of the center beam, a portion of the inner wall of the tank and a portion of two trusses, the parts being disconnected from each other to more clearly illustrate the same,

Figure 7 is an isometric view of one end of one of the trusses and a portion of the inner wall of the tank, to illustrate the connecting means between these parts,

Figure 8 is an enlarged, vertical, sectional view of the parts shown in Figure 7 in their connected positions, and

Figure 9 is a view, similar to Figure 3, illustrating another method of fastening the deck plates to the trusses.

In the drawings (Figure 1), the numeral 10 designates a cylindrical tank which forms the shell of a bubble tower. Only a portion of said tank is shown and it is pointed out that the tank may be of any desired diameter and height. A plurality of transversely extending bubble trays are mounted at spaced elevations throughout the height of the tank in the usual manner, and said trays will vary in number according to the size of the tank. Since the invention herein relates particularly to the construction and mounting of

the bubble trays, only one of said trays has been shown, but it is noted that additional trays (not shown) are disposed above and below the tray which has been illustrated. The operation of the bubble tower in fractionating the hydrocarbon liquid which is conducted through the trays of the tower forms no part of the present invention and any of the conventional methods of operation may be employed.

The bubble tray A is supported within the tank 10 by means of an annular, angle ring 11 which is secured to the inside wall of the tank 10. This ring is welded or otherwise secured to the tank wall and is present in all bubble tower tanks, being ordinarily employed for supporting the tray floor, which is usually constructed of cast iron. The tray floor A is constructed of a central beam B, which beam is fabricated of a relatively thin, light material. As is clearly shown in Figure 6, the beam includes a central, longitudinal plate 12 which has angle bars 13 welded or otherwise secured to its upper edge. The angle bars 13 provide outwardly directed flanges at the upper end of the beam and terminate short of the end of the plate 12. Similar angle bars 14 are welded, or otherwise secured to the lower marginal portion of the plate 12 and these angle bars provide outwardly directed flanges at the lower end of the plate. The lower edge of the plate 12 is inclined upwardly at its ends, as indicated at 15 and the lower angle bars 14 follow this contour and extend entirely to the end of the plate. Obviously, the plate 12 together with the angle bars 13 and 14 secured to its upper and lower edge portions, form an I-beam. If desired, the central beam B could be constructed of a single piece of material having integral flanges on its upper and lower ends; however, by fabricating the beam as illustrated, the cost of manufacture is materially reduced.

The beam B extends diametrically across the interior of the tank 10 and for fastening said beam to the inner wall of the tank, each end of said beam is adapted to engage and rest upon an angular support 16 (Figure 6), which is welded, or otherwise secured to the inner wall of the tank below the annular ring 11. The angular support 16 is provided with elongate slots 17 therein and when the end of the beam B is resting upon the support, these slots are adapted to register with bolt holes 18 formed in the ends of the lateral flanges of the angle bars 14. Thus, bolts 19 may be passed through the bolt holes 18 and the slots 17, and such bolts may receive nuts 20 to securely fasten the end of the beam to the support 16. The provision of the slots 17 compensate for any longitudinal mis-alignment of the beam relative to the inner wall of the tank.

When the end of the beam is in position upon the angular support, the end of the plate 12 of said beam abuts an inwardly extending lug 21, which is welded or otherwise secured to the tank wall. The lug is disposed above the angular support 16 and in substantial alignment with the annular, angle ring 11, said ring being cut out, as shown at 11a to permit the lug 21 to be properly located. The extended end of the plate 12 beyond the angle bars 13 of the beam B is formed with a bolt hole 22 which is adapted to register with an elongate slot 23 formed in the lug 21, whereby a bolt 24 may fasten the plate 12 to the lug. Manifestly, the slot 23 permits a limited movement of the beam B relative to the lugs 21, longitudinally of the beam and diametrically of the tank. When the ends of the beam B are secured to the angular support 16 and the lugs 21,

the upper surface of the angle bars 13 which form the top of the beam B lie in substantially the same plane as the upper surface of the angle ring 11 which is secured to the inner wall of the tank 10.

As explained, the beam B extends diametrically across the center of the tank 10 (Figure 2) and a plurality of trusses or supporting elements T extend from the center beam to the angle ring 11. The trusses are disposed at substantially a right angle to the longitudinal axis of the beam B and as is clearly shown in Figure 2, said trusses are disposed in parallel, spaced relationship to each other. Each truss is constructed of a single piece of material which has a general trapezoidal shape in cross-section (Figure 3). By shaping the truss in this manner, said truss is provided with a flat top 25 and inclined sides 26 which are spread toward their lower ends. In order to add rigidity to the truss, the extreme lower ends of the sides 26 are bent outwardly to provide longitudinal flanges 27. For further bracing each truss, a plurality of straps or bars 28 are secured to the underside of the flanges 27 and span the space between the inclined sides 26. These straps may be welded, or otherwise secured, to the flanges.

As will be seen from the drawings, each truss is constructed of a single piece of relatively thin, light material. The particular trapezoidal shape is advantageous because it permits the inexpensive fabrication of the truss and also provides maximum strength. Furthermore, the upper surface of the truss presents a flat surface on which the deck plate of the tray floor may be mounted, as will be hereinafter explained.

For fastening the trusses T to the central beam B, said beam is provided with a plurality of outwardly extending brackets 29 which are welded, or otherwise secured, to the underside of lateral flanges of the angle bars 13, one bracket being provided for each truss. Each bracket 29 (Figure 6) is preferably U-shaped in cross-section and may be formed either as a single piece of material, or may be fabricated of three separate pieces welded, or otherwise permanently fastened together. The top of the bracket 29 is provided with an elongate slot 30 which extends parallel to the longitudinal axis of the beam B. The inner end of each truss T is provided with an elongate slot 31 which extends at substantially a right angle to the slot 30 in the bracket. In fastening each truss to its bracket, said truss is engaged over the bracket, whereby the top of the truss rests upon said bracket and the slots 30 and 31 are in registration. Since the slots 30 and 31 are disposed at a right angle to each other, it is obvious that each truss may be secured to its bracket in various transverse and longitudinal positions within the limits of said slots, whereby irregularities in construction of the parts may be compensated. A bolt 32 is adapted to pass through the slots 30 and 31 and receives a nut 33 so as to securely fasten each truss to its bracket. It is pointed out that the particular shape of the truss makes the nut 33 readily accessible from beneath said truss.

The outer end of each truss T is adapted to be secured to the angle ring 11 which is mounted on the inner wall of the tank 10 and this connecting means is clearly shown in Figures 7 and 8. As illustrated, the end of the truss T has an outwardly extending bar or tongue 34 welded, or otherwise secured, to the underside of its top. The projecting portion of the tongue or bar is

offset downwardly so as to engage within a groove 35 formed between the underside of the lateral flange of the angle ring 11 and an arcuate plate 36 which is secured to the angle ring by welding, or other means. The plate 36 is spaced below the lateral flange of the ring 11 a distance substantially equal to the thickness of the tongue or bar 34, whereby said tongue may be slidably engaged within the groove 35 formed between the plate and flange. Due to the length of the plate 36, the groove 35 is considerably longer than the transverse width of the tongue 34 and therefore, said tongue may be supported within the groove at any point therealong. Therefore, the tongue may be disposed within the groove at various points so as to compensate for any irregularities in manufacture or to obtain proper positioning of the truss within the tank, also, this arrangement eliminates the necessity of requiring the plate 36 to be accurately located at a given point, for obviously its length will compensate for an incorrect location of the plate within certain limits. The construction facilitates the manufacture and assembly of the bubble tray.

After the tongue 34 has been engaged within the groove 35, said tongue rests upon the plate 36 so as to support the outer end of each truss T. In order to prevent displacement of the tongue from its desired position, an angular clamp 37 (Figure 8) may be provided. This clamp engages the underside of the plate 36 and also has an upstanding flange engaging the underside of the tongue. A tightening screw 38 extends through the clamp and is threaded within an opening 39 formed in the projecting portion of the tongue. By tightening the screw 38, the tongue is pulled downwardly into tight engagement with the plate 36 while the clamp is pulled inwardly, whereby a frictional engagement between the tongue and the plate is maintained and a lateral displacement of the tongue within the groove is prevented. Obviously, with this type of connection, it is not necessary to provide bolt holes or openings in the angle ring 11.

It is pointed out that although the brackets 29 have been illustrated as fastening the inner ends of the trusses T to the central beam B, these brackets could also be employed for fastening the outer ends of said trusses to the angle ring 11. In such instance, each bracket would be welded or otherwise secured to the underside of the lateral flange of the ring 11. Similarly, the tongue 34 and the plate 36 could be employed for fastening the inner end of each truss to the central beam B. In other words, the fastening means between the trusses and their supports is interchangeable.

The beam B and trusses T form a supporting structure which is adapted to support a plurality of deck plates 40 which form the floor of the bubble tray. As illustrated, each deck plate is of a sufficient length to extend from the center beam outwardly to the angle ring 11 and is of such width as to span the distance between the trusses T. Each floor section is constructed of a relatively thin material which is made possible because of the relatively narrow distance between the parallel trusses T.

Each floor section has one longitudinal edge supported on one of the trusses T, as is clearly shown in Figure 3. The longitudinal edge of the adjacent plate is upset as illustrated at 41 so that said edge may overlie the plate which is resting on the top of the truss. The overlap-

ping edge portions of adjacent deck plates are formed with a plurality of registering elongate slots 42 and a bolt 43 is arranged to extend through each pair of registering slots. A washer 44 surrounds each bolt and engages the uppermost deck plate so as to prevent the head of the bolt from passing downwardly through the slots through which it extends. Each bolt receives a nut 45 which is adapted to be tightened against the underside of the top 25 of the truss and with this arrangement, the deck plates are securely fastened to the trusses T, but due to the slots 42, are permitted to undergo a limited lateral movement with respect to each other. Such lateral movement compensates for thermal expansion and contraction of the deck plates. Manifestly, the nuts 45 are readily accessible from beneath the trusses.

As shown in Figure 3, the deck plates are frictionally secured in position on the trusses T and capable of a limited lateral movement. If desired, the deck plates may be mounted on the trusses as shown in Figure 9. In this case the lowermost deck plate is welded or otherwise affixed to the top of the truss, as shown at 46. The edge of the adjacent plate is upset, as explained, and overlies the end portion of the plate which is secured to the truss. In this instance the slots 42 are provided, as are the bolts 43, washers 44 and nuts 45. The construction shown in Figure 9 fastens one end of each deck plate to one of the trusses, with the other end overlapping the next adjacent truss and capable of a limited lateral movement relative thereto. In both instances thermal expansion and contraction may be compensated.

Since the top of the beam B, the top of each truss T and the top of the angle ring 11 lie in the same plane, it will be obvious that the deck plates 40 will lie flat on the supporting structure. The inner end of each plate rests upon the top of the angle bars 13 and is secured to said bars by bolts 40a, which extend through slots 40b in the plate and openings 40c in the angle bars 13.

It is desirable to clamp the outer marginal edges of the deck plates to the supporting ring 11 and for this purpose a plurality of clamps 47 are employed. One of these clamps is clearly shown in Figures 4 and 5, and said clamp includes a lower angular member 48 which is formed with depending inclined flanges 49 which reinforce and add rigidity to said member. An upstanding lug 50 is preferably formed integral with the member 48 and is adapted to engage the underside of the deck plate, while the remainder of the member engages the underside of the ring 11. The clamp also includes a complementary upper member 51 having longitudinal upstanding flanges 52 which reinforce and add rigidity to this member. The member 51 is adapted to overlie the top of the deck plate and also to overlie a portion of the lateral flange of the ring 11, as is clearly shown in Figure 4. A bolt 53 passes through an opening 54 in the upper member 51 and extends downwardly through an enlarged or elongate slot 55 formed in the marginal portion of the deck plates 40. The lower end of the bolt 53 threads into a nut 56 which is welded or otherwise secured to the lower clamping member 48 and when the bolt 53 is tightened, the members 48 and 51 are drawn together so as to frictionally clamp the marginal edge portion of the deck plate 40 to the annular ring 11. Due to the provision of the elongate slot 55,

this marginal edge portion of the deck plate may undergo movement relative to the ring 11, which movement may be caused by thermal expansion and contraction. As is clearly shown in Figure 2, a plurality of the clamps 47 are provided and serve to clamp the marginal edges of the various deck plates to the supporting ring 11. The clamp not only serves to fasten the deck plates in position but also insures a tight seal of the plate on the ring 11 so as to prevent any leakage at this point. Obviously, the deck plates are reinforced and stiffened by the clamps 47 so as to prevent distortion of the periphery of the tray floor. If desired, the clamp 47 may also be utilized for clamping the marginal edges of each deck plate to the central beam E.

Although the central beam has been found desirable, it has also been found that such beam could be entirely eliminated. If no central beam is used, the trusses T extend completely across the tank and have their ends secured to the supporting ring 11 at opposite sides of the tank, the fastening means being either the brackets 29 or the tongue 34 and plate 36 connection. Therefore, it is obvious that the invention is not to be limited to the use of the central beam.

The structure above described makes it possible to produce a tray floor from relatively thin, light material, without sacrificing strength and it is not necessary to construct the tray floor of cast iron or other heavy metal, as has been the practice, in order to obtain the necessary rigidity. By making the parts out of thin, light material, manufacturing costs are decreased and handling and assembly are facilitated. Although the particular material of which the parts are constructed forms no part of this invention, it is pointed out that a bubble tray can be economically constructed of stainless steel, which has the additional feature of being corrosion-resistant, without making the cost prohibitive. The particular shape of each truss T is important because it gives maximum strength and permits said truss to be constructed of a single piece of the thin, light material. The connecting means between the trusses and the beam 13, as well as the connecting means between the trusses and the ring 11 facilitate manufacture and assembly of the tray because irregularities either in manufacture or in construction may be compensated for, and also accurate positioning of the trusses within the tank may be accomplished. The provision of the clamp 47 strengthens the peripheral portion of the floor formed by the deck plates and also maintains a tight seal between the various plates and the supporting angle ring 11.

What I claim and desire to secure by Letters Patent is:

1. A bubble tray assembly adapted to be mounted within a tank including, a substantially annular support secured to the inner wall of the tank, a plurality of trusses extending across the interior of the tank in parallel relation and secured to the support, a plurality of floor sections mounted on the trusses and on the support, a plurality of clamps for clamping the marginal portions of the sections to the support, each clamp comprising an upper and lower member which are disposed above and below the marginal portions of the section and support, and a headed bolt extending through one of the members and through the floor section and having threaded engagement with the other member for urging the members toward each other to frictionally clamp the sections to

the support while permitting the sections to undergo limited lateral movement relative to the support.

2. A bubble tray assembly adapted to be mounted within a tank including, an annular supporting ring secured to the inner wall of the tank, a plurality of trusses transversely extending across the tank, each truss having an end connecting to the supporting ring, said connecting means comprising a projecting element on the truss and a plate disposed below the ring spaced therefrom to form a groove for receiving the projecting element, and a plurality of floor sections supported on said trusses and ring.

3. As a sub-combination in a bubble tray assembly, a clamp comprising, an upper flat member having its longitudinal edges bent upwardly to provide flanges, a lower complementary member having depending longitudinal flanges and also provided with an upstanding lug at one end, and a connecting means for drawing the members toward each other, whereby an element or elements may be frictionally clamped between the members.

4. As a sub-combination in a bubble tray assembly, a clamp comprising, an upper flat member having its longitudinal edges bent upwardly to provide flanges, a lower complementary member having depending longitudinal flanges and also provided with an upstanding lug at one end, a connection including, a tongue projecting from a bubble tray element to be fastened, and a pair of outwardly extending members secured to the tank wall and spaced from each other to form a groove for the reception of the tongue, whereby the element may be supported.

5. The combination with a tank having an annular support secured to its inner wall and having a plurality of trusses extending transversely across the interior of the tank, of an improved mounting for said trusses including, means for connecting the end of each truss to the annular support within the tank, and connecting means for each end of each truss comprising an arcuate plate which coacts with the support to provide a groove, and an extending tongue on the end of the truss adapted to engage with the groove so formed and to rest upon the plate, whereby said truss is supported thereby.

6. The combination set forth in claim 5, wherein the groove formed by each arcuate plate and the support is of a length greater than the transverse width of the tongue, whereby variations or irregularities in construction of the trusses and in location of said plates may be compensated for.

7. The combination as set forth in claim 5, together with a clamping means for frictionally clamping each end of the truss to its respective supporting plate.

8. A bubble tray assembly adapted to be mounted within a tank including, an annular supporting ring secured to the inner wall of the tank, a central beam extending diametrically across the tank, means for securing the ends of the beam to the tank wall, a plurality of trusses disposed at a right angle to the beam and extending between the beam and annular ring, said beam having elongate openings therein and each truss having elongate openings at its inner ends adapted to register with the openings in the beam, the openings in said beam being disposed at a right angle to the openings in the trusses, whereby said openings may be regis-

tered in spite of irregularities of manufacture of the parts, bolts passing through the registering openings for fastening the trusses to the beam, means for fastening the outer ends of the trusses to the supporting ring, and a plurality of deck plates mounted on the beam, trusses and ring.

9. A bubble tray as set forth in claim 8, wherein the means for securing each end of the beam to the tank wall comprises an outwardly extending lug on the tank having an opening adapted to register with an opening in the end of said beam, and a bolt passing through said registering openings to fasten the beam to the tank wall.

10. The combination with a tank having an annular supporting ring secured to its wall and transversely extending trusses extending across its interior, of a plurality of deck plates supported on said ring and trusses, said deck plates having certain edges overlying the ring and having their longitudinal edges overlying the trusses, the longitudinal edge portion of one plate being upset so as to overlie the edge portion of the adjacent plate on the truss, means for frictionally clamping the longitudinal edge portions of said plates to the truss, and additional means for frictionally clamping the plates to the supporting ring.

11. The combination set forth in claim 10, wherein the longitudinal edge of the plate resting directly on the truss is permanently fastened to the truss with the overlying edge portion of the adjacent plate being frictionally fastened in place.

12. As a subcombination in a bubble tray assembly, a clamp for securing a truss to a support including, a body having an upstanding flange, said body being engageable with the underside of the support with the flange engaging the truss, and a headed bolt extending through the body and threaded into the truss for pulling said truss downwardly into engagement with the support, whereby the truss is frictionally fastened thereto.

13. A bubble tray assembly adapted to be mounted within a tank including, a substantially annular support secured to the inner wall of the tank, a plurality of trusses extending across the interior of the tank and secured to the support, a plurality of flat floor sheets mounted overlying the trusses and on the support, and frictional clamping means for fastening the marginal portions of the sheets which overlie the support to said support, each fastening means including substantially flat clamping members disposed above and below the support and marginal portion of a sheet, and means independent of the support for securing the clamping members together with the support and a sheet frictionally held therebetween.

14. A bubble tray assembly adapted to be mounted within a tank including, a substantially annular support secured to the inner wall of the tank, a plurality of trusses extending across the interior of the tank and secured to the support, a plurality of floor sections mounted overlying the trusses and on the support, and a plurality of frictional clamps for fastening the marginal portions of the sections to the support, each clamp including an amplified upper plate overlying the section and support, a lower plate beneath the support, and means independent of the support for drawing the plates toward each other to frictionally clamp the marginal portion

of the floor section to the support, the amplified clamping area of the upper plate providing for a sealing between the floor section and support.

15. An individual truss for a bubble tray including, an elongate body of material bent upon itself so as to be substantially trapezoidal in cross-section, said body having an unobstructed flat and substantially smooth top surface adapted for receiving flat deck sheets with expansion joints therebetween, whereby said sheets may undergo movement upon said top surfaces, means at each end of the body for independently suspending it between supports, outwardly directed flanges along the lower edges of the body integral therewith, and spaced straps extending transversely across the bottom of the body, each having its end portions secured to the flanges whereby each truss is individually braced across its bottom.

16. An individual truss for a bubble tray including an elongate body of material bent upon itself so as to be substantially trapezoidal in cross-section, said body having an unobstructed flat and substantially smooth top surface adapted for receiving movable deck sheets, and means at the outer end and top of the body for hanging its outer end in spaced and movable relation to a support.

17. In combination in a bubble tray, a marginal support, a plurality of trusses each trapezoidal in cross-section and having flat and substantially smooth tops, and expansible deck sheets movably secured on the tops of said trusses, the trusses and the sheets being frictionally clamped to said support to permit expansive and contractive movements of said trusses and sheets.

18. A bubble tray assembly adapted to be mounted within a tank including, an annular supporting ring secured to the inner wall of the tank, a beam extending across the tank, means for securing the ends of the beam to the tank wall, a plurality of trusses extending between the beam and annular ring, said beam having elongate openings therein and each truss having elongate openings at its inner ends adapted to register with the openings in the beam, the openings in said beam being disposed at a right angle to the openings in the trusses, whereby said openings may be registered regardless of irregularities of manufacture of the parts, bolts passing through the registering openings for fastening the trusses to the beam, means for fastening the outer ends of the trusses to the supporting ring, and a plurality of deck plates mounted on the beam, trusses and ring.

19. The combination in a bubble tray assembly adapted to be mounted in a tank, of an annular supporting ring adapted to be secured to the inner wall of a tank, a diametrical beam disposed within said support and adapted to be secured to the wall of the tank, a plurality of trusses disposed at an angle to the beam and having their inner ends attached to the beam, the outer ends of the trusses being spaced from the support, extensions on the outer ends of trusses overlying the support and adjustable thereon, and means for frictionally clamping the extensions on the support in their adjusted positions.

20. The combination as set forth in claim 19, wherein the tops of the beam and the trusses are flat and unobstructed, deck sheets resting upon the flat tops of the beam and trusses with their outer marginal portions resting upon said

support, and means for frictionally clamping the sheets on the beam, trusses and support to permit them to undergo expansion and contraction.

21. The combination with a tank having an annular support secured to its inner wall and also having a plurality of transversely extending trusses relatively within said support having their outer ends spaced from the support, of an

improved mounting for the outer end of each truss including, a member rigidly carried by the end of each truss bridging the space between the truss and the support, and means for frictionally clamping said member to the support to permit longitudinal movement of the truss when clamped and to compensate for irregularities in the construction of the truss.

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