Claims

[Claim 1] An X-beam structure, comprising:
a plurality of beams extending in X-axis, Y-axis, and Z-axis directions and formed in a lattice shape and a plurality of cross intersections 130 at which an X-axis beam, a Y-axis beam, and a Z-axis beam meet one another,
wherein a cross section of each beam has a right-angled X shape, and the cross intersections 130 are provided with continuous beams 110 onto which discontinuous beams 120 are attached or welded to the continuous beams 110.

[Claim 2] The X-beam structure of claim 1, wherein the X-axis beam is spaced apart from an X-axis beam positioned on the same plane and adjacent thereto at the same distance, the Y-axis beam is spaced apart from the Y-axis beam positioned on the same plane and adjacent thereto at the same distance, and the Z-axis beam is spaced apart from the adjacent Z-axis beam positioned on the same plane and adjacent thereto at the same distance.

[Claim 3] The X-beam structure of claim 1, wherein the attached beams 120 have protrusions 121 in an angular shape formed at ends thereof and central portions of the protrusions 121 are provided with cut-outs 122 into which are consistent with the cross-sectional shpe of the continuous beams 110.

[Claim 4] The X-beam structure of claim 3, wherein the cross intersections 130 is formed so that a portion at which the cut-out 122 contacts the continuous beam 110 and a portion at which the protrusion 121 contacts the adjacent protrusion 121 have a smaller cross sectional area toward the outside from the inside.

[Claim 5] The X-beam structure of claim 1, wherein brackets 141 and 142 are welded onto webs of beams meeting at a beam intersection 130.

[Claim 6] A pressure tank having the X-beam structure of any one of claims 1 to 5 comprising a tank body 200 having a high-pressure fluid accommodated therein and manufactured in a prismatic shape, wherein the X-beam structure 100 is disposed in the tank body 200 and reaches the other opposite side wall from one side wall of the tank body 200 and is regularly orthogonally arranged.

[Claim 7] A pressure tank having an X-beam structure of claim 5, wherein beam structure openings 211 are provided at a place at which the tank wall

210 of the tank body 200 contacts the X-beam structure 100 in the same shape as the cross section of the X-beam structure 100 and the X-beam structure 100 is extended to the outside of the tank wall 210 by being inserted through the beam structure openings 211.

[Claim 8] A pressure tank having an X-beam structure of claim 5, wherein an outer surface of the tank wall 210 is provided with stiffening members 220 in an orthogonal pattern and the beam structure 100 is welded to the stiffening members 220 after being inserted through the tank wall 210 and the stiffening members 220.

[Claim 9] A pressure tank having an X-beam structure of claim 5, wherein the distance from the tank wall 210 to the most adjacent the cross intersection 130 is different from corresponding distances between adjacent internal cross intersections 130.

WHAT IS CLAIMED IS:

1. A pressure tank having an X-beam structure, comprising:

a plurality of beams extending in X-axis, Y-axis, and Z-axis directions and formed in a lattice shape and a plurality of cross intersections 130 at which an X-axis beam, a Y-axis beam, and a Z-axis beam meet one another,

wherein a cross section of each beam has a right-angled X shape,

at the cross intersections 130, continuous beams 110 consecutively formed and attached beams 120 are attached or welded to each other,

the attached beams 120 have protrusions 121 formed in an angular shape at one side or both sides of ends thereof and having inclined surfaces and contact adjacent attached beams 120 through the inclined surfaces of the protrusions 121, and ends at which the protrusions 121 are not formed are linearly formed to contact the continuous beams 110,

central portions of the protrusions 121 are provided with cut-outs 122 into which the continuous beams 110 are inserted,

the cross intersections 130 are attached to the continuous beams 110 so as to contact the continuous beams 110 through the cut-outs 122, and a portion at which the protrusion 121 contacts an adjacent protrusion 121 has a

gradient of 45 degrees and has a cross-sectional area that becomes smaller from the inside toward the outside, and

the cut-outs 122 of four attached beams 120 are inserted into and attached and welded to the continuous beams 110 to attach and weld the protrusion 121 to the adjacent protrusion 121, the pressure tank having an X-beam structure further comprising:

a tank body 200 having a high-pressure fluid accommodated therein and manufactured in a prismatic shape, wherein the X-beam structure 100 is disposed in the tank body 200, reaches the other opposite side wall from one side wall of the tank body 200, and is regularly orthogonally arranged,

beam structure openings 211 are perforated at a place at which a tank wall 210 of the tank body 200 contacts the X-beam structure 100 in the same shape as that of a cross section of the X-beam structure 100,

an outer surface of the tank wall 210 is provided with stiffening members 220 having a lattice shape, and

the X-beam structure 100 is inserted through the beam structure openings 211, is extended to the outside of the tank wall 210, and is welded to the stiffening members 220.

2. The pressure tank having an X-beam structure of claim 1, wherein the X-axis beam is spaced apart from an X-

axis beam positioned on the same plane and adjacent thereto at the same distance, the Y-axis beam is spaced apart from the Y-axis beam positioned on the same plane and adjacent thereto at the same distance, and the Z-axis beam is spaced apart from the adjacent Z-axis beam positioned on the same plane and adjacent thereto at the same distance.

3. The pressure tank having an X-beam structure of claim 1, wherein brackets 141 and 142 are welded onto webs of beams meeting at the beam intersection 130.

4. The pressure tank having an X-beam structure of claim 1, wherein the distance from the tank wall 210 to the most adjacent the cross intersection 130 is different from corresponding distances between adjacent internal cross intersections 130.