

[54] **METHOD FOR CONSTRUCTING A
FLOATING ROOF TANK**

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113/120 R**

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[58] **Field of Search**..... **29/454, 421 R, 434, 436,
29/462; 113/120 R**

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[57] **ABSTRACT**

A method for constructing a floating roof tank without using a high scaffold within the tank, wherein, when a side wall of the tank is built up to a certain level, a number of short angle supports are erected on a bottom plate of the tank for forming a floating roof thereon by assembling and welding a deck plate and a number of pontoons. After sealing a gap between the side wall of the tank and the pontoons, air is blown into a closed space beneath the assembled floating roof to lift the same up horizontally to a predetermined level with the aid of a pulling means. The floating roof is maintained at the lifted level to make a working space thereunder for carrying out the necessary works.

8 Claims, 2 Drawing Figures

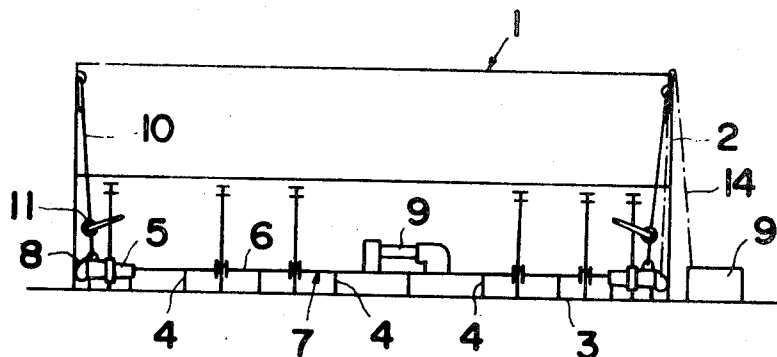


FIG. 1

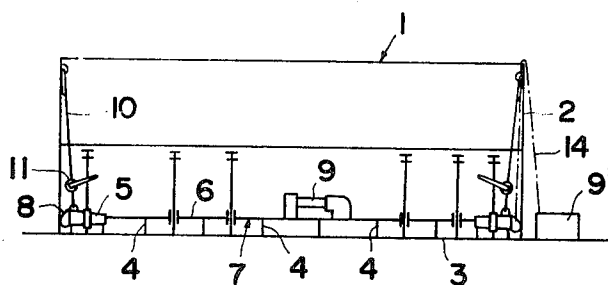
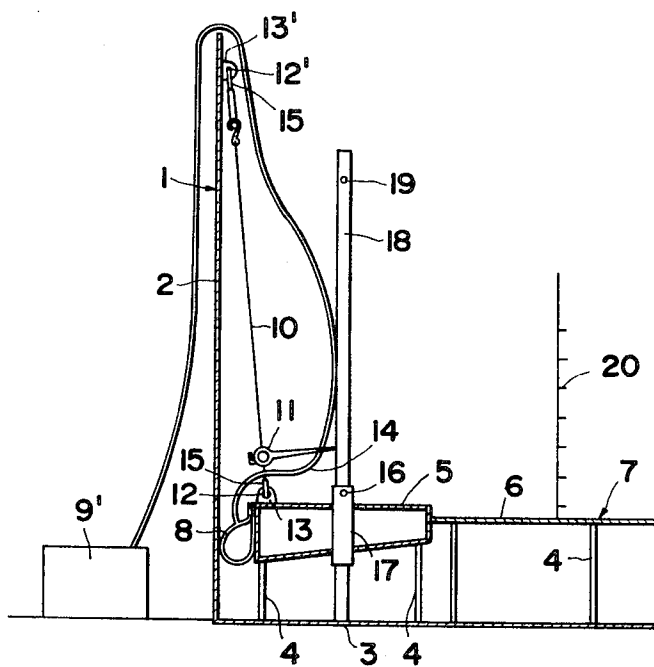


FIG. 2



METHOD FOR CONSTRUCTING A FLOATING ROOF TANK

BACKGROUND OF THE INVENTION

This invention relates to a method for constructing a floating roof tank. More particularly, the invention concerns a method for constructing a floating roof tank, which can contribute to facilitate the construction work and at the same time to reduce the amount or number of scaffolding materials and working equipments to a considerable degree as compared with the conventional methods.

In the construction of floating roof tank, it has thus far been the usual practice to build a high scaffold like a spider web within the tank to form a floating roof thereon by assembling a number of pontoons and a deck. The assembling work on a high scaffold is dangerous and usually involves serious accidents of the workmen. In addition, the roof construction employing a high scaffold takes a lot of time in assembling and disassembling the scaffold as well as in transferring a large amount of materials to and from the construction site which is usually remote from a storage place, obviously resulting in a prohibitively high construction cost.

SUMMARY OF THE INVENTION:

It is therefore an object of the instant invention to provide a method for constructing a floating roof tank, which will eliminate the drawbacks inherent to the conventional methods as mentioned above.

It is a more particular object of the present invention to provide a method for constructing a floating roof tank, which does not necessitate erection of a high scaffold within the tank.

It is a further object of the present invention to provide a method for constructing a floating roof tank, which involves only a reduced number of steps.

It is still another object of the present invention to provide a method for constructing a floating roof tank, which can significantly facilitate the construction work while reducing the construction cost to a material degree.

An one preferred form of the invention, the method comprises the steps of erecting a number of short angle supports on a bottom plate of a tank when a side wall of said tank is built up to a given level; forming a floating roof and on the erected angle supports by securely welding a deck and a number of pontoons to each other; securing inflatable sealing means around the outer periphery of the connected pontoons; feeding compressed air to said sealing means for hermetically sealing a gap between said side wall of said tank and said pontoons; blowing air into a closed space beneath said floating roof to float the same horizontally up to a predetermined level with aid of pulling means to make a working space beneath said roof; and fixing said roof at the elevated level on a number of support columns of a predetermined length.

The above and other objects, features and advantages of the present invention will become clear from the following particular description and the appended claims, taken in conjunction with the accompanying drawing which shows by way of example a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS:

In the accompanying drawing:

FIG. 1 is a diagrammatic sectional view generally showing a floating roof tank under construction according to the method of the invention; and

FIG. 2 is a fragmentary sectional view showing on an enlarged scale one portion of the tank of FIG. 1.

PARTICULAR DESCRIPTION OF THE INVENTION:

The present invention is now described more particularly with reference to the accompanying drawing. Referring to FIGS. 1 and 2, when the side wall of a tank 1 is built up to a suitable level as shown at 2, for example, to the level of the second row, a number of low working supports 4 is erected on a bottom plate 3 of the tank with use of short angle or round steels having a length of, for example, 500 mm. Thereafter, a floating roof 7 is formed by assembling a deck plate 6 and a number of pontoons 5 with use of a crane or other suitable lifting means. The deck plate 6 and pontoons are welded hermetically to each other, and a sealing means 8 having a rubber scarf band is fixed around the outer periphery of the welded pontoons 5. The air sealing means 8 is connected by means of an air feed pipe 14 to an air compressor 9 which is located outside the tank 1. A blower 9 is fixedly mounted on the deck 6 and has at its output end opened into the deck 6. A number of apertured connecting pieces 13 are fixed securely on the pontoons 5 at a suitable distance from adjacent ones. At the same time, a corresponding number of similar apertured connecting pieces 13' are securely fixed on the inner surface of the side wall 2 in vertical alignment or to form pairs with the apertured pieces 13 on the pontoons 5. A wire rope or chain 10 is threaded through the apertures 12, 12' of the upper and lower connecting pieces 13, 13'. The wire rope 10 is fixed by a shackle 15 and is provided with a universal puller (hoisting chain block) 11 to wind up the ropes or chains 10 as will be explained hereinafter.

After assembling the floating roof 7, compressed air is introduced into the sealing means 8 from the air compressor 9' to hermetically seal the gap between the side wall (shell plate) 2 and the pontoons 5. Thereafter, air is blown into the hollow closed space below the floating roof 7 from the blower 9 on the deck 6 to float the roof 7. In this instance, in order to prevent inclinations or localized deformation of the roof 7, the wire rope or chain 10 is wound up by means of the puller 11 to lift the floating roof 7 in a horizontal state up to a suitable level to make a working space beneath the roof 7, for example, up to a height of 1900 mm on a scale 20 which is graduated on the inner surface of the side wall 2. As soon as the floating roof 7 reaches the predetermined level, a number of openings are bored through the pontoons and the deck plate for inserting there-through support guide pipes or sleeves 17 each with a pin hole 19. The support guide pipes 17 are fixed in the respective openings, each slidably receiving there-through a support column 18 with a pin hole 19. The support guide pipes 17 are fixed on the support columns by inserting and fixing pins in the pin holes 19 and 16 of the support columns 18 and the support guide pipes 17. After fixing the support guide pipes 17, the amount of air from the blower 9 is gradually reduced. The blower 9 is switched off after confirming that the lower ends of the respective support columns are lowered to the level of the bottom plate 3. In this

manner, a working space is made under the roof 7 to carry out the necessary work.

It will be understood from the foregoing description that, according to the method of the present invention, the construction of the floating roof tank may be completed without using a high scaffold so that it becomes possible to reduce the costs which would otherwise be incurred in connection with procurement, transportation and erection or disassembling of the scaffold materials. For example, for the construction of a 160,000 K/ tank, it has thus far been required to erect a scaffold having a height of about 1800 mm, using about 110 tons of scaffold materials including channel and angle steels. The removal of such a scaffold after completion of the work usually takes at least three days by eight workmen. However, the method according to the invention does not necessitate the erection of a high scaffold, and the deck support can be formed with use of only 9 tons of 500 mm long angle steels and removed in only two hours by two workmen.

In addition, according to the present invention, the construction work can be carried out on low deck supports in a far safer manner as compared with the conventional methods. As mentioned hereinbefore, the cost and time of the construction can be reduced to a considerable degree since the necessary construction work can be carried out with use of a reduced amount of materials and few equipments, including a compressor, blower and pulling wire ropes or chains. Moreover, leveling of the floating roof is carried out by means of the hoisting blocks so that any types of floating roof tank, such as a center pontoon type tank, a buoy roof type tank, a tank having double deck roof and so on, can be constructed by the present invention.

What is claimed is:

1. A method for constructing a floating roof tank, comprising the steps of:

erecting a number of short angle supports on a bottom plate of said tank after building a side wall up to a given level;

forming a floating roof on said angle supports by connecting pontoons around a deck plate;

securing inflatable sealing means around the outer periphery of said pontoons;

feeding compressed air to said sealing means for hermetically sealing a gap between said side wall and said pontoons;

blowing air into a closed space beneath said floating roof to float the same horizontally up to a predetermined level with the aid of a pulling means to make a suitable working space beneath said roof; and fixing said roof at the elevated level by means of a number of support columns.

2. A method according to claim 1, wherein compressed air is fed to said sealing means from an air compressor which is located outside said tank.

3. A method according to claim 1, wherein air is blown into said closed space by a blower which is mounted on said floating roof.

4. A method according to claim 1, wherein said floating roof is pulled by winding up pulling means which are spanned between said side wall and said pontoons.

5. A method according to claim 4, wherein said pulling means are a number of wire ropes.

6. A method according to claim 4, wherein said pulling means are a number of chains.

7. A method according to claim 4, wherein each of said pulling means has a universal puller at a suitable position within the length thereof.

8. A method according to claim 1, wherein said inflatable sealing means is a scarf band securely connected to the outer periphery of said pontoons.

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