DESCRIPTION

TITLE: LIQUEFIED GAS STORAGE TANK

[0001] The present invention relates to the field of the storage and/or transport of a cargo of liquefied gas, such as liquefied natural gas, liquid ammonia as well as liquefied petroleum gas. More particularly, the invention relates to a tower for loading and unloading a liquefied gas storage tank.

[0002] Liquefied natural gas, commonly known by the acronym “LNG”, for “Liquefied Natural Gas,” is an important source of energy and is composed of approximately 95% methane. More particularly, LNG is stored in the liquid state in a thermally insulated tank at a temperature near -160°C, at which LNG occupies 1/600 of the volume that it would occupy in the gaseous state, thus making it possible to facilitate transport from one site to another.

[0003] Conventionally, the tank comprises a loading and unloading tower suspended from a cover which closes an opening in the tank. The loading and unloading tower may comprise a tripod type structure, that is, comprising three vertical poles connected to one another by cross members forming a lattice structure, said tower being guided by a support of the tank emerging from a bottom wall. The loading and unloading tower then comprises at least one unloading pipe and a pumping member whose function is to unload the cargo from the tank, said pumping member being connected to a drive device arranged outside the tank. Furthermore, in order to allow complete suction of the cargo, the suction element is arranged at least in part in a sump formed in the bottom wall of the tank which makes it possible to increase the amount of the cargo extracted by the unloading pipe while ensuring the immersion of the suction element in said cargo, thus preserving its integrity.

[0004] It is then known to place the unloading pipe in one of the poles of the loading and unloading tower. One of the drawbacks of such an arrangement

of the loading and unloading tower then lies in the proximity between the support guiding the tower and the sump formed opposite the unloading pipe. Such a proximity indeed limits the deformation property of the tank wall during storage of the cargo and during cool-down of the tank prior to filling it with the liquefied gas, this deformation property being necessary to limit the deterioration of the tank. Furthermore, such an arrangement of the unloading pipe in one of the poles of the structure of the tower complicates its accessibility for an operator. It is thus understood that such a configuration of the tank and more particularly of the loading and unloading tower increases the mechanical stresses on said tank, necessary for the storage of liquefied gas, while limiting the accessibility of the unloading pipe.

[0005] The present invention falls within this context by proposing an arrangement of the pumping member different from the already existing positioning solutions making it possible, on the one hand, to facilitate access to the pumping member and to the unloading pipe, and on the other hand to reduce the mechanical stresses imposed on the storage tank.

[0006] The main object of the present invention is thus a tank intended for a structure and configured to contain a liquefied gas, comprising a bottom wall, a top wall and several side walls extending between the bottom wall and the top wall, the storage tank comprising at least one loading and/or unloading tower extending along a vertical direction between the bottom wall and the top wall, the tower comprising a base and at least three poles secured to the base, two poles of which form rear poles and the third pole forms a front pole, the tower comprising at least one member for pumping the liquefied gas and a sump extending through the bottom wall and wherein the pumping member is at least partially arranged, characterized in that the sump is arranged at least partly outside a perimeter defined by a triangle of vertices centered on the poles and passing through a periphery of the front pole, the sump being arranged in an angular sector delimited by two axes each passing through a center of the tower and forming an angle of at most 90°.

[0007] The tower thus makes it possible to be able to load or unload liquefied gas into or from a tank wherein the tower is installed.

[0008] The perimeter delimited by the triangle and the front pole corresponds to an axial projection of the three poles of the tower onto the bottom wall of the storage tank, this projection being visible in a plane perpendicular to the vertical direction of the tower. The triangle has three vertices which are each located at the center of each pole, the perimeter encompassing an outer periphery of the front pole.

[0009] Thus, there is an advantage in locating the sump in this area delimited by the different features described above, this arrangement making it possible to move the sump and the pumping member away from the base of the tower. The distance from the sump reduces the stiffening of the bottom wall of the tank, the separation of the pumping member facilitating the mounting, installation, maintenance or other operations to be carried out on said pumping member.

[0010] According to an optional feature, the pumping member is configured to supply fuel to at least one consumer of the structure. According to another solution, the pumping member is configured to pump the cargo from the tank, in particular in order to unload it.

[0011] According to an optional feature of the invention, the sump is arranged outside an arc of circle centered on the center of the tower, said arc of circle being tangent to a rear zone of the front pole of the tower.

[0012] Moreover, “center of the tower” means the center of a circle passing through the center of the three poles of the tower. This center is taken as reference for the arc of circle passing through the front pole constituting a boundary of a zone wherein the sump is arranged.

[0013] More specifically, this zone wherein the sump is arranged is defined in response to at least three conditions, which are that the sump must be arranged outside the perimeter, it must be arranged in the angular sector previously described and that it be outside the arc of circle centered on the tower and passing through a rear periphery of the front pole. In other words, the sump is in a zone of the bottom wall defined on the one hand by an angular sector delimited by two axes each passing through a center of the tower and forming an angle of at most 90°, the front pole being arranged in the angular sector, the zone being defined on the other hand by an arc of circle centered on the center of the tower, the arc of circle being tangent to the rear zone of the front pole of the tower.

[0014] According to an optional feature of the invention, the angle of the angular sector is open on the front pole. In other words, the front pole is arranged in the angular sector while participating in determining the exclusion perimeter.

[0015] According to an optional feature of the invention, the tower comprises at least one unloading member arranged between the front pole and either one of the rear poles. An axial projection of this unloading member, here a pump, crosses the triangle that forms a part of the exclusion perimeter. It is understood that the pumping member which is arranged in the sump is intended to suck liquefied gas in order to supply fuel to at least one consumer of the structure or to unload the liquefied gas from the storage tank. The unloading member for its part is intended only for unloading liquefied gas from the storage tank.

[0016] According to another optional feature of the invention, the unloading member is a first unloading member, the tower comprising a second unloading member, the first unloading member being arranged between the front pole and one of the rear poles, the second unloading member being arranged

between the front pole and the other rear pole and according to an axial projection identical to that of the first unloading member.

[0017] According to another optional feature of the invention, one of the axes participating in defining the angular sector is secant with an axis passing through the center of the tower and the center of the front pole forming an angle of between 40° and 50°.

[0018] According to another optional feature of the invention, one of the axes participating in defining the angular sector is secant with an axis passing through the center of the tower and the center of the front pole forming an angle of 45°.

[0019] According to another optional feature of the invention, the arc of circle has a minimum radius equal to 1600 mm.

[0020] According to another optional feature of the invention, the arc of circle has a radius of 1650 mm or 1700 mm.

[0021] According to another optional feature of the invention, the arc of circle is a minimum arc of circle, the sump being arranged between the minimum arc of circle and a maximum arc of circle centered on the center of the tower and of radius at most equal to 3400 mm.

[0022] According to another optional feature of the invention, the tower comprises a liquefied gas loading system from the tank, a projection of the loading system onto the bottom wall being arranged in the angular sector, a location of the sump in the angular sector being distinct from the projection of the loading system. By “distinct” is meant the fact that the location of the sump and the axial projection of the loading system is not overlapping, that is, the sump is not arranged totally or partially below the loading system.

[0023] According to another optional feature of the invention, the angular sector comprises a first sub-sector and a second sub-sector that are symmetrical relative to an axis passing through the center of the tower and the center of the front pole.

[0024] According to one aspect, a projection of the loading system on the bottom wall is arranged in the first sub-sector, while the sump is arranged in the second sub-sector.

[0025] Conveniently, the sump and a projection of the loading system on the bottom wall are arranged in the same sub-sector.

[0026] According to another optional feature of the invention, a straight line passing through the center of the loading system and the center of the front pole also passes through the sump. More precisely, this straight line passes through the sump, without however necessarily passing through the center of said sump.

[0027] According to another optional feature of the invention, an axis passing through the center of the tower and through the center of the front pole passes through the sump.

[0028] According to another optional feature of the invention, at least the bottom wall of the storage tank comprises at least one thermally insulating layer and a sealing membrane borne by the thermally insulating layer, the sealing membrane participating in defining an internal volume of the tank, the sealing membrane comprising several metal strips having raised edges and connected to one another by their raised edges.

[0029] An object of the present invention is also a structure comprising a storage tank as described in the present document, the structure being chosen

from a liquefied gas transport ship, a barge, a reliquefaction unit, a gasification unit, a gravity platform or a land-based structure.

[0030] Other features, details and advantages of the invention will emerge more clearly both from the description which follows and from several exemplary embodiments, which are given for illustrative purposes and without limitation with reference to the appended schematic drawings, in which:

[0031] [Fig. 1] is a schematic representation of a ship seen from above and equipped with a liquefied gas storage tank according to the invention and comprising a loading and/or unloading tower;

[0032] [Fig. 2] is a representation in perspective of the tower shown in Figure 1;

[0033] [Fig. 3] is a schematic section of a first example of positioning a sump in a wall of the tank shown in Figure. 1;

[0034] [Fig. 4] is a schematic section of a second example of positioning a sump in a wall of the tank shown in Figure 1.

[0035] The features, variants, and the different embodiments of the invention can be combined with one another in various combinations as long as they are not incompatible or exclusive of one another. It is possible, in particular, to imagine variants of the invention that comprise only a selection of the features that are described below in isolation from the other features that are described, provided that this selection of features is sufficient to confer a technical advantage and/or to differentiate the invention from the prior art.

[0036] In the figures, the members common to several figures retain the same reference.

[0037] In the detailed description that follows, the terms “longitudinal”, “transverse” and “vertical” refer to the orientation of a storage tank according to the invention. A longitudinal direction corresponds to a main direction of elongation of the storage tank, this longitudinal direction being parallel to a longitudinal axis L of a reference frame L, V, T shown in the figures. A vertical direction corresponds to a direction along which a loading and/or unloading tower mainly extends, this vertical direction being parallel to a vertical axis V of the reference frame L, V, T and this vertical axis V being perpendicular to the longitudinal axis L. Finally, a transverse direction corresponds to a direction parallel to a transverse axis T of the reference frame L, V, T, this transverse axis T being perpendicular to the longitudinal axis L and the vertical axis V.

[0038] Figure 1 shows a structure 1 here corresponding to a liquefied gas transport ship. In order to transport the liquefied gas, the ship comprises at least one tank 2 for storing and/or transporting liquefied gas comprising at least one bottom wall 4, visible in figures 2 to 4, and a top wall, not visible here and opposite to one another in a vertical direction V of the tank 2, said walls being connected to one another by side walls 6. The bottom wall 4, the top wall and the side walls 6 participate in delimiting a storage volume of the liquefied gas.

[0039] The tank 2 is configured to store a gas in the liquid state, which gas may be liquefied natural gas, liquid ammonia as well as liquefied petroleum gas, for example. These gases are in the liquid state at low temperatures, generally below 0°C and can range down to -163°C for liquid natural gas, for example.

[0040] Such a tank 2 can be installed for example on a structure 1 intended for transporting liquefied gas, such as a ship or a barge, for the processing of the liquefied gas, such as a reliquefaction unit and/or a gasification unit, as well as for storing liquefied gas, such as a land-based structure or a gravity platform.

[0041] Furthermore, at least the bottom wall 4 comprises at least one thermally insulating layer and a sealing membrane borne by the thermally insulating

layer. Advantageously, each of the walls of the tank 2 comprises at least one thermally insulating layer and a sealing membrane.

[0042] As can be seen in Figure 1, the walls of the tank 2 comprise at least one primary space participating in delimiting an internal volume of the tank 2 and a secondary space carrying the primary space, each of the spaces comprising a thermally insulating layer and a sealing membrane. It is understood that the walls of the tank 2 are thus composed of layers and membranes superimposed on one another.

[0043] More specifically, the walls of the tank 2 comprise, from the outside of the tank 2 to the internal volume of said tank 2, a secondary thermally insulating layer, a secondary sealing membrane borne by the secondary thermally insulating layer, a primary thermally insulating layer arranged on the secondary sealing membrane and a primary sealing membrane borne by the primary thermally insulating layer, the primary sealing membrane participating in defining the internal volume of the tank 2. The thermally insulating layers are formed of thermally insulating blocks, or boxes made of plywood panels filled with a thermally insulating material.

[0044] In the remainder of the description, the characteristics described in relation to the term “sealing membrane” may relate to the primary sealing membrane and/or to the secondary sealing membrane, unless otherwise mentioned.

[0045] The sealing membrane itself comprises several metal strips each having an external face in contact with the primary thermally insulating layer and an internal face facing the internal volume of the tank 2. In addition, the metal strips have a folded edge, the metal strips being connected together via their folded edges. In other words, the folded edges of two adjacent metal strips are made integral with one another by welding, for example, thus making the metal strips integral with one another. The attachment of the metal strips

to one another by means of their folded edges promote an elasticity of the sealing membrane, in particular when the walls of the tank 2 undergo thermal deformations when loading and/or unloading the tank 2 of liquefied gas.

[0046] Furthermore, and as shown in Figures 1 and 2, the tank 2 comprises a loading and/or unloading tower 8 extending vertically between the bottom wall 4 and the top wall. The tower 8 is configured to load and/or unload the liquefied gas into and/or from the tank 2 and comprises a pumping member 10 capable of sucking the liquefied gas contained in the tank 2. For example, the pumping member 10 is a pump which can retrieve liquefied gas flowing in the sump 14 in order for example to supply a consumer of a ship wherein the tank 2 is installed, such a consumer being for example a motor of an electricity generator.

[0047] More particularly, the top wall comprises an opening wherein a cover 12, a component of the tank 2, is arranged so as to close the storage volume of the tank 2 in a sealed manner, in particular by extending the top wall at the opening. As shown in Figure 2, the cover 12 is at least partially traversed by the tower 8 so as to be able to load or unload liquefied gas to or from the storage space of the tank 2.

[0048] The tank 2 further comprises at least one sump 14 wherein the pumping member 10 is at least partially housed. The sump 14 is arranged through the bottom wall 4 of the tank 2 and thus makes it possible to suck the liquefied gas flowing into the tank 2.

[0049] The tower 8, particularly visible in Figure 2, comprises a structure which extends mainly along a main direction of extension parallel to the vertical direction V, having an upper end and a lower end, the upper end facing the top wall while the lower end is facing the bottom wall 4. More particularly, the tower 8 is formed by at least three poles 16, otherwise called tripod structure, and a

base 18 advantageously arranged at its lower end, which makes the three poles 16 integral with one another.

[0050] More specifically, the structure of the loading tower 8 comprises the at least three poles 16 secured to one another by means of a lattice structure 20, each of the three poles 16 passing through the cover of the tank 2. A front pole 16a of the tower 8 and two rear poles 16b of the tower 8 are then defined, defined according to a direction of travel of the ship, visible in Figure 1, under normal navigation conditions, the front pole 16a being the pole of the tower 8 furthest forward in the tank 2.

[0051] In addition to the pumping member 10, the tower 8 comprises at least one unloading member 22, 24 of the liquefied gas present in the tank 2, the unloading member 22, 24 being arranged between the front pole 16a and one or the other of the rear poles 16b, the pumping member 10 being configured to supply fuel to at least one consumer of the structure 1. “Arranged between the front pole 16a and either of the rear poles 16b” means that a line passing through the center of the front pole 16a and the center of said rear pole 16b passes through the unloading member 22, 24.

[0052] In this configuration, the unloading member 22, 24 is intended only for the unloading of liquefied gas from the tank 2, the pumping member 10, which is positioned in the sump 14, being for a return intended to suck liquefied gas in order either to supply fuel to at least one consumer of the structure 1 or to unload the liquefied gas from the tank 2.

[0053] As shown in Figures 3 and 4, the tower 8 comprises a first unloading member 22 and a second unloading member 24, the first unloading member 22 being arranged between the front pole 16a and one of the rear poles 16b, the second unloading member 24 being arranged between the front pole 16a and the other rear pole 16b. The unloading members 22, 24 are aligned with respect to one another along a direction parallel to the transverse direction T.

[0054] According to the invention and as can be seen in Figure 3, the sump 14 is arranged at least in part outside a perimeter P defined by a triangle passing through the center of the three poles and through the front pole 16a, in an angular sector delimited by two axes A1, A2 each passing through a center of the tower 8 and forming an angle α of at most 90°. The perimeter envisaged here is a shape which combines a triangle and a circle, the latter being an axial projection of the front pole 16a onto the bottom wall, its center then being placed at a vertex of the triangle.

[0055] The sump 14 is also arranged beyond an arc of circle C1 centered on the center of the tower 8, said arc of circle C1 being tangent to a rear zone of the front pole 16a of the tower 8. More specifically, the sump 14 is arranged in a zone 26 defined in response to at least three conditions, which are that the sump 14 must be arranged outside the perimeter P which combines the triangle and the projection of the front pole, that it be arranged in the angular sector previously described, and that it be beyond the arc of circle C1 centered on the tower 8 and which is tangent to the rear zone of the front pole 16a.

[0056] According to one aspect of the invention, the pumping member 10 is also arranged at least partially outside the perimeter P defined above, in the angular sector delimited by the two axes A1, A2 each passing through the center of the tower 8 and forming an angle of at most 90°, and lastly beyond the arc of circle C1 centered on the center of the tower 8 and which is tangent to the rear zone of the front pole 16a of the tower 8. Indeed, the pumping member 10 is at least partially arranged in the sump 14.

[0057] The perimeter P delimited at least in part by the triangle of vertices centered on the posts corresponds to an axial projection of the center of each pole joined by the sides of the triangle, this projection being visible in a plane perpendicular to the vertical direction V.

[0058] It should be noted that each of the poles 16 has an inner face 28 oriented toward the other poles 16 and an outer face 30 facing the outside of the tower 8, the distinction between the inner face 28 and the outer face 30 being evaluated for example here with regard to the sides which form the triangle represented in Figures 3 and 4.

[0059] Since the front pole 16a is part of the exclusion perimeter, it is understood that the location of the sump 14 is distinct from a projection of the front pole 16a over the angular sector, as is shown in Figures 3 and 4 by a cross on the projection of the front pole 16a into the angular sector.

[0060] The angular sector here is defined by the two axes A1, A2 passing through the center of the tower 8, that is, the center of a circle passing through the center of the three poles 16 of the tower 8. In other words, the two axes A1, A2 are secant with one another at the center of the tower 8. These two axes A1, A2 form an angle of at most 90°, and participate in defining at least in part transversely the zone 26 wherein the sump 14 and the pumping member are arranged.

[0061] Advantageously, each of the axes A1, A2 passes through one of the unloading members 22, 24 of the tower 8. For example, and as shown schematically in Figures 3 and 4, each of the axes A1, A2 passes through an outer circumference of the unloading members 22, 24.

[0062] In addition, the angle of the angular sector is open on the front pole 16a. In other words, the front pole 16a is flanked transversely by the axes A1, A2 defining the angular sector.

[0063] As shown in Figure 3, one of the axes A1, A2 participating in defining the angular sector is secant with an axis passing through the center of the tower 8 and through the center of the front pole 16a, forming an angle of between 40° and 50°. Advantageously, the angle is 45°.

[0064] Even more advantageously, each of the axes A1, A2 contributing to delimiting the angular sector is secant with an axis passing through the center of the two rear posts 16b each forming an angle of between 40° and 50°.

[0065] The angular sector comprises two angular sub-sectors that are symmetrical relative to the axis passing through the center of the tower 8 and the center of the front pole 16a, this perpendicular axis also corresponding to the longitudinal axis of the tank.

[0066] Finally, concerning the arc of circle C1, it is inscribed within a circle centered on the center of the tower 8, that is, the center of the circle passing through the center of each of the poles 16 of the tower 8, and it constitutes a minimum limit of the zone 26 wherein the sump 14 is arranged. It is understood that the location of the sump 14 in the zone 26 is situated beyond this arc of circle C1, toward the front of the tank 2.

[0067] As can be seen in Figures 3 and 4, the arc of circle C1 is tangent to a rear zone of the front pole 16a of the tower 8, that is, a zone of the front pole 16a which is located inside the triangle, which participates in forming the perimeter P. Advantageously, the arc of circle C1 passes through the inner face 28 of the front pole 16a. It is understood that the sump 14 can, for example, be arranged at the front of the front pole 16a, or can be aligned with respect to the front pole 16a, transversely, and generally at any location in the zone 26.

[0068] The arc of circle C1 has a minimum radius of 1600 mm, 1650 mm or 1700 mm, this dimension being measured in a plane perpendicular to the vertical direction V between the center of the tower 8 and, here, the inner face 28 of the front pole 16a.

[0069] According to the invention, the zone 26 wherein the sump 14 is arranged is longitudinally delimited by the arc of circle C1 described above,

which is a first arc of circle C1, and a second arc of circle C2, the zone 26 thus extending between the first arc of circle C1 and the second arc of circle C2 and between the axes A1 and A2 which border the angular sector according to the invention.

[0070] The first arc of circle C1 corresponds more precisely to a minimum arc of circle while the second arc of circle C2 corresponds to a maximum arc of circle. Similarly to the first arc of circle C1, the second arc of circle C2 is centered on the center of the tower 8, and has a maximum radius equal to 3400 mm, advantageously between 3200 mm and 3400 mm. Advantageously, the second arc of circle C2 has a radius of 3300 mm.

[0071] It will be understood from the foregoing that the invention thus relates to a zone 26 of the bottom wall 4 of the tank 2 wherein the sump 14 and the pumping member 10 are arranged. This zone 26 is at least delimited transversely by the axes A1, A2 defining the angular sector, longitudinally at least by the first arc of circle C1 and advantageously by the second arc of circle C2, while excluding the inside of the perimeter formed by the perimeter P of the tower 8.

[0072] Two exemplary embodiments of the invention will now be described wherein the location of the sump 14 in the zone 26 is different. A first embodiment of the invention, with reference to Figure 3, will be described first, then a second embodiment of the invention, with reference to Figure 4, will be described below in the description of the first embodiment.

[0073] As shown in Figure 3, an axis 34 passing through the center of the tower 8 and the center of the front pole 16a passes through the sump 14, the axis 34 being substantially parallel to the longitudinal direction L. In other words, the sump 14, the front pole 16a and the center of the tower 8 are aligned relative to one another. It will be understood that in this arrangement, the sump 14 is sufficiently remote from the tower 8 in order to limit the stiffening of the bottom

wall 4 of the tank 2 that its placement requires. In addition, the pumping member 10 is also aligned with the front pole 16a and the center of the tower 8, which facilitates the operations of installing, mounting and/or maintaining said pumping member 10 in the tank 2.

[0074] As shown in Figure 4, the tower 8 comprises the system 36 for loading liquefied gas from the tank 2, a projection of the loading system 36 onto the bottom wall 4 being arranged in the zone 26, a location of the sump 14 in the zone 26 being distinct from the projection of the loading system 36. By “distinct” is meant the fact that the location of the sump 14 and the projection of the loading system 36 do not overlap, that is, the sump 14 is not arranged below the loading system 36. The different arrangement of the location of the sump 14 and the projection of the loading system 36 makes it possible to avoid spraying liquefied gas directly into the sump 14, and therefore at least partially onto the pumping member 10, during the loading of liquefied gas from the tank 2. In addition, a superposition of the loading system 36 and the sump 14 would complicate the installation and mounting of the tower 8 in the tank 2.

[0075] As shown in Figure 4, the angular sector is separated into a first sub-sector and a second sub-sector by the axis 34 passing through the center of the tower 8 and the center of the front pole 16a, the projection of the loading system 36 being arranged in the first sub-sector, while the sump 14 is arranged in the second sub-sector. In other words, the location of the sump 14 and the projection of the loading system 36 transversely frame the front pole 16a.

[0076] Advantageously, a straight line passing through the center of the projection of the loading system 36 and through the center of the front pole 16a also passes through the sump 14. This straight line passes more precisely through the sump 14, without however necessarily passing through the center of said sump 14.

[0077] The present invention cannot, however, be limited to the means and configurations described and illustrated here, and it also extends to any equivalent means or configuration and to any technical combination using such means. In particular, the description of the location of the sump 14 in the first embodiment and in the second embodiment is not limiting on the invention, these examples being only illustrations of the implementation of the invention. Thus, and as a reminder, the invention relates to the fact that the sump 14 is arranged in a zone 26 delimited at least by the angular sector defined by the two axes A1, A2, the perimeter P of the tower 8 and optionally the arc of circle C1.

Claims

1. A tank (2) intended for a structure (1) and configured to contain a liquefied gas, comprising a bottom wall (4), a top wall and several side walls (6) extending between the bottom wall (4) and the top wall, the tank (2) comprising at least one loading and/or unloading tower (8) extending along a vertical direction between the bottom wall (4) and the top wall, the tower (8) comprising a base (18) and at least three poles (16, 16a, 16b) secured to the base (18), two poles (16) forming rear poles (16b) and the third pole (16) forming a front pole (16a), the tower (8) comprising at least one pumping member (10) for the liquefied gas and a sump (14) extending through the bottom wall (4) and wherein the pumping member (10) is at least partially arranged, characterized in that the sump (14) is arranged at least partly outside a perimeter (P) defined by a triangle of vertices centered on the poles (16, 16a, 16b), and passing through a periphery of the front pole (16a), the sump (14) being arranged in an angular sector delimited by two axes (A1, A2) each passing through a center of the tower (8) and forming an angle (α) of at most 90°.

2. The tank (2) according to claim 1, wherein the sump (14) is arranged beyond an arc of circle (C1) centered on the center of the tower (8), said arc of circle (C1) being tangent to a rear zone of the front pole (16a) of the tower (8).

3. The tank (2) according to any one of claims 1 or 2, wherein the tower (8) comprises at least one member (22, 24) for unloading liquefied gas arranged between the front pole (16a) and one or the other of the rear poles (16b).

4. The tank (2) according to any one of claims 1 to 3, wherein one of the axes (A1, A2) participating in delimiting the angular sector is secant with an

axis passing through the center of the tower (8) and a center of the front pole (16a) forming an angle of 40° to 50°.

5. The tank (2) according to claim 2, wherein the arc of circle (C1) has a minimum radius equal to 1600 mm.

6. The tank (2) according to any one of claims 2 or 5, wherein the arc of circle (C1) is a minimum arc of circle, the sump (14) being arranged between the minimum arc of circle (C1) and a maximum arc of circle (C2) centered on the center of the tower (8) and of maximum radius equal to 3400 mm.

7. The tank (2) according to any one of claims 1 to 6, wherein the tower (8) comprises a system (36) for loading liquefied gas from the tank (2), a projection of the loading system (36) onto the bottom wall (4) being arranged in the angular sector, a location of the sump (14) in the angular sector being distinct from the projection of the loading system (36).

8. The tank (2) according to any one of claims 1 to 7, wherein the angular sector comprises a first sub-sector and a second sub-sector that are symmetrical relative to an axis passing through the center of the tower (8) and the center of the front pole (16a).

9. The tank (2) according to claims 7 and 8, wherein a projection of the loading system (36) onto the bottom wall (4) is arranged in the first sub-sector, while the sump (14) is arranged in the second sub-sector.

10. The tank (2) according to claims 7 and 8, wherein the sump (14) and a projection of the loading system (36) onto the bottom wall (4) are arranged in the same sub-sector.

11. The tank (2) according to any one of claims 1 to 8 or 10, wherein an axis (34) passing through the center of the tower (8) and through the center of the front pole (16a) passes through the sump (14).

12. The tank (2) according to any one of claims 1 to 11, wherein at least the bottom wall (4) of the tank (2) comprises at least one thermally insulating layer and a sealing membrane borne by the thermally insulating layer, the sealing membrane participating in defining an internal volume of the tank (2), the sealing membrane comprising several metal strips having raised edges and connected to one another by their raised edges.

13. A structure (1) comprising a tank (2) according to any one of claims 1 to 12, the structure (1) being chosen from a liquefied gas transport ship, a barge, a reliquefaction unit, a gasification unit, a gravity platform or a land-based structure.