CLAIMS

1. A sealed and thermally insulating tank incorporated into a bearing structure, the bearing structure comprising a plurality of bearing walls ~~(1, 2)~~, the tank comprising

a plurality of tank walls each fixed to a respective bearing wall ~~(1, 2)~~, a tank wall comprising:

a thermal insulation barrier ~~(3, 5)~~ held on the bearing wall, the thermal insulation barrier having a planar support surface parallel to the respective bearing wall,

a sealing barrier ~~(4, 6)~~ supported by the insulation barrier and comprising a repeating structure alternately made up of an elongate metal strake ~~(8, 108, 208)~~ and an elongate welding flange ~~(9)~~ connected to the support surface and projecting with respect to the latter, the welding flange ~~(9)~~ running parallel to the metal strake ~~(8)~~ over at least part of the length of the metal strake, the metal strake comprising in the widthwise direction a planar central portion placed on the support surface and lateral edges ~~(13)~~ that are turned up with respect to the support surface and arranged against the adjacent welding flanges and welded in a sealed manner to the welding flanges ~~(9)~~, in which the metal strake extends between two opposite edges of the tank wall and has two end portions which are each assembled in a sealed manner to a respective stopping structure ~~(10, 27, 28)~~ at said opposite edges of the tank wall,

characterized in that the metal strake ~~(8, 108, 208)~~ is made up of at least one continuous metal strip having several longitudinal portions of different thicknesses, the longitudinal portions comprising an intermediate portion ~~(113, 35)~~ and at least one end portion ~~(114, 33)~~ of which the thickness is greater than the thickness of the intermediate portion of the strip, the thicker end portion ~~(114, 33)~~ forming an assembly zone for assembling the strip with the stopping structure ~~(10)~~ or with another continuous metal strip butt-joined to the first continuous metal strip to constitute the metal strake.

2. The tank as claimed in claim 1, in which the metal strake ~~(8)~~ is made up of a single metal strip extending in one piece between the two opposite edges of the tank wall, and in which the two end portions ~~(33)~~ of the strip are thicker than the intermediate portion ~~(35, 36)~~ and are each assembled with the respective stopping structure ~~(10, 27, 28)~~ at the opposite edges of the tank wall.

3. The tank as claimed in claim 1, in which the metal strake ~~(108, 208)~~ comprises a second continuous metal strip butt-joined to the first continuous metal strip in the continuation of the first continuous metal strip, in which each of the two continuous metal strips has, at the region ~~(40)~~ of connection of the two metal strips, an end portion ~~(114)~~ that is thicker than the intermediate portion ~~(113)~~ of the strip.

4. The tank as claimed in claim 3, in which at least one of the two continuous metal strips has, at the opposite end to the region ~~(40)~~ of connection of the two metal strips, a second end portion ~~(114)~~ which is thicker than the intermediate portion ~~(113)~~ of the strip, the second end portion ~~(114)~~ being connected to the stopping structure ~~(10, 27, 28)~~ at an edge of the tank wall.

5. The tank as claimed in claim 3 or 4, in which at least one of the two continuous metal strips has, at the opposite end to the region ~~(40)~~ of connection of the two metal strips, a second end portion ~~(114)~~ of the same thickness as the intermediate portion ~~(113)~~ of the strip, the second end portion ~~(114)~~ being connected to the stopping structure ~~(10, 27, 28)~~ at an edge of the tank wall.

6. The tank as claimed in one of claims 1 to 5, in which each end portion of the metal strake ~~(8, 108, 208)~~ is welded in a sealed manner to the respective stopping structure ~~(10)~~.

7. The tank as claimed in claim 6, in which the strake ~~(8)~~ is welded to the stopping structure by a cold metal transfer CMT method or by TIG welding using a filler metal or by cold welding.

8. The tank as claimed in one of claims 1 to 7, in which the stopping structure ~~(10)~~ comprises a plate ~~(27, 28)~~ positioned over the

insulating barrier and the end portion of the metal strake ~~(8, 108, 208)~~ comprises a first segment bearing against the plate of the stopping structure and a second segment bearing against the thermal insulating barrier, the first segment and the second segment being connected by a folded segment ~~(34)~~ forming a discontinuity in the thickness direction of the metal strake.

9. The tank as claimed in one of claims 1 to 8, in which the welding flanges ~~(9)~~ are interrupted before the end of the metal strake ~~(8, 108, 208)~~, the turned-up edges of two adjacent metal strakes being welded to one another by an edge weld positioned along part of their length as far as the end of the metal strake.

10. The tank as claimed in claim 9, in which the edge weld of the turned-up edges ~~(13)~~ is performed using a cold metal transfer process.

11. The tank as claimed in one of claims 1 to 10, in which the thicker end portion ~~(114, 33)~~ of the metal strip has a thickness greater than or equal to 0.9 mm.

12. The tank as claimed in one of claims 1 to 11, in which the intermediate portion ~~(35)~~ of the metal strip has a thickness less than 0.9 mm and preferably a thickness of 0.7 mm.

13. The tank as claimed in one of claims 1 to 12, in which the stopping structure ~~(10)~~ is welded to a bearing wall.

14. The tank as claimed in one of claims 1 to 13, in which said metal strake and the stopping structure are made of a nickel-steel alloy with a low coefficient of expansion.

15. The tank as claimed in one of claims 1 to 14, in which the metal strip is made of an alloy based on iron and comprises by weight:

$34.5\% \leq Ni \leq 53.5\%$

$0.15\% \leq Mn \leq 1.5\%$

$0 \leq Si \leq 0.35\%$, preferably $0.1\% \leq Si \leq 0.35\%$

$0 \leq C \leq 0.07\%$

optionally:

$0 \leq Co \leq 20\%$

$0 \leq Ti \leq 0.5\%$

0.01%≤Cr≤0.5%

the rest being iron and unavoidable impurities resulting from the production process.

16. The tank as claimed in one of claims 1 to 15, in which the tank wall further comprises:

a secondary thermal insulation barrier ~~(3)~~, the thermal insulation barrier having a planar support surface parallel to the respective bearing wall, and a secondary sealing barrier ~~(4)~~ supported by the secondary insulation barrier and bearing the primary insulation barrier ~~(5)~~,

the secondary sealing barrier comprising a repeating structure alternately made up of an elongate metal strake ~~(8, 108, 208)~~ and an elongate welding flange ~~(9)~~ connected to the support surface and projecting with respect to the latter, the welding flange ~~(9)~~ running parallel to the metal strake ~~(8)~~ over at least part of the length of the metal strake, the metal strake comprising in the widthwise direction a planar central portion placed on the support surface and lateral edges ~~(13)~~ that are turned up with respect to the support surface and arranged against the adjacent welding flanges and welded in a sealed manner to the welding flanges ~~(9)~~,

in which the metal strake extends between two opposite edges of the tank wall and has two end portions which are each assembled in a sealed manner to a respective stopping structure ~~(10, 28)~~ at said opposite edges of the tank wall,

characterized in that the metal strake (8, 108, 208) is made up of at least one continuous metal strip having several longitudinal portions of different thicknesses, the longitudinal portions comprising an intermediate portion ~~(113, 35)~~ and at least one end portion ~~(114, 33)~~ of which the thickness is greater than the thickness of the intermediate portion of the strip, the thicker end portion ~~(114, 33)~~ forming an assembly zone for assembling the strip with the stopping structure ~~(10)~~ or with another continuous metal strip butt-joined to the first continuous metal strip to constitute the metal strake.

17. A ship ~~(70)~~ for transporting a cold liquid product, the ship comprising a double hull ~~(72)~~ and a tank ~~(71)~~ as claimed in one of claims 1 to 16 placed inside the double hull.

18. The use of a ship ~~(70)~~ as claimed in claim 17 for loading or unloading a cold liquid product, in which a cold liquid product is conveyed through insulated pipes ~~(73, 79, 76, 81)~~ from or to a floating or on-shore storage facility ~~(77)~~ to or from the tank of the ship ~~(71)~~.

19. A transfer system for a cold liquid product, the system comprising a ship ~~(70)~~ as claimed in claim 17, insulated pipes ~~(73, 79, 76, 81)~~ arranged in such a way as to connect the tank ~~(71)~~ installed in the hull of the ship to a floating or on-shore storage facility ~~(77)~~ and a pump for driving a stream of cold liquid product through the insulated pipes from or to the floating or on-shore storage facility to or from the tank of the ship.

~~**20.** A continuous metal strip with turned-up lateral edges suited to the creation of a tank as claimed in claim 1, the metal strip being obtained from a blank (112) having, along its length, a reinforced first end zone (114) having a first thickness (e+s) and a central second zone (113) having a second thickness (e) smaller than the first thickness (e+s) and a third end zone having the first thickness (e+s) or the second thickness (e), the metal strip having, across its width, a planar central zone and two lateral edges bent up substantially perpendicular to the planar central zone, the two lateral edges having a width that is small in comparison with the planar central zone.~~

~~**21.** The metal strip as claimed in claim 20, the metal strip being made of an alloy based on iron and comprising by weight:~~

~~$34.5\% \leq Ni \leq 53.5\%$~~

~~$0.15\% \leq Mn \leq 1.5\%$~~

~~$0 \leq Si \leq 0.35\%$, preferably $0.1\% \leq Si \leq 0.35\%$~~

~~$0 \leq C \leq 0.07\%$~~

~~optionally:~~

~~$0 \leq Co \leq 20\%$~~

~~$0 \leq Ti \leq 0.5\%$~~

0.01%≤Cr≤0.5%

the rest being iron and unavoidable impurities resulting from the production process.