

PATENT SPECIFICATION

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(19)



(54) STACKABLE SPHERICAL OR CYLINDRICAL VESSEL

(71) We, RHEM AUSTRALIA LIMITED a Company incorporated in the State of Victoria, Commonwealth of Australia, of Brodie Street, Rydalmere, New South Wales 2116, Commonwealth of Australia, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to stackable spherical or cylindrical vessels.

Storage vessels are used nowadays to store and transport a great variety of gases and liquids. Such vessels may be either pressurised or unpressurised and are usually of steel. Examples of materials enclosed in such vessels are liquefied petroleum gas, refrigerants and ammonia or petroleum products, wine, beer and water.

These storage vessels are either spherical or cylindrical with rounded ends. For convenience the latter vessels will be called simply cylindrical vessels in this specification and claims.

The problem which this invention seeks to overcome is the difficulty experienced in securing such vessels to each other and in supporting the vessels in a stable manner on the trays or tables of road or rail trucks.

This invention provides a spherical or cylindrical vessel which is adapted to be stacked with similar vessels, for example in a pyramidal arrangement. This vessel has both lower and upper mounting means, which can be removable if desired. The lower mounting means support the vessel, for example, on the table of a rail truck or the mounting means of other vessels. Both lower and upper mounting means are adapted to engage one another to prevent relative movement. A female or male coupling member is also provided on the lower mounting means, adapted to engage a corresponding male or female coupling member

on a similar vessel on the same level to prevent relative lateral movement.

One embodiment of a cylindrical vessel according to the invention is shown in the accompanying drawings.

In the drawings:

Figure 1 is a side elevation of the cylindrical vessel;

Figure 2 is an end elevation of the cylindrical vessel shown in Figure 1;

Figure 3 is an end elevation of cylindrical vessels A, B and C stacked in a pyramidal arrangement;

Figure 4 is a side elevation of the cylindrical vessels shown in Figure 3 showing coupling in linear relationship.

Figure 5 is an enlarged portion of the end elevation shown in Figure 3 showing a female and a male coupling member in engagement;

Figure 6 is a plan view from the top of the coupling members shown in Figure 5;

Figure 7 is a part detail in end elevation showing lower and upper mounting means in engagement; and

Figure 8 is a plan view from the top of the mounting means shown in Figure 7.

Referring in detail to the drawings:

Considering Figures 1 to 6 numeral 9 indicates the vessel, 10 its cylindrical side wall and 11 the rounded end walls. 12 indicates a join (for example a weld) between 10 and 11. 13 indicates a protective cover for fittings such as gauges, valves or regulators. 14 indicates upper mounting means joined to the vessel at 15 and 16. 17 indicates a dowel pin adapted to engage a corresponding hole in a lower mounting means.

19 indicates lower mounting means joined to the side wall at 20, 21, 22 and 23. 24 indicates a male coupling member joined to a lower mounting means by bolts 25. 26 indicates a female coupling member and 26a L-shaped keepers. 27 indicates bolts

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joining the female coupling member to the lower mounting means.

28 indicates end buffers joined to the vessel at 29 and 30. 31 indicates a fastening fork joined by way of a chain 32 to the buffer at 33. 34 indicates means suitable for cooperating with lifting gear joined to the vessel at 35 or 36.

Considering Figures 7 and 8 numeral 18 indicates a bolt and nut securing together the lower and upper mounting means.

Considering Figure 3 vessel C may be placed on a flat surface. Vessel B may then be lowered so that the female and male coupling members engage. Vessel A may then be placed so that its lower mounting means engage the upper mounting means of vessels C and B.

Considering Figure 4 the end buffers are secured together by fastening forks 31 preventing relative longitudinal movement of the vessels.

When not in use the female and male coupling members may be removed and stored.

For extra security chains may be attached from the means suitable for cooperating with lifting gear to corresponding means on road or rail trucks.

WHAT WE CLAIM IS:—

1. A spherical or cylindrical vessel, adapted to be stacked with similar vessels, having lower mounting means adapted to support the vessel on a surface or engage upper mounting means on a lower similar vessel and upper mounting means adapted to engage lower mounting means on an upper similar vessel; and a female or male

coupling member located on the lower mounting means of a similar vessel on the same level.

2. A spherical or cylindrical vessel as claimed in claim 1, wherein the female coupling member has one substantially upright face and means secured to the member and spaced from the face so as to define a downwardly converging space adapted to receive a male coupling member.

3. A spherical or cylindrical vessel as claimed in claim 2, wherein the means defining the downwardly converging space comprise a pair of L-shaped keepers located on opposite upright edges of the face.

4. A spherical or cylindrical vessel as claimed in claim 2 or claim 3, wherein means defining downwardly and upwardly converging spaces are provided at the top and bottom of the upright face respectively.

5. A spherical or cylindrical vessel as claimed in any one of the preceding claims, which includes buffer means adapted to secure stacks of vessels in linear relationship.

6. A spherical or cylindrical vessel as claimed in any one of the preceding claims, which includes attachment means suitable for cooperation with lifting gear.

7. A cylindrical vessel as claimed in claim 1 substantially as described with reference to any one of Figures 1 to 8 of the accompanying drawings.

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