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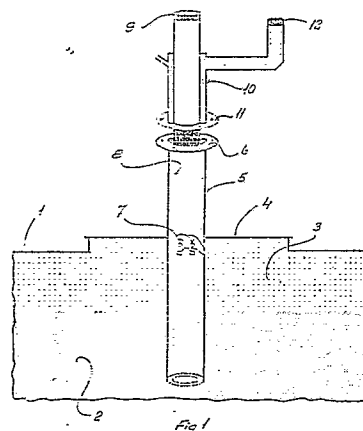
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54 A method for recycling petrol vapours.

57 The disclosure relates to a method for recycling petrol vapour from a petrol tank to a transport vehicle, in which method the filler pipe (5) extending down into the petrol tank (1) is provided with a number of holes (7) in that portion of the filler pipe (5) which is located within the petrol tank (1), an additional pipe (8) being inserted into the filler pipe (5) to form a new filler pipe (8) within the earlier filler pipe (5), and a petrol vapour recycling unit (10) being applied on the earlier filler pipe (5) and the new filler pipe (8), whereby petrol vapour will, during filling of the petrol tank (1), flow therefrom through the holes (7) provided in the earlier filler pipe (5) into a through the space between the earlier filler pipe (5) and the new filler pipe (8) to the petrol vapour recycling unit (10).



Description

The present invention relates to a method, in the filling of a petrol tank from a transport vehicle, a so-called tanker, for recycling petrol vapours from the petrol tank to a receptacle device or back to the transport vehicle, the petrol tank displaying a filler pipe extending down into the petrol tank.

It is becoming increasingly necessary to prevent, in an efficient manner, the discharge of those petrol vapours which flow out from petrol tanks when these are being filled, into the ambient atmosphere, and to take care in a suitable way of such petrol vapours, for example by recycling them to the vehicle from which filling takes place.

The difficulties involved are particularly manifest in petrol tanks for so-called free-fall or chute filling. Such petrol tanks are generally sunk or embedded in the distribution forecourt of the petrol stations and are fitted with a filler pipe placed in a well and provided with a filler thread attachment, the well being covered with some suitable type of covering material. The filler pipe often extends through a manhole. According to one prior art method for recycling petrol vapours from such a petrol tank for free-fall filling, exposure of the manhole is required by excavating the covering material, removal of the manhole (approx 30 bolts), removal of the filler pipe, provision of a larger aperture in the manhole for a new filler pipe and new air venting pipe, welding of the new filler pipe in place, remounting of the manhole with the new pipes, reassembly and refilling. Hence, this prior art method entails a considerable labour input and will obviously involve appreciable costs.

The task forming the basis of the present invention is to obviate or at least reduce the drawbacks and inconveniences inherent in the above-mentioned prior art method and to realise a new method for recycling of petrol vapours from a petrol tank.

This task is solved according to the present invention in that the method disclosed by way of introduction is characterised in that a number of holes are provided in that portion of the filler pipe which is located within the petrol tank; that an additional pipe is inserted in the filler pipe to form a new filler pipe inside the earlier filler pipe; and that a petrol vapour recycling unit is applied on the earlier filler pipe and the new filler pipe, whereby petrol vapours, during filling of the petrol tank, flow therefrom through the holes provided in the earlier filler pipe and into the space between the earlier filler pipe and the new filler pipe to the petrol vapour recycling unit. The original filler pipe is cut a distance below ground level, when the petrol tank is embedded or sunk in the ground, and is provided with means for applying the petrol vapour recycling unit.

The method according to the present invention makes possible gas recycling from existing petrol tanks for, for example free-fall or chute filling, in an extremely rapid and economical manner. Any possible aversion to modification of existing petrol

tanks for freefall filling, for recycling of petrol vapours therefrom, will obviously be eliminated entirely or at least to a considerable degree as a result of the method according to the present invention, since both labour input and costs will be minimised on employment of the method according to the present invention.

The present invention will be described in greater detail hereinbelow with reference to the accompanying drawings. In the accompanying drawings, fig 1 schematically illustrates a portion of a petrol tank with an arrangement according to the present invention. Fig 2 schematically illustrates a view of an apparatus for carrying out the method according to the present invention.

The method according to the present invention is applicable to a per se conventional petrol tank 1 with petrol 2 and petrol vapour 3 and a filler pipe 5 extending through a manhole 4. The filler pipe 5 with filling thread attachment (not shown) is generally located in a well whose diameter is considerably less than the diameter of the manhole 4.

By the method according to the present invention, the filler pipe 5 is cut a distance above the manhole 4 and a distance below ground level. The end of the filler pipe 5 is fitted with a mounting flange 6. A number of holes 7 are provided in the wall of the filler pipe 5 below the manhole 4, through which holes the petrol vapour 3 can flow into the filler pipe 5.

A new filler pipe 8 is inserted down into the filler pipe 5, the new filler pipe being provided with a per se conventional filling thread attachment 9. A petrol vapour recycling unit 10 is applied on the new filler pipe 8, this unit optionally being of per se conventional type and having a flange 11 corresponding to the flange 6 for sealing connection with the flange 6. The petrol vapour recycling unit 10 is provided with a thread 12 for connection of a suitable hose which may extend to the road tanker or a similar unit for taking care of the petrol vapour 3 which, during filling of petrol 2 into the petrol tank 1, flows through the holes 7 into the space between the old filler pipe and the new filler pipe 8 to the petrol vapour recycling unit 10 and further thence to the road tanker or other receptacle means.

For mounting the petrol vapour recycling unit 10, when this is tubular and is provided with a threading, the end of the filler pipe 5 can be threaded after being cut, whereafter the recycling unit 10 is screwed in place to sealing connection.

For carrying the method according to the present invention into effect, the tool schematically illustrated in fig 2 may be employed. On the upper portion of the earlier filler pipe 5, a bracket 20 is disposed for a number of guide tubes 21 in which sounding tubes or probes 22 are insertable. The upper end of the sounding tubes 22 is coupled to a water source (not shown) by the intermediary of an openable and closable valve 23 and a suitable hose 24. By causing water to flow out from the open end of the sounding tubes 22, these can be pressed

down into the material which covers the tank 1 until this end comes into contact with the tank 1 or the manhole 4. If two or more sounding tubes 22 reach the same level, it can be assumed with a high degree of probability that the tank 1 or the manhole 4 has been found, whereupon the upper sounding tube ends can be used as a reference mark for placing a hole making device 26 disposed at the end of a pipe 25 lowered into the earlier filler pipe 5 at a suitable level for the holes 7 beneath the manhole 4 or the tank wall. This device comprises two interconnected piston and cylinder assemblies 27 and 28 which are connected to a source of hydraulic pressure by the intermediary of a hose and an openable and closable valve 29. The piston of the one assembly 27 is secured to the wall of the pipe 25 so that its cylinder and the other piston and cylinder assembly 28 will be movable in a radial direction for urging the tip 30 of the device 26 against the inside of the earlier filler pipe 5, whereupon the tip, which is secured on the piston of the second assembly 28, is pressed through the pipe wall for creating one of the holes 7. Thereafter, the valve 29 is closed for release of pressure so that the parts can return to their starting position in a conventional way, e.g. by springs or pressure in the opposite direction and the pipe 25 can be revolved through a number of degrees for realising a suitable distance between the holes 7. The pipe 25 may thereafter be lowered further one or more times for providing several rows of holes 7. When the desired number of holes 7 has been provided, the tool is removed and the earlier filler pipe 5 can be cut and the other measures described in the foregoing can be implemented. Naturally, in

certain cases there is nothing to prevent cutting of the filler pipe 5 before the holes are provided.

5 Claims

1. A method, in the filling of a petrol tank from a transport vehicle, for example a so-called road tanker, for recycling petrol vapours from the petrol tank to a receptacle device or back to the transport vehicle, the petrol tank displaying a filler pipe (5) extending down into the petrol tank (1), characterised in that a number of holes (7) are provided in that portion of the filler pipe (5) which is located within the petrol tank (1); that an additional pipe (8) is inserted into the filler pipe (5) to form a new filler pipe (8) within the earlier filler pipe (5); and that a petrol vapour recycling unit (10) is applied on the earlier filler pipe (5) and the new filler pipe (8), whereby petrol vapour, during filling of the petrol tank (1), flows therefrom through the holes (7) provided in the earlier filler pipe (5), into and through the space between the earlier filler pipe (5) and the new filler pipe (8) to the petrol vapour recycling unit (10).

2. The method as claimed in claim 1, characterised in that the original filler pipe (5) is cut a distance below ground level, when the petrol tank (1) is embedded or sunk into the ground, and is provided with means for application of the petrol vapour recycling unit (10).

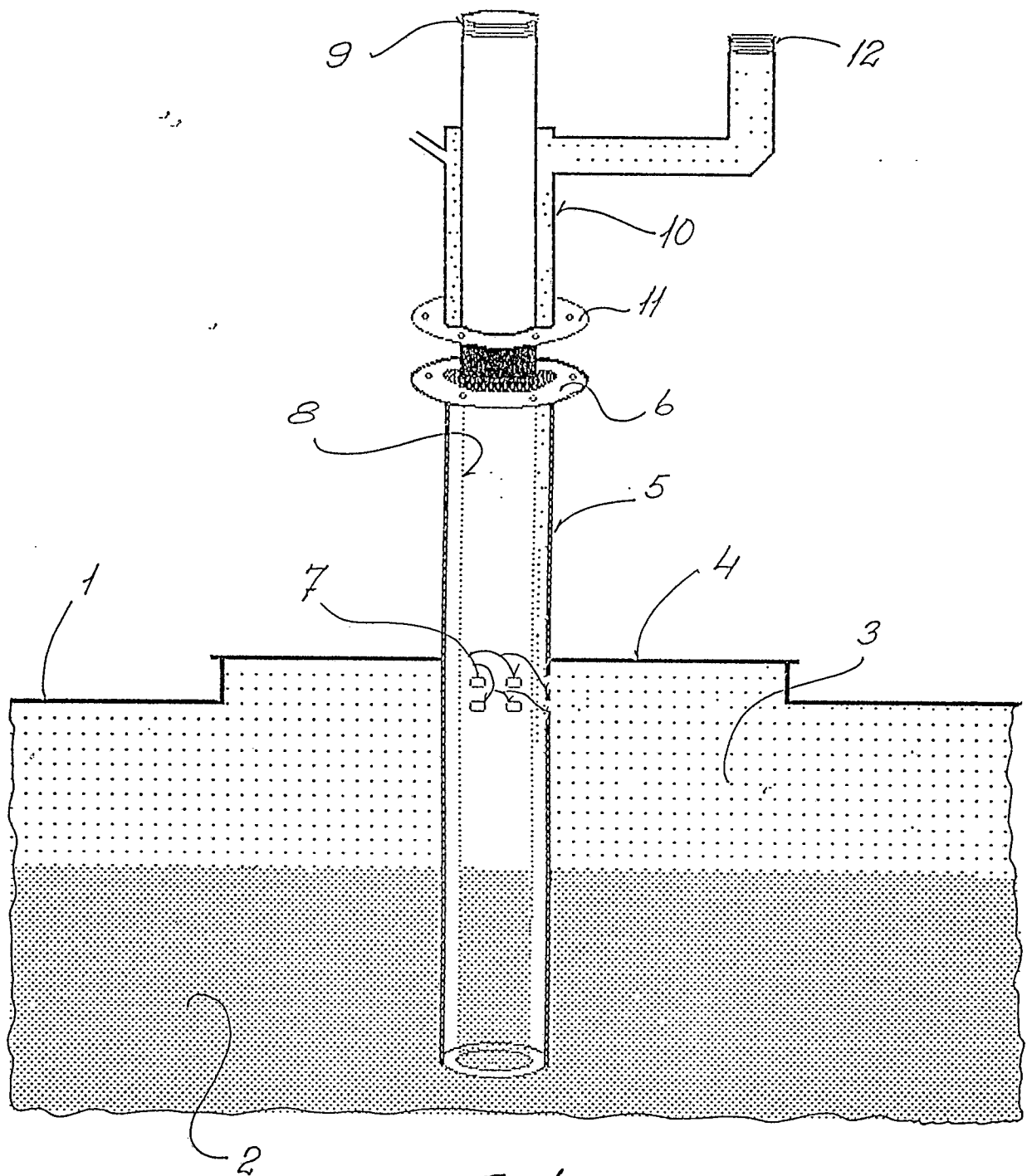


Fig 1

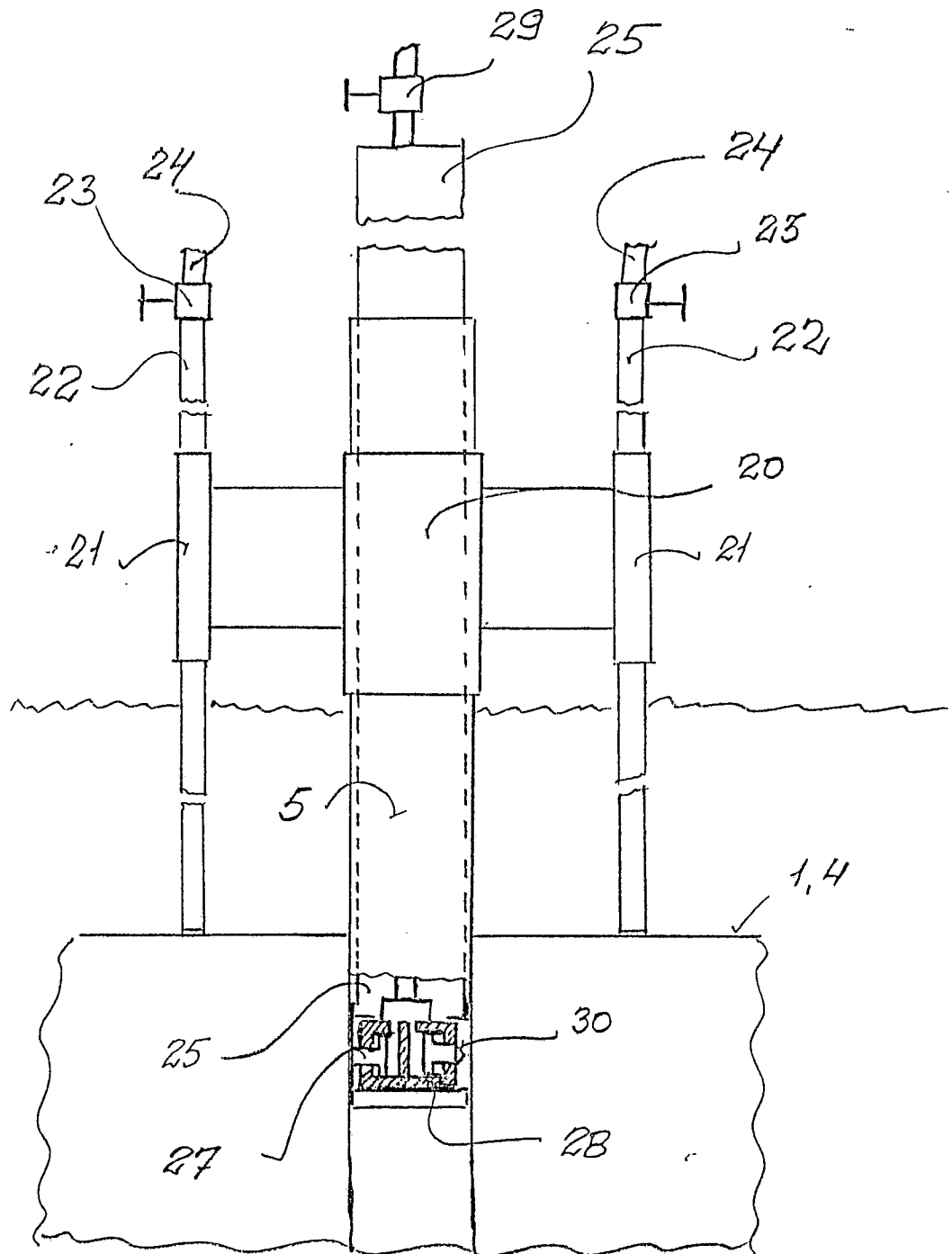


Fig 2



EP 89 85 0024

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	US-A-4 074 734 (DE BEAU et al.) ---		B 67 D 5/06
A	US-A-4 009 739 (D.J. WEATHERFORD) ---		B 65 D 90/30
A	US-A-3 016 928 (R.J. BRANDT) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 67 D B 65 D B 21 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24-04-1989	Examiner SCHELLE, J.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	