May 30, 1967 G. NEMETH 3,322,294

ANTI-COMBUSTION CONTAINER

Filed Jan. 25, 1965 2 Sheets-Sheet 1

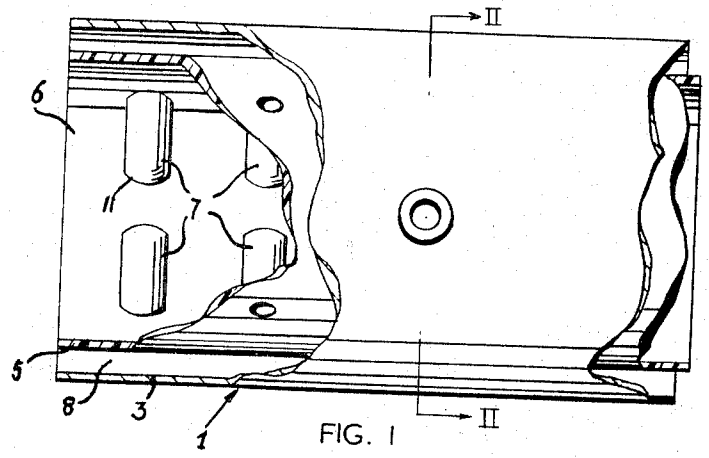


FIG. 1

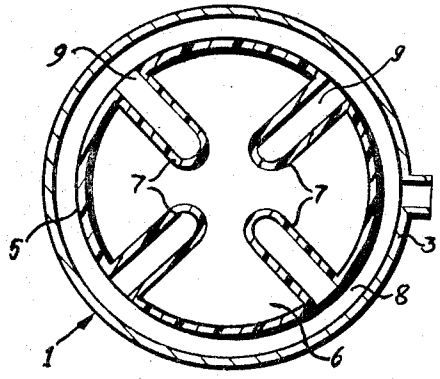


FIG. 2

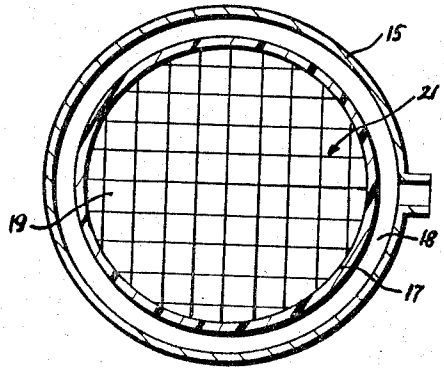


FIG. 3

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ANTI-COMBUSTION CONTAINER

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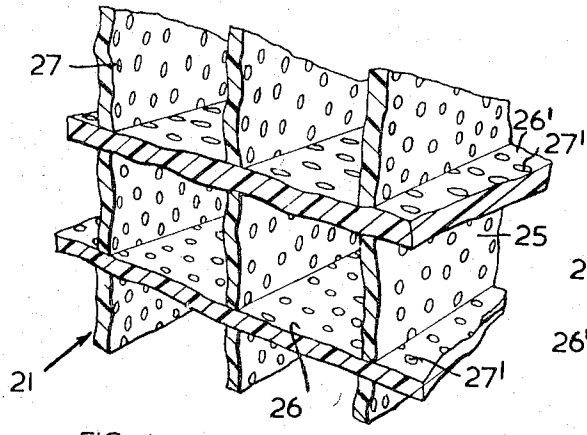


FIG. 4

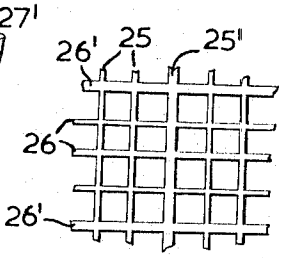


FIG. 5

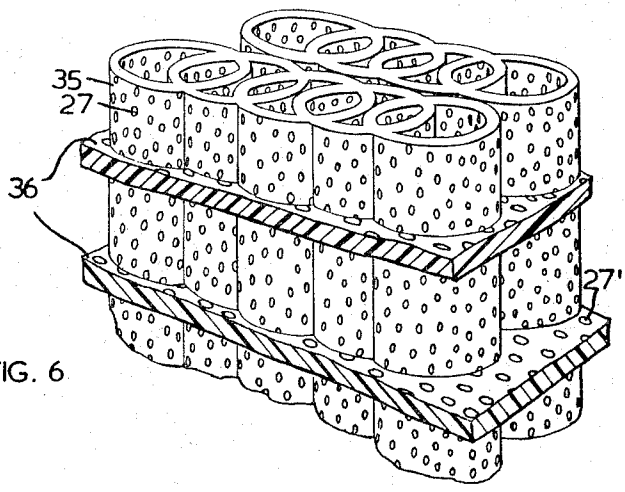


FIG. 6

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ANTI-COMBUSTION CONTAINER

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14 Claims. (Cl. 220—14)

This invention relates to an anti-combustion container and in particular to a container for preventing the combustion of a combustible fluid contained therein.

Generally, the use of combustible fluids in internal combustion engines, jet engines, oil or gas heating systems, paints and solvents etc., presents a danger in that the ignition of the fluid results in complete or incomplete combustion of the fluid, i.e., the fluid may burn or explode depending on ambient conditions and the nature of the fluid.

The transportation of combustible fluids presents the problem of ensuring that the fluids are not ignited during transport due to collision of the transport vehicle with another object.

Having in mind, therefore, the hazards attendant upon the transportation and storage of combustible liquids and gases, and wishing to decrease the danger involved in the use of such liquids and gases, it is the object of the present invention to provide an anti-combustion container for combustible fluids which will inhibit combustion of the latter.

It has been found that the division of a combustible fluid container into cells by means of foraminous partitions formed of non-inflammable material greater reduces the possibility of explosion when the combustible fluid is ignited.

According to its broadest aspect the present invention relates to an anti-combustion container for preventing combustion of a combustible fluid comprising a pair of normally non-communicating inner and outer chambers in spaced relation to one another, the inner chamber normally containing said combustible fluid therein, and the outer chamber normally containing a non-combustible fluid about at least a portion of said inner chamber, said inner chamber being frangible and adapted upon said container being subjected to impact to permit said non-combustible fluid to mix with said combustible fluid to render the latter non-combustible, said inner chamber including an interior assembly of mutually intersecting partitions defining a plurality of cells, all of said partitions being foraminous to provide intercommunication between adjacent cells to ensure the free flow of said fluid with said container, said partitions being formed of substantially rigid, non-inflammable, non-corrosive, non-absorbing, heat conducting and substantially chemically inert or chemically compatible materials.

The invention will now be described in detail with reference to the accompanying drawings which show, by way of example, two embodiments of the invention, and wherein:

FIGURE 1 is a partly sectioned view of a portion of a container showing one embodiment of the invention;

FIGURE 2 is a cross-section taken along line II—II of FIGURE 1; and

FIGURE 3 is a cross-section view of a second embodiment of the invention;

FIGURE 4 is a detailed view of a portion of the interior assembly;

FIGURE 5 is a diagrammatic representation on a reduced scale of a second type of interior assembly; and

FIGURE 6 is a detail view of another type of interior assembly.

Referring to the drawings and in particular to FIGURES 1 and 2, the container, generally indicated at **1** includes a pair of concentric cylinders **3** and **5** the inner of

which defines a chamber **6** which contains a combustible fluid such as gasoline, kerosene or alcohol.

The inner cylinder **5** is provided with a plurality of radially extending spaced apart tubes **7** which project inwardly towards the longitudinal axis of the cylinders **3** and **5**. Each of the tubes **7** has an open end **9** and a closed end **11**. The closed ends **11** of the tubes **7** are equidistant from each other and from the longitudinal axis of the cylinders **3** and **5**.

The outer side of cylinder **3** and the cylinder **5** define an outer annular chamber **8** which is in fluid communication with the tubes **7**. A non-combustible fluid is retained in the outer chamber **8**, which fluid when mixed with the combustible fluid in the inner chamber **6**, renders the latter non-combustible. An example of a suitable non-combustible fluid is a mixture consisting of 70% trichlorofluoromethane and 30% chlorodifluoromethane.

In order to ensure the free flow of fluid within the inner chamber **6**, vertical and horizontal cellular partitions **25** and **26** are provided within the chamber. This feature of the invention has been excluded from FIGURES 1 and 2 for the sake of clarity. However, the cellular partitions are normally provided in the embodiment of the invention shown in FIGURES 1 and 2.

Referring to FIGURE 3, this embodiment of the invention includes a pair of concentric cylinders **15** and **17** which perform the same function as the cylinders **3** and **5** employed in the embodiment shown in FIGURES 1 and 2. The inner cylinder **17** defines a chamber **19** in which is located cellular partitions **21** to permit free flow of the fluid within the chamber **19**. Chamber **18** corresponds to chamber **8** in the embodiment of the invention shown in FIGURES 1 and 2.

With reference to FIGURE 4, the mutually intersecting foraminous partitions **21** define a plurality of cells, said partitions being perforated as at **27**, **27'** so as to provide communication between adjacent cells and to permit the free flow of fluid within the chamber **6** or **19**, as the case may be. Some of the horizontal partitions **26'** have a greater thickness than the remaining horizontal partitions **26** and the vertical partitions **25**.

Moreover, the perforations **27'** formed in the horizontal partition **26'** are larger in diameter than the perforations **27** formed in the horizontal and vertical partitions **25**, **26**.

Alternatively, and as will be seen in FIGURE 5, certain vertical partitions **25'** may have a greater thickness than the remaining vertical partitions **25** and, although not shown, the perforations in the former are larger, in diameter, than the diameter of the perforations in the latter.

If desired, and as shown in FIGURE 6, the interior assembly can be provided with vertical partitions **35** which take the form of a plurality of interconnected hollow cylindrical members each provided with perforations **27** and a plurality of interposed horizontal partitions **36**, each of the latter being of greater thickness than the vertical partitions **35** and each having perforations **27'** of greater diameter than the diameter of the perforations **27**.

In the case of the interior assembly shown in FIGURES 3 and 4, as well as that shown in FIGURE 6, both the vertical and horizontal partitions are of the same substantially rigid material, i.e. metal or thermoplastic such as nylon, and have the same characteristics i.e. non-inflammable, non-corrosive, non-absorbing, heat-conducting and substantially chemically inert or chemically compatible to the fluid to be contained with the assembly.

It will be appreciated that whereas circular perforations **27**, **27'** have been shown in FIGURES 4 to 6, any geometrical design may be employed, such as diamond-shaped, triangular, rectangular or elliptical. However, it

is essential that the cross-sectional area of each perforation 27' be greater than the cross-sectional area of the perforations 27. Moreover, it will also be appreciated that, if desired, the vertical partitions may be of greater thickness than the horizontal thickness and, in consequence, the cross-sectional area of the perforations of the former will be greater than the cross-sectional area of the perforations in the horizontal partitions. Such an arrangement has not been illustrated because it is felt that this textual description is self-explanatory.

It will also be appreciated that the partitions of increased thickness shown in the forms of the invention illustrated in FIGURES 4 to 6 will give greater rigidity to the interior assembly that partitions all formed from thinner gauge material.

It will be appreciated that the use of foraminous partitions in a combustible fluid container is in itself an anti-combustion system of particular utility. The addition of an external chamber with a non-combustible fluid as described hereinbefore is a further safeguard against combustion and a safeguard against any failure of the first-mentioned system.

I claim:

1. An anti-combustion container for preventing the combustion of combustible fluid comprising a pair of normally non-communicating inner and outer chambers in spaced relation to one another, the inner chamber normally containing said combustible fluid therein, and the outer chamber normally containing a non-combustible fluid about at least a portion of said inner chamber, said inner chamber being frangible and adapted upon said container being subjected to impact to permit said non-combustible fluid to mix with said combustible fluid to render the latter non-combustible, said inner chamber including an interior assembly of mutually intersecting partitions defining a plurality of cells, all of said partitions being foraminous to provide intercommunication between adjacent cells to ensure the free flow of said fluid within said container, said partitions being formed of substantially rigid, non-inflammable, non-corrosive, non-absorbing, heat-conducting and substantially chemically inert or chemically compatible materials.

2. A container according to claim **1** where said interior assembly occupies not more than 3% and not less than 2% of the usable volumetric capacity of said inner chamber.

3. A container according to claim **1** wherein said interior assembly is metallic.

4. A container according to claim **1** in which said interior assembly is formed from a non-inflammable plastic material.

5. A container according to claim **1** wherein said non-inflammable fluid is contained in said outer chamber under pressure.

6. A container according to claim **1** wherein the wall of said inner chamber is formed from glass.

7. A container according to claim **1** wherein the wall of said inner chamber is formed from a non-inflammable plastic material.

8. A container according to claim **1** wherein said interior assembly is formed from a plurality of substantially horizontal and spaced partitions and at least one substantially vertical intersecting partition.

9. A container according to claim **1** wherein said interior assembly is formed from a plurality of substantially vertical and spaced partitions and at least one substantially horizontal intersecting partition.

10. A container according to claim **1** wherein the fluid in said outer chamber, is a mixture of 70% trichlorofluoromethane and 30% chlorodifluoromethane.

11. A container according to claim **1** including means for puncturing the wall of said inner chamber in order to permit said non-combustible fluid to mix with said combustible fluid.

12. A container according to claim **1** wherein the walls of said inner and outer chambers are formed by a pair of inner and outer concentric cylinders.

13. A container according to claim **12** wherein the inner of said concentric cylinders is formed from weaker material than the outer of said cylinders to ensure that the inner cylinder is at least as frangible as said outer cylinder.

14. A container according to claim **12** including a plurality of radially extending, spaced apart tubes projecting inwardly from said inner cylinder towards the longitudinal axis of said cylinders, said tubes being in fluid communication with said outer chamber and containing said non-combustible fluid.

No references cited.

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