Nov. 11, 1930. S. BRAUNSTEIN 1,781,048

CONTAINER FOR STORAGE AND TRANSPORT OF LIQUEFIED GASES

Filed April 16, 1929

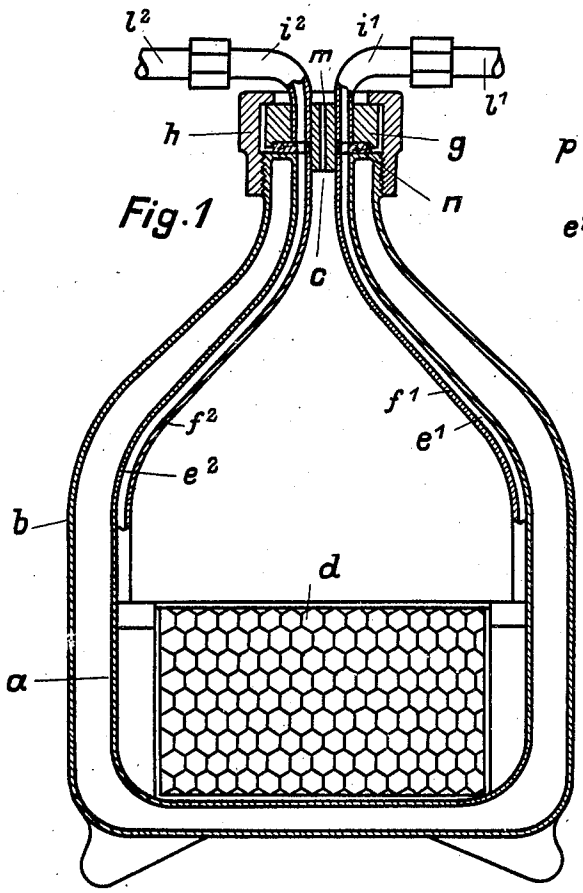


Fig. 1

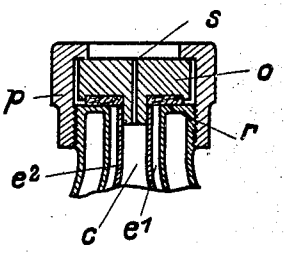
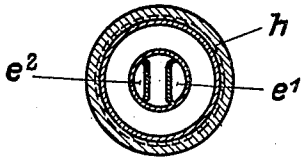


Fig. 3

Fig. 2



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UNITED STATES PATENT OFFICE

SCHULIM BRAUNSTEIN, OF BERLIN, GERMANY

CONTAINER FOR STORAGE AND TRANSPORT OF LIQUEFIED GASES

Application filed April 16, 1929, Serial No. 355,534, and in Great Britain March 23, 1928.

My invention relates to a container for the storage and transport of liquefied gases, and its object is to provide means for utilizing the low temperature of the liquefied gas for cooling purposes. Previously, it was possible to utilize liquefied gases, e. g. liquid air for cooling purposes, only by pouring the liquid cooling agent on to the spot where it was desired that the cooling should take place. The pouring action was always accompanied by considerable losses of cold, as the liquefied gas in its transit absorbed heat and always rose to a boiling condition while being poured out. Owing to the low temperature of the liquefied gas, an estimate of the cooling effect could be formed only by measuring the liquid while it was being poured out or led away. This brought about an expenditure of liquefied gas, which, from an economic standpoint, bore no relation to the cooling effect obtained or required.

The object of the present invention is to provide a container for holding liquefied gas which container may be readily transported from place to place, the container having therein a tubular conduit leading out from the top of the container and immersed in the liquefied gas and the top of the container being provided with means whereby cooling pipes may be connected to the conductors in the container or disconnected therefrom, and whereby the container may be stoppered when the pipes are disconnected so as to permit the container to be transported from place to place and then connected up with the cooling pipes.

An example of my invention is depicted in the accompanying drawing; in which

Fig. 1 shows in section the storage container with a device for conveying the gaseous cooling medium.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 shows the neck of the container closed by a cork.

The container *a* with the liquefied gas therein is surrounded by a covering *b*. The intervening space is evacuated of air in known manner to create efficient heat insulation. Inside the container *a* is placed a permeable device *d* somewhat like a honeycomb cooler for the flow of the gaseous cooling medium such as air. The inlet pipe e^1 and the outlet pipe e^2 for the gaseous cooling medium are led into the container *a* immediately alongside of the filling inlet *c*, and are conveniently formed by soldering curved strips f^1, f^2 on to the inner wall of the container *a*. In this manner, the inward and outward flow of the cooling medium is made to occur through the neck of the container, which in all circumstances is to be of narrow dimensions. In order to adapt the container or bottle for cooling purposes, a stopper *g* is fastened by a screwed cap *h* into the neck of the container, said stopper *g* holding two communication tubes i^1, i^2 which serve to connect the inlet and outlet tubes e^1, e^2 of the cooling medium conducting device *d* to the tubes l^1 and l^2. Between the stopper *g* and the neck of the container is inserted a packing ring *n*. The stopper *g* is furnished with a small bore *m* through which the vapours of the liquefied gas can escape.

When transporting the container, a stopper *o* is pressed into the neck by means of a screwed cap *p*, said stopper *o* being provided also with a corresponding bore *s* and sealing the filling opening *c* and the inlet and outlet pipes e^1 and e^2 simultaneously. By interposing a packing ring *r* of rubber or the like an absolutely hermetic closure of the pipes e^1 and e^2 is ensured.

It will be seen that I have provided a refrigerating structure in which containers for the liquefied gas such as liquefied air may be used, these containers being adapted to be inserted in a refrigerator for instance, and connected up with the pipes containing the fluid to be cooled and left connected up until the liquid air is exhausted when a new container may be put in place or filled with liquefied air and connected up with said pipes. I am aware of the fact that it is old to use a liquid air container in a refrigerating system, but in this case the container is permanently disposed within the refrigerating system and liquid air must be poured from time to time into the container to replenish it. This causes a large loss of liquefied air and is relatively difficult at a private house where-

as these containers may be filled with liquefied air at the factory and then brought to the house and disposed within the refrigerator in the same manner that ice is placed in the refrigerator today from time to time as may be necessary, the old and empty container being removed. While I have referred above to the use of this structure in refrigerating system of private houses, it will be understood that inasmuch as the container is portable, it may be carried from place to place and whenever desired to be used connected up with the cold air pipes for refrigerating purposes.

What I claim as my invention and desire to secure by Letters Patent of the United States, is:—

1. A container for the storage and transport of liquefied gases comprising a heat insulated vessel adapted to contain a liquefied gas, the vessel being formed to provide inlet and outlet conduits extending into the vessel and opening at the mouth thereof, a removable stopper for the mouth of the vessel having inlet and discharge pipes which when the stopper is in place communicatively connect with said conduits, and means for closing said conduits when the stopper is removed.

2. A container for storage and transport of liquefied gases comprising a heat insulated vessel having a contracted neck, a conduit disposed within said vessel and having its ends extending into said neck, a removable stopper for the contracted neck, inlet and outlet pipes engaged with said stopper and adapted when the stopper is in place to register with the conduits, the stopper having an air vent and means for closing the adjacent ends of said conduits when the stopper is removed.

3. A container for the storage and transport of liquefied gases comprising a heat insulated vessel having a contracted neck exteriorly screw-threaded, the vessel being adapted to contain liquefied gases and having a conduit extending into the body of the vessel, the extremities of the conduit terminating at the top of said neck, a stopper adapted to rest upon the top of said neck and carrying inlet and outlet pipes adapted when the stopper is in place to register with the adjacent ends of said conduits, a gasket disposed between the stopper and the upper end of the vessel, and a cap engaging said stopper and adapted to have screw-threaded engagement with the neck, the stopper having a vent.

4. A container for the storage and transport of liquefied gases comprising a heat insulated vessel adapted to contain a liquefied gas, conduits extending into the vessel and terminating at the mouth thereof, and a closure for the vessel including a stopper fitting upon the mouth of the vessel and having a gasket adapted when the stopper is in place to have air-tight engagement with the wall of the vessel at the mouth thereof, and means having screw-threaded engagement with the mouth of the vessel to force the stopper against the mouth of the vessel and hold it in place.

5. A container for the storage and transport of liquefied gases comprising a heat insulated vessel adapted to contain liquefied gas, conduits extending into the vessel and terminating at the mouth thereof, the conduits being spaced from each other, a stopper having a central portion formed with a vent, the central portion extending below the body of the stopper whereby it may be inserted between said conduits, the stopper being provided with a gasket on its under face adapted to engage with the end wall of the vessel and a cap having screw-threaded engagement with the neck of the vessel and holding the stopper in place, the vent opening through said cap.

In testimony whereof I affixed my signature.

SCHULIM BRAUNSTEIN.