May 12, 1931. H. MEYER 1,805,370

METHOD OF AND APPARATUS FOR INFLATING INFLATABLE BODIES, SUCH FOR EXAMPLE AS INFLATABLE BOATS

Filed Dec. 27, 1929

Fig. 1.

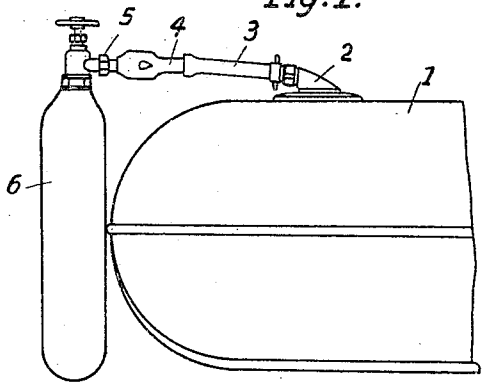


Fig. 2.

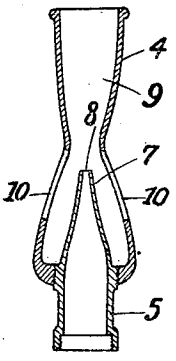


Fig. 3.

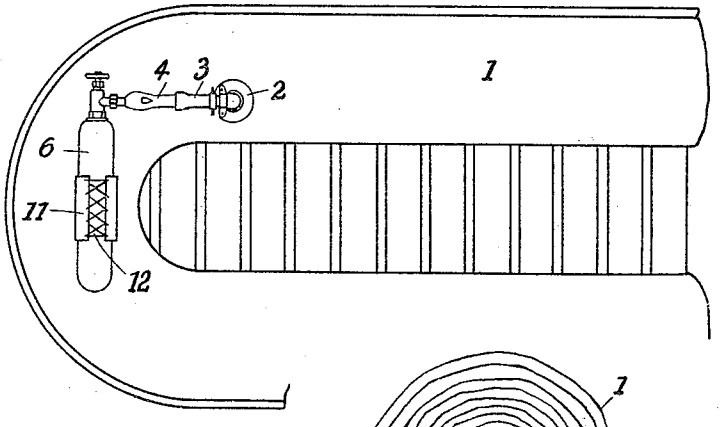
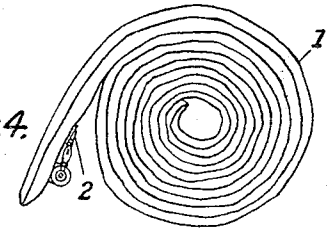


Fig. 4.



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UNITED STATES PATENT OFFICE

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METHOD OF AND APPARATUS FOR INFLATING INFLATABLE BODIES, SUCH, FOR EXAMPLE, AS INFLATABLE BOATS

Application filed December 27, 1929, Serial No. 417,012, and in Germany January 9, 1929.

My invention relates to improvements in the method of and apparatus for inflating inflatable bodies, such for example as inflatable boats, and more particularly in the method in which a gas under pressure or a liquefied gas is delivered through an injector into the inflatable body thus carrying along air for filling the inflatable body. The object of the improvements is to provide a method and an apparatus by means of which the inflatable body can be filled within a short period of time, and by means of a comparatively small amount of compressed or liquefied gas under comparatively low pressure. With this object in view my invention consists in directly connecting the container for the compressed or liquefied gas with the injector, so that the pressure of the said gas is not reduced. Further, the nozzle of the injector is made with a comparatively large delivery opening, the said delivery opening having a diameter of about 2 millimeters or more. In my improved method the entire pressure of the gas is at first used, so that the velocity of the gas flowing through the nozzle is very high and accordingly a large amount of air is taken into the inflatable body. As filling of the inflatable body proceeds, the velocity of the gas delivered through the injector is gradually reduced. To prevent the formation of snow and ice at the nozzle of the injector, which would choke the said nozzle, I store the compressed or liquefied gas under comparatively low pressure of from 50 to 60 atmospheres, which low pressure in connection with the large delivery opening of the nozzle prevents the formation of snow and ice. After the inflatable body has been filled, the compressed gas and air which might still be supplied by the injector are delivered laterally through the openings of the injector without increasing the pressure within the body. The intake opening of the inflatable body is provided with a check valve or gate preventing any loss of air from the inflatable body after filling the same and interrupting the operation of the injector.

I have found that by my improved method the period of time within which the inflatable body may be filled and the amount of compressed or liquefied gas are considerably reduced. For example, an inflatable boat having a capacity of 0,7 cubic meters may be filled by my improved method within 15 or 20 seconds, the container for the compressed or liquefied gas having a capacity of 1½ liters of gas, such for example as liquefied carbonic acid, at a pressure of from 50 to 60 atmospheres. By the method now in use the same inflatable body is filled from a container having a capacity of from 3 to 4 liters at a pressure of 150 atmospheres within a time of about 200 seconds, the pressure of the gas being reduced by a reducing valve.

By my improved method the weight of the gas and its container are reduced, because the necessary amount of the gas and the pressure are reduced. Further, my improved method is in a less degree dependent upon the temperature of the atmosphere, than the method in which liquefied or compressed gas is under high pressure. In hot weather the gas compressed under high pressure is rapidly expanded into a large volume, so that the inflated body is frequently burst by the expanding gas. In cold weather the efficiency of the compressed gas is comparatively low, and frequently it is not sufficient to inflate the boat.

After having thus described my improved method I shall now describe an apparatus in which my method is used. In the accompanying drawings,

Fig. 1, is an elevation showing a body to be inflated, a container for compressed or liquefied gas, and an injector,

Fig. 2, is a sectional elevation on an enlarged scale showing the injector,

Fig. 3, is a top plan view showing an inflatable boat, the arrangement of the gas container being slightly modified as compared to the construction shown in Fig. 1, and

Fig. 4, is a top plan view showing the non-inflated body rolled together into a coil for being stored.

In Fig. 1 I have shown an inflatable body 1 such for example as a body forming a part of an inflatable boat. To the top of the said body a tubular stud 2 is fixed, which is preferably inclined relatively to the body, and

which is connected with a pipe or flexible tube 3 adapted to have an injector 4 secured thereto. The said injector 4 is directly connected at 5 to a container 6 for compressed or liquefied gas, and there is no reducing valve between the container 6 and the injector, the gas from the container being supplied to the injector under full pressure. As shown in Fig. 2, the injector comprises a tapering nozzle 7 having a comparatively large delivery opening 8, the diameter of the said opening being about 2 millimeters, and an outer pipe 4 which is reduced in diameter at 9 and flares outwardly from said reduced portion to the delivery end connected to the tube 3. The pipe is provided with intake openings 10. The gas delivered from the nozzle 7 at high velocity draws in a large amount of air through the pipe 4 and the reduced portion 9 thereof, the pressure of the said air being gradually increased within the enlarged portion 9, whereupon it is delivered through the tube 3 into the body 1.

The modification shown in Fig. 3 is similar to the one illustrated in Fig. 1, and the same letters of reference have been used to indicate corresponding parts. As distinguished from the construction shown in Fig. 1, the container 6 is mounted on the top side of the body 1 where it is held within a pocket 11 adapted to be closed by a cord 12. The pocket provides heat insulation for the container.

I claim:

A boat comprising an inflatable hull of limp flexible material provided with a stud, a container for compressed gas and a duct detachably connecting the container to the stud, said duct including an injector nozzle for the gas and openings for the admission of air so that the gas as it enters the hull draws and forces atmospheric air also into the hull, thereby causing the hull to be inflated with a mixture of gas and air.

In testimony whereof I hereunto affix my signature.

HERMANN MEYER.