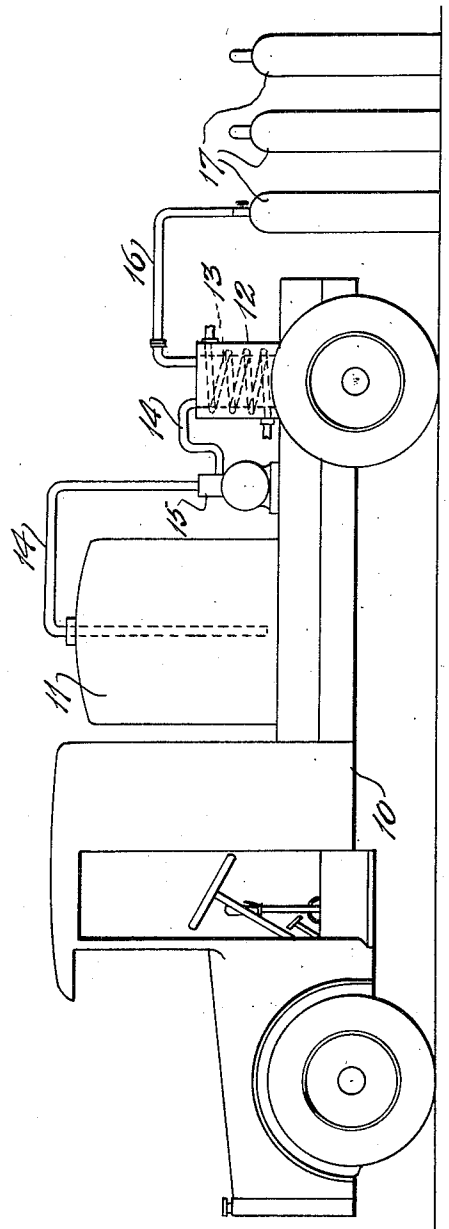
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GAS SUPPLYING METHOD AND DEVICE THEREFOR

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GAS SUPPLYING METHOD AND DEVICE THEREFOR

REISSUED

Application filed February 16, 1928, Serial No. 254,912, and in Germany February 24, 1927.

This invention relates to a gas supplying method, the characteristic feature of which is, that oxygen or similar industrially useful gases having a low boiling point and which are produced otherwise than by mechanical air separation, as for instance the waste gases from chemical processes, are liquefied in a manner known in the low-temperature cooling technics and are delivered to the consumers in liquid state in receptacles for the purpose of being industrially utilized at any desired place.

In large gas producing plants, in which larger quantities of gas must be stored, although the gas consumption is small or where gases must be permitted to escape uselessly into the atmosphere, the impossibility of utilizing such gases has an important bearing on the economy of the total procedure. The same is true of such chemical processes, in which certain gases are produced for chemical synthesis (ammonia-synthesis, electrolytic-decomposition of water and the like), but where only the one or the other component of the gases can be industrially utilized, whereas the rest must be allowed to escape uselessly. It is chiefly the oxygen and the nitrogen which are liberated in certain manufacturing processes.

Now, according to this invention, such gasiform by-products are subjected to subsequent liquefication, so that they not only can be stored in liquid state and with a small requirement of space, but can, in view of their lower weight and in contradistinction to compressed gases, be conveyed in steel-bottles to great distances to be utilized whereever required.

It has already been proposed to transport liquefied gases having a low boiling point, for instance oxygen, in large quantities and in special vessels and to convert them into pressure gas at the place of consumption. The gases, however, were filled in liquid condition at the place of consumption from the transporting vessel into so-called cold or warm vaporizers, in which the conversion into pressure gas took place, in cold vaporizers the resulting pressure being approximately 30 atmospheres and in the warm vaporizer 150 atmospheres. This method of converting the liquefied gas into pressure gas necessitates, however, for small consumers, which represent the majority of the customers, an investment of a large amount of capital, as vaporizers were required at the place of consumption.

It has also been proposed to vaporize the liquefied gas within the transporting vessel at the place of consumption and to use it as gas of the desired working pressure. This is possible in cases where at the place of consumption only low working pressures (15 atmospheres and the like) are required, since in case of higher pressures the vessels must necessarily be of exceedingly strong and heavy construction, whereby the economy of transporting the gas in the liquid state would be offset.

The aforementioned disadvantages are overcome by the present invention, which consists in providing on rolling stock an installation for the production of liquid oxygen, together with a transporting vessel for the liquid oxygen and a pressure gas producer, or only the transporting vessel together with the pressure gas producer may be mounted on said rolling stock, for instance on a motor truck. For this purpose an installation for producing liquefied gas, which may be known per se, is disposed on rolling stock, together with a storage vessel and a pressure gas producing device, into which the liquid is brought, or only a transporting vessel together with a pressure gas producer may be mounted on said rolling stock.

For conveying the liquefied gas into the vaporizer, a pump may be provided, which forces the liquid into the vaporizer, or the conveying means may be omitted and the transporting vessel connected directly to a warm or cold vaporizer.

In the accompanying drawing the figure shows an outline side elevation of an embodiment of the invention using a motor driven truck for the transporting vehicle.

In this embodiment an ordinary motor driven truck 10 is used and on this is mounted a thin walled container 11 for holding a large quantity of gas in liquefied form. To the

rear of this container is shown a heavy walled vaporizing apparatus 12 of any desired form, means for supplying the necessary heat to this apparatus being typically indicated by a pipe coil 13. Piping 14 connects the container and vaporizer so that liquefied gas may be delivered to the vaporizer and suitable means are employed to effect such delivery, the means being here indicated by a small pump 15 interposed in the piping 14. A delivery pipe 16 leads from the vaporizer and is arranged for connection to any one of a plurality of storage bottles 17 located at the point or points to which delivery is to be made.

In operation the liquefied gas under substantially no pressure passes from the container to the vaporizer and is there transformed to gasiform gas under such pressure (say 2500 to 3000 pounds per square inch) as may be desired and, in that condition, is fed into the storage bottles.

The principal advantage of the present process consists in the fact that the consumer can be supplied much more quickly than heretofore with pressure gas at any desired pressure without the necessity of every consumer being provided with a special vaporizing apparatus, which requires the laying out of considerable capital. A further advantage is that such gases as are obtained as by-products in the manufacture of nitrogen and hydrogen, can by this method be used, instead of permitting them to escape into the atmosphere as heretofore.

I claim:

1. A process of handling high pressure gases which consists in passing at intervals liquefied gas from a low pressure storage container into a high pressure vaporizer, applying heat to said vaporizer and thereby converting said liquid into gas of high pressure and storing said high pressure gas in suitable containers.

2. A portable apparatus for handling gases including a wheel supported vehicle, a thin walled low pressure container mounted on said vehicle and adapted to hold a large quantity of liquefied gas and retain the same in liquid state, a high pressure vaporizer mounted on said vehicle and arranged to receive liquefied gas from the container, and piping leading from the vaporizer and adapted to be connected to a storage tank for gas under high pressure.

3. A portable apparatus for handling gases including a motor vehicle, a low pressure container carried by said motor vehicle and adapted to contain a large quantity of liquefied gas, a high pressure vaporizer mounted on said vehicle, piping connecting the vaporizer and container, other piping leading from the vaporizer and adapted to connect the same to a storage tank for high pressure gas, and means to supply heat to the vaporizer.

In testimony whereof I have signed my name to this specification.

CHRISTIAN WILHELM PAUL HEYLANDT.