

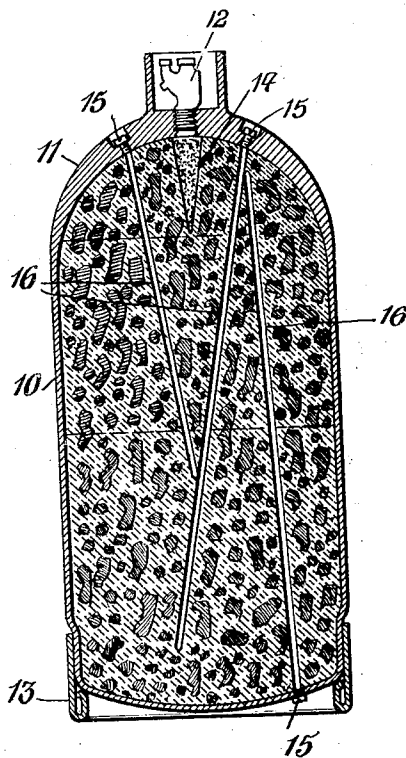
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ACETYLENE CYLINDER

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UNITED STATES PATENT OFFICE

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ACETYLENE CYLINDER

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In the shipment of acetylene gas under pressure, it is customary to use a cylinder which is completely filled with a uniform porous mass whose porosity is such that the largest of the interstices within the mass is so small that an explosive wave cannot be projected through it. In order that the quantity of acetylene compressed within this porous mass shall be at the maximum, it is customary to fill such a cylinder with a liquid that has the quality of absorbing large quantities of acetylene. The liquid universally used for this purpose is acetone, which absorbs approximately twenty-four times its own volume of acetylene.

The cylinders ordinarily in use are of substantial length, the average cylinder being three feet long, and many are longer than this. The valve controlled outlet is at the top end of the cylinder. The release of the gas from the acetone contained in the cylinder and its flow through the porous mass requires an appreciable amount of time, due to the resistance of the mass to the free flow of the gas. This is particularly true of that portion of the gas retained by the acetone in the bottom of the cylinder. It is found in practice that the rate at which gas is released is limited by the filler described. This utilization of the fusible plug openings has the further advantage that in event of fusing of the plugs dangerous pressure in the cylinder due to heat is the more readily relieved.

If this filler be too dense the rate of outflow of the gas when the valve is opened is objectionably slow. If the filler be too porous the outflow of the gas will be so rapid that drops of the acetone will be carried along with the gas which is objectionable not only from the standpoint of the loss of acetone, but from the spitting action.

The object of the present invention is to facilitate the outflow of the gas at as rapid a rate as may be desired under conditions of use, but at the same time to prevent the carrying out of acetone with the gas. To accomplish this object, the cylinder is filled with a porous mass, the density of which may vary through comparatively wide limits, and

this mass is provided with small passages extending lengthwise thereof, but out of direct communication with the cylinder outlet.

In the accompanying drawing I have illustrated a central longitudinal section of a cylinder of a well-known type and in which my invention is incorporated.

The drawing shows a common type of steel cylinder 10 having rounded top 11 provided with a valve controlled outlet fixture 12. The lower end of the cylinder is provided with a reinforcing and supporting base flange 13. The interior of the cylinder is filled with a porous mass which may be inserted in plastic form and may comprise charcoal, asbestos and cement or other suitable porous material which will harden or set after being inserted in plastic form. At the upper end of the cylinder it is customary to provide a small chamber or cavity 14 which communicates directly with the outlet valve.

After the filling material has set the desired amount of acetone is put in. The amount may vary, but in practice the acetone level will be approximately midway of the height of the cylinder before the acetylene gas is admitted and this level will rise during the absorption of the gas until it is near the top of the cylinder when the maximum amount of gas has been forced in under pressure. The high level for the acetone should be below the chamber or cavity 14.

In using the cylinder the valve is opened and the acetylene gas must pass upwardly through the pores of the filling and through the acetone to reach the cavity 14 and the outlet valve.

In carrying out my invention I provide one or more comparatively small passages lengthwise of the cylinder in the porous mass and out of communication with the cavity 14. These passages may be approximately one-eighth inch in diameter and there may be any desired number of them, but they should not be so large or of such number as to materially reduce the action of the porous filler and its retention of the acetone.

The usual cylinder is provided with fusible plugs 15 which may be in the top of the cylinder or in the bottom, or both. In prac-

tice I find that the holes in the cylinder wall which receive the fusible plugs provide suitable access to the porous filler, whereby the holes may be drilled. I have shown three of these holes 16, two of which extend downwardly from the top of the cylinder at opposite sides of the cavity 14, and one of which extends up from the bottom of the cylinder, but I may drill only from the top or only from the bottom and may use a larger or smaller number of the holes.

Although in practice I prefer to remove the fusible plugs and drill the holes after the filling has set, I may in some cases insert wires through these holes before the porous filling is put in and then after the filling has set, pull out the wires and put in the fusible plugs. This permits the formation of smaller passages than is ordinarily possible with very long drills.

It will be obvious that if the shell be of appropriate construction the filler need not be poured in as a plastic mass, but be inserted as a previously formed solid mass, such as a series of asbestos discs, balsa wood or other suitable porous material, and the holes might be made in such mass before it is inserted in which event the holes need not register with the fusible plug openings.

As acetone is used as the acetylene absorbent, I may insert small cords or threads of cellulose acetate or other material soluble in acetone, prior to the insertion of the filling. These will be dissolved by the acetone when it is added and therefore do not need to be mechanically removed.

By the use of the small longitudinally extending passages the gas, particularly that at the bottom of the cylinder, may follow the lines of least resistance and work its way into the passages and then flow comparatively freely to the upper part of the cylinder. It must again pass through the porous filling to reach the cavity 14, and in doing so, any acetone which may have been carried along with the gas will be trapped and only the gas will go to the cavity 14 and the outlet valve. The escape of the gas is thus greatly facilitated, but the spitting out of the acetone is prevented.

The small passages may be of any suitable cross-sectional area, if formed other than by drilling, and may be grooves cut or formed in the outer surface of the filler, particularly if made before in the solid before the latter is put in the shell. They should be of such cross-sectional area that they do not reduce the safety coefficient.

The cylinder may be used with a larger number of torches than is ordinarily possible, and a large volume rapid flow of gas obtained.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An acetylene cylinder having a filler of plastic material, an outlet valve, a fusible plug spaced from the outlet valve, and a passage of comparatively small diameter extending lengthwise of the cylinder from the fusible plug and out of direct communication with the outlet valve.

2. The process of making acetylene cylinders, which includes filling the cylinder with a plastic material which will set to form a porous mass, and providing said filler with one or more longitudinally extending passages of comparatively small diameter and out of direct communication with the outlet opening of the cylinder through which the plastic filler was inserted, whereby the upper parts of said passages are separated from the outlet by a considerable quantity of said filler.

3. The process of making an acetylene cylinder which includes filling the cylinder with a plastic mass which will set to form a porous body, providing a comparatively small chamber at the cylinder outlet, and drilling passages through the filling mass out of direct communication with said chamber, the drilling operation being conducted through openings in the cylinder wall other than the filling opening, whereby the upper parts of said passages are separated from the outlet by a substantial quantity of said mass.

4. The process of making an acetylene cylinder which includes providing the cylinder with an outlet valve, and a fusible plug spaced therefrom, filling the cylinder with a porous mass through the opening receiving said outlet valve and drilling a passage through the porous mass through the opening receiving the fusible plug, whereby the upper part of said passage is separated from the outlet by a substantial quantity of said porous mass.

5. An acetylene cylinder having a porous filler of plastic material which has set in complete contact with the walls of the cylinder, an outlet valve and one or more comparatively small longitudinal passages in the filler and out of communication with said outlet valve, there being between said valve and said passages a substantial quantity of said filler which the gas in said passages must eventually penetrate to reach the outlet.

Signed at Louisville, in the county of Jefferson and State of Kentucky, this 17th day of May, A. D. 1928.

BRUCE MILLER.