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GAS STORAGE CYLINDER

Filed Sept. 30, 1929

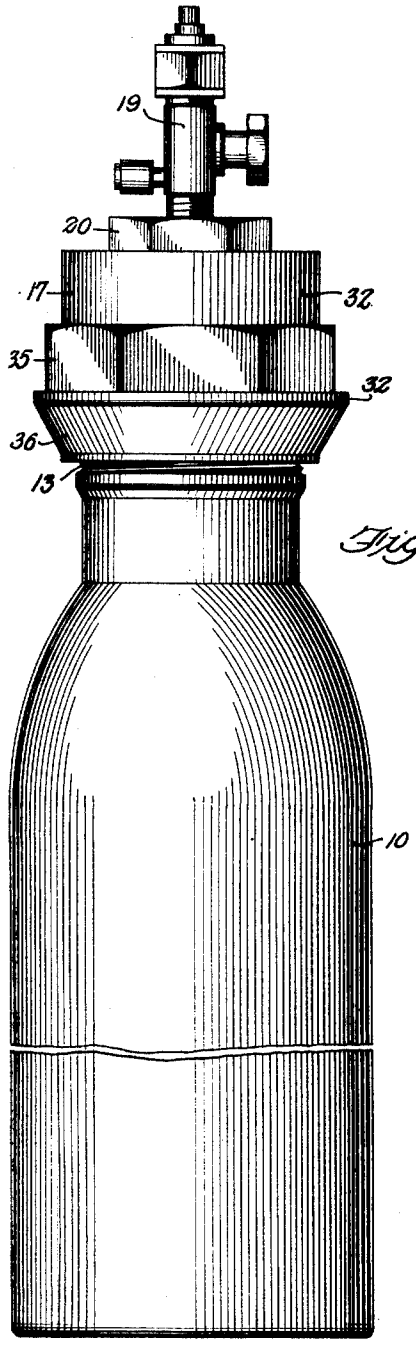

Fig. 1

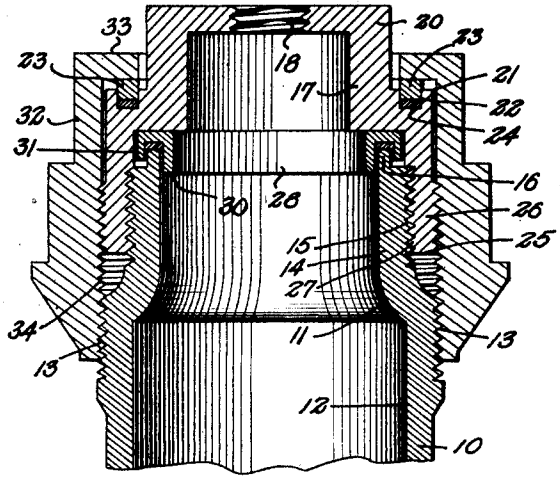

Fig. 2.

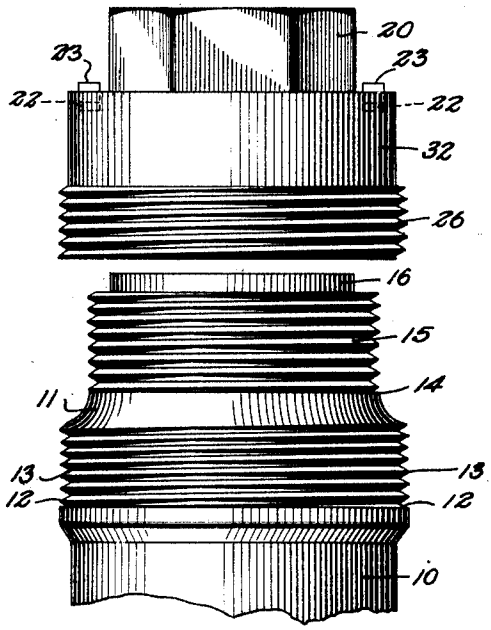

Fig. 3.

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UNITED STATES PATENT OFFICE

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GAS STORAGE CYLINDER

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This invention relates to a gas storage cylinder, and particularly to a closure therefor adapted to permit the recharging of the cylinder and to effect a gas tight connection when the cylinder is in transportation or use.

Cylinders of this character are frequently filled with liquefied or solidified gas as a source of the gaseous charge and are subsequently sealed for the use of the expanded gas in the usual manner. An important item in the use of the high pressure cylinder or tank is to avoid the expense and delay of transporting the cylinder to a gas plant for recharging and thus effect economy in transportation and avoid the return of empty cylinders while providing a very efficient removable closure of the cylinder.

The invention has for an object to provide a novel and improved construction of gas storage cylinder having an exteriorly threaded open end cooperating with a cap having interior and exterior threads and a union interiorly threaded upon both the cap and cylinder.

Another object of the invention is to present a storage tank having a neck with two threaded portions, a cap engaging one of said portions, a union engaging the cap and the other threaded portion of the neck, together with a packing ring supported at the end of the neck and contacting with the inner face of the cap.

A further object of the invention is to provide an improved packing for the cap and union including a grooved packing ring seated on the open end of the cylinder and engaged by the cap, and a contact ring seated at the upper face of the cap for engagement with a flange from the union.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings:

Figure 1 is an elevation applied:

Figure 2 is a central vertical section, omitting the valve, and

Figure 3 is a detail elevation of the parts in separated position, omitting the valve and union.

Like numerals of reference indicate like parts in the several figures of the drawings.

The invention is adapted for application to any desired container and is herein shown as applied to a cylinder or tank 10 designed to receive a liquefied or solidified gas and retain the same under pressure during expansion. The neck 11 of this cylinder has its portion 12 of larger diameter provided with screw threads 13 and its portion 14 of less diameter with threads 15, while beyond the latter threads a circumferential rib 16 is provided at the open end of the cylinder.

The cap 17 is formed with a threaded aperture 18 to receive the usual high pressure valve 19, and at its exterior provided with a wrench hold face 20. Beneath this face a shoulder 21 extends circumferentially with a groove 22 to receive a projecting contact ring 23 which bears on a soft metal packing 24 within the groove. The depending flange 25 of the cap has an exterior threaded surface 26 and an interior surface of similar character to engage the threads 15 of the neck.

Interposed between the under face 27 of the cap and the cylinder end is an annular groove packing ring 28 containing a soft metal packing 29 engaging the rib 16 and flanges 30 and 31 embracing said rib.

For the purpose of clamping the parts in position a union 32 is provided with an inturned flange 33 seating upon the contact ring 23 and the body of the union is formed with an extended interior threaded face 34 engaging both the exterior threads 26 of the cap and the threads 13 of the neck. The outer face of the union has a wrench hold 35 and inwardly inclined face 36 extending downward therefrom.

The general operation of the invention will be seen from the foregoing description and the cylinder is charged with solidified gas by removing the union and cap with the packing ring, after the high pressure valve is disconnected from its line. The desired amount of solidified gas is placed in the cylinder to insure a safe pressure when in use and the cylinder closed by replacing the ring, cap

and union. During such replacement the valve is opened to vent the accumulating gas in the cylinder until all connections are made tight. The valve is then closed and the cylinder ready for connection to the gas line.

The structure provided insures a gas tight closure when in use or being transported, and also permits the convenient opening of the cylinder for recharging with a liquid and solid gas and thus avoids the necessity of returning the cylinder to a gas charging plant.

While the details of construction have been shown and described, the invention is not confined thereto as changes and alterations may be made therein without departing from the spirit of the invention as recited in the following claims.

What we claim is:—

1. A gas storage container having two sets of exterior threads adjacent to an open end thereof, a cap having exterior threads and also having interior threads which engage one set of the container threads, and an interiorly threaded union engaging a portion of the outer end of the cap and the exterior threads of the cap and the other set of threads on the container.

2. A gas storage container having two sets of exterior threads adjacent to an open end thereof, a cap having exterior threads and also having interior threads which engage one set of the container threads, an interiorly threaded union engaging a portion of the outer end of the cap and the exterior threads of the cap and the other set of threads on the container, and an annular packing ring having a groove containing a packing seated at the open end of the cylinder.

3. A gas storage container having an exteriorly threaded open end, a cap having exterior threads and also having interior threads which engage the cylinder threads, an interiorly threaded union engaging the exterior threads of the cap and cylinder, and a contact ring seated in a groove at the upper face of the cap and engaged by an inturned flange of the union.

4. A gas storage container having two sets of exterior threads adjacent to an open end thereof, a cap having exterior threads and also having interior threads which engage one set of the container threads, an interiorly threaded union engaging a portion of the outer end of the cap and the exterior threads of the cap and the other set of threads on the container, an annular packing ring having a groove containing a packing seated at the open end of the cylinder, and a contact ring and packing between the upper face of the cap and said union.

5. A gas storage cylinder having a neck of different diameters, each provided with separate threads, a cap having an inner contact face at the open end of the cylinder and a flange threaded to engage the less diameter of neck and an exterior set of threads thereon, and a union having a flange overhanging and engaging the end of the cap and an interior thread to engage the cap and larger cylinder neck.

6. The storage cylinder defined by claim 5 in which a contact ring is seated in a groove of the cap and projected for engagement with the flange of the union.

7. The storage cylinder defined by claim 5 in which both the cap and union are provided with exterior wrench holds.

8. A gas storage cylinder having a neck provided with separated threaded portions of different diameters and a rib at its open end, an annular grooved packing ring embracing said rib, a cap having an under face to engage said ring and a circumferential groove in its upper face, a depending flange from the cap having interior and exterior threads, a contact ring seated in the groove of the cap, and a union having an inturned flange engaging the contact ring and an interiorly threaded portion engaging the cap and cylinder neck.

9. A gas storage container having two sets of exterior threads adjacent to an open end thereof, a cap having interior threads which engage one set of the container threads, and an interiorly threaded union engaging the other set of threads of the container, said union also engaging a portion of the cap to provide a holding means for the cap in addition to the threaded engagement of the cap on the first said set of container threads.

In testimony whereof we affix our signatures.

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