

Oct. 14, 1952

C. E. JOHNSON

2,613,462

PRESSURE VESSEL

Filed April 6, 1948

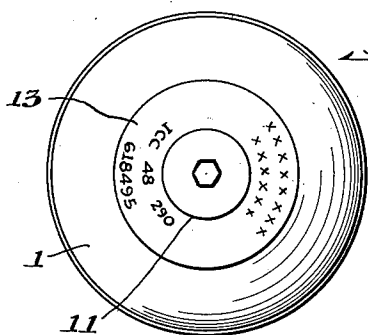


Fig. 2.

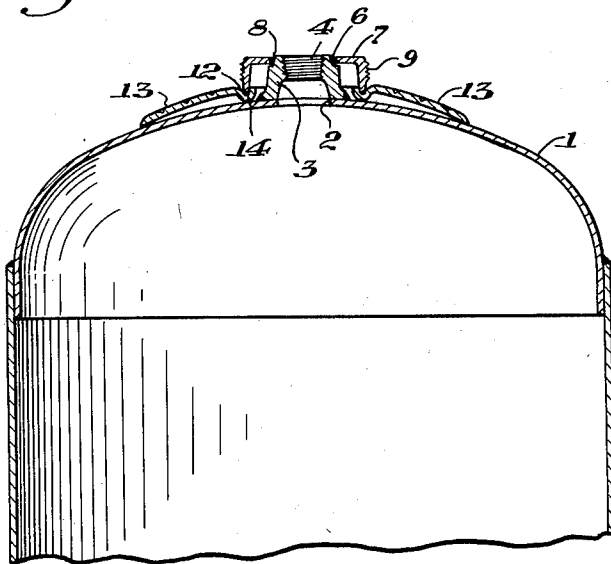


Fig. 3.

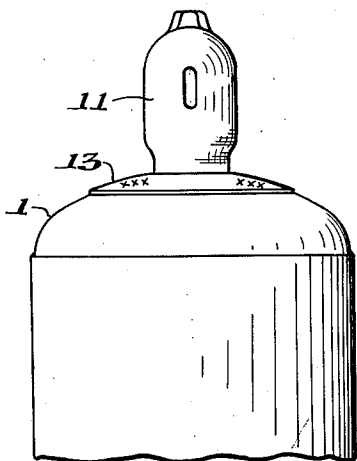


Fig. 1.

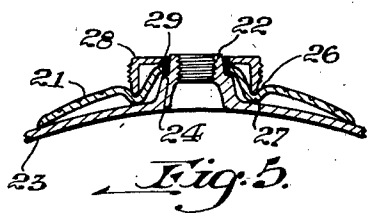


Fig. 5.

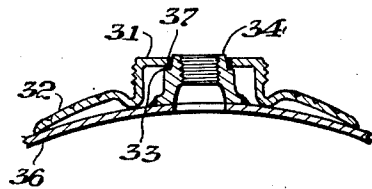


Fig. 6.

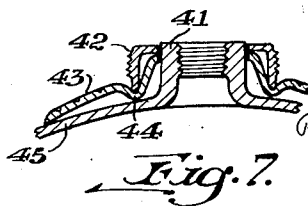


Fig. 7.

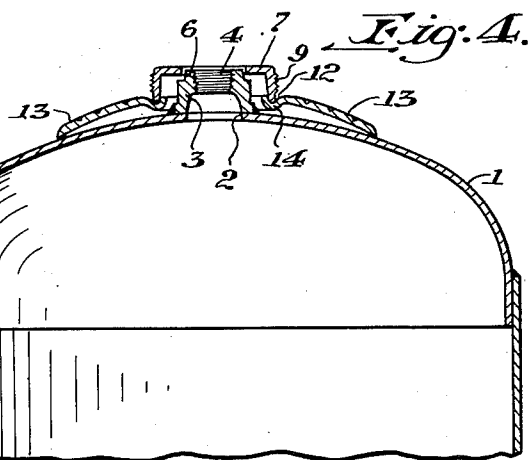


Fig. 4.

INVENTOR.
Carl E. Johnson
BY
Brown, Critchlow, Liepp & Beckham
his ATTORNEYS.

UNITED STATES PATENT OFFICE

2,613,462

PRESSURE VESSEL

Carl E. Johnson, Verona, Pa., assignor to Scaife Company, Oakmont, Pa., a corporation of Pennsylvania

Application April 6, 1948, Serial No. 19,254

5 Claims. (Cl. 40—10)

1

This invention relates to shipping containers for compressed gases, and more particularly to means for identifying such containers.

In the manufacture of containers for handling or shipping liquefied petroleum gas and other compressed gases the Interstate Commerce Commission requires that each container, usually termed "cylinder," be impressed with certain information, such as the name of the manufacturer, the weight of the cylinder and its serial number. When containers are furnished on any order they must be numbered consecutively. In the past it has been the practice to stamp the required information into the metal of the head of the cylinder around its neck. This has to be done before the cylinder is completed and tested. If the cylinder fails the test, the data carried by it has to be applied to a new cylinder in order that there will be no gaps in the numbering system. The time required to make the new cylinder, which can not be made until it is known which cylinder it will replace, slows down production. The light walls of these pressure cylinders make it unwise to stamp data into them deeply, which otherwise would be desirable for the sake of legibility. A simple solution to these problems would seem to be to stamp the necessary information on metal plates and then weld them to the cylinder heads after the cylinders have been tested, but such a procedure is not allowed by ICC regulations without subsequent heat treatment, which must be done before testing.

It is among the objects of this invention to provide a pressure vessel which can be tested before permanent identifying data is applied to it, but which later receives a data-carrying member that is permanently attached to it without being welded to the cylinder head or side wall. Other objects are to provide such a vessel with an identification member that is easy to read and that can carry additional data desired by the user but not presently allowed to be stamped into the wall of a container.

In accordance with this invention the neck at the center of the convex head of a compressed gas cylinder is encircled by an identification member in the form of a wide flange or crown, the outer edge of which engages the head. The upper surface of the crown has stamped deeply therein identifying numbers and figures pertaining to the cylinder carrying it. The crown is held in place by a threaded collar which encircles the neck and is permanently attached to the upper end of it. The crown and collar may be made in one piece or as separate members, but they are not applied to the cylinder until after

2

it has passed its tests. The bottom of the collar presses the underlying portion of the crown toward the head, so that the crown is permanently clamped in place by the collar. If desired, when the collar is separate from the crown, the inner edge of the latter can be secured to the neck. The collar threads are for receiving the usual screw cap that protects the valve screwed into the neck. Preferably, only the outer edge of the crown originally engages the cylinder head, the portion of the crown beneath the collar being sprung down by it toward or into actual contact with the head when the collar is fastened to the neck. Also, it is desirable that the crown have a downwardly bent annular portion that forms a groove for receiving the lower end of the collar, the lower surface of the grooved portion forming a rib that may be pressed against the head.

The invention is illustrated in the accompanying drawings in which Fig. 1 is a side view of my pressure vessel; Fig. 2 is a plan view thereof; Fig. 3 is an enlarged central vertical section through the upper portion of this vessel with the valve and valve cap removed; Fig. 4 is a similar view of the same parts just before the collar is fastened to the neck; and Figs. 5, 6 and 7 are fragmentary views, similar to Fig. 3, of three modifications of this invention.

Referring to Figs. 1 to 3 of the drawings, the compressed gas cylinder has the usual convex head 1 provided with a central opening 2 from which a neck 3 extends upward. The lower end of the neck may rest on the head around the opening and be welded to the head, or it may be integral with the head. The neck is provided with a threaded passage 4 for receiving the usual shut-off valve (not shown). The upper end of the neck is provided with an encircling recess 6 having a horizontal bottom and an upwardly tapered side. Also encircling the neck is a metal collar 7 which has a horizontal top wall, the inner edge of which extends into the neck recess and substantially engages its lower surface. The collar may be secured to the neck by a continuous braze or weld 8 which fills the downwardly tapered annular groove formed between the side of the recess and the collar. If desired, however, the collar can be joined to the neck by a mechanical connection. The top wall of the collar extends away from the neck and is integrally connected to the upper end of a side wall which is spaced from the neck. The outer surface of this side wall is provided with screw threads 9 onto which a valve protection cap 11 can be screwed.

The lower end of the side wall is rounded trans-

versely and is seated in a circular groove 12 formed in a wide metal dished crown 13 that encircles the neck and extends outward over the head. This groove is formed by bending an annular portion of the crown downward near its inner edge, thereby forming below the groove an annular rib 14 which preferably, although not necessarily, engages the top of the head. The outer edge of the crown also engages the head. The inner edge of the crown can be extended up into the collar as far as desired. Stamped in the upper surface of the crown around the collar is the data required by the Interstate Commerce Commission, including the serial number of the cylinder on which the crown is mounted, as well as all those additional markings that are convenient and desirable, such as the water capacity and tare weight of the container, and the name and address of its owner. It will be observed that the crown is clamped permanently in place on the cylinder by means of the collar which is permanently attached to the neck, but that neither the crown nor the collar is welded to the head. However, if found desirable, the outer edge of the crown could in some cases be welded or brazed to the head. Where a weld 8 is used for connecting the collar to the neck, the weld will not affect the strength of the head. This also is true of any other form of attachment at this point. The crown will protect the top of the head against denting by careless handling of the container or by bumping with a wrench while removing valve cap 11 or the valve.

In making such a pressure vessel the neck 3, if a separate member, is welded or brazed to the head 1 and then the cylinder is tested. After testing, the metal crown, which then is in the form of a flat perforated disk, is stamped with the serial number and other information applicable to that particular cylinder. The perforated disk then is pressed to provide it with the groove 12 and the rib 14 and to make it convex. The convexity of the annular disk is greater than that of the head so that when the crown is dropped over the neck, only its outer edge will engage the head, as shown in Fig. 4. The rib will be spaced from the head as well as from the neck. The threaded collar 7 then is set on the crown with its lower edge seated in the groove. Due to the rib being spaced from the head, the top of the collar will be above the top of the neck, and the lower surface of the top wall of the collar will be spaced from the bottom of the neck recess 6 a distance at least as great as that between the rib and head. The collar then is pressed down to spring the inner portion of the crown down, preferably until its rib engages the top of the head. At the same time the top wall of the collar will engage or substantially engage the bottom of the neck recess. While the collar is held in this position it is welded to the neck by circular weld 8, or is otherwise permanently attached to the neck, whereby the crown is held firmly and permanently in place against the head.

It will be seen that this invention makes it possible to test the cylinders before any permanent identifying data is applied to them. Consequently, if any cylinder fails it is unnecessary to go back and make a new cylinder to take its place and to carry the same serial number as the cylinder that failed. The unsatisfactory cylinder is merely discarded and its place is taken by the next cylinder in line, because the permanent identifying data is not applied to a cylinder until after it has passed its test. This saves a ma-

terial amount of time in the production of pressure vessels. The shape and inclination of the element bearing the stamped data is such that all essential data, including serial number, water capacity and tare weight, can be read from almost any position without turning the container to cause such data to face him. This is not possible with a small diameter part or where the part is sloped upward very much. With a separate data-carrying member, as disclosed herein, the data can be stamped into that member as deeply as desired without weakening the head of the cylinder.

The modified embodiment of the invention shown in Fig. 5 has the advantage over the one previously described of permanently joining the inner edge of the identification member 21 to the neck 22 of the cylinder head 23. In this case the opening through the center of the annular member is considerably smaller than the one in crown 13, so that the inner edge of the crown can extend into the lower part of a deep recess 24 encircling the upper end of the neck. The dished crown 21 is made in the same way as the one described above, by pressing a flat perforated disk to make it more sharply concave than the head and to provide it with a circular groove 26 in its top and a rib 27 on its bottom. However, the inner portion of the crown extends some distance inward from the groove, and upward. When the crown is dropped over the neck of the cylinder, only the outer edge of the crown will engage the head. The inner edge will project into the central portion of neck recess 24. An externally threaded collar 28 then is set in the crown groove and pressed down to spring the rib down toward the head. This will lower both collar and crown in the neck recess. While held in this position the inner edges of the collar and crown are permanently fastened to the neck, preferably by a braze or weld 29 that joins the adjoining surfaces into a single unit. Thus, the crown as well as the collar is welded to the neck, but neither need be welded to the head. If the threads on the collar become worn or rusted, the collar can be replaced by a new one without disturbing the crown, by merely chipping out or otherwise removing the upper part of weld 29 and then re-welding a new collar.

In the embodiment shown in Fig. 6 the collar 31 and annular identification member 32 are made in one piece, with the crown 32 projecting from the bottom of the collar like a flange. When this combined unit is first set down on the head, only the outer edge of the crown engages the head. The collar then is pressed downward to force the inner portion of the crown, where it joins the collar, against the head, or nearly so. The inner edge of the top wall of the collar is disposed in a recess 33 encircling the upper end of the neck 34 on the cylinder head 36, and is permanently held therein in any suitable manner, preferably by a braze or weld 37. This form of the invention has the advantage of a collar and identification member combined in one piece, so that only one part has to be handled and no provision has to be made for connecting the crown to the collar or neck.

The modification shown in Fig. 7 omits the recess around the top of the neck 41, as could be done in the other forms of the invention. The adjoining inner edges of the collar 42 and the crown 43 are welded to the side of the neck. This figure also shows that the crown rib 44 may be left spaced from the cylinder head 45.

5

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A pressure vessel comprising a cylinder having a convex head provided with a neck, a wide identification metal crown encircling the neck with its outer edge engaging the head, the upper surface of the crown being provided with identifying data stamped therein, the inner portion of the crown having a downwardly bent annular portion forming a groove in its top and a rib on its bottom, and an externally threaded collar encircling the neck and joined to the upper end of it, the bottom of the collar seating in said groove and pressing said rib toward the head.

2. A pressure vessel comprising a cylinder having a convex head provided with a neck, a wide identification metal crown encircling the base of the neck with its outer edge engaging the head, the inner portion of the crown having a downwardly bent annular portion forming a groove in its top and a rib on its bottom, all but said outer edge of the crown originally being spaced from the head, a collar encircling the neck and having an externally threaded side wall spaced therefrom and a top wall extending inward toward said neck, the upper end of the neck being encircled by a recess receiving the inner edge portion of said top wall, and a weld joining said inner edge portion to the neck, the bottom of said side wall seating in said groove and springing said rib down toward the head, and the upper surface of the crown around the collar having identifying data stamped therein.

3. A pressure vessel comprising a cylinder having a convex head provided with a neck, a wide identification metal crown encircling the neck with its outer edge engaging the head and its inner edge spaced from the head and secured to the neck, the crown having a downwardly bent annular portion between its edges forming a groove in its top and a rib on its bottom, and an externally threaded collar encircling the neck and joined to the upper end of it, the bottom

6

of the collar seating in said groove and pressing said rib toward the head, and the upper surface of the crown having identifying data stamped in it outside of the collar.

4. A pressure vessel comprising a cylinder having a convex head provided with a neck encircled at its upper end by a recess, a wide identification metal crown of greater convexity than the head encircling the neck with its inner edge disposed in the neck recess and its outer edge engaging the head, a collar encircling the neck and extending into said recess above the crown, the collar having an externally threaded side wall spaced from the neck with the bottom of said wall springing an annular portion of the crown toward the head to press the outer edge of the crown tightly against the head, and a weld in said recess joining the inner edges of the collar and crown to the neck, the upper surface of the crown having identifying data stamped therein around the collar.

5. A pressure vessel comprising a cylinder having a convex head provided with a neck, a wide identification metal crown of greater convexity than the head encircling the neck with its inner edge near the upper end of the neck and its outer edge engaging the head, a collar encircling the neck and having a top wall close to the neck above the crown, the collar having an externally threaded side wall spaced from the neck with the bottom of the side wall springing an annular portion of the crown toward the head to press the outer edge of the crown tightly against the head, and a weld joining the inner edge of the collar top wall to the neck, the upper surface of the crown having identifying data stamped therein around the collar.

CARL E. JOHNSON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,948,953	Wayer et al. -----	Feb. 27, 1934
1,948,966	Jaeger -----	Feb. 27, 1934
2,031,351	Rheem -----	Feb. 18, 1936
2,356,901	Wackman -----	Aug. 29, 1944
2 421 460	Merker et al. -----	June 3, 1947