Sept. 7, 1954 A. MANHARTSBERGER 2,688,428

STORED PRESSURE MEDIUM CONTAINER

Filed Jan. 19, 1950

Fig. 1.

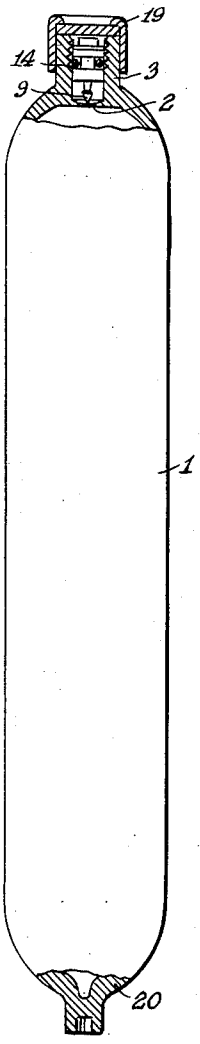


Fig. 2.

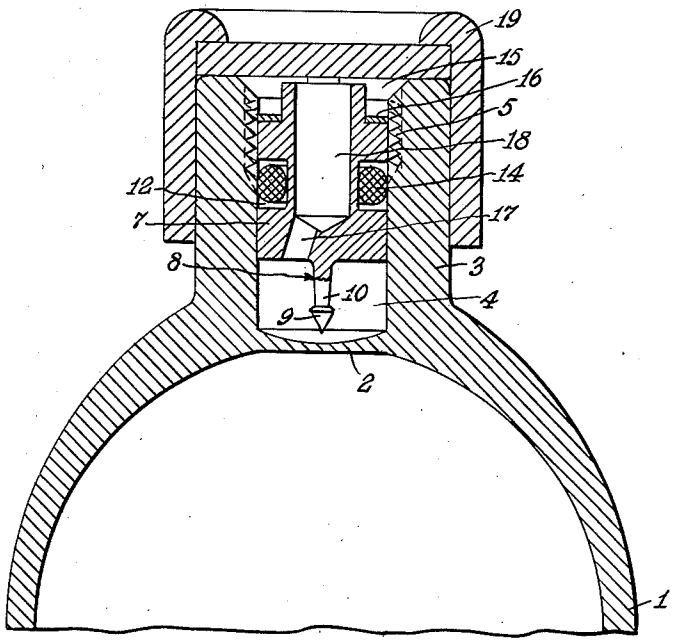
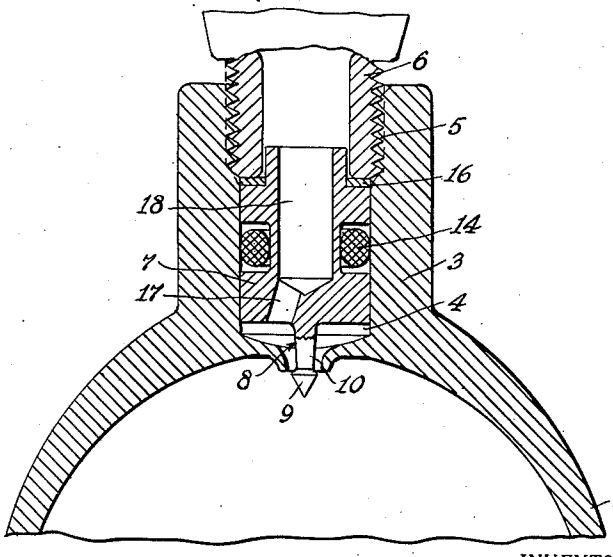


Fig. 3.



INVENTOR.
ALBERT MANHARTSBERGER
BY
Edward T. Connors
ATTORNEY.

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STORED PRESSURE MEDIUM CONTAINER

Albert Manhartsberger, Bloomfield, N. J., assignor, by mesne assignments, to Worcester Pressed Steel Company, Worcester, Mass., a corporation of Massachusetts

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4 Claims. (Cl. 226—20.6)

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The present invention relates to stored pressure fluid medium containers such as are used for pressurizing vessels, inflating tires or the like.

The containers are charged with an expansible fluid medium at a high pressure and are opened with self-contained puncturing means to release the pressure medium. Heretofore, such containers have been provided but because of their high cost have not been practical as "throwaway" units.

The present invention aims to provide an inexpensive stored pressure fluid medium container which is adapted to be discarded after being used.

Another object of the invention is to provide a stored pressure fluid medium container in a one-piece unit with a simple puncturing means incorporated therewith and adapted to be maintained in position after the puncturing operation has been completed.

Another object of the invention is to provide a stored pressure fluid medium container adaptable for use as a tire inflator.

Another object of the invention is to provide a stored pressure fluid medium container simple and economical in manufacture, efficient in operation and rugged in construction.

In accordance with the invention, the foregoing objects are accomplished by providing a one-piece container having a weakened portion of its wall surrounded by a well to provide an outlet and to enclose a puncturing member, the unit adapted to be threadedly engaged with a valve stem or threaded discharge pipe so that the puncturing member is automatically moved into position to open the container and release the stored fluid pressure medium.

The construction in accordance with the invention is advantageous in that a stored pressure medium container is provided which may be carried for long periods of time, such as in a motor vehicle, and is always available for instant use, the unit being discarded after being used.

Other objects and advantages of the invention will be apparent from the following description and from the accompanying drawing which shows, by way of example, an embodiment of the invention. For a better understanding of the invention, reference may be had to the attached drawing and to the following description of a device in accordance with the invention.

In the drawing:

Fig. 1 is a side view of a stored pressure fluid medium container in accordance with the invention. The ends have been shown as broken away to illustrate the positioning of the puncturing member at one end and the seal at the other end.

Fig. 2 is an enlarged fragmentary sectional view of the upper portion of the container including the puncturing member before the container has been punctured.

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Fig. 3 is a view corresponding to Fig. 2 but in which the container has been attached to a tire valve or other discharge means which has actuated the puncturing member into position to open the container.

Referring to the drawing, there is shown a stored pressure fluid medium container 1, in accordance with the invention, which may be made of steel or other suitable material able to withstand the pressure of the stored fluid medium. The container 1 may have any desired shape to suit the operating conditions under which it is to be used, a tubular form being illustrated.

The container 1 may be made by any suitable process and is formed with its upper end having a wall portion 2 of reduced thickness. As may be seen in Figure 2 of the drawing, the wall portion 2 has its puncturing area thinner at the center, gradually thickening out towards the edge or periphery and finally blending with a substantial radius into the main body of the container 1 of which the puncturable area or portion of reduced wall thickness 2 is an integral part. A much stronger and more satisfactory puncturable area is obtained which permits the use of a thinner or weaker center portion at the location where the piercing pin normally enters, thereby considerably reducing the necessary piercing force. In prior devices, in so far as is known, the puncturable areas have a uniform thickness, and if made too thin, have a tendency to fail on the periphery. The disclosed construction, by reason of its bridge-truss-like form eliminates the tendency to fail on the edge. About the reduced wall portion 2, the wall of the container is extended to form a neck 3 for an outlet well 4. The inner surface of the neck 3 is threaded as indicated at 5 to attach the container to a tire valve 6 or to any other threaded discharge means. The inner end of the outlet well 4 is smooth to slideably receive a guiding extension or skirt 7 of a puncturing member 8. In order to retain it in position after being operated, the puncturing member 8 is preferably made with an enlarged head 9 providing a reduced portion 10 between the enlarged head and the skirt 7. In order to prevent leakage past the skirt 7, packing means are provided including an annular gasket recess 12 formed about the wall of the skirt 7 and adapted to receive an O-ring gasket 14. The gasket recess 12 is made somewhat larger along the length of the skirt 7 than the diameter of the O-ring 14 and slightly less in depth than the diameter of the O-ring so as to deform the O-ring into a slightly flattened shape as illustrated to provide a better seal under pressure conditions.

The upper end of the guiding extension or skirt 7 is formed with a reduced end portion to provide a second recess 15 adapted to receive a semiflexible gasket ring 16 made of a tough mate-

rial comparatively thin and with outer and inner diameters of sizes so that the ring is frictionally retained in position between the wall of the recess 15 and the threaded portion 5 of the outlet 4. By reason of the frictional engagement of the O-ring gasket 14 and the flat gasket 16, the puncturing member is normally retained in position within the well 4 spaced from the thin wall 2.

In order to provide for the passage of fluid from the container after the thin wall section 2 has been punctured, the puncturing member skirt 7 is made with a fluid passage 17 extending through the lower end thereof to its hollow center portion 18 which is made of a diameter to receive a valve stem of a tire valve or the like. In order to protect the well end of the container against dirt or moisture, a cap member 19 is provided adapted to be frictionally retained in position by engagement over the outer wall of the neck 3. Preferably the cap 19 is made of waterproof material although for some uses a paper cap will suffice.

The container 1 may be filled and sealed at its lower end 20 in any suitable manner such as disclosed in Yejeski Patent No. 2,189,852, in which an apparatus is described for charging the container and closing the filling opening by working the material adjacent to form a closure.

In using the container 1, its outlet opening 4 is threadedly engaged with any suitable discharge means such as the tire valve 6, which moves inwardly against the flat washer 16 to urge the puncturing member skirt 7 inwardly so that the enlarged pointed head 9 of the puncturing member 8 penetrates the thin wall portion 2. The stored pressure fluid medium is released through the opening formed in the wall 2 and escapes past the reduced portion 10 of the puncturing member through the aperture 17 and into the discharge device, the O-ring gasket 14 and the flat gasket 16 providing a seal to prevent the escape of the pressure medium.

It is thus apparent that a stored pressure fluid medium container has been provided of economical construction which may be discarded after being used.

While the invention has been disclosed and illustrated with reference to a specific embodiment thereof, it will be understood that other embodiments may be resorted to without departing from the invention.

Therefore, the form of the invention as set out above should be considered as illustrative and not as limiting the scope of the following claims.

I claim:

1. A stored pressure fluid medium tire inflator container having a portion of its integral wall of decreased thickness for the easy puncturing thereof and adapted to be attached to a threaded tire valve stem, the integral wall of the container extended outwardly about the weakened portion to provide an outlet for the container, a puncturing member, and a guiding extension for the puncturing member slidable within the outlet, the puncturing member and the guiding extension forming a unitary assembly, and fluid passage means extending through the guiding extension, the inner surface of the outer end of the outlet threaded to engage with the tire valve stem, the inner surface of the inner end of the outlet providing a surface for the slidable engagement of the guiding extension for the puncturing member, the inward movement of the tire valve stem adapted to move the guiding extension to carry the puncturing member inwardly to puncture the wall of reduced thickness for the release of the stored pressure medium, whereby fluid is released from the container without an outward movement of the puncturing member.

2. A stored pressure fluid medium tire inflator container having a portion of its integral wall of decreased thickness for the easy puncturing thereof and adapted to be attached to a threaded tire valve stem, the integral wall of the container extended outwardly about the weakened portion to provide an outlet for the container, a puncturing member, a guiding extension for the puncturing member slidable within the outlet, the extension having an annular gasket recess thereabout, and an O-ring gasket in the recess, the inner surface of the outer end of the outlet threaded to engage with a tire valve stem, the inward movement of the tire valve stem adapted to move the guiding extension to carry the puncturing member inwardly to puncture the wall of reduced thickness to release the stored pressure medium.

3. A stored pressure fluid medium tire inflator container having a portion of its integral wall of decreased thickness for the easy puncturing thereof and adapted to be attached to a threaded tire valve stem, the integral wall of the container extended outwardly about the weakened portion to provide an outlet for the container, a puncturing member, a guiding extension for the puncturing member slidable within the outlet, the extension having an annular gasket recess thereabout, an O-ring gasket in the recess, the outer end of the extension recessed to form a second recess, and a semi-flexible ring in the second recess to frictionally hold the extension in position in the outlet, the inner surface of the outlet threaded to engage with the tire valve stem, the inward movement of the tire valve stem adapted to move the guiding extension to carry the puncturing member inwardly to puncture the wall of reduced thickness to release the stored pressure medium.

4. A stored pressure fluid medium tire inflator container having a portion of its integral wall of decreased thickness for the easy puncturing thereof, the integral wall of the container extended outwardly about the weakened portion to provide an outlet for the container, a puncturing member, a guiding extension of cylindrical shape for the puncturing member, an annular gasket recess about the extension, an O-ring in the annular gasket recess, the outer end of the extension recessed to form a second recess, and a semi-flexible ring in the second recess, the extension having a hollow center and having an aperture at its lower end, the outlet threaded to receive a threaded end of a tire valve stem, the semi-flexible ring adapted to engage with the threaded portion of the outlet to hold the extension in position.

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