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CONTAINER FOR CARBON DIOXIDE BLOCKS

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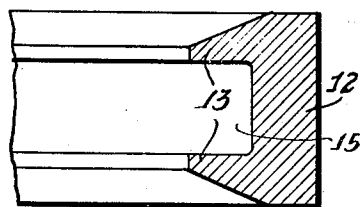
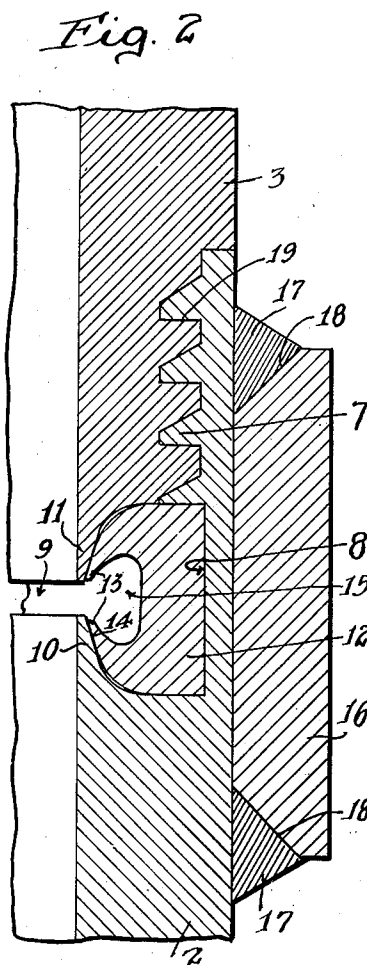
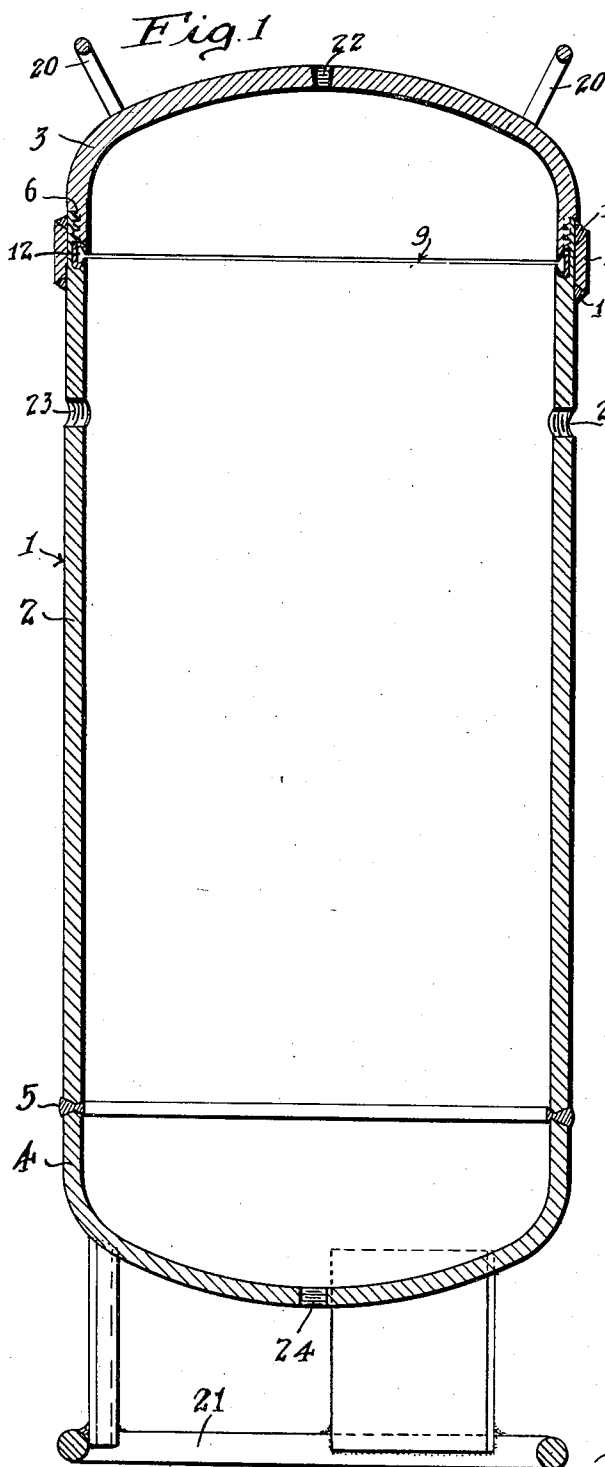


Fig. 3

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CONTAINER FOR CARBON DIOXIDE
BLOCKS

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3 Claims. (Cl. 220—3)

This invention relates to a container or holder for retaining a gas under high pressure, and the invention is particularly applicable in the construction of holders for blocks of solidified gas such as carbon dioxide popularly known as "dry ice."

It is the usual practice to construct holders for this purpose in the form of a closed shell with a head having a small charging opening for introducing the "dry ice"; the opening is usually closed by a cover seating on the inside against a gasket to prevent leakage. Hence these charging openings must be much smaller than the head and consequently it is usually necessary to break up the blocks of dry ice in order to pass the pieces down through the opening. As the internal pressure is very high, frequently reaching 1000 lbs. per square inch, there is a strong tendency for any cover to leak that is not held on its seat from the inside.

The general object of this invention is to provide a holder of this type that will present a charging opening of maximum diameter; that will be readily accessible and which has a closure which can be relied upon to prevent leakage even under the prevailing high internal pressures.

In the preferred embodiment of the invention, a thread connection is employed for securing the closure or cover in place, and one of the objects of the invention is to construct this connection in such a way that there will be no tendency for the force acting outwardly on the cover, to bulge the shell outwardly at this point.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combination of parts to be described hereinafter, all of which contribute to produce an efficient container for carbon dioxide blocks.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawing:

Figure 1 is a vertical section through a holder embodying the invention.

Fig. 2 is a fragmentary view, and is a vertical section on a larger scale taken through the wall of the holder at the junction between the body and the closure, and illustrating details of the preferred construction.

Fig. 3 is a cross-section broken away, through a gasket that I prefer to employ for insuring a gas-tight joint at the threads.

As illustrated in the drawing, the holder I com-

prises a body 2 and a closure 3, the body being preferably in the form of a thick cylindrical steel shell, and if desired, the lower end of the shell has a permanent head 4 that may be connected by a welded joint 5.

The closure 3 is removably secured to the body by any suitable means, but preferably by means of a thread connection 6, including internal threads 7 formed within the mouth of the shell.

In order to insure a gas-tight connection, I construct the holder with a relatively large packing groove 8 that is formed at the junction between the closure and the body, and this groove is undercut, that is to say on its inner side, toward the shell's axis, it presents a narrow slot 9 formed between lips 10 and 11 that project toward each other preferably located, and tapered, as shown. This packing groove 8 forms a very considerable annular cavity that substantially weakens the wall of the body. This is necessary, however, in order to enable a satisfactory packing ring or gasket 12 to be employed. The weakening of the wall is compensated for as will be described hereinafter.

The packing ring is of substantially channel form in cross-section, and preferably has the shape illustrated in Fig. 3, presenting tapered lips 13 so that when in place in the packing groove the lips 13 press themselves outwardly against the inner inclined faces 14 of the lips 10 and 11, terminating at the slot 9, and so that the gas pressure exerts itself in the pressure groove 15 of the packing ring to force the packing lips outwardly, also exerting a powerful force urging the packing ring to expand and forcibly fill the packing groove at all points.

In order to render it practicable to employ this relatively large packing groove 8 and packing ring 12, I provide a girth 16 consisting of a ring that encircles the shell opposite the groove. This girth may be shrunk on but is preferably an easy press-fit and secured by welds 17 set in channels between the skin of the shell and beveled faces 18 on the band.

If an ordinary V-thread were employed for connecting the cover, it is evident that the force due to the gas pressure would tend to push the cover 3 outward, and by reason of the inclined faces of the thread, a horizontal component force would be developed pressing radially outwardly at the thread and tending to expand the mouth of the body. Of course, the girth tends to prevent this, but I also prefer to meet this difficulty by employing a special thread preferably of substantially the form shown, in which the

inner face 19 of the thread 7 of the body, is in a plane substantially perpendicular to the longitudinal axis of the shell.

The use of the girth 16, increasing as it does, the thickness of metal outside of the threads of the body, makes it possible to locate the threads on a larger diameter, giving an increased area of metal in the horizontal cross-section of the cover at the threads. This is most desirable.

The heads 3 and 4 are preferably dished as shown, and the cover-head 3 should be provided with two handles 20 to facilitate attaching and removing it.

The cover should be provided with a tapped hole 22 for attaching a pet-cock that can be opened to indicate whether the internal pressure is low enough to permit the cover to be removed with safety. Other openings 23 and 24 are provided for other connections.

For convenience a supporting foot 21 can be welded on to the lower head, to support the holder in an upright position on the floor.

It will be evident that the holder described above presents a charging mouth of maximum diameter equal to the inside diameter of the body, enabling it to be charged with a large cube of the solidified gas, such as "dry ice"; and the construction is such that the holder will be gas-tight; at the same time, it can withstand the high internal pressures that may be developed on its interior.

It is understood that the embodiment of the invention described herein is only one of the many embodiments this invention may take, and I do not wish to be limited in the practice of the invention, nor in the claims, to the particular embodiment set forth.

What I claim is:

1. A gas-tight holder having a body consisting of a shell, a removable cover with means for securing the same to the body, said body and said cover having an undercut annular packing groove formed between the body and the cover adjacent the junction point thereof, and a channel-form packing ring of compressible material received in the said groove and having a substantially cy-

lindrical outer face seating against the back of the groove, said packing ring having a pressure groove on its inner face exposed to the gas pressure within the holder, said packing ring having projecting lips projecting toward the interior of the holder and pressed against the wall of the packing groove by the gas pressure.

2. A gas-tight holder having a body consisting of a shell, a removable cover having a thread connection with the body, said body and said cover having an undercut annular packing groove formed between the body and the cover adjacent the junction point thereof, and a packing ring of compressible material received in the said groove and having a pressure groove on its inner face exposed to the gas pressure within the holder, said packing ring having projecting lips pressed against the wall of the packing groove by the gas pressure, the threads in the body having inclined faces on the side toward the body of the closure and substantially horizontal faces on their other sides as viewed in section on a substantial radial plane, so that the force developed by the internal pressure is devoid of a horizontal component that would tend to enlarge the diameter of the body at its junction with the cover, the threads of the closure having inclined faces engaging the inclined faces of the threads on the holder.

3. A gas-tight holder having a body consisting of a shell, a removable cover with means for securing the same to the body, said body and said cover having an undercut annular packing groove formed between the body and the cover adjacent the junction point thereof, and a packing ring of compressible material received in the said groove and having a pressure groove on its inner face, facing the interior of the holder, and exposed to the gas pressure within the holder, said packing groove having inwardly projecting tapered lips, and said packing ring having inwardly projecting tapered lips overlying the tapered lips of the packing groove, and pressed against the same by the gas-pressure.

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