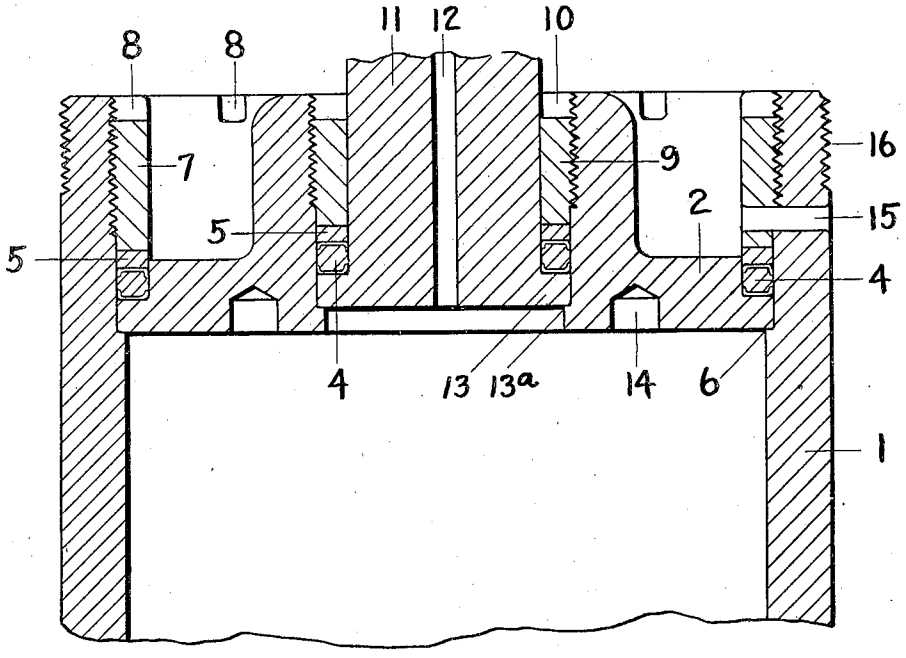
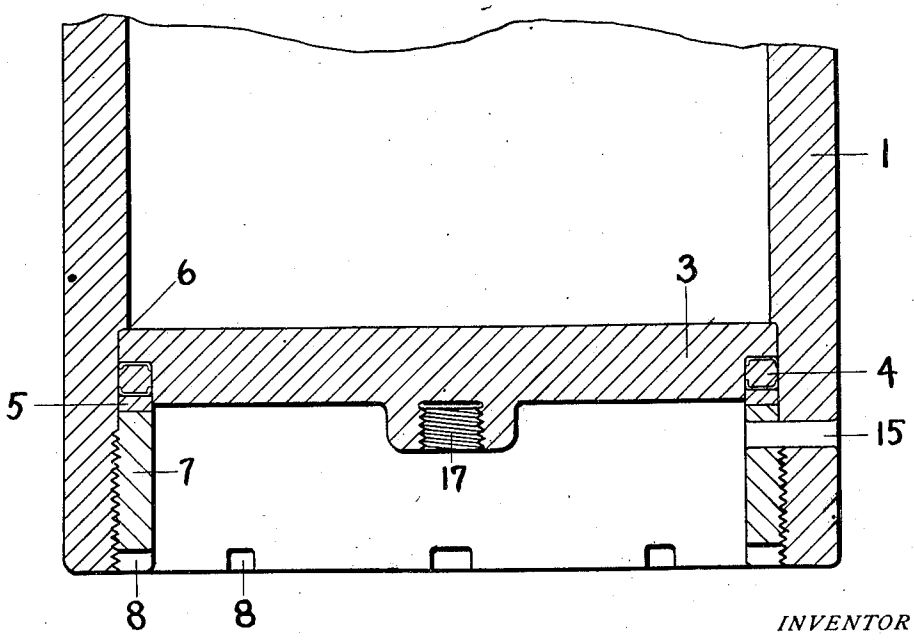
Oct. 22, 1929. B. P. JOYCE 1,732,235

CONTAINER FOR PRESSURE FLUIDS

Filed July 5, 1927





INVENTOR.

Bryan P. Joyce.

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UNITED STATES PATENT OFFICE

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CONTAINER FOR PRESSURE FLUIDS

Application filed July 5, 1927. Serial No. 203,514.

The subject of this invention is a container for pressure fluids.

The packing disclosed in my patents Nos. 1,635,482 and 1,651,131, issued July 12, 1927 and November 29, 1927, is preferably used in this invention. The principal object of this invention is to provide an all metal container for pressure fluids which is largely made of tubing instead of a forging, the advantages of this construction being,—

1. Containers are now constructed of forgings and very expensive equipment is required in their manufacture; the containers of the present invention require but ordinary equipment in their manufacture.

2. When manufactured from forgings, containers must be practically complete before they can be tested for strength and porosity, while the parts of the present invention may be tested in the rough.

3. The interior surface of the present container may be tinned or have some other suitable coating applied thereto, thereby correcting any slight porosity of the material as well as preventing deterioration through rust or attack of the container walls by the fluid contained therein.

4. My containers are made of high grade material with consequent saving in weight, thereby materially reducing shipping charges.

5. In some cases it is necessary that the fluid contained be dry; for example, the nitrogen for use in hydropneumatic recuperators for gun carriages. The containers made from forgings have but one small opening and as moisture accumulates in them through condensation it is very difficult to dry them. The head of the present container may be removed and the interior thoroughly dried and cleaned.

6. The present invention has the advantage that should any part be damaged either in manufacture or service, that part may be replaced.

Another object of my invention is to provide a sealed removable head for containers so constructed that the sealing effect is proportional to the fluid pressure within the container, and will increase as the pressure is increased.

To these and other ends, my invention consists in the construction, arrangement, and combination of elements, described hereinafter, and set out in the claims forming a part of this specification.

One embodiment of my invention is illustrated by way of example in the accompanying drawing, wherein:

Figure 1 is a longitudinal sectional view of a container constructed in accordance with the invention.

The container consists of a metal tube or cylinder, having its bore enlarged at each end to form shoulders, 6, against which the heads, 2 and 3, are seated. Each head is provided with an all metal packing ring, 4, preferably made of a broad ring of lead or similar soft metal, between two channel rings of copper or harder metal, as disclosed and claimed in my patents Nos. 1,635,482 and 1,651,131. Each head has its periphery cut away on its outer face to afford a seat for its adjacent packing ring. The heads and packing are secured in place by the ring, 7, threaded into the tube, 1, as shown. The ring, 7, is provided with spanner slots, 8, for assembly and may be locked in place by the pin, 15. The ring, 5, prevents distortion of the packing, 4, when the ring, 7, is screwed home.

The head, 3, may be provided with a central boss containing a tapped hole, 17, to be used in disassembling it.

Figure 1 shows a separable valve assembly consisting of the cylindrical piece, 11, having a flange, 13, which seats against an annular shoulder, 13^a, formed upon the head, 2, and is held in place by an externally threaded locking ring, 9, seated in the throat of the head, 2, and holding the packing ring, 4, and washer, 5, securely between the locking ring, 9, and flange, 13. A port or bore, 12, is provided in the piece, 11, in which any desired form of valve and valve seat may be secured or formed. Spanner slots, 10, may be provided in the ring, 9, to allow the use of a spanner wrench therewith and spanner holes, 14, may be provided in the head, 2, to assist in assembling and disassembling the piece, 11.

The tube, 1, is provided with the external

threads, 16, to receive the customary cap used to protect the valve when the container is in transit.

It may be seen that the parts are so arranged as to permit the pressure over the whole area of the heads or the valve to be transmitted to the packing, thereby forcing the soft lead in close contact at the joints to form an effective seal; the harder copper retaining rings preventing the flow of the lead under the pressure. It is understood that metals other than lead and copper may be used, these metals being disclosed as they have been found effective.

The discovery of this all metal packing made the present invention possible, for in this invention the life and effectiveness of the container is dependent upon the life and effectiveness of the packing used. This packing has been fully tested and holds gas under high pressures without leaking. As this packing is all metal, its life is as long as that of the other metal parts of the container.

In my invention the casing, 1, is preferably made of steel tubing, and the heads may be of any metal desired, such as drop forgings, cast steel or bronze, the packing allowing sufficient movement to compensate for any difference in coefficient of expansion between the metals. Should castings be used for the heads, any slight porosity of such castings may be corrected by coating their inner surfaces with tin or other suitable material. As this construction permits choice of material to be used in the heads, the fluid port and valve housing may be made integral with one of the heads.

In using my invention the heads are mounted in the ends of the cylinders and the locking rings, 7, are screwed home and may be tightened sufficiently to afford the desired initial pressure upon the packing rings, 4. The gas or other fluid is then fed into the cylinder through the port, 12, which may be then closed by any of the valves in common use, my invention not being limited to any particular form of valve.

As the pressure of the gas fed into the cylinder rises, it tends to drive the heads more tightly against the packing rings and to flatten the lead rings, thereby expanding them radially and increasing their sealing effect against the adjacent portions of the cylinders and heads.

The foregoing illustrates and describes a combination and arrangement of elements constituting the preferred embodiment of my invention, but it is obvious that many modifications thereof may be made without departing from the spirit of my invention.

I claim:

1. A container for fluids under pressure comprising a metallic cylinder having its bore enlarged at one end and a shoulder formed at the inner end of the bore, a head seatable upon the shoulder having its periphery cut away on the outer side, and forming an annular seat, a packing ring seated on said seat, said packing ring comprising a filler ring having a soft metal sealing surface restrained from escape by rings of harder metal, and means for locking the packing ring securely against the head.

2. A container for fluids under pressure comprising a metallic cylinder having its bore enlarged at one end and a shoulder formed at the inner end of the bore, a head seatable upon the shoulder having its periphery cut away on the outer side, and forming an annular seat, a packing ring seated on said seat, said packing ring comprising a lead filler ring restrained from escape at its sealing surfaces by rings of harder metal, and means for locking the packing ring securely against the head.

3. A container for fluids under pressure comprising a metallic cylinder having its bore enlarged at one end and a shoulder formed at the inner end of the bore, a head seatable upon the shoulder having its periphery cut away on the outer side, and forming an annular seat, a packing of soft metal restrained between two laterally cupped rings of relatively hard metal seated in said seat, and means for locking the packing ring securely against the head.

In testimony whereof he affixes his signature.

BRYAN P. JOYCE.