Aug. 24, 1926. 1,597,504

J. C. BARR

CONTAINER FOR GAS IMPREGNATED WITH RADIO ACTIVE EMANATIONS

Filed July 24, 1923

Fig. 1.

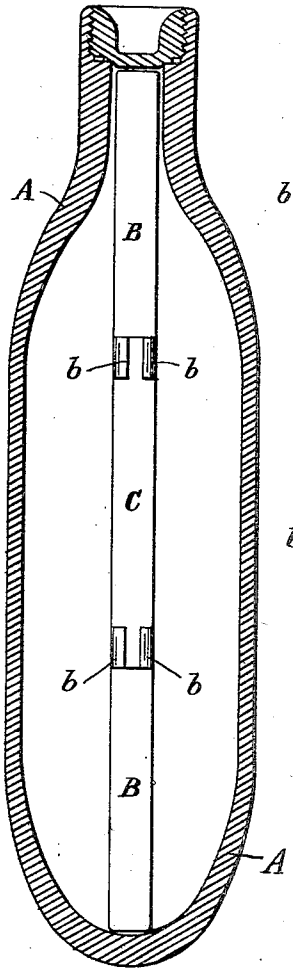


Fig. 2.

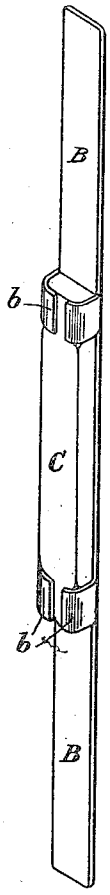
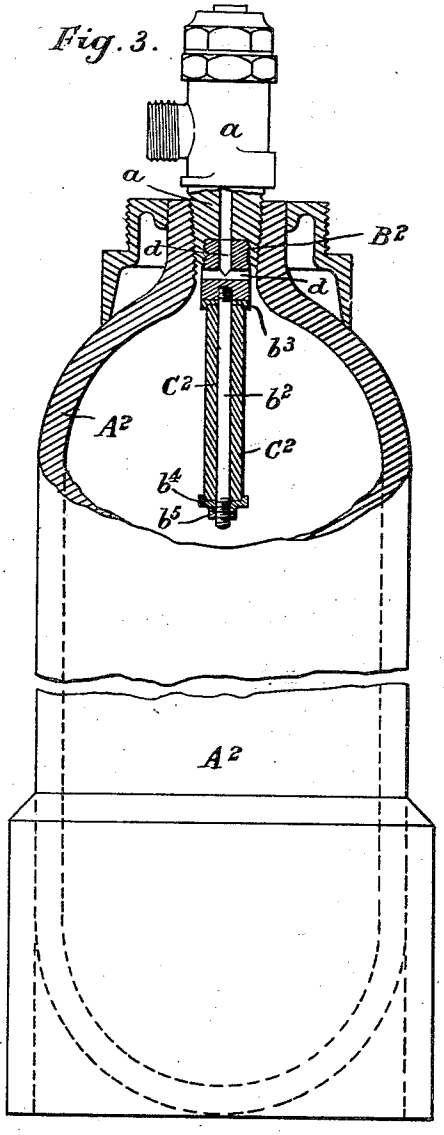


Fig. 3.



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Patented Aug. 24, 1926.

1,597,504

UNITED STATES PATENT OFFICE.

JAMES CRUIKSHANK BARR, OF GLASGOW, SCOTLAND, ASSIGNOR TO THE BRITISH OXYGEN COMPANY LIMITED, OF UPPER EDMONTON, MIDDLESEX, ENGLAND, A BRITISH COMPANY.

CONTAINER FOR GAS IMPREGNATED WITH RADIOACTIVE EMANATIONS.

Application filed July 24, 1923, Serial No. 653,614, and in Great Britain July 24, 1922.

This invention has for its object to utilize capsules, cylinders, or containers, such as are employed for containing compressed, or liquefied, gas in such manner that they can be employed for securing, and conserving, compressed, or liquefied, gas impregnated to a predetermined radio active value with emanations from radio-active substances and so that, when the said containers are opened to liberate the gas, the said gas will escape impregnated with the said emanations into the water, to be charged therewith, or for utilization in other required way. In the term "gas" in this specification and in the claims, I wish it to be understood that I include any suitable gas, or gaseous mixture.

According to this invention the said containers are provided with means whereby the radio-active substance can be retained in position therein in such manner that emanations therefrom will impregnate the compressed, or liquefied, gas and, when the container is opened (by perforation, or by opening a valve, for example) the gas impregnated with such emanations, will escape, for instance, into water, required for curative, or other purpose, whilst the radio-active substance will be retained in the container to impregnate with its emanations future charges of compressed, or liquefied, gas.

The radio-active substance employed may be of any suitable description, such, for example, as radium sulphate precipitated from radium bromide, or radium chloride.

The means by which the radio-active substance is retained in the container can be of any suitable kind; for example, the said substance can be inserted as a solid and be attached to the inside of the container by varnish, or applied as a paint, or it can be absorbed by some absorbent, such, for example, as filter-paper, asbestos, or fire-clay, which can be held by a clip, or holder, inside the container, or be attached to the valve of the container, (if a valved container be employed), or to a specially provided piece screwed into a hole in the side of the container, or in other equivalent way such that it will not be displaced when the container is opened, or be forced out by the escaping gas, or it may be employed in the condition of a solution which will pass along with the gas from the container into, for instance, liquid to be activated.

The accompanying drawing represents ways in which this invention may be performed, but it is to be understood that these are only examples, and that the invention is not limited to these examples.

Figure 1 is a sectional elevation, drawn to an enlarged scale, of a small container, or steel capsule having a neck at one end through which the capsule may be charged and discharged, such as those commonly known as "sparklets", shewing the application of this invention thereto, Figure 2 shews, separately, in perspective, the support for the material which carries the radio-active substance.

Figure 3 is an elevation, partly in section, shewing how this invention can be applied to a large container, or cylinder.

Referring first to the example shewn in Figures 1 and 2, before the capsule A is charged with compressed, or liquefied, gas and closed, as shewn, a strip of metal, or other suitable material, B, is inserted therein, the said strip carrying, at C, material which is impregnated with the radio-active substance. The said material may be layers of filter-paper, or other suitable absorbent material, treated, for example, with a solution of a suitable salt of radium, this, when dried, being treated so as to precipitate the salt as the insoluble radium sulphate.

The said absorbent material thus carrying the radio-active substance is connected to the strip B, in any suitable way, for instance, by confining the said material to the strip B, by wing-pieces *b* projecting from the strip and turned over, the material B, to hold it in position. The device thus arranged will remain in the capsule which can be charged with compressed, or liquefied, gas without removing the device, which can however be readily removed when desired for testing, or other purpose.

In the application of the invention to a cylinder as shewn in the example Figure 3, the valve-piece *a* of the cylinder A^2, has screwed into it a supporting piece B^2, perforated at *d*, for the passage of gas to and

from the cylinder when the valve in the valve-piece a is opened. Into the piece B^2 is screwed a rod b^2, upon which is placed a tubular piece of absorbent material C^2, such as filter-paper to which the radio-active substance is applied as aforesaid, or in other convenient way. The said tubular-piece C^2, is shewn as being held between cupped, or flanged, discs, b^3, b^4, these, and the tubular-piece C^2, being held in place by a screw-nut b^5. If the tubular piece C^2 be replaced by loose fibrous absorbent material it can be surrounded by a perforated, or reticulated, tube, but this is not necessary when the tubular piece is formed of filter-paper, or other absorbent material which is coherent.

I claim:—

1. Means for securing and impregnating a gas to a predetermined radio-active value comprising a capsule for the compressed gas, and a neck at one end of said capsule through which the capsule may be filled and emptied, in combination with removable carrier means arranged within the capsule, and radio-active material supported by said carrier.

2. Means for securing and impregnating a gas to a predetermined radio-active value comprising a capsule in which the compressed gas is confined, and radio-active material within the capsule serving to impregnate the compressed gas with its emanations.

3. Means for securing and impregnating a gas to a predetermined radio-active value comprising a sealed capsule for containing the gas under heavy pressure, said capsule being adapted to charge liquid in an associated container, and radio-active material within the capsule serving to impregnate the compressed gas with its emanations.

4. Means for securing and impregnating a gas to a predetermined radio-active value comprising a capsule for the compressed gas, and a neck at one end of said capsule, in combination with a carrier adapted for self-support within the capsule extending into the capsule neck, and radio-active material mounted on the carrier.

5. A method of charging liquid which comprises introducing into a measured quantity of the same a definite quantity of compressed gas impregnated to a predetermined radio-active value with the emanations of a radio-active substance.

In testimony whereof I have signed my name to this specification.

JAMES CRUIKSHANK BARR.