

March 6, 1928.

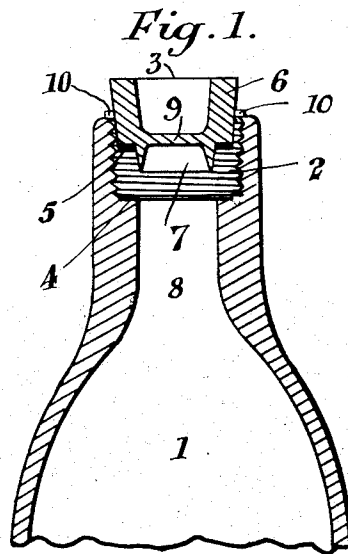
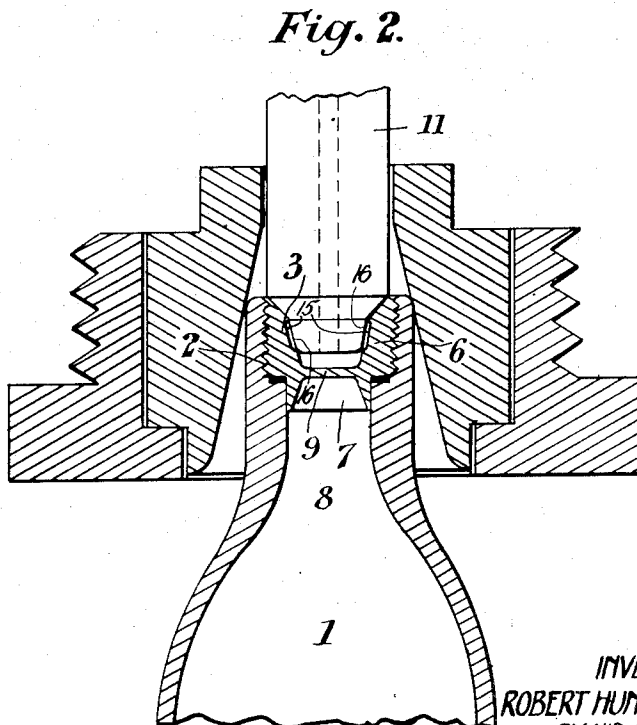
1,661,997

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CAPSULE OR CONTAINER FOR GASES OR LIQUIDS UNDER PRESSURE

Filed Jan. 15, 1926

2 Sheets-Sheet 1



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Fig. 3.

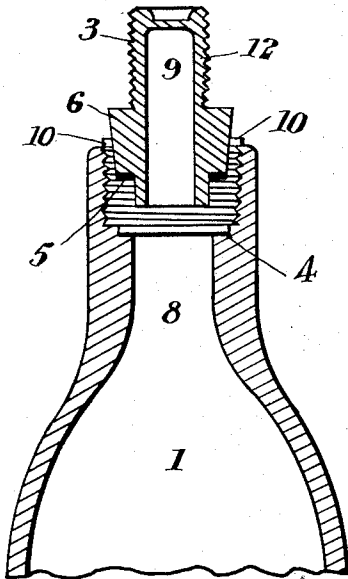


Fig. 5.

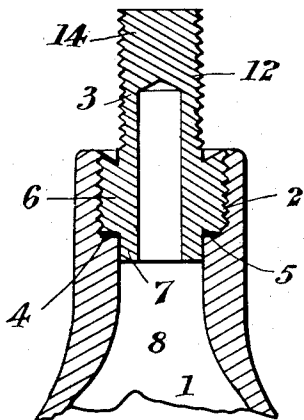
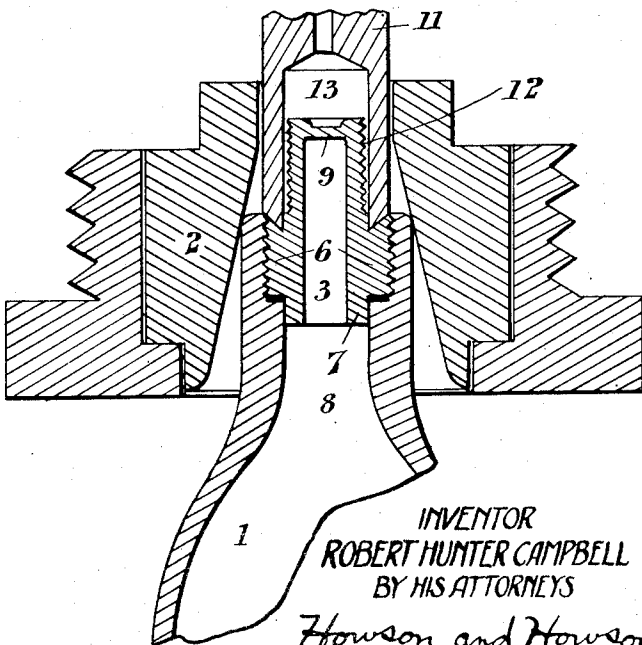


Fig. 4.



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UNITED STATES PATENT OFFICE.

ROBERT HUNTER CAMPBELL, OF LONDON, ENGLAND.

CAPSULE OR CONTAINER FOR GASES OR LIQUIDS UNDER PRESSURE.

Application filed January 15, 1926, Serial No. 81,511, and in Great Britain November 4, 1925.

This invention relates to capsules, or containers designed to confine fluids (gases, or liquids) under pressure and is a modification of, or improvement upon, the invention described and claimed in the specification of U. S. Letters Patent Number 1,387,451, granted me August 16th, 1921.

The neck of the capsule, or container, described and shown in the specification of the said Letters Patent is internally screw-threaded adjacent to the shoulder, or the like, against which sealing is effected by a device consisting of a closing element (such as a hard metal disc) and a plastic element (such as a ring of soft or plastic metal) which is pressed into the said screw-threaded part of the said neck and retains the said closing element in sealing position in the neck of the said capsule, or container; the said closing element and the said plastic element being two distinct and separate elements.

This invention has for its object to provide an improved and simplified closing device which is efficient in use and which can be easily and cheaply manufactured, and consists in the modified one-piece closing element, as hereinafter described, wherein the aforesaid closing element forms part of the plastic element and has a part which can be easily punctured, to liberate the gas, or liquid, when required, or a part which can be easily broken to effect the liberation of the said gas or liquid.

I will describe my invention with reference to the accompanying drawing in which Figure 1 shows, in section, one form of closing device in accordance with this invention in the position it occupies when the capsule, or container, is being charged with gas, or liquid, and Figure 2 shows, in section, the said device pressed into the internally screw-threaded neck of the said capsule, or container, to effect a gas tight closure. Figures 3 and 4 are similar sections to Figures 1 and 2 showing a modified form of closing device to that shown in the said Figures 1 and 2, and Figure 5 shows in section, a closing device for capsules, or containers, intended for use in apparatus such as described and claimed in the specification of my copending U. S. application, Serial Number 64,190, filed October 22, 1925.

In the several figures, 1 denotes the capsule, or container, 2 the internally screw-threaded part of the said capsule, or container into which the closing device 3 is

to be pressed and 4 the shoulder projecting inwardly to the base of the threading in the said neck constituting, through a packing ring, or washer, 5, the seat for the said closing device. In each of the modifications shown the closing device 3 consists of a closed hollow plug of soft, or plastic, metal having a part 6 of considerable thickness constituting the metal which is to be pressed into the screw-threaded part 2 of the neck of the said capsule or container. The thickened part 6 of the said closing plug is of a diameter slightly less than that of the internally-screw-threaded part 2 and it has, integral with its underside, a downwardly projecting annular or ring-like, part 7 adapted to enter the contracted portion 8 of the neck of the said capsule or container.

The hollow closing plug 3 shown in Figures 1 and 2 is closed by a diaphragm 9 (adjacent the junction of the thickened part 6 and the annular, or ring-like part 7) which is made relatively thin so that it can be easily punctured to liberate the gas, or liquid, in the capsule, or container 1 when required. In charging the capsule, or container, 1 the closing plug 3 is supported on the open end of the said capsule, or container, by lugs, or projections, 10 formed on the exterior of the thickened part 6 of the said closing plug which lugs, or projections, rest upon the top of the said capsule, or container, leaving sufficient space between the exterior of the said thickened part and the interior of the neck of the said capsule, or container, for the gas, or liquid, to be admitted from the charging machine in the usual manner. When the capsule, or container, has been charged to the desired pressure the closing plug 3 is pressed by a plunger 11 into the neck of the said capsule or container, and onto the seat 4 therein, and by the continued pressure of the said plunger the metal of the thickened part 6 of the said closing plug is caused to spread, flow, or squirt, outwards so as to enter and be firmly held in the internally crew-threaded part of the said neck and effect a tight closure of the said capsule, or container. When it is desired to liberate the gas or liquid, the diaphragm 9 is punctured by any suitable, or known, means. The plunger 11 may, as described in the before mentioned specification of U. S. Letters Patent Number 1,387,451, be provided with projecting feathers 15 which form longitudinal grooves

16 in the internal surface of the thickened part 6 of the closing plug as the said plunger is advanced, so that when it is desired to re-use the capsule, or container, it is only
5 required to hold the said capsule, or container, in a suitable appliance to prevent it turning, and to apply to it a spindle corresponding to a screw-driver and having a male end adapted to engage with the grooves
10 formed in the internal surface of the said thickened part of the closing plug. When the appliance is rotated in the direction to unscrew the whole closing plug will be easily removed and the capsule, or container,
15 will be ready for another closing plug, and re-use.

The hollow plug 3 shown in Figures 3 and 4 is similar to that shown in Figures 1 and 2 with the exception that it is provided with an
20 externally screw-threaded stem 12 extending from, and integral with, the upper side of the thickened part 6 of the said hollow plug, and this stem is closed, at, or towards, its upper end by a diaphragm 9 which, like the
25 diaphragm shown in Figures 1 and 2, can be easily punctured to liberate the gas, or liquid, when desired. The screw-stem 12 is provided to adapt it for use in apparatus where the end of the said capsule or container, can be screwed in to make a joint
30 on the top of the closing part. The hollow plug is supported on the top of the capsule, or container, 1 by the lugs, or projections 10 when the said capsule, or container, is
35 being charged and when charged the said hollow plug is pressed by the plunger 11 into the neck of the said capsule, or container, to effect a tight closure in the same manner as that already described with reference to
40 Figures 1 and 2, and therefore no further

description is necessary, but the lower end of the said plunger is hollowed at 13 to receive the said screw-threaded stem 12.

The closing plug 1 shown in Figure 5 is similar to that shown in Figures 3 and 4, 45 with the exception that the extending externally screw-threaded stem 12 is not adapted to be punctured, it being solid at its upper part as shown at 14. This type of closure is more especially intended for
50 use with capsules, or containers, applied to apparatus such as is described in the before mentioned specification of my copending U. S. application, Serial Number 64,190, filed October 22, 1925, wherein the liberation
55 of the gas, or liquid, is effected by breaking the said stem at a weak part, that is, the hollow part adjacent the said solid upper part 14 of the said stem 12. The charging of the capsule, or container, 1 and the method
60 and means for effecting a tight closure is precisely the same as that already described with reference to Figures 3 and 4 and therefore no further description is necessary.

What I claim is:—

05 For use with a container designed to confine fluids under pressure having an internally threaded neck with a shoulder projecting inwardly at the base of the threading, a one-piece closing element made wholly
70 of soft metal adapted to spread outward under pressure and effect a tight closure with the threaded neck and lugs upon said closing element adapted to support the same on the open end of the container when the latter
75 is being charged.

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

ROBERT HUNTER CAMPBELL.