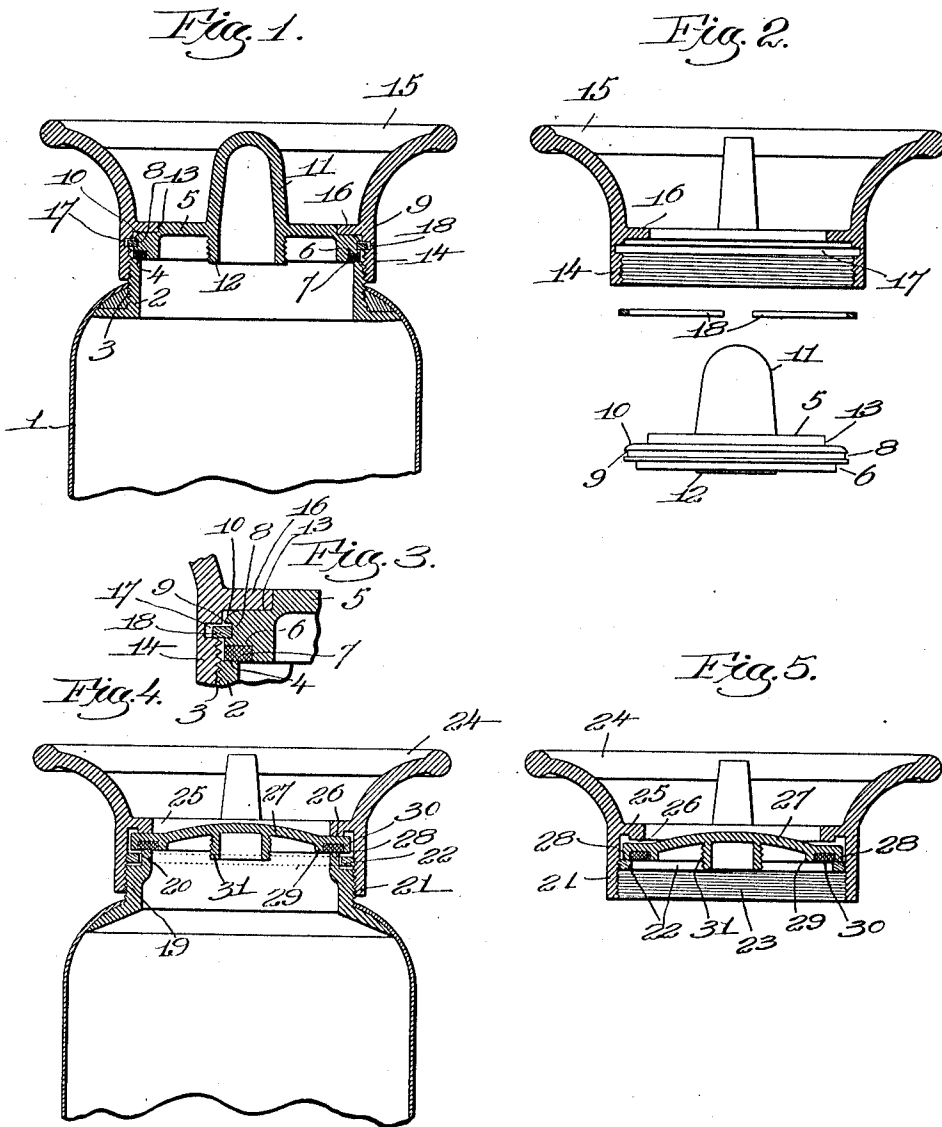


J. B. THOMAS.
FIRE EXTINGUISHER.
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Witnesses.

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UNITED STATES PATENT OFFICE.

JESSE B. THOMAS, OF BOSTON, MASSACHUSETTS.

FIRE-EXTINGUISHER.

1,019,859.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JESSE B. THOMAS, a citizen of the United States, and resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Fire-Extinguishers, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to that type of fire extinguishers wherein one of the chemical ingredients is contained within a cylindrical canister provided with a removable, fluid-tight closure, a receptacle for the other chemical ingredients being suspended within the canister.

My invention has special reference to the means for closing the canister, and it has for its object the production of simple, novel and efficient means for connecting the sealing member or cover permanently with an open or ring-like cap adapted for threaded engagement with the neck of the canister.

The coupling or connection between the cover and the cap is so constructed and arranged as to permit relative rotative movement of said parts and a limited axial movement of the one relative to the other, whereby when the cover is seated the requisite sealing pressure is exerted thereupon by a continued rotative movement of the cap. When the cap is turned backward to open the canister the pressure upon the cover is first relieved and as the cap lifts by continued rotation the connection between it and the cover serves to lift the cover from its seat on the canister. This arrangement obviates any rotative movement of the cover upon or against the usual packing ring or gasket, either when closing or opening the canister, and if for any reason the cover should bind, as by corrosion, deterioration of the packing, or otherwise, requiring some force to raise the cover it is provided by the rising movement of the cap when turned backward, acting through the permanent connection with a direct upward pull upon the cover.

The novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a vertical diametral section of the upper portion of a fire extinguisher

embodying one form of my present invention, the cover being shown in sealing position and held in place by the cap; Fig. 2 is a similar view of the cap and the coupling member, separated, with the cover adjacent thereto and shown in side elevation; Fig. 3 is an enlarged sectional detail of a part of Fig. 1; Fig. 4 is a view similar to Fig. 1, but showing a modified form of the coupling or permanent connection between the cover and cap; Fig. 5 is a vertical diametral section of the connected cover and cap removed from the canister.

Referring to Fig. 1 the metallic canister 1, of usual construction, has at its open upper end an upright annular neck 2 externally screw-threaded at 3 and forming at its upper end an annular lip 4.

A circular, imperforate metal plate 5 constitutes a cover for the canister, and as shown in Figs. 1 and 2 the underside of the cover has an annular seat 6, for a packing ring or gasket 7 of rubber or other suitable material, so located that when the cover is applied to the canister the lip 4 and packing ring 7 will contact with each other. The cover is provided with a peripheral groove 8, the top of which constitutes a peripheral flange 9, Figs. 2, and 3, and also shown in Fig. 1, for a purpose to be described, the edge of the cover adjacent said flange being beveled or transversely convexed, at 10. The cover has a central, hollow projection 11, Fig. 1, at its exterior, and on the underside of the cover is formed a threaded boss 12, which provides a convenient support for the depending cage (not shown) for the usual acid bottle. At its upper face the cover 5 is annularly recessed to form a seat 13. An annular cap 14 is internally threaded to screw onto the neck 2 of the canister, said cap having a circular rim 15 by means of which it can be screwed on or off the canister. The open-centered cap has an inverted annular extension 16 which enters freely the seat 13 of the cover when the parts are assembled, directly engaging the cover and forcing it downward to effect sealing engagement between the packing ring and the lip 4 when the cap 14 is screwed down, to thereby hermetically close and seal the canister.

As shown in Figs. 1, 2 and 3 the cap has an internal annular groove 17 so located that when the cap and cover are assembled

the grooves 8 and 17 will be opposite each other, and a split expansible metal ring 18 is seated loosely in the two grooves. This ring constitutes a coupling member to permanently connect the cap and cover, the normal internal diameter of the ring being less than the extreme diameter of the cover 5, and said ring is of less thickness than the width of either groove, to provide a clearance whereby a limited relative axial movement of the cap and cover is permitted.

In practice I prefer to make the coupling ring rectangular in cross-section, as shown, as thereby it presents two parallel plane faces opposite the parallel upper and lower faces of the grooves 8 and 17, and thus offers the greatest resistance to any axial pull tending to disconnect the cap and cover. To assemble said parts the coupling member 18 is first contracted and snapped into place in the cap groove 17, and then the cover 5 is inserted and moved axially until the bevel 10 engages the inner edge of and expands the ring as the cover is pressed toward the cap, the ring contracting as soon as the beveled flange 9 passes beyond the upper face of the ring. Said ring immediately contracts to normal diameter as it enters the cover groove 8, which occurs when the grooves 17 and 8 are brought opposite each other. When the parts are thus coupled or connected it is practically impossible to disconnect them without breaking one or both of said parts, yet they are freely rotative relatively and have some limited relative movement axially.

To close the canister the cap is screwed onto the neck 2 and the cover 5 revolves with it until the lip 4 and packing ring 7 are brought into engagement, stopping rotation of the cap causes the annulus 16 to press downward upon the external face of the cover, forcing the lip and packing ring into sealing engagement. This obviates any rubbing or grinding movement between the lip and the packing ring, as will be obvious.

When it is desired to open the canister the cap is turned backward, or unscrewed, it rising at the same time, and such axial movement soon brings the upper face of the coupling member 18 against the peripheral flange 9, whereupon a continued rotation of the cap will lift the cover 5 and disengage the packing ring and lip.

When the cap and cover are wholly detached from the canister they will remain coupled together, as will be obvious, in readiness to be again applied to said canister when desired.

The amount of clearance between the coupling member and the opposing walls of the grooves 17 and 8 determine the extent of relative axial movement between the cap and the cover, as will be manifest. By this per-

manent connection between said cap and cover the latter can be readily removed from the canister at any time, without the use of tools or extraneous appliances, for backward rotation of the cap exerts a direct and powerful lifting action, in an axial direction, upon the cover by or through the intervening coupling member.

In Figs. 4 and 5 I have shown a slight modification, the canister neck 19 having its upturned lip 20 reduced in diameter, leaving an annular clearance between the exterior of the lip and the internally threaded cap 21, for the reception of a coupling ring 22 which is externally threaded and screwed tightly into the cap to the extreme inner end of the threaded portion 23 thereof after the cover is positioned. Said cap is open centered, as before, with a circular rim 24, and it has an inturned annular portion 25 provided with a depending lip or bead 26, which is adapted to at times engage directly the external face of the imperforate cover 27. This cover has on its inner face an annular seat formed by a peripheral flange 28 and an inner concentric flange 29, the packing ring or gasket 30 being held in the seat in position to engage the lip 20 on the canister neck. A central depending and threaded boss 31 on the cover is adapted to sustain the bottle cage, not shown, and forming no part of this invention.

From an inspection of Figs. 4 and 5 it will be seen that the edge of the cover is loosely held between the lip or bead 26, at its exterior and the ring 22 at its interior, both the bead and the ring being on the cap 21 and such a distance apart that free rotative movement and a limited relative axial movement of the cap and cover will be permitted. The bead 26 acts upon the cover to force the packing ring and lip into sealing engagement when closing the canister, while the upper face of the ring 22 acts upon the peripheral flange 28 of the cover to lift the latter when the cover is turned backward. Thus in both embodiments of my invention the cap and cover are permanently and loosely connected, so that the cover can be lifted axially to disengage the packing ring and opposed lip, and when the cover is applied to close the canister said cover will be forced axially, but without rotative movement, into sealing position when the cover is screwed down upon the canister neck.

In the two forms of my invention illustrated herein the coupling or connecting means between the cap and the cover is wholly exterior to the hermetic seal or closure when the canister is closed, so that there cannot be any danger of corrosion or other damage by the contents of the extinguisher, whether the latter is in use or at rest.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a fire-extinguisher, a canister having
5 a neck, a cover having a peripheral flange,
an annular lip on one and an opposed annu-
lar seat on the other of said members, a
packing ring in the seat, to be engaged by
the lip, a cap cooperating with the neck and
10 adapted to engage directly the exterior face
of the cover and force the lip and packing
ring into sealing engagement, and an annu-
lar coupling member applied to and connec-
ted internally with the cap and having
15 its inner edge of less diameter than and ex-
tended loosely beneath the peripheral flange
of the cover, whereby the cap and cover are
connected permanently while relative rota-
tive and limited axial movements of said
20 parts are permitted.

2. In a fire-extinguisher, a canister having
a neck, a cover having a peripheral flange,
an annular lip on one and an opposed annu-
lar seat on the other of said members, a pack-
25 ing ring in the seat, to be engaged by the lip,
an open-centered cap adapted for threaded
engagement with the neck and to engage di-
rectly the external face of the cover, to force
the lip and packing ring into sealing en-
30 gagement, and an annular coupling member
rectangular in cross-section applied to and
connected internally with the cap and hav-
ing its inner edge of less diameter than and
extended loosely beneath the face of the
35 peripheral flange on the cover, whereby the
cap and cover are connected permanently
while relative rotative and limited axial
movements of said parts are permitted when
opening or closing the canister.

3. In a fire-extinguisher, a canister having
40 a neck, a cover having a peripheral groove,
an annular lip on one and an opposed an-
nular seat on the other of said members, a
packing ring in the seat, to be engaged by
the lip, a cap adapted for threaded engage-
45 ment with the neck and having an annular
portion to engage directly the external face
of the cover adjacent its periphery and force
the lip and packing ring into sealing en-
50 gagement, the cap having an internal annu-
lar groove below said cover-engaging por-
tion and opposite the groove in the cover,
and an expansible coupling ring seated
loosely in said groove and also seated
55 loosely in the peripheral groove of the cover,

to connect the cap and cover permanently
while permitting rotative and limited axial
movement of one of said parts relatively to
the other.

4. In a fire-extinguisher, a canister having 60
a neck, a cover having a peripheral flange,
an annular lip on one and an opposed an-
nular seat on the other of said members, a
packing ring in the seat, to be engaged by
the lip, said cover having a continuous 65
groove in its periphery and a beveled edge
above and adjacent the groove, a cap adapt-
ed for threaded engagement with the neck
and having an inturned annular portion to
project over and engage directly the exter- 70
nal face of the cover and force the lip and
packing ring into sealing engagement, said
cap having an internal annular groove be-
low said inturned annular portion thereof
and opposite the groove in the cover, and a 75
split, expansible coupling ring seated loosely
in said grooves, to connect the cap and
cover permanently, the beveled edge of the
cover passing through and temporarily ex-
panding the ring until the grooves of the 80
cover and cap are opposed to each other
when said parts are assembled, contraction
of the ring thereupon to normal diameter
causing it to cooperate simultaneously and
loosely with the grooved parts of the cap 85
and cover, the thickness of the ring being
less than the width of the grooves, to per-
mit a limited relative movement of said cap
and cover axially.

5. In a fire-extinguisher, a canister having 90
a neck, a cover, cooperating sealing means
on the cover and neck, respectively, an annu-
lar cap adapted for threaded engagement
with the neck and having an annular por-
tion in direct engagement with the exterior 95
of the cover, the annular cap receiving
loosely the periphery of the cover, opposed
annular grooves in the latter and the cap,
respectively, and a radially expansible cou-
pling member seated loosely in the grooves 100
to permanently connect the cap and cover
while permitting relative rotative and
limited axial movements of said parts.

In testimony whereof, I have signed my
name to this specification, in the presence of 105
two subscribing witnesses.

JESSE B. THOMAS.

Witnesses:

JOHN C. EDWARDS,
THOMAS J. DRUMMOND.