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PYROTECHNIC-OPERATED FIRE EXTINGUISHER

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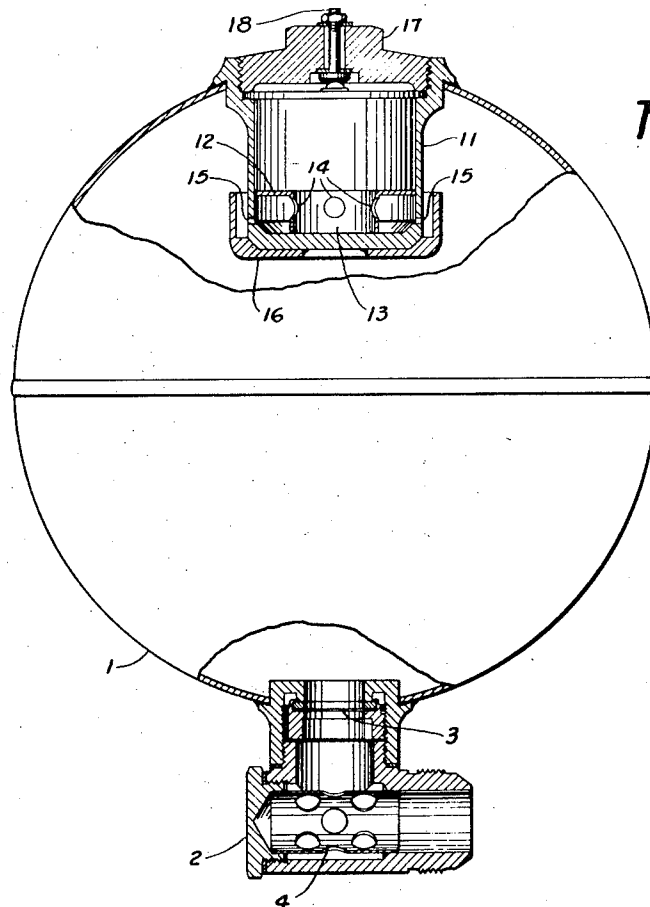
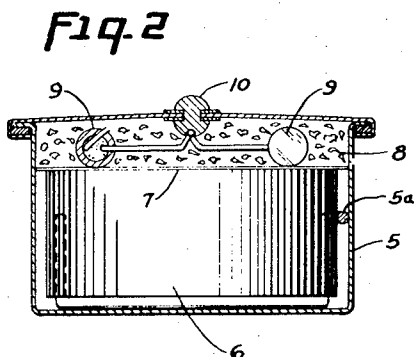


Fig. 1



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PYROTECHNIC-OPERATED FIRE
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8 Claims. (Cl. 169-26)

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This invention relates to fire extinguishers of the kind in which a liquid extinguishing medium, such as methyl bromide, is expelled from its container by gas evolved from the burning of a so-called powder grain.

The general object of the invention is an extinguisher of this type which is reliable in operation, of simple construction, and so organized as to apply the evolved gas effectively to discharge the extinguishing medium.

The invention will be readily understood from the following description of the preferred embodiment illustrated in the accompanying drawings, of which:

Fig. 1 is a partially sectioned elevation of the extinguisher; and

Fig. 2 is a partially sectioned detail of the pyrotechnic charge unit.

In this preferred embodiment, the extinguisher comprises a spherical container 1 for the liquid, having a bottom outlet shown as consisting of an elbow fitting 2, the vertical bore of which is normally closed by a diaphragm 3. As will be understood, this diaphragm is designed to be ruptured by the internal pressure upon ignition of the powder grain, the ruptured portion being blocked from passing beyond the neck portion of the fitting 2 and into the discharge line by the perforated sleeve 4.

The pyrotechnic charge is mounted in the upper part of the container. As shown in Fig. 2, it consists of a hermetically sealed container 5, proof against deterioration, comprising a powder grain 6 and, above it and separated from it by a screen 7, an igniter charge 8 of black powder. Two electric squibs 9 are inserted in the latter charge to ignite it. A contact 10 is sealed in the cover of the unit. The element 5a is a so-called grid, comprising a piece of wire which serves to locate the powder grain 6 and space it slightly from the bottom of container 5, to facilitate burning of the grain from both ends rather than from the top only and thereby increase the rate of gas generation. The pressure developed within the charge container 5 is sufficient to rupture part of the bottom wall over an unsupported area, as below described.

Seated in an opening in the upper part of liquid container 1 and secured in place, as by welding, is an open-topped container cup 11 in which the pyrotechnic unit is supported. The unit is mounted with clearance between at least one of its walls and the container cup, as by supporting it on a floor member 12. The latter has a central opening around which is a depending flange 13

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having large openings 14 opening into the annular space surrounding the flange. Thus, the central portion of the bottom of the charge container 5 is unsupported; and it is this area which bursts through when the charge is set off. The ruptured or sheared-out portion of the bottom wall of container 5 moves down into the space within flange 13, with no substantial obstructing of discharge openings 14.

The container cup 11 is provided with a series of restricted metering orifices which open into the interior of liquid container 1 and which serve to restrain and thereby prolong the gas discharge. As shown, these small metering orifices, marked 15, are located in the lower part of the side wall of container cup 11. It has been found that, by discharging the gases evolved from the pyrotechnic unit into the annular space surrounding flange 13 and thence through the metering orifices, much of the flame temperature of the burning powder is dissipated and that the metering orifices are thereby protected against burning.

Supported in the liquid container is a baffle 16 which serves to intercept the discharge from the metering orifices and prevent the jets of gas from directly striking the spherical wall of the liquid container and tending to sweep around such wall toward the bottom outlet, rather than, as desired, serving as a gas piston acting on the surface of the liquid. In the illustrated extinguisher, this baffle is in the form of a cup 16 telescoped up over the bottom of the charge cup 11 and secured to it, as by welding. The wall of cup 16 is spaced from but extends up over the metering orifices, so that the velocity of the gas jets striking the baffle is reduced and the gas diverted upwardly toward the top of the liquid container.

Lastly, it will be noted that container cup 11 is adapted to be closed and the charge unit sealed in place, by a screw stopper 17, through which passes a binding post 18 for engagement with contact 10 on the charge unit.

In the light of the foregoing description, which will be understood to be illustrative, the following is claimed:

1. A container for fire-extinguishing liquid, having a rupturable diaphragm closure at its lower end; an open topped, pyrotechnic container cup seated in an aperture in the container wall at its upper end and depending into the container, said cup having radially directed metering orifices spaced around the lower part of its side wall; a charge-supporting floor member in

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the container cup having a central opening and, around the opening, a depending flange spacing the floor member above the said metering orifices and forming an annular chamber within the said lower part of the container cup, said flange having openings of greater area than the said metering orifices; a baffle cup secured to the outside of the bottom of the container cup, with its side wall outwardly spaced from and extending upwardly beyond the said metering orifices; a sealed, pyrotechnic charge container seated in the container cup on said floor member, said charge container having a rupturable bottom wall; and a closure cap for the open top of the container cup.

2. A container for fire-extinguishing liquid, having a rupturable diaphragm closure at its lower end; a pyrotechnic container cup mounted on the container wall at its upper end, said cup having radially directed metering orifices spaced around the lower part of its side wall and opening into the container; a charge supporting floor member in the container cup having a central opening and, around the opening, a depending, apertured flange spacing the floor member above the said metering orifices and forming an annular chamber within the said lower part of the container cup; a baffle wall surrounding the container cup in the line of discharge from the metering orifices; a sealed pyrotechnic charge container seated in the charge cup on said floor member, said container having a rupturable bottom wall; and a closure cap for the container cup.

3. A container for fire-extinguishing liquid, having a discharge outlet at its lower end; a pyrotechnic container cup mounted on the container at its upper end; a charge supporting floor member in the cup having an opening there-through and, between the opening and the cup wall, a depending, apertured flange spacing the floor member above the bottom of the said cup; the pyrotechnic container cup wall having gas metering orifices opening into the container from the space between the cup wall and the apertured flange; a baffle supported within the container, spaced from but in the line of discharge from said metering orifices; a sealed pyrotechnic charge container seated in the charge cup on said floor member, said container having a rupturable bottom wall; and a closure cap for the container cup.

4. A container for fire-extinguishing liquid, having a discharge outlet at its lower end; a pyrotechnic container cup mounted on the container at its upper end; a charge supporting floor member in the cup having an opening there-through, said floor member being spaced above the bottom of the said cup; the pyrotechnic container cup wall having laterally directed gas metering orifices opening into the container from the space beneath the floor member; a baffle supported within the container, spaced

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from but in the line of discharge from the said metering orifices; a sealed pyrotechnic charge container seated in the charge cup on said floor member; and a closure cap for the container cup.

5. A container for fire-extinguishing liquid, having a discharge outlet at its lower end; a pyrotechnic container cup mounted on the container at its upper end, said cup having gas metering orifices through its wall and opening into the container; a baffle supported within the container, spaced from but in the line of discharge from the metering orifices; a rupturable, sealed pyrotechnic charge container seated in the container cup; and a closure cap for the container cup.

6. A container for fire-extinguishing liquid, having a discharge outlet at its lower end; a pyrotechnic container cup mounted on the container at its upper end; a charge supporting floor member in the cup having an opening there-through and, between the opening and the cup wall, a depending, apertured flange spacing the floor member above the bottom of the said cup; the pyrotechnic container cup wall having gas metering orifices opening into the container from the space between the cup wall and the apertured flange; a sealed pyrotechnic charge container seated in the charge cup on said floor member, said container having a rupturable bottom wall; and a closure cap for the container cup.

7. A container for fire-extinguishing liquid, having a discharge outlet at its lower end; a pyrotechnic container cup mounted on the container at its upper end and incorporating a charge supporting floor member having an opening therein, a depending wall portion encircling said opening and having laterally directed gas discharge openings therein; and a sealed pyrotechnic charge container seated in the charge cup on said floor member, said container having a rupturable bottom wall.

8. A container for fire-extinguishing liquid, having a discharge outlet at its lower end; a pyrotechnic container cup mounted on the container at its upper end; outwardly and upwardly directed gas discharge ducts leading from the interior of the said cup to the interior of the container; and a rupturable pyrotechnic charge container seated in the charge cup, a wall of the cup having an opening therein to define a rupture area for the charge container.

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