

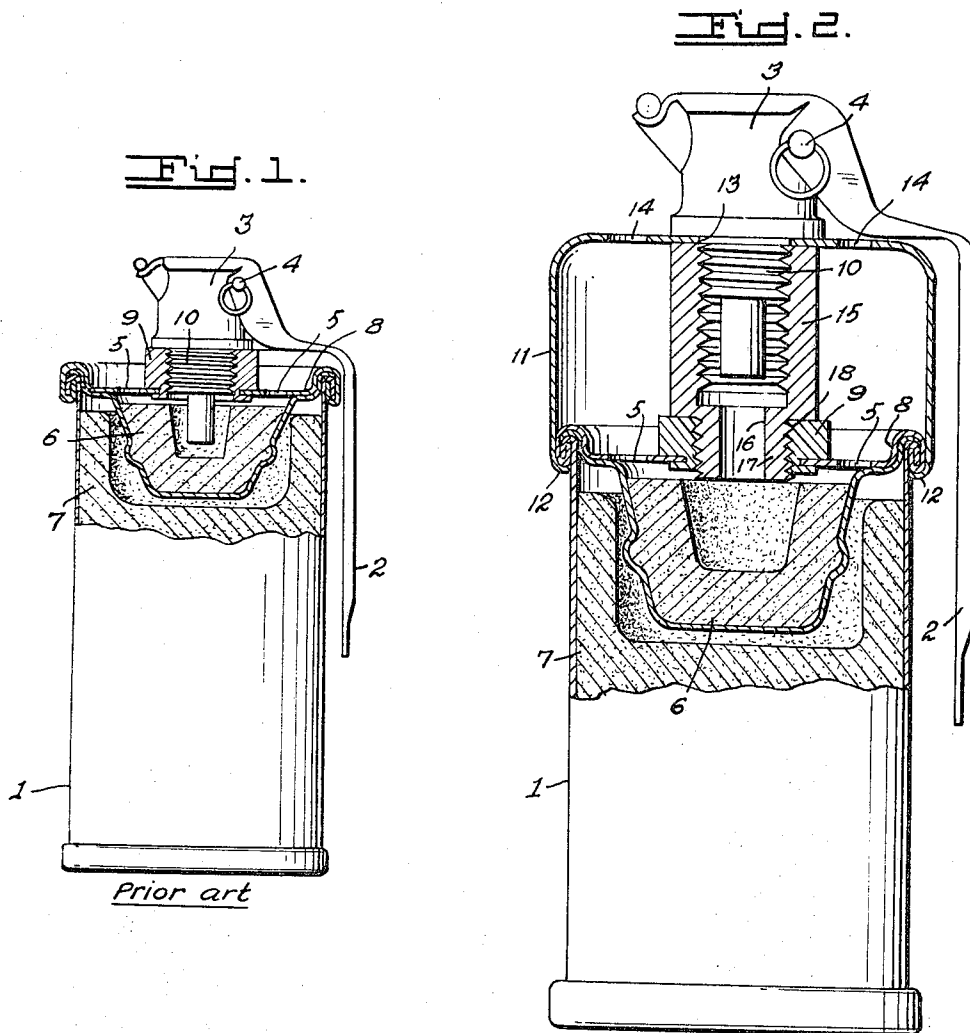
March 12, 1968

J. E. FOSTER

3,372,641

PRESSURE RETENTION CHAMBER FOR SMOKE MARKER GRENADE

Filed Oct. 19, 1966



INVENTOR,
John E. Foster

BY: Harry M. Saragovitz,
Edward J. Kelly &
Herbert Berl ATTORNEYS.

1

3,372,641

PRESSURE RETENTION CHAMBER FOR SMOKE MARKER GRENADE

John Edward Foster, Timonium, Md., assignor, by mesne assignments, to the United States of America as represented by the Secretary of the Army
Filed Oct. 19, 1966, Ser. No. 588,676
3 Claims. (Cl. 102—65)

ABSTRACT OF THE DISCLOSURE

A pressure retention chamber fixed to the top of a smoke marker grenade which provides a larger volume with the canister of the grenade when the cover is ruptured due to impact and thereby reduces the pressure, yet retaining sufficient pressure to enable normal burning of the smoke mix in the canister.

This invention relates to an impact resistant smoke marker grenade and more particularly to a pressure-retention chamber to be added to existing smoke hand grenades to enable them to be dropped from low flying aircraft.

Generally, smoke hand grenades currently used consist of a conventional sheet metal canister containing a smoke mix, a first fire material and a fuze assembly.

The fuze assembly is activated by removal of a safety pin which releases a retention handle which, when the grenade is thrown, is ejected and a firing pin, which is spring-loaded, ignites the highly flammable first fire material. This, in turn, ignites the smoke mix.

Vent holes in the top of the canister permit escape of combustion gases to maintain necessary pressure within the canister.

The aforesaid grenade has a disadvantage in that when dropped from a height of approximately one hundred feet or more onto a solid surface, such as concrete, etc., the burning smoke mix has a tendency to be dislodged from the remainder of the material upon impact with the surface. This results in detonation of the smoke mix which causes blow-out of the top of the canister and loss of pressure necessary to continue normal burning of the smoke mix.

This disadvantage is eliminated by the present invention by provision of a pressure retention chamber to be added to the existing smoke hand grenade. This chamber sustains sufficient pressure within the canister to prevent detonation, and/or extinction of, the burning smoke mix when the grenade is subjected to severe physical shock and gives it capability of being launched from low flying aircraft.

It is, therefore, a primary object of this invention to provide a means for the prevention of the detonation of, and/or extinction of, the smoke mix in a smoke hand grenade when the grenade is subjected to a severe physical shock.

Another object is to provide a cup shaped, vented, pressure retention chamber to the top of a conventional smoke hand grenade to sustain normal burning of a smoke mix therein.

A further object is to convert a conventional hand smoke grenade for use in dropping from low flying aircraft at a very small increase in cost.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in connection with the annexed drawing, in which:

FIGURE 1 is a side elevational view, partly in section of a conventional smoke hand grenade; and,

2

FIGURE 2 is a similar view on a larger scale, but illustrating the pressure retention chamber as applied thereon.

Referring in detail to the drawing, there is illustrated in FIGURE 1 (labeled "prior art") a conventional type smoke marker hand grenade. This grenade consists of a canister 1 containing a smoke mix 7, a cover 8, for closing canister 1, a series of vent holes 5 in cover 8, a first fire material 6 carried by cover 8, a supporting member fixed on cover 8 and a fuze assembly 3 detachably secured to supporting member 9 by threads 10, there being also shown the usual retention handle 2 and a safety pin 4 therefor.

The grenade shown in FIGURE 1 is activated in the classic manner of hand grenades and is as follows: safety pin 4 is pulled out to release retention handle 2 which is then ejected by a spring (not shown). This releases a spring-loaded firing pin (not shown) in the fuze assembly 3 to ignite the first fire material 6 which, in turn, ignites smoke mix 7. Combustion gas pressure is relieved through holes 5.

The pressure retention chamber of the invention is illustrated in FIGURE 2 and the original parts of the grenade are indicated by the same reference characters as in FIGURE 1.

The pressure retention chamber is indicated by 11 and is substantially cup shaped as shown. It may be attached to canister 1 by crimping its edge over the cover 8 as at 12, or by any other means desired.

Chamber 11 is provided with a central opening 13 and vent holes 14.

An internally threaded tubular spacer 15, having a flash passage 16 is provided with a reduced end portion 17 which is externally threaded as at 18. This spacer 15 is threadably mounted in the internally threaded supporting member 9 as shown.

Fuze assembly 3 is threaded into the internally threaded spacer 15 as illustrated in FIGURE 2.

Cover 8 now becomes the "inner cover" since cup shaped retainer 11 is the outer cover.

The operation of the grenade in FIGURE 2 is exactly the same as the one in FIGURE 1 and has been described before. However, when the detonation of smoke mix 7 which occurs when it is loosened by the impact of the grenade with a surface, it ruptures the "inner cover 8" and a single chamber is formed by the canister 1 at one end and the pressure retention chamber 11 at the other.

The increased volume encompassed by the pressure retention chamber 11 is sufficient to reduce the pressure caused by the post-impact detonation to a point below that at which it would become ruptured. The increased volume is small enough to retain sufficient pressure to enable continued burning of smoke mix 7, with venting of the smoke through vent holes 14 in pressure chamber 11. The last named holes are similar in size and number to the vent holes 5 of the conventional grenade, shown in FIGURE 1.

Thus, sufficient internal pressure for normal operation after the effects of the post impact detonation have subsided is maintained within the canister 1.

Subsequent burning and smoke emission takes place in the normal fashion, with smoke passing through vent holes 14.

It is possible with the improved grenade of this invention to provide a continuous smoke screen by launching sufficient quantities of grenades from low flying aircraft, not heretofore feasible.

While only a preferred form of the invention is shown and described, other forms of the invention are contemplated.

plated and numerous changes and modifications may be made therein without departing from the spirit of the invention as set forth in the appended claims.

What is claimed is:

1. In combination with a smoke marker grenade including a canister containing a smoke mix, a first fire material supported in said canister above said smoke mix a vented inner cover closing said canister, a supporting member carried by said inner cover and a fuze assembly detachably secured to said supporting member; pressure retention means fixed to the top of said canister and comprising a cup shaped outer cover fixed to the top of said canister, there being a central opening for receiving said fuze assembly therein and a series of vent holes surrounding said central opening, and a spacing member fixed at one of its ends to said fuze assembly and at its other end to said supporting member for spacing said fuze assembly relative to said first fire material and whereby an annular chamber is formed over said inner cover, said chamber, upon rupture of said inner cover to form a single area with said canister to increase combustion volume therewith and reduce combustion pressure sufficiently to enable normal burning of said smoke mix.

2. A device as set forth in claim wherein said spacing

member comprises an elongated tubular body having an internally threaded bore for threadably receiving said fuze assembly therein, an axially aligned flash passage and a reduced externally threaded portion for threadable engagement in said supporting member.

3. A device as set forth in claim 1 wherein said outer cover is similarly vented as said inner cover.

References Cited

UNITED STATES PATENTS

2,042,461	6/1936	Gibson et al.	102—65
2,094,561	9/1937	Lowy	102—65
2,328,916	9/1943	LeComte	102—65
2,340,329	2/1944	King	102—65
2,396,064	3/1946	Van Karner	102—65
2,959,127	11/1960	Weinert	102—65
3,081,702	3/1963	Klostermann et al. ..	102—65 X

BENJAMIN A. BORCHELT, *Primary Examiner.*

SAMUEL W. ENGLE, *Examiner.*

W. KUJAWA, *Assistant Examiner.*