March 8, 1927. 1,620,475

R. B. LAWRENCE

HAND GRENADE

Filed March 7, 1924

Fig. 2.

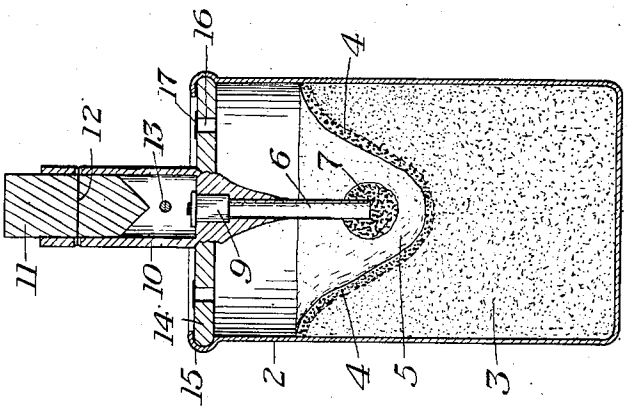
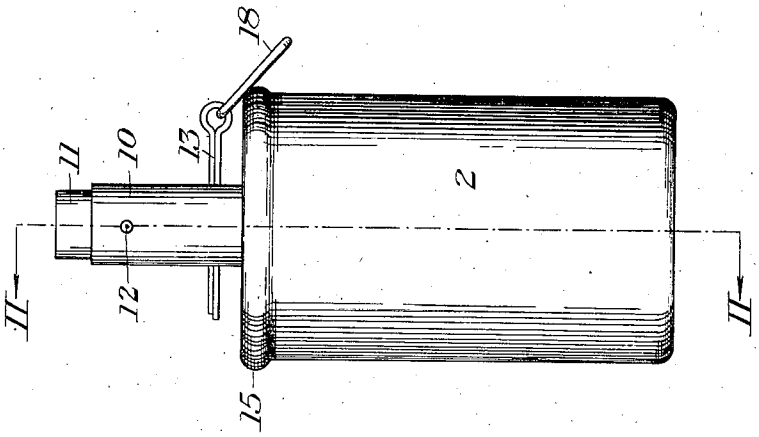


Fig. 1.



INVENTOR

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UNITED STATES PATENT OFFICE.

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HAND GRENADE.

Application filed March 7, 1924. Serial No. 697,495.

This invention relates to hand grenades and is particularly directed toward a gas-emitting grenade for the production of a smoke, a lachrymatory or sternutatory gas or the like, or a lethal gas.

I provide a grenade comprising a container having a solidified mass of ignitible material therein adapted to emit gas upon ignition. I have found that for most purposes such a grenade is far superior to one wherein the gas is produced from a liquid which must be gasified by explosion. A grenade wherein the material is in solidified form does not tend toward deterioration as do certain other types and it is exceedingly convenient and efficient in use.

The grenade preferably comprises a container of sheet metal or other suitable material in which the material is placed, an igniter with safety means therefor to prevent accidental setting off of the grenade, and one or more gas openings in the container with pressure-removable closures therefor. Such closures are effective for sealing the ignitible material away from outside conditions, yet do not need to be removed to set the grenade in operation.

In the accompanying drawings, which illustrate the preferred embodiment of the invention—

Figure 1 is a side elevation of a hand grenade embodying my invention; and

Figure 2 is a section on the line II—II of Figure 1.

In the illustrated embodiment of the invention there is shown a metal container 2 having a solidified mass 3 of ignitible material therein. This mass may consist of any desired substances suitable for the purpose. If tear gas is to be produced, I preferably employ a mixture of chloracetophenone and smokeless powder. Chloracetophenone is a crystalline product which gives off a very powerful lachrymating gas when heated, and the powder upon ignition furnishes sufficient heat for the purpose. The two may be formed into a solidified mass in the container by mixing them with acetone, tamping the mass into place and allowing the acetone to evaporate. A suitable booster coating 4 of black powder may be placed over the mass to insure complete ignition. This is preferably held in place by mixing it with collodion and acetone and coating the exposed surface of the principal mass. A depression 5 is made in the center of the mass and a fuse 6 terminates therein. The end of the fuse 6 carries a ball of powder 7 adapted to be ignited by the fuse and in turn ignite the booster coating 4 for setting the grenade into action. The powder ball is made by mixing black powder with acetone and collodion. A detonator 9 is provided at the upper end of the fuse 6 and lies inside a casing 10. The casing 10 has a striker 11 slidably mounted therein but normally held a short distance away from the detonator 9 by a shear wire 12 which passes through the casing and the striker. A safety pin 13 also passes through the casing to prevent contact between the striker and the detonator until such pin is removed. The casing 9 is carried by a cover 14 and the entire upper portion of the grenade may be assembled separate from the container 2 and placed therein after the gas producing substance has been put in place. The cover 14 is preferably permanently secured to the container 2 by rolling over the edge portion of the container as at 15. As seen in Figure 2, the assembly of housing fuse and striker may be bodily unscrewed from the cover 14.

Gas openings 16 are provided in the cover 13 and these are normally sealed by closures 17 of any suitable type. In the drawings these closures are shown as small paper or cloth tabs which are pasted over the openings, but paraffin plugs or the like may also be used. These seal the material in the grenade from outside conditions but are readily blown off by the pressure generated when the grenade is set into operation. When it is desired to use the grenade the pin 13 is removed by pulling on its attached ring 18 and the grenade is gripped by the body and brought down with the striker 11 foremost on any solid substance to shear the wire 12 and set off the detonator 9. The grenade is then thrown, the fuse 6 being timed to ignite the powder ball 7 in about five seconds. As the powder ball burns, it ignites the booster coating 4 and the solid gas producing material immediately begins to emit gas in very large quantities. The purpose of the depression 5 is to provide a very large area for combustion and thus increase the efficiency of the grenade. This shape also makes complete combustion more

likely and is effective for producing higher concentrations than would otherwise be possible with a grenade of the same size.

I thus provide a simple and effective hand grenade which is safe to be handled but which may be readily discharged and thrown. It is convenient to use and has been found exceedingly trustworthy and efficient in operation.

Any desired gas-producing substance may be employed, and the terms "gas" and "gas-producing substance" are intended for the purposes of this specification to include smoke and smoke-producing substances, and the like.

While I have shown the preferred form of the invention, it will be understood that it is not so limited but may be otherwise embodied within the scope of the following claims.

I claim:

A grenade comprising a container, a solidified mass of ignitible material therein adapted to emit a gas upon ignition, the mass having an exposed surface with a depression therein so as to give a greater exposed area than the cross sectional area of the container, and igniting means supported by the container and operable from outside the same for igniting the material at such surface, the igniting means being spaced away from the surface of the ignitible material.

In testimony whereof I have hereunto set my hand.

RUBEN B. LAWRENCE.