A directional dispensing grenade is disclosed having a canister, a portion of which has a substantially constant cross-sectional bore area with an obturating piston disposed therein that is adapted to be propelled through the canister. The open bore end of the canister is closed with a cap extending across the open bore end and a frusto-conical surface slopes inwardly from the bore wall to a blow-out disc formed integrally with the end closure cap. Between the piston and the end cap is a charge of powder material to be dispensed which, when the piston exerts a force against it, causes the disc to blow out and is expelled through the resulting blowout orifice in the end cap. In the opposite end of the canister is an integrally formed, internally protruding and internally closed but externally open propellant-charge well with a rupturable bottom. The well contains an ignitable propellant-gas-generating charge which is effectively sealed therein by a cap inserted into the well which has a percussion primer and a fuse disposed therein that are adapted to ignite the propellant-gas-generating charge to produce a propellant gas which will rupture the bottom of the well and propel the piston through the canister. The striking surface of the percussion primer is externally exposed and adapted to be struck by the firing pin of a resiliently biased hammer which is mounted between two parallel ribs and is normally prevented from striking the percussion primer by a handle and a safety pin which releasably retain the hammer in a resiliently biased, cocked position.

7 Claims, 3 Drawing Figures
DIRECTIONAL DISPENSING GRENADE WITH EXTERNALLY OPEN, INTEGRALLY-FORMED AND INTERNALLY CLOSED, PROPELLING CHARGE WELL AND INTERNAL FRUSTO-CONICAL MATERIAL DISCHARGE GUIDING SURFACE

This invention relates to an improved grenade dispenser which is particularly adapted to selective directional discharge or dispensing of material through the ignition of a gas-generating charge in the dispenser.

Grenades and dispensers have been made heretofore employing various constructions. Among the problems associated with grenade dispensers for sensitive or chemically reactive materials are the sealing of the propellant charge material from the material to be dispensed, and also providing for safety of loading of the entire grenade dispenser with both the dispersed material charge and the propellant mixture charge. Another problem lies in the provision of a simple and inexpensive grenade dispenser which will permit relatively quick and effective discharge of material therewith without contamination of the discharged material by the propellant gases generated by a propellant charge.

It is a major object and feature of this invention to provide a grenade dispenser employing a propellant charge and a charge of material for dispensing or discharging in which the material to be dispensed, hereinafter termed "discharge material", is hermetically sealed from the propellant charge and from the atmosphere while in stored condition, and which is substantially effectively sealed from the gases generated by the propellant charge during firing of the charge and propelling of the discharge material from the grenade.

A further feature of the invention lies in the provision of a grenade dispenser of simple design which enables preloading and hermetic sealing of discharge material and an operating pusher piston within a main body canister, the main body being provided with an externally open well into which the propellant charge and actuating assembly therefor may be thereafter inserted and secured, thereby enabling safe and effective loading of the grenade without contamination of the discharge material, and removing propellant explosive dangers to the loading operator during loading of the discharge material while minimizing the hazards of subsequent loading of the propellant charge and associated actuating assembly.

Still other objects, features and attendant advantages will become apparent to those skilled in the art from a reading of the following detailed description of a physical embodiment constructed in accordance with the invention, taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a longitudinal section of a grenade dispenser constructed according to the invention;

FIG. 2 is an end view of the arrangement of FIG. 1, as viewed toward the propellant-charge-containing end of the dispenser; and

FIG. 3 is an end view of the opposite dispensing end of the dispenser.

Referring now to the figures of the drawings, the illustrative grenade dispenser generally indicated at 11 includes a canister body 12 having formed unitarily therewith a closed end wall 13a in which is formed a well 23 having a unitary rupturable membrane wall portion 23a formed across the bottom thereof. The canister also includes an opposite end wall formed by a plug or cover 15 which is suitably hermetically sealed to the adjacent side wall portion of the main body as along the lines 17, 19, as through spin welding, or by suitable adhesive or bonding agents.

Prior to assembling and securing the end 15, a piston pusher 21 is inserted in the canister body 13 through the open end of the body, and a charge of discharge material M to be dispensed is placed in the body 13 also through the open end thereof. The discharge material M is preferably in com-
said canister having an internal cavity therein, for carrying a charge of particulate material for directional discharge into the atmosphere,
said canister having an internally protruding and externally open well, extending reversely into said cavity, with an integral closed bottom wall and annular side wall, formed integrally in and by a unitary end wall thereof opposite the end wall having said blowout opening section,
a wall of the integral said well forming a rupturable blowout membrane,
a propellant-gas-generating charge in closed secured relation within said well, enclosing means enclosing and sealing said propellant-gas-generating charge within said well,
means mounted on said opposite unitary end wall for igniting said propellant-gas-generating charge to thereby rupture said hermetically sealed canister at said well blowout membrane and effect movement of said charge of particulate material toward and through said discharge blowout opening,
and an internally facing frusto-conical surface in said cavity at said end thereof having said discharge blowout opening section, said frusto-conical surface being of an area corresponding to a major portion of the cross-sectional area of said cavity for guiding of material toward said discharge blowout opening section, the small end of said frusto-conical surface terminating adjacent said discharge opening blowout section.

2. A directional dispensing grenade according to claim 1, said frusto-conical surface being formed integrally with said section of body material forming said blowout opening and being disposed in surrounding relationship about said section of body material forming said blowout opening.

3. A directional dispensing grenade according to claim 1, said canister having an open end closure member disposed at the end thereof opposite said externally open well, said frusto-conical surface and said section of body material forming said blowout opening being integral with and forming substantially the total interior surface of said end closure member.

4. A directional dispensing grenade according to claim 3, said piston having an annular pressure-sealing obturating flange on the face thereof opposite said compartment, said obturating flange being tapered-edged and slightly oversized and forming a light press fit with the adjoining said cavity wall.

5. A directional dispensing grenade according to claim 4, said cavity and piston forming a second open compartment surrounding said well, and said second compartment serving as an initial pressure-damping compartment for reducing peak effective pressure on said piston after ignition of the propellant-gas-generating charge.

6. A directional dispensing grenade according to claim 1, said means for igniteing said propellant-gas-generating charge comprising:
a percussive ignition unit at said well and in ignition-chain-initiation relation to said propellant-gas-generating charge, and being disposed for external percussive ignition of said unit, and percussive striking means carried externally of said canister for percussive ignition of said percussive ignition unit, for igniting said propellant-gas-generating charge to thereby rupture said hermetically sealed canister at said well blowout membrane and effect movement of said charge of particulate material toward and through said discharge blowout opening.

7. A directional dispensing grenade comprising:
a hermetically sealed canister having a section of body material forming a blowout opening for discharge of material therethrough,
said canister having an internal cavity therein, for carrying a charge of particulate material for directional discharge into the atmosphere,
said canister having an internally protruding and externally open well, extending reversely into said cavity, with an integral closed bottom wall and annular side wall, formed integrally in and by a unitary end wall thereof opposite the end wall having said blowout opening section,
a wall of the integral said well forming a rupturable membrane,
a propellant-gas-generating charge in closed secured relation within said well,
enclosing means enclosing and sealing said propellant-gas generating charge within said well,
a percussive ignition unit at said well and in ignition-chain-initiation relation to said propellant-gas-generating charge, and being disposed for external percussive ignition of said unit, and percussive striking means carried externally of said canister for percussive ignition of said percussive ignition unit, for igniting said propellant-gas-generating charge to thereby rupture said hermetically sealed canister at said well blowout membrane, and effect movement of said charge of particulate material toward and through said discharge blowout opening,
a frusto-conical surface formed in said cavity at said end thereof having said discharge blowout opening section, for guiding of material toward said discharge blowout opening section, the small end of said frusto-conical surface terminating adjacent said discharge opening blowout section.

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