

[54] ANTIPERSONNEL MINE DESTRUCT SYSTEM

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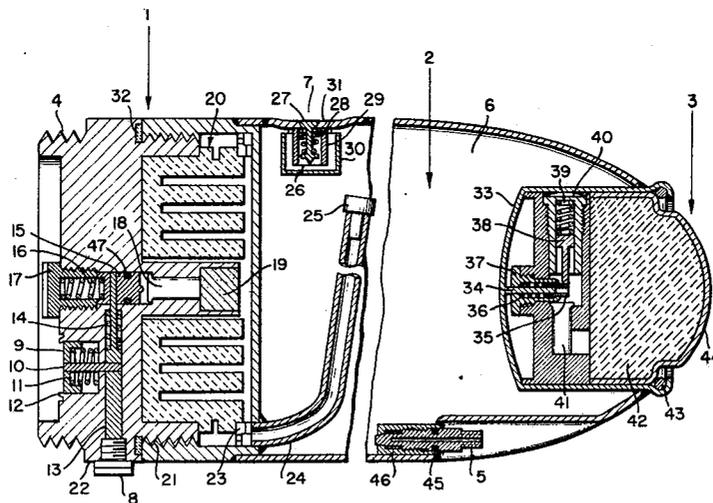
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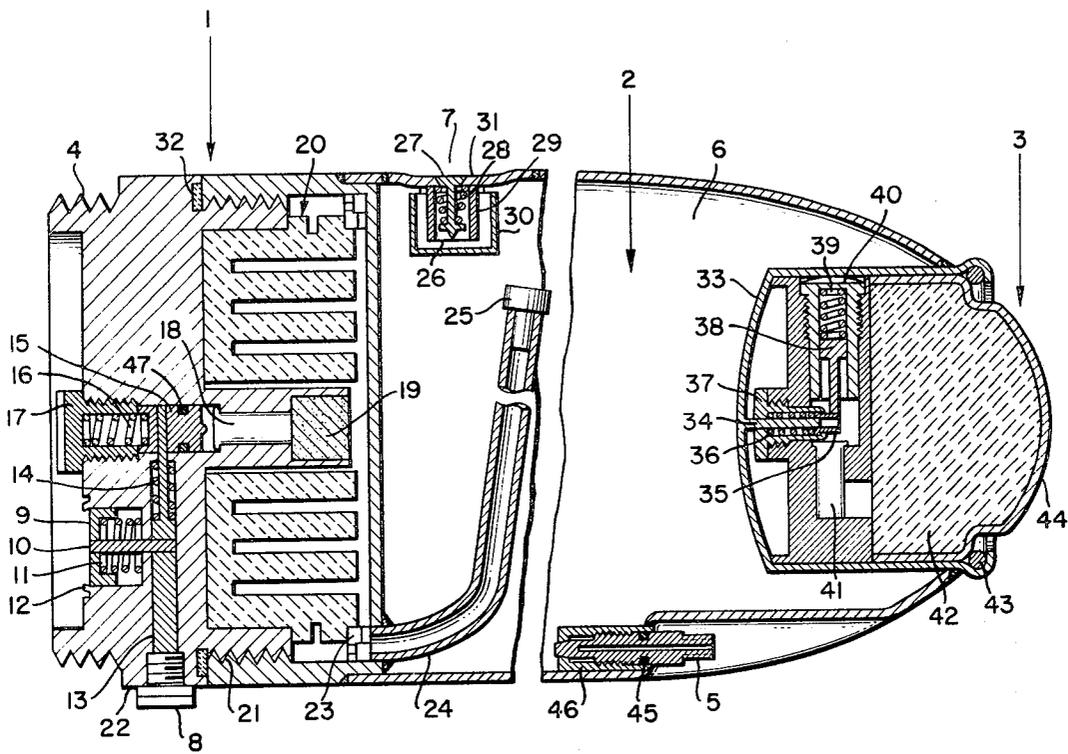
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[57] ABSTRACT

The invention consists of a device which may be launched from a tube by propulsive means in the same manner as a bazooka. The device in a low trajectory dispenses fuel so as to form a gas-air cloud along the flight path, detonating it after it is formed. The objective of the detonation is to set off any antipersonnel mines below the flight path thereby clearing the path for safe traversal by personnel.

1 Claim, 1 Drawing Figure





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## ANTIPERSONNEL MINE DESTRUCT SYSTEM

The present invention relates broadly to a system in which a fuel-air mixture is formed above a mine field by means of a dispensing canister which follows a trajectory appropriate to the purpose and which mixture is caused to detonate after the fuel is dispensed and mixed with the air. While other applications may be possible, the primary application is that of setting off antipersonnel mines by means of the fuel-air detonation, the objective being to clear a path over which personnel may traverse with safety. An objective of the invention is to provide a dispensing canister which can be launched from a tube by rocket means from the shoulder of a person in the same manner as a shoulder launched weapon commonly known as a "bazooka." Another objective is to provide a means of dispensing the fuel in such a manner that a continuous cloud of fuel and air approximately 3 to 4 feet minimum diameter or larger is created along the path of the moving canister, detonation of the cloud being initiated by an appropriate fuse and intermediate explosive charge when the fuel in the canister is depleted.

While other methods of clearing mine fields exist, this method offers a means by which a cloud of gas and air can be rapidly created and detonated to clear a path by using a launching tube, canister, and rocket launching means which are hand carried. Also, the means by which the fuel is ejected from the canister into the air is new in the proposed application. The details of the system are further explained in the schematic drawing, the FIGURE.

The FIGURE shows the explosive gas disseminating shell which includes a gas generator section on the left adjoined to the fuel canister. The fuel canister envelops a high explosive section which is on the opposite end.

This device consists of three sections, a gas generator section 1, fuel canister section 2, and high explosive section, section 3. The device is propelled forward in a launching tube by propulsion means, an example of which can be that currently used on infantry weapons of the type known as Redeye and the Bazooka. The propulsion means may be attached to the device by threads 4 or other means consistent with requirements. The fuel canister section is filled at the filling port 5 with a fuel 6, examples of which are ethylene oxide, methyl acetylene, butane, hydrogen or other highly explosive gases. Upon pressurization the fuel is ejected through fuel nozzle 7 of which there are as many as may be required around the periphery to provide even dispersal of the fuel and air to form a fuel-air shaft of approximately 3 to 4 feet in diameter or larger along the path of the device. In order to load the device into the launching tube, it is first necessary to remove safety screw 8 which in normal storage would prevent accidental arming. Upon build up pressure in the launching tube, the gases generated by the propulsion means exert pressure on piston 9, which moves along pin 10 which is fitted tightly into the piston 9, compressing spring 11 which upon release of the pressure generated by the propulsion means returns the piston 9 to its original position against the swaged stop 12 at the same time withdrawing pin 10 from pin 13 allowing it to be moved outward by spring 14. The length of the pin 14 is such that it cannot be completely released

until the device leaves the launching tube at which time it fully releases firing pin 15 which moves by force of spring 16 held by special screw 17 against the percussion type initiator 18 setting it off and igniting the ignition material 19, which in turn ignites the propellant grain 20. The gas generator threads 21 hold the gas generator head 22 in place. The generated gases must pass through a screen ring 23 before exhausting through tube 24. The length of tube 24 is determined by the requirement for cooling of the gases by the surrounding fuel 6 before they exhaust into the fuel. For gases which are exothermic on decomposition such as ethylene oxide or methyl acetylene, the temperature must be kept below the autodecomposition point. This is not a requirement with gases such as propane and hydrogen. As pressure builds up in the gas generator, fuel restrictor cap 25 is ejected from the exhaust tube 24 allowing the gas to mix with and heat the fuel 6. It will be a requirement of the propulsive means that a slight rotation be given to the device so that the fuel will be centrifuged to the outer wall of the canister leaving any vaporized fuel at the center core. As the pressure builds up in the fuel canister, a rupture disk 26 breaks, allowing fuel to enter the annulus around pintle 27 exerting pressure on the pintle head moving it outward against spring 28 which is guided by sleeve 29. Cap 30 which is held in place by supports attached to nozzle plate 31 serves to direct the fuel into the nozzle and also to assure depletion of the fuel next to the wall by the pressurized gases as the fuel is spun out against the wall. The gases in the gas generator are prevented from escaping by metallic gasket 32. Upon build up of pressure in the fuel canister, pressure disk 33 is pressed inward so that pressure disk pin 34 is thrust into retainer sleeve 35 which is held in place by spring 36 and special screw 37. As the pressure drops in the chamber, pressure disk 33 moves toward its original position withdrawing retainer sleeve 35 and allowing firing pin 38 to move under the force of spring 39 both of which are held in place by special screw 40. The firing pin moves toward and initiates detonator 41 which in turn sets off the high explosive charge 42. The high explosive charge and all of the high explosive section are held in place by expansion ring retainer 43 and cover 44. The detonation of the high explosive initiates detonation of the gas-air shaft that has been formed and the detonation propagates back along the gas-air shaft to the initial point of mixture creating a high pressure wave which sets off any antipersonnel mines in the vicinity. Thus, a device has been invented which can be launched from a tube held approximately horizontal and which forms a fuel and air mixture directly over a path along the ground and which serves to set off antipersonnel mines so that the path can then be safely traversed by personnel. There are two fittings in the system which involve the use of special O-ring seals. The first is in the filling port 5. The filling port 5 may be attached to a line from the filling cylinder and screwed outward so that fuel may flow through it and through sleeve 46 into the canister. O-ring 45 prevents fuel from escaping to the atmosphere. When the canister is filled with the desired quantity of fuel the filling port 5 is screwed tight sealing the opening in sleeve 46. It is noted that O-ring 45 will then be no longer required to function. A second area in which an O-ring is used is

with firing pin 15 where O-ring 47 prevents the escape of gases from the gas generator back into the firing pin port after the initiator 18 has been fired. The canister as shown in the figure has been forshortened for purposes of demonstration and may be made any length compatible with the launching means. It should be observed that the trajectory of the device should be such that it is always close to the earth's surface to provide maximum effectiveness of the exploding fuel and air mixture in clearing a mined area. The percussion type initiator 18 and detonator 41 are commercial items which may be purchased for use in the system. The propellant 20 and explosive 42 may also be obtained

commercially.

I claim as my invention:

1. A fuel dispensing system which may be launched from a tube by rocket means from the shoulder in the same manner as a bazooka, creating a continuous gas-air cloud approximately three to four feet or larger in diameter which can be exploded over an antipersonnel mine field setting off the mines, the explosion of the gas-air mixture being initiated automatically by an appropriate fuse and intermediate explosive charge when the fuel in the canister is depleted.

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