United States Patent [19]

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[54] **DUAL PURPOSE GRENADE**

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[52] **U.S. Cl.** ..... **102/56,** 102/7.2, 102/67, 102/24 HC

[51] **Int. Cl.** **F42b 13/50**

[58] **Field of Search** ..... 102/7.2, 24 HC, 56, 64, 102/67

[56] **References Cited**

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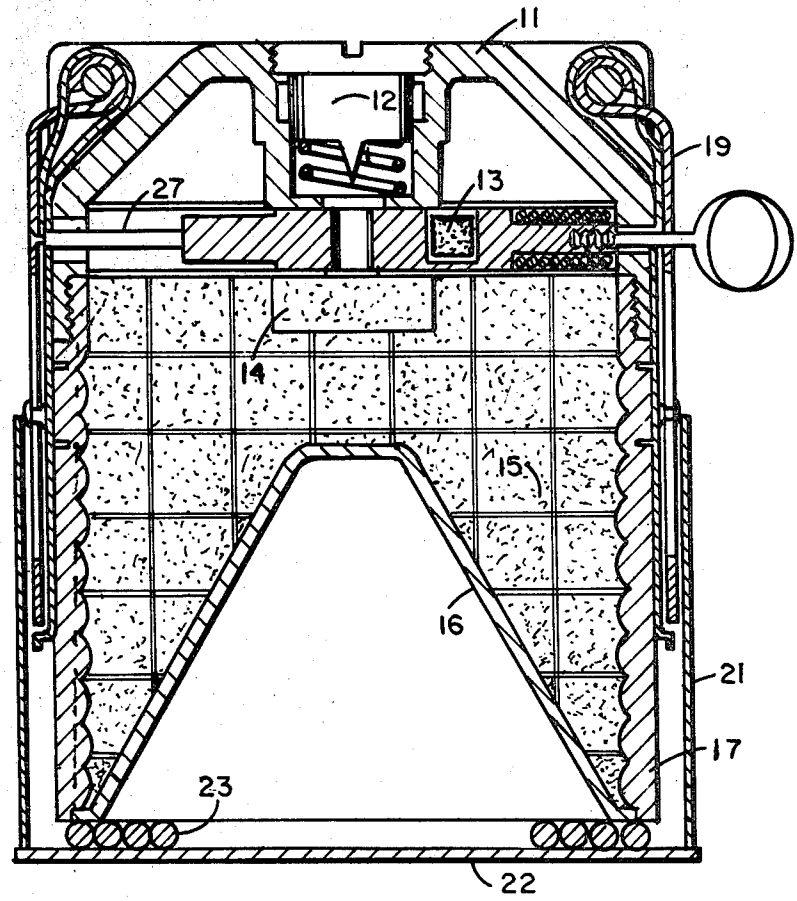
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[57] **ABSTRACT**

A dual purpose grenade having a shaped high explosive charge for effectiveness against lightly armored targets, the said shaped charge having embossed walls for effectiveness against personnel.

4 Claims, 4 Drawing Figures



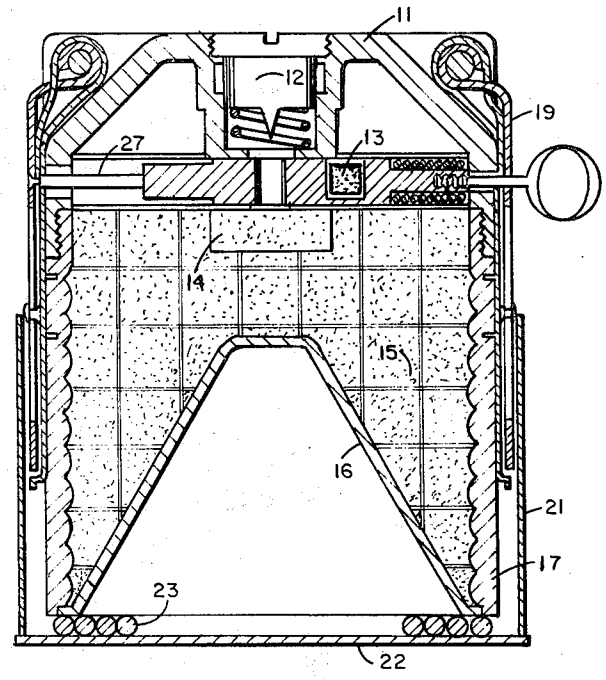


FIG-1

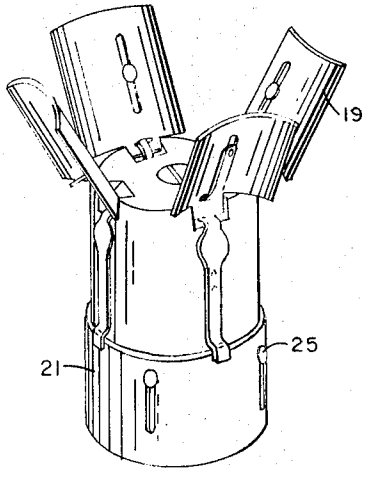


FIG-4

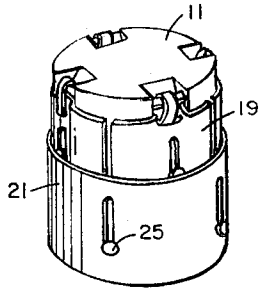


FIG-2

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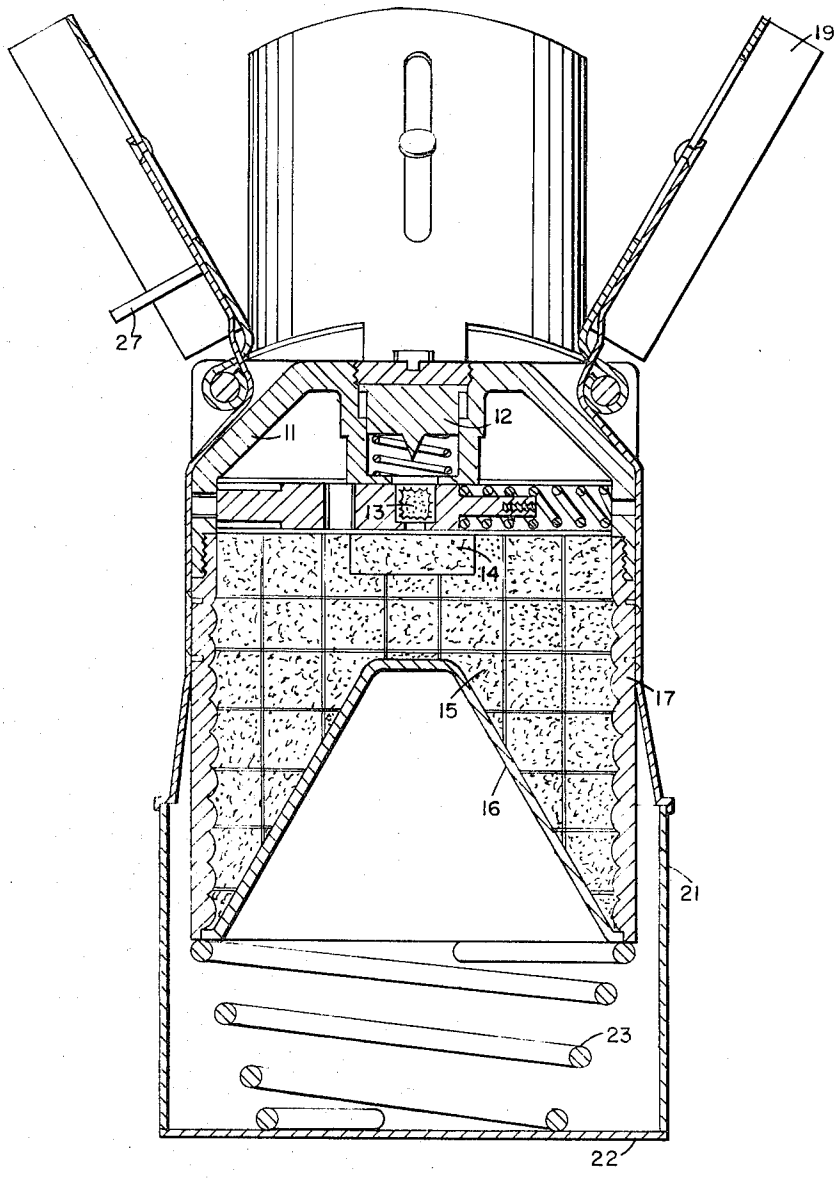


FIG-3

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DUAL PURPOSE GRENADE

This invention relates to a multi-purpose missile.

It is an object of this invention to provide a dual purpose grenade which may be delivered from an air-to-ground missile delivery system.

Another object is to provide a grenade having effectiveness against personnel and lightly armored vehicles.

A further object is to provide a grenade of improved construction, low fabrication and maintenance cost, high durability, and facile in use under a wide variety of service conditions.

Other objects and many of the attendant advantages of this invention will be more fully appreciated as the same become better understood from the following detailed description and drawings wherein:

FIG. **1** is a cross-sectional view of the device of this invention in the unarmed position.

FIG. **2** is a schematic view of the device of FIG. **1.**

FIG. **3** is a cross-sectional view of the device in the armed position.

FIG. **4** is a schematic view of the device of FIG.

One of the most difficult enemy positions to destroy due to its location is the emplacement on the far side of a hill or mountain. With this view in mind, the missile of this invention was conceived for an air-to-ground missile delivery system. In actual use, artillery shells of the carrier variety are fired over the enemy emplacement. At a predetermined time and altitude the missiles herein described are deployed from the carrier in somewhat of a dispersed pattern and thereupon gravitate towards the target area. Upon deployment from the carrier, the pressure due to nesting is removed and, as a result, a plurality of vanes open in a radial fashion from the airborne missile thereby orienting and stabilizing the missile in its gravitating flight so that impact will take place on the desired spring activated surface. If the missile, upon impact, contacts the surface of a lightly armored vehicle, it will effectively damage or destroy the same in addition to effectively destroying, maiming, or otherwise creating havoc with nearby enemy personnel as well as personnel within the vehicle.

The grenade of this invention, as shown in FIG. **1,** is provided with a canister **11** containing, in series, a spring retarded firing pin **12,** a sliding detonator **13,** a booster **14,** and a shaped high explosive charge **15.** The interior of the high explosive charge is provided with a copper-like cone **16,** while the outer surface of the charge is surrounded by a perforated or embossed wall **17** to provide controlled fragmentation when the missile explodes. The cone **16** of the shaped charge provides effectiveness against lightly armored targets, while the embossed mass provides effectiveness against personnel.

The grenade is also provided with a plurality of spring actuated vanes **19** which are pivotally mounted in spaced relationship around the periphery of the upper end of the canister as shown in FIGS. **3** and **4.** In the unarmed position, the spring actuated vanes **19** are held against the outer surface of the mid-section of the canister **11** by a cylindrical sleeve **21** which circumscribes the vanes and the lower half of the canister. The sleeve is secured to a base **22** forming an open end cylindrical cup within which is mounted a spring **23.** In the unarmed state, the spring **23** is maintained in the helicoid or compressed state by the inward pressure of

nesting against the base **22** as shown in FIGS. **1** and **2.** In the armed state, the pressure due to nesting is released and the spring **23** expands thereby pushing the base **22** away from the canister **11** and moving the sleeve **21** in a downwardly direction along the longitudinal axis of the canister **11** to the position shown in FIGS. **3** and **4.**

In operation, the missiles or grenades are placed in nesting alignment in a carrier type artillery shell. The pressure of nesting maintains the grenade in the unarmed form as shown in FIGS. **1** and **2.** After the shell is fired, it will travel to a predetermined position in space, at which time, the carrier will deploy the grenades in somewhat of a dispersed pattern in the air. As the pressure due to nesting is released, the cylindrical sleeve **21** will move along the longitudinal axis of the canister due to the expanding pressure of the spring **23** on the base **22** as described. This action will continue until the sleeve **21** is prevented from further movement by a plurality of stops **25** which determines its maximum travelled distance. As the sleeve moves longitudinally along the axis of the canister **11,** the pivotally mounted vanes will be cleared and will pivot in an upwardly and outwardly direction to a position above the canister **11** as shown in FIGS. **3** and **4.** When the vanes **19** are in the position shown, they will tend to orient and stabilize the airborne gravitating missile in flight so that the base **22** of the device will be in position to impact with the target.

As the vanes **19** move in an outwardly direction, a pin **27** which holds the spring activated sliding detonator **13** in the unarmed position as shown in FIG. **1,** will be withdrawn and the detonator **13** will slide into position under the firing pin **12,** as shown in FIG. **2.** Thus, the airborne gravitating missile will be armed while in the air prior to contact with the target.

Upon impact with a target such as a lightly armored vehicle, the sleeve **21** will maintain the canister **11** a sufficient distance (stand-off) from the target to produce good penetration upon explosion. Locking tabs are provided to maintain the cup in its extended position upon impact with the target. Due to inertia, upon impact, the firing pin **12** will continue to travel in the direction of the gravitating flight of the missile and will set off the detonator **13** which in sequence will initiate a booster **14** thereby actuating the high explosive charge **15.** When the high explosive charge is set off, the shaped copper-like cone **16** will form a high velocity jet in a downwardly direction thereby penetrating such vehicle. As an added advantage, upon explosion of the charge, the embossed wall **17** will break due to strain into minute fragments of controlled size for effective destruct capabilities against any personnel that may be within the immediate area. Thus, the device of this invention provides an area coverage weapon to be fired indirectly from an artillery shell.

Obviously, many modifications and variations are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

I claim:

1. A dual purpose grenade which comprises;

a base,

a hollow cylindrical sleeve of open end construction secured in axial alignment to said base,

a spring means mounted in said sleeve against said base,

a canister having a lower and upper end,

said lower end of said canister insertably mounted into said sleeve against said spring,

said canister containing, in series, a firing pin, a detonator, a booster, and a shaped high explosive charge, and

a plurality of spring actuated vanes, each of which having an upper and lower end,

said upper end of said vanes being pivotally mounted on said upper end of said canister,

said lower ends of said vanes being restrained in position adjacent to the body of canister by said cylindrical sleeve.

2. The device of claim **1** wherein said spring is in the expanded state and said cylindrical sleeve is moved in telescopical fashion along said canister to a stand-off position.

3. The device of claim **2** wherein said cylindrical sleeve is held in the stand-off position by a plurality of locking tabs positioned in spaced relation around the outer surface of said canister.

4. The device of claim **2** wherein said vanes are unrestrained and extend upwardly and outwardly from said pivotal point on said canister.

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