April 2, 1957 O. B. MAHAFFIE 2,787,217

INCENDIARY MUNITION

Filed March 5, 1953

Fig. 1.

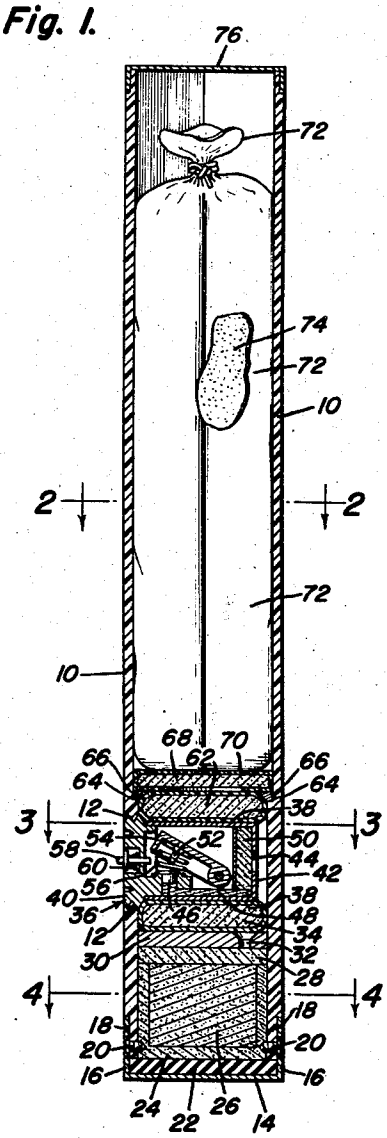


Fig. 2.

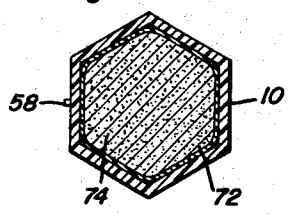


Fig. 3.

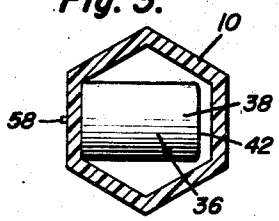
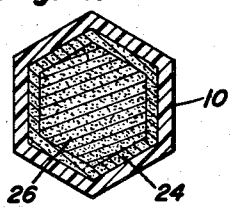


Fig. 4.



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2,787,217

INCENDIARY MUNITION

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2 Claims. (Cl. 102—6)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment to me of any royalty thereon.

This invention relates to munitions and particularly to those of the incendiary type.

It is an object of this invention to provide a single incendiary munition which performs the functions of two separate incendiary munitions, and which has advantages that exceed the sum of the advantages of the two separate munitions which it replaces.

It is another object of this invention to provide an incendiary munition which upon actuation separates into two independent incendiaries, one comprising a mass of burning jellied gasoline, and the other an incendiary bomb with the ability to "seek" a target.

It is a further object of this invention to provide a highly effective, incendiary munition wherein an incendiary mass is ejected out of the casing, and both the casing and the incendiary mass are adapted to burn independently.

It is a still further object of the invention to provide an effective, incendiary munition wherein the casing is inflammable and includes two incendiary charges, one of which is adapted to be ignited and ejected out of the casing, and the other of which is adapted to be ignited and burn with the casing.

It is a specific object of this invention to provide a highly destructive, incendiary munition wherein an inflammable casing houses a conventional incendiary charge, and an incendiary mass of jellied gasoline which is adapted to be ignited and ejected out of said casing, both the ignition and ejection of said mass, and the ignition of said charge being accomplished by the same means.

The above and other objects will become more apparent from the following detailed description considered along with the accompanying drawings wherein:

Fig. 1 is a sectional view taken in a longitudinal plane that passes through the center of my improved incendiary bomb.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1.

Referring to Fig. 1, reference numeral 10 designates the bomb casing which is elongated, hollow and hexagonal in cross-section. Casing 10 is made of an inflammable material, metallic or non-metallic, many well-known plastics being eminently well suited for the purpose. Casing 10 is open at both of its ends and has a threaded opening 12 formed in one of its sides. The forward end of casing 10 is closed by a steel nose cap 14. The collar 16 of nose cap 14 is seated on reduced portion 18 of casing 10, and is secured thereto by threaded members 20 or other conventional securing means. A resilient disk 22 is positioned in the nose cap 14 within collar 16, and normally acts as a seal, but acts as a shock absorber when the bomb lands. If preferred, disk 22 may be omitted without thereby causing any appreciable effect on

the operation of the munition. Positioned adjacent to disk 22 within casing 10 is cup 24, which is made of an inflammable material. Cup 24 houses a charge 26 of incendiary material such as thermit. Each of the securing means 20 penetrates slightly into incendiary charge cup 24 and aids in positioning said cup. A layer 28 of easily ignitable, inflammable material is positioned adjacent to incendiary charge 26 within casing 10. Flash hole plate 30, which may be made of either a non-inflammable or an inflammable material, has at least one opening 32, and is positioned parallel to and contiguous with layer 28, within casing 10. Positioned adjacent to plate 30 is a charge 34 of combustible, gas generating material, such as, but not limited to, a mixture of black powder and powdered magnesium, which is designated as an ignition-ejection charge.

Conventional, inertia type fuze 36 is positioned in threaded opening 12 of casing 10, and extends into said casing adjacent to ignition-ejection charge 34. Fuze 36 comprises a cylindrical casing 38 having an externally threaded head 40 that seats in opening 12, and an end wall 42 which has an opening 44 therein. Mounted within fuze casing 38 is the following firing train: percussion cap 46, slow-burning, delay element 48, and primer charge 50. Also mounted within fuze casing 38 is the firing mechanism which comprises firing pin 52 which is carried by pivotally mounted firing pin carrier 54, said carrier being normally urged away from percussion cap 46 by spring 56. Headed pin 58 is slidably mounted in an opening (unnumbered) in fuze head 40, but is normally forced to its inwardmost position (shown in Fig. 1) by an adjacent bomb when the bomb which it is a part of is clustered with other bombs. In this inwardmost position, the pin 58 compresses spring 60, and the innermost portion of said pin is disposed so as to limit the movement of the firing pin carrier 54 toward the percussion cap 46 and thereby prevent premature or accidental firing of said percussion cap.

An ignition-ejection charge 62 which is similar to ignition-ejection charge 34, is positioned adjacent to fuze 36 on the rearward side thereof. At a point near the rearward extremity of charge 62, the interior of casing 10 is enlarged and thereby provides a shoulder 64 which seats hexagonal positioning ring 66. Hexagonal blowout plate 68, covered with an inflammable covering 70 (either a film or a coating) is positioned adjacent to charge 62 and ring 66. An inflammable sock 72, made of fabric or the like and filled with a highly inflammable jellied gasoline 74, is positioned next to blowout plate 68 and occupies substantially all the remaining space in casing 10. The rearward end of casing 10 is closed by tail cap 76, which may have streamers or a fin assembly attached or connected thereto.

The operation of the bomb is as follows: Prior to dropping, the bomb is clustered with a plurality of similar bombs. The pin 58 of each bomb is urged to its inwardmost position (shown in Fig. 1) by the side of an adjacent bomb. In this position the bombs are unarmed. The cluster is dropped from the aircraft that carries it over the target, and at a predetermined time the cluster separates into individual bombs which disperse into a pattern of falling bombs. When the bombs disperse, the pin 58 of each bomb is ejected out of the opening in fuze head 40 by spring 60. Upon impact, the fuze is activated by inertia, and the firing pin carrier 54 pivots toward the percussion cap 46 against the force of spring 56. When the firing pin 52 contacts percussion cap 46, it fires said percussion cap, which in turn sets off the delay element 48. After impact, but during the delay period, the bomb comes to rest in a generally horizontal position on the ground, street, building roof or other place. When the burning zone in the delay element 48 reaches the primer

charge 50, it sets it off, and said primer charge in turn sets off the ignition-ejection charges 34 and 62. Charges 34 and 62 burn and generate gas until the gas reaches a pressure which is sufficient to force the blowout plate 68 rearwardly and eject the sock 72 out of the bomb casing 10. During the period of generating gas and ejecting the sock 72, the blowout plate covering 70 of inflammable material and the sock 72 and its incendiary filling 74 are ignited. Covering 70 aids in igniting the sock 72 during this period. It will therefore be apparent that the sock 72 and its incendiary filling 74 are ignited and ejected at substantially the same time, and that they are projected as a flaming mass which will move within the limits of its range until it strikes an obstruction. When striking an obstruction, the flaming mass has the property of clinging to the obstruction while it ignites it.

Ejection of the sock 72 out of casing 10 has the reaction of projecting the bomb casing 10 in the direction opposite to that in which the sock 72 moves. During this movement, and after the bomb casing 10 has come to rest, the charge 34 burns. Some of the heat produced by burning charge 34 is transmitted through opening 32 in flash hole plate 30 to the inflammable layer 28, and ignites said layer. Layer 28, in turn, ignites the cup 24 and the incendiary charge 26. At some point after the fuze sets off the chain of events which actuate the bomb, the inflammable casing 10 and other inflammable parts of the bomb are ignited. It should be particularly noted that the casing 10 and its associated structure constitute an incendiary device which operates independently after the sock 72 is ejected.

While the preferred form of bomb utilizes a sock of jellied gasoline as the incendiary charge which is ejected out of the bomb, other types of incendiary charges could be employed. An alternative fuze mounting would be to mount the fuze in the noze of the bomb and have it extend through the structure in the forward end of the bomb to a point adjacent to the ignition-ejection charges. The action of the bomb is the same regardless of whether the fuze is mounted in the side or nose of the bomb.

It will be apparent that I have provided a bomb which performs the functions of two incendiary bombs. It combines a tail ejection, jellied gasoline incendiary with an additional incendiary of a more conventional nature, with the added feature of having both incendiaries projected in opposite directions after the bomb initially comes to rest. This feature causes each indendiary to "seek" a target, in that each moves until it contacts an obstruction or comes to rest. It should be noted that each incendiary is capable of destroying a different type of target; the jellied gasoline incendiary being adapted to cling to a fragile structure, and the burning bomb casing being adapted to penetrate and ignite a stronger structure. The efficiency of the munition is generally increased by using a maximum amount of inflammable material. In general, I have provided an incendiary bomb which is highly efficient and effective, and which satisfies each and every object of the invention.

Having fully described my invention in detail, it should not therefore be limited to the precise structure shown for it is intended to embrace all minor changes that fall within the spirit of the invention and the scope of the appended claims.

I claim:

1. A bomb comprising a closed, elongated, inflammable casing, a fuze mounted therein, a gas generating ignition-ejection charge adjacent said fuze, said ignition-ejection charge extending to the forward and rearward side of said fuze, an apertured plate positioned on the forward side of said ignition-ejection charge which thereby forms a forward chamber in the casing, an incendiary charge comprising a mass of thermite positioned in said forward chamber, a slidably mounted blowout plate positioned on the rearward side of said ignition-ejection charge which thereby forms a rearward chamber in the casing, and an incendiary mass comprising a sock of jellied gasoline positioned in said rearward chamber.

2. A bomb comprising a closed, elongated, inflammable casing, a fuze mounted therein, an igniter charge adjacent said fuze, said igniter charge extending to the forward and rearward side of said fuze, an apertured plate positioned on the forward side of said igniter charge which thereby forms a forward chamber in the casing, an incendiary charge positioned in said forward chamber, a blowout plate positioned on the rearward side of said igniter charge which thereby forms a rearward chamber in the casing, an inflammable covering surrounding said blowout plate, and an incendiary mass positioned in said rearward chamber.

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