



US Army Corps
of Engineers
Huntsville Center

EXPLOSIVE SAFETY MANAGEMENT GROUP

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FACSIMILE HEADER SHEET

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(includes header sheet)

REMARKS: Forwarded to you at the request of Mr. Mike Gifon, Huntsville Corps of Engineers.

GERMAN EXPLOSIVE ORDNANCE

SUSPENSION. SD 1: 302 bombs in AB 500-1 container; 224 bombs in AB 250-2 container; 50 bombs in AB 70-D1 container.

Packing is nose to tail with tail cup of each forming a safety device for fuze behind it.

FRZ bombs are carried in AB 70-D1 container and packed in the same manner as the SD1 bombs.

COLOR AND MARKINGS. SD1 yellow, FRZ—Body is mustard color. Tail (sheet steel) black. (cast aluminum) natural color. Ogive is painted red on Amatol-filled bombs. Markings on FRZ:

NX
 AEM-5-38
 NX-E-6-37
 109

} Stenciled in black

AK 1927-12-38—Stamped

REMARKS. The FRZ is a French bomb used by the Germans.

2-kg "BUTTERFLY" SD 2A AND SD 2B

DATA:

- Over-all Length: 3.5 in.
- Body Length: 3.1 in.
- Body Diameter: 3.0 in.
- Wall Thickness: 3/8 in.
- Filling: Cast TNT surrounded by a layer of bitumen composition.
- Weight of Filling: 7.5 oz.
- Total Weight: 4.4 lbs.
- CHG/WT Ratio: 11.4%.
- Fuzing: SD 2A; (41) (airburst or impact).
 SD 2B: (41) A (Airburst or impact) (67) (Delay 5-30 min.) (70) B (Antidisturbance).

CONSTRUCTION. The body of the bomb is a cylindrical cast iron casing. A fuze pocket is situated transversely in the side of the body. The SD 2A and SD 2B differ only in the method in

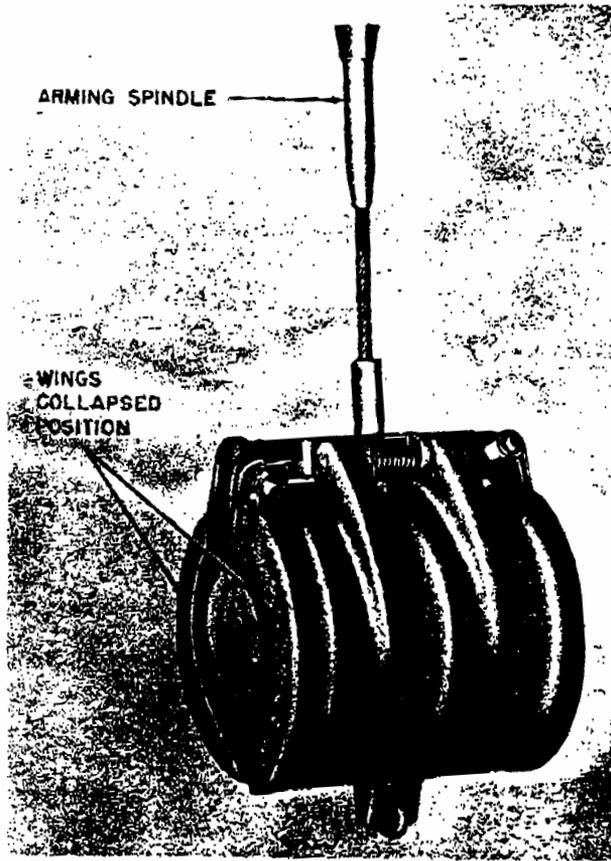


Figure 39A—SD 2-Kg "Butterfly" Bomb



Figure 39B—SD 2-Kg "Butterfly" Bomb

which the fuze is secured in the bomb. The fuze is threaded into the SD 2A while it is secured in the SD 2B by a bayonet joint and two U-shaped safety clips.

The bomb body is encased in a thin sheet steel container made in four pieces—two end flaps and two pieces covering the sides of the bomb. (See figs. 39A and 39B.) These parts are hinged together, the hinges being mounted with torsion springs tending to force the parts of the wings away from the body, but are prevented from opening until a safety pin is pulled when container opens. After release, the wings because of their air drag, rise to the upper end of the 6-inch wire cable connected to the fuze. The rotation of the wings relative to the bomb body arms the fuze. When fuze (41) A is employed in the bomb, the wings consist of two triangular shaped flaps.

SUSPENSION. 23 bombs in the AB 23 SD 2 container; 108 bombs in the AB 250-3 container; 6 bombs in the Mark 500 Roden container; 24 bombs in the AB 24t container.

COLOR. Body of bomb may be painted either black, lead-grey, red, yellow, or field grey. If the bomb is painted field grey it may have a $\frac{3}{4}$ -inch yellow band on the body, the wing assembly will be painted field grey with a yellow stripe on the inside and outside of the wings and may have a $\frac{3}{4}$ -inch red stripe at right angles to the yellow stripe on the wings. If the bomb body is painted yellow, the wings will be painted yellow with a $\frac{3}{4}$ -inch strip of red on the wings. In addition to the specific color combination given, the wings may be field grey or unpainted.

SB 3-kg

DATA:

Over-all Length: $13\frac{5}{8}$ in.
 Body Length: $13\frac{5}{8}$ in.
 Body Diameter: $3\frac{3}{16}$ in.
 Wall Thickness: $\frac{1}{16}$ in.
 Tail Length.
 Tail Width.
 Filling.
 Weight of Filling: 4 lb.
 Total Weight: $6\frac{1}{2}$ lb.
 Chg/Wt. Ratio: 61.5%.
 Fuzing: (23) A.

CONSTRUCTION. The case consists of a

BOMBS

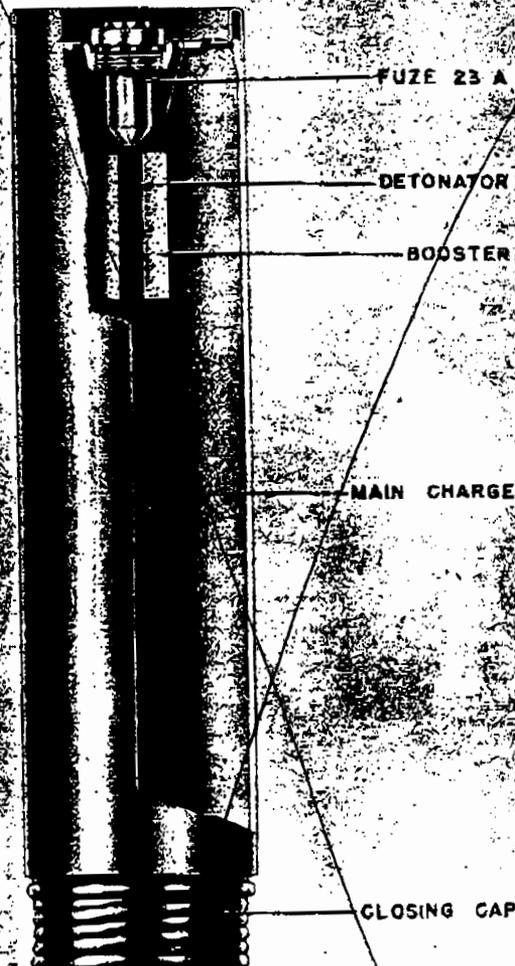


Figure 40—SB 3-Kg Bomb

welded steel tube $\frac{1}{16}$ inch thick, which has a pressed steel filler cap threaded on to the nose. Two cardboard discs cover the filling under the nose cap. (See fig. 40.)

A steel fuze adapter, of spot welded construction, is crimped on to the base of the bomb. No fuzes were found in the specimen recovered, but enemy documents indicate that these bombs are fitted with the mechanical impact all-ways acting (23) A fuze. Design of adapter in base confirms documentary evidence.

There is no form of tail or stabilizing ring.
SUSPENSION. Thought to be carried in containers.

BOHANNON

the fuze used in conjunction with the M20 sensing element.

5-6 BUTTERFLY BOMB FUZES.

Butterfly bomb fuzes M129, M130, M130A1, M131, and M181A1 are covered in this paragraph.

5-6.1 IDENTIFICATION.

5-6.1.1 TYPE.

- a. M129. This fuze is a direct arming (arming vane) impact or mechanical time (aerial or ground burst) firing (selective) type.
- b. M130 or M130A1. This fuze is a direct arming (arming vane), mechanical time firing (long delay) type.

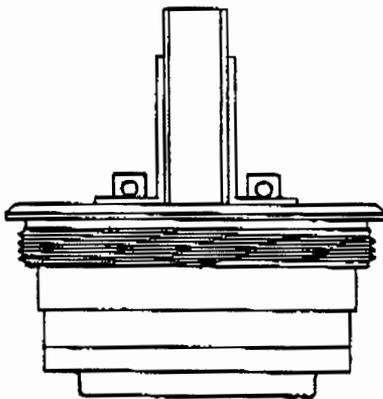
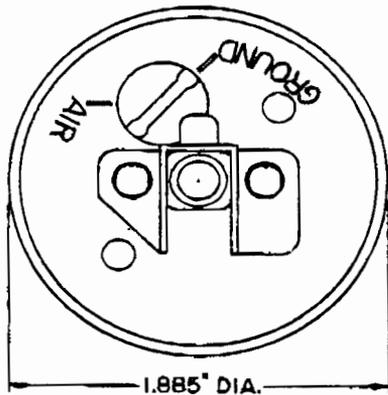
- c. M131 or M131A1. This fuze is a direct arming (arming vane), mechanical time firing, antisturbance type.

5-6.1.2 PAINTING AND MARKING. The fuzes are unpainted. Fuze M129 can be identified by the selector switch and the markings "GROUND" and "AIR" on the top surface of the caps. The M130 or M130A1 and M131 or M131A1 are not distinguishable.

5-6.1.3 FITTINGS AND FEATURES. The general physical characteristics of the fuzes are shown in figures 5-50 and 5-51.

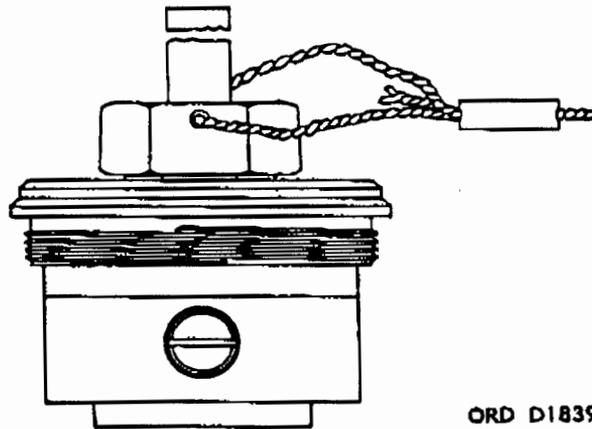
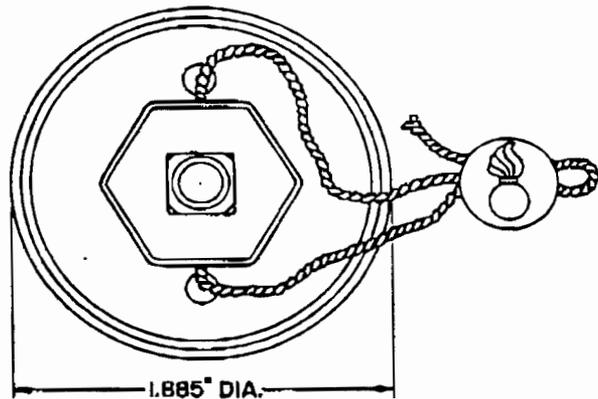
5-6.1.4 WEIGHTS. The weight of a fully loaded fuze is approximately 6.3 ounces.

5-6.1.5 MATERIALS. The fuze caps are zinc die castings.



ORD D1838

Figure 5-50 Dimensional Characteristics of Fuze M129



ORD D1839

Figures 5-51 Dimensional Characteristics of Fuze M130 and M131

5-6.2 to 5-6.3

TM 9-1385-51

5-6.2 HAZARDOUS COMPONENTS.

5-6.2.1 The primer charge is composed of lead azide and primer mixture.

5-6.2.2 The booster charge is composed of approximately 0.4 ounce tetryl.

5-6.3 FUNCTIONING. When a fuze is installed in a "Butterfly" bomb, (figure 5-52), the arming pin clip is removed from the fuze. When the bomb is released from the cluster, the vane assembly springs open and engages the square head on the arming pin. The vane

TM 9-1385-51

5-6.3.1

assembly (rotated by the airstream) unscrews the arming pin.

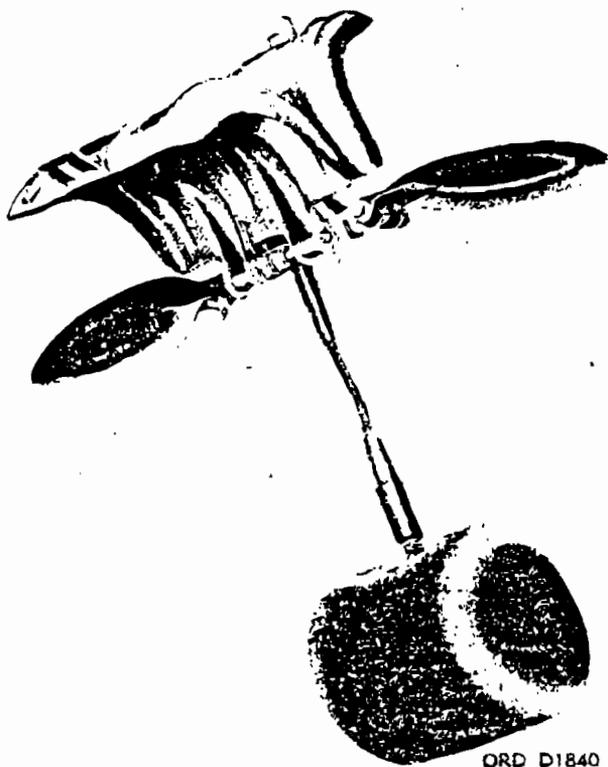


Figure 5-52 "Butterfly" Fragmentation Bomb M83

5-6.3.1 Fuze M129. (figure 5-53).

- a. Ground burst setting. After the arming pin has unscrewed approximately $\frac{1}{4}$ inch, it releases the segment gear. The force of a spring-loaded firing pin cup on the half round section of the cam shaft turns the cam shaft, which is connected in the segment gear. The segment gear (regulated by a timing mechanism) allows the cam shaft to turn for approximately 2.5 seconds. The segment gear then strikes the segment gear stop, thus halting the rotation of the cam shaft. The segment gear stop is prevented from rotating by the projection of the safety pellet. The fuze is now fully armed. Upon impact the safety pellet is forced down by inertia forces,

thus permitting the segment gear stop and segment gear to be rotated further. The cam shaft turns until it releases the spring-loaded firing pin cup. The firing pin spring drives the firing pin into the primer charge, thus initiating the explosive train.

- b. Air burst setting. When the setting plug is set for "Air" burst the fuze operates as described above, except that the safety pellet has already been depressed. The fuze fires approximately 2.5 seconds after the arming stem has unscrewed approximately $\frac{1}{4}$ -inch.

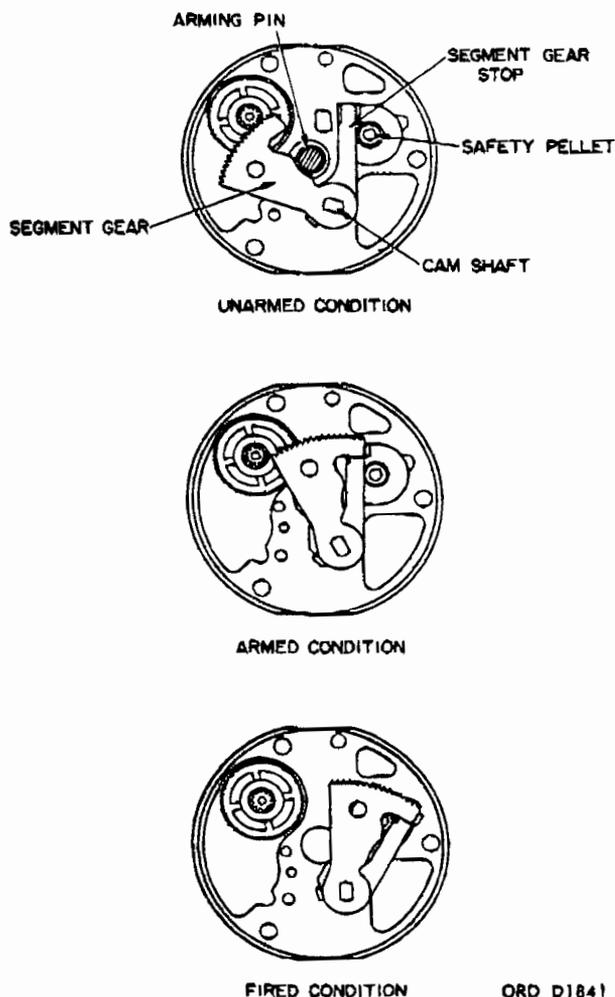


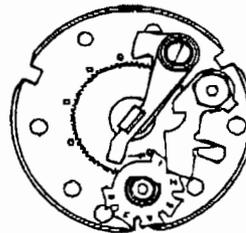
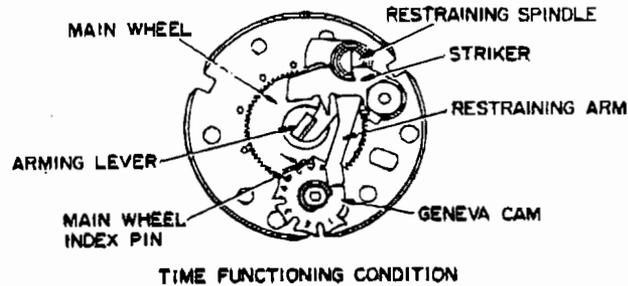
Figure 5-53 General Arrangement of Fuze M129

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56.59

5-6.3.2 to 5-7.1.2

TM 9-1385-51

5-6.3.2 Fuze M130 (figure 5-54) or M130A1. After the arming pin has unscrewed approximately $\frac{1}{4}$ -inch, it releases the arming lever. The arming lever moves until it is centered over the hole previously occupied by the arming stem and releases the timing mechanism. The main wheel is now rotated by the timing mechanism. With a maximum setting time of 60 minutes, the main wheel index pin engages the first slot of the geneva cam as the main wheel completes its first revolution and rotates the cam slightly. The main wheel index pin rotates the geneva cam further for each revolution of the main wheel until the geneva cam releases the restraining arm. The number of main wheel revolutions required before the restraining arm is released, depends on the factory fuze setting. The fuze may be set for 10, 20, 30, 40, 50, or 60 minutes delay. The restraining spindle (actuated by the force of the spring-loaded striker and connected to the restraining arm) rotates with the restraining arm, thus releasing the striker. A point on the striker drives into the primer charge, thus initiating the explosive train.



ORD D1842

Figure 5-54 General Arrangement of Fuze M130

the firing pin cup. The firing pin drives into the primer charge, thus initiating the explosive train.

5-7 FIRE BOMB FUZES

Fire bomb fuzes M154, M157, AN-M173, AN-M173A1, AN-173 MOD, FMU-7A/B, FMU-7/B, and FMU-7B/B, with Igniters M13, M14, AN-M15, AN-M16, M23, and AN-M23A1 are covered in this paragraph.

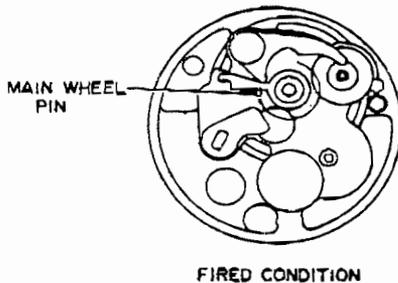
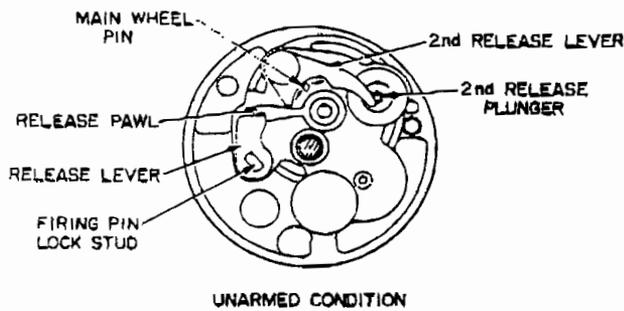
5-7.1 IDENTIFICATION.

5-7.1.1 TYPE. These fuzes are all-ways action, non-delay, impact fired fuze systems.

5-7.1.2 PAINTING AND MARKING. Although the fuze model number of fuze FMU-7A/B or FMU-7/B is stenciled in black on the fuze head, the other fuzes covered herein

TM 9-1385-51

5-7.3 to 5-7.3.2



ORD D1843

Figure 5-55 General Arrangement of Fuze M131

Igniter		Fuze	
Designation	Hazardous Components	Designation	Hazardous Components
M13 and M14 AN-M15 and AN-M16 M23 AN-M23A1	Burster (2.5 grams of tetryl) and White Phosphorus (WP) or Sodium (Na) filler. White Phosphorus (WP) filler.	M154 M157 AN-M173 FMU-7/B FMU-7A/B FMU-7B/B AN-M173A1	Primer M26 and a 0.75 gram black powder charge. Primer M26, Detonator M31 Booster 12 grams of tetryl.

5-7.3 FUNCTIONING.

5-7.3.1 FUZE M154 (figure 5-57). When the bomb is released from the aircraft, the arming wire is withdrawn from the fuze and remains with the aircraft. This action frees the fuze arming pin which moves under the action of the arming pin spring to free the safety pin. The compressed safety pin spring expands forcing the safety pin into the center of the fuze. As the safety pin moves toward the center of the fuze, movement of the striker in the sleeve

may or may not be marked. The igniter AN-M123A1 or M23 is painted light green or has a single light green circumferential band. Designation, symbol of filler and loading information are stenciled in red. The other igniters are marked by stenciling in purple or light red and a single band matching the color of the markings may be painted around the igniter body.

5-7.1.3 FITTINGS AND FEATURES. The general physical characteristics of the fuzes and igniter are shown in figure 5-56.

5-7.1.4 MATERIALS. All of these fuzes have a zinc-alloy body. The head and arming pin of the fuze M154 are brass. The head and vanes of the anemometer type fuzes are either brass or zinc alloy and the bodies of the igniters are made of sheet steel.

5-7.2 HAZARDOUS COMPONENTS. The hazardous components of igniter/fuze assemblies are listed below. The modified fuze AN-M173 contains all the hazardous components of the fuze AN-M173 except the booster charge.

is no longer impeded and the fuze is armed. Upon impact from any angle, the striker and sleeve are forced together so that the firing pin impinges the primer, initiating the explosive and incendiary train.

5-7.3.2 FUZES M157, AN-M173, AN-M173-A1, and AN-M173 Modified (figures 5-58 and 5-59). When the bomb is released from the aircraft, the arming wire is withdrawn from the fuze and remains with the aircraft. This action releases the anemometer

Change 27

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