Aug. 3, 1948. P. J. DAWSON 2,446,268

FUSE FOR PROJECTILES

Filed Aug. 17, 1942

2 Sheets-Sheet 1

FIG. 1.

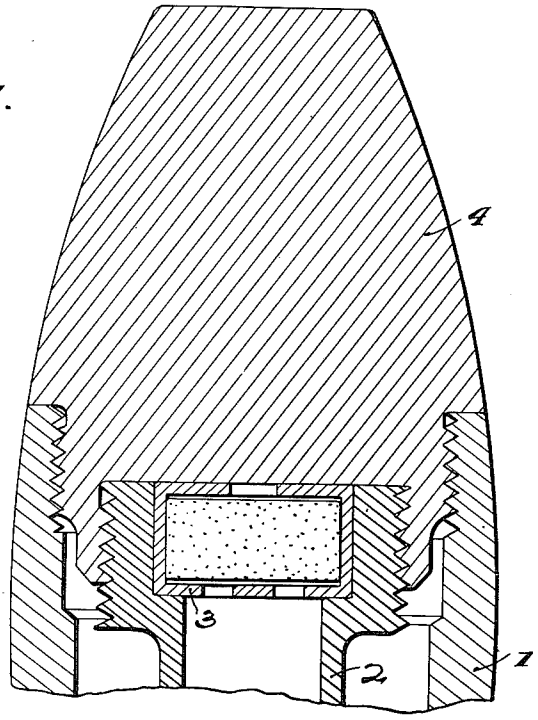
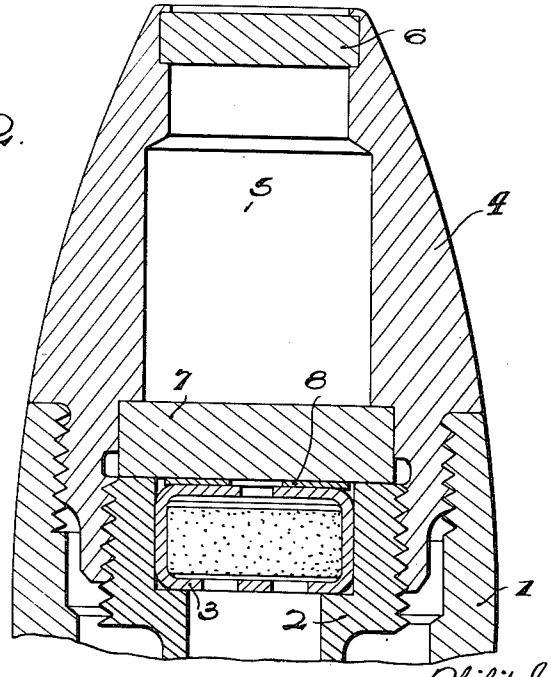


FIG. 2.



Inventor

Philip John Dawson.

By Cameron, Kerkam & Sutton.

Attorneys.

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Filed Aug. 17, 1942 2 Sheets-Sheet 2

FIG. 3.

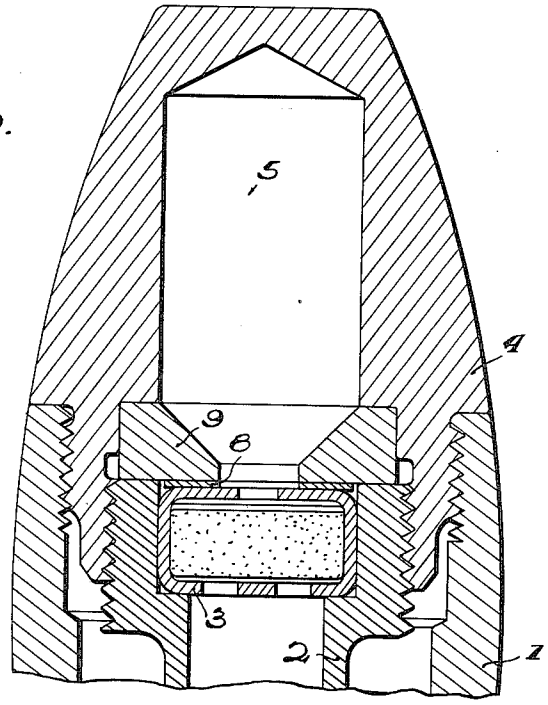
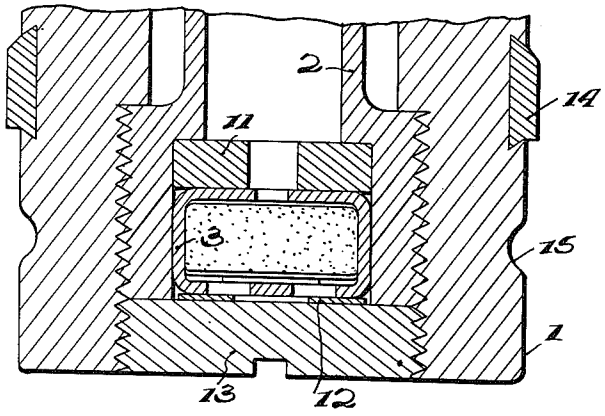


FIG. 4.



Inventor

Philip John Dawson.

By Cameron, Kerkam & Sutton

Attorneys

Patented Aug. 3, 1948

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FUSE FOR PROJECTILES

Philip John Dawson, Beckenham, Kent, England, assignor to The Minister of Aircraft Production, London, England

Application August 17, 1942, Serial No. 455,022
In Great Britain December 7, 1940

1 Claim. (Cl. 102—73)

1

The invention relates to fuzes for projectiles and has for its object to provide an improved and simplified form of safe fuze which can be arranged to give any desired degree of sensitivity.

The invention is based on the discovery that an explosive projectile can be caused to function on impact by a fuse from which the conventional striker and arming mechanism are omitted, inserted in the body of the projectile in contact with or close to a detonator or a part which carries a detonator.

The fuze of the present invention accordingly comprises a body adapted for attachment to the projectile, and having no striker and arming mechanism, part of the body, or a member carried thereby, being located in contact with or close to a detonator or a part carrying the detonator when the fuze is attached to the projectile.

In one form the fuze may comprise a solid body adapted to form the nose of a shell and to be screw-threaded for connection to a correspondingly screw-threaded part at the nose end of the shell body, with its base in contact with the detonator housing.

Alternatively the body may have a bore extending longitudinally partway therein or the bore may extend throughout the body and be closed at its base by a disc, or partly closed by a washer, the said disc or washer abutting against the detonator housing. Where a disc or washer is employed, this may conveniently be held in position against the inner end of an enlarged recess in the bore by the upper end of the detonator housing which is accommodated in the outer end of the recess, this outer end of the recess terminating in a depending portion of the fuze body screw-threaded externally to enter the shell body, and internally to receive the detonator housing. In this form the nose end of the bore in the fuze body is closed, for example, by an end cap, or the bore may extend from the inner end of the fuze body only part way towards the nose so that the nose end of the fuze is integral with the body portion. A washer or disc may be inserted in the detonator housing above the detonator.

When the upper end of the fuze bore is closed by an end cap, such cap may comprise a disc, for example, of brass, fibre or other material, which is retained in an enlarged recess at the outer end of the bore by any suitable securing means. Conveniently the outer end portions of the fuze body may be turned over inwardly to secure the cap in position.

In another alternative the fuze may have the

2

form of a plug inserted at the base of the projectile below the base of the detonator housing.

The sensitivity of the fuze may be regulated by a choice of thickness of the fuze body, and/or by varying the thickness and/or diameter of the end cap and/or the rear disc or washer, and also in the case of a washer being used partly to close one end of the bore in the fuze body, by varying the diameter and shape of the washer orifice. The sensitivity of the fuze may also be regulated by choice of materials used for its components and also by choice of the materials constituting the detonator.

It is believed that the operation of the fuze relies upon a shock or pressure wave reaching the detonator.

The dimensions of the fuze and its component parts can thus be chosen so that this shock wave is insufficient to cause detonation after a certain remaining velocity has been reached but is sufficient at higher remaining velocities to operate the fuze on contact of the projectile with a sufficiently resistant substance. In other cases the fuze and its component parts can be so formed that the shock wave is sufficient to operate the fuze only on contact with substances of or above a given resistance so that on striking substances offering a lower resistance the fuze can penetrate without operating. A fuze of an anti-aircraft shell can thus be arranged to penetrate outer portions of an aircraft, such as wing or fuselage coverings or skins, without operating until it strikes a harder material such as a spar, petrol tank, or other relatively hard part of the aircraft.

The accompanying drawings show in sectional elevation four forms of fuze according to the invention.

Referring to Fig. 1, 1 is the shell body, 2 is the housing for the detonator 3, and 4 is the fuze body, which constitutes the nose of the shell. The base of the fuze body is screw-threaded externally to be accommodated in the mouth of the shell body and internally to receive the detonator housing. The base of the fuze 4 is in contact with the detonator and its housing. The casing of the detonator 3 has a forwardly facing aperture which is so constructed as to allow limited movement within the casing of a portion of the detonating composition relative to the remainder thereof.

In the form shown in Fig. 2 the fuze body 4 has an axial bore 5 closed at the nose end by a disc 6 held by spun portions of the fuze body and opening at the base into a recess in which is accommodated a disc 7 which abuts against the

detonator housing 3. Above the detonator is shown a paper washer 8 which makes contact with the top of the detonator and with the disc 7. The washer 8 is not always required but may be necessary in order to ensure a good fit. The presence or absence of this washer and/or variation of the material from which it is made may be used also to vary the characteristics of the fuze.

The fuze shown in Fig. 3 differs from that in Fig. 2 in having a bore which does not extend to the nose of the fuze and the substitution of a washer 9 with a tapering bore for the disc 7 shown in Fig. 2.

In the form shown in Fig. 4, the fuze is fitted at the base of the projectile. In this form the base of the body 1 is threaded to receive the detonator housing 2 containing the detonator 3, located below a washer 11. Below the detonator a further washer 12 is provided. The fuze closes the base of the projectile, and is constituted by a screwed plug 13 which when in position seats against the washer 12 and detonator housing 2. Outside the body a driving-band 14 is fitted and a cannelure 15 is also provided.

Owing to the simplicity of construction of the fuze it is more economic in construction than hitherto known safe fuzes. Moreover it is capable of much quicker manufacture than the usual type of fuze.

Further advantages of the improved fuze are that above certain ranges it will probably become inert and so be rendered innocuous on reaching the ground; its sensitivity can be readily adjusted by dimensional variation or variation in the materials from which its parts or parts of the projectile near the fuze are made or composed of. The composition of the detonating explosive may also be varied to produce the result.

I claim:

In an explosive percussion fuzed projectile of the type having no striker or arming mechanism, the combination of a hollow projectile body, a detonator casing located in said projectile body and containing tightly packed detonating composition, and a fuze body rigidly secured to said projectile body and positively locating said detonator casing in said projectile body, said fuze body comprising a solid nose plug forming a complete rigid closure for said projectile body and securing the detonator casing against access from the exterior of the projectile, the detonator casing having in its forwardly facing wall an aperture which is so constructed as to allow limited forward movement within said detonator casing of a portion of the detonating composition relative to the remainder thereof under shock due to impact of the projectile on its target.

PHILIP JOHN DAWSON.

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