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FUZE FOR PROJECTILES

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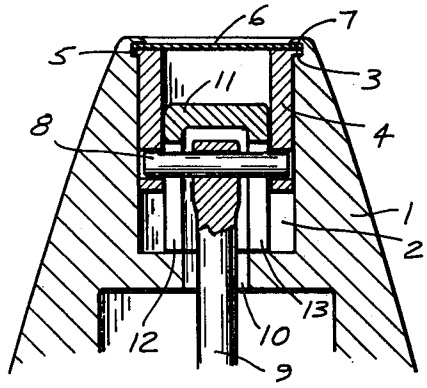


FIG. 1

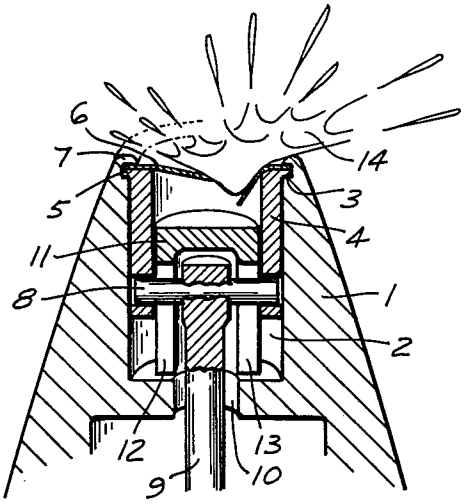


FIG. 2

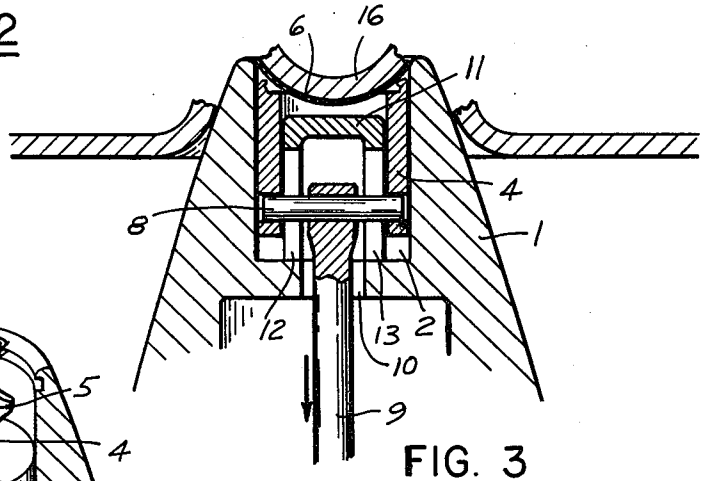


FIG. 3

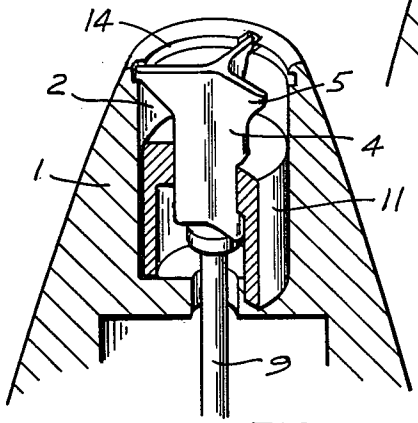


FIG. 4

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FUZE FOR PROJECTILES

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The present invention relates to a fuze for projectiles, rockets, or the like, in which ignition is achieved by a displacement of a fuze part upon striking the target in the axial direction of the projectile.

It is sometimes necessary to make fuzes of the said kind as sensitive as possible, such that the fuze is caused to be initiated upon impact against a very thin aluminum plate. However, the fuze must not be so sensitive that it is initiated upon impact with large raindrops.

Hitherto, especially in the case of small projectiles, it has not been possible to combine a desired high sensitivity to impact against solid targets with sufficient safety against initiation through impact against raindrops.

The known fuzes have been provided with a disc as an impact member, which disc has been arranged in a plane at right angles to the axis of the projectile.

The disc has been of such a size that a part of the thinnest target conceivable, of approximately the same size, can accomplish a retardation at the impact that is sufficient to release the ignition mechanism of the fuze.

Often such a fuze is not rain-safe, as a large raindrop, at a high striking velocity, can actuate the impact member of the fuze with a greater effect than a thin solid object with an area that is of approximately the same size as the impact device of the fuze at a lower impact velocity of the fuze.

The object of the present invention is to avoid this disadvantage of the known fuzes.

A fuze for projectiles, rockets, or the like, in which ignition is achieved by means of a displacement, effected by the target, of an impact member in the axial direction of the projectile, in which the impact member has an impact surface situated in a plane at right angles to the axis of the projectile and has an extent that is greater than the size of large raindrops, according to the invention, as an impact surface of such a form that only parts of the raindrop can have the possibility of affecting parts of the impact surface.

Other objects, features and advantages of the invention will be pointed out hereinafter and set forth in the appended claims. In the drawings FIG. 1 shows a fuze according to the present invention, FIG. 2 shows the same fuze as FIG. 1, but after the effect of a raindrop, FIG. 3 shows the same fuze after the impact against a target, and FIG. 4 shows another design of a fuze according to the invention.

In FIG. 1, **1** is the point of a fuze having a hole or recess **2** of substantially circular cross-section. At its outer end the hole **2** is provided with a bearing surface **3**. In the hole there is inserted an impact member or sleeve **4** that is provided with a flange **5** for bearing against the said bearing surface **3**. At the outer end of the sleeve there is a frangible disc **6**, of predetermined strength and size that the disc is destroyed upon impact against a raindrop or the like. The impact member or sleeve **4** and the disc **6** are retained in their positions by means of a ring **7**, for which a fold can be substituted. In the sleeve **4**, is a transversal pin **8** that goes through the upper end of a rod **9**, e.g. a striker pin or a connecting member to the striker pin. The said rod can further either directly or indirectly actuate an ignition composition. The rod **9** passes through a hole **10** made in the bottom of the hole **2**. Inside the sleeve **4** another sleeve **11** is arranged,

the upper end of which is closed. The sleeve has two axial recesses, **12** and **13**, running from the other end of the sleeve. The said recesses are diametrically opposite each other. The recesses have a width exceeding the thickness of the pin **8**. Because of the sleeve **11** having this design, it can be passed over the upper end of the rod **9** and over the pin **8**, so that the sleeve **11** will bear against the bottom of the hole **2**, at the same time as the pin **8** and the rod **9** can move freely, axially downwards.

If a projectile with a fuze with the impact device described above hits a drop of water **14**, as shown in FIG. 2, the disc **6** will be destroyed and the pressure of the drop of water will mainly be transmitted to the sleeve **11**. Because of its bearing against the bottom of the hole **2**, this sleeve is incapable of transmitting any movement to the rod **9**. If, instead, the drop of water had hit the point of the fuze on the surface formed by the sleeve **4** and its flange **5**, the pressure arising would not be sufficient to move the sleeve **4** rearwards, and thereby to cause initiation.

From the above it is thus obvious that, in accordance with the present invention, by providing an impact sleeve having force transmitting portions circumscribing an area of substantially greater size than the total outwardly exposed impact surface area of such force transmitting portions that transmits the movement to a striker pin, the advantage is gained that a raindrop will not be capable of causing initiation.

In FIG. 3 the fuze is shown after having hit a target, e.g. a wall **15**. At the impact, the point of the fuze pierces the wall **15**, and a part **16** of the wall is carried along. The part **16** will then enter the point of the fuze with such a force that the flange **5** is either sheared off or, as shown in the figure, bent upwards, so that the sleeve can be moved rearwards, which takes place at the impact. The last-mentioned movement is transmitted via the pin **8** to the rod **9**, which causes initiation.

With the design shown in FIG. 4, the point of the fuze has again been designated **1**, and a rod that forms a connection to the striker pin, with **9**. The impact device is designated **4**, but in FIG. 4 it has been given the form of a slide consisting of three thin flanges. A sleeve **11** is arranged in a hole **2** at the point **1** of the fuze, and the front end of the sleeve towards the fuze is closed and provided with the recesses which permit axial movement of the impact member **4**. The outer parts of the flanges of the impact member are designated **5**, and bear against a recess **14** at the front end of the fuze. In the recess **14** a disc such as the one shown in FIGS. 1–3 and designated **6** can be arranged.

It should be obvious that the fuze shown in FIG. 4 functions in the same way as those according to FIGS. 1–3. A raindrop is broken up at the impact against the end surface of the impact member **4**, while a firm object of the same size or larger carries the impact member and consequently also the rod **9** downwards, so that the fuze is caused to function.

While the invention has been described in detail with respect to certain now preferred examples and embodiments of the invention it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention, and it is intended, therefore, to cover all such changes and modifications in the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A fuze for explosive missiles comprising, in combination, a main body member having a longitudinal axis coincident with the longitudinal axis of a missile associated therewith, said main body member defining a forwardly opening nose compartment, an impact member slid-

ably supported within said compartment having a forwardly facing outwardly exposed impact surface for abutment with all confronted objects, the outer extremity of said impact member circumscribing an area of substantially greater area than said outwardly exposed impact surface area defined thereby, whereby engagement of said impact surface with objects having an abutment surface at least as large as said circumscribed area of said impact member transmits a substantially greater force than engagement of said impact surface with objects of smaller size than said circumscribed area of said impact member.

2. A fuze as set forth in claim 1, wherein said impact member comprises a sleeve slidably supported within said nose compartment, radially outwardly extending frangible stop means integral with said sleeve overlying and abutting the front end of said main body member, said stop means of said sleeve abutting with said front end of said main body member and limiting rearward movement of said impact member, and said stop means yielding in response to transmission of a predetermined force inwardly through said impact member to release said impact member for movement inwardly of said nose compartment.

3. A fuze as set forth in claim 1, wherein said impact

member comprises a pin slidably supported within said nose compartment, radially outwardly extending and forwardly facing fins integral with said pin having frangible terminal portions defining said circumscribed area, said frangible terminal portion of said fins overlying and abutting the front end of said main body member limiting rearward movement of said impact member, and said terminal portions being frangible in response to transmission of a predetermined force inwardly through said impact member to release said impact member for movement inwardly of said nose compartment.

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