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PERCUSSION FUZE

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The invention relates to a percussion fuze having a fuze body, a striker axially displaceable in said body and projecting therefrom when in the position of rest, and a shearing member securing the striker in the said projecting position until impact occurs.

It is the object of the invention to form the fuze in such a way that, on the one hand, it is largely insensitive to hits on camouflage and the like but is, on the other hand, readily responsive to impact on the target. To this end, it is intended not only to give optimum configuration to the space occupied by, and bulk of, the percussion fuze, but also to shape the shearing member, provided to secure the striker in its projecting position, in such a way that the said shearing member is not affected by the flying qualities of the projectile nor involves any substantial expenditure on the fuze manufacture.

According to the invention, the shearing member has the form of an annular collar which is associated with one of the parts (either the fuze body or the striker) which are displaceable relatively to each other, and on which a circular shearing edge of the other of said relatively-displaceable parts is able to act so that the shearing collar is cut off on impact by the aforesaid shearing edge.

Two percussion fuze constructions, each in accordance with the invention, are illustrated, by way of example, in the accompanying drawing, in which:

FIGURE 1 shows a longitudinal cross-section through the head of one form percussion fuze constructed in accordance with the invention; and

FIGURE 2 shows a longitudinal cross-section, corresponding to FIGURE 1, but illustrating another form of percussion fuze constructed in accordance with the invention.

Referring to FIGURE 1, a striker 3 is axially guided in a cylindrical recess 1 in a fuze body 2. The head of the striker 3 projecting out of the fuze body 2 is of ogival or pointed shape, and a projecting edge 4 of the striker 3 is seated on an annular end face 5 of the fuze body 2. Underneath the edge 4, the striker 3 has an annular groove 6, and by rolling the front edge of the fuze body 2, material is pressed into groove 6. Outwardly, this produces a groove 7 which extends to above a joint 8 between the edge 4 and the fuze body 2, so squeezing these together. At the point of transition, the angle of bevel of the striker 3 is approximately equal to that of the fuze body 2. Its head is flattened or hemispherical to parabolic. It could also have some different aerodynamically favourable form.

Centrally held inside the fuze body 2 is a sleeve 9 provided with a collar 10, and through a central bore 11 in the sleeve 9 runs a needle 12 which projects into a bore 13 in the striker 3. Mounted in this bore 13 at a certain distance from the end of the needle 12 is a plug 14 of soft, resilient material, particularly a rubber-like synthetic plastics material.

The striker 3 has, in the direction of the collar 10, an annular face 15 and a shearing edge 16 encircling the sleeve 9 at a short distance therefrom. The said face 15 and shearing edge 16 may be surface-hardened or compressed or have a surfacing material or lining of a more solid material, for example, steel. The fuze body 2, the striker 3 and the sleeve 9, 10 consist mainly of a soft

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material such as copper, brass or the like, particularly light metal. The sleeve 9, and its collar 10 can however also be of sintered material or may be pressed or extruded from synthetic-resin-bonded dust or the like, so that the collar 10 acts as a bursting member.

By rolling the top edge of the fuze body 2 into the annular groove 6, the striker 3 is on the one hand prevented from falling out of the recess 1 in the fuze body 2 and, on the other hand, the fuze is sealed so that no water can penetrate the joint 8.

Accordingly to FIGURE 2, a striker 19 is again axially displaceably guided in a cylindrical bore (here shown at 17) in a fuze body 18. That part of the striker 19 which projects out of the fuze body 18 is approximately ogival in shape. A projecting part 20 of the striker 19 takes the form of an annular shearing collar of fixed axial height and is seated on an annular end face 21 of the fuze body 18. Above the shearing collar 20, the striker 19 has a round stepped recess 22. The striker diameter at this point is preferably somewhat smaller than that portion of the striker 19 which is guided in the recess 17. The striker 19 is by rolling the upper portion of the fuze body 18 inwardly or by some other means secured from falling out of the fuze body 18. An inner edge 24 of the fuze body 18 or its end face 21 serves as a shearing edge for the shearing collar 20. Rigidly connected to the striker 19 is a striker pin 23, for example (as shown in FIGURE 2) being screwed thereto. The striker pin 23 ends at some distance before the front end of a fuze needle 25. A sleeve 26 associated with the needle 25 fits into a coil thrust spring 27.

When a projectile having a fuze according to FIGURES 1 or 2 is fired, then, when it strikes leaves or the like, the front end of the striker 3 or 19 pushes its way through the obstruction without being pushed into the projectile. In the case of the embodiment shown in FIGURE 1, the impact produced for example by raindrops, hailstones, insects or the like is absorbed by the soft-resilient plug 14 and is therefore not transmitted to the needle 12. In the case of the embodiment shown in FIGURE 2, a space is provided between the end of the striker pin 23 and the end face of the pin 25, to break the impact impulse.

When the shot strikes the target, the striker 3 or 19 is suddenly forced into the projectile. In the embodiment shown in FIGURE 1, the shearing edge 16 cuts the collar 10 from the sleeve 9, and the edge 4 of the striker 3 is pushed forwardly, widens the rim of the fuze body 2 and enters the guide recess 1. In the embodiment shown in FIGURE 2, the shearing edge 24 cuts off the annular collar 20, and the pin 23 strikes the pin 25 which is pushed rearwardly.

In both embodiments, the fuze responds reliably and quickly even if the shot does not strike the target frontally.

I claim:

1. A percussion fuze which includes: a first member forming a cone-shaped percussion body having an axial bore therein, a second member having a first portion arranged with circumferential play in and substantially coaxial with said bore, said second member also having a second portion integral with said first portion and protruding from the latter beyond the narrower end of said cone-shaped percussion body while tapering in the direction away from said first member, said second member being provided with groove means adjacent said narrower end of said first member, said narrower end portion of said first member having radially inwardly directed collar means integral with said first member and extending into said groove means to interconnect said first and second members, said radially inwardly directed collar means being yieldable radially outwardly in response to a selected minimum impact upon the front end

of said second member, one of said members having connected thereto radially outwardly extending flange means adapted to be sheared off by the other member in response to an axial minimum movement of said second member relative to said first member, and striker pin means arranged within and in axial direction of said members and spaced from said second member and movable into effective position for detonating a charge on engagement by said second member upon movement of said second member relative to said first member in excess of said first-mentioned movement of said second member relative to said first member while making said interconnection of said first and second members ineffective.

2. A percussion fuze which includes: a first member forming a cone-shaped percussion body having an axial bore therein, a second member having a first portion arranged with circumferential play in and substantially co-axial with said bore, said second member also having a second portion integral with said first portion and protruding from the latter beyond the narrower end of said cone-shaped percussion body while tapering in the direction away from said first member, said second member being provided with groove means adjacent said narrower end of said first member, said narrower end portion of said first member having radially inwardly directed collar means integral with said first member and extending into said groove means to interconnect said first and second members, one of said members having connected thereto radially outwardly extending flange means adapted to be sheared off by the other member in response to an axial minimum movement of said second member relative to said first member, said radially outwardly extending flange means forming a portion of an insert inserted into said first member and partially extending into said second member, and striker pin means arranged within and in axial direction of said members and spaced from said second member and movable into effective position for detonating a charge on engagement by said second member upon movement of said second member relative to said first member in excess of said first-mentioned movement of said second member relative to said first member while making said interconnection of said first and second members ineffective.

3. A percussion fuze which includes: a first member forming a cone-shaped percussion body having an axial bore therein, a second member having a first portion ar-

anged with circumferential play in and substantially co-axial with said bore, said second member also having a second portion integral with said first portion and protruding from the latter beyond the narrower end of said cone-shaped percussion body while tapering in the direction away from said first member, said second member being provided with groove means adjacent said narrower end of said first member, said narrower end portion of said first member having radially inwardly directed collar means integral with said first member and extending into said groove means to interconnect said first and second members, one of said members having connected thereto radially outwardly extending flange means adapted to be sheared off by the other member in response to an axial minimum movement of said second member relative to said first member, said second member having an axial bore therein closed toward the outer end face of said second member, striker pin means extending into said bore of said second member and being arranged within and in axial direction of said members and spaced from said second member and movable into effective position for detonating a charge on engagement by said second member upon movement of said second member relative to said first member in excess of said first-mentioned movement of said second member relative to said first member while making said interconnection of said first and second members ineffective, and cushioning means arranged at the bottom of said bore in said second member and normally spaced from the adjacent end of said striker pin means.

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