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FUSE POWDER COMPOSITION

George C. Hale and David Hart, Dover, N. J.

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

The present invention relates to the employment of metals with solid non-metallic elements to form substantially gasless fuze powder compositions which are intended for use primarily in powder trains of ammunition to provide a definite burning time interval.

The primary object of this invention is to provide new and simple fuze powder compositions in which the products of combustion are essentially non-gaseous. A further object is to provide new fuze powder compositions which will burn uniformly in powder trains of ammunition for definite intervals without failure to burn through when once ignited, and which are easily ignitable even when compressed to high density.

We have discovered that the employment of a metal with a solid non-metallic element, each in a very finely divided state, produces a fuze powder composition which meets each and all of the requirements indicated above.

As examples, the following compositions have been particularly successful in producing easily ignitable, uniform burning, non-gaseous fuze powders of definite burning time intervals.

No. 1

	Percent
Zirconium	75
Sulfur	25

No. 2

	Percent
Titanium	60
Tellurium	40

No. 3

	Percent
Titanium	80
Sulfur	20

No. 4

	Percent
Manganese	70
Sulfur	30

The burning time of a powder column 2" long by 0.22" diameter for each of the fuze powder compositions indicated above is as follows,

	Seconds
No. 1	Less than 1
No. 2	Less than 1
No. 3	7
No. 4	4

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It is not intended that this invention be limited to the specific examples set forth above, as it is known that by varying the proportions of the combining ingredients, viz, metals and solid non-metallic elements, the burning rates of the desired compositions may be varied over a wide range.

These new fuze powder compositions are very readily prepared, but careful control of the particle size of the ingredients is essential. It is desirable that the metals and solid non-metallic elements be finely divided so as to pass through a 250 mesh screen. Dry incorporation may be used or the compositions may be mixed with water or any other liquid necessary to avoid accidental ignition in manufacture. After thorough incorporation the fuze powders are granulated in commercially available mechanical granulators or by passing through screens. Although binding agents have not been found necessary to assist in granulating these powders, one may be used if special cases require it.

Having thus described the invention, what is claimed as new is:

1. A fuze powder including finely divided zirconium 75 per cent and finely divided sulfur 25 per cent.

2. A fuze powder including finely divided titanium 60 per cent and finely divided tellurium 40 per cent.

3. A fuze powder including finely divided titanium 80 per cent and finely divided sulfur 20 per cent.

4. A fuze powder including finely divided manganese 70 per cent and finely divided sulfur 30 per cent.

5. A fuze powder composed of a mixture consisting essentially of finely divided sulphur and a finely divided metal selected from the group consisting of manganese, zirconium and titanium, the said sulphur and said metal from said group being so proportioned that when the powder is burned no substantial amount of gaseous products will be evolved.

6. A fuze powder composed of a mixture consisting essentially of finely divided manganese and finely divided sulphur, the said sulphur and manganese being so proportioned that when the powder is burned no substantial amount of gaseous products will be evolved.

GEORGE C. HALE.
DAVID HART.

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