

UNITED STATES PATENT OFFICE

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PYROTECHNIC COMPOSITION

Samuel Wiley, Metuchen, 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 me of any royalty thereon.

This invention relates to a pyrotechnic composition.

In pyrotechnic compositions, magnesium and aluminum are employed separately or together and function as fuels or reducing agents. One disadvantage attendant upon their use in pyrotechnic compositions is that they are associated with oxidizing agents in whose presence they are readily oxidized during storage. They are also readily oxidized in the presence of moisture.

The usual practice intended to obviate this difficulty consists in coating the magnesium or aluminum with an oily or waxy substance, for example, paraffine. This protection is only partially effective as the metals will be oxidized on prolonged storage. In addition this practice is open to the objection that it incorporates an inert substance in the pyrotechnic composition.

I have discovered that if the magnesium or aluminum is embodied in an alloy before being reduced to small particles or powdered form they may be included in a pyrotechnic composition without becoming subject to oxidation and they will retain all their desirable properties and characteristics.

As an example an alloy of equal parts of magnesium and aluminum was ground into powdered form and exposed to the weather for a period of three months without becoming oxidized or deteriorated. When placed in pyrotechnic compositions it was found to be stable and fulfilled all requirements in functioning.

The following formula is representative and suits the required conditions of candlepower and time of burning.

	Per cent
Magnesium-aluminum alloy of equal parts	52
Barium nitrate	47
Castor oil	1

The proportions of the ingredients entering into the formation of the alloy may be varied to suit the convenience of cost and availability of supply. Even when the proportions are at the greatest extremes, the ingredients will be more stable when first formed into an alloy than they will be if introduced separately into the composition.

Other alloys that produce corresponding results are magnesium-silicon, aluminum-silicon, magnesium-zinc and aluminum-zinc.

In compositions intended to give a green color and employing an oxidizing agent having that color characteristic in burning, I have found that a magnesium-copper alloy will produce excellent results as the copper upon burning gives off a green color.

I claim:

1. A pyrotechnic composition comprising an oxidizing agent and particles of an alloy of two reducing agents one of which is silicon and the other of which is of the group magnesium-aluminum.

2. A pyrotechnic composition comprising an oxidizing agent and particles of an alloy of two reducing agents one of which is zinc and the other of which is of the group magnesium-aluminum.

3. A pyrotechnic composition comprising an oxidizing agent and particles of an alloy of magnesium and copper.

4. A pyrotechnic composition comprising an oxidizing agent and particles of an alloy of two reducing agents one of which is of the group copper-silicon-zinc and the other of which is of the group magnesium-aluminum.

SAMUEL WILEY.