UNITED STATES PATENT OFFICE.

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PYROTECHNIC COMPOSITION.

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No Drawing. Application filed April 16, 1921. Serial No. 461,954.

To all whom it may concern:

Be it known that I, ROBERT R. FULTON, a citizen of the United States, residing at Indian Head, Maryland, have invented new and useful Improvements in Pyrotechnic Composition, of which the following is a specification.

This invention relates to a new and useful improvement in pyrotechnic composition.

One of the objects of my invention is the production of a non-gaseous ignition mixture to be used as the base charge or principal ingredient of incendiary bombs, and as an ignition powder in connection with pyrotechnic and thermit compositions which are ignited with difficulty.

A further object is to provide a pyrotechnic composition which will ignite from the spit of a miner's or safety fuse, or at the touch of a red hot wire; which burns quietly with only a slight evolution of gaseous products, and which produces an extremely hot, molten slag which forms in globules and resembles steel; which is safe to handle and manipulate; and which will not deteriorate when stored for long periods of time.

Other objects will be in part obvious and in part hereinafter pointed out. The process preferably consists of a mixture of iron oxid, cupric oxid, aluminum metal, magnesium metal, and red or amorphous phosphorus, all finely powdered.

In preparing the composition, I prefer to use the ingredients in about the following proportions, viz:—

Iron oxid	35	parts.
Cupric oxid	5	"
Aluminum metal	7	"
Magnesium metal	5	"
Red phosphorus	1	"

Good results may be obtained, however, when the ingredients are varied within the following limits:—

Iron oxid	35–50	parts.
Cupric oxid	5–10	"
Aluminum metal	7–20	"
Magnesium metal	2– 8	"
Red phosphorus	5– 3	"

The ingredients may be mixed in any order except that the red phosphorus should be added last. The red phosphorus used in this composition should be free from white or yellow phosphorus, and phosphoric acid. The iron oxid may be magnetic iron oxid, powdered hammer scale, or a cheap grade of the oxid of iron such as Venetian red. The aluminum and magnesium may be of the technical variety, but the cupric oxid should be of fairly good grade.

The amounts of the various ingredients employed depends upon the amount of heat, the rapidity of reaction, and the sensitivity to flame desired. The sensitivity to flame may be controlled through wide limits by varying the amounts of red phosphorus and magnesium. The amount of heat may be controlled to a considerable extent by varying the amounts of iron oxid, cupric oxid and aluminum. The composition should be stored in dry, air-tight containers of glass or tin.

My composition ignites from the flame of a match, from the spit of a fuse, or at the touch of a red hot wire; burns quietly with only a slight evolution of gas, producing a temperature sufficient to melt aluminum, copper, steel, iron, nickel-chromium alloy, and other high melting point metals. It possesses in a high degree all the desired properties of a pyrotechnic mixture to be used as the base charge or principal ingredient of incendiary bombs, and as an ignition powder for pyrotechnic compositions, thermit mixtures, and the like which require a high temperature for ignition.

What I claim is:—

1. A pyrotechnic composition of the character herein described containing iron oxid, cupric oxid, aluminum metal, magnesium metal and phosphorus.

2. A pyrotechnic composition of the character herein described containing black iron oxid, cupric oxid, aluminum metal, magnesium metal and red phosphorus all in powdered form.

3. A pyrotechnic composition of the character set forth comprising substantially thirty-five parts of iron oxid, five parts cupric oxid, seven parts aluminum metal, five parts magnesium metal, one part red phosphorus.

Signed at Indian Head, Maryland, this 25th day of March, 1921.

ROBERT R. FULTON.