UNITED STATES PATENT OFFICE.

ERNST LEUSMANN, OF HANOVER, GERMANY.

PYROTECHNIC COMPOUND.

SPECIFICATION forming part of Letters Patent No. 590,231, dated September 21, 1897.

Application filed November 14, 1896. Serial No. 612,141. (No specimens.)

To all whom it may concern:

Be it known that I, ERNST LEUSMANN, a subject of the German Emperor, and a resident of Hanover, Germany, have invented certain new and useful Improvements in Double Fulminating Heads for Combustible Compounds; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a compound for Bengal lights; and its object is to produce such a compound that in burning will create a special beautiful effect by white or white and colored sparks flying out from the burning mass, such colored sparks being either green or red or other color, as desired.

The compound forming the subject-matter of this invention consists of a combination of shellac, nitrate of a metal of the alkaline earths, solution of an adhesive, and powder of aluminium. To this mass powder of iron or chlorate of potash and sulfur is added, according to the effect that is desired. If it is intended to produce a green light, nitrate of baryta is the nitrate to be used. If it is a red light that is wanted, nitrate of strontia is used instead. The solutions of adhesives may be produced with gum, glue, dextrine, or any other suitable adhesive.

The invention may be more clearly described by explaining the following examples:

Two parts of gum, glue, dextrine, or other similar adhesive are dissolved and then mixed with two parts of shellac, thirty-five parts of a nitrate of a metal of the alkaline earths—as, for instance, of strontia or baryta—and five parts of aluminium powder, to which mixture thirty parts of iron powder may be added. The mass is carefully stirred until a semifluid paste is attained, into which the wooden bars or torches are to be dipped.

In producing the ignitible mass the following method may be employed: Four parts of shellac are dissolved in six parts of alcohol, to which solution ten parts of a nitrate of a metal of the alkaline earths—as, for instance, of strontia or baryta—and two parts of dextrine or the like, and also two parts of finely-powdered aluminium, are added, the whole being mixed, so as to obtain a semifluid, which is brought onto the wooden bar, handle, or torch. When the handles or torches are dry, the ignitible mass is provided with a fulminating head of any suitable description—for instance, such as forms the heads of Swedish matches.

Bengal-light compounds as known until this day produce merely a steady light of various colors, especially red and green. The new compound has an effect which is very different and by far more beautiful, arrived at especially by means of the addition of aluminium powder. The particles of aluminium are made to burn in the flame and thus produce an intense heat, which in turn makes the iron powder to glow and fly outward, the mass at the same time burning away with a green or red color.

If there is no iron powder in the compound, the aluminium powder will only have a driving action on the other parts of compound, so that beautiful bright white, green, and red sparks fly out. This beautiful effect is gained in especially high degree of perfection when, for instance, to the above-described second compound formed of two parts of powdered aluminium about three parts of chlorate of potash and two parts of sulfur are added.

The advantages of the new compound consist in that a far higher effect is obtained by the white stars of glowing iron and the bright white, green, and red sparks.

Having now described the nature of my said invention and how the same may be performed, I declare that what I claim is—

A compound for Bengal lights, consisting of an alcoholic solution of shellac, a nitrate of a metal of the alkaline earths, pulverized aluminium, sulfur, an alkali chlorate, as chlorate of potash, and a binding agent, in or about in the proportions set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ERNST LEUSMANN.

Witnesses:

SCHLÜTE. [L. S.]

JOH. KRACKE. [L. S.]