

UNITED STATES PATENT OFFICE.

JACOB EHRLICH, OF BELLEVILLE, NEW JERSEY, ASSIGNOR TO VERONA CHEMICAL CO., OF NORTH NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

EXPLOSIVE.

No Drawing.

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To all whom it may concern:

Be it known that I, JACOB EHRLICH, a citizen of the United States, residing at Belleville, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Explosives, of which the following is a full, clear, and exact specification.

My invention relates to explosives and refers particularly to explosives containing salts of organic amino sulphonic acids.

Explosives of increased efficiency may be produced by intermixing solutions of the ingredients and bringing to dryness, because of the more complete and uniform composition of the products thus produced.

In order that explosives of this character shall possess the highest efficiency, it is essential that the oxidizing and oxidizable ingredients be soluble, inert with respect to each other during their soluble condition and during their production into dry form, stable under ordinary atmospheric and temperature conditions, and that they be capable of explosion with a maximum of effect under explosive means.

It is further evident, that the explosive force and effect is due largely to the rapidity of oxidation of the oxidizable ingredient and the ability of the oxidizing ingredients to furnish the required oxygen with sufficient rapidity and in sufficient quantities to satisfy the explosive reaction.

The explosives of my invention possess all of the above mentioned, and other, valuable properties and are materials of this character of the highest value and efficiency.

I have found that the amino compounds of the salts of organic sulpho acids are highly oxidizable and that the presence of the amino group increases the explosive force of the powder over those in which this chemical group is absent.

I have further found that my explosives possess great stability to the conditions under which explosives are made, stored, shipped and employed and that, therefore, they can be produced and employed with a maximum of safety.

The explosives of my invention, therefore, contain the salt of an organic amino sulphonic acid intermixed with an oxidizing compound.

By organic amino sulpho acids, I mean the sulpho acids of amino compounds of

benzene, naphthalene, anthracene, their homologues, isomers, compounds and substituted products.

By oxidizing compounds, I mean those compounds which, under proper conditions, will cause an oxidation of the oxidizable compounds causing an explosion; among these may be mentioned nitrates, nitrites, chlorates, per-chlorates, chromates, bichromates, peroxides, permanganates, liquid oxygen, nitric acid esters, aliphatic and aromatic nitro compounds and their substituted products, although I do not limit myself to the specifically mentioned compounds.

The salts of the organic amino sulpho acids may replace wholly, or in part, other oxidizable substances such as aliphatic and aromatic hydrocarbons, wood meal or other forms of cellulose, coal, charcoal or other forms of carbon, sulphides, sulphur, carbohydrates, acetyl cellulose, salts of aliphatic or aromatic sulphonic acids, resins, fatty oils, glue, metallic magnesium, zinc, aluminum, iron complex cyanides, alcohols, glycerines, aromatic bases, ureas, tars, turpentine, camphor, soap, etc. Inert materials such as kieselguhr, mica, etc. may be used to reduce the explosive power.

As an example of an explosive of my invention, I can use 20 parts by weight of the anhydrous sodium salt of sulphanilic acid and 43 parts by weight of potassium nitrate. These salts may be employed by intermixing their aqueous solutions and drying, or by intermixing the finely ground dried powders, but I prefer the former method because of the greater uniformity of the product thus produced.

The product thus obtained possesses high explosive power, is not liable to exposure by mechanical means or mechanical shock, is unaffected by ordinary temperatures or moderate amount of exposure to dampness and possesses the valuable attributes of a desirable explosive.

I do not limit myself to the particular products, quantities or steps of procedure as specifically described as these are given simply as a means for clearly describing my invention.

What I claim is:—

1. An explosive containing a salt of an organic amino sulpho acid.

2. An explosive containing a salt of an aromatic amino sulpho acid.

3. An explosive containing a water-soluble salt of an organic amino sulpho acid.
4. An explosive containing a water-soluble salt of an aromatic amino sulpho acid.
- 5 5. An explosive comprising an oxidizing substance and a salt of an organic amino sulpho acid.
6. An explosive comprising an oxidizing substance and a salt of an aromatic amino sulpho acid.
- 10 7. An explosive comprising an oxidizing substance and a water-soluble salt of an organic amino sulpho acid.
8. An explosive comprising an oxidizing substance and a water-soluble salt of an aromatic amino sulpho acid.
9. An explosive comprising a water soluble oxidizing substance and a water-soluble salt of an organic amino sulpho acid.
- 10 10. An explosive comprising a water-soluble oxidizing substance and a water soluble salt of an aromatic amino sulpho acid.

Signed at Belleville in the county of Essex and State of New Jersey this 29th day of April, 1925.

JACOB EHRLICH.