

# UNITED STATES PATENT OFFICE

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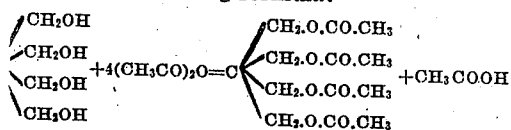
## EXPLOSIVE MIXTURE CONTAINING TETRAACETATE OF PENTAERYTHRITE

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7 Claims. (Cl. 52-20)

The present invention relates to the production of blasting explosives containing tetraacetate of pentaerythrite. It is well known that by acetylating pentaerythrite, the tetraacetate thereof is obtained according to the following formula:



an acetic anhydride is used as the acetylizing substance.

Tetraacetate of pentaerythrite is a white crystalline substance, poorly soluble in cold water but easily soluble in common organic solvents. This product is easily soluble in nitroglycerine and in the nitric ethers of the various alkyltrimethylmethanes, the product also acting as a solvent of the various aromatic nitro-compounds of tetranitropentaerythrite or hexogene (cyclomethyltrinitromine), eutectics being formed with the latter. For instance the eutectic with trinitrotoluene has a melting point at 48.9° C., and tetranitropentaerythrite or hexogene (cyclomethyltrinitromine) at 67.0° C. The tetraacetate of pentaerythrite is not inflammable, is a good gelatinizing means for nitroglycerine and imparts stability to the nitric compounds with which it is used.

These properties of tetraacetate of pentaerythrite render it highly advantageous for the preparation of explosive mixtures as for instance:

- 1) Gun powders in which a part of the gelatinizing substances is substituted by said tetraacetate;
- 2) Mixtures of aromatic nitro-compounds, in which tetraacetate of pentaerythrite the latter having the function of lowering the point of solidification and phlegmatizing the nitro-compounds;
- 3) Mixtures of tetranitropentaerythrite or hexogene (cyclomethyltrinitromine) and tetraacetate of pentaerythrite in which the presence of the latter enables the mixture to be melted at 80° C. and consequently to be employed for preparation of melted charges, a convenient phlegmatization of the nitropentaerythrite being obtained at the same time;
- 4) Mixtures of explosives according to the type mentioned with the addition of inorganic salts, the hygroscopicity of which is diminished by the presence of the acetate of pentaerythrite.

Only by way of example the following composition of some explosive compounds is indicated in which as an advantageous ingredient tetraacetate of pentaerythrite is introduced:

### 1. Propelling explosives

	Per cent
Nitrocellulose (11.60-13.0% of N) .....	50-64
Nitroglycerine or nitric ethers of alkyltrimethylmethanes .....	42-28
Tetraacetate of pentaerythrite .....	2-8

### 2. Bursting explosives

	Per cent
(a) Trinitrotoluene or tetranitropentaerythrite .....	80-50
Tetraacetate of pentaerythrite .....	20-50
(b) Trinitrotoluene or tetranitropentaerythrite .....	15-60
Tetraacetate of pentaerythrite .....	5-25
Nitrate of ammonium .....	80-20

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. A blasting explosive, comprising a mixture of tetraacetate of pentaerythrite and a nitro-compound.
2. A blasting explosive, comprising a mixture of tetraacetate of pentaerythrite and an aromatic nitro-compound.
3. A blasting explosive, comprising a mixture of tetraacetate of pentaerythrite and an aliphatic nitro-ester.
4. A blasting explosive, comprising a mixture of tetraacetate of pentaerythrite and a heterocyclic nitro-compound.
5. A blasting explosive, consisting of a mixture of tetraacetate of pentaerythrite, an inorganic oxidizing salt, an aliphatic nitro-ester and a heterocyclic nitro-compound.
6. A blasting explosive, consisting of a mixture of tetraacetate of pentaerythrite, an inorganic oxidizing salt, an aromatic nitro-compound and a heterocyclic nitro-compound.
7. A blasting explosive, consisting of a mixture of tetraacetate of pentaerythrite, an inorganic oxidizing salt, an aromatic nitro-compound, an aliphatic nitro-ester and a heterocyclic nitro-compound.

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