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PRIMING MIXTURE

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This invention relates to explosives and more particularly to the use of salts of dinitrophenylazide in the manufacture of priming mixtures for small arms ammunition, in commercial detonators, in high explosive shells and the like.

In my prior Patent No. 1,906,394, granted May 2, 1933, I have disclosed and claimed a priming mixture containing lead dinitrophenylazide. I have now found that superior results can be obtained by using alkali or alkaline earth salts of dinitrophenylazide. While the salts of barium, strontium, sodium and potassium may be used to advantage, I prefer to use the potassium salt of dinitrophenylazide. Any of the well known oxidizers and fuels can be used with potassium dinitrophenylazide in proper combinations and proportions to produce operable priming mixtures.

The potassium dinitrophenylazide may be prepared by dissolving 100 grams of diazodinitrophenol in 1200 cc. of acetone. To this solution I then add a solution consisting of 30 grams of potassium azide dissolved in 300 cc. of water. The heat of the solution should be maintained below 50° C. The addition of the potassium azide solution causes a reaction resulting in the formation of potassium dinitrophenylazide. The potassium dinitrophenylazide is precipitated from the solution which may be cooled and filtered to obtain the potassium dinitrophenylazide. It may then be washed with water. The dinitrophenylazide salts of barium, strontium and sodium may be prepared in the same way substituting the corresponding azide for potassium azide in the above procedure.

As a specific example of a center fire priming mixture employing potassium dinitrophenylazide I may employ:

	Percent
Potassium dinitrophenylazide	16
Basic lead trinitroresorcinol	15
Barium nitrate	40
Antimony sulphide	29

The mixture is formed into pellets of the proper weight, loaded into priming cups in the usual loading machines and then the loaded priming cups are placed in the cartridge shells in the usual manner.

As a specific example of a rim fire priming mix-

ture I may employ the following ingredients in substantially the following proportions:

	Percent
Potassium dinitrophenylazide	17
Basic lead trinitroresorcinol	18
Barium nitrate	35
Lead sulphocyanate	5
Ground glass	25

The ingredients are thoroughly mixed and then the mixture is made into pellets of the proper weight in the usual manner. These pellets are spun into the rims of cartridge shells in the usual manner and the cartridge shells may then be loaded with propellant powder and bullets to complete the cartridge.

The superiority of the alkali and alkaline earth salts of dinitrophenylazide over the heavy metal salts of dinitrophenylazide in priming mixtures is contrary to the usual behavior of priming mixture ingredients. Substantially all alkali and alkaline earth salts are soluble in water and are hygroscopic. They are therefore not useful for the preparation of priming mixtures which are loaded into cartridges and which must be capable of withstanding all sorts of weather conditions without decomposition. The corresponding salts of the heavy metals have heretofore been used in the preparation of priming mixtures, such for instance, as lead styphnate, lead azide and the like.

Potassium dinitrophenylazide, on the other hand, is admirably suited for use in priming mixtures. It is relatively insoluble in water, has a higher ignition temperature than lead dinitrophenylazide and is therefore more stable. As a further advantage it produces a molten residue upon decomposition and it has been found that priming mixture components which produce a molten mass result in better ignition of the propellant powder.

I claim:

1. A priming mixture comprising an alkali or an alkaline earth salt of dinitrophenylazide.
2. A priming mixture comprising potassium dinitrophenylazide.
3. A priming mixture comprising barium dinitrophenylazide.
4. A priming mixture comprising strontium dinitrophenylazide.

5. A priming mixture comprising potassium dinitrophenylazide and basic lead trinitroresorcinol.
6. A priming mixture comprising potassium dinitrophenylazide, basic lead trinitroresorcinol and barium nitrate.
7. A priming mixture comprising potassium dinitrophenylazide, basic lead trinitroresorcinol, barium nitrate and a fuel.
8. A priming mixture comprising substantially 16 per cent of potassium dinitrophenylazide, substantially 15 percent basic lead trinitroresorcinol, substantially 40 percent barium nitrate and substantially 29 percent antimony sulphide.
9. A priming mixture comprising substantially 17 percent potassium dinitrophenylazide, substantially 18 percent basic lead trinitroresorcinol, substantially 35 percent barium nitrate, substantially 5 percent lead sulphocyanate and substantially 25 percent ground glass.

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