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EXPLOSIVE

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My invention relates to explosives whose characteristic ingredients are chlorates or perchlorates, or nitrates, of an alkaline metal, or of ammonium.

I am aware that patents have been issued covering the use of liquid oily dinitrotoluene with chlorates or perchlorates of alkaline metals, or ammonium, together with nitrates of alkaline metals, or of ammonium, and various other substances, and I find that explosives made from such formulæ, when freshly made, are excellent but that they begin to lose some of their power in a short time, which power, however, they recover if warmed to about 30° C. or higher.

I find that the so-called commercial liquid dinitrotoluene remains liquid at temperatures ranging from 33° C. to 66° C., in different samples, but that in winter it crystallizes when the atmospheric temperature reaches near or below freezing.

I have discovered that mononitrotoluene, particularly the isomer called orthonitrotoluene, is just as good a sensitizer as the binitrotoluene and, as it does not crystallize until the temperature falls below −10° C. it is practically not affected by ordinary freezing temperatures. I find, however, that while orthonitrotoluene is a good sensitizer it is too fluid and has not sufficient viscosity to make a good plastic explosive powder, so I add to it sufficient trinitrotoluene to give it the necessary body and, by so doing, I also add more oxygen and thus obtain a more powerful explosive.

Orthonitrotoluene is a good solvent for trinitrotoluene, which is a solid crystalline substance which melts at 68° C. By melting trinitrotoluene in steam vats I can mix it with orthonitrotoluene in any desired proportion and thus produce a sensitizer which is stronger than the orthonitrotoluene alone. The trinitrotoluene is therefore dissolved in the orthonitrotoluene and is prevented from solidifying by the said orthonitrotoluene and, in turn, increases the viscosity and the explosive effect of the mixture.

My improved explosive, therefore, comprises chlorates or perchlorates of alkali metals, specifically sodium or potassium, or of ammonium, with or without nitrates of alkali metals, specifically sodium or potassium, or of ammonium, or the above nitrates without the chlorates, together with carbonaceous substances, such as sawdust, charcoal, flour or starch, with or without silico-aluminous substances, such as brick-dust, powdered clay, or sand, or with or without carbonates of alkaline earth metal, particularly calcium carbonate, such as limestone, together with liquid orthonitrotoluene mixed with liquefied trinitrotoluene, said dry substances being first thoroughly mixed together and then the liquid mixture poured over and thoroughly mixed with the said solids, whereby each grain is coated with the said liquid.

The exact proportions of which the various kinds or grades of explosives are composed, will vary within rather wide limits depending upon the character of the work required of them, their cost, and the circumstances under which they are to operate, for instance, the following would be typical powders:—

Rock powder #1

	Parts
Sodium chlorate	78
Trinitrotoluene	7
Orthonitrotoluene	8
Sawdust	7

Rock powder #2

	Parts
Sodium chlorate	73
Sodium nitrate	7
Sawdust	5
Trinitrotoluene	8
Orthonitrotoluene	7

Stumping powder #1

	Parts
Sodium chlorate	40
Sodium nitrate	38
Sawdust	7
Trinitrotoluene	8
Orthonitrotoluene	7

Stumping powder #2

	Parts
Sodium chlorate	33
Sodium nitrate	40
Sawdust	9
Trinitrotoluene	9
Orthonitrotoluene	9

Stumping powder #3

	Parts
Sodium nitrate	73
Sawdust	9
Trinitrotoluene	9
Orthonitrotoluene	9

Having, therefore, described my invention, what I claim is:—

1. An explosive consisting of an oxidizing agent, a powdered carbonaceous absorbent, and a liquid mixture of liquid orthonitrotoluene with melted trinitrotoluene.

2. An explosive consisting of alkaline chlorates, a powdered carbonaceous absorbent, and a liquid mixture of liquid orthonitroluene with melted trinitrotoluene.

3. An explosive consisting of sodium chlorate, a powdered carbonaceous absorbent, and a liquid mixture of liquid orthonitrotoluene with melted trinitrotoluene.

4. An explosive consisting of sodium chlorate, alkaline nitrates, a powdered carbonaceaus absorbent, and a liquid mixture of liquid orthonitrotoluene with melted trinitrotoluene.

5. An explosive consisting of sodium chlorate, sodium nitrate, a powdered carbonaceaus absorbent, and a liquid mixture of liquid orthonitrotoluene with melted trinitrotoluene.

6. An explosive consisting of an oxidizing agent, 70 to 80 parts; a powdered carbonaceaus absorbent, 5 to 10 parts; and a liquid mixture of 5 to 10 parts of liquid orthonitrotoluene with 6 to 12 parts of melted trinitrotoluene.

7. An explosive consisting of sodium chlorate, 70 to 80 parts; a powdered carbonaceous absorbent, 5 to 10 parts; and a liquid mixture of 5 to 10 parts of liquid orthonitrotoluene with 6 to 12 parts of melted trinitrotoluene.

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