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EXPLOSIVE CONTAINING NITROPARAFFIN

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With respect to physical characteristics, explosives are of two general types, solid and liquid. Solid explosives, illustrated by the widely-used trinitrotoluene for instance, have certain advantages of potency, etc., but are handicapped in preparation and manipulation, by their solid state. If such solid explosive be dissolved in known solvents such as benzene, toluene, acetone, alcohol, and ether, the resultant solutions are not explosive. Known liquid explosives on the other hand, as illustrated by nitroglycerine for instance, while having convenience of a liquid are subject to drawbacks such as sensitiveness to mechanical shock or other undesirable characteristics. In accordance with the present invention, explosives may be had which are of great potency and have the advantages of both solid and liquid explosives, and are so insensitive to shock as to be easily handled and transported.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

In accordance with the invention, an explosive agent is made up with a nitroparaffin capable of acting as a solvent. This involves liquid nitroparaffins, and the simpler members, that is a liquid mononitroparaffin having not over two carbon atoms, as mononitromethane, and mononitroethane. These have excellent solvent properties for explosive agents such as nitroaromatic compounds. While nitromethane itself has been reported to be explosive, I have found that in a reasonable state of purity it cannot be detonated by a No. 6 blasting cap. Apparently contamination by considerable amounts of higher nitromethanes, especially tetranitromethane, has caused confusion in tests of the explosive character of nitromethane.

I dissolve in the mononitroparaffin an aryl nitro explosive compound, i. e., trinitrotoluene, picric acid and explosive picrates, trinitrobenzene, tetranitroaniline, nitrophenyldinitromethane. The proportions of explosive compound in the liquid nitroparaffin may vary over a considerable range, depending upon particular effects desired, and for practical results are in the general range of ten per cent up to saturation. At ordinary room temperature 50 to 60 per cent solutions are readily

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prepared. Suitably raised temperatures extend the range of solubility. I incorporate in such solution, an accelerator. This is an aliphatic tetranitro explosive compound of the class consisting of pentaerythritoltetranitrate and tetranitromethane. The amount of such accelerator may vary, depending upon particular effects desired, and for practical purposes may be in the range of one to ten grams for each 100 cc. of the aforesaid solution. In general, pentaerythritoltetranitrate mixtures are less sensitive to shock than those with tetranitromethane.

A liquid preparation of mononitroparaffin and explosive material as indicated, may be handled and loaded in the various usages customary with liquid explosives. However, the present mononitroparaffin liquid explosive is not to be confused as a mere equivalent of nitroglycerine. It has properties and capabilities which entirely transcend those of nitroglycerine. Nitroglycerine is sensitive and has a tendency to be erratic. The composition of the present invention is safely handled and transported. Nitroglycerine freezes at low temperatures, thereby handicapping its use in cold climates; and thawing out frozen nitroglycerine or dynamite is hazardous. To the contrary, the present composition is not subject to such difficulty. Nitroglycerine is subject to degeneration, in irregular and unpredictable degree. The present composition is stable.

Where an explosive is desired in solid state instead of liquid, as for instance in industrial usages, this liquid explosive may be made up in solid form superior to dynamite, by incorporating a solidifying material, such as an absorbent, kieselguhr, cellulose, wood dust or the like; or an active or inactive solid or thickening material, as nitrocelluloses, guncotton and the like may be used.

Nitromethane containing trinitrotoluene dissolved to saturation, and pentaerythritoltetranitrate at the rate of about 5 grams per each 100 cc. of the solution, for example provides an extremely powerful high explosive which is quite insensitive to shock and handling in transportation, and can be detonated by a No. 6 blasting cap or more powerful blasting cap, as desired. In instances where desired, the accelerator may be added to the solution of the mononitroparaffin and the aryl explosive compound just before using.

This application is a continuation, in part and as to common subject matter, of my application Ser. No. 500,375, filed August 28, 1943, now abandoned.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:

1. An explosive, containing as solvent a liquid mononitroparaffin having not over two carbon atoms, and dissolved therein an arylnitro explosive compound in amount of about ten per cent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tetranitromethane.

2. An explosive, containing as solvent a liquid mononitroparaffin having not over two carbon atoms, and dissolved therein trinitrotoluene in amount of about ten per cent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tetranitromethane.

3. An explosive, containing as solvent a liquid mononitroparaffin having not over two carbon atoms, and dissolved therein a compound of the class consisting of picric acid and explosive picrates in amount of about ten per cent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tetranitromethane.

4. An explosive, containing as solvent a liquid mononitroparaffin having not over two carbon atoms, and dissolved therein tetranitroaniline in amount of about ten per cent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tetranitromethane.

5. An explosive, containing as solvent a liquid mononitroparaffin having not over two carbon atoms, and dissolved therein nitrophenyldinitromethane in amount of about ten percent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tetranitromethane.

6. An explosive, containing as solvent a liquid mononitroparaffin having not over two carbon atoms, and dissolved therein trinitrobenzene in amount of about ten per cent up to saturation,

and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tertanitromethane.

7. An explosive, containing as solvent mononitromethane, and an arylnitro explosive compound dissolved therein in amount of about ten per cent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tetranitromethane.

8. An explosive, containing as solvent mononitromethane, and trinitrotoluene dissolved therein in amount of about ten per cent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tetranitromethane.

9. An explosive, containing as solvent mononitromethane, and dissolved therein a compound of the class consisting of picric acid and explosive picrates in amount of about ten per cent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tertanitromethane.

10. An explosive, containing as solvent mononitromethane, and tetranitroaniline dissolved therein in amount of about ten per cent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tetranitromethane.

11. An explosive, containing as solvent mononitromethane, and nitrophenyldinitromethane dissolved therein in amount of about ten per cent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tetranitromethane.

12. An explosive, containing as solvent mononitromethane, and dissolved therein trinitrobenzene in amount of about ten per cent up to saturation, and per each 100 cc. of such solution about one to ten grams of an accelerator from the aliphatic tetranitro class consisting of pentaerythritoltetranitrate and tetranitromethane.

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No references cited.