

## UNITED STATES PATENT OFFICE

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## PROCESS FOR PURIFYING EXPLOSIVES

No Drawing.

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The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

5 This invention relates to a process for purifying explosives.

In the purification of explosives by recrystallization from solvents, I have discovered that the solution may be washed to remove acids and other ingredients by a cleansing agent which does not combine with the particular solvent employed.

15 Certain substances such as toluene, benzene, xylene, carbon tetrachloride and others, which are good solvents for various explosives are insoluble or practically insoluble in water and, consequently, I may conveniently employ water as a cleansing agent.

20 In general, the process consists in dissolving a sufficient amount of the explosive in a solvent to form a solution of suitable concentration at a temperature which is near the boiling point of the solvent. This solution is then brought into contact with a cleansing agent previously raised to the approximate temperature of the solution and the whole is then agitated so that a thorough washing effect is obtained. The cleansing agent may be drawn off and the operation repeated in this manner as often as desired before crystallization is allowed to take place.

35 As a specific example of my improved process a solution of tetryl is made by dissolving approximately 25 parts of the crude tetryl in 75 parts of toluene. This solution which is at a temperature of approximately the boiling point of toluene (110° C.) is agitated in a closed vessel provided with a reflux condenser with an equal volume of water at a temperature of 80 to 85° C. The agitation is then discontinued and the water and the tetryl solution are allowed to separate, which they do readily. This washing operation may be repeated as often as desired or

necessary to remove the acids and other impurities from the solution.

When the solution is sufficiently cleansed, it is cooled with agitation, and preferably with the gradual addition of cold water (though this is not necessary) until the tetryl crystallizes from the solution.

In carrying out the process the proportions of the ingredients of the solution and the temperatures used will be determined by the particular explosive or solvent.

I claim:

1. A process for purifying a normally solid aromatic nitro explosive compound insoluble in water which consists in forming a solution of the explosive compound in a solvent which is practically insoluble in water and agitating the solution with a substantially equal volume of water of approximately the same temperature as the solution.

2. A process for purifying a normally solid aromatic nitro explosive compound insoluble in water which consists in forming a solution of the explosive compound in a solvent which is practically insoluble in water and washing the solution with water of approximately the same temperature as the solution.

3. A process for purifying a normally solid aromatic nitro explosive compound insoluble in water which consists in forming a solution of the explosive compound in a solvent which is practically insoluble in water and washing the solution with a substantially equal volume of water.

4. A process for purifying a normally solid aromatic nitro explosive compound insoluble in water which consists in forming a solution of the explosive compound in a solvent which is practically insoluble in water and washing the solution with water.

5. A process for purifying tetryl which consists in forming a concentrated solution of the tetryl and a solvent substantially immiscible with water at a temperature which

is near the boiling point of the solvent and agitating the solution with a substantially equal volume of water of approximately the same temperature as the solution.

- 5 6. A process for purifying tetryl which consists in forming a solution of twenty-five parts of tetryl and seventy-five parts of a solvent substantially immiscible with water, maintaining the solution at a temperature  
10 approximately the boiling point of the solvent, adding an equal volume of water of approximately the same temperature as the solvent, agitating, and then separating the water and solution.

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