

UNITED STATES PATENT OFFICE.

FIN SPARRE, OF WILMINGTON, DELAWARE, ASSIGNOR TO THE E. I. DU PONT DE NEMOURS POWDER COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF NEW JERSEY.

EXPLOSIVE.

No. 852,142.

Specification of Letters Patent.

Patented April 30, 1907.

Application filed September 11, 1906. Serial No. 334,082.

To all whom it may concern:

Be it known that I, FIN SPARRE, a subject of the King of Norway, residing at Wilmington, county of Newcastle, and State of Delaware, have invented a new and useful Improvement in Explosives, of which the following is a full, clear, and exact description.

I have found that tetranitrodiglycerin $C_6H_{10}(ONO_2)_2$ forms a powerful explosive which, while liquid, does not solidify at temperatures met with in practice, and which is also stable and comparatively insensitive. I have also discovered that when mixed with trinitroglycerin (ordinary nitroglycerin) it imparts to it a non-freezing quality and lessens its dangerous sensitiveness.

The invention consists in a practical application of my discovery of the valuable qualities of tetranitrodiglycerin as an explosive, and to this end the invention consists in tetranitroglycerin absorbed in wood pulp or other porous substance preferably associated both with trinitroglycerin and nitrate of soda or other inorganic oxidizing agent. The trinitroglycerin and the tetranitrodiglycerin, and mostly so the trinitroglycerin, each perform the function of a blasting oil, while the tetranitrodiglycerin also performs the functions of lowering the freezing point of the mixture and rendering it less sensitive, whereby the excellent and peculiar qualities of trinitroglycerin are utilized while its principal objectionable features are avoided. The nitrate of soda acts both as a dope and as a supplier of oxygen to more readily effect the combustion of the wood pulp.

The tetranitrodiglycerin is formed by the nitration of diglycerin, the process being substantially the same as the nitration of glycerin to form the ordinary trinitroglycerin.

The following are examples of explosives containing tetranitrodiglycerin:

I. 25% ordinary nitroglycerin, 15% tetranitrodiglycerin, 50% nitrate of soda, 10% wood pulp.

II. 15% ordinary nitroglycerin, 15% tetranitrodiglycerin, 3% sulfur, 2% rosin, 55% nitrate of soda, 5% wood pulp, 5% sawdust.

III. 20% ordinary nitroglycerin, 10% tetranitrodiglycerin, 3% collodian cotton, 27% ammonium nitrate, 30% nitrate of soda, 10% wood pulp.

The ingredients are simply mixed together in the ordinary way employed in the manufacture of dynamite, although, preferably, the tetranitrodiglycerin is first mixed with the ordinary nitro-glycerin before the other ingredients are added.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. An explosive containing tetranitrodiglycerin, an inorganic oxidizing agent and a porous substance substantially as described.

2. An explosive containing tetranitrodiglycerin, trinitroglycerin and a porous substance in which the same are absorbed substantially as described.

3. An explosive containing tetranitrodiglycerin, trinitroglycerin, an inorganic oxidizing agent and a porous carbonaceous substance substantially as described.

4. An explosive containing trinitroglycerin, tetranitrodiglycerin, nitrate of soda and wood pulp substantially as described.

5. An explosive substance containing of tetranitrodiglycerin 5 to 30 per cent., of trinitroglycerin 10 to 45 per cent., of an inorganic oxidizing agent 15 to 75 per cent. and of a porous carbonaceous substance 5 to 25 per cent., substantially as described.

In testimony of which invention, I have hereunto set my hand, at Wilmington, on this 7th day of Sept., 1906.

FIN SPARRE.

Witnesses:

FRANK H. MASON,
S. M. MUNDA.