INDEX

TO THE

LITERATURE OF EXPLOSIVES

PART II.

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American Journal of Arts and Science	1819–1890.
Philosophical Transactions of the Royal Society	1665–1890.
Proceedings of the U. S. Naval Institute	1874–1890.
Revue d'Artillerie	1871–1890.
Journal of the Royal United Service Institution	1857–1890.
H. M. Inspectors of Explosives Reports	1873–1890.
Dingler's Polytechnisches Journal	1820–1890.
Nicholson's Journal of Natural Philosophy	1797–1813.
Edinburgh Journal of Science	1824–1832.
Popular Science Monthly	1872–1890.
Proceedings American Chemical Society	1879–1890.
Brande's Journal of Science and Arts	1816–1830.

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INDEX.

American (The) Journal of Science. New Haven, Conn. 1819–1890. Abbreviated title: Am. Jour. Sci. Continued from page 14, Part I.

1886. Berthelot. Velocity of the explosive wave in liquid and solid detonants. **31** [3], 149–150. *Ann. Chim. Phys.* **6** [6], 556; 1885.

Kaemmerer. Improved method of preparing nitrogen dioxide. **31** [3], 151. *Ber. Berl.* **18**, 3064; 1885.

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Dixon. Combustion of carbon monoxide and hydrogen. **31** [3], 392. *J. Chem. Soc.* **49**, 94; 1886.

Sandmeyer. Hypochlorites of ethyl and methyl. **32** [3], 74. *Ber. Berl.* **19**, 857–861; 1886.

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Dixon. Combustion of cyanogen. **32** [3], 160. *J. Chem. Soc.* **49**, 384–391; 1886.

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Frankland, P. F. and Dingwall. Decomposition of potassium chlorate by heat. **33** [3], 508. *J. Chem. Soc.* **51**, 274; 1887.

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1888. Munroe Charles E. Wave-like effects produced by the detonation of gun-cotton. (Ill.) **36** [3], 48–50

Dana J. D. History of the changes in the Mt. Loa craters. Explosive eruptions. **36** [3], 104–109.

Ramsay. Molecular weight of nitrogen peroxide. **36** [3], 150–151. *J. Chem. Soc.* **53**, 621; 1888.

1889. Vieth. On the combination of oxygen and nitrogen in gaseous explosions. **37** [3], 225. *Ber. Berl.* **21**, 695; Nov. 1888.

Curtius and Jay. Diamide hydrate and other salts (Explosive reactions with). **37** [3], 493. *J. Prk. Chem.* **39**, 27, 107. *Ber. Berl.* **22**, 134 (ref.); Mar. 1889.

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1665–1890. Abbreviated title: *Phil. Trans.* (Since 1887 the annual volumes have been divided into parts *A* and *B*, each paged separately. *A* is devoted to the physical sciences and mathematics, while *B* is given up to natural history.) Continued from page 18, Part I.

1882. Debus, H. Chemical theory of gun-powder. **173**, 523–594.

Milne, J. and Gray, I. On seismic experiments. (Ill.) **173**, 863–883.

1883. Reynolds, Osborne. Experimental investigation of the circumstances which determine whether the motion of water shall be direct or sinuous. (Ill.) **174**, 935–982. (cf. Threlfall. *Phil. Mag.* **21**, 164–180; 1886.)

1884. Dixon, Harold B. Conditions of chemical change in gases; hydrogen, carbonic oxide and oxygen. (Ill.) **175**, 617–684.

1886. Bell, Chichester A. On the sympathetic vibrations of jets. (Ill.) **177**, 383–422.

1888. Baker, H. Brereton. Combustion in dried oxygen. (Ill.) **179** (*A*), 571–591.

Proceedings of the United States Naval Institute. Annapolis, Maryland. Abbreviated title: Proc. U. S. Nav. Inst., 1874-1890. Continued from page 28, Part I.

1886. Munroe, Chas. E. Notes on the literature of explosives. No. X, **12**, 179-198.

Jenssen, Fred. H. Causes of explosions in the manufacture of high explosives. **12**, 179-181. *Trans. Tech. Soc., Pacific Coast*, **1**, 200; 1884.

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fulminate by hydrochloric acid. **12**, 193–194. *J. Chem. Soc.*, 69; 1885.

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von Förster, Max. Compressed gun cotton for military purposes, particularly regarding its use in shells. Translated by Karl Rohrer. **12**, 563–603; from *pamph.*

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Threlfall, R. On the theory of explosions. **12**, 603–615. *Phil. Mag.* **21**, 164–180; 1886.

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Abbot, H. L. Photographs of Flood Rock explosion. **12**, 618.

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Benjamin, M. Explosives (Notice). **13**, 249. *Appleton's Annual Cyclopædia*, 1884; pp. 342–347.

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Oxholm, C. W. E. Report upon trials with submarine mines executed jointly by Sweden, Norway and Denmark, 1874–1876. (Notice of translation.) **13**, 249. *Prof. Papers, Eng. School of Application, U. S. A.* **2**, 1–121; 1885.

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Griffin, L. R. F. A remarkable explosion. **13**, 405–409 *Pop. Sci. Monthly*, **30**, 810–814; 1887.

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——— The use in Germany of gun-cotton for charging projectiles. **13**, 413–417. *Rev. d'Artil.* **30**, 530–538, 1887; *Militaire Spectator, Breda.*

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Munroe, Charles E. Notes on the literature of explosives, No. 15. **13**, 567–600.

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Pollard, J. M. Resistance of the air to the motion of projectiles. (Dia.) **14**, 97–118.

Munroe, Charles E. Notes on the literature of explosives, No. 16. **14**, 149–168.

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——— Naphtha explosion at Pawtucket, R. I. **14**, 166. *Prov. Jour.*, July 19, 1886.

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——— Discussion of Graydon's system, by E. L. Zalinski and W. W. Dudley. **14**, 423–428.

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Williams, Ed. J Explosive compounds. (Potassium chlorate, prussiate and bichromate, nutgalls, cannel coal, starch, and crude coal oil.) **1**, 590. *U. S. Pat.*, No. 222169, December 2, 1879.

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Eder, J. M. Chemical composition of pyroxyline and the formula of cellulose. **2**, 173. *Berl. Ber.* **13**, 169.

Mann, F. Process of manufacturing nitroglycerine. **2**, 190. *U. S. Pat.*, No. 226867, April 27, 1880. (Vide **1**, 176.)

Warren, Robert W. Explosive compound. (Explosive gelatine mixed with pulverized nitro-cellulose to a dry powder and then mixed with gunpowder.) **2**, 229. *U. S. Pat.*, No. 227601, May 11, 1880.

Parkes, Henry. Improvements in the methods of working nitro-cellulose. (Various solvents used with camphor for making celluloid.) **2**, 231. *English Pat.*, No. 1869, November 10, 1879.

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Felhoen, Chas. Explosive compound. (Common gunpowder cake mixed with 10 per cent. of nitronaphthalene.) **2**, 303. *English Pat.*, No. 2266, June 9, 1879.

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Schmerber, Jules and Charles. Process of treating pyroxyline in the manufacture of plastic compounds. **2**, 403. *U. S. Patent*, No. 233558, Oct. 19, 1880.

Engels, Jacob. Explosive made from pyroxyline, nitroglycerine, pyropaper, xyloidine, nitromannite and silicate of soda, which explodes at a low temperature with or without a percussion cap. **2**, 405. *German Pat.*, No. 10232, Nov. 28, 1879.

Leeds, A. R. Action of hyponitric anhydride on organic bodies. (With phenol it gives picric acid.) **2**, 416–430.

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Morse, Charles A. Explosive compound. (Solutions of nitroglycerine and resin in some volatile solvent are mixed and the solvent allowed to volatilize.) 2, 438. *U. S. Pat.*, No. 234489, Nov. 16, 1889.

Heick, William. Explosive compound. (Mixture of honey and glycerine, treated with nitric and sulphuric acids, chlorate and nitrate of potash, prepared sawdust and prepared chalk.) 2, 459. *U. S. Pat.*, No. 235871, Dec. 25, 1880.

1881. Morse, Charles A. Manufacture of explosive compounds. (Nitroglycerine, a resinous substance and niter intimately mixed.) 3, 64. *U. S. Pat.*, No. 236714, Jan. 18, 1881.

Keil, Frederick C. Explosive compound. (Nitroglucose, nitrate and chlorate of potash, and prepared vegetable matter.) 3, 67. *U. S. Pat.*, No. 238916, Mar. 15, 1887.

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Sattison, John. Method of controlling the explosion of blasting compounds containing potassium chlorate.

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Dean, Gilbert S. Method of preparing nitroglycerine compounds. (100 pts. nitroglycerine, 10 pts. pulverulent nitrocellulose, 2 to 3 pts. water.) 3, 159. *U. S. Pat.*, No. 241941, May 24, 1881.

Lewin, John M. Explosive compound. (Nitroglycerine, cellulose and niter.) 3, 161. *U. S. Pat.*, No. 242783, June 14, 1881.

Devine, Silas R. Explosive compound. (Potassium chlorate and nitrobenzene.) 3, 161. *U. S. Pat.*, No. 243432, June 28, 1881.

Hoggson, Samuel J., and Pettis, George C. Manufacture of plastic compounds from pyroxylene. (The pyroxylene to be used is treated with sal-ammonia to render it less explosive.) 3, 164. *U. S. Pat.*, No. 245952, Aug. 23, 1881.

Lockwood, Charles S. Treatment of pyroxylene. (It is mixed with a solution of camphor in chloral.) 3, 166. *U. S. Pat.*, No. 246891, September 13, 1881.

Drummond, Isaac W. Compound of celluloid and luminous material. (Celluloid and calcium sulphide.) 3, 168. *U. S. Pat.*, No. 248413, Oct. 18, 1881.

Volney, Carl W. Explosive compound. (Mixture of monochlordinitrine and potassium nitrate.) 3, 169. *U. S. Pat.*, No. 249490, Nov. 15, 1881.

Varney, Thomas. Explosive compound. (Title only.) 3, 169. *U. S. Pat.*, No. 249701, Nov. 15, 1881.

von Planitz, Gustave. Explosive compound. (The product of the treatment of rosin by nitric acid.) 3, 171. *U. S. Pat.*, No. 251145, December 20, 1881.

Punshon, R. Explosive compound. (Nitric acid is mixed with pulverized asbestos and picric acid and the doughy mass is put into paper capsules and coated with a cement

of powdered glass and sodium silicate.) **3**, 178. *English Pat.*, No. 2242, June 1, 1880.

1882. Krause, O. H. Obituary of Joseph Goldmark. (He reduced the manufacture of fulminating powder to a comparatively safe process, and established, 1858, a factory for cartridges and percussion caps, and perfected machinery for their manufacture.) **4**, 7–9.

Bjoerkmann, C. G. Explosive compound. (Glycerine mixed with one-third its weight of a carbohydrate, such as glucose, is nitrated and the liquid is mixed with combustible bodies containing oxygen in such proportion that a powder results.) **4**, 41. *English Pat.*, 2483, June 19, 1880.

Mackie, S. J. Explosive compound. (Dry sodium nitrate is ground in a mill with loose gun-cotton and the mass is pressed in moulds, a split tube being inserted to receive the fulminate.) **4**, 41. *English Pat.*, No. 4230, October 18, 1880.

Mills, B. J. Explosive compounds. (Nitroglycerine, moderately nitrated cellulose and alcohol. Also another composed of moderately nitrated cellulose, sodium nitrate, wood cellulose and sulphur.) **4**, 48. *English Pats.*, Nos. 800 and 801, February 24, 1881.

Proudhomme, H. Explosive compound. (Title only.) **4**, 48. *English Pat.*, No. 4200, April 14, 1881.

Tschirner, Max. Improvements in the manufacture of explosive compounds. (Picric acid, tar and potassium chlorate. *Vide* **2**, 375.) **4**, 80. *German Pat.*, 15508, February 6, 1880.

Lewin, I. M. Use of cotton and dextrine for the preparation of a gelatinous nitroglycerine. (Finely divided pure cotton with 5 pts. dextrine are heated under pressure in closed vessel and the jelly formed is dissolved in nitroglycerine to the extent of 7 per cent., forming a mass from which the nitroglycerine will not drain. This is mixed with niter and sawdust.) **4**, 80. *German Pat.*, No. 15073, January 18, 1881.

Elliott, Arthur H. On nitrosaccharose. (Manufacture and properties.) **4**, 147–153.

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Veley, V. H. Rate of decomposition of ammonium nitrate. **5**, 235. *J. Chem. Soc.*, **43**, 370.

Kjeldahl, J. Determination of nitrogen in organic bodies. (By oxidation with permanganate in acid solution.) **5**, 243. *Zeit. Anal. Chem.*, **22**, 366.

1884. Munroe, Charles E. Flashing test for gunpowder. **6**, 7–12.

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Guyard, A. Researches on nitrogen iodide. 6, 34. *Bull. Soc. Chim.*, 41, 12.

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Michaud, E. F. and E. N. Process of extracting glycerine from fatty matters. (Saponifies with water and "zinc-powder" in a closed vessel under steam pressure.) 6, 109. *U. S. Pat.*, No. 293344, Feb. 12, 1884.

Villiers, A. Tetranitrated ethylene bromide. 6, 131. *Bull. Soc. Chim.*, 41, 281.

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Green, A. G., and Rideal, S. New volumetric method for the estimation of nitrous acid. (Depends on formation of diazobenzene by action of nitrous acid on aniline.) **6**, 170. *Chem. News*, **49**, 173.

Cross, C. F., and Bevan, E. J. Oxidation of cellulose with special reference to the chemistry of bleaching and dyeing. **6**, 197. *J. Soc. Chem. Ind.*, **3**, 206.

Hyatt, J. W. Art of manufacturing celluloid and other compounds of pyroxylene. (Consists in displacing aqueous particles by means of pressure applied to a suitable liquid (alcohol, etc.), whereby the aqueous particles are caused to leave the pulp, their places being occupied by the unobjectionable liquid particles, which can afterward be utilized as a solvent.) **6**, 2c4. *U. S. Pat.*, No. 296967, April 15, 1884.

Hyatt, J. W., Wood, H. W., Stevens, J. H. Process and apparatus for effecting the desiccation of pyroxylene pulp. (Formed into a cake which is subjected to great pressure in contact with a surface of bibulous material.) **6**, 204. *U. S. Pat.*, No. 296968, April 15, 1884. Improvement on No. 133229, Nov. 19, 1872.

Hyatt, J. W., Stevens, J. H., Everding, J. Manufacture of pyroxyline material. (Material first formed in cakes or plates, liquid solvents are then flowed over the cakes until a sufficient amount has been absorbed while the cakes are held apart, and finally the material is allowed to remain in an air-tight case a proper length of time.) **6**, 204. *U. S. Pat.*, No. 296969, April 15, 1884.

Hyatt, J. W., Stevens, J. H, Wood, W. H. Manufacture of celluloid and other compounds of pyroxyline. (Pyroxyline is ground to pulp, pressed in cakes and dried; then

the cakes are softened with required amount of liquid solvent by being formed into a pile with the solvent between the cakes, when they are mixed or masticated in heated rolls or other suitable apparatus.) **6**, 204. *U. S. Pat.*, No. 296970, April 15, 1884.

1884. Wood, W. H., and Stevens, J. H. Application of celluloid for enameling textile fabrics, etc. (Sheets of veneer of pyroxylene material made to adhere by subjecting to heat and pressure while in contact with a dried surface of a cement containing oxidizable or drying oil.) **6**, 204. *U. S. Pat.*, No. 297098, April 15, 1884.

Hyatt, J. W. and I. S. Treating and moulding pyroxylene. (Use of finely comminuted camphor mixed with pyroxyline pulp and rendered a solvent thereof by heat.) **6**, 204. *U. S. Pat.*, Reissue No. 10469, April 15, 1884. Original No. 105338, July 12, 1870; Reissue No. 5928, June 23, 1874.

Edson, J. B. Finishing and glossing the surface of fabrics having a coating of some pyroxylene compound.) They are passed through a fluid solvent of the zylonite or similar material, which by evaporation leaves the desired gloss.) **6**, 207. *U. S. Pat.*, 297770, April 20, 1884. Improvements on Nos. 289240 and 289242, November 27, 1883, and No. 290553, December 18, 1883.

Hyatt, J. W. Process of desiccating pyroxylene in comminuted form. (Grinds the nitrocellulose in water and then removes the aqueous particles by agitating the nitrocellulose in contact with an absorbent.) **6**, 207. *U. S. Pat.*, No. 297935, Apr. 29, 1884.

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Hart, Peter. Notes on the concentration of sulphuric acid. (Historical review of methods, with recent process of concentrating in cast iron.) **6**, 244. *J. Soc. Chem. Ind.*, 3, 355.

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measuring tanks, temperature regulating and converting pots, centrifugal machine, etc.) 6, 249. *U. S. Pat.*, No. 299388, May 27, 1884.

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Medola, Raphael. New test for nitrous acid. (Para-amido-dimethylaniline is used as reagent.) 6, 288. *Berl. Ber.*, 256; 1884.

Aarbe, P. Cartridge, and method of waterproofing the same. 6, 298. *U. S. Pat.*, 302819, July 29, 1884.

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Letson, A. F., and Honezger, F. Explosive hand grenade extinguisher. (Consists of a glass shell holding a fire extinguishing liquid, and a cork provided with a tube and bulb filled with a charge of gunpowder.) 7, 155. *U. S. Pat.*, No. 318761, May 26, 1885.

Penniman, R. S. Explosive compound. (Protected ammonium nitrate and potassium chlorate.) 7, 185. *U. S. Pat.*, No. 320583, June 23, 1885.

Ramsay, W., and Cundall, J. T. The oxides of nitrogen. (Molecular composition.) 7, 200. *J. Chem. Soc.* (269), 187.

Ehrenberg, A .Sodium fulminate. 7, 201. *J. prakt. Chem.*, 32, 230.

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Taylor, E. R. Apparatus for manufacture of carbon bisulphide. 7, 215. *U. S. Pats.*, Nos. 321661, 321662 and 321771, July 7, 1885.

Gerhard, C. Composition for Bengal lights. (Strontium nitrate and chlorate, potassium chlorate, powdered glass and flour with an alcoholic solution of a resinous substance.) 7, 217. *U. S. Pat.*, No. 323662, Aug. 4, 1885.

Stevens, J. H., and Wood, W. H. Utilizing celluloid, etc., in the production of enameled goods or veneering.

(Sheets of celluloid, and material suitable to form a backing, are subjected to a high degree of heat and pressure.) 7, 253. *U. S. Pat.*, No. 329093, October 27, 1885.

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Grandval, A., and Lajous, H. Rapid determination of nitric acid. (Depends on transformation of phenol into picric acid.) 7, 293. *Comptes rend.*, 101, 62.

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Zadek, C. W. A. Explosive compound. (Calcium or magnesium resinate and trinitroglycerin.) **8**, 45. *U. S. Pat.*, No. 335006, January 26, 1885.

Pool, F. V. Art of manufacturing nitrocellulose. (Title only.) **8**, 68. *U. S. Pat.*, No. 336822, February 23, 1886.

Müntz, A. Formation of deposits of sodium nitrate. (Theory.) **8**, 70. *Bull. Soc. Chim.*, **45**, 340.

Bielefield, M. Explosive compound. (Nitrocellulose in a solution of ammonium citrate and nitrate.) **8**, 112. *U. S. Pat.*, No. 340276, April 20, 1886.

Weibach, C. Pyrotechnic match. (A stick with an ignitable head and an adjacent coating of different compounds producing colored lights when lit.) **8**, 113. *U. S. Pat.*, No. 340747, April 27, 1886.

Lindsley, M. F. Process of making explosive compounds. (Wood fiber, charcoal, bituminous coal and starch ground together and formed into grains which are treated with acids and, after removal of acids, treated in a solution of potassium carbonate and nitrate.) **8**, 114. *U. S. Pat.*, No. 341155, May 4, 1886.

Jarvis, J. G. Manufacture of zylonite and other pyroxylin compounds and articles made therefrom. (Camphor is dissolved in any solvent which is not a solvent of pyroxylin, and mixed with pulverized pyroxylin.) **8**, 169. *U. S. Pat.*, No. 342208, May 18, 1886.

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Eissler, M. Dynamite. (Coated granules of nitrates, nitrocellulose and nitroglycerine combined with rye flour.) **8**, 236. *U. S. Pat.*, No. 347424, August 17, 1886.

Sundstroem, K. J. Pan for concentrating sulphuric acid. (Title only.) **8**, 237. *U. S. Pat.*, No. 349414, Sept. 21, 1886.

Mowbray, G. M. Process for and apparatus for washing, decolorizing and draining pyroxylin. (Uses oxalic and hydrochloric acids or acid oxalates for decolorizing.) **8**, 238. *U. S. Pat.*, No. 349658, Sept. 21, 1886.

Mowbray, G. M. Method of drying pyroxyline. (Title only.) **8**, 238. *U. S. Pat.*, No. 349659, Sept. 21, 1886.

Mowbray, G. M. Manufacture of pyroxylin. (Title only.) **8**, 239. *U. S. Pat.*, No. 350497. Oct. 12, 1886.

Mowbray, G. M. Manufacture of pyroxylin. (Use of steeled cast-iron pots for holding mixed acids during conversion.) **8**, 239. *U. S. Pat.*, No. 350498, Oct. 12, 1886.

Du Pont, E. Explosive compound. (Nitrates and sulphur combined with charcoal retaining its fibrous structure.) **8**, 242. *U. S. Pat.*, No. 352611, November 16, 1886.

Wilson, W. V. Manufacture of artificial leather or cloth. (Fabric coated with mononitrocellulose dissolved in amyl acetate, mixed with oil and a coloring matter.) **8**, 242. *U. S. Pat.*, No. 352726, Nov. 16, 1886.

Prinzhorn, H. Composition of matter for fuel. (Charcoal, sodium and potassium nitrates or other soluble hyperoxide, glue, dextrin, gum arabic or other adhesive material, clay and iron-filings.) **8**, 242. *U. S. Pat.*, No. 352889, November 16, 1886.

Price, T. Composition for neutralizing the fumes of explosives. (Ammonium carbonate and urate, lime and ferrous

sulphate.) 8, 281. *U. S. Pat.*, No. 354345, December 14, 1886.

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Giebermann, R. Separation of glycerine from fats. (Title only.) 9, 49. *U. S. Pat.*, No. 359148, Mar. 8, 1887.

Schultze, E. Gunpowder. (Nitrohydrocarbon (such as nitro-colophony, tar, turpentine or turpentine oil), pyroxyline and nitrates or salts furnishing oxygen in combination with nitrogen.) 9, 78. *U. S. Pat.*, No. 359289, March 15, 1887.

Berthelot and Vieille. Heat of combustion of solid hydrocarbons and sugars. 9, 112. *Bull. Soc. Chim.*, 47, 867.

Nordenfelt, T., and Meurling, V. A. Manufacture of gunpowder. (The sulphur and saltpeter are incorporated with the carbon (sic) in solution and the solvent evaporated.) 9, 124. *U. S. Pat.*, No. 362899, May 10, 1887.

Bernstein, R. Granular nitrocellulose. (Is prepared from the pulverized nut, fruits or shells of nuts of the *Phytelephas macrocarpa* and kindred plants.) 9, 125. *U. S. Pat.*, No. 363197, May 17, 1887.

McClelland, J. A. Plastic composition. (Pyroxyline dissolved in a non-volatile gum or resin.) 9, 158. *U. S. Pat.*, No. 366231, July 12, 1887.

Volney, C. W. Explosive compound. (Solution of nitrostarch in nitroglycerine.) 9, 158. *U. S. Pat.*, No. 366281, July 12, 1887.

Jorissen, Armand. Detection of nitrates in chlorates. (By reduction with nascent hydrogen and testing with Griess' reagent.) 9, 174. *Arch. Pharm.*, 2, 395.

Amend, O. P. Solvent for pyroxyline. (Mixture of acetate, chloride and chloracetates of amyl.) 9, 179. *U. S. Pat.*, No. 371021, October, 4, 1887.

Domeyer, A., and Hagemann, O. C. Process of recovering glycerine from soap lyes. 9, 179. *U. S. Pat.*, No. 371127, October, 4 1887.

Schoeneweg, H. Explosive. (Nitrated hydrocarbons, nitrated

cellulose and an oxalate or oxalic acid.) **9**, 180. *U. S. Pat.*, No. 371376, October 11, 1887.

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Smolianinoff, S. D. Dynamite. (Asbestos, potassium nitrate and chloride and nitroglycerine.) **9**, 203. *U. S. Pat.*, No. 372338, November, 1, 1887.

Kratschmer, Dr. Apparatus for determination of nitric acid. **9**, 217. *Fres. Zeit.*, **26**, 608–610.

1888. Berthelot, Longuisiene and Recoura. Caloriometric measurements. (Heat of formation of glucose, etc.) **10**, 15. *Bull. Soc. Chim.*, **48**, 700–702.

Bothamley, H., and Thompson, G. R. Estimation of chlorates by the copper-zinc couple. **10**, 26. *J. Chem. Soc.*, **53**, 164.

Heusschen, L. G. Explosive compound. (Coal oil, glycerine, potassium or sodium nitrates, a sulphate and sulphuric acids.) **10**, 29. *U. S. Pat.*, No. 374740, December 13, 1887.

Antheunis, G. Blasting powder. (Mahogany sawdust, sodium nitrate, charcoal, sublimed sulphur, potassium ferrocyanide and ammonium picrate.) **10**, 29. *U. S. Pat.*, No. 374921, Dec. 20, 1887.

Roth, C. Explosive. (Combination of an aromatic chlor-nitro-carburet with an oxidant such as ammonium nitrate.) **10**, 30. *U. S. Pat.*, No. 375651, December 27, 1887.

Meldola R., and Moritz, E. R. Kjeldahl's method for nitrogen. (Removal of nitrogen compounds from sulphuric acid by KNO_2.) **10**, 45. *J. Soc. Chem. Ind.*, **7**, 63.

Emmens, S. H. Explosive derived from phenol. (New crystallized product obtained by action of hot fuming nitric acid upon picric acid in excess.) **10**, 48. *U. S. Pat.*, No. 376145, January 10, 1888.

Bichel, C. E. Manufacture of explosives. (Sulphur and a hydrocarbon are distilled together and the product is mixed

with potassium nitrate or equivalent oxidizing agent.) **10**, 49. *U. S. Pat.*, No. 376849, January 24, 1888.

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Day, T. Cuthbert. Estimation of nitrites alone or in presence of nitrates and chlorides. **10**, 85. *J. Chem. Soc.*, **53**, 422.

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Field, W. D. Pyroxyline varnish. (Pyroxyline is dissolved in the acetic acid derivatives of the lighter alcohols of fusel oil.) **10**, 118. *U. S. Pat.*, No. 381354. April 17, 1888.

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Judson, Egbert. Dynamite. (Consists of a base of nitrate, or its equivalent, the grains of which are protected by a paste, consisting of a cereal or leguminous powder combined with nitroglycerine.) **12**, 23. *U. S. Pat.*, 420626, Feb. 4, 1890.

Broncs, B. Explosive compound. (Consists of a double salt of sodium picrate with other picrates, potassium nitrate, saccharine matter, a gummy or resinous substance and soot.) **12**, 51. *U. S. Pat.*, 421662, Feb. 18, 1890.

Orth, H. Explosive compound. (Consists of the double picrate of sodium and barium or lead combined with nitrated naphthalin.) **12**, 51. *U. S. Pat.*, 421753, Feb. 18, 1890.

1890. Munroe, C. E. Determinations of the firing points of various explosives. **12**, 57–64.

Emmens, S. H. Manufacture of explosives. (Consists in fusing a suitable hydrocarbon derivative such as trinitrophenol with a nitrate.) **12**, 75. *U. S. Pat.*, 422514, Mar. 4, 1890.

Emmens, S. H. Manufacture of explosives. **12**, 75. *U. S. Pat.*, 422515, March 4, 1890.

Emmens, S. H. Explosive. (Paper converted into a nitrocompound and impregnated with ammonia and picric acid.) **12**, 76. *U. S. Pat.*, 423230, Mar. 11, 1890.

Abel, F. A. Gelatinous explosive. (Nitroglycerine and nitrocellulose to which tannin is added to impart a propulsive character to the explosive.) **12**, 125. *U. S. Pat.*, 425648, Apr. 15, 1890.

Germain, P. Dynamite. (Uses spongy vegetable matter for a dope.) **12**, 178. *U. S. Pat.*, 427679, May 13, 1890.

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Maxim, H. S. Manufacture of explosives. (Fibrous guncotton, confined in an exhausted receiver, is dissolved by acetone vapor.) **12**, 240. *U. S. Pat.*, 430212, June 17, 1890.

Maxim, H. S. Recovering solvents from explosives. **12**, 240. *U. S. Pat.*, 430214, June 17, 1890.

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Maxim, H. S. Manufacture of explosives. (Method of treating gun-cotton with acetone in vacuuo, pressing and granulating.) **12**, 365. *U. S. Pat.*, 436898, Sept. 23, 1890.

Mindeleff, D. Explosive compound. (Nitroglycerin, alcohol and a soluble explosive.) **12**, 416. *U. S. Pat.*, 437499, Sept. 30, 1890.

Lundholm, C. O., and Sayers, J. Manufacture of explosives. (Suspending cellulose nitrates and nitroglycerin in water, or a liquid incapable of dissolving them, and agitating them together in the liquid.) **12**, 418. *U. S. Pat.*, 438816, Oct. 21, 1890.

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Hodgson, J. Use of Davy's Safety-lamp. (Experiments in mines.) **1**, 131–135.

Buddle, John. The practical application of the wire-gauze safe-lamp. **1**, 302–307.

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its densities, at successive turns of dilution (with tables). **4**, 291–299.

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M. F. Reduction of the oxide of silver by ammonia. (No fulminate formed under these circumstances.) **5**, 368–369.

1819. Ure, Andrew. On nitric acid. (Reply to Richard Phillips.) **6**, 242–255.

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Leroi. Gunpowder inflamed without a spark. (When mixed with glass, feldspar and the like it may be inflamed by a blow of copper on copper.) **7**, 183.

——— Rupert's Drops. (A bottle is broken by filling with water, placing a drop in it and breaking. Illustrates the efficiency of water-tamped shells.) **7**, 371.

1820. Brande, W. T. On a substance produced during the distillation of coal tar. (Naphthaline?) **8**, 287–290.

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Oxon (*pseudonym*). On the cold which occurs at sunrise, and on nitre in plants. (Nitre found in juices of polygonum bistorta; also in *ashes* of Achillea millefolium, though *not* in the juice.) **9**, 421–422.

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lished at Bazas, France, 1630. (Contains an account of the discovery of the air-gun or Arquebuss.) **11**, 271.

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Leuthwaite, J. On firing gunpowder by electricity. (By passing the electricity through various fluids.) **11**, 391.

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