Descriptive Index to Chemical Patents.

The following is an epitome of the chemical patents issued by the United States in 1855. It was prepared by Dr. Daniel Breed, of the U. S. Patent Office. As chemical processes cannot, like a machine, be illustrated by drawings, we think that Dr. Breed's plan of indexing, not only facilitates reference, but also affords an excellent means of diffusing a knowledge of new processes, and of thus giving an impulse to improvement in the Chemical Arts.—[Ed.

Amalgamation—Pressure applied to ores and mercury (quicksilver) in a cylinder: Leander R. Streeter, May 29.

Benzole—Distilled from coal in atmosphere of hydrogen: Stephen Meredith, July 31.

Bleaching—Diffusion of steam to all parts of (revolving) bleach, by means of perforated pipes, etc., to promote action of chemicals (appar.): Harrison Loring, June 5.

Bleaching—Exhaustion and atmospheric pressure, to hasten chemical action in pores of fabrics (appar.): Chas. T. Appleton, April 17.

Carbon—From gas retorts; used in smelting iron: Saml. Macferran, July 24.

Cotton Seed—Soaked or steamed, and then passed between rollers to break the hulls and to force out the kernel previous to expressing the oil: Danl. W. Messer, July 24.

Cotton Seed—Fibers removed from, by sulphuric acid (oil of vitriol,) etc.: Oscar Reichenbach, Oct. 23.

Digestion—Mixture to promote; made of malt liquor and Liebig's extract of the fourth stomach of the ox: J. J. Sherman, May 8.

Fire—Solution for extinguishing; bicarbonate of soda (pearlash) 16 lbs., to water 100 gals.: Ed. F. Overdeer, March 14.

Glue—Clarifying by treatment with mixture of sulphate of lime (plaster of Paris) and water, and decantation. Wm. Adamson, January 30.

Gold and Silver—Reclaimed from jewellers' scraps, and other metals, by oxydation of the latter by nitrate of potash (niter) under heat, without fluxing, and then dissolving the oxyds in sulphuric acids: L. B. Darling, March 27.

Gold and Silver Ores—Sulphurets oxydized by nitrate of soda instead of nitrate of potash (niter): Homer Holland, May 29.

Hides—Hair loosened by mixture of carbonate and sulphate of soda: Andrew H. Ward, January 2.

Hydro-carbon Vapor—Prevented from condensing by hot air or steam around gas generator and gas pipes (appar.): Samuel J. McDougall, June 5.

India Rubber Cloth—Made pervious to air, but not to water by sudden drying (of fresh cement) at 160° Fah. (evaporation of camphene makes the gum porous): H. G. Tyer, and John Helm, Jan. 2.

India Rubber and Gutta Percha—Vulcanized or not, rendered plastic by treatment with "bisulphurate" of carbon (?) and absolute alcohol: Francis Baschnagel, Aug. 14.

India Rubber Cloth—Made by pressing cloth upon each side of sheet rubber by means of rollers: H. G. Tyer and John Helm, Jan. 30.

India Rubber—Scraps and powder of hard, vulcanized, molded and cemented by heat and pressure: Chas. Morey, Jan. 9.

India Rubber, Vulcanized—Treated with alkalies and oil to remove sulphur: Sigismund Beer, May 29.

Lead, Carbonate (*white*)—Precipitated from solution of subacetate of lead by jets of carbonic acid (cls. app.): Rich. Barker, April 3.

Lead—Corroded by vapor from vinegar factory, and then converted into carbonate (white lead) by gas from fermenting wort, etc. (cls. app.): Robert Rowland, Oct. 9.

Lubricator—Mixture of oil with oleate of zinc, prepared by mixing a solution of soap with one of acetate of zinc: Jacob Marshall, May 22.

Lubricator—Nitrate of potash (saltpeter) hard soap and fat salt pork (refrigerating): Eleazur Brown, July 10.

Lubricator—Oil soap, hot water, and oil, lard, &c.: Freeman Prentiss, May 29.

Lubricator—Tallow, oil, and pulverized lead Nathan Dresser April 17.

Metals, Precious—Ores amalgamated by exhaustion and pressure in a cylinder: Leander R. Streeter, May 29.

Oil—Extracted from seeds by steam, both within and around the boiler: Wm. Wilber, Sept. 11.

Oil, for Wool—Mucilage from sea moss, flax seed, &c.: Thos. Barrows, Aug. 23.

Oil (*fixed*)—Mixed with crude turpentine for lubrication or illumination: Henry W. Adams, April 3.

Paper—Made from entire bark of resinous wood, by moderate heat, and then steaming, the resin being retained as size or stiffening: Chas. C. Hall, Feb. 20.

Paper—Introduction of soluble soap or wax into pulp, and then an addition of mineral salt to render the soap insoluble: Henry Glynn, Feb. 6.

Petroleum (*Asphaltum*)—Bitumen, &c., dry distilled at low temperature, then purified by acid, quicklime, (also peroxyd of manganese,) and re-distillation: Abraham Gesner, March 29.

Roofing—Use of lime in combination with rubber and shellac solutions, in composition for: Jas. West, Oct. 30.

Silica—Dissolved by steam forced into the under stratum of silicates in boiler (cl. app.): Benj. Hardinge, May 8.

Silver—See *Gold*.

Soap—Pressure and high temperature, to produce soap from neutral fatty substance and carbonated alkalies, (the glycerine and carbonic acid being set free): R. A. Tilghman, Jan. 2.

Soda—Borate of, (borax) made from native borate of lime by boiling the latter in water and acid, separating the lime, adding solution of soda, boiling, removing impurities, evap. and cryst.: Thos. Bell and Henry Scholefield, Oct. 9. Eng., July 5, 1854.

Soda Water—Diffusion of gas by perforated disk to charge water: Marcus F. Hyde March 6.

Starch—Sugar added to, during manufacture: Henry Colgate, July 24.

Sugar—Melted in a vacuum for refining: Conrad W. Finzel, April 17. Eng., May 7th, 1853.

Tannin—Extracted from old leather by caustic alkali, and being set free by acid, it is again used for tanning hides. The residual skin is made into glue, Obadiah Rich, Jan. 2.

Tanning—Bleaching and stuffing by three different mixtures, uses alum, borax, table salt, sulphuric acid, acetate (sugar) of lead, chlorhydrate (muriate) of lime, flour, gum tragacanth and alcohol: L. Woodbury Fiske, Feb. 6.

Tanning—Use of close vats in liming hides to prevent the formation of a pellicle on the surface of the vats: L. Woodbury Fiske, Feb. 6.

Turpentine—Crude, freed from chips by melting and passing through sieves: Alex. C. Blount May 8.

Wheat—Cleaned by mixing with freshly slaked (warm) lime before smut-milling: Chas. Campbell, May 1.

Wool—Softened and cleaned by a warm solution of nitrate of potash (niter), Thomas Barrows, July 10.

Zinc-White—Blast (hot or cold) diffused through the mass of the fuel, by means of perforated grate bars, to liberate zinc vapors: J. E. Burrows, Aug. 14.

Zinc-White—Blast (hot or cold) diffused through the mass of the fuel by means of perforated grate bars, to liberate zinc vapors: S. T. Jones, Aug. 14.

Zinc-White—Crushing ore and mixing with fuel, in combination with blast diffused through the mass, by means of perforated grate bars or otherwise: Saml. Wetherell, Nov. 13.

Zinc-White—Jets of air conducted into furnace to consume gases or smoke (cl. apps.): J. G. Trotter, Jan. 30.

Zinc-White—Produced from Franklinite by means of a peculiar furnace, in which air is mixed with vapors (cl. apps.): Thaddeus Selleck, Jan. 30.

Zinc-White—Spelter is vaporized in a close furnace, then the vapor passing into a chamber with heated air, is oxydized (cl. apps.): Smith Gardner, March 27.

Zinc-White—Currents of air in walls of a furnace to partially cool vapor before reaching the cooling chamber (cl. apps.): Saml. Wetherell, Feb. 20.

Crystalization of Wrought-Iron.

The following is from the *Mining Magazine* (American):—

"This peculiar change in wrought-iron is a subject well worthy the most careful examination, at this time when wrought-iron is every day becoming more and more used. That certain causes produce a change in the iron by which its strength is greatly diminished, and its fibrous quality destroyed, without any perceptible external change, the observations both in England and France leave us no room to doubt; and it is of the first importance that these causes should be well defined, and, if possible, the time during which wrought-iron can be subjected to them without incurring risk of fracture, determined by observation and experiment. The fracture of axles of locomotives and cars is not uncommon, and many lives have been destroyed by this accident, which has frequently happened in the ordinary working of the road, without any increase in the average load or speed, and without any previous sign of weakness. The experiments published show that when subjected to shocks and torsions, wrought-iron has a tendency to assume a crystaline state, and becomes brittle; this change may also be produced by magnetism and heat, and by the process of manufacture.

Mr. Hood, at a meeting of the Institution of Civil Engineers in England, stated that a large anchor, which had been in store for more than a century at Woolwich Dock, and was supposed to be made of extremely good iron, had been recently tested as an experiment, and had broken instantly with a comparatively small strain. The fracture presented large crystals. In this case, Mr. Hood believed that this effect was produced by magnetic influences dependent on the length of time the iron had been in the same position.

Mr. Low stated that at the gas works under his direction, wrought-iron fire-bars, though more expensive, were generally preferred. A pan of water was kept beneath them, the steam from which would speedily cause them to become magnetic. He had frequently seen these bars, when thrown down, break into three pieces, with a large crystaline fracture. The same change may be produced in any piece of wrought-iron by heating and rapidly cooling it by dipping it in water for a few times.

This change is also often produced in iron by hammering it when below a welding heat, and in forging intricate pieces of iron-work, the ends have frequently been jarred off while the other were being hammered. The larger the piece of iron is, the more difficult it is to keep it at an uniform heat, and the more likely this change is to take place: and we have lately learned from an English paper that "Mr. Nasmyth's wrought-iron gun has proved a complete failure; and this, not on account of the mechanical difficulties which had to be encountered—formidable as they were—but from an unexpected peculiarity in the material employed, when brought together in so large a mass as was necessary for Mr. Nasmyth's purpose."

The explosion of the large wrought-iron gun on board the U. S. ship *Princeton*, some years since, was doubtless owing to the same cause.

Concussion alone, if long continued, will produce this change. A small bar of good tough iron was suspended, and struck continually with small hand hammers, so as to keep up a constant vibration. This bar, after this experiment had been continued for some considerable time, became so exceedingly brittle that it entirely fell to pieces, under the light blows of the hand hammers, presenting throughout its structure a highly crystaline appearance.

The cold hammering of railway axles sometimes produces crystalization in the same manner as in the experiment just cited. In order to test this, Mr. Nasmyth subjected two pieces of cable bolt iron to one hundred and sixty blows between sways, and afterwards annealed one of the pieces for a few hours. The unannealed piece broke with five or six blows of the hammer, showing a crystaline fracture, while the annealed piece was bent double under a great number of blows, and exhibited a fine fibrous texture.

The shocks which the axles of road vehicles experience in use sometimes occasion this change, though the process must be very slow when compared with that of railway axles. The wheels of cars and locomotives being fixed to the axle, and the axle rotating is much more liable to this change from two causes. Where the wheel is of cast-iron, the different vibrations of the two different materials seem to facilitate this change, and in this country, where cast-iron car wheels are to a great extent used, the fracture generally takes place close to the wheel. Owing to the rapid rotation of the axles they become highly magnetic, and there seems to be a close connection between magnetism and crystalization. The presence of steam seems to have an influence in producing this change, owing, perhaps, to the developement of electricity, and this may have a great effect upon the axles of locomotives.

The severe winters of New England, as well from the action of frost on the iron axle, as from its effect in making the track rough, doubtless has a tendency to hasten the process of crystalization, and to produce fracture in axles affected by this change. We have known of the fracture of the axles of the driving wheels of two locomotives occurring on one road in New England in one week during the month of February, 1856. One of them was broken close to the wheel, and the whole surface, from the center to within an eighth of an inch of the circumference presented a bright granulated appearance; a narrow rim extending round the whole axle looked smooth, and of a duller color, as though it has been fractured for some time.

From the fact that this process of crystalization appears to begin in the center of the axle, and from a belief that the effect of the blows and concussions which an axle receives would be greatly diminished if the axle was made hollow; this plan has been tried upon several English roads, with highly encouraging results. A hollow and a solid axle have been run hot in a lathe for two hours, without oil, at a speed corresponding to twenty miles an hour traveling; the solid journal broke off, with 179 blows, quite short and crystaline; but the hollow journal would not break transversely, and longitudinally in several places, with four hundred blows, without any appearance of change in the texture of the iron.

There seems to be no doubt that under certain circumstances wrought-iron is liable to undergo a change by which its strength and tenacity are destroyed, and that railway axles are in a special manner liable to this change. Some of the causes, or supposed causes of it, we have briefly alluded to; not with sufficient fulness, perhaps, to afford much valuable practical information, but enough so, we trust, to lead others, with better opportunities and greater abilities, to investigate this subject, so important in its bearings both on the safe and the economical working of railroads."

[We omit a part of the extract respecting the difficulties in forging the wrought-iron gun of Nasmyth. A steel gun, of larger caliber than that of Mr. Nasmyth, has, since his failure, been successfully forged at the Mersey Steel Works, Liverpool; and repeated experiments have proven it to be the strongest cannon in England. The idea, then, that huge masses of wrought-iron cannot be forged without becoming crystaline, based upon the failure of Nasmyth's gun, or that of the *Princeton*, is incorrect.

Please's Pastils.

Willow charcoal, 1-2 lb., benzoic acid, 6 oz., 1-2 drachm each of otto of thyme, otto of caraway, otto of rose, otto of lavender, otto of cloves, and otto of santal.

Prior to mixing, dissolve 3-4 oz. niter in half a pint of distilled or ordinary rose water; with this solution thoroughly wet the charcoal, and then allow it to dry in a warm place.

When the thus nitrated charcoal is quite dry, pour over it the mixed ottos, and stir in the flowers of benzoin. When well mixed by sifting—the sieve is a better tool for mixing powders than the pestle and mortar—it is finally beaten up in a mortar with enough mucilage to bind the whole together, and the less that is used the better.