Nitric Acid.

Nitric acid is obtained from nitrate of potass, by distilling it with sulphuric acid. Upon the large scale 112 lbs. of nitre and 56 lbs. of sulphuric acid yield about 52 lbs. of a red fuming nitric acid of a specific gravity of 1.48. The red color is owing to the presence of nitrous acid. Some manufacturers employ three parts nitre and two parts sulphuric acid; and if the distillation be carried on at as low a temperature as possible, an almost colorless acid is obtained. The apparatus generally employed for distilling nitric acid consists of an iron pot set in a furnace, with an earthenware head luted to it, communicating with two or three receivers, of earthenware furnished with stop cocks of the same material; the last having a safety-tube dipping into a small quantity of water. The nitric acid, like hydro-chloric acid, is a solution of the dry acid in water; the strength of the liquid acid will therefore depend upon the quantity of real or dry acid contained therein. Tables have been constructed for the purpose of ascertaining the quantity per cent of acid and water by the specific gravity of the solution. The most extensive of those tables is that by Dr. Ure

Nitric acid of the specific gravity 1,4855 is the strongest colorless acid met with in commerce. The nitric acid of commerce is never pure; it generally contains traces of sulphuric acid, from the heat at which it was distilled being too great, and of hydro-chloric acid, on account of the nitre containing chloride of potassium. In order to detect the sulphuric acid, dilute a portion of the acid suspected to contain it with three times its weight of water, and add a few drops of solution of chloride of barium or nitrate of baryta, which, if sulphuric acid be present, will form a dense white precipitate sulphate of baryta. To detect the hydrochloric acid, add to another portion of the acid a few drops of the nitrate of silver; when if hydrochloric acid be there, a curdy white precipitate, falls which when exposed to light, gradually blackens, will be formed—the chloride of silver.

Nitric acid is used for the purpose of seperating a few of the metals, especially gold and platinum, from all others; these few being insoluble in nitric acid,—all others soluble; thus, it is in constant use in the process of assaying, for separating silver from gold. It is also used to separate tin and antimony from other metals which yield soluble oxides; for, when compound minerals containing tin or antimony and other metals are subjected to the action of nitric acid, the other metals form soluble nitrates, whereas tin and antimony remain as insoluble oxides, and can thus be separated. It is used, moreover, to peroxidise iron and manganese, by which these metals are rendered insoluble, even were they previously in solution with other substances, such as the soluble earth, &c. Dilute nitric acid separates sulphur from the sulphurets of the metals in the form of a grey powder; but, if concentrated, the sulphur unites with a portion of the oxygen, and sulphuric acid is formed. The concentrated acid detects sulphureted hydrogen, by precipitating the sulphur as a grey white powder if in solution, or by a white cloud if in the atmosphere, and at the same time destroys its fetid odor. It is used to determine with certainty that the precipitate with nitrate of silver formed when testing for chlorine, is really owing to the presence of that substance; for, though many other substances, such as phosphoric acid, carbonic acid, oxalic acid, &c., form similar precipitates, these latter are all soluble in nitric acid, the chlorine alone being insoluble. Nitric acid is a test for certain organic substances, particularly those containing nitrogen, to the solution of which it generally imparts a bright color; for instance, to a solution of guaiacum it gives a blue and green color; solutions containing animal matter, exhibit a yellow color; and it is the most characteristic test for morphia and strychnia, giving with a solution of these substances a bright blood-red color to the former, and scarlet-red to the latter. It distinguishes gum from starch, by converting the former into mucus or saclactic acid; it is much used in the manufacture of suberic acid from cork, and in the manufacture of oxalic acids, &c.

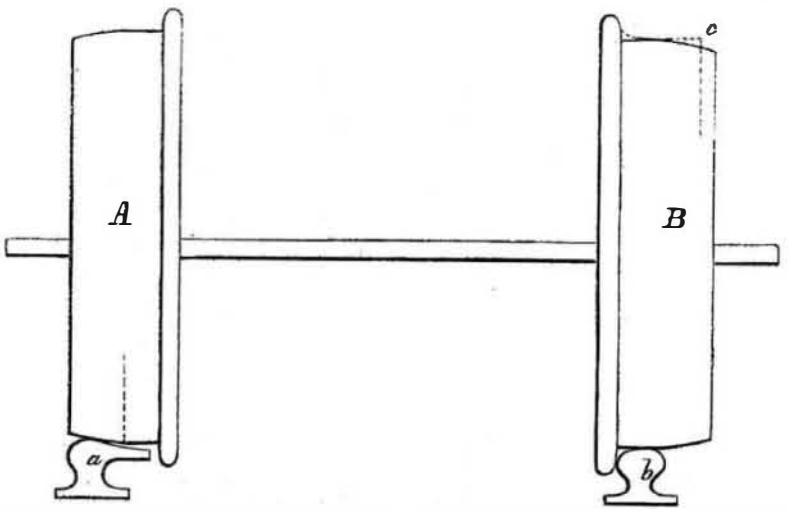
A Lost Art.

The most remarkable Chinese porcelain is the Kiasing, or azure pressed: the secret of its manufacture has been lost, but the specimens which are preserved are of inestimable value. The art was that of tracing figures on the china which are invisible until the vessel is filled with liquid. The porcelain is of the very thinest description, almost as thin as an egg-shell. It is said that the application in tracing these figures is internal, and not by external painting, as in ordinary manufacture, and that after such tracing was made, and when it was perfectly dry, a very thin covering or coating was laid over it of the same paste of which the vessel had been formed, and thus the painting lay between two coatings of china ware. When the internal coating became sufficiently dry they oiled it over, and shortly after, placed it in a mould and scraped the exterior of the vessel as thin as possible without penetrating to the painting and then baked it in the oven. It is evident that if such be the mode adopted, it would require the nicest dexterity and patient care for which the Chinese are remarkable; but although they constantly endeavor to recover the exact method, the materials have been hitherto unavailing.

Asbestos.

Pliny mentions having seen napkins of cloth made of asbestos; which being taken from the table after a feast, were thrown into the fire, and by that means were better cleansed than if they had been washed in water; but its principal use was, according to that author, for making the shrouds for the royal funerals, to wrap up the corpse, so that the human ashes might be preserved distinct from the wood.

FLAGG'S IMPROVED RAILROAD CURVE.



The purpose of this invention is to obviate the friction which at present occurs between the rails and the wheel, at the curves of railroads. That friction is, to a great degree, caused by the fact, that both wheels and rails are adapted only for running on straight lines of roads, and have no adequate means of accommodating themselves to each other, on the curved parts. The rails being laid parallel to each other, the inner rail is, of course, a curve of shorter radius than the outer; and the wheels being fixed on the same axis, and their treads being of the same diameter, the wheel on the inner rail must constantly tend to get in advance of that on the outer rail.

The nature of this invention consists in so forming both the rails and wheels for railroads that the same freedom of motion is permitted on curves as on the straight parts of the track, when a pair of wheels is placed as usual, on the same axis and both made fast thereto. It also permits the accurate guiding of the flanges, of the horizontal lateral movement of the wheels, doing away with the swinging motion from side to side.

The alterations which are made in the rails to adapt them to the purpose of turning curves consist in giving the inner rail, on the curved part of the road, a greater breadth on its upper surface than the outer one (which remains of the same form as on the straight portions of the track) and in sloping or bevelling said inner rail inwards towards the middle of the track. The degree of inclination given to the bevelled part of the inner rail is such as to prevent the tread of the wheel from resting on any part except the higher lide of the edge of the rail, while tho lower part of the bevel of the rail is still high enough to act as a guide to the flange of the wheel which passes over it.

The alteration in the ordinary wheels, which adapt them to the rails above described, consists in making the tread in two distinct portions, one next the flange, having only the slight coneing of ordinary railroad wheels; and the other part comprising the remainder of the treads being more decidedly coneing. The first of these portions is generally made about one and a half or two inches, and is intended to run on the straight parts of the road, and to keep on the outer rail while running on the curves; the second portion is designed exclusively for running on the inner rails of curves, and is made from three to three and a half inches wide.

To pass over curves of from 500 to 1000 feet radius, a breadth not exceeding three inches on the surface of the inner rail, will be sufficient; and on curves of less than 500 feet three and a half inches will be required. In laying the inner rails upon curves, the inner or guiding edge is laid flush with the inner or guiding edge of the rail upon the straight part or tangent of the road. By widening the rails according to the shortness of the radius of curvature, the vibratory motion of the car from side to side of the track, is prevented.

There are two other kinds of wheel that are well adapted to run upon rails as above described, one of which is invented by Mr. Elgar, having a portion near the flange cylindrical and another portion coned. The other may be uniformly coned, but should be somewhat wider than the wheel now recommended.

The increased width of wheel allows of greater lateral play of the journal in the boxes, and it is advisable that this play should be about one inch—not so much to meet the case of general travel, as to facilitate the turning of short curves into warehouses, &c, upon the principle as recommended by Mr. Stimpson.

The above cut represents the bearing of the wheels when upon a curve. A, wheel running upon its smaller circumference, upon the elevated portion of the rail (marked *a*.) The wheel B, being the outer one is shown to be bearing nearest the flange, upon the ordinary T rail. The dotted line *c*, at the top of this wheel, shows the form of the present wheel as contrasted with Mr. J. F. B. Flagg's, who resides at No. 190 Arch street, Philadelphia.

Manchaneel Poison and its Antidote.

There is a tree called the Manchaneel, in the West Indies; its appearance is very attractive, and the wood of it peculiarly beautiful; it bears a kind of apple resembling the golden pippin. This fruit looks very tempting, and smells very fragrant, but to eat of it is instant death, and its sap or juice is so poisonous, that if a few drops of it fall on the skin, it raises blisters and occasions great pain.—The Indians dip their arrows in this juice to poison their enemies when they wound them. Providence has so appointed it, that one of these trees is never found, but near it grows a white wood, or a fig tree, the juice of either of which, if applied in time, is a remedy for the diseases produced by the Manchaneel.

Liquid Glue.

One quarter of a pound avoirdupois of shell lac, dissolved in three ounces of apothecaries measure of naptha; put the shell lac into a wide-mouthed bottle, and pour the naptha upon it; cork it up and stir it with a piece of wire two or three times during the first six and thirty hours. It can be made without any measurement at all, by adding shell lac to naptha until it becomes of the consistence of cream. When the shell lac is thoroughly dissolved in naptha it forms a liquid glue always ready for use, and peculiarly applicable to the pattern-maker, joiner, or carpenter, and perfectly waterproof, with which the longest joint may be rubbed close.

LITERARY NOTICES.

The July No. of the Pictorial National Library is now on our table. We cannot speak too highly of this work, as we esteem it one of the most valuable publications issued in this country. The present number contains a great amount of useful and entertaining matter, from the pens of some of our best writers, and is embellished with a number of fine engravings. This number commences the volume. Wm. Simonds, Boston, publisher.

We are indebted to Messrs Long & Bro. of No. 43 Ann street, N. Y., for the August No. of Godey's Lady's Book, which is decidedly the gem of the season.

Mr. Godey seems to be indefatigable in his exertions to render his publication worthy of the extensive patronage which it has received, and in this number—as in all others—he has been eminently successful.

The August number of Graham's American Monthly Magazine is now on our table. It contains some very beautiful engravings, among which the Siesta by Ellis, is of superior merit. Mr. Graham, evidently, does not intend to allow his Magazine to be surpassed by any, if beauty of embellishments, and choice reading matter can prevent it. W. H. Graham, Brick Church, has the work for sale.

Holbrook's New England Railroad Guide and Traveller's Pocket Companion, is an admirable little publication, containing all the information a traveller can possibly require in his passage to any part of New England.

"The Spirit of the Age," is a new weekly paper, published by Fowler & Wells, this city, edited by Mr. H. Channing. There can be no mistake about its spirit, and the ability of its management.