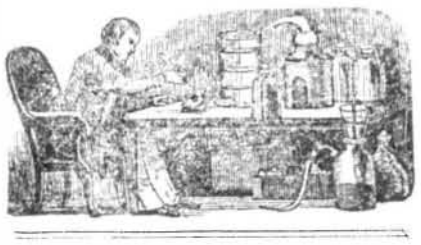


Prepared for the Scientific American.

Manufacture of Gas.

(*Concluded from our last.*)

On the occasion of the illumination for the peace of 1814, when theallied sovereigns visited England—the Pagoda erected by order of the government in St. James's Park, was bril liantly illuminated with more than ten thousand gas burners, which were simultaneously ignited, and the gas light rose into the air with the majesty of a rocket—the whole appearing like a mass of living light. A splendid scene, presenting one unbroken volume of flame, lighting up the heavens and the earth as far as the eye could reach, with astonishing distinctness. This exhibition of the astonishing power of gas light, it is said, encouraged the justly celebrated chemist and architect who erected the splendid lantern on the Capitol at Washington, for the illumination of the Capitol grounds. To the mind of the chemist, it furnishes a successful precedent establishing the practicability of lighting an extensive area, by elevating a powerful concentric burner, several hundred feet above the object on which its rays are to fall. From the improvement in the construction of burners—and from the discovery and application of Oil gas. whose power and economy has been supposed to exceed far that of Coal gas, and that the illumination of the Capitol by Mr. J. Crutchett will far exceed that of St. James's Park. That illumination by gas was far more splendid and magnificent than any former exhibition. The power of the light from the concentration of its flame, gave a remarkable distinctness to objects at a great distance.—This gas has been introduced into the larger cities and villages in England, France, Scotland and to a considerable extent in the United States. A stronger and more intense light then, can be had from the ordinary sources, is indispensable in some of the departments of active industry Necessity more than any other cause has led to the adoption of coal gas thus extensively, notwithstanding the numerous and valid objections to its use. Gas made from oil, now termed Solar Gas, is an excellent substitute for coal gas, being far superior in the brilliancy and power of its light, and the safest. but not the cheapest as some have stated, as the Olifiant Gas Company of Edinburg, Scotland, have fallen to wreck in their competition with coal gas, although the said company was formed with the most sanguine expectations.

Every year presents us with new discoveries tending to promote the convenience, comfort and happiness of man. To this end the Solar gas as now applied to the general purposes of light contributes its full share. The industrious mechanic and assiduous student are now furnished with the means of pursuing their several occupations advantageously during the shades of evening without the fear of injuring their health or enfeebling their sight. To operatives of every class it is a precious boon offering vast advantages never before obtained by means of artificial light.

Oil Gas, named by the associated Dutch Chemists Olifiant Gas, from the peculiar oil-like substance formed by its union with chlorine, was discovered in the year 1796. For a considerable period it received but little attention, except in the laboratories of chemists. Its high illuminating power rendered it always a favorite subject for experiments. During the progress of gas lights, numerous efforts were made to construct an apparatus for generating the gas on a large scale, and applying it to the useful purposes of light, without much success. On the due admixture of atmospheric air turned the question of its utility, the solution of which has been obtained at a recent period.

By the discovery of Mr. James Crutchett, the inventor of the atmospheric mixer, the great question of the practical application of the solar gas for the purposes of light, is placed beyond doubt. Few inventions offer greater advantages than this. By it may now be obtained an agreeable, healthful and safe light, with an unvarying intensity for all the practical purposes of life. For cities, villages, factories and workshops, public halls and private residences, it possesses superior advantages.

By a number of experiments lately made in England for separating the ammoniacal compounds, some valuable discoveries have been made. The basis of the plan (that of Mr. Johnston,) is that under a certain state of circumstances, certain salts will act upon the ammonical compounds while in a dry, or solid state, as efficiently as the same salts act in solution. All that is wanting has been found to be, the presence of a sufficiency of the water of crystalization to bring the reacting atoms into contact. In the experiments alluded to, the sulphate of iron was used. Its action upon the ammoniacal compounds of the gas, is to form the sulphate of ammonia by the acid of the iron uniting with the volatile alkali, while the sulphur and cyanogen compounds are absorbed by their union with the oxide of iron.

It has been found that experiments on this principle are not so successful when the thickness of the lime is increased beyond a certain point, as the weight of the salt compresses too much the under strata, and to obviate this some sawdust had been used which separated the purifying particles so nicely that the gas was considered porfectly purified which passed through the mixture. There is one important fact, however, passed over in the conclusions arrived at by the above experiments of Mr Johnston, viz. that ammoniacal gas will adhere so intimately to water, in about one-sixth of its bulk, that even at the boiling point it will not be driven off, and in that combination it will pass over sulphuric acid unless it be the *concentrated*. It is well known that ammoniacal gas will become liquid under the pressure of seven atmospheres and by mechanical means the gas can thus be purified by an escape valve upon a condenser weighted to eight atmospheres, and the liquid ammonia can be drawn off by a tap. The gas can also be washed with pure water, and we have thought that the apparatus of Mr. Winder, described in No. 1, this volume of the Scientific American, might be employed as an excellent mechanical gas purifier. It could be made strong enough with copper cylinders to stand nine condensed atmospheres and the combination of this quality with its hydraulic powers might be economically employed. Of course experiment would be the only true test We are not aware of the precise manner or nature of Mr. Crutchett's invention—his *atmospheric purifier*, of which so much has been said regarding the illumination of the Capitol at Washington. There has appeared to our view many exaggerated statements regarding its economy and qualities. Time and experience will determine its true value.

There has been much complaint respecting the great price of gas in this city, in comparison with the price of gas in Liverpool and some other of the British cities It cannot be expected that gas can be made as cheap in New York as in Liverpool, in consequence of the cheapness of labor and coal in the latter place, but it has appeared to the minds of many that it might be made cheaper than it is.—We have seen some accounts published lately which ascribe to the oil gas, or solar light, as it has been termed, the remarkable value over coal gas of triple illuminating power, but it is well known that by the estimate value of the quantity of oxygen required for combustion, that it is only one third superior to light carburetted-hydrogen, and by this calculation, in comparison with coal, oil will be found to be no more economical for an illuminating gas.

The Worth of a Single Stump.

A friend informs us that during the present year sixteen coal-boats have been snagged in one of the bends of the Mississippi river. Each boat was probably worth $1,000. Here in the retail way, has a single snag cost the community $16,000 in one year.

Boiled Linseed Meal is a superior and economical food for calves.

For the Scientific American.

Japanning.

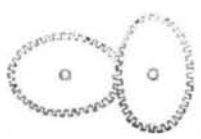
(*Continued from our last.*)

Copal varnish is one of the very finest varnishes for japanning purposes. This varnish is now easily to be had, but there was one period when it was unknown in the manufacturing arts, as it was insoluble in alcohol in any considerable degree. It can be dissolved, however, by linseed oil rendered dry by adding some quicklime at a heat somewhat less than will boil or decompose the oil by it. This solution with the addition of a little turpentine, forms a very transparent varnish, which when properly applied and slowly dried, is very hard and durable. This varnish is applied to snuff boxes, tea boards and other utensils. It also preserves paintings and renders their surfaces capable of reflecting light more uniformly. If powdered copal be mixed in a mortar with camphor it softens and becomes a coherent mass, and if camphor be added to alcohol it becomes an excellent solvent of copal, by adding the copal well ground, by employing a tolerable degree of heat, having the vessel well corked which must have a long neck for the allowance of expansion and the vessel must only be about one fourth filled with the mixture. Copal can also be incorporated with turpentine with one part of powdered copal to twelve parts of pure turpentine subjected to the heat of a sand bath for several days in a long necked mattress, shaking it frequently. This is a good varnish for metals such as tin; the varnish must be dried in an oven each coat and it can be colored with some substances, but alcohol varnish will mix with any coloring matter. For white japans or varnishes, we have already shewn that fine chalk or white lead, was used as a basis and the varnishes coated over it. To japan or varnish white leather, so that it may be elastic, is altogether a different work from varnishing or japanning wood or metal or papier mache.—For white leather oil is the principal ingredient, as it is well known that chalk is extensively used to give white leather its pure color, or speaking more philosophically, its fair colorless whiteness. White leather having already the basis of white varnish, it should get a light coat of the pure varnish, mentioned on Page 104, and dried well *in the oven*, or a coat of the oil copal, in this article, will answer very well. This being well dried, boiled nut oil nicely coated and successively dried will make a most beautiful white varnish leather, not liable to crack. This quality takes a long time to dry, and of course is more expensive. Coarse varnish may be made of boiled linseed oil into which is added gradually the acetate of lead as a drier. This addition must be done very cautiously as the oil will be apt to foam over. A better and more safe during mixture than the mere acetate of lead, is to dissolve the acetate of lead in a small quantity of water, neutralize the acid with the addition of pipe clay and evaporate the sediment to perfect dryness and feed the oil when gently boiling gradually with it.—These varnishes or japans, as far as described, have only reference to white grounds. There is some nice work to be observed and there is much in applying the varnishes at the right time, knowing by the eye the right moment when the mixture is perfect, or when to add any ingredient. Those things require practice, but every person can practice by those receipts and practice to some purpose. In future numbers we shall treat of the different colors of japan work and afterwards how they are all finished. G. R.

New York, Dec. 20, 1847,

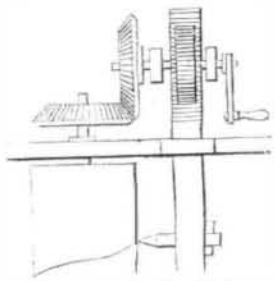
MECHANICAL MOVEMENTS.

Oval Gearing.



There was a time when spur wheel gearing was the universal method for connecting all kinds of machinery; bands and drums were supposed to be impossible things for driving shafts, just as the wheels of a locomotive engine were once supposed to be only able to spin round on a rail instead of moving forward, aud it was upon this supposition that one of the first locomotives constructed was made with jointed legs, which marched behind the car and pushed it forward. Drums and bands and cams are now more generally used for the transfer of motion than spur wheels. The above cut, however, will show that although one of the oval wheels was driven at an uniform speed, it would produce a regular and at the same time a varying speed in the other.

Wheel Gearing.



Suppose the spur wheel which gears into the perpendicular rack to be revolved by the handle on the right, the rack will be moved at the same time that the bevils will revolve the cylinder with which the horizontal bevil is connected and a regular spiral line will be described on the surface of the cylinder by the projecting point connected with the lower part of the rack.

Kissing Invention.

A great invention says an exchange paper, has lately come out, by which kissing is made easy to the humblest capacity. The lady sits in a chair. In the back of the chair is a wooden bowl, in which her head reclines, her lips being uppermost. Her beau bends down and she receives the salute full upon her lips so easy and so sweet. One young lady fainted with ecstacy on having the modus operandi explained to her, probably on account of her having a great deal of impatience to put it in practice.

A gentleman last month dropped his umbrella from the gallery of St. Michaels, church London, which fell upon the head of a lady, causing her death the next day.

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