Electric Globes of Fire in a Saw Mill.

MESSRS. EDITORS—Some months since a remarkable phenomenon occurred at a saw-mill worked by me. The small pit in which the crank worked was filled with water on a rainy day through the carelessness of the engineer. The saw was in operation, and at every revolution of the crank-shaft the crank plunged into the pit thus filled. While standing outside the mill house I saw a brilliant light within, and concluding the mill was on fire I called out to the engineer to extinguish the flames, who ran into the mill, directly towards the crank and pitman, when he noticed brilliant balls of fire, apparently about two inches in diameter, rolling off from the crank and pool of water in which it was working. The steam was cut off, the machinery stopped, and these globes of fire ceased to flow. I was informed by the engineer, an intelligent colored man, that the like had occurred before at a saw mill in charge of a Mr. Parker. The crank at this mill frequently become heated from friction, and to prevent this Mr. P. has made a box, water-tight, put it into the pit under the crank, and filled it with water. At every revolution of the shaft, the crank plunged into this box so fitted. The mill had not worked an hour before brilliant globes of fire were generated by the crank thus working in the water. This arrangement did not succeed to keep the rest of the crank cool. It is a philosophical question how these balls of fire are generated. It is well known that water is an extinguisher of heat—here it seems to have become fuel for the heat created by the pitman and crank, and instead of extinguishing that heat, became fuel for it, and generated these brilliant balls.

It is well known, also, that the compounds of water are oxygen, and hydrogen; were they separated, the oxygen uniting with the iron crank and forming the oxyde of iron, and the hydrogen, an inflammable substance, ignited by the heat of the crank, and generating these brilliant balls? Was this the Paine light? C. B. GREEN.

Jackson, Miss., 1853.

[The light was no doubt electric; streams of electric light have been generated in some factories by the friction of belts.

(For the Scientific American.)

Turbine Water Wheel---Parker's Claims.

MESSRS. EDITORS.—In the 25th number of the present volume you correct an error of one figure in Vol. 6, page 272, Sci. Am., I entirely agree with Mr. Sloan, that "the articles on water wheels in Vol. 6 are valuable, and that any error however small, should be carefully corrected." I would direct your attention to some other slight errors in those articles.

In the preceding number, page 264, Vol. 6, the following extract of the specification of a patent issued the 10th of July, 1847, to the undersigned, appears, viz.:—"I make the area of the cross section of the shute (or of all the shutes) by which the water is let on the wheel, equal to that of all the issues at which it leaves it. To produce a maximum effect the shutes and issues of the wheel, should be of equal size, and they move with the same velocity as the water." There is an error in the last sentence—"and they," should read, "and the wheel."

There are some errors on page 408, of the same volume. In the second paragraph—article "Hydraulics"—the word "volition," should have been "rotation," and the third paragraph—a description of figure 67—is misplaced. It should have been inserted after the first sentence of the fifth paragraph, after the words, "in diagram, figure 67." As it is, it is thrown in between the announcement of a principle and its illustration.

As you advocate the claims of persons who first publish to the world a discovery, I hope you will indulge me in a few remarks on the above principle of having the area of a cross section of the inlet, equal to that of the issues of the wheel.

This principle of action of water on a turbine [by the term "turbine," from the Latin, "turben," a whirling, a whirlwind, a vortex, I presume, I understand, wheels that receive the water with a whirling motion,] water wheel, I claim to have discovered by the investigation of the principles of hydrodynamics, and not by experiments, experiments, however, have since verified the result. This principle I published to the world, in 1847, by having it recorded in the Patent Office, and then again in 1851, in the Scientific American.

But why at this late date should it be attempted to fix the discovery on Mr. Parker? Mr. Parker claims the discovery of giving the inlet water a whirling motion, and so far as my information extends, he is entitled to it, in this country at least. But in France, perhaps, he was preceded by Fourneyron, who commenced the investigation in 1823. But that he discovered or practiced prior to 1847, the principle of making the inlet and outlet of equal sectional area I deny. In a description of Parker's wheel in the Journal of the Franklin Institute, nothing of the kind is mentioned, but, on the contrary, the inlet is said to be variable, and no mention made of the reduction of the co-efficient of effect thereby. In the article referred to (page 272, Vol. 6, Scientific American,) it is stated that the inlet was 10½ inches, and the issues of the wheel 9 inches; but by making the correction it leaves the issues 6 inches, or something more than one half that of the inlet, which agress with the practice of his agents at the South. And I have not seen any publication that intimated that they should be of equal size, until the one in question of the 5th of March, 1853. J. B. CONGER.

Jackson, Tenn.

Price of Diamonds.

Rough diamonds, fit for cutting, are sold at £1 13s. 4d., to £2 the carat. A carat is rather more than three grains, and 156 carats equal to one ounce Troy. But if the stones are above one carat, the square of the weight is multiplied by the price of a single carat; so that, for example, a rough stone of three carats costs 3x3x £2 or £18. It is similar with cut diamonds, and in 1850 the purest briliants of one carat brought more than £8, a brilliant of two carats 2x2x £8, or £32. When stones are over eight or ten carats, however, this is altered, so that they are valued still more highly. Diamonds of a quarter of an ounce weight are extraordinarily costly, but still larger are met with; and one of the largest known is that of the rajah of Mattun, in Borneo, which weighs nearly two ounces and a half; that of the Sultan of Turkey weighs two ounces; one in the Russian sceptre more than an ounce and a quarter.—The greatest diameter of the last is one inch, the thickness ten lines. The Empress Catherine II. purchased it in the year 1772, from Amsterdam, and for it was paid £75,000, and an annuity of £650. Diamonds weighing an ounce exist also in the French and Austrian regalia. One of the most perfect is the French, known as the Pitt or Regent diamond. It was bought for Louis XV., from an Englishman named Pitt, for the sum of £135,000 sterling, but has been valued at half a million. One of the stones most renowned in the East, is the Koh-i-noor, or Mountain of Light, now in possession of the Queen of England. It came from Golconda to Persia, and while uncut weighed more than five ounces, but now, polished, only about two ounces. It is valued at more than £2,000,000 sterling. If we look only to the common mode of estimating the value, a perfect brilliant weighing half a pound, would be worth £20,000,000. Some have stated that such a diamond exists among the royal treasures of Portugal as large as a hen's egg; according to others this is only a topaz.

An Erect Position.

A writer on health very justly condemns the habit of lounging, in which a large number of persons indulge, as injurious to health. He says:—"An erect bodily attitude is of vastly more importance to health than is easily imagined. Crooked bodily positions, maintained for any length of time, are always injurious, whether in the sitting, standing, or lying posture, whether sleeping or walking. To sit with the body leaning forward on the stomach, or to one side, with the heels elevated to a level with the head, is not only in bad taste, but exceedingly detrimental to health. It cramps the stomach, presses the vital organs, interrupts the free motion of the chest, and enfeebles the functions of the abdominal and thoracic organs, and in fact, unbalances the whole muscular system. Many children become hunchbacked, or severely round-shouldered, by sleeping with the head raised on a high pillow. When a person finds it easier to sit or stand, or walk or sleep in a crooked position than a straight one, such a person may be sure his muscular system is badly deranged, and the more careful he is to preserve a straight, or upright position, and get back to nature again, the better."

Improvements in Dyeing.

The following processes for obtaining a new description of blue, and extracts of madder have been lately introduced into notice in France, and are now translated for the first time into English from "L'Invention," a foreign publication to which we are often indebted for much useful information on the arts and manufactures abroad.

A NEW BLUE—If in an alkaline molybdate there is precipitated after the addition of a phosphate all the molybdic acid that it contains there will be obtained in the form of a fine powder a bright citron yellow color which is wonderfully increased by adding a few drops of nitric acid. Caustic alkalies and carbonates of the same dissolve this powder after it has been washed and dried, and furnish a transparent solution from which it is precipitated by acids without any change of color. For example by dipping a piece of cloth in soda, and transferring it to a concentrated acid solution the yellow coloring matter is precipitated on the surface in very great purity.

This powder exhibits very great sensitiveness in presence of the reducing metals, for example by rubbing a small quantity of this powder with a cork and adding a few streaks of chlorohydric acid on a piece of tin, there are obtained in succession every imaginable hue, from yellow to the deepest blue. This property is turned to account by dipping the fabric, when taken out of the acidulated bath, into a solution of the chloride of tin, by which it is colored to a deeper or lighter blue, according to the quantity of tin contained in the solution. This product offers, in printing calicoes and other fabrics, an advantage that had hitherto been with difficulty realized, and whose results still left much to be desired, namely, that of being able to produce on goods, blues of an extreme purity on a yellow ground, or the contrary.

MADDER—A new method of making an extract of the above dye has been lately patented in France. Madder in powder, or the flower of the same, is steeped in a neutral organic oxyde, such as the hydrate of methylene, acetone, &c., whether these oxydes are alone or mixed with alcohol or other ethereal matters. The madder may be used either wet or dry, according to the degree of richness that it is required to give the extract that is being manufactured. After having been steeped for a certain length of time, the ligneous substances remaining in the solution are submitted to pressure so as to extract entirely all the coloring matter that they contain. The coloring matter is then precipitated by adding water to the solution and afterwards separated by means of a filter. It is then dried, and can be warehoused or sent away immediately. It is to be observed that by this process neither the madder nor the solutions made use of are submitted to the action of heat, by this means we avoid the noticeable changes that the last-named agent exercises over coloring mater. If a quicker precipitation of the extract of madder is required instead of employing water alone for this purpose, it can be used acidulated with sulphuric acid, but in this case the precipitate must be carefully washed until it presents no further acid re-action. Unless this precaution is taken the employment of the extract of madder thus obtained would be detrimental on account of the re-action of the acid that would ensue. Another way of obtaining a new dye from madder, which has received the name of "Rubiacine" has been likewise lately patented in the same country. The madder is placed whole or pounded into an alkaline solution in which it is left to steep for two or three days. At the expiration of this period the solution is neutralized by means of acidulated water, any alkali and acid may be used for this operation. It is then poured altogether in a filter and slightly pressed, after which it is evaporated, and the so-called "Rubiacine" is obtained solid, it is then pounded and put up in casks. This material possesses dyeing properties equal to four times that of madder powder, and equal weight for weight to the extract of the same, it is particularly noticeable for the property that it possesses of dyeing cotton a Turkey red.

Extravagant Profits of Lead Mining.

The "Grant County Herald" remarks as follows, under this head: "We learn that smelters at Franklin, Iowa Co., are paying $40 per 1000 lbs., for mineral. We fear that this rate is the result of competition, or else over estimated demand. That mineral will fluctuate the coming season between $30 and $40, we have no doubt but that its steady value, based upon the eastern and St. Louis price of lead, will be $40, we donbt very much. Be that as it may, miners may rely upon a very high compensation for their labors henceforth." We fully agree in the above opinion. The price of our staple, for some time to come, must mainly depend on the prices asked by the owners of Spanish and English lead, for it is plain that our own mines cannot supply the market. If foreign dealers choose to keep the price to near its present limit, we think they can do so, but this cannot be a safe reliance in the transaction of a heavy business.—[Galena Advertiser.

Curious Geological Formations.

In making some excavations on the Pacific Railroad, near St. Louis, the workmen came upon some flint nodules of a curious shape.—They are rounded much like a melon, and may easily be supposed to be a petrification of that fruit. A specimen having been broken with a tolerably smooth cleavage, disclosed a series of what appeared to be rings, and in the centre the appearances of some ore looking like silver ore. From one of them in its natural state a portion of what might be mistaken for an outer coat had been removed, much as if the stone had once been a melon and been petrified after a part of its rind had been peeled away. The surfaces of these nodules exhibited numerous perfect impressions made by the leaves of plants, so distinctly and so delicately traced as to produce a very beautiful effect. The specimens were found in a ledge of limestone, which abounds in stones of a similar kind.

Meteorology.

Our foreign exchanges make mention of a curious phenomen that lately presented itself in the Gironde, France, being nothing less than the descent of an aerolite weighing over 90 lbs., by which a horse was killed from the injuries received. It appears that the phenomenon was seen by a child that was tending the animal, and who was some yards off at the time of the occurrence; a sudden noise like thunder at a distance, caused him to look up, and he perceived a black mass, the sight of which terrified him so much that he could not take to flight, cleaving the air and falling in the direction towards him. Fortunately he escaped, and the mass fell upon the horse's back, which was knocked down by the blow. The aerolite has been examined by different persons, who, from a close examination, judge it to contain a large quantity of iron mixed with other earthy and metallic substances.

The New Orleans papers speak highly of specimens of hemp made from the fibres of the okra, or "gumbo" plant. They state that the merit of this hemp consists in the cheapness of its culture, the abundance of the raw material, the quickness with which it grows, giving, they understand, three crops a year, its superior yield to the acre, of five times as much as the Kentucky hemp, its more durable qualities in water or damp than any other hemp, and its easy manufacture into bagging. It is stated that the article can be produced at the North as well as the South, though not so profusely, and that it will supersede all other sorts of hemp in the manufacture of bagging.

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