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Commissioner of Patents' Report.

Last week we presented an outline of the Report of Chief Examiner Page; this week we present that of Chief Examiner Fitzgerald. He states that he examined 666 cases, "a larger number than was ever before examined by one Examiner in the same length of time." The number of patents passed by him was 270, the number rejected, 460. "Many applications," he says, "after one set of claims have been rejected, are amended and returned for a new examination, upon new or amended claims, requiring the same labor on the part of the examiner [not quite, we think] as new applications." He also states that 400 cases, owing to re-examinations for amended claims, amount to 460—a little morethan 1-6th of the whole—that is, every 600 applications amount to 700 examinations. Much of this examination is the fault of the Patent Office: many patents now in existence have had their claims rejected, re-rejected and finally granted. We believe that the Patent Office Examiners might save a great deal of trouble to themselves. Mr. Fitzgerald states that he rejected three applications for every four he examined. He believes that multitudes of inventors will still bring forward old inventions, owing to want of information on subject.

But one appeal, it is stated, has been taken from Mr. Fitgerald's desk since 1846: if reference, however, had been made to Mr. Trapp's invention for manufacturing barrels, the allusion would have been anything but pleasant. Mr. Fitzgerald has charge of five classes; 1st, mills for grinding, horse powers, regulators and mechanical movements generally. 2nd, carriages and implements of travel. 3rd, machinery for working lumber, such as planing machines and tools for working in wood. 4th, hydraulics and pneumatics, such as water-wheels, wind-mills and hydraulic engines. 5th, manufactured textile goods, and machinery for manufacturing fibrous textile fabrics, such as looms, carding and spinning machines, &c. Twenty-four patents were granted on mills, the principal one of which was for a strong artificial current of air driven in at the eye of the stone, in such a manner as to force the flour more rapidly through the mill than formerly. In reference to flour separators, the Report states, "Patents upon such machines are granted liberally, because slight changes in them, which would be of no importance in machinery generally, often produce marked results, and require contrivance instead of mere mechanical skill." This is a singular statement. Two good improvements for hanging mill shafts were patented; thirty-seven patents were granted on carriage contrivances, such as a tilting wagon, carriage axles, springs, and car couplings; eight of the patents were for improved wheels.

Thirty-four patents were for improvements on filters, windmills, water-wheels and blowers, and no less than six of them were for modes of raising and drawing water from wells. Eight patents were granted on pumps, some rotary and some reciprocating. But few patents were granted for water-wheels—it would seem that this field is almost entirely pre-occupied. Ten patents were granted on saw-mills; twelve patents on turning machinery, and twelve on boring and mortising machines. Several patents were granted for stave machines, and no less than twenty on planing machines.

No less than about 90 patents were granted on machinery for the manipulation of fibrous and textile manufactures: five of them were on cotton gins, and the Du Bois machine, illustrated on page 404, Vol. 4, Sci. Am., is particularly mentioned. Five patents were granted for sewing machines, one of which is illustrated in the first number of our last volume. No less than 30 patents were granted on looms for weaving, some of which appear to be very complicated, but no less ingenious and good on that account. This Report of Examiner Fitzgerald is very interesting, and when we consider the multitude of patents granted for machines of a certain class like looms, the question arises, "can there be any other improvements added, are we not at the end of invention?"

The answer is an easy one: No. Invention begets invention, and oftentimes when we think, "can any improvement really be made upon this and that old class of machines?" the past rises up in the character of Hope pointing to glittering prizes yet to be awarded to future inventors.

Mr. Fitzgerald is a lawyer, and states that it is more difficult to become acquainted with science and art than with law. He is no doubt perfectly correct in this statement, but the influence of inventive and scientific men in the government is no more than a mite compared to a mountain, in comparison with that of the gentlemen belonging to the bar.

McCallum's Improved Railroad Bridge. Interesting Experiment.

On last Wednesday afternoon, the 6th inst., we witnessed at the Novelty Works, this city, a very interesting experiment, in testing the qualities of a new bridge invented by Mr. Daniel C. McCallum, of Owego, Superintendent of Bridges on the New York and Erie Railroad—the architect of the famous Cascade Bridge, on that road, and one of the best builders of bridges in our country. The experiment was conducted in the presence of some of the most practical scientific men in the country, such as Mr. Seymour, State Engineer, Mr. Horatio Allen, of the Novelty Works, and engineer on the unfinished part of the Erie Railroad; Mr. S. S. Post, engineer at Piermont, of the finished part of the Erie Railroad; Major Morrell, and a number of other distinguished gentlemen. The subject of experiment was a model 12 feet long, (10 feet long between the supports) made of three-quarter inch stuff, 21 inches deep at the centre, 12 inches deep at the abutments. The roadway was built about midway between the sides. It was levelled up with brick, to receive a superincumbent load of pig metal. This slender bridge was to be tested to its breaking point—in other words, loaded until it broke. The iron was weighed out, each bar balanced, and all laid in line on the bridge. A cord line was run from abutment to abutment, along the bottom of the lower string, to indicate every change of position the beam would assume—to see how it would behave itself. The iron was piled on until the slender but sturdy bridge appeared like the famous dwarf in the Arabian Tales, who walked about carrying for his armour a tremendous iron bar on his shoulder. The metal was laid on until 12,000 lbs. arose in a pile above it, still there was no sign of breakage, nor did it give way until 2,000 lbs. more—14,000 altogether—were laid on. It then gave way in the middle, leaving the abutments perfectly sound, a new result, and a desired one, developed, to the great satisfaction of all present. The principle of the bridge is a new composite beam of a straight under string, or chord, united to a top camber eliptical beam by angular thrust braces, angular counter braces and tension rods, the panels being divided by perpendicular posts radiating from the centre of the chord. The camber is not the same as the arch commonly used, by being placed on the side of common truss bridges, but is united as described, making the combination a new one entirely, and one to remedy the evils we are about to speak of. Railroads have developed and called into requisition new combinations to meet new exigencies. The New York and Erie Railroad, above all others, with its numberless bridges, broad gauge and huge locomotives, has afforded great opportunities for testing various kinds of bridges, and this bridge is the result. The effect of the load on the camber is to deflect it, which has a tendency to extend in the direction of the abutments, thereby calling into instant action the thrust braces, with an upward pushing force, to maintain the position and form of the beam, and the tension rods tend to sustain it. By observation on the New York and Erie Railroad, Mr. Post stated that the bridges all failed at a very short distance from the abutments—this bridge obviated that evil entirely, and its combination presented several "new and excellent points." Mr. McCallum has taken measures to secure a patent.

Sulphur and Sulphuric Acid.

This substance is very abundant in nature, and is found sometimes pure, but more commonly mixed with other substances. Sulphur has some peculiarities. At ordinary temperatures it is solid, when heated to 226°, it melts, and then it boils at 600°, yielding a yellowish gas; at a temperature below 390°, the melted sulphur is very fluid, though not so much as at 240°. If it is now allowed to cool it first becomes thick, then fluid again; when thrown into water at 240°—when fluid—it becomes a hard brittle mass, but if heated to 600° for some time, and then thrown into water, it remains brown and transparent, and is so flexible that it may be drawn into threads; in this state it is used for taking copies of reliefs, medals, &c., and in a few days it becomes hard, solid and sharp in outline, and is used extensively in making casts for the electrotype process.

Sulphur is insoluble in water, but soluble in alcohol, in ether, and some oils, and with bisulphuret of carbon. It combines with oxygen and the metals, and in that state the metals are called sulphurets. It is very troublesome to iron founders, because it requires to be burned in the open air at 560°, to expel it in the state of gas. When this is done it generally frees the iron from its injurious combination,—but few of our founders are aware of this peculiarity, hence the iron is heated up rapidly to 1000°. The roasting of ores (sulphurets) is for the purpose of driving away the sulphur; hence great care should be exercised to conduct the process in a perfect manner. Experience and watchfulness are requisites which should belong to every one who has charge of roasting sulphur ores.

Sulphuric acid is a combination of sulphur 2, oxygen 2; this acid is manufactured extensively in Boston. Sulphuric acid is manufactured in large leaden chambers, the leaden plates of which are joined together by the oxy-hydrogen blow-pipe—thus they are run together without the intervention of solder, as the common solders would be acted on by the acid. We would recommend this plan to be generally adopted in joining all leaden plates for whatever purpose. Platina vessels are employed to concentrate it, and the acid itself is very extensively used in almost every department of the arts and manufactures. It is used by the silversmith, dyer, bleacher, in the refining of the metals and the making of paints, &c. Dr. Liebig uses this pithy expression—"it is no exaggeration to say, we may fairly judge of the commercial prosperity of a country from the amount of sulphuric acid it consumes." Our moulders use it for cleaning their castings, and our chemists for making soda out of salt.

Coating Iron with Copper.

As we have had not a few enquiries respecting Mr. Pomeroy's invention for coating iron with copper, since we noticed the same about six weeks ago, we will describe the leading features of the patent, so as to obviate future trouble to us, by letter or inquiry about it. The first process consists in immersing the iron plate or plates in dilute sulphuric acid, submitting them to a brisk heat, and then immersing in a solution of clay and water, of such a consistency that a sufficient quantity of clay may coat the plate uniformly, when the said plate is again submitted to a brisk heat, and when dry is ready for the next process. This process is to have a bath of molten copper placed over a furnace to keep it fluid, and into this is dipped the prepared iron plate. Sheet iron so treated should not be kept in the bath but a few seconds, or it will become *hot* short; after it is dipped it may be run between rollers, to make it smooth. The thicker the iron plate is, the longer may it be kept in the copper bath, and the thicker will be its coating. The coating of copper may be increased with subsequent immersions. All the metal should be covered with the copper or it will oxidize faster than if there was no coating. It is stated that iron can be coated with brass in the same way as with the copper. The clay coating is the principal feature of this invention, that is, the coating of the metal with clay, preparatory to its immersion in the bath of copper or brass.

The Britannia Tubular Bridge.

On the 21st Oct., (last month) the government inspectors instituted a series of experiments on the great Tubular Bridge. A train of two locomotives and 28 wagons with 280 tons of coal was drawn into all the four tubes. The deflections were ascertained to be exactly three-fourths of an inch under this load, over the immense mass. After a repetition of this experiment, this great train was taken out about a mile and shot through the tube with the greatest attainable velocity, when the deflection was found to be less than when the load was allowed to remain at rest in the tube.

Messrs. E. & L. Clark, the resident engineers, have watched, from day to day, the effect of gales upon the tube, and have stated that the heaviest gales do not produce so much motion over the extent of the tube as the pressure against the sides by ten men. The strongest gusts of wind do not produce more oscillation than one-quarter of an inch. The action of the sun, at noon-day, only moves the tubes about three-eighths of an inch.

If a compass is held over any part of the bottom cells, the south pole is affected, when held over the top cells the north pole is affected. This effect is observable in all parts of the tube, although its position is only 10° of the magnetic meridian. The work on this bridge was commenced on the 13th of April, 1846, and on the 5th of last March the first engine passed through it. It has thus been four years in the course of construction. The effect of two trains running through the parallel tubes at the same time, makes a noise resembling distant thunder. Large models will be exhibited at the Great Fair of the Industrial Exhibition, but we recommend our American friends who go there, if they have the funds and time to spare for such a trip, to visit the Bridge itself.

Patents Granted---Secret Use.

Four of the patents on our list of this week, were applied for through this office. Some of the very best and most successful inventions which have been patented recently, have come through the same source. The march of improvement is still onward, and the progress of invention is steady and firm. Every improvement and discovery applicable to the useful arts, is entitled to the protection of a patent. The secret use of an invention is no security to the continued safe using of it, even by the inventor, for another may discover the same thing, secure a patent and stop the inventor from using his own invention. It is also as easy to keep an invention secret and use it thus, after it is patented, as to keep it secret without a patent,—there is thus a perfect security for the inventor.

West India Mail Company.

This British Company recently held its half yearly meeting at the London Tavern (London.) The disbursements were $735,580, the income was $1,134,225 leaving a surplus of $398,645,—good profits, undoubtedly. There was a general increase on the profit sheet over 1849. Mails are to be carried to the Pacific from England twice every month, according to the recent negociation with this company and the government. Five new steamships of 2,250 tons, with engines of 800 horse power, like the Asia, are constructing, and will be ready for sea early in 1851. The company is in a very prosperous condition, and are determined to run our Pacific lines as closely as possible, but there is no fear of the American line, they will come off with flying colors.

It is often asked of us, "Is lead used in the whitening of sugar?" It is, but not white lead. It is stated that the lead is all removed from the sugar. It should be made the test of chemical experiment.

The "Southern Press," at Washington, will please to accept our thanks for its courtesy.