POETRY AND PATENTS.

It is well said that extremes often meet, although we do not often find them united in one and the same person. In a mind which is susceptible of all the higher flights of poetical imagination, we should hardly expect to find associated ideas of a mechanical nature. In other words, we should not look for an inventor in the person of a poet, especially in one whose poetry possesses a singular sweetness, combined with elevation of sentiment and grace of expression. But we often find that which we do not look for, and thus it happened that in a visit to the Patent Office library last week we found a recently printed copy of a translation from a patent granted in the reign of King Charles II. It bears date the 29th of September, 1626, and was granted to one "Master William Drummond, of Hathorneden," the subject matter being the construction of machines, weapons, and engines of war for attack or defense by land or sea. Before, however, entering upon a description of the inventions, some of which are very interesting, we will offer a few brief remarks concerning the inventor. This personage, then, was none other than William Drummond, of Hawthornden, the well known poet, who achieved considerable celebrity in his day. He was descended from a very ancient and noble Scottish family, and was born on the 13th of December, 1585. He was educated in Edinburgh, at the High School, and afterwards proceeded to the university of that city, where he took his M. A. degree in July, 1605. On leaving college he went to study law on the Continent, and returned in 1609. In the year following, his father, Sir John Drummond, died, and William retired to the paternal estate at Hawthornden, which, according to Ruddiman, is "a sweet and solitary seat, and very fit and proper for the muses." Here, with an interval of eight years of foreign travel, Drummond spent his life in his favorite literary pursuits, dying on the 4th of December, 1649. His literary celebrity gained for him the close friendship of many men of eminence, among whom may be mentioned Michael Drayton and "Rare Ben Jonson." Such was the man of whom Her Majesty's Patent Office bears record that he "spent much time, labor, and money, in contriving and constructing machines of many different sorts, which may be of use and profit to the State, in affairs both of peace and war."

The "letter" in which these machines are described, contains several points of interest, and, as we shall presently see, bears ample testimony to the truth of the axiom that "there is no new thing under the sun." There are no less than sixteen inventions notified, although only fifteen are described. The first of these is an instrument for cavalry use, by which it is said that one man can be rendered as available in battle as five or six men with the ordinary weapons. The instrument is stated to be also extremely suitable for foot soldiery, and, from its effect being at once terrible and rapid, the inventor calls it a "thundering staff," adding that some call it "box pistoll," "musket box," "carrabin," or "box-dragoun." Although no drawings are given, the descriptions are, for the most part, sufficiently clear to enable us to realize approximately the construction of the various weapons. Hence, the one just described appears clearly to be the prototype of the magazine or repeating rifles, of which so many have been described and illustrated in our pages during the last few years. In this instrument, then, we recognize the first attempt to afford the soldier the means of keeping up a rapid and continuous fire; the idea, however, waited for full practical development until the time of the late American war. The second invention is termed a shooting spear, with which a foot soldier, besides doing his own duty, could fill the place of five or six musketeers. This would appear to be a gun with a blade answering to the bayonet at the end of it. The third machine is very special in its way, being described as made of "musket barrels fastened together, by the aid of which any soldier may be considered able to fill the place of a hundred musqueteers. This machine may, from its effect, be called a lightning chariot, in the vulgar tongue, fyerie waggon." There can be no mistake as to the identity of this instrument with the machine guns and mitrailleurs of the present day. It was evidently a group of gun barrels fastened together and arranged for rapid firing, the whole being borne on a carriage. The fourth invention is an engine of war of similar character to the previous one, and is for use either by land or sea. It was to fire five balls in the same as it then took to fire one, and it was called "open ordinance." So far as this description goes, we see no reason why Master William Drummond should not be credited with the invention of breech-loading ordnance. The remainder of Drummond's inventions relating to the art of war include mortars for defending walls or ships, movable towers, and a ship which was to enter any ports, no matter how well they were barricaded or defended, and which could destroy ships by fire or forcibly capture them. This ship was to be immense and of terrible effect, and was to be called *Leviathan*. It is not possible, from the meager description before us, to say whether this vessel was in any sort a prototype of the "Great Eastern," or whether she was a huge sea torpedo. Following these warlike inventions come others relating to the arts of peace. These include an instrument for measuring the force of the wind; a light, rapid-moving boat; an instrument "by which the distance of a voyage may be exactly calculated, and the different longitudes of places, either at sea or on the nearest shore, determined." Then we have a distilling apparatus for use at sea, to provide ships with fresh water, made from salt water at a very small expense; burning glasses for setting objects on fire either by land or sea; telescopic glasses; and finally, that *pons asinorum* of ancients and moderns, perpetual motion. Amongst these latter inventions will be noticed one for ascertaining longitude. This is a point of interest, inasmuch as it is apparently the first recorded suggestion of a means for discovering the longitude of ships at sea. It was not until 1674 that a Frenchman named St. Pierre proposed to Charles II. a method of doing this. On the proposal being submitted to a committee of astronomers, Flamsteed, who was one of the committee, drew attention to the incorrectness of the lunar tables, by which the position of the moon among the fixed stars was to be calculated. Charles was struck by the deficiency, and immediately founded the Observatory at Greenwich, giving Flamsteed the title of astronomer royal, with a salary of £100 per annum. Previously to this, it does not appear that any attempt at determining the longitude of a ship while at sea had ever been made.

It will thus be seen that there are several sound practical ideas embodied in this singular patent, and such as are very rarely, if ever, found associated with the Muses. That these inventions were not the mere offspring of a poetical idealism, which transformed the ordinary appliances of warfare and science into fantastic shapes, and gave to them multiple forms, seems clear from other portions of the document. There is evidently something more here than would result from a poetic mind simply investing ordinary matter-of-fact objects with its own imagery, or conjuring up forms and shapes founded on the basis of a reality, such as a cannon or a musket. In the "letter" before us, it is specifically stated that the "said Master William Drummond hath invented these and no few other matters with exceeding industry, and no common ingenuity." Also, in the opening sentence of the document already quoted, we see that Drummond expended "much time, labor and money, in contriving and constructing" these machines. These facts formed the considerations upon which the patent for twenty-one years was granted, although it was stipulated that the inventor should reduce one or more of the machines to practice within three years from the date of the patent. It is thus probable that he had previously only made models of his inventions; we are not aware, however, of any record of any of them having been subsequently reduced to practice. The specification is interesting as containing the germs of some of the most important improvements in gunnery that our times have seen; as embodying the first suggestion for determining the longitude of ships at sea, and finally as showing that the genius of hard-headed practical invention can sometimes co-exist with the spirit of tender and imaginative poetry. The contrast between the two conditions of mind necessary to the successful development of either the poet or the inventor, is so great as to render an instance of their co-existence well worthy of notice.—*Mechanics' Magazine.*

FACTS ABOUT THE RIVER AMAZON.---STEAM NAVIGATION AND RAILROADS.

We condense, from a somewhat lengthy but interesting paper, contributed by Geo. E. Church to the London *Fortnightly Review*, the following facts in relation to the Amazon river:

South America contains seven millions of square miles. The Amazon river drains over one third of this vast area. Its basin is more than twice the size of the valley of the Mississippi. It would hold forty-nine countries the size of England. It is generally supposed that its tropical situation bespeaks diseases of various types. On the contrary, its general health is far superior to that of its North American rival, while some of its districts, especially those of Bolivia and Matto-grosso, are blessed with the same delightful temperature which characterizes the table-lands of Mexico. The principal reason for this general health is that constant sea-breezes blow up the valley. Dry when they leave the coast of Africa, they become saturated in their ocean transit westward. They distribute their moisture, ever on a decreasing scale, from the mouth of the river upwards, until, entirely drained, they sweep across the Pacific coast range of the Cordillera of the Andes, to parch the shores of Peru.

Only by floating upon the majestic tide of the Amazon does one get an idea of its mass of waters. The Mississippi river poured into it near its mouth would not raise it six inches. In Bolivia, on the Beni branch of its Madeira affluent, two thousand miles from its outlet, it is one hundred and seventy feet deep. It presents still more astonishing soundings the same distance up the main stream. With its branches, it offers not less than fifteen thousand miles of waters suitable for steamboat navigation. The Bolivian affluents of its main branch alone count three thousand miles of river navigation. One half of this is suitable for steamers drawing six feet of water, and the other half for craft drawing three feet.

There is but one obstacle between the Atlantic Ocean and the heart of Bolivia, *viâ* the Amazon river; this is the line of rapids of the Madeira, at the northeast angle of Bolivia. They are rocky obstructions, found at intervals in the river, and are eighteen in number. They have a total fall of $228\frac{41}{100}$ feet, with a length of broken water of 64,505 feet. The total fall in the navigable stretches between them is $43\frac{95}{100}$ feet. This makes a total from the upper rapid of Guajará-merim to the lower, called San Antonio, of $272\frac{36}{100}$ feet. The total length of river between these two points is $229\frac{38}{100}$ miles, of which 217 miles are of clear channel, perfectly navigable, with a depth of water from 10 to 120 feet in the dry season.

It was in 1853 that the first steamers commenced running on the Amazon river. The year previous to this, the imports and exports were but £413,926 sterling. The effect of steam was similar, to some extent, to the resultant in the Plata valley. The difference was that the Brazilian valley had not the same temperature nor the same population as the Plata had. The fault was that no effort was then made to reach the real populated section of the Amazon basin—Bolivia. Had this been done at that date, we should now see a commerce, entering and clearing at Pará, far in excess of any figures shown at the ports of Buenos Ayres and Montevideo The borders of the Amazon would have presented along their whole extent little ports and towns, the centers of commerce, and of efforts to bring the adjacent lands into use, and thus furnish outlets for the over-crowded States of Europe. But 1870 promises to commence what should have been done in 1853.

On the lower Amazon there are now running sixteen steamers, and their number is being rapidly increased from the United States. The present ones are mostly of English construction, and appear to be unsuited to the commerce, so much so that most of the new ones lately sent out are of the Mississippi river pattern, flat bottom, and affording great facility for ventilation. There are two now nearly finished in the United States for the Bolivian rivers, above the rapids. They belong to the National Bolivian Navigation Company, lately chartered by the Congress of the United States. This company is the owner of concessions of great value from the Government of Bolivia.

Three great efforts are now making to reach this inexhaustible treasure house of old Spain—the new Bolivia. On the south, the energy of the Argentine Republic is brought to the problem, and will accomplish all that nature will permit; for there is no country in South America whose people are carrying it to a more splendid destiny than this. The Argentine Central Railway has been pushed forward to Cordoba, about 250 miles distant from the port of Rosario, on the Parana river. The steady earnestness of its contractors promises to extend it to Jujuy, 585 miles north of Cordoba. This will draw much trade from Southern Bolivia; and if extended to the northeast, around the spurs of the Andes, to the Bolivian province of Tarija, will give a great commerce to the Plata valley. Already many of the products of Santa Cruz de la Sierra and of Tarija find their outlets by carts and on muleback over this route.

Peru, having at Tacna, Arica, and Arequipa, tasted of the vast riches which lie upon the eastern slope of the Andes, appears determined to retain a little of it, even at the expense of a railway from the coast of the Pacific to the Lake of Titicaca. This road is finished as far as Arequipa, 117 miles distant from the port of Islay, on the Pacific: 220 miles more, making in all 337 miles, will complete the work. This is under contract. Certainly, the wealth in the northwest corner alone of Bolivia must be astonishing; for Peru is trying to reach it at an expenditure of ten millions of pounds sterling. The road, too, is to scale a pass of the Andes 14,600 feet above the level of the sea; and, when it reaches Puno, its eastern terminus, it will be separated by Lake Titicaca from Bolivia.

These efforts are bold and full of merit. The country is so rich that they will all reap large returns; but it is by the way of the Amazon river that Bolivia looks for her greatest development; and it will be in connection with the Amazon valley of Brazil that she will receive it.

The subject is full of interest for Europe and America. This sudden launching into notice of a country hitherto prevented from participating in the general progress of the world, is of considerable moment to commerce and civilization.

Kerosene Frauds.

W. J. Martin, Professor of Chemistry at Davidson College, N. C., writes to the *American Chemist* as follows: "I have been making some experiments on the photometric and economical value of the different kinds of *burners* for kerosene lamps, with a view to publishing the results in a local paper for the information of our people. During the progress of the experiments, I have been led incidentally to test the flashing and burning points of a number of samples of oil which came into my hands, and one specimen examined today is so remarkable that I send you an account of it, to be used as you think fit. This kerosene was bought of Trimble & Barrick, Philadelphia, and is marked on one head of the barrel, "*Brilliant Refined Burning Oil. Philadelphia A. F. Beam;*" and on the other head, "M. Evans, State Inspector. Approved. Fire test, 110°. November 26, 1870." (The first initial of the inspector's name I could not decipher.) Now this oil, heated over the water bath, with the thermometer bulb three quarters of an inch below the surface, starting at 50°, and heated to 110° in fifteen minutes, flashed freely at 60°, took fire and continued to burn at 70°; and at 75° the flame would descend and ignite the mass with the light one inch above the surface. With the State Inspector's brand of approval at a fire test of 110°, for the oil to take fire at 70° seems to me an intolerable outrage, which I would gladly be instrumental in exposing and punishing. The degrees are, of course, Fahrenheit."

Whereupon the editor of the *Chemist* remarks: "It is possible that at the time Prof. Martin obtained his sample, the barrel did not contain the oil which the State Inspector approved."

Then why, asks the SCIENTIFIC AMERICAN, was the article sold or offered for sale? If dangerous oils like this can be peddled throughout the country, what is the use of inspection?

DEEP MINES.—The copper mine near Lake Superior was long supposed to be the deepest mine in the United States, being 1,300 feet in depth. But the Amador Quartz Mining Company, of Sutter Creek, Cal., has penetrated 1,350 feet "into the bowels of the earth, without let or hindrance." The Brazilian gold mine, owned by an English company, has been abandoned. The shaft was badly timbered, and water came in too fast to make it profitable in working. It was 1,890 feet deep.