NEW YORK, FEBRUARY 12, 1848.

Inventions.

We have a number of accounts in manuscript of recent important inventions, which some of our readers no doubt are anxious to hear from. We trust that next week will bring forward this delayed matter, a delay which we could not control.

Steam Boiler Explosions.

The subject of "steam boiler explosions" is one in which the whole travelling community feel a deep interest. It is one that has long excited much public attention, and never has it engaged more than at the present moment The late unhappy accidents in our own country has drawn the attention of Congress to the subject, and in England the Government has lately commissioned Captain Denham, R. N. to make inquiry into steam vessel accidents and he has daily been pursuing his investigations for some time. It seems that although explosions of steam boilers has been the subject of much scientific investigation, and although men of the most profound understanding and diligent habits have made it the subject of their research, yet there are still clouds and darkness hovering o'er it—there is still a variety of conflicting opinions. Steam boilers still explode after all the experiments of Perkins and in spite of safety valves and mercury gauges. The fearful explosion of the Cricket, on the Thames, last summer, a steamboat fitted with Joice's oscillating engines, and the more distressing explosions of the A. N. Johnson and the Blue Ridge, mentioned in our last number, are sad evidences that the same elements which destroyed the life of the celebrated Monk of Vaucleuse, are as actively destructive of human life in our present days of boasted advancement in science, as they were in the days of old, It cannot be expected that in a newspaper article we could enter deeply and minutely into the detail of opinions that have been advanced on different sides of this important question.—Like the pulpit, the press calls the attention of our people to the weighty matters that concern their moral, political or scientific interest, and we, therefore, briefly would point attention to those sources where deep and profound information can be acquired upon a single subject.

A pamphlet was published last summer on "the causes of steam boiler explosions, with an easy and effective means of preventing their destructive effects." We called attention to it at the time, and intended to do so again, and no more appropriate time could have happened for this purpose than the present. The basis of Mr. Wilder's theory is, "that caloric is an imponderable fluid of an unlimited velocity," and that by imposing a barrier to the flight of this fluid in a certain direction, such as fitting a loaded musket with a cork in its muzzle, is a sure method to burst the musket and cannot be imputed to the mere "*expansive* force of the liberated gas of the powder." This is sound reasoning.—From a number of examples and a chain of argument Mr. Wilder says, "it has been proved that explosions in steam engines are the consequence of the escape of elementary caloric from its combination with the vapor of water and result directly from the removal in the valve chambers of engines of the compressive force which kept up the combination."—This is fairly asserting that steam and caloric are combined and kept together by a certain compressive force, but whenever that force is removed so as to allow the caloric suddenly to take one direction, there is a separation of the caloric from the steam and that caloric so separated from steam is an *imponderable* fluid of incalculable velocity which will shatter to pieces every thing that offers resistance to its progress in a certain direction, and "this occasional violence is shown by the prodigious strength of beams, cranks, &c. which are sometimes broken." The remedy Mr. Wilder proposes, is to have valve seats which let the steam "directly into the ends of the cylinders with the least interval between them and the piston when at the end." This plan he believes would remove all resistance to the velocity of the caloric in a direct line and would be a perfect security with the common safety valve when the engine is at work, as "at no other time are explosions known to take place."

We agree with Mr. Wilder in a number of his views, only we believe that for all that has been advanced, explosions will be very rare indeed if there are careful engineers and plenty of water in the boilers. The explosion of the A. N. Johnson, however, is proof positive of Mr. Wilder's theory, for it is reported that the dying engineer declared that there was plenty of water in the boilers, and it is well known that the engine had been standing for twenty minutes before, and at the third revolution of the wheels the explosion took place. Another account, in the Cincinnati Commercial, says that a negro girl heard the second engineer say to the first "that the boilers were not safe." This is but doubtful testimony. We differ from Mr. Wilder in our opinion regarding what *his* caloric is. We believe it to be electricity It is well known that there is an abundance of electricity in almost every substance in nature and that it is perfectly at repose where the positive and negative kinds are combined, but when disturbed its extraordinary activity and subtility are incalculable. There is plenty of electricity in water and it is given off abundantly in steam. Now it is well known that water is composed of two gases, oxygen and hydrogen, in parts, by weight—Oxygen 88.9

Hydrogen 11.1

100.0

Now if these two gases are mixed together in these quantities and a spark of electricity passed through them an explosion takes place and water is the result. Or if a flame is communicated to them the effect is the same. It is well known also that oxygen and hydrogen have positive and negative qualities. If water is decomposed by a galvanic battery, the oxygen escapes at the negative wire and hydrogen at the positive pole. If water, therefore, contains electricity in an inert state, and if by heat the original elements of water are separated, is it not reasonable to suppose that in a steam boiler, where these elements may be separated, that the action of the valve according to part of Mr. Wilder's theory, may be the mechanical means of passing the electricity again through the elementary gases, and thus cause an explosion. This argument is somewhat abstract but it will be understood. If it can be proven that heat will decompose water into its constituent gases, some strength will be given to our argument.

At the meeting of the British Association of Science in 1846, Professor Grove submitted some very interesting statistics, the result of many experiments, to prove that heat would decompose water. Dr. Playfair and others objected to the conclusions of Prof. Grove, because his experiments were made with platina and they asserted that "if his experiments had been made with pure quartz," (a substance which will not mix with water) they would have been free from objections.

Since that period we have seen a letter of Mr. James Johnston, C. E., of Scotland, addressed to the Engineers' Magazine, wherein he states, "that he has tried experiments with pure red hot quartz, and the result has been the same as with platina." He also says "I have also made some experiments to ascertain if the common opinion is correct, that red hot iron when brought into contact with water, decomposes it by absorbing the oxygen and setting the hydrogen free." "That is the the theory of those who assert that explosive mixtures of gases cannot be formed in boilers; they suppose that in order to decompose water the hot iron must take up the oxygen and consequently explosive gases cannot be formed for want of oxygen. This theory I find to be erroneous."

"On thrusting a piece of red hot malleable iron into distilled water, a great many bubbles of gas ascend and this gas I find contains oxygen, for it is an explosive mixture, as immediately after collecting it, I have passed an electric spark through it and a violent explosion ensued."

This is very important scientific information and although the experiments would be dangerous to make, it would be valuable to ascertain what is the lowest temperature at which water is converted into its constituent gases by heat while it is under pressure in boilers.

From these facts it will be seen that Mr. Wilder, Professor Grove and Mr. Johnston all agree that it is a subtile fluid which is the cause of explosions, the only difference being in regard to what it is, and the precise way in which it distinctly operates. If the valve seats of engines were constructed in the ends of the cylinders, and a small valve on the steam boiler were opened always when the engine is about to be set in operation to let the electricity escape, and with a good water indicator, who would dispute the assertion, that explosions of steam boilers would soon be unknown.

We are well aware that the most correct and perfect explosive preventives will be of no avail under the management of ignorant, careless and reckless men. A fearful explosion once took place in a coal mine, where Sir Humphrey Davy's safety lamp was used, and it was at once considered that it was all a piece of nonsense to suppose that it could prevent fire damp explosions. It at last came out by one miner who was saved, in giving his evidence on the subject, in answer to a question asked him by the Coroner, said "Weel. jest as I was a lighting my pipe at the lamp, I'll be soused if I know'd any thing more till I opened my eyes in the 'osp ital."

On another page will be found an account of a new Steam Guage, invented in England and recommended by Stephenson, the great engineer. We are confident that we have steam guages in our own country to answer every possible purpose perfectly, but like the miner with the lamp, all these things would be nullified in the charge, not the care of reckless men.

Interesting to Agriculturists.

Mr. Editor:—Perceiving your paper open to all valuable communications, I venture to send you the following, hoping it may prove interesting to our farmers. It is on the use of muriate of lime, (chloride calcium,) as a manure. Being on the outskirts of the city and having several acres of land laid out for my own use, I have an opportunity of trying different substances as manures. Owing to its great affinity for water, which it attracts from the atmosphere, it renders a valuable addition to dry, sandy soil, always keeping the ground gently moistened and porous, which is of advantage to good crops. I am fully satisfied it will supersede guano, poudrette, the salts of ammonia, nitre, &c. It was at the suggestion of a friend, Mr. T. Breakell, a manufacturing chemist, that I was led to try it, hoping it will prove valuable to our farmers.

In the course of a week or so I will send a list of experiments on the increase of produce and the manner of using it.

Yours, respectfully, H. Barker.

New York, Jan 31, 1848.

Mr. Breakell says he can furnish the chloride for $30 per ton; 80 lbs. is sufficient for an acre.

A French Discovery.

Fires in chimnies, in France, have recently been prevented, by placing three frames of wire work, one foot above each other, near the base of the chimney; no flame will pass them.

[We have seen the above in a number of exchanges and have been surprised to perceive the great ignorance respecting Sir Humphrey Davy's discovery. This great chemist discovered long ago that flame would not pass through wire gauze. The Safety lamp is constructed on this principle. It is simply a lamp covered with wire gauze of twenty eight tubes or meshes to the square inch and which can be used by the miner with perfect safety in an atmosphere composed of a substance as explosive as gunpowder, when touched with a flame. Thus the French discovery mentioned above is about half a century old.—Ed.

Napier's Foundry—Cunard Steamers.

The machinery of these vessels is all prepared and fitted up by Robert Napier, Engineer, Glasgow, Scotland. His foundry is in Washington street, named by the inhabitants of that city after the admired Father of our country. Mr. Napier employs about 1500 hands in his foundries, and makes it a rule to keep none but steady sober men in his employ. He has long stood at the head of British engineers, at least for steamboat machinery, and the most perfect machinery in the world for this kind of work has been invented by himself and fitted up under his instructions. The new Cunard line of steam ships to ply between Liverpool and New York, from accounts which we have received from time to time, will be something to excite wonder and admiration. The pistons of the cylinders are of brass. each weighing about four tons, ninety inches in diameter and of proportionate thickness. The cylinders are ninety inches in the diameter of bore and near ten feet in length and turned on Mr. Napier's lathes as easy as if they were flutes, and with the utmost mechanical precision. Mr. Napier is at present fitting up a frigate for the British Government with peculiar machinery.—The frigate is called the Dauntless and is of 1500 tons burthen with engines of 580 horse power, and all the boilers and machinery so arranged as to be lower than the surface of the water. The engine works horizontally like a locomotive's. The cylinder is 7 feet in diameter with a four foot stroke. It is fitted with a screw and the wheel and pinion are therefore used. The wheel with the crank and axle weigh about 18 or 19 tons. It is 9 feet 10 inches inches in diameter and 4 feet broad on the hem. The hem is divided into three breadths of teeth, the middle row catching between the strokes of the teeth of the outside rows, in order to lessen the noise and friction each tooth occupies about 6 inches of the wheel, and what is not a little singular in that iron country, they are made of wood.—The engine is made to perform 30 strokes per minute and the screw to make 70 revolutions. This vessel is to be one of the finest pieces of workmanship ever finished in Mr. Napier's Foundry, but they do not calculate it to run more than 12 miles per hour.

New Hampshire Coal Mountain.

Some of the New Hampshire papers are ridiculing the reports instituted respecting the discovery of coal in the Osippee mountain.—Hardly a single appearance of coal formation is said to exist in the Granite State.

Steam Power for Factories.

The Naumkeag Steam Cotton Mill, in Salem, Mass., contains 27,600 spindles, driven by an engine of 400 horse power. It employs 575 hands, who receive in wages $120,000 a year, and manufactures 5,000,000 yards annually. This mill, we believe, is the largest in the country, having a capital of $600,000.

Scientific American—Bound Volumes.

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