A Question of Chemistry at Law.

A very particular chemical question has recently been tried in a Jury Court in Scotland; as one of scientific importance, and connected with mining and mineralogy, an account of it must be of great interest to many of our readers. The plaintiffs were William and Elizabeth Gillespie, (his wife;) the defendants, James Russell and his son. In April 1850, the Russells obtained a lease of the whole coal, ironstone, iron-ore, limestone, and fire-clay, but no other minerals in the land of Torbane Hill, the property of the plaintiffs, for 25 years for £300 ($1500) per year. The Russells had sunk their shaft and had come upon coal, iron, lime and fire-clay of workable value, but they did not work them, but raised 19,000 tuns of a substance which they sold under the name of "gas coal." This the Gillespies alleged was not a mineral comprehended in the lease of defendants, that it was not coal, and that the contract was violated.—The defendants asserted that it was "coal," and this was the question at issue; namely, whether it was coal or another mineral—a chemical question entirely. Eminent chemists appeared on both sides as witnesses.

On the part of the plaintiffs, Profs. Ansted and Anderson, Mr. Brande, the celebrated chemist, Alexander Rose, the Rev. Dr. Anderson, Dr. George Wilson, and Dr. J. T. Cooper, were severally examined. Mr. Brande produced an analysis he had made of the mineral, from which it appeared that 100 parts of it contained only 10 of carbon, 26 of ash, and 70 of volatile matter, principally carburetted hydrogen. The result of this analysis satisfied him that it was not coal.—The effect of the evidence of the other eminent chemists and mineralogists seemed to be that it was not coal, but a new mineral hitherto unknown—a species of bituminous shale. That a substance containing less than 68 or 70 per cent of carbon could not be considered as coal; that it was rather a kind of bituminous clay. It was lower in specific gravity than coal, and lower in scale of hardness. It was less brittle than coal; its streak was brown instead of black; it was slightly translucent, while coal was opaque. It was a clay largely impregnated with bitumen, but had no property in common with coal, except that gas might be produced from it. The Torbane mineral left no available coke, and no substance could be called coke unless it gave a considerable residuum of coke. On cross-examination it was however admitted that some substance which went to compose coal might be found in Torbane mineral, though in different degrees and arrangements. Further scientific witnesses were then examined as to the appearance of the mineral under the microscope; and they gave their opinion that it was different in organic structure from coal, and presented no traces of vegetable origin. Operative coal miners and coal managers were then examined. The former had worked in the Torbane pits and in coal mines; and they stated that the mineral when struck produced a deaf and not a clear sound like coal; that it emitted a smell of gas so strong as to produce headaches, or to make them vomit, which they had never experienced when working coal, and that it was very difficult to work compared to coal; and the latter as practical men gave their opinion that the mineral was not coal. Scientific and practical evidence was further given that the mineral yielded gas of a highly illuminating power and in large quantity—14,000 cubic feet of gas to the ton; whilst the best Cannel (the Wigan Cannel) only produced 11,500; that it yielded much more tar than any other coal, and much less ammonia; and that although not coal, it had been probably so called from also producing gas, which it produced of high quality.

On the part of the defendants, Prof. Johnson, of Durham, Prof. Ramsey, of London, Professor Hoffman, Chemist in the Government School of Mines, Professor Fyfe, Dr. Douglas Maclagan, Dr. Gregory, Professor Frankland, Mr. Dicenson, Government Inspector of Coal Mines in England, and a number of other scientific, practical, and operative witnesses were examined. The result of their evidence was, that it was a coal of the Cannel or Parrot kind, differing in no essential respect from that sort of coal, but agreeing geologically and chemically with it in all its characteristics. Professor Hoffman, who had been a pupil, and for some time assistant, of Liebig, had subjected it to the usual solvents and tests, to ascertain if it was a mixture of bituminous matter, and he only discovered the merest trace of bitumen, and it was not reduced to a fluid state, as would have been the case if it was bitumen. The ingredients of coal varied considerably, but carbon was the largest; and from 100 parts of this substance he extracted 65·66 of carbon. There was nearly 9 per cent of hydrogen, but he did not consider this incompatible with this mineral being coal; he did not believe there was bitumen in this body. Coal shales generally contain 60 per cent of earthy matter; this mineral could not be called shale, or schist, its predominant constituents not being earthy matter, as in shale, but carbonaceous: he considered it a true coal. Dr. Fyfe stated that he had analysed all the Cannel coals in Scotland, in order to obtain their gas producing qualities; and he had also analysed the disputed mineral, and it in no respect differed from the ordinary Cannel coals, except in being of a very superior quality. Comparing its constituents with Capeldrae Cannel coal, he found them to be as follows:—

TORBANE HILL MINERAL.		CAPELDRAE CANNEL.	
Carbon	60·25	Carbon	56·7
Hydrogen	8·8	Hydrogen	6·8
Oxygen	3·6	Oxygen	8·8
Nitrogen	1·5	Nitrogen	1·9
Sulphur	·3	Sulphur	·25
Ash	25·6	Ash	25·4

The only difference between the two was, that this was a better gas coal than the other.—The further scientific evidence went to establish that this mineral burnt exactly like a Cannel coal—that, when heated in a retort, its products were exactly those of a Cannel.

Dr. Douglas Maclagan exposed this substance to the action of naphtha, which made substances containing bitumen yield it; he found only an infinitesimal quantity—mere traces of it. Shale was a mineral with a larger quantity of earthy matter than coal, but the earthy matter in this substance was incompatable with its being a shale. Carbonaceous matter was the base of this mineral, and not clay. Prof. Frankland could discover no bitumen in it, but its gas producing powers were much greater than those of bituminous coal.

It was found among the ordinary coal strata. Several scientific witnesses of the highest repute were then examined upon the structure of the mineral as exhibited by the microscope. Its structure was vegetable, characteristic of the fossil plants of the coal formation. The woody fibre, and the cellular tissue, were found in this mineral, while shales did not exhibit any traces of vegetable structure.

After the jury had been addressed by most eminent counsel on both sides, the Lord President summed up. The jury were to determine whether the substance in question fell within the term whole coal in the demise, for it was not pretended that it came within any other terms specified in it. On the one side there were four geologists, who gave it as their opinion that it was not coal, and five on the other side who said it was coal, all speaking with perfect sincerity, according to what they, as geologists, classed as coal. Men of the highest reputation in geology and chemistry had been examined, but they differed very much in opinion. On one side there were five of the most eminent chemists, who had applied all their skill and energy to find out whether it was coal or not, and who had expressed themselves as clearly of opinion that it was not coal, while ten, equally eminent on the other side, were of a diametrically opposite opinion. Is this substance, then, a coal or not, in the ordinary language of those who deal in it, and of the country? because to find a scientific definition of coal after what has been brought to light for the last five days would be, he said, indeed a difficult thing. The jury, after retiring about five minutes, returned with a verdict for the defendants, thus establishing that, in their opinion, the substance in question was, in effect, coal, and removing altogether from the company the slightest imputation of concealment and deceit.

The evidence in this case, impresses us painfully with respect to the chemical abilities of men whose names are now famous in the annals of science. What a conflict; and that not on the speculative opinion of whether the mineral was coal or shale, but the details of every analysis. It is indeed difficult to reconcile experiments, when one chemist produces 10 parts of carbon out of 100, and another 60 parts out of the same quantity. A witness on one side demonstrated that it was largely impregnated with bitumen, while another as clearly demonstrated that it scarcely contained a trace of it. Such testimony is enough to shake public confidence in the present state of chemical knowledge, and must diminish our reliances in the dogmas propounded by scientific experimentalists in the laboratory. We believe the decision of the jury to be right, although that great chemist, Rose, was brought from France to prove the contrary. On such a question as this, Prof. Fyfe was the most competent chemist, for no man in the world has devoted so much attention to the analysis of coals, and with so much success. We happen to know what the substance is, and as it is similar in every respect to Boghead coal, it is nothing more than a superior Cannel coal,. It is the best kind in the world for making gas, containing nearly three times more, than the common bituminous coal. Such a question as this has never come before any of the courts in our country, but may do so at some future period.

Recent Foreign Inventions.

New Explosive Compounds (Gun Powder and Priming.)—George Winnewater, of London, patentee.—There are three explosive compounds embraced in the patent. No. 1 is composed of fulminating mercury 300 parts by weight; chlorate of potassa 288 parts, sulphate of antimony 312; of charcoal 40; of nitre 20; ferrocyanide of potassium 23; binoxyde of lead 6; and etheroxylin (that is 75 pyroxylin dissolved in 150 of sulphuric acid) 900 parts. No. 2 contains fulminating-zinc 75 parts; chlorate of potassa 4; sulphite of antimony 7; binoxyde of lead 15; ferro cyanide of potassium 1; etheroxylin, 224. No. 3 consists of amorphous phosphorous 75 parts; binoxyde of lead 64; charcoal 9; nitre 6; and etheroxylin 107. These materials are ground separately and mixed with great care. They are made into pellets and used both as substitutes for gunpowder and for priming—percussion composition.

Oil from Coal Shales, &c.—J. Perkins, of Manchester, Eng., patentee.—This invention is for distilling at a low temperature coal shales, and other bituminous substances found in the carboniferous formations yielding bituminous matter, and obtaining therefrom paraffine. The apparatus used is simply a common gas retort, built up in brickwork and heated by a fire, to which is connected a coil of iron pipe immersed in cold water to condense the distilled matters.

Making Carbonate of Soda.—Chas. F. Merckshagen, of Barmen, Prussia, patentee—The inventor mixes sulphate of soda with charcoal, and calcines them to produce sulphuret of sodium; this is then decomposed by mixing it with an excess of bicarbonate of soda and exposing the mixture in a moist state in a reverberatory furnace. The product is then washed, evaporated and dried.

New Metallic Alloy.—Andre M. Massonett, of Paris, France, patentee.—Take of copper filings 5 ozs.; burnt calamine or zinc 12 1-2 ozs.; bitartrate of potash 10 ozs.; hydrochlorate of ammonia or nitrate of potash 5 ozs.; quick lime 1 1-4 ozs.; these are melted together in a crucible and cast into ingots.

To Prepare Wood for Railway Sleepers.—Wm. Romaire, of London, patentee.—For 50 cubic feet of timber take 3 bushels of unslacked lime, 1 gallon of the oil of gas tar, and as much water as will cover the wood. These are placed in a tank lined with lead and boiled—the wood in the liquor—for about three days. The timber is then removed and either dried in the sun, or in ovens heated to 70 deg. If the timber is to be used in very hot climates, about 4 ounces of arsenic should be added to the solution. The timber so prepared is excellent for docks as well as railways.

Preserving Metals from Corrosion.—John Carvalho de Mideiros, of Paris, patentee.—This invention consists in applying mercury to any metallic surface, to which it can be applied to preserve iron or any sheathing of ships from being attacked by barnacles, &c., it also prevents oxydization.

Soap and Paint.

Soap or strong soap-suds, will destroy green paint more readily than any other colors. The ley has the same effect on oil paints that it has with grease. Many painted rooms, window blinds, &c., are soiled by carelessness or ignorance of washer-women, in the application of soap or strong soap water. When it does not destroy the paint, it affects the lustre.

A Great Railroad Scheme.

It is reported that a company to construct a railroad to the Pacific is now being organized in this city, at the head of which, it is said, are Erastus Corning, Simeon Draper, and other capitalists. The object is to provide a substantial six feet gauge road from New York to the Pacific ocean, running through Missouri, Arkansas, Texas, Northern Mexico, and California. The estimated cost is $100,000,000, which is to be the capital of the company. It is said that thirteen of the most responsible contractors of the United States have undertaken to build one hundred miles each on the route above described, and to take in payment fifty per cent. cash, twenty-five per cent. in the bonds of the company, and twenty-five per cent. in its stock.

Photography on Stone.

The "Comtes Rendus" says that M. Barreswill and Lemercier propose to prepare a negative picture on paper, and then produce a positive picture on lithographic stone. The negative is obtained by any method, the most rapid being preferable. The positive is produced by a fatty or resinous coating laid on the stone, and capable of being rendered soluble in some solvent by the action of light (and perhaps of oxygen). The negative is laid upon the stone thus prepared, and covered with a glass plate; the whole is then exposed to the sun, the stone is then washed with the solvent, and then treated by the ordinary processes of lithography.—The authors have hitherto employed asphaltum for coating the stone, and sulphuric ether as the solvent. They expect in this manner to reproduce lithographs.

Delegates to the Worlds Fair from Washington.

At the last meeting of the National Institute at Washington, the following Delegates were appointed to visit the Exhibition of the World's Fair at the Crystal Palace, New York:—Col. Peter Force, Prof. A. D. Bache, Prof. Joseph Henry, Capt. Wm. Easby, Robert Mills, Esq., Prof. J. H. C. Coffin, Commander Chas. Wilkes, Prof. L. D. Gale, Dr. Thos. T. Everett, J. C. C. Kennedy, Dr. Daniel Breed, Wm. Q. Force, Esq.

They will meet in the city of New York on the first, Tuesday of October, at 9 o'clock, A. M., and visit the Exhibition during the week. It is expected that each delegate will select some subjects upon which he will make a report.

Prof. Gale, and Drs. Everett and Breed are Examiners in the Patent Office.

Agassiz's Cabinet Sold.

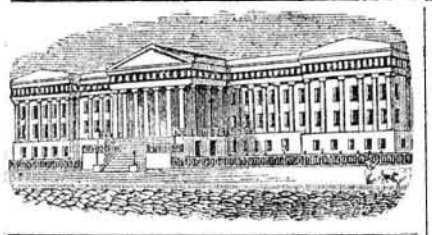
The "Boston Traveller" has been informed that the valuable cabinet of many thousand specimens in Comparative Anatomy, Mineralogy, and other sciences, collected in the course of years by that distinguished savant, Prof. Agassiz, has been purchased for the University at Cambridge, at the price, as is rumored, of $12,500, the greater part of which, it is said, was obtained by private subscription.

New Kind of Cotton.

A new kind of cotton has been brought from among the Pino Indians of New Mexico, by an officer of the Mexican Boundary Commission.—Its peculiarity consists in a fine silky staple, superior in length and strength to all kinds previously known. We learn that the seed has been introduced into Texas, and that the plant will soon be grown there extensively. It has also the great advantage of not degenerating, and not requiring a renewal of seed. The plant, if all these peculiarities are proved permanently to belong to it, must effect a revolution in cotton raising.

A New Railroad for Broadway.

A new elevated railroad for Broadway, invented by Wm. Dietz, of Albany, has been very favorably noticed by some of our cotemporaries; as we may be able to present an engraving of it in a few weeks, we will not further allude to it at present.



]Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING SEPTEMBER 13, 1853.

GEAR OF VARIABLE CUT-OFF VALVES FOR STEAM ENGINES—By M. W. Baldwin, of Philadelphia, Pa.: I claim the arrangement of the sliding pivot block fitted with a stem, connected with the sector by straps, chains, or cogs, the hand lever, and the intermediate connecting mechanism, as described.

INDIA RUBBER SOLES FOR BOOTS AND SHOES—By John Chilcott & Robert Snell, of Brooklyn, N. Y.: We claim constructing the whole, or any portion of the sole of a boot or shoe, as described, of india rubber, with the inside and edges covered and protected by leather, which is united with it by any water-proof cement, with or without stitching, and forms a hard, firm, leather edge.

CUTTING BOOTS AND SHOES—By John Chilcott & Robert Snell, of Brooklyn, N. Y. Patented in Belgium Sept. 16, 1852; in France Sept. 17, 1852; in England Sept. 30,1852: We do not claim the manufacture of boots without crimping; but we claim the form of the piece of leather or other material, as described, by which we are enabled to make what is termed the "upper leather" of a boot, to fit any leg, foot, and heel, not absolutely deformed, of one piece, without crimping or joining other pieces thereto, the distinguishing characteristics of this form being that one half or side of the boot is formed by a part, A, without joint, and the other half or side by the junction of a part, B, folded from the back of the side, A, and part, Ch, which is partly cut from, or which when flat lays close or near to the front of A above the instep, and partly folded over from the instep; the part Ch being of such shape as to form one side of the foot, and extend round the heel to the other side, A, and cover an opening made in the lower part of the back, to give the required form to the heel, and also to make part or all of the necessary stiffening.

BED BOTTOMS—By Pierre Demeure & Auguste Mauritz, of New York City: We claim the manner of constructing the spring mattress bx combining the vertical springs with an elastic or spring net-work of spiral metallic springs for supporting said vertical springs, or for increasing the elasticity so that a person lying upon the bed will be equally supported on all sides, as described.

SHAPE OF SCYTHES—By Wm. P. Greenleaf, of Washington, N. H.: I claim widening and curving the blade of the scythe at the shank, in the manner described, for the purpose of strengthening the same and adapting it to cutting bushes as well as grass.

SAFETY VALNES FOR STEAM BOILERS—By Z. H. Mann, of Cincinnati, Ohio: I claim the construction and application to a safety valve of flutter wheel, governor, and supplementary lever, as described, or equivalet devices, in order to ensure promptness of action and an increase of vent, according to the force of steam; and this I claim either with or without the adjustable link and counter weight, as described.

REVOLVING MANDREL FOR LINING CYLINDERS WITH METAL—By George Potts, of Cincinnati, Ohio: I claim the revolving mandrel, furnished with one or more rollers, whose distance from the axis of the mandrel can be increased or diminished by means of a nut, sleeve, and conical head, as described, or any equivalent device, for the purpose of lining with one metal the interior of a cylinder formed of another metal.

BUCKING CLOTH—By Andrew Robeson, Jr., of Newport, R. I. Patented in England Nov. 8, 1852: I claim the employment of a closed kier or vessel, as described, and extracting the bowking liquor from the lower part of it, and forcing it into the upper part of it while steam is being injected only into the upper part of the said vessel, and on the top of the goods, whereby, while the bowking liquor is being thrown on the top of the mass of goods, the steam is constantly and simultaneously made to press upon and pass into and through the goods, and facilitate the action of the bowking liquor, and its pass ge through the cloth, as stated.

[What is the difference between this plan and that of the closed kiers, for clearing Turkey-red goods—the closed vomiting boiler? We can see none.—Ed.]

FENCES—By Hervey S. Ross, of Cincinnati, Ohio: I claim the zig-zag and interlocked arrangement of panel, supported by a swivel-joint to posts at suitable intervals, and having the joint between the two middle pannels furnished with inclined hook and eye, each of said middle panels being provided with boards sloping in opposite directions, so that by the action of a flood, each half of the intervening line of panels may separate midway and swing in direction of the current, or devices substantially equivalent.

BOOT JACKS—By Samuel B. Sumner, of Grantville, Mass.: I claim the application to an instrument for taking off boots of the side bars, B, the shaft and the bar, D, arranged and operating in the manner as described.

CUTTER HEAD FOR MOULDING MACHINES—By Josiah M. Smith, of New York City: I claim the combination of the slotted supporting flanges, or their equivalents, with the chisels hinged and operated as set forth.

WORKING THE VALVES OF STEAM ENGINES—By Richard H. Townsend, of New York City: I claim, first, the combination of a cam and eccentric by means of the sector or its equivalent, to operate on the valve or parts that move the same, and cut off or work with the full pressure by the eccentric, according to the position of said sector, as described.

Second, I claim adjusting the position of the sector by means of the governor through the screw, or other suitable means, whereby the governor regulates the position of the sector to communicate the desired motion to the valve of the engine from the eccentric or cam, or both, according to the power required from the engine, as specified.

Third, I claim the rod and points to take motion from the block at its extremes of motion, and communicate the same by means of the right angle lever to the throttle or stop valves, as specified.

MANUFACTURE OF PLAIN AND FIGURED FABRICS—By Frederick W. Norton, of Lasswade, Great Britain: I do not confine or restrict myself to the precise details or arrangement which I have had occasion to describe or refer to, as many variations may be made therefrom, without deviating from the principles or main features of my invention.

I claim, first, the manufacture of woven fabrics by cross-weaving, by carrying the cross warp alternately over a stationary warp, and binding the cross-warp on each side of the stationary warp by a shot of filling.

Second, carrying contiguous movable cross-warps over and across each other's path, and over one or more stationary warps, and binding said cross warps to the stationary warps by shots of filling.

Third, the manufacture of ornamental fabrics by cross-weaving elongated printed warps, as described.

HANGING MILL SAWS—By James Rankin, of Detroit, Mich.: I claim the arrangement of an air chamber, cylinder, and valve, as described, for the purpose of straining saws in motion by the elastic pressure of compressed air, or its equivalent.

SCREW FASTENINGS FOR BOOTS AND SHOTS—By John Chilcott & Robert Snell, of Brooklyn, N. Y.: We claim the combination, as described, of two screws, of which one forms a nut for the other, and will hold it secure until it is all worn away.

LARD LAMPS—By L. A. Stockwell, of Batavia, N. Y.: I claim the combination of a reservoir of a lamp for burning lard or tallow, with an outer covering so arranged as to form an air chamber surrounding the reservoir, in the manner described.

RE-ISSUE.

FANCY POWER LOOMS—By William Crompton, of Hartford, Ct. (assignor to Merrill H. Furbush & Geo. Crompton, of Worcester, Mass.) First patented Nov. 25, 1837; extended April 9, 1851: re-issued Sept. 13, 1853: I claim first, the jacks with hooks or projections thereon, capable of being taken or passed by the lifter and depresser, as required, in combination with the harness or heddles, for the purpose of opening the shed.

Second, the combination of the jacks, constructed and arranged as described, with the lifter and depresser.

Third, the combination of the pattern chain or cylinder with the jacks, constructed as described.

Fourth, arranging and connecting the lifter and depresser which operate the jacks in such a manner that they shall operate simultaneously to elevate and depress the jacks and warps in forming the shed, as described.

Fifth, giving motion to the pattern chain or cylinder, as described.

Sixth, the combination of the pattern chain or cylinder with the jacks, lifter, and depresser, as described.

Seventh, so constructing or arranging the lifter and depresser, and the hooks or projections on the jacks, with reference to each other, as set forth, as to bring the upper warps all into the same plane, and the lower warp all into another, when the shed is opened.

I do not claim broadly the bringing of the warps into said planes.

Eighth, connecting the hook jacks to the bottom treddles or levers, by inclined wires or their equivalents, to hold the jacks against the tubes or bars of the pattern cylinder or chain, when not thrown out by the rollers or other projections thereon.

ADDITIONAL IMPROVEMENT.

WINNOWERS AND THRESHERS—By Geo. F. S. Zimmerman, of Charlestown, Va. First patented Feb. 8, 1853: I claim constructing the suction pipe or tube, of any desired form, with a sliding hinged flap bottom, attaching said tube to the side of the thresher or winnower in any position, and also attacning said pipe or tube to the grain discharge or bagging spout, having a sieve-like or reticulated bottom, and using said attachments in combination, for the purpose of cleaning and chaffing, or double winnowing grain of all kinds, with a blowing blast of air and a suction draught or current of wind, also in combination, and in one operation, and at the same time, as set forth.

I do not, however, claim inventing or originating the double cleaning of grain, but simply the peculiar combination mentioned.

[For the Scientific American.]

Steam Boiler Explosions—Lieut. Hunt Criticised.

In the "Scientific American" of the 3rd inst., you published an abstract of a paper by E. B. Hunt, U. S. N.; to me the whole article is extremely illogical and "quantitatively" unmeaning. He says that "perfectly deaerated water, with a limited surface, would not boil," &c. This statement hardly needs a contradiction, for perhaps there may not be one in a thousand but knows that as perfectly deaerated water as we can get, boils as readily as any other, and in a vacuum boils at 140 degs. less temperature than in the open air, and under certain circumstances it may be boiled by the application of cold to the out side of the boiler.

Lieut. Hunt makes it essential to an explosion that air bubbles or aerated water be thrown into the boilers, and in his explanation he says the boat stops at the wharf; the "doctor" or pump supplying the water to the engine (a new feature in making steam) being worked by the engine itself, stops the water supply when the engine stops; the water in the boiler then goes on boiling until all the air bubbles are boiled off from the water &c. &c. Again in connection he says, the engineer then starts the engine; this starts the pump, which throws a stream of air charged with water, directly into the glowing fluid. Then comes the terrific consequences &c.

Now Messrs. Editors if this is an explanation, the result must be uniform; it must be infallible, and every steam boiler pursuing the routine described must and will be blown up. That all are not blown up sufficiently, perhaps, overturns this beautiful theory; but I wish to follow it up a little more closely, for I do not think a document can be found among all the absurd theories which have ever been written in explanation of steam boiler explosions that show more ignorance or want of knowledge of the existing arrangements of pumps, doctors, engines, and boilers now in use on our Western rivers of "tragic reputation" than the article quoted.

The doctors upon the Western rivers are small engines (not pumps) for driving the force pumps to supply the boilers, and are separate and distinct from the main engine, and are never started simultaneously with the main engine.—Very often the doctor may not be started at all; this depends entirely upon the will of the engineer; he must either start it before he goes to the other or afterward; if he should start it before, why the explosion would follow at once, if delayed until after the main engine is started. explosions would not follow so uniformly as they now do at the 2nd or 3rd revolution.

Had Lieut. Hunt said the pumps threw a stream of water charged with air, it would have been a much fairer statement of the case, though without any foundation in fact—for the pump never "throws a stream of air charged with water," nor even "a stream of water charged with air."

Taking all the steamboats upon the Western rivers, perhaps 700 in all, few are without doctors, and so few as to be of little moment in the examination of the subject. The average capacity of the forcing pumps will not exceed 150 cubic inches at a single stroke; now then, giving every latitude to Mr. Hunt's premises, what will be the proportion of air contained in this water? It is less than 4 per cent, or 6 cubic inches; now this is injected into the remotest corners of the water in the boilers, which average, on each boat, about 1,600 gallons, or, in round numbers, 500,000 inches of water against 6 of "air bubbles;" at this rate these air bubbles are agents of tremendous power, and if they could only be controlled, we have nothing to do but squeeze a "Highland bagpipe" into the back end of a boiler, and any amount of power could be created at pleasure.

The worst of this theory is, that not a particle of air is ever pumped into the boiler in the ordinary running; the truth is, that when the water reaches the pump, in all the western boats without exception, by being passed through the heater, it is very nearly at the boiling point, say 210 degs. Every intelligent engineer knows that this expels the air as effectually as if it were under an exhaust pipe.

This subject of explosions has been mystified quite too much: do not let the true fact be obscured by inexperienced writers;—proclaim the truth, that in ninety-nine cases out of every hundred, explosions occur from negligence of the engineer, in letting the water get low in his boilers. Keep up a good supply of water—place a limit to excessive pressures, and employ competent engineers—are rules of more value than all the abstruse theories that can be written. Show me a good supply of water and I will risk the air bubbles. AN ENGINEER.

Telegraph Batteries.

MESSRS. EDITORS:—In No. 46, page 363, I noticed a communication under the head of telegraph batteries; I often wished some one more competent than myself, would take this subject in hand, and as it is now started, allow me to make a short statement as far as my experience goes. I have been an operator on a Morse line for the last four years, and should know something about it. For two years I used Grove's battery, but during all this time I often wished for something cheaper and more convenient, taking out each cup and cleaning it every evening, and again putting it in in the morning, is no small trouble. About eighteen months ago I heard of Olmstead's battery, which is merely a modification of Daniells'; it consists of a strong glass cup holding about a quart, into this is placed a cylinder of copper sheeting, then comes a porous cup, and again into this is placed the zinc cylinder. Into the glass vessel is put a strong solution of sulphate of copper, and in the porous cup pure water, some would perhaps add a few drops of sulphuric acid, but this is not necessary. as the acid contained in the sulphate of copper will shortly penetrate the porous cup and action commence. One cup of this battery is nearly equal to one of Grove's, I say nearly, as I do not think it quite so, but the difference is so small that it is of no moment in telegraphing.

The expense of Grove's for a local battery of two cups for one year—

50 lbs. nitric acid at 12 cts. per lb.	$6,25
6 zinc cylinders 25 cts. per piece	1,50
Total	$7,75

Olmstead's, same number of cups, and the same time—

10 lbs- sulphate of copper 10 cts. per lb.	$1,00
2 zinc cylinders 25 cts.	50
Total	$1,50

Balance in favor of Olmstead's, $6,25

This would make in a main or line battery of thirty cups, a difference of $93,75, saying nothing about the mercury which can be entirely dispensed with in Olmstead's Another item is the convenience, there is no taking out the cups every evening and cleaning them, if it is once in operation, all that is necessary is to break the circuit during the night, and it will work for months, merely adding crystals of sulphate of copper when it seems to give way.—Of course the zinc cylinders will have to be cleaned about once a month, and at the same time fresh water placed into the porous cup.—There are no nitrous fumes, and therefore no corrosion at the connections. Perhaps some telegraph operators who are tired of Grove's battery, can benefit by it, and all I have to tell is, try it with a local of two cups, and it will recommend itself. The platina of a Grove's will pay for the whole of an Olmstead's.

Nazareth, Pa., Sept. 10, 1853- C. G. B.

Inventors---Their Rights and Wrongs.

The "Wall Street Journal," of this city, after some censurable remarks on the management of the Patent Office, says:—

"But there are outside influences injurious to the interests of real men of genius, and tending to perpetuate evils in the Patent Office, by destroying sympathy for the labors in the public mind.—Similar causes have been at work here detrimental to the literary class. We allude to the intrusion of pirates, pretenders, and humbugs into every society organized for the purpose of securing adequate protection by law for property in intellectual labor, whether in literature or mechanism. Call a national convention of inventors or authors, and what is the inevitable result? A brazen and impudent pretender rises with his budget of resolutions, or his speech, at every turn, brimful of humbug and himself, and so sickens off men of merit, that they leave the field to the braggadocio and the little circle who may be deluded by his boasts into toleration or support. The folly, the contemptible silliness, the arrogance of some of these universal humbugs who have figured in literary and inventive associations, must even now be remembered with a smile by the members of these bodies.—We appeal to them if their experience does not recur to some Katerfelto starting from his chair at the first pause after organization, and insisting on reading a bombastic series of resolutions, full of sound and fury, or a constitution of a society in which he hopes to be factotum, so utterly complicated and impracticable as to seem as if concocted during a nightmare. These vain and selfish idiots, their insufferable vanity, and the disgust inspired by their presence, have hitherto prevented any concert of action among inventors to effect any good. The same cause has prevailed among authors; in fact, the literary class is morbid, and but very few are unaffected by inordinate self-conceit, which takes the form either of excessive impudence or excessive shyness."

[The Patent Laws are not yet perfect; there are some reforms required, and these will no doubt be brought about in the way and by the means pointed out by the "Wall Street Journal." The picture drawn in the above of the officious Katerfelto is true to the life. A number of Inventors' Conventions have been held in this city and elsewhere, for the purpose of reforming the Patent Laws, and just such characters have always had too much to say and do with them, hence such conventions resulted in evil instead of good. Honest and worthy inventors have been jostled aside by pirates who pretended to be their friends.

Manufacturing Gold.

M. Theodore Taffereau has laid a paper before the Academy of Sciences at Paris, in which he asserts that he has produced gold by artificial means. He believes that there are very few simple substances in nature, and considers that "the forty metals now assumed to be such are in reality compound ones, probably of one radical with some unknown body, hitherto not studied, but which of itself alone modifies the properties of this radical, and thus presents us apparently with forty bodies, while in reality there is but one." He asserts that he has discovered this body, by which the radical is converted into gold.

[The above we have seen in a number of our exchanges. Mons. Traffereau is no doubt more rogue than fool. He merely revives the old piece of scoundrelism, by which humbug-alchemists cheated so many crowned fools during the middle ages.

New York Mechanics' Institute.

At the regular monthly meeting, on the 13th inst., James Rodges, Esq., Chairman, and Mr. John Tagliube, Sec'y., it was moved, seconded, and voted, that the Institute now proceed to fill the vacancies in its corps of Officers and Directors, and that the ballots should be cast for each candidate separately; whereupon Charles H. Delevan was elected second Vice-President, C. Godfrey Gunther third Vice-President, and Messrs Charles Burdell, Thomas Hunt, C. H. Hankins, and M. C. Tracy were elected Directors.