Air Engine.

At the request of one of our subscribers we publish the following succinct account of an Air Engine, invented by Mr. J. Stirling, C. E. of Dundee, Scotland, and patented Oct. 1st 1846:—

Mr. Stirling's engine is constructed on the principle that air has its bulk increased with an increase of temperature, and diminished when the temperature is lowered. Two strong air tight vessels are constructed with a cylinder, one at each end of it, the pistons working in the common way. Four-fifths of the inside of these vessels are occupied with air tight plungers which are attached to the opposite ends of a beam and can be moved up and down the remaining fifth part of the vessel. By the motion of the plungers, which are filled with non-conducting substances, the air to be acted upon is moved from one end of the outside vessel to the other, and as one end is kept at a high temperature and the other as low as possible, when the air is brought to the hot end, it has its pressure increased, and diminished when it is brought to the cold end. It follows, therefore, that as the interior vessels move in opposite directions, the pressure of the enclosed air in one vessel is increasing as that of the other is diminished. A difference of pressure is thus produced on the opposite sides of the piston, and it is thereby made to move from one end of the cylinder to the other and by continually reversing the motion of the plungers, the greater pressure is successively thrown upon a different side and a reciprocating motion of the piston is kept up. The piston is connected with a fly-wheel in the usual way and the plungers by whose motion the air is heated and cooled, are moved in the same manner and nearly at the same relative time as the valves of a steam engine. This is the way in which motion is produced. But there is one thing economical about it. The heat required to raise the temperature of the air is not lost every time the air is cooled. The air when heated to its greatest temperature is not at once brought into contact with the coolest part of vessels, but is made to pass from the hot to the cold end of the air vessel by a multitude of narrow passages, the first being nearly as hot as the air and gradually declining until it becomes nearly as low as the coldest part of the vessel. As every body by contact will give out some of its heat to another that is colder than itself, it follows that the air which enters these narrow passages must give out a portion of its heat to the hottest and more and more as it goes through the passages until it is about to escape into the coldest vessel when there is but a small portion of heat to be extracted to bring it to the coldness required, and thus the greater part of the heat has been left behind in the metal of which the passages are made, which are so contrived and arranged as to retain that heat until it is again required to heat the air, and it is very evident from the manner in which the heat is distributed over the whole length of these passages that it is capable of being again employed for the purpose of expanding the air, for when the cold air is made to enter the passages to be heated, it comes in contact with matter hotter than itself and therefore it begins to acquire heat when it first enters these passages and receives an increase of temperature as it advances, and so when it comes to the last it requires but a small addition of heat to give it the required elasticity to move the piston. By this ingenious and scientific arrangement of Mr. Stirling instead of being obliged to supply at every stroke of the engine as much heat as would be necessary to raise the air from the lowest to the highest degree of temperature, it requires only as much heat to be furnished as will heat the air to the same number of degrees by which the hottest part of the air vessels, exceeds the hottest part of the intermediate passages, and this is the foundation of the economy of producing power from heated air by a small expenditure of fuel and which for three years has been attended with great success, but of this we shall speak more particularly in our next number.

(*To be continued.*)

A lady had her head nearly severed from her body in Baltimore, lately, by the explosion of a steam boiler used in a refectory.

John Fitch.

Who has not heard of John Fitch the obscure and unlettered but ingenious American Mechanic. In 1775 John Fitch conceived the project of a Steam Boat and in 1788 applied for, and obtained a patent for the application of steam to navigation. He had previously made a model of his contrivance, and showed it to General Washington, who then recollected that a Mr. Rumsey of Virginia had mentioned the same subject to him in the winter of 1784. But Fitch alledges that the model then exhibited by Rumsey, was a boat to stem the current of rapid rivers, by means of wheels cranks and poles: a contrivance, which, he says, had been tried many years before either his or Rumsey's had been thought of, on the Schylkill, by a farmer near Reading, and failed. Fitch claims to have made an experiment in 1783, on the Delaware and succeeded in moving about by paddles, which derived their motion from a steam engine. Both Fitch and Rumsey were supported by associations of wealthy persons, who advanced money to make partial experiments and to assist in taking out patents in England. It appears that in 1786. Rumsey having procured a patent in Maryland, made a trial by steam alone, *against the current of the Potomac, at the rate of four or five miles an hour.* His boat was about fifty feet in length, and was propelled by a pump worked by steam, which propelled a quantity of water up through the keel, and forced it out at the stern, through a horizontal trunk in her bottom. The reaction of the effluent water carried her at the above rate, when loaded with three tons in addition to the weight of her engine, about a third of a ton. The boilers held no more than five gallons, and needed only a pint of water at a time; and the whole machinery only required a space of not more than that of four barrels of flour.

It was not till 1786 that Fitch got ready to make his experiment. In that year his boat was launched in the Delaware. A view of his first boat was represented in the second vol. of the Sci. American, page 25. This engine had a twelve inch cylinder. and the piston a stroke of three feet. Each revolution moved twelve oars or paddles five feet and a half, which worked perpendicularly, and represented the strokes of the paddles of a canoe. As six paddles were raised from the water, six more were entered and the two sets of paddles made their strokes at about eleven feet in each evolution. The boat performed her trip to Burlington, a distance of about twenty miles but unfortunately burst her boiler in rounding to the wharf. He procured another boiler, and performed another trip from Trenton to Burlington and back in the same day. She moved at the rate of eight miles an hour, but some part of the machinery was continually breaking, and the unhappy projector only conquered one thing to encounter another. Perhaps this was not owing to any defect in his plans, but to the low state of the arts at that time, and the difficulty of getting such complex machinery made with proper exactness. Both of these Americans, and indeed most of the European experimenters, labored under the disadvantage of imperfect models, to make their experiments with; their machines being the productions of inexperienced workmen, laboring with improper and inefficient instruments. Little else than failure could be anticipated of the best conceived machines under such circumstances.

As early as the year 1747, the legislature of New York passed an act for granting and securing to John Fitch the sole right and advantage of making and employing for 15 years the steam boat by him invented.

In 1798, that act was repealed, and similar priviliges extended to Robert R Livingston, (Chancellor of the State.)

John Fitch was undoubtedly the father of American Steam Navigation, but he had no rich friends to take him by the hand and forward his invention and being poor he faded away as it were in obscurity. He died of a broken heart on the banks of the Ohio, where he now sleeps but although dead, he yet speaketh.

An observatory, to cost $40,000 is proposed to be erected in Brooklyn, N. Y., the result of Prof Mitchell's lecture in that city.

A Good Word to Young Men.

We take the following from the Philadelphia Ledger, and we must say there is a good deal of truth in it. We heartily recommend it to the attention of all young men; not that they should be proud and despise the advice of experience, but that they should act according to the teachings of sound reason. The opinions of the Ledger are the very opinions expressed more than once about old and young Generals. We should have been glad, however, if mention had been made of the names of some brilliant exceptions in our own country.

"Give us young men to direct the affairs of young countries. Young men are bold, adventurous, ardent and aspiring. Not content with the present they aim at something better. Consequently they must always aim upwards, and generally aim high. Old men are conservative, and consequently timid.—They wish to keep things as they are, because *they* have monopolized the best of everything yet obtained. Old men wish to keep what they have got, young men to get what they can. Among farmers, old men plod on, and laugh at the innovations which young men call improvements. Among mechanics, old tinkers shake their heads at new machinery. Among physicians, old men bleed and blister and butcher according to old books, established authorities when *they* were young. Among preachers, old men stick to creeds and platforms, and swear by Hooker or Hopkins. Old soldiers stick to Frederick and Baron Steuben. Old politicians stick to their old mistakes. In our Revolution the old men were Tories, who wished to keep what they had got, while the Whigs were young men seeking their fortunes. Washington was middle aged, the great lights of the Continental Congress no more; Knox, and Greene and Schuyler and Mercer and Morgan and Shelden and the rest of them were young fellows, and Hamilton hardly of age. In the French Revolution, the old nobles, the old priests, the old fools—ran away. The *movement* was directed by those splendid young men who afterwards became Napoleon's marshals; Napoleon himself being a mere stripling when he crossed the Alps and cleared Italy of Austria's grannies.

In our last war with the British, the War Department was first directed by Dr. Eustis, then by Gen. Armstrong, and our armies led by Gen. Hull, Gen. Wilkinson, Gen. Hampton, Gen. Dearborn, all remains of the Revolution. Every thing went wrong. Defeat, surrender, disgrace, were the order of the day.—If our young soldiers and subordinate officers gained a victory, the granny generals were sure to lose all its fruits. Mr. Madison became disgusted and the country indignant. He called to his cabinet Alexander J. Dallas and other men of greener years, and put our armies under the command of Brown, Scott, Gaines, Ripley, all young fellows. *Then* every thing prospered, and the star-spangled banner was enveloped in a blaze of glory. "Old Hickory" was just or scarcely forty when he gained the battle of New Orleans. On the ocean, all the commanders who did anything were young. While *old* Chauncey was poking about on Lake Ontario, *young* Perry and *young* Elliot and *young* McDonough were gaining victories on Lakes Erie and Champlain. While *old* Rogers made cruise after cruise without finding the enemy, *young* Hull and *young* Decatur and *young* Biddle and *young* Jones and middle aged Stewart and Bainbridge were finding and capturing the enemy every day.—Give us *young* men to act, and nothing over middle aged men to think. Our country is young, and therefore we must "go it while wer're young."

An Elevated Mind.

The soul that is impressed with the grandeur of its powers and feels that it would be indignity to itself, and its Creator, to debase them in any ignoble and degrading association, is pluming its wings for a flight to the bosom of the Godhead

Dr. P Ellsworth of Hartford, has performed amputation of the thigh upon a patient who felt no pain whilst the operation was going on, having been placed under the influence of nitrous oxide vapor, (laughing gas.) Ether was first tried but without success.

Law's Stave Jointer.

WILMINGTON, N. C. January 6th, 1848.

Messrs. Munn, & Co.

GENTLEMEN.—In your paper of 1st. inst., there is a communication from Judson & Pardee, complaining that my stave jointer is an infringement upon their jointer. From the tenor of that paragraph your readers would be likely to infer that my machine and theirs were one and the same thing, whereas there is a wide difference between them. Their machine joints but one edge of the stave at a time and it must necessarily pass through the machine the second time to finish it, and then the staves are not always brought to equal widths at each end, mine joints both edges of the stave in once passing through and brings both ends to equal widths, and will do the work of two of their machines, and do it more perfectly. The machinery, therefore, *cannot* be alike. My jointer resembles theirs only in the following particulars, viz: both joint with circular saws; this is no new thing both feed the stave to the saw in a curved line, this also is not new, and this is all there is of encroachment. I claim nothing not a whit that is in Judson's machine but what I do claim and what Judson's machine has not got is, first, the double or S form of the curve, second, the index bed in combination with the moveable saw to govern the width of the stave, and thirdly, the mode of shifting the saw with the double levers and weight, or equivalent, what.—They advertise the public, that I "got my ideas" from them I feel myself called upon to reply. that the principal features of my jointer were planned and explained to my machinist long before I knew any thing about their mode of jointing, and farther, I shall be able to prove, that after *very many* unsuccessful efforts, they abandoned the idea of jointing both edges of the stave at a time, as impracticable for general use, my jointer does this with *great ease and facility.*

I would here state that my jointer is attached to my newly invented stave dressing machine, which for dressing staves of all kinds and *all shapes* has not its equal in the world; of this fact the public will soon have an opportunity of judging for themselves, and I am quite sure that after a twelve months trial, if not before, the decision will be in the affirmative.

The staves are taken promiscuously from the heap and placed in the hopper, from whence they pass at the rate of 8 to 10 per minute, and when they reach the floor are finished ready in every respect for the truss hoop and unlike some machines, they spoil no stock however crooked or twisted the stave may be. Yours, &c.

H. LAW.

TO CORRESPONDENTS.

"W. L. of N. J."—Your plan for conveying electric intelligence has been long known and used in small experiments, but if you try it on a large scale, you will find that it will not work. If you can make it operate on a globe that has a greater extent of surface than nine tin foil common vases for electric experiments you can do more than any other experimenter. A patent certainly could be obtained, if the invention will operate for the purpose you have set forth.

"G. W. D of H., N. Y."—You will find out whether Mr. Waldo has got a patent within the last two years; by examining our Lists of Patents, as published in the Scientific American. All are published there.

"N. M. of Mass."—It is impossible to answer your question without examination at the Patent Office, which can be done for the usual fee $5, and all post paid to Washington and from it. The patents for stoves are too numerous. There is not a stove inventor who has paid attention to the great improvements wanted in an easy way of cleaning out the ashes, and kindling the fire. There is not a stove that has the least convenience in this respect that we have ever seen but one, and there is no patent on it.

"A. H. of N. C."—The application for a patent should be made as soon as possible so that the fullest protection for infringement may be obtained. We are much obliged to you and will attend to your report.