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SEPTEMBER, 1837.

Practical and Theoretical Mechanics and Chemistry

Notices of various things in existence, or in progress; Extracted from a Letter addressed to the Editor, by JACOB PERKINS, Esq., London.

In publishing some communications recently received from our old friend Perkins, we observed that the gentleman, in whose hands they had been placed, had been long detained, and that the information furnished was nearly a twelvemonth old. The letter from which the subjoined extracts are taken, made a part of the papers received, and the Editor hopes that some of the interest felt by him on the matters to which it relates, may still be excited in the minds of his readers.

"You no doubt, in common with many others, have wondered at my long delay in producing some things so confidently promised in my communications to you, and in certain public announcements, made some years since. The particular causes of this delay are too much of a private nature to justify, or warrant, their detail, and I will simply state, therefore, that the extravagant demands made upon me in consequence of the insolvency of persons with whom I have been connected, involved me in law, and that the seal of Chancery was placed even upon my unfinished experiments; this however, is now broken, and since I have been able to resume them, I have compelled the most inveterate of my opponents to acknowledge that I have struck upon some veins in the mines of scientific knowledge well worth

exploring. I send you by the bearer, Col. Petival, a model of my new steam-boiler, or rather generator, which I am about to patent both in this country, and in the United States; so far it has realized my most sanguine expectations both as regards economy and safety. The pamphlet which accompanies it [not received] will explain my general views, but the most interesting part of this improvement must remain unpublished until the respective patents are secured.

The paper which I have sent you on the application of the Pneumatic Engine to railway purposes, looks, I must acknowledge, a little *Redhefferish* in some of its parts; it, however, relates actual facts, and will be applied in a manner which will become the subject of patents in the United States.

You still hear from this side of the water accounts of the running, or intended running, of steam carriages upon common roads. I am aware that you have repeatedly expressed an opinion that they could not succeed. This, from the first attempt made, up to the present time, has also been my settled conviction: that is, that they never can so run as to compete with rail-roads. But notwithstanding the numerous failures and abandonments, much money will yet be spent before the project will be given up. There are now two splendid steam tugs to start in a few days, with their attached omnibuses; they will undoubtedly run for a short time, after which they will be withdrawn and soon pass into the shades. This grand concern was patronized by the late celebrated engineer Telford, who as a constructor of canals, bridges, turnpike roads, &c., &c., has established a fame which will be imperishable. My attachment to him was very great; he was a man to be loved; was extremely liberal in all his views and actions; and to this country his loss is a very heavy one. Had he lived a few years longer, he, I am well assured, would have experienced severe mortification in witnessing the entire failure of his favourite system of steam-coach traveling, which was eventually to supersede the rail-road system. There are, you know, spots upon the sun, and probably upon every other luminary.

I intend shortly to send you a drawing of my ice making machine. It is very simple in its construction, and economical in its operation, so much so that I can make ice from filtered water at a cost of about one shilling per cwt., which does not exceed one-eighth of its market value. This estimate is made under the supposed application of steam-power, manufacturing in the large way. When made by hand its cost will be about a penny per pound.

I have lately obtained a patent for a centrifugal locomotive blower, which gives a much stronger blast than the ordinary revolving blower, when of only one half the size. One of its important features is its giving the blast without noise. The air is drawn in at one side, and is driven out at the other, not at the periphery, as heretofore; every fan is at work throwing the air over the disk, which is equal in diameter to the fans, on the delivery side.—Many blowers which have been put up for steam-boats, cupola furnaces, &c., have been taken down on account of their trumpet-like noise, although they were otherwise very efficient. I intend to try them for a new purpose in steam-boats, namely, to dispense with the huge chimney, and to throw the exhausted air and smoke into the paddle case. Speaking of the paddle case, reminds me of my oblique paddle-wheel, so well understood, and explained by you in your Journal; it has not yet been tried on a large scale, but in all my experiments in the small way it has performed well. I had a boat fitted on one side with the ordinary paddle-wheel, and on the other with my oblique paddles, each exposing an equal surface, and being equal in diameter, the rudder being fixed in a line with the keel; when the

wheels were made to revolve, the boat moved in a circle of small radius, showing the great advantage in favour of my wheel. I still hope to live long enough to try it on a large scale on my return to my own country, which I intend shall be at an early day. To you it may appear strange, but it is true notwithstanding, that long as this wheel has been before the public there are very few indeed, even among professed engineers, who understand its true principle.*

The Adelaide Gallery, of which you have frequently heard, continues to attract attention. When I first proposed the establishment of such an exhibition as that which is made there, its success was a subject of much doubt. It is now, however, firmly established. Its average number of visitants is 300 per day, each paying one shilling for admittance; on some occasions there have been 1000; and the visitors are of the most respectable class. My steam gun showers its balls every hour from 12 to 4 o'clock. The gallery opposite to this gun is 150 feet long, and it is frequently filled three or four deep, with intelligent spectators, and although it has been thus in use for three years it still continues to be the lion of the day. Foreigners who visit the gallery not unfrequently avow that the object of their journey from the continent was to see this gun. On a recent occasion just before the last volley was discharged, the atmosphere became suddenly very dark, and many were waiting to see the last shower of balls; the steam was somewhat higher than common, the gun had been recently lengthened, and from the concurrence of these circumstances the velocity of the balls was much increased, and a very remarkable effect was produced. When the balls came into contact with the cast-iron target, a very brilliant group of stars was seen on the plate, each about the size of a marygold, and somewhat resembling it in appearance; light was seen also at the mouth of the gun; and the leaden balls were completely pulverized. What could have produced these effects? was it not the result of the development of electricity by the friction, or from some uninvestigated cause?

The action of a soft iron disk upon hard steel, such as a file, is exhibited four times a day. This has been regularly kept up for three years, yet it has undergone very little wear. I am of opinion, in fact, that if the file had never been held upon it until it had attained its full velocity, there would not have been any loss of metal. I do not know to what extent the combustion of steel by soft iron may have been carried in the United States, but our experiments are so brilliant as to excite the highest admiration, and to induce numbers to repeat their visits to the Gallery. Our disk is a foot in diameter and an eighth of an inch thick. It requires about a three horse power to drive it, and revolves about 6000 times in a minute. It is very accurately fitted up with friction wheels. The blaze of light which rises about 12 inches, perpendicularly, from the point of contact, is so vivid that but few persons can look steadily at it even at noon day. The stream of light is about an inch and a half thick at the distance of a few inches from the point of contact, and at the distance of 7 or 8 feet it spreads out to about 10 inches. The sparks not unfrequently touch the ceiling, which is about 20 feet high; a ring of fire is seen all around the disk, appearing like a band of light about five-eighths of an inch wide. Of what does this light consist? It is manifestly different from that of the sparks, which all fly off

* A gentleman recently from England, an Engineer by profession, and a frequent visitant at the Adelaide Gallery in London, where the model is daily exhibited in operation, denied the possibility of the main thing which characterizes it, when mentioned to him by the editor, yet professed to know every thing about it. See Vol. V, p. 334, of this Journal.

in a tangent. In operating with the disk, it never becomes warm; the file, however, has to be held at least two inches from the sharp end, as it becomes highly heated. The whole appearance, in fact, is very interesting, and when fully investigated, I am well convinced that some of the phenomena will be found to depend upon electricity.

My son Anger is doing well with his patented apparatus for heating by hot water. The system of heating by hot water and steam is being abandoned, and the old apparatus removed from various public buildings to give place to the new. This is the case in the British Museum, where Anger has given great satisfaction. He has fitted up two ships for the North Pole, and orders crowd upon him faster than he can execute them. A thousand reports of explosions, fires, &c., have been invented and propagated, as caused by his system, the whole of which are utterly false, and the intended evil is recoiling upon the interested individuals who have aimed the blow at him. The apparatus has already worked well in various buildings during successive years without losing a drop of water. The filling pipes are regularly examined once or twice a week, when, owing to some invisible leak, it may, for a time, require a few pounds of water, but oxidation soon fills up any such small opening, sealing it perfectly. It would seem incredible, but it is a fact, that in this apparatus a stream of hot water which is not thicker than your little finger, carries the heat 700 feet, and then returns to the boiler at the temperature of 100 degrees. The boiler is a coil of tube of the same diameter with the conducting pipe. From the extent of that magnificent building, the British Museum, the expenditure this year, on the heating apparatus, will be upwards of \$6000.

Prior to the ascertaining the proper strength for the pipes, in the early trials, there were a number of explosions, but not such as produced any injury beyond that to the pipe.

I have several other things on the tapis, which it is my intention to communicate to you at an early day. For some of them I am preparing to obtain patents, which will soon be matured.

Yours, &c.

J. PERKINS.

Physical Science.

Igniting Gunpowder by Electricity.

An easy method of Igniting Gunpowder by common Electricity, by CHAS. P. PAGE, M. D. of Salem, Massachusetts.

Having often witnessed the futile attempts of experimenters to ignite gunpowder by small Leyden jars, I presume the following communication may be of value. I have been in possession of the fact for six years, but have never been able to fix upon a rationale. In common experiments for igniting gunpowder by electricity it is found necessary to introduce iron filings, or detonating powder, or to use very large jars, or batteries. But by a simple arrangement, powder may be exploded by a half pint or smaller jar; and what appears most singular in the experiment, there is no audible discharge of the jar; and when examined after the experiment, it is found still highly charged. An effectual method which has long been in use is that of passing the charge through water, but in this case also large jars are requisite. If a piece of wetted cotton thread be introduced in any part of the circuit, the powder may be ignited by a few inches of coated surface. The experiment is best regulated by Lane's discharging electro-