Scientific American

NEW-YORK, FEBRUARY 26, 1853.

The Commissioner of Patents.

With a change of administration there will no doubt be a change in the Patent Office.—This has been the rule, and we suppose ever will be. A new Commissioner of Patents has always been appointed with the elevation of an opposite political party to power. The present Commissioner, S. H. Hodges, Esq., has been but a short time in office, but during that period he has earned for himself in his new capacity, a high character for urbanity, ability, and courtesy. He has qualities of mind which eminently fit him for such an office, and had his political party been successful, we would have anticipated much good from his future administration. This, however, we cannot expect, and we have no views to present opposed to political rules when good men are selected to fill the places of good men.

The office of Commissioner of Patents is a very responsible one, and politically speaking is one of great influence. The number of inventors in these United States is not small, and their influence we know is very powerful. A man of courteous manners, of a clear mind, well acquainted with law, mechanics, and scientific matters, and of an honest open character, is required to fill such an office. He should also be intimately acquainted with inventions and the affairs of the Patent Office. Now where is the man to be found in the political ranks of the successful party who has these personal qualifications, without which we would not desire to see him appointed Commissioner of Patents. The Hon. D. K. Cartter, of Ohio, the present Chairman of the Committee of Patents in the House of Representatives, appears to us to be well qualified to fill it. We have no interest in the matter excepting the desire to see a good and proper Commissioner appointed. We certainly have some knowledge of the qualifications necessary for any man to fill that office, and we merely point to a gentleman who appears to us to possess them. We do not say who should get the office, we merely point out the qualifications a person must have to perform its duties for the benefit of inventors, the progress of art and science, the honor of our country, and the credit and influence of the party in power.

Hot Air and Steam---The Ericsson Engine.

On page 186 are two letters discussing the merits of water and hot air, as applicable to propel machines with the greatest economy by expanding them through the agency of heat produced by combustion. The question discussed—strictly speaking—is not one we have raised, and we might truly say, "there is no controversy between us" in respect to what we have hitherto said. The arguments presented, however, are the only scientific ones that we have seen in favor of hot air as a superior substitute for steam. Mr. Mathiot expresses himself in favor of steam, while Mr. Bass seems to be halting between two opinions. We are well aware that the capacity of water for heat is 3·74 times greater than air weight for weight; but at the same time air is 815 times lighter than water; it takes 815 cubic feet of air to weigh as much as 1 cubic foot of water. Knowing as we do, that we would have a poor set of flying artillery if every pound shot required a cubic foot of powder to discharge it, we have in all our articles on this subject spoken of the comparative values of air and water, bulk for bulk, as motive agents, especially as air cannot be used at a high heat. Instead of adopting a positive theory, that "substances have a capacity for heat inversely as their atomic weights;" we would rather say, "substances have a capacity for heat, according to their nature and conditions," for ice, water, and steam (the same substances under different conditions) have different capacities for heat; water has a capacity of 1·0000, ice, ·5130, steam, ·8470.

The manner in which Mr. Bass has treated the question, shows him to be exceedingly dexterous in exterminating non-existing improbabilities. He compares water and air bulk for bulk, and raises the temperature of a volume of the latter to 3,682,210°, a heat respecting which no one can form any possible conception who has not visited the warmest corner of Hades. Let us treat the question as it stands plain and open.

As the capacity of water for heat is to air as 1·0000÷·2669=3·74, so will the same amount of heat which will raise a certain weight of water to 1180°, raise 3·74 times the weight of air to the same temperature. In comparing the two bodies we must take the real temperature of them both as it is. Air is 815 times lighter than water; it doubles its volume by the application of 491° of heat, and with the doubling of its volume, its capacity for heat is increased 50°—this we must also take into consideration. One pound of water multiplied by 1180° expands to 1728 times its volume. But air is 815 times lighter than water, and it takes 791 volumes of it to one of water multiplied by 1180° to equal the expansion of the water into steam. It is true, there is much less fuel used, but look at the volume of air to be operated on, and any person can see that when we take the element of time into consideration, the balance is in favor of steam, yes in favor of the steam engine without a condenser. But as in the Ericsson engine, the air is heated only to 384°, therefore we have (with the saving of fuel to be sure, for how can it be otherwise) 1180÷384=3·07; 791×3·07=2428·37 that is if the Ericsson engine could use its air at a temperature of 1180°, it would only have to use 791 cubic feet to produce the same effect by the same fuel, which it now requires to heat 2428·37 cubic feet of air. Mr. Mathiot views the question aright respecting the value of highly heated air. The man who consumes five times more food than another, and yet does the same amount of work five times faster, is the more profitable laborer; so it is with the steam and hot air engines; the former consumes more fuel, but yet does more work in less time. And what is meant by *capacity for heat*, just this, that if a body requires more heat to raise it to the temperature of another body, it takes a longer time in proportion to part with it. In the steam boiler we have a magazine of heat of 1180°, yet it raises the iron to only 212°, the strength of which is but insensibly diminished at such a temperature. The heat of a common fire is only 1141°; heat up the crown plates of the Ericsson's furnaces to this heat, and put on a pressure of 30 lbs. to the square inch, and what would become of them? they would be flattened out like pan cakes. They are limited to both a low heat and pressure, and to produce as rapid and as good effects in the same time as water to which heat is applied, they would have to carry hot air reservoirs as large as the temple of Babylon. The cold water fed into the boiler to supply that taken off in steam from it, is diffused among the hot water in the boiler, which may be compared to a mass of liquid fire as great in quantity as the hot water in the boiler is to the feed water. On the other hand, the cold air fed into the hot air chamber of the caloric engine, fills up the whole boiler, as it were, every stroke, and the heat of the furnace acts upon such a quantity of so bad a conductor as air, and the fire-surface is so small in comparison with the quantity of matter to be heated every stroke, that steam, when the element of time is taken into consideration, is far above air as a cheap agent in moving machinery. The pressure of steam (force increased for the engine) can be highly augmented in any steam boiler, without absorbing extra power of the engine, but this cannot be accomplished in the hot air engine, its pressure is limited and circumscribed by a low figure.

In calculating the economy of any motive agent, we must never leave out the element of time. Water being 815 times less bulky than air, weight for weight, has thereby the advantage of being more quickly acted upon because of its density. The feed pump of a steam engine is required to restore one volume of water for every 1728 volumes of steam used; the feed pumps of the Ericsson engine have to feed in 491 volumes of cold air for every 875 volumes of hot air used; and thus the difference of capacity in the two elements—air and water—for heat is beautifully compensated in the steam engine, by using the less bulky agent, to supply the magazine of force.

We would like, had we room, to say something to corroborate Mr. Mathiot's views of Mr. Frost's experiments. The time has already arrived when the honor which is justly due to his memory, is sought to be purloined by others. We will speak of this at some future time.

We perceive that some ignoramus in the "Akron (Ohio) Standard," has been endeavoring to astonish mankind by his knowledge, asserting that if, as we stated, the Ericsson required 8 times its power (250 horse-power) to double its speed, it would have engines twice the power of the Arctic's. Why, the engines of the Arctic work up to 2,290 horse-power.

The saving of heat to use it over and over again, is an idea imbibed by the false teachings of Prof. Harvefelt, of Sweden, who, perhaps, after reading the boast of Archimedes about his lever, stated in a public lecture, "that there is nothing in the theory of heat which proves that a common spirit lamp may not be sufficient to drive an engine of 100 horse power." Ericsson embraced this view, and "he has been in the habit of regarding heat as an agent, which, while it exerts mechanical force, undergoes no change;" so said John O. Sargent. This is a converse theory to that of Mr. Paine, with respect to the decomposition of water by mechanical action.

Burning Fluid Lamp Controversy.

On page 187 will be found a letter from Dr. Nichols, of Haverhill, Mass., respecting "burning fluids and the wire gauze lamp." We have but a few words in explanation to say respecting it and the matters upon which it treats. On page 173, in making a few remarks about burning fluids, we said, "there is no fluid so clear and beautiful for domestic artificial illumination as a mixture of turpentine and alcohol distilled together." It should have read, "double-distilled alcohol and turpentine *mixed* together." As we have furnished many persons with receipt for mixing these fluids, the error is a singular one.

We have repeatedly stated that the common burning fluids should not be used in houses where there are servants or children. We know of two cases of explosions, not of lamps nor cans containing the fluid, but by the fluid. One was by a servant girl, who thought that as paper saturated with oil was excellent for kindling a fire, she would try some of the burning fluid, which must, as she thought, be much better; she therefore saturated some paper with the fluid, put it in the stove, piled on some chips and charcoal, and then ignited the paper with a match, when lo, to her astonishment, off went the kindling pile like powder, the covers were thrown off the stove, and chips and charcoal scattered over the floor. The other case differed only from this in using some shavings for kindling a fire which had been saturated with spilt fluid, and were used in ignorance of this fact. No one was hurt, but these cases are positive proof of the danger of having such a fluid about.

We have the word of Mr. Newell, and also that of Dr. Jackson, to the effect that the latter had nothing to do either by consultation or otherwise, with the holes in the cap of Newell's lamp. We therefore rely on this personal testimony as positive. We do not know what kind of fluids they sell in Boston, but we know that a burning fluid (alcohol and turpentine mixture) has been sold here under the deceptive character of *rosin oil*—a safety fluid.

Prof. B. Silliman, of Yale College, in a letter to the "Boston Traveller," which has been extensively copied in other papers, asserts that the danger of explosions in lamps burning alcohol and turpentine mixtures, "may be entirely avoided by the use of wire gauze protectors, which have been recently introduced." These quoted words are from the letter. He also adds, "I have no interest whatever in the invention."

The subject of burning fluids and "safety fluid lamps," has excited a most interesting and explosive state of feeling among some of our New England professors of chemistry. The letter of Prof. Silliman is used as a tremendous truncheon of high authorative endorsement of Newell's wire gauze lamp, so are the certificates of Drs. Jackson and Hayes, of Boston, also that of Prof. Cleveland, of Bowdoin College, Maine. The lamp as made by Newell & Co., with the wire gauze protector, is the best we have seen; this is all we can say of the matter; we can only speak of that with which we are acquainted, and if it is a re-invention, the fact of Jennings' previous claim was, we believe, unknown to the re-inventor, whose name, we humbly think, has unjustly, for his honor, been kept from the public.—This subject has received all the attention we can devote to it, at least for some time.

Novel Engineering Project---A Marine Railway One and a Quarter Miles in Length.

The introduction of railways has produced many astonishing changes in the course and channels of our internal trade, and not least among these changes is that which is just being shadowed forth by the completion of the several lines of railroad in the States of Virginia, Pennsylvania, New York, and Ohio, through the various points on the Ohio river. What this change is to be is already indicated by the delivery, on the sea board, of cotton, pork, and other Western produce, by way of the Baltimore and Ohio Railroad, now completed to Wheeling. The advantages which must accrue by thus delivering produce in these sea board markets in from ten to twenty days, instead of as formerly, by way of New Orleans in about three months, are too evident to be overlooked. Some enterprizing gentlemen engaged in the Western trade have investigated this subject thoroughly, and have become satisfied that the present means for passing steamboats around the falls of the Ohio (by the Portland canal) will soon become entirely inadequate to the increased commerce of the Ohio, which must result from these new outlets. With these views they have projected the following novel plan for increasing the facilities so as to pass steamboats of the largest class around these falls.

It may be premised that the only present mode of passing boats in times of low water, is by the Portland canal, on the Kentucky side of the river; this canal can only pass boats the dimensions of which do not exceed 180 feet in length and 48 feet beam over the guards, consequently the business must then be carried on by boats within these dimensions. Referring again to the project above mentioned:—It is simply to construct upon the Indiana bank of the river a railway, the length of which will be about one and a quarter miles, and the width about 72 feet, with proper locks at each terminus; the whole to be of such magnitude as to be able, without discharging cargo, to pass steamboats of the largest class, or say about 350 feet in length and 80 feet beam over the guards. The difference in level between the head and foot of the falls may be assumed at about 24 feet, and it is proposed to lift the boat a part of this height in the lock, and the balance by the grade of the railway. The power to be used will be one or more stationary steam engines, applied to the moving of the carriage upon which the boats will be transported, by means of a tow rope or chain.

This project, although when first presented to the mind it appears chimerical and difficult of execution, will be found, upon thorough examination, to be perfectly practicable, and to present less engineering difficulties than many other important works already successfully executed.

The plans have been submitted to several eminent engineers, to obtain their views as to the feasibility of the project, and without exception, they have all concurred in the opinion that the work can be executed without difficulty, and at moderate expense.

The estimated cost of the work is $600,000, and it is estimated from reliable data that very soon after it is in successful operation, the receipts from tolls alone will not be less than $150,000 per year.

To Correspondents.

We have to ask some of our correspondents who are expecting replies through the Scientific American to exercise patience, as we are unusually pressed with enquiries; all will receive attention as soon as we have time at command.