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THE CREATIVE PRIDE OF THE MECHANIC.

If any form of pride is justifiable and proper it is that of production, or calling into existence. The author feels a pride in his successful book, the writer in the influence of his articles, the business man in the enterprise he has awakened, the wealthy man in the fortune he has accumulated. Each and all feel an honorable pride in their own agency in achieving success. But none of them can feel the thrill of satisfaction which belongs to the mechanic or the inventor.

The author and writer have used only the means already prepared and needing only arrangement. This arrangement of words, phrases, and sentences, is their "style," and rarely can they justly claim the enunciation of original ideas. The human mind, in some age, has evolved them, in some form, before they reproduced them. They may, by giving them a new dress, or presenting them from a new point of view, add to the force or intensify the effect, but rarely is the writer a creator.

The same is true of the successful business man, and the accumulator of fortunes. They simply use the means provided at their hands, means in most cases already prepared and needing only the directing power of judgment and the controlling power of will.

But the mechanic, from misshapen materials constructs the noble edifice the storm-defying ship, and the thousand machines which become co-laborers with him in aiding the progress of the race. He, from crude matter, eliminates the moving, acting, almost intelligent machine, which performs the labor of hundreds of human hands in a better manner than those hands could do even aided by brains. He has the advantage of the thinker or writer in seeing, in palpable form, the result of his labor in beholding its action, and estimating its value. No producer could have enjoyed a higher degree of satisfaction than Fulton when his first steamboat successfully stemmed the current of the Hudson. What could have equaled the pride of Watt when his engine was fairly at work doing the labor of a hundred horses?

The author waits sometimes years for an evidence of the public's appreciation of his labors. He is open to criticism. Envious or prejudiced cynics charge him with plagiarism or pirating, or with lack of originality or talent. Often no return of material profit succeeds his labor. He may be assured in his own mind that his production is meritorious, but he may find it difficult to convince others of the fact. He is compelled to appeal to the tastes and prejudices of others or to their appreciation of the truth; and possibly he is so far ahead of the demands of his time that he must wait for his utterances to do the work of educators before he will be understood and rewarded, and that reward may never come to him in this life.

The journalist is in a worse condition. A caterer to the present wants and changing caprices of the whimsical public, he may be unduly flattered on the one hand, or unjustly blamed on the other, or he may be tempted to use his position and prostitute his talents to the work of sustaining a rotten project or assisting in the designs of unprincipled and ambitious schemers. His work is constant and mainly secret and unknown. Few give him credit for aiding in some measure of public advantage or social reform, but rather claim for themselves the origination of the movement or the credit of giving practical form to his suggestions. He seldom knows whether his labor has been of effect or not and if he does ascertain that it was the moving power he is seldom personally benefited.

But the mechanic appeals directly to a powerful element, the material needs of the race. He constructs a machine which saves labor and gives those who introduce and use it

the means of wealth. The crude material, shapeless and inert, becomes, under his hand and by the exercise of his skill, formed, finished, and endowed with life. It is a portion of himself and obeys his will. Even if envious detractors seek to rob him of the credit of his invention or skill his success contrasted with their failure is a sufficient refutation of the slander, and he can rejoice in the consciousness that others acknowledge his merits and appreciate his labors. Beside he has the gratification of seeing his creation grow day by day under his hands and in witnessing the ultimate full success of his endeavor. We doubt if any pursuit is more generous in its returns than that of the mechanic, not only in its material returns, but in the satisfaction its success offers to the workman.

PHYSIOLOGY OF INVENTION.

It is a suggestive thought that the mind is more constitutionally adapted to the power of invention than it is to any other characteristic of being. The child is always inquiring, the youth, imitating, and the man, inventing. The vocation of life does not seem to alter these conditions. An active, energized mind habituated to thought, in its abnormal state, is capable of original conceptions. We have seen in dreams what we could not conceive while awake, and no principle appears to be more strongly marked as a propensity of the mind than its ever wakefulness to new thoughts and ideas. The deeper study which involves the walks of science, culling here and there a beautiful flower, is attended with fixed physiological principles worthy to be observed. One of these is the economy of the blood in its relation to the brain. The brain is always in motion. When an effort of memory is required there are conditions to be filled before it can be made to serve. The slightest thing we perfectly remember is away from us in a moment, if we are interested in viewing something else, hence we say "wait a moment," and presto! it is there. What is the cause or the servant that brings up this memory? It is the blood which by an effort of the will replenishes the organs necessary for service. A student of theology could not tell his age on being suddenly asked the question. One of two gentlemen called to see a lady of uncommon personal attractions who came herself to the door she asking the former gentleman his name entirely unlooked for by him, he turned to his friend very much agitated "what in the devil is it?" But the ability of the mind to serve in this respect is more apparent to us when we ask for time to recall an almost obliterated impression, and that may be the work of several hours. It is then that the long laborious process of revocation begins, which gives the brain the full benefit of all the blood it can command. It does appear that the same law governs the exercise of our other faculties. It is necessary to be in undisturbed quiet. The sacred injunction to devotion was when you have gone into the closet, "shut the door." It is indeed an indispensable condition that the whole mind be diverted from all other objects, and its concentration upon this one for moments or hours until the whole system is wrought up to the acme it is desirable to obtain. A single effort of this kind is worth more than a thousand hours amid the occupations of life eating and drinking and thinking at the same time while the poor stomach at the loss of the blood to the brain becomes dyspeptic, or the brain for use of the nervous power without sufficient blood, giving headache, and the body itself wreaking under the general disorder, makes the whole man sick and faint. When a man eats he wants the blood to help digestion. When he sleeps he wants it to be at comparative rest, and as it is the steam which works the engine of the mind give it its time and its place.

THE COMBUSTION OF PETROLEUM BY THE RETORT SYSTEM.

We notice, in the columns of a cotemporary, a letter on the combustion of petroleum by the retort system, criticising the views of its editor on the same subject.

The chemistry of the writer of this letter is quite novel, and perhaps our readers may be interested as well as instructed by a glance at this unique view of the combustion of hydro-carbons.

The writer says, "I will describe the process: As the oil flows out of the pipe it falls upon the red hot bottom of the retort, and is vaporized. This vapor, which, it will be remembered, is a chemical combination of oxygen and hydrogen, at a temperature which renders it easily decomposed if brought in contact with chemical substances for which either of its constituents have much affinity. In this case, the oxygen has a stronger affinity for the carbon of the vapor, to an extent sufficient to form carbonic oxide, that it has for the hydrogen of the superheated steam; and, similarly, the carbon has a stronger affinity for the oxygen than it has for the hydrogen of the oil vapor; they consequently unite forming carbonic oxide, each setting free the hydrogen with which it had been previously combined."

Thus, it is assumed, that enough steam is put into the retort, if decomposed, to form the combinations, which this writer not only asserts are made, but which it appears was the problem he propounded to himself at the outset.

Of course, the decomposition of the steam blown into the retort is simply imaginary, there is no evidence given to prove that such is the fact; but, on the contrary, if the statement of the temperature given is correct, and we assume it to be so, no such decomposition takes place, and this decomposing and recomposing theory falls to the ground. The statement that the oxygen (from the decomposed (?) steam) has an affinity for the carbon of the vapor, which he says is composed of "oxygen and hydrogen, to an extent sufficient to form carbonic oxide," is mere chemical *hoccus pocus*. The

reason that carbon, under any circumstances, combines with oxygen in the proportion to form carbonic oxide, is due to the existence of a proper temperature and the presence of a proper quantity of oxygen; and the statement that "the carbon, which is part of the oil vapor, has stronger affinity for the oxygen than it has for the hydrogen of the oil vapor," renders his views still more foggy.

In short, after imagining the decomposition of the hydrocarbon and the steam, in a closed retort, instead of readjusting themselves back again into the combinations they had just been decomposed from, the carbon combines with the oxygen and sets free the hydrogen from both. That is his "theory."

This writer remarks: "The process just described is a cooling one, a great deal of heat being rendered latent (how much?) by the decomposition(?) of the steam, and none gained by the union of the oxygen and the carbon, in the formation of carbonic oxide."

As a matter of fact, a great deal of heat is generated when carbon and oxygen unite in the proportions to form carbonic oxide; the original discovery that "no heat is gained," exhibits still more plainly the extraordinary nature of the imaginary *hoccus pocus* asserted to be going on inside of this mysterious retort.

The contents of the retort having been adjusted, as per hypothesis, "the proper quantity of air to convert this carbonic oxide into carbonic acid, and the hydrogen into water, is now admitted; and as the mixture of the air and the two gases issue from the burners, it is ignited by the heat of the flame, and the combustion is complete."

But in a few lines before this writer had declared that, in the union of carbon and oxygen, in the formation of carbonic oxide, "no heat is gained;" now he asserts that, by the combination of the carbonic oxide with another equivalent of oxygen, "the combustion is complete," which of course means the highest attainable heat with a given quantity of combustible matter.

So, according to his conception of combustion, while the formation of C. O₂. (carbonic acid) is perfect combustion, and produces intense heat, partial combustion, or the formation of C. O. (carbonic oxide), produces no heat at all!

FAIR OF THE AMERICAN INSTITUTE.

This exhibition is now in very successful operation. When the visitor first enters, especially if he be a stranger, the effect of the scene is bewildering. Along the whole northern side of the principal hall are lines of shafting driving a crowd of machines of almost every conceivable description. The whirr, the hum, and the bustle is confusing, but to the practical man is very pleasing. It is gratifying to see the interest manifested by ladies in this department, and to the engineer, machinist, and manufacturer, the exhibition is a school of pleasing instruction.

In the annex adjoining the machine department are the boilers which furnish steam for the engines. Several of them are somewhat unique. The Root boiler is a series of wrought iron pipes cut to the length of the boiler desired, and placed in parallel rows, both vertically and horizontally. On each end of each pipe is screwed a square block, and, as their edges fit to adjoining blocks, together they form the ends of the boiler when completed. Each of these blocks has sockets which receive return bends that connect each pipe with the one below and above. A cross pipe (steam space), connects the sections at the top of the front end and a similar pipe (water space), connects them at the bottom back end. The boiler is set at a downward inclination from front to rear of about three inches to the foot. John B. Root, 500 Second ave., corner 28th street this city is the patentee, and he claims for this boiler "absolute safety from explosion; economy in fuel, weight, room, and cost, accessibility for repairs and facility for enlarging when the necessities of business require." He affirms that there can be neither foaming nor priming. The boiler is evidently a rapid generator of steam.

There are several of Davis' Patent Super-heating Boilers in the exhibition. These boilers are very simple in construction and lay claim to peculiar excellence mainly for their super-heating arrangements. They are upright tubular boilers the tubes being arranged in concentric circles. The tops of those nearest the center are partially closed by caps with a small central hole while the outer ones are open to the smoke box. The object of this arrangement is to throw the heat outward against the greatest body of water, which is contained in the space between the tubes and the shell. Above the top tube sheet is a central steam dome surrounded by a circle of cast iron hollow spheres connected to one another by pipes, except two, one of which receives the steam from the dome and the other discharges it to the engine. The steam after leaving the dome makes the circuit of the spheres thus becoming somewhat superheated, as claimed by the manufacturers one hundred degrees above the ordinary temperature and increasing its expansive force fully one-third. It is an easy working boiler and quite a favorite.

Perhaps no boiler attracts more attention than the "Gerner boiler." It is quite a curiosity. The shell contains a cone shaped cylinder, the small end over the grate, and inclined so that the top longitudinal line is level. This incloses a similarly-formed tube or cone of a diameter sufficient to leave a space of three inches all around its outer surface. The exterior cone is not entire, but has a longitudinal opening on its top, the two sides of the aperture being connected by straps.

The inner cone is the steam chamber and the space between the two contains water up to a certain height. Communication between the two is by means of one or more double pipes which lead the steam made in the water space into the