Arts, Manufactures and Machinery.

Increase and Diminution of Velocity.

The fatigue produced upon the muscles of the human frame does not altogether depend on the actual force exerted at each effort, but partly on the frequency with which it is exerted. The exertion necessary to accomplish every operation consists of two parts; one of these is the propulsion of the tool or instrument used; and the other is the motion of some limb of the animal producing the action. If we take as an example the act of driving a nail into a piece of wood, one of these is, the propelling the hammer head against the nail; the other is, raising the arm in order to lift the hammer. If the weight of the hammer is considerable, this latter part will cause the greatest portion of the exertion. If the hammer is light, the exertion of raising the arm will produce the greatest fatigue. It does therefore happen, that operations requiring very trifling force, if frequently repeated, will tire more effectually than much more laborious work. There is also a certain degree of rapidity beyond which the action of the muscles cannot possibly be pressed

It is of considerable importance for the economy of labor, to adjust the weight of that part of the animal's body which is moved, the weight of the tool it urges, and the frequency of repetition of these efforts, so as to produce the greatest effect. An instance of the saving of time by making the same motion of the arm execute two operations instead of one, occurs in the simple art of making the tags for boot-laces, they consist as is well known of very thin tinned plate iron, and used to be cut of long strips of that material into pieces of such a breadth that when bent round they just enclosed the lace. Two pieces of steel have recently been fixed to the side of the shears, by which each piece of tin as soon as it is cut is bent into a semi-cylindrical form. The additional power required for this operation is almost insensible, and it is executed by the same motion of the arm which produces the cut. This work is usually done by women and children, and with the improved tool more than three times the quantity is produced in a given time. Whenever the work is itself light, it becomes necessary to economise time, to increase the velocity. Twisting the fibres of wool by the fingers would be a most tedious operation; in the common spinning-wheel the velocity of the foot is moderate, but by a very simple contrivance that of the thread is most rapid A piece of cat gut or gutta percha passing round a large wheel, and then round a small spindle effects this change. This contrivance is common to a multitude of Machines, some of them very simple. In large shops for the retail of ribands it is necessary to take stock at short intervals, that is, to measure, and rewind every piece of riband, an operation which, even with this mode of shortening it, is sufficiently tiresome, but which without it would be almost impossible from its expense. The small balls of sewing cotton, so cheap, and so beautifully wound, are formed by a machine on the same principle, and but a few steps more complicated.

In turning from the smaller instruments in frequent use to the larger and more important Machines, the economy of increasing the velocity becomes more striking. In converting cast into wrought iron, a mass of metal of about a hundred weight is heated almost to a white heat, and placed under a heavy hammer moved by water or steam power. This is raised by a projection on a revolving axis; and if the hammer only derived its momentum from the space through which it fell, it would require a considerably greater time to give a blow. But as it is important that the softened mass of red-hot iron should receive as many blows as possible before it cools, the form of the cam or projection on the axis is such, that instead of lifting the hammer to a small height it throws it up with a jerk, and almost the instant after it strikes against a large beam, which acts as a powerful spring, and impels it down on the iron with great velocity by this means about double the number of strokes can be made in a given time. In the smaller tilt-hammers this is carried still further: by striking the tail of the tilt-hammer forcibly against a small steel anvil, it rebounds with such velocity that from three to five hundred strokes are made in a minute.

The most frequent reason for employing contrivances for diminishing velocity, arises from the necessity of overcoming great resistances with small power.

Systems of pullies, the crane, and many other illustrations present themselves, which more strictly belong to others of the causes which we have assigned for the advantages of Machinery.

The common smoke-jack is an instrument in which the velocity communicated is too great for the purpose required, and it is transmitted through wheels which reduce it to a more moderate rate.

On Brick Manufacture.

WASHINGTON, June 3, 1848.

Messrs. Editors:—I am prosecuting the manufacture of Brick, and find the chief obstacle in obtaining moulding sand or dust that will burn red. My clay burns a beautiful deep red, but the sand that I use will not burn red. All of the loam or sand that I can find is of a light (or dark as you may prefer) drab color that is fine and soft, slips well and gives the bricks a fine surface, but burns almost as white as lime. The only sand that I can find that will burn red is a coarse yellow sand on or near the banks of the river, but this makes the bricks have an ugly, sharp and somewhat rough surface, and does not slip so well in consequence of its coarseness.

I have been at a number of brick yards in this State, Virginia, Maryland, Pennsylvania, and your own State, and find in most of them that the sand used is very similar to that used by my workmen, yet theirs burn red while mine is of a white frosty color. The bricks are hard and durable but unsaleable in consequence of their unseemly appearance.

The object of this communication is to learn from you or some of the innumerable contributors to your valuable paper, the quality in sand or dust requisite to its burning red; and whether that quality (whether it be iron or other minerals) now absent in the dust that I am using may not be supplied. I have tried an experiment in a small way, of crushing slightly burnt salmon bricks to a dust, and find that the dust thus prepared slips well and burns a beautiful red color, but it is too expensive. Let me here ask if a kiln might not be constructed similar to a lime kiln, in which clay might be burnt partially, so as to destroy the sticking matter in it, (the clay being previously dug up and dried) and then by means of a roller be converted into dust without material cost.

I hope you will bring this matter to the attention of brickmakers, and invoke their aid and counsel in my behalf. It is not possible that in this little bye place I can be in the way of any one in this branch of industry. If I can gain no information that will enable me to procure such sand as will answer the desired purpose, I shall be compelled to abandon the business or abandon the present mode of manufacture, and resort to some other where the moulding is executed without sand or dust.

I have seen and examined the dry presses, where sand is not used, but they will not answer for my clay, and if they would, are entirely too expensive for this market, as I cannot dispose of more than six hundred thousand bricks per annum. If there is any machine now in use by which bricks can be made with tempered clay without sand, I would be glad of such information.

In speaking of sand or dust, in all cases I mean the sand used for dusting the moulds.

Yours, &c. H. J. B. C.

The brick manufacture is one of no small interest to thousands in this country. The above letter invites attention, and practical, plain and condensed information is solicited. There can be no doubt upon this part of the subject, that it must be an entire absence of iron in the dust mentioned above that causes it to burn white Iron is a coloring flux, and we would suggest the sulphate of iron (copperas) burnt in a crucible, pounded into fine dust and mixed with the sand. A very small portion would suffice and the expense could not be much.—ED.

For the Scientific American.

The English Patent Laws.

There are some features of the English Patent Laws that are admirable, and others that exhibit more barbarous legislation than would be expected in the Fejee Islands. It is an admirable feature in the English Patent Laws that any new application of any substance or mechanical contrivance can be patented and that without any trouble—nothing is left for exparte decision in this respect, and there is no trouble unless the application is contested. A very different process indeed from the manner in which our Patent Office business is conducted, where a dash of the pen, " you may appeal," completely checkmates a poor inventor, though his invention could have been proven to be entirely original, and useful. Talk about encouragement to poor inventors as we may, the writer of this believes that there is much mock philanthropy exercised on this subject and he knows something about it. A rich man can sustain his patent, a poor man has but a very small chance of doing so. Let any one read the history of patent litigation, and he will find my assertions not incorrect. But to my tale. I have mentioned one good feature in the English Patent Law, but if the account of any invention be published previous to applying for an English patent, the law decides against the applicant, and the British Attorney General declares that the invention has " become public property " This is the barbarous feature in the English Patent laws. How potent, grave and reverend gentlemen are pleased with such laws, is " more than can be dream't of in our philosophy." The only principle of reasoning to be adduced from it is, that houses and lands should also become public property after being heard of and seen.

A case of this kind was recently decided in England, and a knowledge of that fact induced me to pen these few remarks, knowing that they would meet the eyes of many of our inventors and scientific men through the columns of the Scientific American. If useful knowledge, science and art have been steadily advancing with rapid strides, there can be no doubt but laws, especially Patent Laws, are worthy of their age, six hundred years old and a little over, and the making, and deciding upon these laws is left to as sensible and worthy men, with nearly the same views, as those who condemned Galileo for his discoveries in science. R. B

New York, June 14, 1848.

Steam Boilers.

The following ingenious views in reference to steam boilers will be found to be original and interesting.

Some years since in using a water bath, open boiler and fire at the bottom, I pressed to the plane surface of the bottom a metallic plate —ebullition immediately commenced. I removed the plate and ebullition instantly ceased. The water in the boiler was considerably below a temperature of 212° F. Cause—the concentration of heat on the thin stratum of water between the metallic bottom and plate. By a practical application of the principle we can get up steam—suddenly—before the bulk of the water is heated. It may be said that " the steam thus generated would in a closed boiler as suddenly equalize itself to the temperature of the water." I think not. The large bubbles come through to the top of the water. To apply the principle—let the copper tube flue of a locomotive boiler have another tube fitted over it leaving a space all around between the two, say of the 1-20th of an inch or 1-16th; when not supported the exterior tube will rest in contact on the interior one. Heat the flue and steam will rapidly be generated in the space between the two —too rapidly—we must have 4 longitudinal slits for the ingress of water and egress of steam from the outer tube, leaving occasional rings to preserve the continuity of the tube. But perhaps the mud would be deposited on the flue and burn it—then elevate one edge of each of the four sections of the tube, making vanes of them, or introduce little cups or spiral vanes, which by the steam forcibly impinging against them will give a rotary motion to the outer tube and incrustations of mud, salt, &c. will be prevented. What might be the thermo magnetic electrical effect of such a rattle trap we will not now enquire. A common iron boiler flue could not have the " rotating mud-flier !" around it, but the "jacket" could be kept in violent agitation and be open at the bottom to let the mud fall down. F. S.

Vicksburg, Miss. June, 1848.

Collections of Specimens from Soundings.

The charts of the Coast Survey exhibit a perfect representation of the character and configuration of the bottom of the ocean, within a certain distance from land. The idea occurred to Lieut Bache, in 1842, to form a collection of all the different materials obtained in the sounding operations, and he accordingly commenced reducing this idea to practice by placing in small bottles, duly labelled, specimens of all the materials found at the bottom. It was the intention of this lamented officer to form a large geological map, by glueing on the surface of a suitable chart the several substances contained in the bottles, in their proper order, and thus at one view to present to the eye, the means of generalizing the geological phenomena of the submarine formation. The plan of a map of this kind has not yet been carried into practice, but the collection of the materials has been continued.

Besides the formation of the map above mentioned, the microscopic examination of these specimens could scarcely fail to develope some interesting facts, which might prove of value to navigation as well as of importance to science. Accordingly, specimens of the materials of soundings were submitted by the Superintendant to Prof. J. W. Baily of West Point, who kindly undertook the examination of them. He finds that all the deep sea soundings are of the highest interest being filled with organisms, particularly with those of the calcareous polythalamia, to an amount that is really amazing, hundreds of millions existing in every cubic inch. The specimen from latitude 38 04, longitude 73 56, from the depth of ninety fathoms, is crowded with remains, mostly large enough to be recognized by a practised eye without the aid of a magnifier. The forms which occur at different depths and in different places are so various that they might serve to identify the position of the mariner, and thus furnish another illustration of the fact, that branches of knowledge apparently the furthest removed from utility are frequently found applicable to the useful arts of life. In this connexion, it may be mentioned, that Professor Agassiz has accompanied Captain Davis in his hydrographical operations connected with the coast survey, and has reaped a rich harvest of discovery relative to the animals which inhabit different depths of water. Every few feet of increase in the depth give changes in the character of organized beings which inhabit the ocean.

Two Dispositions Contrasted.

A genial and happy disposition finds materials of enjoyment everywhere. In the city or the country—in society or solitude—in the centre of the forest—in the hum of the multitude, or in the silence of the mountains, are alike materials of reflection and elements of pleasure. It is one mode of pleasure to listen to the music of Don Giovani, in a theatre glittering with light, and crowded with elegance and beauty, it is another to glide at sunset over the bosom of a lonely lake, where no sounds disturb the silence but the motion of the boat through the water. A happy disposition derives pleasure from both, a discontented temper from neither, but is always busy detecting deficiency, and feeding dissatisfaction with comparisons. The one gathers all the flowers, the other all the nettles in his path.—The one has the faculty of enjoying everything, and the other of enjoying nothing. The one realizes all the pleasures of the present, good, the other converts all into pain, by pining after something better, which is only better because it is not present, and if it were present would not be enjoyed.

Ovid compares a broken fortune to a falling column; the lower it sinks, the greater the weight it is obliged to sustain.