

## Arts, Manufactures and Machinery.

**Accumulating power.—Fly wheel necessary in Rolling and Punching Iron.—Regulating Power.**

Whenever the work to be done requires more force for its execution than can be generated in the time necessary for its completion, recourse must be had to some Mechanical method of preserving and condensing a part of the power exerted previously to the commencement of the process. This is mostly accomplished by a fly-wheel, which is in fact nothing more than a wheel with a very heavy rim, so that the greater part of its weight is near the circumference. It requires great power applied for some time to set this in rapid motion, and when moving with considerable velocity, if its force is concentrated on a point, its effects are exceedingly powerful. In some of the iron-works, where the power of the steam-engine is a little too small for the rollers which it drives, it is usual to set it at work a short time before the red-hot iron is ready to be removed from the furnace to the rollers, and to allow it to work with great rapidity until the fly has acquired a velocity rather alarming to those unused to such establishments. On passing the softened mass of iron through the first groove the engine receives a great and very perceptible check, and its speed is diminished at the next and at each succeeding passage, until the iron bar is reduced to such a size that the ordinary power of the engine is sufficient to roll it.

The powerful effect of a large fly-wheel when its force can be concentrated in a point was curiously illustrated at one of the largest of our Manufactories of steam-engines. The proprietor was showing to a friend the method of punching holes in iron plates for the boiler of steam engines. He held in his hand a piece of sheet-iron three-eighths of an inch thick, which he placed under the punch; observing, after several holes had been made, that the punch made its perforations more and more slowly, he called to the engine-man to know what made the engine work so sluggishly, when it was found that the fly-wheel and punching-apparatus, had been detached from the steam-engine just at the commencement of his experiment.

Another mode of accumulating power arises from lifting a weight and then allowing it to fall. A man even with a heavy hammer, might strike repeated blows upon the head of a pile without producing any effect. But if he raises a much heavier hammer to a much greater height, its fall, though far less frequently repeated, will produce the desired effect.

Uniformity and steadiness in the rate at which machinery works are essential both for its success and duration.

The beautiful contrivance of Mr. Watt, who invented the Governor of the steam-engine, must immediately occur to all who are familiar with that very admirable Machine.

The regularity of the supply of fuel to the fire under the boilers of steam-engines contributes to the uniformity of their rate, and also economises the consumption of coal. Several patents have been taken out for methods of regulating this supply. The general principle is to make the engine supply the fire by means of a hopper, with small quantities of fuel at regular intervals, and to diminish this supply when it works quickly. One of the incidental advantages of this plan is, that by throwing on a very small quantity of coal at a time, the smoke is almost entirely consumed.

The dampers of ashpits and chimneys are in some cases connected with Machines in order to regulate their speed.

Another contrivance for regulating the effect of machinery consists in a vane, or a fly of little weight but presenting a large surface. This revolves rapidly, and soon acquires a uniform rate, which it cannot greatly exceed; because any addition to its velocity produces a much greater addition to the resistance which it meets with from the air. The interval between the strokes on the bell of a clock is regulated by this means; and

the fly is so contrived, that this interval may be altered by presenting the arms of it more or less obliquely to the direction in which they move.

This kind of fly, or vane, is generally used in the smaller pieces of mechanism, and, unlike the heavy fly, it is a destroyer instead of a preserver of force. It is the regulator used in musical boxes, and in almost all mechanical toys.

Another very beautiful contrivance for regulating the number of strokes made by a steam-engine, is called the cataract, and depends on the time required to fill a vessel plunged in water, the valve through which the fluid is admitted being adjustable at the will of the engine-man.

### Skill in Darning Rents.

A man at Constantinople, having left in charge of a friend of his, a purse without seam or join, in which he had placed a certain number of diamonds, complained on his return from distant travel, that his number of jewels was not correct. The friend maintained the integrity of his trust and adduced as proof the entire woof of the the purse, in which neither seam nor join appeared, and the seal of the owner still remained untouched at the mouth of the purse. The owner of the jewels was forced to admit both the facts but still persisted that the amount of diamonds was no longer what he had left. The case was brought before more than one magistrate, but nothing could be elicited upon the subject, and the unaltered condition of the purse, which the owner could not deny, was considered conclusive evidence against his claim. In despair, he applied to the Sultan himself, and the strange persistency of his demand impressed the latter so much, that, though compelled, upon the face of the facts, to dismiss his claim as untenable—the subject remained impressed singularly on his mind, and induced him to try the following experiment. At morning prayer, the next day, when the slave who usually brought the carpet, upon which he knelt, had withdrawn, he made a long slit in it, and left it to be again withdrawn by the slave. When the latter came to fulfil his duty of rolling up and removing the precious carpet, he remained aghast at the injury it had received, and immediately apprehending the dreadful effects of the Sultan's displeasure, hastened with the rug to the quarter of the city where the Jews resided, and seeking out one peculiarly renowned for his skill, committed it to his best exercise of it, and carried it back so restored, that the next morning it lay spread for the Sultan's use, without the trace of either damage or reparation. The Sultan no sooner perceived what had been done than he called the slave, who tremblingly confessed what he had done. He was immediately despatched in search of the pre-eminent cobbler, and the Jew no sooner appeared before the Sultan, than the latter, sending for the sealed purse, about which the controversy had been held, charged him with having in like manner repaired a slit in the woof of the apparently uninjured bag. The Jew instantly admitted the fact, and thus the reclamation of the poor defrauded friend and diamond-owner, was substantiated.

It is wonderful to what perfection people will attain in a certain branch of business steadily pursued. The skill of the Constantinople Jews is successfully imitated by numerous girls in the manufacturing districts of Britain. In Paisley, where a great number of fine shawls are manufactured and in which holes are frequently made in the clipping of the wrong side, there are girls in every warehouse, who will darn the same and render it perfectly invisible from any other part of the shawl. This is an infinitely more difficult job than the darning of a carpet, or a purse, as some of these shawls are very fine. There are those who wear a hundred dollar shawl, that had a hole in it before it entered the merchant's store, and it had been sold and worn, made as perfect by the needle of the darning, as it was when it came from the weaver.

Upwards of twenty tons of railroad spikes are manufactured every week at an establishment in South Malden, Mass.

### Green Tea and Black Tea.

There are two or three opinions common in the United States about green tea, which are great mistakes. One is, that the Chinese themselves do not use green tea, this is a mistake. But they don't use such green tea as is used in England and America. They most commonly pick out the fine and dried parts, and separate them, calling one gunpowder, and another hyson, and another hyson skin.

The second mistake is, that the green tea is made by roasting it on copper plates, which turn it green, and give it its sharp astringent qualities. All the tea made about Zeetung (a good many thousand pounds) is fried in iron pans.

But if the Chinese don't make green tea on copper pans, they do what is a great deal worse. They mix Prussian blue with what is sold to foreigners, which gives it the greenish blue color it so often has, and something of its astringent qualities. Prussian blue is poison; and the only reason why green tea does those who use it at home so little harm is, that it requires but a small quantity to color a large amount of the tea. But still, small as the quantity is, it does harm; and the people not accustomed to the use of green tea, can hardly sleep after drinking it. You may almost always tell whether there is any Prussian blue in the tea, by drawing off the infusion, and placing it in a white cup. If the infusion is perfectly clear, and of a slightly saffron green color, it is all right; but if it has a dirty appearance, as if there was some coloring matter suspended in it, than there is some of the Prussian blue, or something else, there.

The Chinese put the Prussian blue, and such stuffs in the tea, as foreigners have taken a notion that green tea is not green tea unless it is very green. People in England and America don't like green tea, such as the Chinese use, and won't buy it. Well, the Chinese are very accommodating people, and they laugh in their big sleeves, and say, "Since the foreigners want very green tea, we'll give it to them; but they must pay us a little more for making it so green." Little green tea goes to the United States, that has not more or less of Prussian blue, or some other drug added to give it a higher color. The foreigners who live in China very seldom drink green tea, and use none but the black. It is very much better, and has not the same stimulating effect on the nerves that many people suffer from when they drink the green. Where so much green tea is raised, black tea is more used by the people, though the greater part of what is used by the mass of the people, is very coarse indeed, and not half so good as our common sassafras tea.

### Cotton Cultivation in India.

A late report made by a select committee of the House of Commons, upon the subject of the cotton trade, seems to put the question about that country's deriving its supply from the raw material from the East Indies to rest for an indefinite period. Amongst other things, this report states. "The cotton goods annually exported from England amount to about \$25,000,000 in value, or nearly one half the whole amount of exports. The manufacturing of cotton goods employs 3,000,000 people, or about one-tenth of the whole population. These two statements are decisive, as the importance of this branch of business to Great Britain.—The importation of raw cotton from India commenced in 1790, a year or two before that from America began. Since 1813 the trade from India has been perfectly free. India furnishes in weight, about one eighth of the entire British consumption. But, in point of quality, it is only about half the value of American cotton. The value of India cotton imported, is, therefore about one-sixteenth of the whole. "India can never compete with America in the production of cotton. Cotton is known to have been cultivated in India more than 2,300 years, but yet the quantity exported does not exceed in quantity one-fourth, or in value one-eighth, of what is exported from a few of the Southern of the United States, where it has not been known sixty years. The voy-

age from India is about three times the length of the American voyage, and the freight is, at least, twice as much, but allowing for the difference in value, the expense is four times as much." Cotton is brought from its place of growth to that of shipment from two to six hundred miles. "Under all circumstances, the project of substituting Indian for American cotton is perfectly visionary."

"Those," says the report "who argue against the propriety of being dependent upon a foreign country for cotton, forget that England is entirely dependant upon one country for tea, which furnishes nearly £25,000,000 of the annual revenue, and almost entirely upon another for tobacco which raises nearly twenty millions of the same revenue.

### Evils of Match Making.

In England and Germany, attention is being directed to a series of peculiar affections to which the workers in the manufacture of lucifer matches are liable. The establishment of the fact that there was anything of this nature connected with the business was recent, for the first establishment only commenced operations in Germany sixteen or twenty years since, and the gentleman who claims priority in England, has been in the business but ten years.

The first operations of cutting the wood, counting and placing the matches in frames for dipping, and the dipping in sulphur are not productive of injury, but the other stages comprising the grinding and mixing of the explosive compound, the process of dipping into it, and the counting and boxing, are attended with serious inconvenience from the action of the fumes of the phosphorous. Besides irritations of the nostrils, eyelids and throat, a peculiar disease of the teeth and gums is caused which runs sometimes to alarming extents. The gums become soft and spongy, ulcerate and fall away, and the teeth become loosened and fall out. Often portions of the jaws die and are removed.

Since these effects have been noticed, measures are taken for protection, and it is found where soda is used in solution as a wash, and free ventilation is secured, the injury is considerably abated.

### An Old Printer.

We have in our employ a printer, 76 years of age, who commenced his apprenticeship of seven years in the King's Printing Office, London, in 1785—64 years ago. He was a soldier under Sir John More at Corunna in Spain, in 1809, where he received a ball in the right arm. He was present at the burial of Sir John, and remembers the minute particulars of the scene. He was also with the Duke of Wellington, through his whole campaign, and lost an ankle bone by a grape shot in the battle of Waterloo. This old man after having all this hard service, is still one of the swiftest and best compositors we have ever known, and though lame from his wounds, is still able at early morn and dewy eve, while younger men are wasting the golden hours in sensual pleasures, or snoring them away in bed, to ramble over the fields, and through the woods in search of wild flowers, with which he forms tempting bouquets for the belles of the village, or to gratify the wishes of some favorite little girl. It speaks well for the heart of the old man, that the children all love him.—*Blackstone Chron.*

### Gibraltar.

Gibraltar, the strongest fortress in the world, owes its safety to the invention of an engineer, who, during the memorable siege from 1780 to 1782, by the Spaniards, suggested the idea to Gen. Elliot, the Governor, of throwing red hot balls at the leathern-covered gun-boats and floating batteries of the Spaniards. It was found to be successful; the Spaniards were forced to give way, and break up the siege, from the effect of a power so resistless. Redhot shot, however, were invented long before the siege of Gibraltar. The Turks used it against the Greeks, at the siege of Athens.

There are 218 newspapers published in Pennsylvania, exclusive of miscellaneous publications. This, we believe, exceeds the number published in any other State in the Union. Ohio boasts of 174, and New York of about 200.