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Mechanics, the Agents of Power.

Nations are powerful in proportion to their productive capacity of things useful and necessary; but so far as the mere physical power of men are concerned, there is but little difference between those of different countries. The barbarian can endure as much toil and fatigue as the civilized man, and yet the productive powers of our country, in comparison with those of China, for example, with her 226,000,000 of inhabitants, is beyond calculation. How can we account for this? The Chinese are an industrious and patient people, and they have every variety of soil and climate, and yet they are weak and powerless in comparison with a nation having nine times less inhabitants.

There is one thing very evident to us as the ruling element of national power in modern times,—we mean mechanical genius, in the production of useful machinery. As a nation multiplies its machines, so does it multiply its power. The great and powerful nations of the present day, are those which have the greatest number of machines. For example, in China, the work which we do with machinery they perform with manual labor. With one steam engine of 100 horse power, we are able to do as much work as can be done there by a thousand men, and a thousand steam engines of an hundred horse power each, are equal to the labor of a million men. With all other kinds of machines, the same comparisons are equally applicable. This is the way we increase productive labor; this is the way we economise labor. In China there are few machines, and these are but rude; there are no steam engines, steamboats, railroads, power looms, wood planing machines, thrashing machines, reapers—none of those machines, countless in number, by which we economize labor, and render our country great in power and comfortable in its varied abundance. Every new machine invented to economize labor, therefore, is a public benefit, and every inventor a public benefactor. Oh, how much we owe to inventors: without them we have no reason for supposing we would be more comfortable, greater, or more civilized than the Chinese, or even ruder nations. But with all our machines, countless in number though they be, much is yet before our inventors to accomplish; their task will not be done until they have relieved man from an incalculable amount of drudgery, which he yet performs; not until they have placed him in a still more favorable position for his intellectual and moral developement.

Improvements in machinery, by increasing productive labor, give man more leisure, and thus increase his pleasures. A friend recently from France, who had visited a great number of flour mills in that country, spoke in sorrow of the continual drudgery caused by rude and inefficient machinery—enlightened and refined though that country is, and full of ingenious artisans. Day and night, from year's end to year's end, Sabbath days and all, the clatter of the hopper never ceased—the operatives were perfect slaves to the machines. With our improved machinery they could accomplish four times as much work, and thus find leisure to improve their minds, and rest their toil-worn frames.

In our last number a correspondent gave us pleasing information regarding his success in thrashing by a portable steam engine; this application of steam power, more universally adopted, will save a vast amount of labor. Plowing by steam is another application which, when fully successful, as it no doubt will be, will also effect an immense saving.

It is not possible for us to point out all the objects to which inventors can yet devote their energies and talents in making new conquests of mind over matter, but they are still as numerous as the sands on the sea shore. An inventor should have this thought ever present with him, "how can I best economize labor of any kind." Every person gains by improvements in machinery, and none so much as those mechanics who combine their own labors, with machinery, in the business in which they are particularly engaged. The manufacturer who makes the cheapest and best article, by having the most improved machines to economize labor, soon obtains a superior custom for his products, and thus while he benefits his country by adding to its productive powers, he also benefits himself. At every Exhibition of Industry,—such as the Fair of the American Institute now open in the Crystal Palace, this city, inventors and mechanics should scrutinize *every* machine and article exhibited, search out their defects, and study how to improve them. This is one excellent way to benefit themselves and their fellow men by improving and increasing the Agents of Power, and probably would result in profit in a pecuniary point of view to many.

Great Exhibition of the American Institute at the Crystal Palace, New York.

SECOND WEEK.

The day announced for the commencement of the Exhibition was September 22nd. On the 25th the Hon. Henry Meigs, Secretary, delivered his usual Annual Address. We noticed, however, a slight variation in its wording. Last year he expressed a belief that steam power was perhaps about to be superseded by a new motor then on exhibition. He alluded to Dr. Drake's exploding gas engine. This year, although he sticks to the annihilation of steam, he leaves out the gas machine, and substitutes electro-magnetism. His mind doubtless rests on the new electric engine, of Mr. E. C. Shepard, now first exhibited, and of which we shall hereafter speak.

At the conclusion of his Address Mr. Meigs announced that the exhibition was formally opened. But there was nothing of any account to see, and therefore nothing to open upon. The managers had made known in their circulars, that articles could be sent in for competition until Oct. 4. The result is that the largest proportion of the exhibitors have delayed until the present week, to send in their contributions, and it is only now that the Exhibition has reached an organized or complete state. Better late, however, than never. The exhibition will be a splendid one, and promises to surpass all others, of a purely American character, that has ever been held in this country. At the time this report was written the contributions for exhibition were still pouring in rapidly.

Motive Power.

The display of working machinery, at this Exhibition, is unusually large, and the managers have made ample arrangements for the supply of motive power. The main line of shafting is driven by two horizontal steam engines, each of thirty horse power, as follows:—

Improved Steam Horizontal Engine.—By G. H. Reynolds, of Milford, Mass.—The improvements relate to a new cut-off arrangement, whereby the steam is used expansively, and results in a saving of fuel, the inventor informs us, of 25 per cent. It is alleged that the fact of this great economy has been fully demonstrated, in a number of instances, by the application of the invention to old engines. It may be applied at small expense. Another improvement consists in a peculiar construction of the pillar boxes of the main or crank shaft. The boxes are so arranged that they may be taken out and repaired without removing the shaft. In the ordinary engines, whenever the pillar boxes need examination or replacement, the shaft, fly-wheel, etc., must be removed. This necessitates the use of tackles, and the aid of a number of men, requires time, etc., the larger the machine the greater the trouble. The improvement above-mentioned obviates all this, and enables one man to do the whole. The boxes in which the shaft rotates, are divided vertically, instead of horizontally, and a strong strap covers the boxes and keeps them in place. By removing the strap, the fly-wheel having been first blocked up, the boxes can be taken out. A set screw in the side of the strap permits the horizontal tightening of the boxes laterally when desirable, which is the direction in which they wear the fastest. The common boxes can only be tightened vertically. The engine on exhibition operates extremely well, is beautifully finished, and reflects much credit on the inventor of the improvements, and on the manufacturers, Messrs. Hinkley & Equery, Bangor, Me. Price of engine $1000.

Improved Horizontal Steam Engine.—By William Burdon, Brooklyn, N. Y.—The power of this engine is thirty horses. Its construction embraces no special peculiarity. It runs beautifully, is elegantly finished, and looks strong and substantial. Mr. Burdon is well known as an extensive manufacturer of steam engines, and enjoys a high reputation for the excellent and durable character of the work which he produces. Besides the motor above noticed, he exhibits several other engines in the present Exhibition.

Telegraph Cables.

A case containing specimens of various submarine telegraph cables, is exhibited by the American, New York, Newfoundland, and London Telegraph Co.

England and Belgium.—The cable which extends from Dover, England, to Ostend, Belgium, is 70 miles in length. It consists of 6 small copper wires separately covered with gutta percha, and these again imbedded together in the same substance. The mass is covered by twelve large iron wires, which form a flexible shield of great strength. The cable complete is an inch and a half in diameter It was laid down in 1853.

England and France.—The cable which connects England and France extends from Dover to Calais, in France. Length 25 miles. Laid in 1851. Construction similar to the above.

Scotland and Ireland.—Extends from Port Patrick, Scotland, to Carrickfergus, Ireland. Length 29 miles. Laid in 1853. Same construction.

England and Ireland.—Extends from Dublin across St. George's Channel to Holyhead, Eng. Length, 69 miles.

Newfoundland and Nova Scotia.—Crosses the Gulf of St. Lawrence. Length, 85 miles.—Laid in 1856. This cable was laid by the New York, N. F., and London Telegraph Co. It is composed of 3 small copper wires, laid in gutta percha, and bound with strong iron wires.

Europe and Africa.—Crosses the Mediterranean Sea, and extends from Cagliari, the chief seaport of Sardinia, to Bona, the seaport of Algiers, Africa. Length 185 miles. Laid in 1856. Three copper wires, arranged as above.

Denmark and Sweden.—Extends from Elsinore to Helsingborg. Length, 12 miles. Laid in 1854.

England and Holland.—Extends from Orfordness to the Hague. Four separate cables. Length, 108 miles. Laid 1854-55.

Varna to Balaklava, Black Sea.—Laid in 1854, and failed in 10 months. Composed of a single wire encased simply in gutta percha, the whole not larger than a quill.

The above comprise the principal submarine telegraph cables now existing.

Grate Damper.

This is a contrivance for use in connection with the ordinary parlor grates. It consists of a balance damper, which swings in the throat or opening from the grate to the chimney. Holes are made in the damper through which the gas and smoke escape, but the heat is really all thrown into the apartment. If an increased draft is wanted, as in lighting a fire, the damper is opened. It is alleged that the use of this invention in any grate will double the quantity of heat thrown into the apartment. If so, it is a great economizer of fuel. Price $3 and upwards, according to size. Can be readily applied to common grates. Exhibited by Jacob Cohen & Co., 45 Greene st., N. Y.

Solder-Iron Furnace.

This invention is intended to permit the use of anthracite coal for heating the solder-irons of tin-smiths. Charcoal is used at present, which is expensive. The apparatus exhibited at the Palace consists of a sort of stove, which is intended to be placed in the center of a large bench, for the convenience of the workmen. The sides of the stoves are perforated, and provided with tubes or sleeves, which extend into the center of the fire. The solder-irons are heated by being placed in the sleeves. This device insures the rapid heating of the irons, but prevents them from being burned or melted, or pasted up with dirt, saves the necessity of filing, &c. The saving of time by the removal of these objections is estimated at 12 per cent. for each working, while the cost for fuel is said to be six times less than that of charcoal used in the ordinary manner. The apparatus at the Palace heats 8 irons, and is intended for 4 workmen. Price $35, with cover for carrying off heat. Can be made of any desired size, with corresponding variation in cost. Patented by John Wilson, May 12th, 1856. Exhibited by the manufacturers, Wilson, Green & Wilson, Brandywine, Del.

Recent American Patents.

Hydraulic Brick Press.—By Ethan Rodgers, Cleveland, Ohio.—The followers which press the clay into the molds are operated by hydraulic pressure. A large and small pump are employed, and the parts are so arranged that the necessary pressure is obtained, and the machine worked with rapidity.

Chimney Register and Weathercock.—By J A. Royce, Lee, Mass.—On top of the chimney is placed a device similar to an ordinary slatted hot air register. This register has a vane and rudder, and is turned to the proper position by the action of the wind against the rudder, and its slats, after it is thus moved, are closed more or less by the action of the wind against a sail, which is on a mast projecting up from the slats. When the wind blows hard, the slats are operated so as to almost entirely close up the flue of the chimney and thus diminish the draft, and when it is calm they open the flue and thus increase the draft. The design of the improvement is to avoid a greater consumption of fuel during windy weather than there is when the weather is calm.

Fly Trap.—By Dr. Samuel Arnold, Green Hill, Tenn.—A hemispherical glass vessel filled with soap suds is provided, over which a hollow cylinder is placed. The cylinder communicates with the glass vessel, and is provided with grooves on its inner side to receive some condiment attractive to flies; it is also perforated, to allow the flies to enter, and pass to the condiment. The cylinder also has a piston. When a number of flies have entered the cylinder some one around the table revolves it, and thereby frightens the flies, which in a moment thereafter are precipitated into the soap suds by the automatic descent of the piston.

New Bomb Shell.—By A. M. George, of Nashua, N. H.—Consists in constructing a shell with a separate chamber or cavity in front of the chamber which contains the powder or compound by which the shell is exploded. The said chamber is filled with melted iron or other metal, which will be scattered by the explosion of the shell, inflicting great injury. It further consists in certain means of protecting the charge of powder or explosive compound from the heat of the melted metal in the front part of the shell during the placing of the shell in the piece of ordinance for discharge. The fuse is ignited in the same way as that of the common bomb-shell, and when the charge in the chamber becomes ignited, the said chamber and the whole of the shell explode at once, and the melted metal is scattered about, to the destruction of everything surrounding the spot where the explosion takes place.

Contrivance for Notching Barrel Hoops.—By Daniel Lamson, of East Weymouth, Mass.—Consists in the use of a reciprocating knife and inclined plate, whereby the ends of hoops may be properly notched, and with the greatest facility. The above invention is simple, performs the work in a rapid manner, and the cost of construction is trifling.

Machine for Painting Wheels for Vehicles.—By S. B. Fuller, of Worthington, Mass.—Consists in having a vibrating and rotating spindle pass through the bottom of a tub or reservoir in which the paint is placed. The wheels being placed one at a time upon the spindle, are immersed in the paint by depressing the spindle. They are then raised above the surface of the paint, and the spindle rotated so that the superfluous paint will be thrown from the wheel by centrifugal force. It is said that two men can perform as much work with a