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Museums for Models, &c.

A very laudable effort is being made in several of our principal cities to establish, under various names, depositories where models, drawings, and specimens of valuable or novel inventions, may be made accessible to the public, the design being to benefit the patentees by the advertisement it affords of their wares, and to advance the interests of the public, by the instruction and entertainment such an exhibition will offer. The general idea is by no means new, as all our fairs are exhibitions of this kind, but the novelty consists in the endeavor to make such an institution perpetual. There are several difficulties in the way of the success of such an enterprise, though none of them we think absolutely insurmountable. One of these difficulties—the most serious probably in any such concern which may be started under circumstances which compel it to be self-supporting—is the want of sufficient patronage. Either the public or the inventors, or both, will be so slow in appreciating the advantages afforded, and in being made to believe that the concern is really well conducted; that the financial affairs of the exhibition will become embarrassed, and the proprietors bankrupt some years before the museum is properly started. We may be mistaken, and would speak with modesty on the subject; but really do not believe that such an establishment can burst forth at once upon an astonished world. Be that as it may, we shall endeavor to promote the success of all by diffusing intelligence of their whereabouts and success, with a view to the interest alike of their projectors, the inventors, and the public.

It may here be regretted that more than one such enterprise should be started at once. Strictly speaking, we know but two in the whole country—one the "Hall of Patents" in this city, comprising the whole third and fourth floors of a very large single building at Nos. 594 and 596 Broadway, and the other the "Hall of Arts," Boston, located at the corner of Essex and Lincoln streets. Both are private enterprises, and are started or proposed to be, under the charge of highly respectable parties. The manager of the first named is Mr. R. D. Goodwin, a successful real estate agent, and a prominent member of the American Institute; the latter is conducted by Elizur Wright, Esq., successively the active and talented editor of several popular newspapers, one of the more noted of which was the *Chronotype*. We say "propose to be," for we are not certain as either has yet opened, although advertised to do so many months since. The Boston enterprise was at last accounts delayed to allow time for plastering and finishing the halls, which were at first intended to be used rough. The New York rooms were apparently finished, but empty, at Christmas; they contained one well filled small glass case, and a broken "real estate" sign, at the period of our last visit in February, and at the very latest advices, March 12, had received goods for exhibition from only two houses, both New York establishments, and was advertised to open on the 16th. This last report may be incorrect, but we are endeavoring to do exact justice to all the parties directly or indirectly interested.

The financial support of such an enterprise being a matter of the most difficulty, it may here be mentioned that the Boston hall proposes to charge a moderate admittance fee to visitors, while that in our city is to be absolutely free. Both, we think, charge a small sum to exhibitors, according to the space occupied; and both allow, in fact desire, the presence of exhibitors, or their agents, to explain, and, if they choose, sell their goods, patent rights, &c.

While thus noticing these, one or both of which we hope may yet prove a highly useful means of diffusing information, it may be unjust not also to notice the various humbler exhibitions of similar articles which have been a long time in existence. The Mechanics' Institute, while at the corner of the Bowery and Division streets, advertised for such articles to be stored and shown free of charge, and received quite a number, but we think have not attempted it since their removal up town. The American Institute continue to show at their rooms, 351 Broadway, any models or full sized machines which are offered, and we may add that they are, we believe, always well cared for. We do not know the terms on which such articles are received, nor how long they are allowed to remain, should think generally not long; but, in addition to the advantages of ordinary exhibition to a few occasional visitors, the inventor or a friend can generally have the privilege of explaining them to the Mechanics' Club at its regular sessions there. The Crystal Palace, yet open, offers plenty of vacant room and attracts some visitors; the annual fairs—State, county and charitable—are well known and generally well appreciated, and there are dozens yes, scores of energetic agents and dealers who make their stores and offices quite interesting museums. Mr. Copeland's office is always a curious museum of inventions relating to marine steam engineering. Mr. Haswell's little less so. Messrs. Bridges & Brother, Taulman & Lowe, Mr. Bowles, and several others, exhibit and explain with great courtesy the several improvements in railroad or manufacturers' articles. Mr. Schenck, Mr. Hills, Andrews & Jessup, and the agent of the Essex Company show most of the modern improvements in tools. Mr. Prentice, ditto of draughting instruments, and Mr. Pike of philosophical toys. All these latter are simply warehouses where the goods are for sale, a state of things to which any more pretentious exhibition must of necessity very rapidly tend. The benefits of exhibition, without such immediate results, would be too intangible for our fast age; but although conducted with a view to direct sales of rights, goods or machines, it is possible to establish large exhibitions much more instructive and beneficial than the mere agencies and stores. The direct collision of rival inventors and inventions on the same floor, although arousing bad blood at times, serves to elicit truth and prevent stagnation, and unpromising as our report now appears, we hope to see such a perpetual fair in successful operation before many years.

The Burning of Gunpowder.

There are some operations so slow as to challenge the highest effort of the imagination. Such are some of the changes revealed to us by geology. There are others so extremely rapid that their division into successive steps becomes still more difficult. In this last class may be included the successive ignition of each grain in a charge of gunpowder. It is in one of those subjects difficult to reduce to experiment—a fact which, were it not sufficiently obvious of itself, could be readily proved from the diverse opinions expressed by *savans* who have investigated the questions connected therewith.

Professor Treadwell, of Cambridge, has within a few months published a paper on the construction of large cannon, in which he concludes that it is possible and perfectly practicable, with our present means and materials, to construct large cannon which will throw balls to a very greatly increased distance. He proposes to do this by shrinking hoops upon the guns, a form of applying the material which would certainly increase the effect of the exterior layers of metal, although it would tend to increase the crush, and contribute to the disintegration of the interior particles when the explosion of the charge occurs.

But we recurred to that paper mainly for its graphic description of the process of firing, which is as follows:—

"Count Rumford has proved that the burning of the grains is slow, or that a sensible time is required with each grain before it is wholly converted into the gaseous state; and various experiments made in England and in Prussia have shown that there is no sensible difference produced in the velocity of the shot by communicating the fire to the center rather than to one end of the charge, which ought evidently to take place if the fire is communicated from one grain to another in succession, as this communication, being in both directions when proceeding from the middle, would require but half the time that is required when proceeding from one end, and ought to produce a sensible increase in the velocity of the shot.

I think therefore that these two facts warrant the following inference as to the course of the action during the production of the force. When the fire reaches the charge from the touch-hole, the nearest grains become kindled, the hot fluid evolved is thrown further into the charge, and the burning succeeds successively until the pressure becomes so great as to condense the air contained between the grains sufficiently to produce the heat required for firing those grains, which are then consumed more or less rapidly, as they are fine or coarse. We have, then, first the burning in succession of a small part of the charge; then the immensely rapid, though not instantaneous, kindling of every grain composing it; and then the consumption of those grains, which is not accomplished without time. It is a task for the conception to grasp these events, following one another in distinct succession, each having its beginning, middle, and end, and all being comprised in the period of 1-200th of a second (gun 4 feet long, *formula* $t = 2s + v$). When we have mastered the imagination of these, we may go further and combine with them the connected and contemporaneous action of the ball, which passes from rest to motion, and through every gradation of velocity up to 1,600 feet a second, and leaves the gun as our historical period of 1-200th of a second expires."

We may add that the formula does not apply exactly, and the time during which the powder burns profitably is, consequently, less even than the Professor has estimated. The formula would apply if the powder acted with equal force on the ball from its commencement of motion until it left the muzzle; but this is not the fact. The powder, or rather the expanding gases produced by its combustion, acts with most force at the beginning of the motion, and gradually dies away. We will present some facts relating to the varying pressure on the interior of a gun in our next issue.

The Manufacture of Iron.

The name of Henry Cort, a native of Great Britain, should be forever kept prominent as among those of inventors to whom the world owes most. Cort cheapened wrought iron, a step nearly or quite as important as the previous invention, by Lord Dudley, which had cheapened the production of pig. Cort introduced as great a change at that period in the wrought iron manufacture as the processes agitated within the past year could do now, even if perfectly successful. He invented the puddling process almost exactly as now conducted, and although Mr. Joseph Hall, of Staffordshire, the author of a book on the subject, recently published in London, claims for himself the invention of the "principle of boiling iron," Mr. Cort would appear, referring to his original English patent, dated in 1784, to have understood the fact that the metal would boil, and actually to have boiled it, although he perhaps was as blind as we are, (and also every one of whom we have tried to take lessons) with regard to its precise nature and effects. The following from the original patent of Mr. Cort will be interesting to iron makers, as showing how far puddling was set forth at that day, and to others as a brief and clear explanation of the process by which this all-important metal is changed from the stiff and crystalline carbonate, which can only be worked by melting and casting, into the fibrous condition in which it is worked on the anvil:—

"I make use of a reverberatory or air furnace or furnaces, of dimensions suited to the quantity of work required to be done, the bottoms of which are laid hollow, or dished out as to contain the metal when in a fluid state. My furnace, for the first part of the process, being got up to a proper degree of heat by raw pit-coal or other fuel, the fluid metal is conveyed into the air furnace by means of ladles or otherwise. When this air furnace is charged with sow and pig metal, or any other sort of cast iron, the door or doors of the furnace should be closed till the metal is sufficiently fused; and when the workman discovers (through a hole which he opens occasionaly) that the heat of the furnace has made a sufficient impression upon the metal, he opens a small aperture or apertures, which I find is convenient to have provided in the bottom of the doors (but which is or are closely shut, as well as the doors, at the first charge of the furnace with cold cast metal); and then the whole is worked and moved about through these apertures by means of iron bars and other instruments fitly shaped, and that operation is continued in such manner as may be requisite during the remainder of the process. After the metal has been some time in a dissolved state, an *ebullition*, *effervescence*, or such like intestine motion takes place, during the continuance of which a blueish flame or vapor is emitted; and during the remainder of the process the operation is continued (as occasion may require) of raking, separating, stirring, and spreading the whole about in the furnace till it loses its fusibility, and is flourished or brought into nature. And the whole of the above part of my method and process of preparing, manufacturing, and working of iron is substituted, instead of the use of the finery, and is my invention, and was never before used or put in practice by any other person or persons."

Sending Money by Mail.

We alluded, in our last number, to the British system of money orders as infinitely superior to our abortive practice of registering letters. An English gentleman in this city, Mr. George Edwards, is earnestly endeavoring to introduce the money order system in this country, and in precisely the same manner in which it was first made successful in Great Britain, by the agency of a private company. The money order system was first established in England as a private enterprise, and subsequently purchased by the government. The system, whether public or private, would certainly very much facilitate the payment of subscriptions for newspapers, small transactions in books, &c., now quite extensively conducted. The system is briefly this:—A party wishing to send five dollars to a friend or business connection, goes to the nearest Post Office, deposits the money, which is placed by the Postmaster to the credit of the Government, and received therefor a money order which he encloses in his letter. The recipient presents this document at any Post Office he pleases, and receives therefor the amount of its face, which is charged by the Postmaster, in turn, to the Government. The price of orders for twenty-five dollars is six cents, and for between that amount and fifty dollars, twelve cents. These are the English prices. We are not aware that any tariff of rates has been determined on for the American Company, if the enterprise is ever made to succeed, as we sincerely hope it will be.

Inventions Wanted.—Coal Burning.

It may not be impossible—although it now seems so from the nature of the material—to regulate a coal fire as quickly and easily as when wood is employed for fuel. This is one of the great difficulties in the employment of coal for fuel in a great variety of situations, but especially on locomotives. The power required on a railroad is exceedingly variable. At times the train is running down a grade of such inclination that absolutely no power is required to impel it, and immediately afterwards, perhaps, it is exerting all its force to move the train slowly *up* a similar inclination. A wood fire is easily controlled, but the steam-generating power of coal-burning locomotives cannot well be. Shutting the draft does not immediately lower the temperature of a heated mass of anthracite and, as a consequence, water is made into steam and blown off to waste in many instances; while, on the other hand, a suddenly increased current of cold air blown through the grates into a coal fire does not seem to very rapidly raise it. Can this difficulty be successfully overcome?

Steel made by mingling manganese with iron has been lately affirmed to be better than carbon steel.