

Scientific American.

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In consequence of the great pressure of matter upon our columns, we shall publish with our next number a supplemental sheet, one-half the size of our regular paper; and it is our intention to continue to issue these supplements at such intervals as we may deem necessary in order to dispose of the interesting matter that crowds upon our columns. It is our intention to illustrate some of the principal manufacturing establishments of the country, and the subject of the first article will be the celebrated Saw, Printing-Press, and Engine Works of Messrs. R. Hoe & Co., of this city. The information which will be imparted from time to time, upon the great manufacturing processes of the country, will be of rare interest and importance to all who desire to become acquainted with them.

We have reason to feel the liveliest gratitude to our friends generally, for the kind efforts they have made to extend the circulation of the SCIENTIFIC AMERICAN; and we hope they will still exert themselves in its behalf. We promise them our best efforts to increase its value and interest, so that it may become a necessity to every well-regulated shop and household. A gentleman from Cincinnati voluntarily called upon us, a few days ago, and announced his intention to travel extensively during the winter, for the purpose of introducing a valuable improvement; and said he would undertake to send us two hundred new subscribers, and we have no doubt he can do it. Such an act of friendship as this, without any special reason for it, we cannot too highly appreciate.

We are anxious to add some important permanent improvements to the SCIENTIFIC AMERICAN, which is acknowledged to be "the best journal of the kind ever published;" and if our friends generally will take hold of the matter in earnest, and give us their efficient co-operation, it will enable us to carry out our long cherished plans. We shall spare neither pains nor expense in furnishing its columns with the choicest practical information drawn from every available source; and we shall extract from the columns of our foreign exchanges—English, French and German—such descriptions and illustrations of recent mechanical improvements abroad as will interest and benefit the industry of our own country.

Lowell and its Cotton Manufacture.

Lowell is the Manchester of America—the metropolis of American cotton manufacture. The last number of Hunt's *Merchant's Magazine* contains an interesting article on this topic, taken from a record of the venerable Nathan Appleton, of Boston, who had been identified with the rise and progress of this city, and from which we condense some interesting facts.

The power-loom, it seems, was introduced into the United States by Mr. Francis C. Lowell, in 1814, and was first used in his factory at Waltham, Mass. He was a very ingenious man, and made several improvements, not only in the power-loom, but also in other machines. The company at Waltham was very successful; and this induced Mr. Appleton, in 1821, (who was a small stockholder) to extend his interests in another

direction, and to commence the manufacture of cotton cloth, and the printing of calicos. After examining various sites for a new manufacturing village, in company with Mr. P. T. Jackson, it was suggested by a friend that they should purchase the Pawtucket Canal, and thus obtain the whole power of the Merrimack river, with a fall of thirty feet. The spot where Lowell now stands was visited for this purpose in November, 1821, by a party consisting of Messrs. N. Appleton, P. T. Jackson, Kirk Boot, Warren Dutton, Paul Moody, and John W. Boot. At that period there were not more than a dozen families residing in the vicinity; but the impression made upon the minds of the party was so favorable, in regard to the manufacturing capacities of the situation that, one of them remarked, "some of us may live to see this place contain 20,000 inhabitants"—an anticipation which has been more than realized. The Pawtucket Canal was purchased from a private company which owned it, and Kirk Boot was appointed treasurer of the association which had been formed. "The Merrimack Company," now so famous, began soon afterwards to erect two mills, the first wheel of which was set in operation on the first of September, 1823. Three additional mills were soon afterwards erected; and from the very start, the place assumed an air of prosperity. The name given to it by the act of incorporation was in honor of the first introducer of the power-loom at Waltham, and who had done so much to improve the cotton manufacture of America.

The standard for a mill-power sold by the corporation owning the canal, was 25 cubic feet of water per second on a fall of 30 feet, with sufficient adjacent land for factories. The price paid for it was \$14,336, of which \$5,000 remained on mortgage, subject to an annual rent of \$300. This water power was estimated as equal to 60-horse, and was considered necessary for running 3,584 spindles, with carding machines, looms, and all the necessary machinery for making cotton cloth.

The Merrimack Company commenced the printing of calicos in 1825; and in the subsequent year, John D. Prince, of Manchester, England, was engaged to take the charge, under whom the works were most ably managed—with Dr. Dana as chemist—until 1855, when he retired at an advanced age, on a life annuity of \$2,000 per annum. The prints of this company (the fast colors), have obtained a wide-spread celebrity. It has been the settled policy of the Lowell companies to secure men of ability in every department, and to act towards them in the most liberal manner; this has been the secret of their success—their dividends amounting annually, with very few exceptions, to more than twelve per cent ever since they were established. To show how much the public have been benefited by improvements in our manufactures, the Merrimack prints sold readily in 1825 for 23-07 cents per yard; in 1858, the same classes were sold for 9-15 cents. To exhibit the benefits which the public have derived from improvements in the manufacture of cotton cloth, it is only necessary to state that the class of goods made at Waltham in 1816, which were readily sold for 30 cents per yard, now sell for 8 and 9 cents per yard.

The capital employed in manufacturing at Lowell, is \$12,000,000, and the population has arisen from twelve families to 38,000 persons. There are 139 mill-powers used, amounting to 9,000-horse. A great improvement was made in the canal for supplying the water, in 1846, under J. B. Francis, Esq., the engineer of the corporation, and whose work on "Lowell Hydraulic Experiments" does him great credit. The first water wheels employed were of the overshot class, the best of which realized only 75 per cent of the water power; as these have worn out, the turbine has been substituted, which, as improved by Uriah A. Boyden, realizes 88 per cent of the power.

Lowell is a great city, not from the number

of its population, but because it is a hive of industry (a producing community), and therefore a mine of wealth in regard to the stable interests of our country.

The Patent Office.

From the Report of the Secretary of the interior, we learn that the income of the Patent Office, for the first three-quarters of the present year ending Sept. 20th, was \$150,984; its expenditures during the same period were \$144,433, showing a surplus revenue of \$6,551. This affords us much satisfaction, as the excess of expenditure, during the same period of last year, was \$2,526 over the income. While the other departments of government have spent more than the national revenue has warranted, the Patent Office has exhibited quite the contrary spectacle. During the period referred to, then were 4091 applications made for patents, and 696 caveats were filed. There were four more applications made in the same period of last year and 124 more caveats filed. Considering the great financial crisis through which our country has passed since then, our inventors have stood the shock manfully as is shown by the above statistics. In the three quarters referred to, 2,816 patents have been issued, 15 extensions granted, and 1,256 applications rejected. The Secretary recommends the establishment of a Board of Appeal in addition to the present force of the Office. The inventors of our country and the public have great reason to feel gratified at the above exhibit, as it affords indubitable evidence of the able management which prevails in the Patent Office.

Patent Law Changes in France.

A project of law will be presented to the Corps Legislatif at its next session, introducing some important improvements in the law of patents. Among them the following are the principal:—1st, The time allowed for putting a patented invention into operation is to be extended from two to three years; 2d, Instead of granting patents without examination, as hitherto, all applications and plans are to be submitted to competent "experts" named by government, and either refused (on successful opposition) or confirmed by the ministry; 3d, Instead of the onus of prosecution being left to patentees, as at present, all infractions on patent rights are to be prosecuted by the Procurator-Imperial: this results from the preceding rule—government thus first proving, and then undertaking to defend the ingenious discoveries of the inventor; 4th, If any invention be found of such public utility as to render its freedom beneficial, government is to have the right of buying it up from the patentee on fair terms, determinable by a jury composed of three arbiters named by the inventor, three by the Minister, and three by the Presidents of the Cour Imperial.

[We copy the above from one of our foreign exchanges, and it will afford us much pleasure to chronicle the passage of the act referred to. In the year 1855, while sojourning for a short time in the gay French capital, we were solicited by the late lamented Gardissal, editor of *L'Invention*, to contribute to the columns of his journal some views respecting the operation of the American Patent System, and to urge the importance of a preliminary examination, in all cases, by competent experts, so as to determine upon the patentability of an applicant's invention prior to the official decision. We prepared three articles upon this subject, and their appearance in the above-mentioned journal attracted a degree of attention much greater than we thought they deserved. One fine morning, while we were engaged in dotting down some items in "sight-seeing for home friends," we were waited upon by a fussy little gentleman whose face betokened an unwonted enthusiasm. Seizing us by the hand, he showered upon us all sorts of most admirable *bon mots*. The secret was, we had supported views expressed in an old neglected French

pamphlet, in which its author had vainly attempted to make everybody believe that a preliminary examination was the great object to be attained in the otherwise excellent French Patent Law. We shall never forget this warm and enthusiastic friend; and we hope he may live to see *l'Examen préalable en matière de Brevets* fully established. But we encountered an opponent in the person of M. Jobard, of Brussels, a sincere and able man. His views, however, were peculiar; he had got them incorporated into the Belgian law, and seemed to think that no one but himself knew much about that subject; and he was evidently alarmed at the hardihood of our conduct in poking a side-thrust into his favorite theories. He evinced his want of knowledge of our system by giving an amusing account of an attempt on his part to get a patent here for some of his notions. The subject of a preliminary examination has since been agitated somewhat in France, and it now appears that the French legislators are beginning to think that there are some virtues in the United States system of granting patents. We wish these deliberations a happy issue.

An Improvement in Candles.

There is an old saying that "time tries all" and surely if this be true, candles have stood the test of time well, for they were among the earliest inventions of the fathers of our race, and despite burning fluid, gas and coal oil, still keep their place as light-givers,—a luxury to the rich—a blessing to the poor. Tallow candles are of two kinds, either dipped or molded, the former being the oldest, the latter the best, and they were invented in the middle ages by the *Sieur de Brez* at Paris. The very name, candle, suggests antiquity, its equivalent or derivative being found in the oldest languages; thus in Persian it is *kandil*, in Armenian, *cantol*; in Welsh, *canwyll*; and in Erse, *cainneal*. With all this age to support it, however, we must say that the candle is a greasy article, and much given to guttering, and wants snuffing very often; or rather did, for we wish to notice an invention which prevents these evils, and considerably elevates *M. Chandelle* (as the French call him) in the scale of illuminators. Mr. J. H. Tatum, of this city, patented on the 8th of Oct., of this year, a method of indurating or hardening common candles so that they are in every way equal to spermaceti or the highest priced varieties, without materially increasing the cost. They do not gutter, and a plaited wick can be used, so that they do not require snuffing. We have seen them burn, and were charmed with the pleasant, cool, and healthy light they gave.

Mr. Tatum's process is simple in the extreme; the candle of common "stock," when molded or dipped in the usual way, is immersed in a vat of liquid fat and gums of such a nature that it adheres to the tallow, and forms a thin coating outside it; and then the candle is dipped in another composition, whose base is stearic acid, which will not itself adhere to tallow, but will adhere to the intermediate composition. This gives the candles an indurated coating, which, being fusible at a much higher temperature than the tallow, causes the candle to burn with a beautiful cup-shape, prevents guttering, and improves the light. All grease is prevented; and on the hottest day they will remain as hard and clean as in winter.

This improvement is a valuable one to the candle trade, as it will give an excellent appearance to any "stock," and greatly improve the quality of the candles in their illuminating power and saleableness, besides extending their use, and giving them greater facilities to replace burning fluid.

We are told by philosophers (and they ought to know) that the progress of the ages is developed in the most minute details of life. So we suppose that Macbeth, when next he calls "What ho there! lights," instead of being served with torches, will be answered by an array of indurated candles.