In the selection of localities, those which afford the best opportunities for diversity of industry will, in the end, always prove the best.

We are the more inclined to favor these organizations from the fact that they are making an intelligent effort to better the condition of the laboring classes, and that they are composed of select and peace loving workingmen, who see that in the strikes and other means employed by trades unions to force higher wages, the true interests of labor are not really advanced.

STEAM ON THE ERIE CANAL.

We find it necessary to repeat what we have already said in regard to the propulsion of boats, under the conditions specified in the New York State law offering the $100,000 prize.

Many of our correspondents apparently think it is sufficient to confine their thoughts to the invention of a means of propulsion, without regard to speed. We have already shown that the minimum velocity required by the act (three miles per hour) involves a modification of the form of the square box boats now in use. The advance of such a boat at the required speed would create injurious side swells, no matter what means of propulsion were adopted.

Some of our correspondents appreciate this difficulty and regulate their plans accordingly. One suggests the employment of side wheels, with outriggers carrying longitudinal shields running parallel to the sides of the boat and outside of the wheels, the shields to be as long as the boat. This would undoubtedly prevent side swells to a very great extent, but it would make the width of the boat so great in proportion to its tunnage that it could not carry the stipulated load and get through the locks.

Another correspondent proposes a wheel with radial flukes, which shall engage the bottom of the canal and thus propel the boat. This device is old, and besides does not provide for the obviation of side swells.

As we understand the law, the speed may exceed three miles per hour, provided the inventor can so construct his boat that greater velocity can be safely attained.

Inventors will see that the conditions under which success can be attained are few, and those of failure numerous. It would be wise for many of them to give the law more careful scrutiny than they appear to have done.

BUILDINGS FOR MANUFACTURING PURPOSES.

Some two or three years since we called attention to the necessity of a special profession of "Architectural Engineering." Our interest in the subject has now been revived by a failure of an expensive building, designed by a supposed competent architect, for a special manufacturing business, to answer the purpose for which it was built. The proprietors have, we are informed, been compelled to expend considerable money and lose valuable time to rectify its defects, besides having to change machinery from floors upon which it was originally placed to others less convenient.

The fact is that men who can build graceful and handsome churches are not therefore necessarily competent to design a factory, esp cially one intended for new branches of industry. To imitate is not to design. But every new building intended to be occupied by machinery long used and well understood, must, although the same ground plan is observed, be more or less varied in detail to adapt it to the peculiar circumstances of its location, the soil upon which it stands, etc. It requires more than artistic talent and knowledge of the properties of materials to do this. Knowledge of the nature of the operations to be carried on in the building, judgment matured by experience, and inventive skill, combined with skill in the art of building, are necessary.

Some of the finest manufacturing buildings in the country were in their internal arrangements entirely designed by men familiar with the peculiar industry for which they were constructed, but who were quite unfamiliar with architecture as an art.

Utility rather than beauty must be the controlling idea in erecting such buildings. Yet whenever without sacrificing convenience and strength to appearances, beauty of design can be secured, it is of course very desirable. To combine these elements requires no mean skill, and it is evident that to greatly excel in this class of work a man must have made it a special study.

EX-COMMISSIONER FISHER'S EXPERIENCE IN THE PATENT OFFICE.

We commence this week the publication of extracts from a speech recently delivered before the Young Men's Christian Association, Cincinnati, by Hon. S. S. Fisher.

The incidents he relates occurred while holding the office of Commissioner of Patents, and his amusing experience is not unlike that of the chiefs of other bureaux under the Federal Government. We have withheld the publication a week or two, undecided if we could afford the space the lecture would occupy. But his description is so graphic and racy, and portrays such a good insight into the peculiarities of office seekers generally, that we decide to make copious extracts, which will be continued through several numbers.

INSPECTION OF THE BOTTOMS OF WELLS.—Sufficient light to enable any one to see the water or earth at the bottom of a well, can be directed down the shaft by means of an ordinary looking glass. If the well be under cover, two glasses will be required, and our own ingenious readers will, by a little experimenting, soon be able to arrange them in the right positions.

[Special Correspondence of the Scientific American.]

BURDEN HORSESHOE PATENT EXTENDED---VALUE OF THE INVENTION.

Washington, D. C., June 26, 1871.

On the 14th of June the famous patent of Henry Burden, of Troy, N. Y., for a Horse and Mule Shoe Machine, was extended by Commissioner Leggett. No contestant appeared in opposition to the extension. The patent was issued June 30, 1857, and reissued in 1865.

Mr. Burden died in January last, and the applicants are his two sons, Mr. James A. Burden and Mr. I. Townsend Burden. He was a man of strong intellect, great energy, and untiring perseverance. To perfect the machine referred to was the ambition and success of his life, and no efforts or sacrifices seemed to him too great for its accomplishment. Others had labored in the same direction, but had failed of success, and abandoned their undertakings. It required the inventive talent and extraordinary persistence of such a man, together with his unusual pecuniary resources and mechanical facilities, to work out the difficult problem. Mr. Burden's first efforts to this end were made prior to 1835, in which year he was granted a patent for a machine, which however proved a failure, and involved a heavy expenditure. In 1843, he received a second patent on another device, but this also failed when put to practical use. In 1853, his determined efforts suffering no abatement in the intervening time, he decided to abandon the particular line of devices he had hitherto chosen in his experiments, and to adopt certain others involving different mechanical principles. The happy result appeared in his patent of 1857. He subsequently devised important improvements, which were embodied in another patent issued in 1862. As an automatic feeding, bending, and molding machine, the patent of 1857, just extended, was all that could be desired, but in the process of creasing and punching the nail holes some difficulties arose, which were overcome in the patent of 1862.

When first entering on his experiments, and this was as early as the year 1835, Mr. Burden carried on extensive iron works, of the highest grade, at Troy; but during the years, from 1853 to 1857, his general business was in many ways sacrificed to the one great object he had so long and sanguinely had in view. Many stories are told of his intense and enthusiastic application at that time; how for days and weeks his meals were brought to his place of business; how he often worked, sometimes in company with his favorite mechanics, 24, and even 30, hours without intermission; and how he many times called up all his workmen at midnight to open the mills and manufacture some new device or modification. His rolling mills were often idle for weeks, that all his hands and shops might be devoted to the horseshoe machine, in its embryo, but surely developing, condition. His machine and pattern shops were at that time fully equal to any, if not the best, in the country; and were provided with the most approved implements.

The present machine turns out, with unerring certainty and perfection, one shoe in a second of time. The average weight of a shoe is one pound, and it is not uncommon for one machine, in the ordinary running of the shop, to transform 10½ tuns of bar iron into perfect shoes in 12 hours, which is equal to the hand work of at least 600 men for the same time.

To estimate the saving to the country from a general adoption of this important article, it must be borne in mind that the prevailing prejudice against its use compelled the inventor to place it in market at a price returning him no profit whatever, and not even covering the cost of manufacture. In other words, he offered it at the price of the material, looking for his returns exclusively to the regular profit on the manufacture of the iron, the machine materially increasing the business of his extensive puddling and rolling mills.

With some modifications, this plan has been adhered to up to the present time, and it is contended by the firm that the public, in proportion to its adoption of the machine horseshoe, is saved the entire cost of the manufacture by hand, the profits to the manufacturer being derived from the invention only so far as the iron is thereby put in a more saleable form.

The average charge for making a horseshoe by hand is estimated by some at sixteen cents, by others as high as twenty cents (the material of course not included); the average price of the Burden shoe has been 8½ cents, so that the latter brings to the consumer a saving of at least two thirds on the entire cost. During the last year, the machine shoe has been sold at still lower rates, averaging less than five cents.

Since the introduction of the invention, 82,000 tuns of iron have been used in the manufacture, and the sales have amounted to $9,000,000, showing a saving to the public of $18,000,000.

It would be difficult to estimate the expenditures and losses during the many years of experiments. In the four years previous to the issue of the patent, the losses caused by the interruptions of the general business of the establishment amounted to at least $100,000. A famous litigation suit, in protection of the invention from an infringement, cost the inventor the sum of $25,000.

The prejudice, already referred to, against the article, both among the blacksmiths and the consumers, was general, and often bitter and violent. In New York city the excitement at one time rose to such a pitch that a blacksmith who had resolved to make trial of the shoe, was killed by his fellow workmen. This opposition was caused in part, and not unreasonably so, by the defective quality of the shoes put on the market by other parties, and even by Mr. Burden himself, on his first attempts to introduce them; and to overcome this, when the manufacturing process had become perfected, was a difficult task, and involved great labor and heavy expenditures. Mr. Burden's sons and other responsible agents visited all sections of the country, and personally conferred with the leading master workmen. Charging the machine with the expenses of inventing and perfecting it, of making and selling the product, and the market price of the iron, and crediting it with all the proceeds of the sales, it is pretty clearly shown that the inventor and his heirs have sustained a heavy loss.

The value of this invention in its relation to the military operations of the late civil war may not be generally known. Many thousand men were spared for active field service whose services would otherwise have been required in the shops. Quartermaster-General M. C. Meigs says: "The army depended, to a very great degree, upon shoes made by this machine, and they gave satisfaction wherever used. It is not possible to state its value to a government. It is one of those inventions which add to the military strength of a nation, not to so great a degree, but in the same manner as the steam engine, the steamboat, and the locomotive."

Assistant Quartermaster-General J. A. Donaldson writes: "During our civil war, as Chief Quartermaster of the Military Division of the Tennessee, and afterwards of the Missouri, I had ample opportunity of testing these shoes, and found them superior in every particular to those made by hand. In the great operations of our armies—when it would have been impossible to manufacture a sufficient number by hand—such, for example, as Sherman's Atlanta campaign, and his March to the Sea—the Burden horse and mule shoes were an essential element of success, and I cannot speak too highly of them."

During the war, about 14,000 tuns of shoes were used in the Government service, the price paid being even less than market price to private individuals, and the saving, as compared with the cost of the same if made by hand, was about $4,000,000.

The history of this invention, if fully written, would finely illustrate the workings of a strong inventive intellect, impelled by an energy well nigh heroic and borne over obstacles and through labyrinthine delays by the presence of a never failing hope. Mr. Burden knew no misgivings, and failures only stimulated to greater exertions. But what we know of the inventor's life is sufficient to excite our admiration and quicken our appreciation of the measure of human vital force that may be embodied in one important invention.

Mr. Burden was born in Scotland in 1791, and came to this country in 1819. He received a thorough education in mathematics and engineering, and in boyhood displayed much inventive genius. In 1820, he invented the first cultivator in the country; in 1840, the railroad spike machine, which became widely known, not only from its intrinsic value, but also from an extended litigation to which it gave rise. Other valuable inventions might be referred to. A thorough mechanician and mathematician, he wasted nothing in blind and random labors.

During the war, Mr. Burden took much interest in furnishing to the various Sanitary Commission fairs, held in the leading cities, miniature horseshoe machines, and the suitable white metal for manufacturing diminutive shoes, which were sold in great numbers as ornaments or mementoes. It has been stated that the sum of $20,000 accrued to the Sanitary Commission from these sales; and many will remember that, at the New York city fair, they were conducted with great success by Mrs. General McDowell.

STEAM FIRE ENGINES.

The boiler and works of a steam fire engine with a running gear are so constructed as to dispense with a reach or perch pole, and to allow the forward wheels to be turned completely under the frame in such a manner as to place the weight of the parts upon the axles, and relieve the frame of all strain except what is necessary to preserve the proper relative position of the axles. This construction of steam fire engines renders them less liable to be injured or disabled by the giving way of parts, and adapts them also to be turned or managed with greater facility, accuracy, and safety, while the engineer and firemen have such access to the engine and boiler, respectively, as greatly facilitates the performance of their duties. The parts composing the engine are arranged directly over the front axle, and the boiler on the rear axle, the axle being connected by curved reaches or braces. Thus the front wheels may be turned completely round the engine, which facilitates turning in narrow limits, and enables the tongue and connected parts to be placed out of the way of the engineer. This construction also allows the engineer and fireman to work entirely separate or without one being in the way of another, and removes the weight of both engine and boiler entirely from the reaches, enabling them to be made light so as to reduce the aggregate weight and cost of the machine. The saving effected in repairs, and the increased speed with which this engine may be driven, alone, are claimed to equal or exceed in a brief period its entire cost.

Invented by Lysander Button and Theo. E. Button, of Waterford, N. Y.

Brick Kiln.

This invention consists in improving the construction of brick kilns, so that the over burning of some and insufficient burning of other bricks can thereby be prevented, as well as the unnecessary waste of fuel. It consists in the application to the top of the kiln of a series of horizontal intersecting flues, and of registers above the crossings of the flues, where by the products of combustion can be directed in their course. Upon a brick kiln of suitable size and shape, and built up of