

AMERICAN STEEL.

We have frequently urged upon our metallurgists and iron manufacturers the importance of engaging in the production of steel to supply all our wants in the arts. Success has attended the efforts of several parties who have engaged in the manufacture of steel west of the Alleghanies, and we see no reason to doubt that similar success would attend like efforts in other parts of our country. In Pittsburgh there are several establishments in which steel is made, and it has taken the place of coarse English and German steel which had been used in the fabrication of the cheaper sorts of implements and tools. The Pittsburgh steel is equal in quality to the same foreign grades, while its cost is less, hence its use is becoming very general in the West. All the finer sorts of steel, however, are still imported in great quantities from England; also much of the more common qualities for the Eastern sections of our country. Now, it appears to us that all the steel we require could and should be manufactured on this side of the Atlantic. We have all the necessary natural elements for producing every quality of it. The best English steel is not made from native iron but from imported Swedish and Russian brands. Long experience and acquired skill with cheap fuel are the advantages which have made England the steel manufactory of the world. In several sections of the United States there are unlimited supplies of the same ores as those of Sweden, and fuel is more abundant than in Great Britain. The very best qualities of steel can be made here from native ores, and it only wants enterprise, capital and skill to establish and conduct the manufacture of fine American steel with success. There are many inducements for entering upon this business at present. The tariff is a premium to capital and industry, and the steel trade is not like an ephemeral business that changes with the fashions; it is as fixed as the very hills.

This has been called "the age of iron," and the next will be "the age of steel," because steel is yet destined, from its very nature, to supersede iron in a thousand various applications. It is much stronger than iron, and for several purposes it is far more durable. Its greater cost has been one of the main reasons for its more limited application, but improvements in its manufacture will yet be made so that it will be produced at cheaper rates, and then it will be more generally used. Already steel axles and tires for locomotives have superseded, in a measure, those formerly made of wrought iron; and when steel can be made and forged in large masses it will be employed for all the large shafts and working parts of marine and other engines. If steel could be produced at \$100 per ton, capable of bearing a strain of forty tons on the inch, bridges double the span of those made of iron would be erected.

For all machines and structures where welding is not required, steel is far superior to wrought iron. We import all the steel for manufacturing our wire, saws, axes and fine tools of every description. These are permanent applications of this metal for which it will always be used; but, beside these, new applications of steel are being made constantly. Thus several tracks of steel rails have been laid in England, and these have now been tested for about four years with the gratifying result that they are about as good to-day as when laid down, and they last as long as three sets of iron rails. It is probable that all the railway lines in the world will yet be laid with steel rails. Just think of fifty thousand miles of railway in America yet to be furnished with steel rails. Their first cost is greater but they are the cheapest rails in "the long run." English and French civil engineers are now advocating their use, and their general application cannot be long delayed. A very flattering prospect, we think, is presented to those who early engage in the manufacture of American steel.

NEW STEAM PASSENGER CARS.

We have frequently advocated the employment of steam as the motive-power of common passenger cars for city railroads, because a steam car is as easily controlled as one drawn by horses, and it is therefore equally as safe while it is far more economical. A combined steam and passenger car for short lines of

railway, to obviate the use of a separate locomotive drawing a train, we have also spoken favorably of. Such a car we illustrated and described on page 257, Vol. V (new series), of the SCIENTIFIC AMERICAN, on which occasion we said; "The time is not far distant when passenger cars combining the engine will become general on most of our small railroads." We now chronicle the adoption and employment of three such cars on the Jersey City and Bergen Point Railroad—a line about four miles in length. Each car is 26 feet 9 inches in extreme length and 7 feet 9 inches in width. The seats extend along the sides, leaving a wide space in the middle, and it is heated by steam pipes running under the center of the floor. At the front end the engine room is partitioned off from the passenger apartment. The machinery, consisting of two small inverted cylinders, each 5½ inches in diameter and 10 inches stroke, is yoked to the pinion that gears into the driving wheel, and the tubular boiler, 27 inches in diameter, is situated at the other side of the engine-room, leaving an ample middle space between for the engineer and brakeman. The water tank is underneath the seats, and thus all the mechanism, boiler and adjuncts, are compacted in a very small space. An improved truck enables the car to turn curves of 60 feet with ease, although the wheels are situated 13 feet apart. At Bergen Hill the grade is about 200 feet, yet this steam car ascends it easily, and upon a level it can run at the rate of 16 miles an hour. A trip in one of these cars has satisfied us that in style of finish, comfort and cleanliness, this system is a great improvement over any of the horse-railroad cars in this or any other city, and the managers of the Jersey City and Bergen Point Railroad deserve credit for enterprise in having adopted them.

MILK.

We have a vivid recollection of seeing, during the early years of life, the maids returning from the farm-yard, in the cool gray twilight of the summer evening, bearing foaming pails of milk warm from the cow; this pastoral scene has been renewed in our mind at various intervals, when we have been so fortunate as to secure a few days in the country. There is a popular tradition in the mind of our citizens that the substance which is delivered to them, matutinally, is a legitimate product of the cow, that it is unalloyed, and is what it purports to be—milk. Alas! what delusions are these! the most consumptive, asthmatical, lop-horned female of the herd would disdain to own such a thin and watery dilution of the early beverage of childhood as is daily sold in the streets of this city. Once, and not long ago either, our dead walls and fences were covered with flaming placards which denounced all dealers of swill milk, and diluters of the same (think of it, ye bovines—diluted swill milk!) to be guilty of a penal offence, for which, upon conviction, they should be punished. The police were appointed inspectors of the milk stands, and had authority to bring to trial any one whom they suspected of transgressing the law; and we fondly hoped that the day was at hand when swill milk and its allies would be stricken out forever from the long list of abuses which are suffered, unchecked, to override us. At first all went well, and a few unhappy Dutchmen were brought to trial, suffered the painful ordeal of an exposure to the public gaze, were fined fifty dollars and let loose from justice, only to sell swill milk with renewed assiduity and without loss of time. How could they otherwise recover that portion of their gains which had been taken from them? And so the farce goes on; the public are daily served with a modicum of a bluish-whity fluid, an analysis of which we dare not attempt; it might be used advantageously on washing day for clearing linen, but it certainly is not fit to be put in the human stomach.

It is estimated that the entire milk crop of the United States, for the year 1862, reached \$160,000,000. New York State produces as much milk (and water) as all the New England States, together with New Jersey, Delaware and Maryland. It would seem that with all this expenditure, and at the price demanded—six cents a quart—we might have the beverage for which we ask in vain. It would be unjust to say that no pure milk comes to this city, but it is a hereditary and an inherent vice of milkmen to dilute their milk most lavishly; doubtless they fear

that in its natural state it would be too rich for the stomach, and hence their liberality in the article of water.

THE COMBINATION OF PAPER-MAKERS.

The recent increase in the price of printing paper has created no small excitement in the business community. By the conjoint action of the paper-makers at a meeting held by them, last fall, at the Astor House, in this city, it was then and there recommended that the prices of paper be forthwith increased to certain fixed rates. This recommendation was adopted; and before the sun rose again, the prices of paper were, by a singular unanimity on the part of the manufacturers, raised exorbitantly. This proceeding drew the attention of the public to the material for paper-making; and by a natural sequence it entered into speculation, which imparted a fictitious value to rags, waste paper and crude material of all kinds. The result of this raid and research among musty old documents and rag bags was an immense quantity of paper stock, which it was fondly hoped and indeed emphatically asserted would reduce the price of printing-paper, at least, to moderate figures, or to rates in some way corresponding to the condition of the currency. Unfortunately, however, this anticipation was not realized; the market became overstocked with refuse paper; the price of rags fell and substitutes for cotton, of one kind and another, were proposed and many of them employed. Notwithstanding all these occurrences the prices of paper remain as high as ever, and the association of paper-makers declare that the charges that are made of combination among them to sustain prices are unfounded. They turn the point of the assertion, by a foolish quibble, upon the word "recommend," as if that in the connection had not the same significance as "resolved." If they are not united what is the need of an association among them, and why may not one or two or more individuals sell their productions at from half to one cent less per pound than the others, unless it be that there is some secret understanding mutually, the proper term for which has not yet been discovered?

There is, however, another side to the question and that is the action taken by the publishers of the country; they represent a powerful interest and are in direct opposition to the paper-makers on the subject of unjust agreement; they too, have had a meeting, and—as a foil to the combination, understanding, or what not, of the manufacturers—have petitioned Congress to repeal the duty on foreign paper, so that the necessary supplies may be obtained from abroad. Their action is again opposed by the paper-makers, who assert that this is unjust and also unpatriotic. In a bit of special pleading these gentlemen set forth the disadvantages which would result to the country at large if such a dangerous precedent as special legislation upon manufacturing interests is adopted.

We think that the prospective danger is very much overrated, and is not by any means so great as the present injury which is being inflicted through the action of the monopolists on the best interests of the people. The curtailment of the reading privileges of our community, entailed by the high price of paper, is no small hardship and one which they cannot bear patiently. The action of Congress upon the matter can be averted by the paper-makers themselves, should they see fit to throw themselves into the imminent deadly breach which they see opening in the policy of the Government upon this matter; only let them lower the price of paper to a standard which will give a fair profit on the material, time and capital involved, and our pressmen and others interested will willingly accede to the demand; they are not unreasonable and ask no sacrifices from paper-makers, and it is but fair that a similar spirit should be exhibited on the other side. We cannot see how it is that there can be no resolution or its equivalent to maintain exorbitant prices. The materials for paper-making grow in every State and can be worked up by improved processes into suitable paper. Rags are scarce, it is true; but straw is plenty, and yet straw paper is sold at prices far beyond its legitimate value. We do not wish to impeach the veracity of the gentlemen composing the association, but there are some facts which conflict so materially with their stand upon this matter that they will

have to be satisfactorily explained before we can believe that no joint action exists in regard to the subject under discussion. Here is one of the mysteries referred to:—

The Philadelphia *North American* says:—"Printing paper of ordinary qualities sells at this moment from 20 to 22 cents a pound. Its legitimate price is about 9 cents. Between the price of paper materials and the manufactured article there is nothing like an adequate proportion. A large commission merchant recently received a consignment of rags from Havana. Knowing the exorbitant price of paper, he expected to realize a handsome sum for the consignors. He visited successively all the paper-makers in this section of the country and corresponded with those more distant. The utmost he could obtain for them was 5½ cents per pound. All the paper mills are stocked with material; waste paper for manufacture has been thrown upon the market by thousands of tons, and yet the price of printing paper is kept up by speculation, or something else, to 22 cents per pound. Here is a mystery that requires explanation. Who will give it?"

DISAFFECTION AT THE BROOKLYN NAVY-YARD

Mr. John Faron, so long the master machinist at the Brooklyn Navy-yard, has been elected Comptroller of Brooklyn, and his former office was therefore vacant. The naval authorities examined several local engineers for the position, but as they were found wanting in some respects, it was deemed expedient to send to Key West for a Mr. Cogswell, who had been or was in a similar position there. This was done, and this gentleman is now the master machinist at the Brooklyn Navy-yard. This appointment was received with a very ill grace by certain parties, and they, resolving to make trouble for the new foreman, have come together and indited the following letter addressed to the men in the Navy-yard:—

SIR—This letter is sent to you who are a workman in the Navy-yard. If you believe in loyalty to your brother workmen, mechanics and laborers, leave the yard on the very day the abolition boss commences his crusade against operatives for party purposes. The Government for which we work well and hard has ransacked the whole nation to find an abolition master machinist. Better mechanics by far than he is were examined, but their political principles did not suit Mr. Lincoln. And all New York State could not find a man fit for the dirty work of making merit secondary to party. Massachusetts bred the man, and Cogswell is his name. He tried to discharge 150 men last week, but the Acting Commandant could not sanction such a step in Admiral Paulding's absence. When that officer returns, the abolition tyrant, who has no thought for the families who he may visit with desolation in mid-winter, will make his attempt. We have no hope from Admiral Paulding, because if he interposed for us, Secretary Welles would come to the rescue. Now, we want you to lay down your tools the day the first large discharge is made, if you should escape the edict of this Cogswell, who intends to begin by discharging a batch of Democrats at a time, until all are gone. If all hands refuse to work, at once inquiries will be made, the Press will look behind the scenes, and the villainies contemplated may be exposed. In union there is strength. Remember all the firesides which may have cause to bless you, if you obey.
YOUR FELLOW-WORKMAN.

It would appear from the testimony of the letter itself, that it is high time some of the men in the yard were discharged, and that their places were filled by sensible men. We cannot think, however, that the men alone are to blame for writing and circulating such a stupid and silly document as the one referred to. We do not know Mr. Cogswell, but we do know that, whatever his antecedents may be, the plan pursued is the one of all others which will create friends and sympathizers for him, even among those politically opposed to him. This mixing of politics with the practical workings of our Government yards is a mischievous feature, and will soon lead to trouble if persisted in. The workmen of the Brooklyn Navy-yard have been unfortunate in their manifestations toward the Government; several times in the course of the war, they have been before the public on charges of disaffection, &c., and at one period numbers of them were discharged for refusing to take the oath of allegiance. From this record it would seem that the appointment of Mr. Cogswell—provided he will reform the management of the naval workshops at Brooklyn, and make them workshops and not places for political discussion and intrigue—comes not a day too soon. We sincerely hope that those persons who instigated the mechanics to this step will repent of it, and repair the mischief before it is too late. The language of the letter is extraordinary, and more fitted for the region about Norfolk than this part of the country; and if the

workmen follow the advice of their instigators and quit their employment in mid-winter, they will certainly regret it when the domestic desolation which will follow their silly acts makes itself felt.

SUPERIORITY OF CORNISH PUMPING ENGINES.

In the annual report just published of Isaac S. Cassin, Chief Engineer of the Water Department in Philadelphia, we find very strong testimony in favor of the Cornish engine over other common condensing engines for the purpose of pumping water. It is stated in the report that four steam engines are employed at the Spring Garden Works, for pumping water; three of which are common condensing engines, the fourth is a genuine Cornish engine, built by I. P. Morris & Co., at a cost of \$30,000. The total quantity of water pumped at these works in 1862, was 3,038,527,420 gallons, of which quantity the three older engines pumped 1,897,391,360 gallons, and the Cornish engine 1,141,136,060 gallons. In the performance of this work, the three common engines consumed 5,777,571 lbs. of coal, while the Cornish engine consumed only 2,547,161 lbs. It thus appears that for the same quantity of work performed the Cornish engine only consumed about one half the fuel. Mr. Cassin says respecting the operations of the latter engine:—

"By a carefully conducted and accurate experiment, made during the past year, it was ascertained that with the consumption of one ton of coal the Cornish engine, No. 4, raised 999,274 gallons into the reservoir, while with the same quantity of coal, engine No. 3, the least efficient of the three old engines, raised 517,969 gallons. Nos. 1, 2 and 3, are condensing engines, driving double-acting pumps, those of Nos. 1 and 2 delivering 160 gallons each, per revolution of the engine, and that of No. 3 delivering 150 gallons per revolution. The engine No. 3 can deliver into the reservoir 2,500,000 gallons per twenty-four hours. The Cornish engine, termed No. 4, is capable of delivering into the same reservoir 5,000,000 gallons in the same period of time—twenty-four hours. It will be seen from this comparison that engine No. 3, with a capacity of 2,500,000 gallons per day, occupying more space than engine No. 4, of double the capacity, consumes nearly the same amount of fuel." The amount required for repairs and other incidental expenses, as well as the fact that a smaller number of hands are necessary in running this description of engine, give them a very decided advantage. The Chief Engineer represents that it is in all respects the interest of the city to adopt exclusively the use of Cornish engines, similar in construction to No. 4.

The average duty (for the year) of the Philadelphia engines is very low, being only 32,998,333 lbs. of water raised one foot high to the 100 lbs. of coals. This is not half the duty which can be performed with a Cornish engine.

AN IMPORTANT PATENT SUIT—COAL-OIL LAMPS.

IRVING A. WILLIAMS *versus* JONATHAN MAYHEW AND OTHERS DOING BUSINESS AS THE "BUFFALO STEAM GAGE COMPANY."

This was an action at law brought against the defendants for the infringement of a patent granted to the plaintiff for an improved mode of constructing lamps for burning kerosene or coal oil, "known as Williams's Coal-oil Burner." The invention claimed by the patentee consists of a peculiar combination of perforated metal cylinders or plates for supplying air to the interior and exterior of the flame, with a circular hollow wick tube; and the evidence put in at the trial, on the part of the plaintiff, showed that the arrangement patented by him is essential to the beneficial operation of all lamps of the class in controversy in the suit. The defendants had violated the patent by making and selling large quantities of coal-oil lamps ("head lights") for locomotive engines.

A number of witnesses, called by the plaintiff's counsel, testified that they were well acquainted with the practical operation of the patented lamp; and that it gave a more brilliant and powerful light than any other locomotive lamp they had ever seen. They also stated that it was superior to gas and every thing else in use for "head lights," and that it enabled the engineers to see switches and objects

along the track of a railroad at a much greater distance than any other locomotive lamp previously known.

The defendants contended that the invention was not new; and their counsel put in evidence a large number of prior patents and extracts and drawings from books; also several old lamps which were alleged to have been used before the plaintiff's invention. These the counsel and the "experts" for the defense claimed were the same as the invention which the plaintiff had patented, and would answer the same purpose. They also contended that the lamps which the defendants had manufactured were, in their construction and arrangement, substantially different from the invention described in the plaintiff's patent and were therefore no infringement of it. They further set up that one Samuel E. Cleveland, of Buffalo, was the first inventor of the very lamp in controversy, and that they had become the sole owners of the right to use it by assignment from him.

During the trial a number of questions arose, of interest to all concerned in the manufacture, use, or sale of coal-oil lamps, relative to the nature and operation of such lamps and also to the extent and character of inventions which preceded that of the plaintiff.

The cause came on to be tried in the Circuit Court of the United States for the Northern District of New York, before the Hon. N. K. Hall and a jury, at Albany, on January 28, 1863. Many witnesses were examined on each side, and all the questions arising in the case were fully argued by the respective counsels.

The defendants, among other points relied upon by them, contended that the plaintiff's patent was limited to the employment of two perforated cylinders as one of the members of his combination; and that as they had employed but one, the patent could not reach over them. But the Court overruled them, and instructed the jury that, as matter of law, upon the language of the plaintiff's claim, his patent covered one, two or more of such cylinders, in combination with the other elements of his invention. They also contended that, as to the second claim of the patent, they had used less than the whole of the combination therein set forth, and that, therefore, the plaintiff could not recover under this claim. But the Court charged the jury that it was a question of fact for them to decide, whether the defendants' lamps contained substantially the invention set forth in the plaintiff's second claim.

The jury brought in a verdict for the plaintiff upon all the issues, finding that the invention was novel and the patent valid; that the defendants' assignor (Cleveland) was not the first inventor of the lamp in question, but that the plaintiff was, and that the defendants had infringed both of the plaintiff's claims.

S. D. Cozzens and A. G. Williams, of New York, were counsel for plaintiff. E. B. Forbush, of Buffalo, and M. Smith for defendants.

APPLICATION FOR THE EXTENSION OF A PATENT.

Wire-strengthened Spoons.—William Mix, of Prospect, Conn., obtained a patent on May 1st, 1849, for an improvement in making wire-strengthened spoons; and he has applied to the Commissioner of Patents for the extension of that patent for a term of seven years. The testimony will close on March 30th, and the petition will be heard at the Patent Office on April 13th.

Persons who wish to oppose the extension of this patent should attend to it without delay. Copies of the claims in this case will be promptly forwarded from the Scientific American Patent Agency upon the receipt of \$1.

PERSONAL.—We are gratified to notice that the Senate has confirmed the re-appointment of P. H. Watson, Esq., as Assistant Secretary of War. Mr. Watson has discharged the duties of this important office for the year past, with distinguished zeal and fidelity; and his re-appointment and confirmation are honorable testimonials to his fitness for the position. We could wish that all our public offices were filled with men of equal worth and integrity.

GOLD diggings are reported to have been recently made in New Zealand, which far exceed those of California and Australia in richness.