Scientific American

NEW-YORK, APRIL 30, 1853

Water and Steam----Waste of Power.

Steam power, for manufacturing purposes, is fast supplanting that of water in many places. Some years ago it would have been thought insane, in a business point of view, to propose a steam engine for driving the machinery of almost any factory. Neither a cotton nor woolen manufactory, it was believed, could be carried on but by the side of some river or creek, where there was an abundance of water and a good fall, to drive a water wheel. This is the reason why we find all the large old factories in our country established on sites commanding great water power. Some of these, too, are situated in exceedingly inconvenient localities, so far as it relates to carrying the raw materials to, and the manufactured products from them. The greatest manufacturing district in the State of New York, is perhaps the Valley of Saquoit, Oneida Co.; the creek bearing this name is studded with factories, and its waters are the hardest wrought of any in our land. This valley is two hundred and twenty-five miles from the sea-board and market—the raw materials have all to be carried up that distance and back again to New York City, involving an immense amount of carriage outlay. The factories in Massachusetts, and some other States, (at least many of them), are also situated far in the interior; thus there are quite a number situated in the mountainous district of Berkshire, near Pittsfield, and there are some away over the Green Mountains, in Vermont. Water privileges, at one time, were great objects of speculation, and water power is no doubt the most economical, in itself, but steam power has greatly reduced the estimation in which water privileges were once held, for in many respects it is superior, hence its domain is spreading far and wide, especially near the great marts of American commerce. One of the largest flouring companies of Rochester, N. Y.—a place distinguished for its water power and mills for grinding—is about to commence manufacturing flour by steam within a mile of New York City. The business is to be conducted on an extensive scale, and if it were not more economical to use steam than water power this project would certainly never have been undertaken; the projectors have no doubt counted the cost. To them, undoubtedly, the success of other steam flouring mills in this city has afforded a practical demonstration of the economy of steam power in comparison with water, even when the raw materials are furnished from the very districts in which the Rochester Mills are established.

In making these remarks we do not wish to be understood as advocating a removal of manufacturing establishments from rural districts to great business marts, and the entire substitution of steam for water power in driving machinery; many reasons might be given by us to show the superiority of rural manufacturing villages ever pent up manufacturing cities; our object is to direct attention to what is called "economical prime movers." Water power is undoubtedly much cheaper than steam power; a wheel is cheaper than a steam engine: it consumes no coal and does not require the constant attendance of an engineer or fireman, and yet we find some manufacturing companies substituting steam for their water power. Economy of fuel has recently exercised a wonderful amount of philanthropic inquiry and excitement, in order to find a cheap substitute for the steam engine, and yet we find shrewd business men adopting the steam engine with all its expense of fuel, in place of a prime mover which consumes no fuel at all. There must be some reason for this; and the natural conclusion is, that the economy of the steam engine has been fully established by its success in many manufactories which compete with those who use water power. But who has been counting the cost of employing one kind of a steam engine for another to save fuel; we have not heard a word about the saving of fuel that may be obtained in steam engines themselves. In the city of New York hundreds of tons of coal are puffed into the air every day, and this with such an apparent easy carelessness, as it to say, "the saving of fuel is not the only thing we care about." The great majority of steam engines in our cities are high pressure and non-condensing. The same power could be obtained with one half the expense of fuel, if larger engines, supplied with steam generated under a high pressure, using it expansively and then condensing it, were employed instead of the small high pressure engines. We know that we are rather under-stating than over-stating the economy of fuel that would be obtained by such a change; still we could not expect to see such a change generally adopted, for other questions of economy are embraced under this leading one. Thus, a larger amount of space would be required for machinery, and a greater expense for the engine, and then a great expense would be entailed for condensing water. The economy of fuel, therefore, is not the only expense to which manufacturers look, or to which their attention should be exclusively directed; "all things must be taken into consideration," and the profit and loss of each carefully estimated. In places near large commercial cities, every manufacturing company that has a quarter of an acre of land attached to their factory, should never use a high pressure non-condensing engine. A pond can easily be constructed beside the factory to contain the water for supplying the boilers and the hot well—this water can be obtained from the roof of the factory, and it can be used over and over again for fifty years. At the present time we know there are hundreds of establishments in our land, which, in the aggregate, recklessly throw thousands of tons of coal away into the atmosphere, every day, in the form of compressed steam. This may be the case in some establishments, where the proprietors are continually grumbling about the expense of fuel. We beseech those men to look well into their own interests, and not over them, before they speak evil again, respecting the expense of steam power. We are perfectly satisfied that there is a general and daring waste of steam power, which can be saved to our country, and we hope that what we have said will be the means of directing the attention of all those engaged in manufacturing operations, to this important question, viz., the saving of fuel in the steam engine, according to the knowledge which all engineers possess respecting it.

Drying Goods in Warm Rooms.

Although water possesses a specific gravity eight hundred and fifteen times greater than that of air, yet it can rise into the air as into a vacuum, and mingle amongst it by the same law that gases diffuse through each other. It is this property of water which enables us to have clean and dry linen, for if it were otherwise, if water was the same as oil, our wet clothes would have to be converted into fuel and burned in the fire before we could expel the moisture from them. Were it not for this property of water, the calico printers and woolen dyers could never dry their pieces in shade, sunshine, or stove room. When wet goods of any kind are submitted to heat in a room, they soon become dry, because the air receives the moisture and retains it in its soft embrace, thus enabling us to obtain dry goods and dry clothing by the property of evaporation which belongs to water, and the law of gaseous absorption which reigns among the gases. A curious property of the evaporation of water, discovered by Dr. Dalton is, that the quantity which will rise in a confined space is the same, whether that space be a vacuum or be already filled with air, hence it is only necessary to know what quantity of vapor rises into a vacuum at any particular temperature, to know what quantity will rise into the air. Thus the vapor of water which rises into a vacuum at the temperature of 80°, depresses the mercurial column one inch; its tension is one-thirtieth of the usual tension of air. If water at 80° be admitted into dry air it will increase the tension of that air one-thirtieth if the air is confined; or increase its bulk one thirtieth if the air is allowed to expand. A certain fixed quantity of the vapor of water, therefore, can only rise into a certain fixed quantity of air, hence the air of rooms employed for drying goods may become so saturated with moisture, that the fuel may be expended foolishly in trying to expel the moisture from the goods when it is impossible for the air to take it up, and hence the evaporation of water is greatly facilitated by a current of air. This is the philosophic principle of evaporation embraced by Bessemer, and that mentioned under the head of Recent Foreign Inventions, in this number of the Scientific American, for evaporating sugar syrups.

In evaporating by means of hot air, as in drying goods in the stove rooms of calico print and bleaching works, when the rooms are heated by flues running along the floors, it should not be forgotten by those who have charge of such drying establishments, that a certain time must elapse after the goods are placed in the rooms, before the air is saturated with humidity; due discretion must therefore be exercised not to let any of the hot air escape until it is saturated with moisture.

It has been proposed to us more than once, to employ hot air in raising steam, under the mistaken idea that more steam could be generated with less fuel by the passing of such a rarified hot body through the water. But in evaporating water by heated air—the way wet goods are dried—the vapor itself carries off exactly the same quantity of heat as if it were produced by boiling the water at 212°, while the air associated with it requires also to have its temperature raised, thus requiring more fuel, hence water can never be evaporated in a drying room, with so small an expenditure of fuel, as steam can be generated in a close boiler. These facts are well worthy of attention, inasmuch as they relate to different branches of business, in which very many of our people are interested.

Events of the Week.

To Prevent Railway Collisions.—Our attention has been directed to some editorial remarks in the "Norfolk Daily News," (Va.) relating to an invention of Dr. T. G. Clayton, of that place, for the prevention of railway collisions. The invention is thus described: "When two opposing trains are on a track, one is to operate signals at suitable distance apart, to warn the other of approaching danger. A bent lever at right angles to the rail, is placed at suitable distances, say every two miles. This lever, acted on by the weight of the cars, raises two signals at the distance of one and two miles ahead, which are so contrived that the train on passsing the last signal, depresses the two, before it strikes the second lever. The levers only act in one direction; cars coming from the opposite direction pass over it without effect on the signals."

It is stated by the "News" that it is to be tried on the Seaboard and Roanoke Railroad, and that the expense will not be more than $35 per mile. We hail every invention which has for its object the benefit of our fellow men. Every addition to the safety of railroad travelling enhances the value of railroad stock, for it secures an additional pleasure in the minds of travellers by the increased confidence of their safety. We have, however, always advocated double tracks as the sure and certain remedy for railroad collisions, for we believe it is the only one in which we can place perfect reliance. We have seen a model of an invention for preventing railroad collisions by one train being made to operate the engineer's bell of the other, at a mile or two miles distant.

Electrical Phenomenon—Two weeks ago page 248, we copied a few remarks from the "Philadelphia Ledger," respecting some experiments which had been made in that city by Dr. Swaim, wherein a mode of lighting gas with the finger was described, viz., by obtaining a charge of electricity from belts for driving machinery. Dr. Swaim was in this city last week, and we had the pleasure of igniting gas with the tip of our finger, by simply walking across a carpeted floor, with a shuffling gait and pointing the finger at the gas pipe. The room in which the experiment was made, was warm, the air dry, and the floor covered with a thick Brussels carpet. The same results cannot be obtained unless the air is dry and the carpet isolated. Large sparks were obtained by pointing to a brass knob, by simply walking across the floor. Many of our readers will remember that on page 394, Vol. 5, Scientific American, we published the remarks of Prof. Loomis, of this city, which were made at the meeting of the American Association for the Advancement of Science, held at New Haven in 1850. He stated that to his knowledge there were certain electric houses in New York city, in which a stranger upon entering and attempting to shake hands, received an electric shock. He had tried and witnessed the same phenomenon as Dr. Swaim by walking across a carpeted floor, except igniting the gas. On the page referred to we mentioned the case of a carpet being set on fire by electricity generated in the same manner. We have much to learn yet respecting electrical phenomena.

Settlement of a great Patent Case.—The case of Sloat vs. Patton, in Philadelphia, in which an injunction was granted has been settled. The complainant having purchased out Mr. Patton's interest for $25,000.

A jury trial had been ordered by Mr. Justice Grier, which was set down at the present term, to test the question of infringement on the Woodworth patent.

New Steam Yacht.—Cornelius Vanderbilt, Esq., the wealthy steamship proprietor, is having a beautiful steam yacht constructed, named the "North Star." The engines are now being put in at the Allaire Works; they are double overhead beams with cylinders of 60 inch diameter and 10 feet stroke. It is reported that Mr. V. will take a personal trip in her to Europe, along with some friends, during the coming summer. We hope he will, so as to test the beam in comparison with the side lever engines on the Atlantic.

The Patent Office done for.

The new Secretary of the Interior, Mr. McClelland, has removed with his clerks into the East wing of the Patent Office. A resolution on the motion of Mr. Cartter, of Ohio, passed the House of Representatives against the occupation of the Patent Office by any other corps than those belonging to the Patent Office; this resolution was struck out by the Senate, and now the Patent Office is done for. It will be long before it can be occupied for the purposes originally designed in its construction. Hundreds of models must still rust and rot in the vaults, and the rights and interests of the inventors of the Republic be trampled under foot. The late Secretary of the Interior is to blame, as he is "the one by whom the offence came." We had hoped that the whole Patent Office building would have been kept intact for the use of inventors' business, and an agricultural department for the benefit of our planters and farmers, the two interests, mechanical and agricultural, dwelling in harmony as they have heretofore.

The New Commissioner of Patents.

Judge Mason, the new Commissioner of Patents, has not yet arrived in Washington. In the meantime the Chief Clerk is Acting-Commissioner. It is said that there is an immense army of office-seekers awaiting his Honor's arrival at the seat of government. Is is intended by many to get the new Commissioner to make some new rules for the hearing of rejected applications, viz., that he will personally consider written arguments in reply to the rejections of the Examiners. In the meantime the Examiners appear to be working hard, as the long list of claims this week in our columns testify.

Natural Curiosity.

We have received from A. Hotchkins, of Schenevus, Otsego County, N. Y., several small branches of a tree which grew in his yard. The tree from which they were taken is a fir, and while one branch is the same as the tree—an evergreen; the other is totally different in appearance, and is annual in its foliage, as it loses its leaves in winter and again buds in the spring. The tree was removed from a swamp about two years ago; the wild branch forms part of the tree and grows in a small clump. It is no doubt the natural growth of a seed which entered a crevice of the bark of the tree, and there found soil enough to root and grow up.

More strikes for wages have taken place since our last. The movement we perceive is spreading west; in general an advance of wages has been obtained.

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