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A NEW TRADE MARK LAW.

By act of Congress, July 8, 1870, provision was made for the registration at the Patent Office of all descriptions of trade marks; and by subsequent legislation some very peculiar, we might almost say savage, additions were made for the pursuit and punishment of trade mark infringers. Except as to these last features, the law for trade mark registration proved to be very popular; hundreds of applications were made, and the official rules and machinery for issuing trade mark certificates had become well established, when, on November 18, 1879, the Supreme Court of the United States, in the case of the U. S. *vs.* Steffens, and the same *vs.* Wittemann, to the public surprise, decided that the whole legislation respecting trade marks must fall, as being void for want of constitutional authority. The court held that a trade mark is neither an invention nor discovery nor the writing of an author within the meaning of the constitution; that no law made under the constitutional authority to issue patents was applicable to the registration of trade marks; that "if trade marks can be in any case the subject of congressional action, that action is limited by the constitution to their use in commerce with foreign nations, among the several States, and with the Indian tribes." Nothing of this kind appeared in the legislation as established, and it was accordingly declared void. The last Congress passed a new trade mark law—approved March 3, 1881—which is intended to avoid the objections raised by the Supreme Court against the former law.

The new law retains the principal features of the old but the inquisitorial provisions of the old law for the purs uit and punishment of infringers are struck out.

The new law provides that owners of trade marks used in commerce with foreign nations or with the Indian tribes may obtain registration, at the Patent Office, by paying an official fee of twenty-five dollars, and complying with such rules and regulations as the Commissioner of Patents may prescribe. The duration of the registration is thirty years, with right to renewal for thirty years more on payment of twenty-five dollars additional. Infringers are to be dealt with by the courts.

Persons who have obtained registration under the old law may apply for new regstration under the present law, and in such cases the money formerly paid in by the applicant shall be credited on the new application.

The new rules and forms for practice under the new law are now in course of preparation by the Commissioner of Patents, and will be duly promulgated. In the meantime all who desire to obtain registration, or who wish to have their old trade marks re-registered, are advised to consult with the proprietors of this journal, Messrs. Munn & Co., 37 Park Row, New York, who will promptly attend to all business thereto pertaining.

The full text of the new trade mark law, and also the new census of the United States (1880) by States and counties, will be found in the new edition of the SCIENTIFIC AMERICAN REFERENCE BOOK, now going through the press. Price 25 cents. To be had at this office and of all newsdealers.

THE ACTUAL COST OF MAKING ILLUMINATING GAS.

An investigation is going on in Philadelphia touching the management of the city gas trust, the gas works being owned by the city and operated by official trustees. A recent witness before the investigating committee was Mr. E. S. T. Kennedy, expert of the New York Mutual Gaslight Company. Mr. Kennedy said that this company manufactured last year 721,000,000 cubic feet of gas, 30 per cent of which was from wood, 30 per cent from Youghiogheny coal, and 40 per cent from naphtha. During the year the amount of gas got from a ton of coal (2,240 lb.) was 15,000 cubic feet.

The gas averaged 27 candle power, and the price charged was $2.25 per 1,000 cubic feet.

The present process with coal, wood, and naphtha was introduced in August, 1878. It deposits no lampblack, and no heavy oil beyond about 1 per cent, and that is so heavy that it is used to great advantage as a fuel in the works. To enrich coal gas, Mr. Kennedy said the method was to add a certain percentage of cannel coal to the common coal.

The gas is entirely free from smoke, and does not blacken a ceiling unless within three feet of the flame, when it scorches. With 120 miles of pipe the loss by leakage is about 8 per cent; it is called "unaccounted-for gas," and the amount of it is determined by deducting from the amount registered in the station meter at the works, the gas consumed in the public lamps, in the offices and works, and the amount of gas paid for by consumers. The average power of the gas from coal alone is about 16 candles.

In the Mutual Works there are three separate departments: for coal, wood, and naphtha. In the coal gas department the coal is brought into the retort room, and is charged into the clay retorts every four hours. That charge will weigh from 215 to 230 pounds. The retorts are set six to a bench, and in drawing the coal one-half of a bench is opened every two hours. As the gas comes off it ascends through a stand pipe to a hydraulic main, which receives a portion of the tarry vapors; the gas then passes off, is cooled, and goes through a double purifying process. It is then measured and stored in the holders. The labor is subdivided, so that there is an average of ninety-one one hundredths of a man to a bench. The average production of coke on a ton of coal is 70 per cent of the original weight of the coal, or a long ton of 2,240 pounds ought to produce 1,500 pounds of coke, or thirty-five bushels. That is the average and ordinary amount produced to-day by the Mutual Gaslight Company.

The average production of gas tar and ammoniacal liquor is 12 or 14 gallons per long ton. The product of ammoniacal liquor varies, some companies producing as low as 15 gallons and others as high as 40; the average would be about 30. The present price of coke is between 8 and 9 cents a bushel; from 2 to 2½ cents a gallon for tar, and about 1 cent a gallon for ammoniacal liquor.

A double system of purification is employed by the Mutual Company. First, with an iron mixture, and afterward with oyster-shell lime. There are two principal impurities to handle—sulphureted hydrogen and carbonic acid. The lime is used to remove the latter. After it becomes thoroughly charged it is treated to a process of Dr. Wilkinson, the result of which is a lime that does one third more work than any lime that can be bought, and at one half the cost of the new lime. The same quantity of lime has been used one hundred and fifty times, and the chemist of the company thinks it will go on forever. There is no depreciation in quantity or quality. They have been using this process for two years without any increase of the lime.

On the following day, after Mr. Kennedy had inspected the plant and processes employed at the Philadelphia gasworks, he took the stand again. In reply to the question: "What does it cost to manufacture gas?" Mr. Kennedy said:

"The average cost of gas per 1,000 cubic feet in the gasholder is 65 cents; that does not include the cost of distribution. That I consider a fair average price based upon present prices of material and labor. I say 65 cents; it may be a cent or two more or less. I will undertake the management of your gasworks and produce coal gas at the present prices of coal for 65 cents in the holder. My calculation is based upon 16-candle gas."

In reply to the question, "What does it cost your company to put gas in the holders under your processes?" Mr. Kennedy replied: "Less than 50 cents a thousand." The Mutual Company expect eventually, he said further on, to manufacture from wood and naphtha exclusively, when the cost would be from 35 to 40 cents.

LAGER BEER.

Lager beer, the beer of Bavaria (and the United States), is prepared by a slow process of fermentation from strong infusions of malt, barley, and hops and grape sugar or glucose. The beer is usually fermented in winter, as it requires a temperature of not more than from 40° to 50° Fah.; and in hot weather the rooms must be cooled by means of ice or ice machines.

This kind of fermentation is what is called sedimentary or under fermentation, in contradistinction to ordinary or surface fermentation—the scum or yeast collecting at the bottom instead of at the surface, so that the air has free access and the gluten is more completely converted into yeast. This *bottom yeast* is quite different from ordinary yeast, and has a tendency to induce the kind of fermentation by which it was produced.

The following is a brief outline of the process employed at one of the largest lager beer breweries in New York city:

The barley is placed in wooden cisterns, covered with water, and allowed to remain for two or three days in soak, the water being changed once in twenty-four hours. It is then allowed to drain, and is subsequently thrown out in heaps on stone floors, where it heats spontaneously and soon begins to germinate, throwing out rootlets and shoots and evolving part of its absorbed water—sweating. It is then spread out and the germination allowed to proceed for from six to ten days, until the rootlets become brownish; then spread and tossed about to cool and check the fermentation. It is then put into large brick ovens or kilns, at a temperature of about 125° Fah., to dry.

The barley is now malt. It is first crushed by passing between a series of large rollers, and next is transferred to the mash tubs, where it is stirred about with water at 120° to 140° Fah., and boiling is then gradually added until all is heated to about 170° Fah. The infusion or wort is allowed to stand until the suspended matters have settled, when it is drawn off, and a second wort is obtained by treating the residuum with hot water. The first wort is boiled with the hops, the second wort is then let in, and the whole is boiled for about four hours. It is then run into the cooler, where it is quickly chilled to between 44° and 50° Fah., by running over small pipes through which cold water is continually flowing. As soon as it is properly cooled it is run into the fermenting tuns, where it is mixed with one gallon of yeast for every 20 to 25 bbls. Fermentation continues for about 20 days. At first there is a heavy froth, which soon subsides, however, leaving the surface clear. At the end of this period it is racked off into hogsheads, the yeast remaining at the bottom of the tuns. These hogsheads are allowed to stand with the bungs open until a few days before the beer is put into barrels for use, when the bungs are driven in to accumulate carbonic acid for *life*. Three varieties of beer are made.

1. "Lager," or summer beer, is prepared from the following:

Water	1 barrel.
Malt	3 bushels.
Hops	1½ to 3 lb.
Yeast	About ½ pint