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PATENT OFFICE REPORT FOR 1890.

The Commissioner of Patents is required to make two reports annually, one in the middle of the year, to the Secretary of the Interior, and one at the close of the year, to Congress.

The annual report to Congress for the year ending Dec. 31, 1890, has lately been presented, from which it appears that the business of the Patent Office has been well maintained. In 1890 the number of applications for patents made was 41,048, an increase of 500 over the previous year. The number of patents issued for 1890 was 26,292.

The State of New York takes the lead in respect to number of patents, 4,585 having been issued to her citizens, 2,641 to Pennsylvania, 2,152 to Illinois, 2,096 to Massachusetts, 1,762 to Ohio, 1,112 to New Jersey; Mississippi, 55.

In respect to patents and population, Connecticut takes the lead, one patent having been granted to 796 of population; District of Columbia, 1 to 980; Massachusetts, 1 to 1,068; New York, 1 to 1,308; Mississippi, 1 to 23,447.

The receipts of the Patent Office for 1890 were \$1,340,372, and the expenses \$1,099,297, leaving an excess of receipts over expenditures of \$241,074.

The total balance to the credit of the patent fund now in the Treasury is \$3,872,745.

Commissioner Mitchell in his report says:

"The first need of the Patent Office is additional room. During the past year the utmost effort and ingenuity have been rendered necessary in order to find space even for copies of patents as they have been produced from week to week. The income from these copies during the past year has been upward of \$60,000. They have been stored in various parts of the building, upon different floors, in different halls and corridors, and only by the most careful systemization is a searcher, however experienced, enabled to know in what hall, corridor, or cranny he must look in order to find a particular patent. During the past year the office has been compelled to appropriate to other uses one of the rooms occupied by inventors and their attorneys for the purpose of inspecting their pending applications, and the consequence is that the remaining room, which has only 23 feet square of floor space, is overcrowded and every day occupied by more than thirty persons at a time. An effort is now being made to restore to the inventors and their attorneys the use of the other room formerly occupied by them. This will be accomplished, if at all, by walling off a space in the already crowded model halls. The Scientific Library, containing about 60,000 volumes, is crowded into disconnected rooms and galleries, appropriated from one of the model halls. The rooms of the examining divisions are overcrowded; some of them are unhealthy at best; others are rendered unhealthy by their crowded condition. From all parts of the office arises a daily demand for additional room, which cannot be supplied, but which must, nevertheless, be supplied if the Patent Office is to do its work at all. It is nearly ten years since my predecessors directed attention to this imperative need. Not a report has been made to Congress during the intervening decade which did not dwell upon the necessity for additional room, and with increasing emphasis from year to year. Meanwhile the amount of work annually transacted has nearly doubled; meanwhile the records and copies have vastly accumulated; meanwhile the number of rooms and the extent of space occupied by the Patent Office have become gradually less and less. During the last six years the patrons of the Patent Office have paid into the Treasury over a million of dollars in excess of every expenditure of every kind, either by the Patent Office or by the Department of the Interior for the benefit of the Patent Office. The net income of the present year is greater than it was during the year before. Last year it was greater than during the prior year. The inventors of the country cannot understand why their money is taken while adequate facilities are denied. The policy of making the Patent Office a permanent source of revenue—a bureau of taxation for the general purposes of the government—has never been advocated, so far as I know, by any one. The time will soon arrive when it will be impossible to discharge the functions of this bureau unless some provision is made to afford relief for its overcrowded condition; and I earnestly request that that relief may be afforded."

The circulation of the Official Gazette is 7,000 copies per week, of which 3,576 copies are given away to members of Congress and other public officers, balance sold at \$5 a year. The cost of the Gazette is \$61,439, or about \$44,000 a year more than is received, nearly all of which comes out of the inventors.

The Commissioner strongly urges upon Congress the necessity for an increased force in order to facilitate and perfect the system of official examinations. He calls attention to the inadequacy of the present salaries paid to examiners, and urges a reasonable increase. He recommends a resumption of the work of making an abridgment of all patents, as it would greatly facilitate the work of examination, and enable

inventors and their attorneys to make their own examinations.

The laws relating to the date of patents, respecting trade marks, limitation of patents, interference proceedings, need, in the opinion of the Commissioner, to be modified. The report, taken as a whole, is a most able and interesting document.

IMPROVEMENT NEEDED IN SECONDARY BATTERIES.

The late Gaston Planté, the originator of the first practical secondary battery, was in some respects like Faraday.

He prosecuted his scientific investigations for the love of science and for the benefit his labors might confer in the future on science and the arts, rather than from any immediate pecuniary benefit he might derive from his work.

The invention of the Planté secondary element bears much the same relation to recent secondary batteries that Faraday's discoveries in induction bear to the dynamo. Both are fundamental, and of great scientific and commercial importance, and both are represented by a host of modern inventions, but it is after all a question whether the highest perfection has been attained in these lines, notwithstanding years of development. Cannot recent results, as wonderful as they appear, be surpassed? We believe they can. In secondary batteries, for example, there are at least three chances for improvement, viz., in efficiency, in durability, and in the matter of weight.

The efficiency of the secondary battery, as compared with alternate transformers, is as 0.72 to 0.94. In point of durability, improvement is much needed. The question of weight is of little importance in a stationary plant, except in so far as it contributes to cost; but in portable batteries, undue weight becomes a serious drawback.

The weight per horse power hour of the Planté battery is 395 pounds; that of the Faure, according to Sir W. Thomson, is 165 pounds; while that of the E. P. S. battery is about 135 pounds. What is wanted is a lighter, more durable, and more efficient element. It is not likely that marked improvement can be made without patient, well directed effort, but we know of no field of invention more promising than that to which we refer.

The endeavor of the investigator in this line should be to inaugurate a new departure. This, we know, is easier said than done. It involves discovery rather than invention, which means months and possibly years of careful searching and experiment; but the prospective reward warrants patient and intelligent labor.

Detecting Olive Oil, Butter and Oleomargarine.

The reagent employed is a solution of silver nitrate at 25 per 1,000 in ethylic alcohol at 95°. About 12 c.c. of the oil in question and 5 c.c. of the reagent are placed in a test-tube. The tube is then set in a beaker of boiling water, and the changes of color which take place in the liquids are watched through the glass. Unless the oils are perfectly limpid, they must be previously filtered. Olive oils sooner or later take a fine green color, which is lighter in the superior qualities. Pure cotton-seed oil is turned completely black. Oil of earth nuts (Arachis) takes first a reddish brown color and finally turns green, losing its transparency. Oil of sesame takes a deep red color and remains reddish. Oil of colza takes yellowish green colors and becomes turbid. Natural butter preserves its natural color. Oleomargarine becomes a brick red, which color may be detected even in samples containing as little as 5 per cent of margarine.—Raoul Brulle.

THE number of retail liquor dealers in the United States, according to the official returns of the officers of the internal revenue for the year ending May 1, 1890, was 185,868, or 1 liquor dealer to every 275 inhabitants, on the basis of the census of 1880. In New York there was 1 retail dealer in distilled liquors to every 150 inhabitants; in New Jersey, 1 to 175; in Ohio, 1 to 230; in Pennsylvania and Massachusetts, 1 to 400; in Indiana, 1 to 325; in Delaware, 1 to 160; and in California, 1 to 75. The average in all the States which have general license laws is 1 dram shop to 250 inhabitants. In Maine there is 1 retail dealer in distilled liquors to every 750 inhabitants; in Vermont, 1 to 820; in Iowa, 1 to 520; and in Kansas, 1 to 800.

THE director of the central dispensary at Bagdad has sent to La Nature a specimen of an edible substance which fell during an abundant shower in the neighborhood of Merdin and Diarbekir (Turkey in Asia) in August, 1890. The rain which accompanied the substance fell over a surface of about ten kilometers in circumference. The inhabitants collected the "manna," and made it into bread, which is said to have been very good and to have been easily digested. The specimen sent to La Nature is composed of small spherules. Yellowish on the outside, it is white within. Botanists who have examined it say that it belongs to the family of lichens known as Lecanora esculenta.