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No. 1000.

For the Week Ending March 2, 1895.

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REPORT OF THE COMMISSIONER OF PATENTS FOR 1894.

The report of the Commissioner of Patents for the year 1894 is in some respects one of the most interesting presentations yet issued from the Patent Office. The reports of the business of the office show that there were granted 20,803 patents, including designs, while there were 38,344 applications for the same. Counting trade marks and reissues, there were 40,492 applications, 12,920 patents expired and 3,812 were forfeited for non-payment of the final fee. The total expenditures were $1,100,047.12, and the excess of receipts over expenditures was $87,392.46. In the Treasury of the United States there is now a balance of $4,369,135.91 to the credit of the office.

Connecticut, with one patent to every 993 inhabitants, was the most inventive State, Massachusetts, with one patent to every 1,335, coming next. At the foot of the list is South Carolina, with one patent for every 25,581 inhabitants. Of foreign countries, England, with 689, and Germany, with 582 patents granted, head the list.

The commissioner describes the methods of the office during the year. A great effort has been made to bring business up to date, and at last it has been accomplished, so that on December 31, 1894, there were but 2,273 new applications in the office which had not been acted on, and no division was more than thirty days in arrears, either on new or on amended work. On the same day 50,507 cases were pending in the office; of these, 12,000 had been pending two years or more, 1,514 five years or more, 130 ten years, and five had been pending fifteen years.

This long pendency of applications indicates often intentional delay, the idea being in some cases to delay the issue of the patent until the art is more fully developed. To prevent this abuse the commissioner proposes to put in force after April 15, 1895, a new rule to the general effect that only six months' delay in making each amendment will be tolerated on the part of applicants, and where cases have been pending for five years or more the applicant may be required to show cause for his delay, and failing in this, his case will be subject to rejection. The last clause seems to be an echo of the Berliner telephone decision. Exactly how the six months' rule can be enforced in the light of the two year period presented by section 4,894 of the patent statutes does not appear, or is not explained in the report.

While the Berliner case is applied to the prevention of delays in prosecution, the portions of the decision touching on the administrative character of the Patent Commissioner's functions are not laid to heart. The ambition of the present commissioner is apparently, by examining all possible references, to grant patents which in a very high percentage of cases will be held valid in the courts. To make this result attainable the office is working on such references, to make what is termed the "perfect classification of this vast material," such material being the 541,571 United States patents, 864,700 foreign patents, and the printed publications of all countries. How any approach to a perfect classification of the vast body of material can be made is a problem nearly unsolvable. A special increase of appropriation of $64,590 is asked for on behalf of this work. It is evident that there is no tendency to greater liberality in issuing patents; the tendency is in the opposite direction. In the law every man is assumed to be innocent until he is proved to be guilty—patent applications seem considered to be for invalid inventions until proved to be for valid ones.

It would be interesting to know how the business of the office has been so expedited—whether it has been by too severe a treatment of applications and by too strict an interpretation of the statutory requirements of invention and novelty. We have repeatedly maintained that the public would be better served by a liberal administration of the Patent Office. An applicant should be treated as entitled to a patent at least prima facie. The granting of an invalid patent does little harm, while the refusal to grant one which, seemingly invalid, would ultimately prove valid, may do the inventor and the community the greatest injury. The old time jurists of the United States held that the inventor was to be encouraged and fostered by the state. The pendulum, however, began to swing the other way and the Supreme Court declared many patents invalid, practically threw out reissues and gave the Patent Office every pretense for illiberal treatment of applicants for patents.

In the courts the pendulum seems to be on its return swing, and patents are again favorably adjudicated on. It is to be hoped that the Patent Office will ultimately take a more favorable view of the claims of the country's inventors. Such important and difficult topics as statutory invention, and degree of invention, and the subjects in general of the patent statutes, the "metaphysics of the law," as they have been termed, deserve adjudication in the highest and most competent courts. The Patent Office examiner presides at too low a tribunal for the determination of such intricate questions as arise in the granting of letters patent.

THE CAREER OF A CHEMIST.

Through some influences similar to the article "On the Choice of a Career," in the issue of the SCIENTIFIC AMERICAN of January 19, my father was persuaded to let me—or make me—study chemistry. I was sent to Germany and passed two years under one of the leading analytical chemists and then two years at a university, devoting my time to the study of organic chemistry. After graduating, I returned as assistant to my old teacher, and through his influence I obtained a position in one of the leading establishments in Germany. There I passed three years, one year in the laboratory and two years overseeing the work done outside.

Here I obtained a thorough knowledge of the manufacture of soda, sulphate, causti soda, alum, the acids, bleaching powder, etc.

About this time my father concluded that my education had been completed far enough for America and called me home—home to a city of 40,000 inhabitants, in which there was not one single establishment employing the aid of chemistry, directly or indirectly. My father himself knew nothing about chemistry, excepting that he had read of the success achieved now and then by some chemist in various parts of the world. He simply expected me to discover something new and to become famous and rich in a few months.

After awhile, however, I obtained a position as chemist in one of the largest American establishments, attending to laboratory work and partly supervising the manufacturing processes.

After five years I had an opportunity to fill a better salaried position. This I accepted, and remained in my new position for four years. Then the entrance of the owner's son into the factory deprived me of my position. I have tried to obtain a new one for the last eight months, but in vain. I am conversant with the processes used in making all the leading chemicals, have made many of them myself for years, but can find no one who wants my services.

Through my training and schooling I am locked out of every other business almost. I am no bookkeeper, I know perhaps as much about pharmacy as the average druggist, yet I cannot accept a position as druggist. I cannot enter a shoe store as clerk nor can I work as stevedore along the wharves.

I cannot follow your advice, "Select a process, study it, find out its weak point, and endeavor to improve that. In this way your opportunity will come." To do this requires money, and I cannot afford to devote more money to studying out a process that may or may not bring in financial returns. I must strive to draw returns out of the knowledge I possess at present, knowledge gained at the schools and in practical work in some of the leading establishments in Germany and America, and to devote this knowledge in working out processes for my employers.

Before undertaking the study of chemistry, the student should ask himself the following two questions:

1. Can I, after finishing my studies, devote a certain number of years and a certain capital to farther research?

2. Must I enter the service of others after finishing my studies?

The chemist must pay more for his education than the minister, the lawyer or the physician. These last three can settle down in any village or town and gradually build up a living, according to their attainments. The chemist, however, provided he is not a man of means, finds thousands of towns and cities in the Union closed against him, because there are no chemical works in them.

If, perchance, he obtains a position as chemist in a town of any considerable size and loses it, he can do nothing else but leave the town, as it is highly improbable that there will be a suitable second opening for him there.

The chemist cannot go into any village by chance and grow up with it as the physician can; he cannot build up a practice like the lawyer, or a congregation like the theologian. He must either enter the employ of some manufacturing concern or he must start an analytical laboratory in some of the large cities, or he must have the means to enable him to devote his time to private independent research. These points must be considered in discussing the question propounded by you "On the Choice of a Career." J. G. L.

Jersey City, N. J.

THE HEAVENS IN MARCH.

The celestial stage this month will present Diana playing a role in which she was once accustomed to terrify mankind. And even to-day the earth contains millions of Adam's descendants who look upon a total eclipse of the moon with awe and dread. But knowledge does not diminish the interest of such an event. It is a wonderful thing to watch the shadow of our planet creeping across the mountainous face of a globe nearly 240,000 miles away. The scale of such a phenomenon is in itself imposing to the imagination. And we like to see our shadow reaching so far; it heightens our respect for the ball that casts it. There should be

a perceptible increase of human dignity after an eclipse of the moon.

This eclipse will occur on the night of Sunday, the 10th, and will be visible throughout most of the inhabited regions of the globe. I believe there are still tribes in Africa who will beat tom-toms and fire guns to drive off the shadowy monster that is trying to smother the moon. The gunpowder of civilization travels so much faster than its astronomy, and is so much easier to understand.

Below, in Eastern standard time, are the elements of the eclipse:

Moon enters penumbra	7:57	P. M.
" " shadow	8:53.7	"
Totality begins	9:51.5	"
" ends	11:27	"
Moon leaves shadow	0:24.8	A. M.
" " penumbra	1:21	"

It should be remarked that the ordinary observer is not likely to notice the penumbral phases, and, putting the whole thing in a nutshell, it may be said that the eclipse will begin about 8:54 P. M. and end about 0:25 A. M.

One interesting feature that all can easily observe is the color of the moon when it is completely under the shadow. Probably the color will be a copper-red. This is due to the refraction or bending of sunlight around the edge of the earth by the atmosphere. If we could see the earth from the moon during the eclipse, we should most likely behold a luminous red ring surrounding it, the color being due to absorption of light by the atmosphere. Occasionally, however, the moon does not look red during an eclipse, but almost disappears from sight, what can be seen of it presenting a faint, dusky appearance. This may be owing to the presence of clouds in the earth's atmosphere which prevent the transmission of light.

Among the planets Venus is fast coming to the front rank. Every eye must notice the gleam of her silver lamp, low in the western twilight, rivaling the brilliance of Jupiter overhead. At the opening of the month she will be in the edge of Pisces, just above the tail of Cetus, and will set about 7:30 o'clock in the evening; at the end of the month her place will be in Aries, directly over the head of Cetus, and then she will set about 8:30 P. M. She is not yet a very interesting telescopic object, the form of her illuminated disk being that of a gibbous moon.

Mars appears very insignificant in comparison with its splendid aspect last autumn. During the month it will move eastward in Taurus from the neighborhood of the Pleiades to a position nearly midway between the "golden horns" of the celestial Bull. It transits the meridian between 4 and 5 o'clock in the afternoon.

Jupiter remains in Taurus above the point of the southern horn, brightly tipped with the star Zeta, but by the end of the month he will have retreated across the border into the territory of the Twins, where he will take up a position just northeast of the star cluster H 1325, and a little west of the still greater cluster M 35.

With the telescope Jupiter is an object of unceasing interest. Following are a few phenomena of his satellites. The fifth satellite is, of course, far beyond the reach of the amateur.

On March 12, at 6:48 P. M., satellite III will disappear behind the planet, and will reappear at 9:43 P. M. At 8:38 P. M. satellite II will also disappear by occultation behind the planet, and when it reappears, at 1:49 A. M., it will come into sight not far behind the edge of the planet, but out of the latter's shadow, at a considerable distance from the planet. At 9:36 P. M. on this same eventful night, satellite I will pass upon the planet's disk. Its shadow will follow at 10:53 P. M., and will be half way across at midnight.

On the 21st, at 5:59 P. M., satellite II will pass upon the disk of the planet. Its shadow will follow at 8:32 P. M., and will be half way across before 10 o'clock. On the same evening, and at the same hour, 5:59, satellite I will pass upon the planet's disk, nearer the equator. Its shadow will follow at 7:17 P. M., and will be half way across by 20 minutes past 8 o'clock. If a telescope that will show both the shadows is used, it will be very instructive to watch their comparative rate of motion. Satellite I, being nearer the planet, moves much faster than satellite II. A more powerful telescope is required to see the satellites themselves on the disk of Jupiter.

The above are Eastern standard times. Subtract one hour for central time.

Saturn is nearing a position where it can be conveniently observed. During March it will be near the border of Libra and Virgo, passing into the latter constellation near the end of the month. It will then be two or three degrees southeast of the star Kappa Virginis. At the close of March Saturn will rise about 8 P. M.

Uranus remains in Libra, making an isosceles triangle with the stars Alpha and Beta. It is nearer to Alpha, and about two degrees north-northeast of the fourth magnitude star Iota.

Neptune is in Taurus, near the fifth magnitude star Iota Tauri. Mars will be in conjunction with it at a distance of 3° north on the 25th.

Mercury is a morning star and will reach its greatest distance from the sun in the morning sky on the 24th.

The month opens with a crescent moon. The moon attains first quarter in Taurus on the morning of the 4th; fulls in Leo on the night of the 10th, and reaches last quarter in Sagittarius at midnight on the 17th. It is in perigee at 7:30 P. M. on the 9th, and apogee at 1:30 A. M. on the 22d. New moon occurs at 5:25 A. M. on the 26th.

The moon's planetary visiting list for March is as follows: Conjunction with Mars on the 3d at 10 A. M.; with Neptune on the 4th at 8 A. M.; with Jupiter on the 5th at 6 A. M.; with Saturn on the 14th at 7 A. M.; with Uranus on the 15th at 5 A. M.; with Mercury on the 23d at 5 P. M.

There will be a partial eclipse of the sun on the 26th, visible in Greenland, but not in the United States.

The sun enters the sign Aries and the astronomical spring begins on March 20 at 4 P. M.

GARRETT P. SERVISS.

Dr. A. L. Loomis.

Dr. Alfred L. Loomis died at his New York home January 23. Dr. Loomis was one of the most widely known of New York physicians. Dr. Loomis was born in Bennington, Vt., on October 16, 1831. He graduated at the College of Physicians and Surgeons in 1852. He was early recognized as a specialist in pulmonary and heart troubles; for two years he was an assistant in the hospitals on Blackwell's and Ward's Islands. In 1859 he was made visiting physician at Bellevue, and 1862 lecturer on physical diagnosis at the College of Physicians and Surgeons. For thirty-five years Dr. Loomis was connected with the Bureau of Charities and Corrections, and his aid and advice were always sought and heartily given in the promotion of everything calculated to elevate the character of the hospitals and other institutions of the department, and to alleviate the sufferings of the inmates. Dr. Loomis was consulting physician to numerous hospitals and a member of several medical societies. In 1886 an unknown friend of the New York University gave, through him, $100,000 to build and equip the Loomis Laboratory, which already has an extended reputation for its bacteriological work.

He was Professor of Pathology and the Practice of Medicine in the University of New York since 1886. He devoted great attention to hygiene and was never in favor of giving much medicine. Among his publications are "Lecture Introductory to the Course of 1871-2 in the Medical Department of the University of the City of New York;" "Lessons in Physical Diagnosis," 1872, ten editions up to 1893; "Diseases of the Respiratory Organs, Heart and Kidneys," 1875; "Peritonitis," 1875; "Lectures on Fevers," 1877; "Diseases of Old Age," 1882; "A Text Book of Practical Medicine," 1884; also, "Climatic Treatment of Pulmonous Phthisis;" "Physical Exploration of the Abdomen;" "Physical Signs of Diseased Conditions of the Liver and Spleen;" and "On the Use of Opium in Acute Uræmia and Convulsions."

By his paper on "The Adirondack Region as a Therapeutical Agent in the Treatment of Pulmonary Phthisis," he paved the way for opening the North Woods as a health resort. The entrance to Bellevue Hospital will be draped in mourning for thirty days, and a commemorative tablet will be placed upon the walls of the medical board room of Bellevue Hospital in honor of him.

Importance of the Eucalyptus Tree to California.

The eucalyptus tree promises to become in time almost as useful to California as the bamboo is to Japan and China. During the past twenty years the eucalyptus has been introduced very extensively throughout the central and southern parts of the State. The eucalyptus tree may be put to many important uses. It has the advantage of requiring little or no attention and of growing with astonishing rapidity. In the vast timberless regions of California it has been an important factor in improving the land. The wood brings a good price when sold for fuel and it is generally acknowledged to have, besides, many valuable medicinal qualities. The eucalyptus is also extensively used to form a windbreak about Californian gardens and orchards.

It has been found very profitable to raise the eucalyptus tree for fuel. The tree's remarkably rapid growth makes it possible to raise a crop or forest of these trees to a size suitable for cutting every three years. Within a year from the time the seed has been planted the tree often reaches a height of ten feet, and a height of fifty feet in three years. It is customary to cut the tree off about two feet from the ground, at intervals of from three to five years. The trees are then cut into cord wood. During the past year the wood is reported to have brought from $6 to $9 per cord. A fair profit from such a crop is thought to be about $50 to the acre. It is estimated that a single acre, if left untrimmed for eighteen years, would, at this rate of growth, produce $10,000 worth of wood. In Australia the wood of the eucalyptus tree is coming to be extensively used for manufacturing purposes, and it is probable that in time new and important uses will be found for the wood in California.

Rock Emery Millstones.

Rock emery is a new phrase in mechanics. It is applied to blocks of emery in their natural condition. It is one of the hardest mineral substances known, except the diamond. Every modern attempt to give regular form to this intractable substance, which no metal tool can cut, has, until recently, failed.

The wonderful success of the emery wheel in the workshop prepared the way for the acceptance of emery millstones in the mill. But great difficulties were at first met with in their manufacture. At last, however, a rock emery millstone has been produced of perfect form, ample strength and suited for every purpose of fine grinding. Hundreds of them are already in use, successfully working on all classes of material. The large emery blocks are set in a metal filling that is nearly as hard and much stronger than cast iron. The face of the millstone is perfect, and so hard that it never needs dressing, and fortunately does not require it, for it is too hard to be cut by any tool. When compared with other millstones, the first point to attract attention is the increased output of the emery stone. The ordinary buhr does daily less grinding, and it soon becomes necessary to take it up for sharpening. The rock emery stone, however, keeps steadily at work, and on all moderately hard grinding, like grain or soft minerals, runs for months, becoming sharper and increasing its output; and when, finally, it requires attention, it is only to deepen its furrows, which are made of a soft rock easily cut out. The emery face should never be disturbed. Rock emery will not glaze, nor is it affected by heat. If the stones get together, no harm is done, nor are rock emery stones damaged by small bits of iron or steel that may get between them.

Rock emery forms, as would be expected, one of the hardest, strongest and most cutting and durable millstones. Rock emery millstones are also but a trifle more expensive than the best French buhrs, which is a point in their favor.

Rock emery millstones not only displace the French buhr, but also the expensive iron mills recently introduced, which cost from three to five times as much as rock emery mills, and do less work and of an inferior quality.

No millstone material can compete with rock emery, for it reduces easily many materials that other millstones cannot grind at all.

Electricity on the New York Canals.

In his recent annual report, referring to the use of electricity on canals, the State Engineer, Mr. Adams, well says:

The many wonderful achievements of recent years in the development of electricity as a motive power inspire the hope that it may soon be made applicable to the propulsion of canal boats at a cost that would render its use practicable and profitable to all concerned. The excessive weight and expense of the best storage battery which science has as yet devised, and which would be sufficiently powerful to meet the needs of this service, seem to exclude such an appliance from serious consideration at this time. Motors placed on the boats and made to operate the common form of screw propellers will not accomplish any appreciable saving of either weight or space over a steam engine and boiler, and in many respects would be decidedly inferior thereto. Such a method would require two trolley wires, for boats bound in opposite directions, and the boats would be helpless when not nearly under these wires. Moreover, the cost of installing such a device in the boats would be practically prohibitive to the majority of the boatmen, the cost being nearly that of steam, while lacking its many advantages above mentioned.

A Novel Rat Poison.

Enormous business has been done lately at French fairs by a man who professed to sell a rat powder that was perfectly harmless, and that struck rats dead on the spot. In order to convince the skeptical, the man first of all powdered a slice of bread with the stuff and ate a piece of it himself. Then he put the remainder under a glass case, in which a rat was kept in captivity. The rat went to eat the bread and instantly fell dead. At five pence a box the powder went off like hot rolls, and the lucky proprietor of the specific was in a fair way to make a fortune. But the police, who in France are very active in protecting the people from fraud, looked into the matter and found that the powder was nothing but ordinary sugar. They also discovered that the case was connected with a powerful electric battery, and that the moment the rat touched the bread the current was turned on, and it was thus his death was brought about. The man was arrested at the fair of Albi.