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THE PHYSICAL LABORATORIES OF EUROPE.

At a meeting of the physical section of the Brooklyn Institute of Arts and Sciences, held on Oct. 28, Dr. W. Le Conte Stevens gave a very interesting lecture on the "Physical Laboratories of Europe." Dr. Stevens, who has accepted the chair of physics in the Rensselaer Polytechnic Institute, of Troy, has just returned from a two years' course of study under Kohlrausch and other eminent German physicists. Dr. Stevens considers the laboratories of Strassburg and Zurich the most perfect in Europe. The University of Strassburg offers particular advantages to students desiring to make original investigations, many rooms in the new and beautiful laboratory building being devoted to this purpose, each student having a room to himself. One peculiarity of the Strassburg laboratory is that Dr. Kohlrausch as well as the other professors live in apartments in the laboratory.

The new laboratory at Zurich is equipped in an unsurpassed manner. The building is located on a hillside, so that it receives little dust and is far enough away from the road to prevent any jarring from traffic. Special rooms are devoted to different kinds of work, the apparatus in many rooms being practically fixtures. One entire section of the building is devoted to electrical work; not a particle of iron enters into its construction, so that accurate work in magnetism and electricity can be carried on in perfect assurance that there is no disturbing influence. Perhaps the most interesting feature of the whole building is the underground rooms for conducting experiments in heat, etc., which requires a constant temperature. These rooms are connected with the main building by a tunnel and are twenty feet below the surface of the ground. There are three rooms opening from an anteroom, all being circular in form. At the conclusion of the lecture Professor Hooper, director of the Brooklyn Institute, tendered Dr. Stevens a reception at the Hamilton Club, which was attended by a number of his Brooklyn friends.

GROWTH OF THE PRATT INSTITUTE.

We have from time to time noted the progress of the institution of learning in Brooklyn founded by and named after the late Charles Pratt. At no time in its history has this institution been so prosperous as it is at present. The registration of pupils for 1891-1892 as given below will give a fair idea of the number of students and their distribution in the various departments. Although this is a young institution, it is thoroughly equipped in all departments and its facilities are constantly increasing. The number of students in the various departments is steadily on the increase. The registration for the year 1891-1892 is as follows:

	Day.	Evening.	Total.
High school.....	144	—	144
Industrial and fine arts.....	559	333	892
Domestic art and science.....	1,388	552	1,940
Science and technology.....	80	232	312
Music department.....	89	244	333
Department of commerce.....	133	293	426
Library classes.....	43	—	43
	2,436	1,654	4,090
Members of the library.....			16,500

Mr. Pratt believed that the eye and the hand must be trained together to secure symmetrical development, and it is now very generally recognized that manual training is an important and necessary adjunct to the educational methods of the common and high schools and colleges.

An additional building, measuring 136 by 160 feet, is to be constructed during the present year; this will contain the library and the valuable technical museum. The playgrounds of the institute now aggregate nearly two hundred thousand square feet. A number of new courses and novel features have been added since the SCIENTIFIC AMERICAN of Oct. 6, 1888, gave a complete pen and pencil sketch of this institution. Classes of physical culture, hygiene, home nursing, and cooking for the sick have been formed; laundry work and all kinds of plain and fancy cooking receive much attention; while the department of science and technology has now opened evening classes which give a full technical education. In the basement of the building occupied by the department of mechanic arts there are special steam and electrical laboratories fitted with engines, dynamos and testing instruments. The library now numbers 34,000 volumes and is increasing rapidly. The institute as a whole has entered upon an era of prosperity which is the fulfillment of the wishes and expectations of its noble founder.

Metalizing Cloth.

A Mons. Moricourt has invented a process for metalizing textile fabrics, whereby it is claimed that they are rendered proof against the attacks of microbes. The materials, wool, flannel, calico, etc., are immersed for about an hour in an ebullient bath composed of 4 kilogrammes of sulphate of copper, 1 kilogramme of sulphuric acid, and 1,000 liters of water. On removal from the fluid the fabric is calendered and dried. The finish thus obtained will, it is said, bear two or three washings before it is again requisite to subject the cloth to the metalizing operation.

Not the Best Way to Sell a Patent.

As soon as an invention is patented, the fact is published throughout the length and breadth of the land and then the patentee begins to receive circulars and letters from agents of all kinds, suggesting to the inventor that they possess unequalled facilities for selling his patent. In some cases these persons state that they have a customer willing to pay several hundred dollars for the patent, and warning the patentee not to negotiate with others till he hears from them again. This conveys the impression that they have a *bona fide* offer, and, more even than this, that a greater sum may be realized from the *anxious* purchaser. But before the letter closes, it states that a power of attorney and a fee of from \$5 to \$25 must be sent by early mail to pay for this preliminary negotiation, and that the balance of their commission will be taken out of the purchase money. By this mode, a number of persons in different parts of the country live on the credulity of patentees, without rendering them the least equivalent for their money. They get from the inventor a power of attorney and a small fee, and that is the last he hears from his agent. Tired of waiting for the mail to bring him the money he so confidently expects, he, after a while, writes to know how the sale is progressing. He receives no reply—he waits—then writes again; still no answer. Then he writes to us, and states what he has done, incloses the correspondence, and wishes us to investigate the matter, and tell him if he has been swindled. He asks if we know the parties, if they are reliable, etc. Sometimes a circular is inclosed, in which our names are used as references, etc.

Now we do not pronounce all dealers in patents to be swindlers; but when such parties refer to us, it is without our authority, and they should be looked upon with suspicion. We advise every patentee to be on his guard against granting a power of attorney to sell his patent to any one whom he does not know, and under no circumstances to pay in advance any sum of money, however small, under the idea that this preliminary payment is necessary to the negotiation of the sale.

Prospective Car Building on the North Pacific Coast.

The Puget Sound *Lumberman* claims to be in possession of data leading to the belief that several of the larger car-building plants in the United States will soon be located on the sound. A prominent Tacoma lumberman lately made the declaration that he firmly believed that within the next ten years nearly all the box, flat and stock cars used in the country will be manufactured on the north Pacific coast. The hindrances to the planting of the industry in that region have been a lack of fuel and material for making wheels; but recently Eastern capitalists and railway men have examined the resources of the country in these respects, and can now see their way to obtain such supplies. The fuel question has been solved by the Wilkeson Coke Company, which is now turning out as fine coke as can be obtained anywhere. The American Foundry Company at Tacoma, by mixing scrap iron with British Columbia ore, has demonstrated what can be done on the coast in the matter of making car wheels, for car builders declare that the wheels thus turned out are as good as any made in the country. Furthermore, iron ore can be obtained in Washington that is equal or superior to that mined in British Columbia. Such ore abounds in vast deposits in the Ce-Elum range, owned by the Pacific Improvement Company, a corporation composed of Scotch capitalists. It is probable that the company will erect a large blast furnace within the coming year.

Tropsin.

A new local anæsthetic has recently been isolated by Giesel from the leaves of the small-leaved cocoa plant of Java. Liebermann, so says the *Medical Record*, has proved that this base is benzoyl ψ tropeine, which bears no relation to the cocaine group, but is chemically closely related to atropine. It is called "tropsin" for brevity. Professor Schweigger, of Berlin, after several months' experience with tropisin in eye surgery, reports that:

1. A three per cent solution produces complete corneal anæsthesia more rapidly than cocaine. Iridectomy could be done painlessly two minutes after putting three drops into the eye.
 2. Anæsthesia lasts from three to six minutes for each installation, and no further prolongation can be produced save by a fresh dose.
 3. Mydriasis is absent, or but slight.
 4. Ischæmia never occurs; but sometimes there is a passing slight hyperæmia and a little smarting unless normal saline solution be used as a solvent.
 5. No injurious symptoms were ever observed.
 6. In removal of foreign bodies, tropisin seems, from its quicker action, far preferable to cocaine.
- Dr. Silex, assistant in the Polyclinic, has obtained similar results.

Recent Decisions Relating to Patents.

LIMITATION.

Claim 1 of letters patent No. 298,314, for a centrifugal creamer, containing as elements a rotary vessel, an upwardly projecting neck open at the top, and having a discharge orifice or notch at its upper edge, must be restricted to a creamer having this notch cut through the side of the neck at a level below its upper horizontal edge, since all the other elements of the claim are old, and creamers had been constructed with holes pierced in the neck for discharge openings, and with open tops, over the walls of which the cream could be discharged. 1.

Letters patent No. 314,142, issued March 17, 1885, to Thomas J. Kirkpatrick, claim "the combination, with the perch or backbone of a bicycle, or similar vehicle, of independent front and rear springs secured to said perch or backbone, and a flexible seat suspended directly from said springs at the front and rear respectively, substantially as set forth." In the specifications the patentee states that in order to extend the flexible seat as far forward as possible, and at the same time secure the full elasticity of the forward spring, "I construct the said springs with two wings adapted to extend forward of the head, and turn upward and backward to connect with the forward end of the seat." *Held*, that in view of the Fowler patents of 1880 and 1881, and the Veeder patent of 1882, the patent must be limited to a forward spring adapted to extend forward of the head and turn upward and backward, "substantially as set forth." 2.

ASSIGNMENT AND LICENSE.

One owning a patent with several claims cannot assign a single claim only, so as to convey the legal title, or enable the assignee to sue thereon in his own name, and such an assignment will be construed as a mere license. 3.

Where a manufacturer owning certain patents, in pursuance of an agreement to form a corporation which is to include the properties of several rivals, and of which he is to become the general manager, assigns his patents to the corporation without reservation or conditions, except that the company is not to assign them to any one else while he continues to hold his allotted proportion of its stock, such assignment cannot be considered as subject to the condition that he shall be retained in his position as manager; and his discharge by the company, whether with or without cause, will not revert in him any interest in the patents. 4.

WHAT CONSTITUTES INFRINGEMENT.

It is an infringement to sell the different fixtures included in a patent of a stove, although a complete set of the fixtures is not sold to any one person, and no stove is sold with them. 5.

In determining whether a design patent is infringed, the test is whether there is a substantial similarity in appearance; not to the eye of the expert, but to that of the ordinary observer, giving such attention as would ordinarily be given by a purchaser of the article bearing the design. 6.

In design patent No. 17,243, issued April 5, 1887, to Daniel C. Ripley, for footed bottles and jars, the words of the claim and specifications which refer to the body of the vessel as "globe-shaped" or "spherical," must be taken in their ordinary, rather than their mathematical, signification, and infringement cannot be avoided by merely elongating the body so as to render it an ovoid, rather than a sphere or globe. 7.

It is doubtful whether letters patent No. 268,112, issued November 28, 1882, for an improved opera glass holder, consisting of a detachable handle, provided with a fastening device consisting of a piston hook and notch on the end, brought together by a spring operated by longitudinal action, are infringed by a fastening device consisting of two jaws, one pronged or bifurcated and the other with a uniform surface made to hold the bar of the opera glass, substantially by lateral pressure, by means of a piston screw. 8.

Letters patent No. 274,048, issued March 18, 1883, to Edwin R. Stillwell, cover a live steam heater or feed water purifier, connected with the boiler by steam pipes, and having a series of pans vertically arranged above the filter, and a space or chamber above the pans, and water inlet, connected to the steam dome by a pipe, so as to discharge the gases from the top of the purifier directly into the boiler. *Held*, that the patent is infringed by a heater which uses the gas discharge pipe connected to the top of the heater, notwithstanding that at the other end it is connected with the steam pipe of the feed pump, instead of with the dome of the boiler. 9.

Letters patent No. 414,844, issued November 12, 1889, to John W. Page and Charles M. Lamb, is for an improved machine for weaving wire fences. The essential device is a hollow needle, approximately cylindrical in shape, open along one side, and adapted to straddle the warp wire and rotate, so as to wind about it the woof wire, with which it is threaded, forming a knot, at the same time having a slight longitudinal reciprocating motion, to give the knot an elongated forward twist, which, as stated in the specifications, "is desirable because of its extreme security." The inventors

state that, owing to the complicated nature of the mechanism, they have deemed it desirable to give a detailed description, but that they do not wish to limit their invention to the details of construction, and that the claims are intended to be construed as broadly as the state of the art will permit. Claim 12 covers "a longitudinally slotted needle, adapted to hold the woof wire, and supported, to rotate in its bearings, substantially as and for the purpose set forth." Claim 14 is the same as claim 12, with the addition that the needle is to "be reciprocated longitudinally," for the purpose set forth. *Held*, that claim 12 covers the needle without the reciprocating longitudinal motion to give the knot the preferred "forward twist," and is infringed by a device constructed under letters patent No. 435,042, and issued August 26, 1890, and which is essentially the same as the needle, omitting this reciprocating feature. 10.

Letters patent No. 232,400, issued to Peter K. Dederick, as assignee of Albert A. Gehrt, are for a method in a baling press, resisting the backward movement of the traverser caused by the expansion of the hay, consisting of the application of friction, so as to stop the motion gradually. Claim 3 covers the combination, with the traverser having the rearward extension, of the lining or planking, and the set screw for adjusting the same, substantially as described. *Held*, that, if this involved any patentable invention, it is limited to the specific device, and is not infringed by the device covered by patent No. 349,934, issued September 28, 1886, to George Ertel. 11.

In his specifications for letters patent for an improvement in safety valves, Ashton states that, in order to prevent back pressure, he provides the chamber inclosing the spring of his pop valve with special vent holes for the steam which finds its way into it, but these vent holes are not mentioned in any claim, and the claims cover only a combination of his peculiar valve with a spring chamber, and an outer casing, "arranged to operate as described." *Held*, that the vent holes, if covered at all, are claimed only in combination with the peculiar pop valve, and there is no infringement in using them with a different form of pop valve. 12.

1. Actiebolaget Separator v. Sharpless, 50 Federal Reporter, 87.

2. Pope Mfg. Co. v. Gormully & Jeffery Mfg. Co., 12 Supreme Court Reporter, 641.

3. Same.

4. Bracher v. Hat Sweat Mfg. Co., 49 Federal Reporter, 921.

5. Lee v. Northwestern Stove Repair Co., 50 Federal Reporter, 202.

6. Ripley v. Elson Glass Co., 49 Federal Reporter, 927.

7. Same.

8. Mack v. Levy, 49 Federal Reporter, 857.

9. Stillwell & Bierce Mfg. Co. v. Brown, 49 Federal Reporter, 738.

10. Page Woven Wire Fence Co. v. Land, 49 Federal Reporter, 936.

11. Dederick v. Gardner, 50 Federal Reporter, 96.

12. Ashton Valve Co. v. Coale Muffler and Safety Valve Co., 50 Federal Reporter, 100.

The Manufacture of Wire.

The finer grades of wire are usually produced from No. 5 or No. 6 rods, and it is of the greatest importance that the chemical composition of the rod should be known, as the quality of the wire depends to a great extent upon the chemical combinations of the material. An analysis of two different grades of rods gave the following results:

FIRST GRADE.	
Carbon	Per cent. 0.089
Silicon	0.008
Sulphur	0.076
Phosphorus	0.068
Manganese	0.446
Copper	0.032
Iron	99.342
100.001	
SECOND GRADE.	
Carbon	Per cent. 0.075
Silicon	traces
Sulphur	0.043
Phosphorus	0.055
Manganese	0.216
Copper	0.032
Iron	99.600
100.021	

The material under the first analysis produced excellent wire, while the second was the reverse, being brittle and inferior in every way. From the above facts we infer that Bessemer steel too highly charged with carbon and deficient in manganese is not suitable for producing good wire. Rods should not contain more than 0.1 per cent of carbon, and be practically free from sulphur and phosphorus.

When the rods or bundles are well opened, place them in tubs or tanks in a solution of sulphuric acid and water at a temperature of 160°, 3 gallons of acid to 300 gallons of water, to remove scale and rust. In thirty minutes remove the rods and dip in a very weak solution of acid and cold water, then place on the floor and keep wet by sprinkling. In ten minutes a dark green,

slimy coating will form on the rods, which will gradually turn brown, according to time exposed. This coating is necessary to act as a protection between the raw surface of the wire and the drawing die. To have the rod clean and properly coated is one of the chief elements of success in drawing from No. 5 to No. 13 without annealing. For one holding to No. 8½ or No. 9 scarcely any coating is necessary; but to draw to No. 13 in four draughts great care must be observed, and one half to one hour is required to form a proper coating, depending on the quality of the material. If highly carbonized, it will take longer; if low in carbon, less time will be required.

When the rods are properly coated, dip them in boiling hot lime water. As more or less acid will accumulate in the lime tank in a short time, the rods must be taken out quickly or the coating will be removed; then wheel directly to the drawing benches. The latent heat of the rods will dry and evaporate the acid in ten minutes. Care must be taken, however, in keeping the lime at the proper temperature and consistency for drying. Many makers think it necessary to bake the rods before drawing, but this is unnecessary expense, as proved by the fact that thousands of tons have been so drawn under my supervision. Thirty-five pounds of 66 proof acid should clean one ton of rods, and 60 pounds is sufficient to clean one ton of fine wire.

The ends of the rods being pointed, they are now ready to draw into wire. Chilled cast iron dies and steel plates are used for this purpose. Some prefer one kind and some the other. Cast iron dies, when properly made, are as profitable and produce as good wire, from the largest sizes to No. 16, as the steel plates. To make No. 13 wire from a No. 5 rod, the first draught is from No. 5 to 8½, second to 10¼, third to 11¼, and fourth to 13. For ordinary purposes this process of drawing will answer, but when good tough wire is required it should be annealed at No. 8 or 10, and draw down to 13 or 14. Reducing the wire too much before annealing causes crystallization, and the wire continues hard and brittle after annealing. These conditions are very apparent under the microscope. Animal fat or grease is employed as a lubricant, and should be used in the first reduction just hard enough not to run, and in the other reductions as hard as convenient to work.

People using cast iron dies often complain of the wire scraping, stretching, and breaking. This fault is not in the material of which the die is made, but in its mechanical construction. In forming the drawing holes in a steel plate a punch is used having quite an abrupt taper, whereas the reamer used in making the holes in cast dies is often nearly parallel; the holes being too straight, and not having clearance enough at the back, the wire stretches and breaks. Apply the same principle in making cast dies as are used with steel plates, and good results will be obtained.

The most approved process for making the finer grades of wire is by the liquor bright process, as follows: First anneal and clean No. 13 in sulphuric acid about the same as the rods, with the exception that the acid and water should not be heated to more than 130°. A greater heat is likely to turn the wire black, which is not desirable. After thoroughly washing, place the wire in the baking oven until the acid is thoroughly evaporated and red oxide is formed on the wire, then dip in the sulphuric mixture about two minutes, then wash and dip immediately in cold lime water. Next place it in the baker for an hour or two, then have it drawn in lime bright, in one hole, to No. 14. Next place the wire in clean water, and soak for twelve hours or more. This softens what grease remains on the wire, and allows the sulphate of copper to take the wire readily.

The copper-coating preparation is made as follows: Dissolve 10 pounds of sulphate of copper by boiling in water, mix with 5 gallons of rye flour and water, 4 quarts of sulphuric acid, and 18 gallons of soft water. Place the wire to be drawn in this mixture for about two minutes, rinse in clean water, then put it on a reel in a tub of rye flour and water and draw down to size required. When the water is hard, add a small quantity of carbonate of soda. The sulphate of copper and acid have a tendency to make the drawing surface of the wire rough and hard, and the rye flour is used to neutralize these conditions. More and better wire can be drawn down to No. 24 by the above process than by any other.

Wire deficient in carbon and manganese will have a black, greasy deposit remaining on the wire after cleaning, which is hard to remove, while wire containing sufficient of these qualities will clean easily, and make good wire for galvanizing, coppering, and other purposes. Bright, high-coppered, crucible, and spring steel wire are handled differently, and the processes will be explained in a later communication.—G. P. Clapp, in Iron Age.

DR. N. W. CADY regards the following as an infallible remedy for sprains: A half hour's douching with water at a temperature of 120° F., and the fixation of the joint by a splint on the flexor side of the joint, or upon the extensor side, if that be more convenient.—Medical Record.