DECISIONS RELATING TO PATENTS.

Supreme Court of the United States

PEARCE *vs.* MULFORD *et al.*

Appeal from the Circuit Court of the United States for the Southern District of New York.

1. Reissued patent No. 5,774 to Shubael Cottle, February 24, 1874, for improvement in chains for necklaces, declared void, the first claim, if not for want of novelty, for want of patentability, and the second for want of novelty.

2. Neither the tubing, nor the open spiral link formed of tubing, nor the process of making either the open or the closed link, nor the junction of closed and open spiral links in a chain, was invented by the patentee.

3. All improvement is not invention and entitled to protection as such. Thus to entitle it it must be the product of some exercise of the inventive faculties, and it must involve something more than what is obvious to persons skilled in the art to which it relates.

The decree of the circuit court is therefore reversed, and it is ordered that the bill be dismissed.

By the Commissioner of Patents.

DICKSON *vs.* KINSMAN.—INTERFERENCE.—TELEPHONE.

The subject matter of the interference is defined in the preliminary declaration thereof as follows:

The combination in one instrument of a transmitting telephone and a receiving telephone, so arranged that when the mouthpiece of the speaking or transmitting telephone is applied to the mouth of a person, the orifice of the receiving telephone will be applied to his ear.

1. While it is true that the unsupported allegations of an inventor, that he conceived an invention at a certain date, are not sufficient to establish such fact, the testimony of a party that he constructed and used a device at a certain time is admissible.

2. Abandonment is an ill-favored finding, which cannot be presumed, but must be conclusively proven.

The decision of the Board of Examiners-in-Chief is reversed, and priority awarded to Dickson.

Characteristics of Arctic Winter.

Lieutenant Schwatka, whose recent return from a successful expedition in search of the remains of Sir John Franklin's ill-fated company, combats the prevalent opinion that the Arctic winter, especially in the higher latitudes, is a period of dreary darkness.

In latitude 83° 20′ 20″ N., the highest point ever reached by man, there are four hours and forty-two minutes of twilight on December 22, the shortest day in the year, in the northern hemisphere. In latitude 82° 27′ N., the highest point where white men have wintered, there are six hours and two minutes in the shortest day; and latitude 84° 32′ N., 172 geographical miles nearer the North Pole than Markham reached, and 328 geographical miles from that point, must yet be attained before the true Plutonic zone, or that one in which there is no twilight whatsoever, even upon the shortest day of the year, can be said to have been entered by man. Of course, about the beginning and ending of this twilight, it is very feeble and easily extinguished by even the slightest mists, but nevertheless it exists, and is quite appreciable on clear cold days, or nights, properly speaking. The North Pole itself is only shrouded in perfect blackness from November 13 to January 29, a period of seventy-seven days. Supposing that the sun has set (supposing a circumpolar sea or body of water unlimited to vision) on September 24, not to rise until March 18, for that particular point, giving a period of about fifty days of uniformly varying twilight, the pole has about 188 days of continuous daylight, 100 days of varying twilight, and 77 of perfect inky darkness (save when the moon has a northern declination) in the period of a typical year. During the period of a little over four days, the sun shines continuously on both the North and South Poles at the same time, owing to refraction parallax, semi-diameter, and dip of the horizon.

The Collins Line of Steamers.

The breaking up of the Baltic, the last of the famous Collins line of steamships, calls out a number of interesting facts with regard to the history of the several vessels of that fleet. There were five in all, the Adriatic, Atlantic, Pacific, Arctic, and Baltic. They were built and equipped in New York. Their dimensions were: Length, 290 feet; beam, 45 feet; depth of hold, 31½ feet; capacity, 2,860 tons; machinery, 1,000 horse power. In size, speed, and appointments they surpassed any steamers then afloat, and they obtained a fair share of the passenger traffic. A fortune was expended in decorating the saloons. The entire cost of each steamer was not less than $600,000, and notwithstanding their quick passages, the subsidy received, and the high rates of freight paid, the steamers ran for six years at great loss, and finally the company became bankrupt.

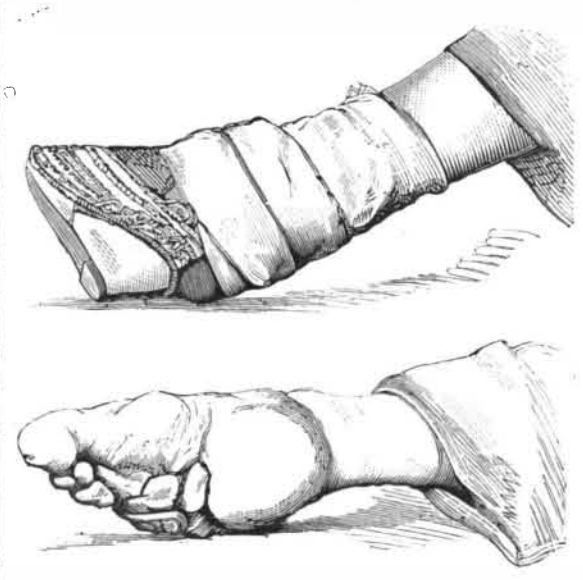
The Atlantic was the pioneer steamship of the line. She sailed from New York April 27, 1849, and arrived in the Mersey May 10, thus making the passage in about thirteen days, two of which were lost in repairing the machinery; the speed was reduced in order to prevent the floats from being torn from the paddle-wheels. The average time of the forty-two westward trips in the early days of the line was 11 days 10 hours and 26 minutes, against the average of the then so-called fastest line of steamers, 12 days 19 hours and 26 minutes. In February, 1852, the Arctic made the passage from New York to Liverpool in 9 days and 17 hours. The Arctic was afterward run into by a French vessel at sea and only a few of her passengers were saved. The Pacific was never heard from after sailing from Liverpool, and all the persons on board were lost. The Atlantic, after rotting and rusting at her wharf, was deprived of her machinery and converted into a sailing vessel, and was broken up in New York last year. The Adriatic, the "queen of the fleet," made less than a half dozen voyages, was sold to the Galway Company, and is now used in the Western Islands as a coal hulk by an English company.

The Baltic was in the government service during the war as a supply vessel, and was afterward sold at auction; her machinery was removed and sold as old iron. She was then converted into a sailing ship, and of late years has been used as a grain carrying vessel between San Francisco and Great Britain. On a recent voyage to Boston she was strained to such an extent as to be made unseaworthy, and for that reason is to be broken up.

One cannot but remark in this connection how small has been the advance in steamship building during the quarter century since the Collins line was in its glory.

CHINESE WOMEN'S FEET.

An American missionary, Miss Norwood, of Swatow, recently described in a *Times* paragraph how the size of the foot is reduced in Chinese women. The binding of the feet is not begun till the child has learnt to walk. The bandages are specially manufactured, and are about two inches wide and two yards long for the first year, five yards long for subsequent years. The end of the strip is laid on the inside of



CHINESE WOMEN'S FEET.

the foot at the instep, then carried over the toes, under the foot, and round the heel, the toes being thus drawn toward and over the sole, while a bulge is produced on the instep, and a deep indentation in the sole. Successive layers of bandages are used till the strip is all used, and the end is then sewn tightly down. The foot is so squeezed upward that, in walking, only the ball of the great toe touches the ground. After a month the foot is put in hot water to soak some time; then the bandage is carefully unwound, much dead cuticle coming off with it. Frequently, too, one or two toes may even drop off, in which case the woman feels afterward repaid by having smaller and more delicate feet. Each time the bandage is taken off, the foot is kneaded to make the joints more flexible, and is then bound up again as quickly as possible with a fresh bandage, which is drawn up more tightly. During the first year the pain is so intense that the sufferer can do nothing, and for about two years the foot aches continually, and is the seat of a pain which is like the pricking of sharp needles. With continued rigorous binding the foot in two years becomes dead and ceases to ache, and the whole leg, from the knee downward, becomes shrunk, so as to be little more than skin and bone. When once formed, the "golden lily," as the Chinese lady calls her delicate little foot, can never recover its original shape.

Our illustrations show the foot both bandaged and unbandaged, and are from photographs kindly forwarded by Mr. J. W. Bennington, R. N., who writes: "It is an error to suppose, as many do, that it is only the Upper Ten among the daughters of China that indulge in the luxury of 'golden lilies,' as it is extremely common among every class, even to the very poorest—notably the poor sewing women one sees in every Chinese city and town, who can barely manage to hobble from house to house seeking work. The pain endured while under the operation is so severe and continuous that the poor girls never sleep for long periods without the aid of strong narcotics, and then only but fitfully; and it is from this constant suffering that the peculiar sullen or stolid look so often seen on the woman's face is derived. The origin of this custom is involved in mystery to the Westerns. Some say that the strong-minded among the ladies wanted to interfere in politics, and that there is a general liking for visiting, chattering, and gossip (and China women *can* chatter and gossip), both and all of which inclinations their lords desired, and desire, to stop by crippling them."

To the alteration and metamorphism of rocks by the infiltration of rain and other meteoric waters, M. De Koninck, of the Belgian Academy of Sciences, assigns the cause of many hitherto unexplained phenomena in geology.

Correspondence.

Ice at High Temperatures.

To the Editor of the Scientific American:

Your issues of October 23 and 30 contain some remarkable articles under the heading of "Ice at High Temperatures."

Prof. Carnelley says: "In order to convert a solid into a liquid, the *pressure* must be above a certain point, otherwise no amount of heat will melt the substance," as it passes at once from the sold state into the state of gas, subliming away without previous melting. And, "having come to this conclusion, it was easily foreseen that it would be possible to have solid ice at temperatures far above the ordinary melting point."

The first conclusion of the professor is correct, but not new. The second conclusion is new, but very doubtful as to its correctness, and certainly does not follow as a sequence from his premise.

If we try to heat ice in a vacuum, we cannot apply any heat to the ice direct, but only to the vessel containing the ice. The vessel may be much heated; but whether it will convey heat to the ice quick enough to heat it over 32°, and whether at all it can be heated over 32°, this is a question of a different nature. Before crediting such a conclusion we must know more of the details of the experiments which the professor made in order to verify its correctness. When saying that "on one occasion a small quantity of water was frozen in a glass vessel which was so hot that it could not be touched by the hand without burning it," he evidently assumes that if the vessel is hot, the ice inside must be equally so; but this assumption is erroneous. Faraday has made water to freeze in a red hot platina pot; the ice thus formed was not red hot like the platina, but was below the freezing point. Just so with Professor Carnelley's glass vessel; the vessel was hot, but the ice inside no doubt was "ice cold." If the professor would surround a thermometer bulb with ice and then make the mercury rise above the freezing point, we would believe in "hot ice;" not before. Until he does, we prefer to believe that the heat conveyed through the vessel to the ice is all absorbed in vaporizing the ice, and not in raising its temperature above 32°.

Professor Carnelley's further statement, apparently proving his theory, that the ice at once liquefies as soon as *pressure* is admitted (say by admitting air), is readily accounted for by the phenomena connected with the "Leydenfrost Drop." Water in a red hot vessel will vaporize off much slower than in a vessel heated a little above the boiling point, from the reason that in the red hot vessel no *real contact* takes place between the vessel and the water. At the place where the two ought to touch, steam is formed quicker than it can escape, which steam prevents the contact between vessel and water; therefore, as no real contact takes place, the heat from the vessel can pass into the water but slowly, viz., in the proportion as it works itself through the layer of steam, which in itself is a bad conductor. Just so in Prof. Carnelley's experiment: The heated glass vessel will convey heat to the ice only at those points where it touches the ice; at those points at once a formation of vapor takes place, which prevents an intimate contact between the glass and the ice, so that they do not really touch each other, consequently the heat can pass into the ice but slowly, having to work its way through the thin layer of rarefied vapor between the two. As soon as pressure is admitted by admitting atmospheric air, vapors can no longer form; an intimate contact will take place between the glass and the ice, and consequently the heat be conveyed over quick enough to make the ice melt away rapidly.

The professor's experiments, therefore, so far as published, do not prove anything to justify his strange conclusion. It is perfectly true that in a vacuum of less than 4·6 mm. mercury pressure, no amount of heat will melt ice, all heat that can be conveyed to the ice being absorbed by vaporization. But before crediting the professor's further conclusion, that ice can be heated much above the freezing point, he must actually produce "hot ice," not only a hot vessel containing ice.

N. J.

Brooklyn, N. Y., October 25, 1880.

Schools of Invention.

The school of invention has not yet been established, but its germ is growing in the mechanical schools. This school, according to Hon. W. H. Ruffner, in *Va. Ed. Journal*, will educate men, and women too, for the special career of inventing new things. Why not? We already have something closely analogous in schools of design, where the pupil is trained to invent new forms or patterns, chiefly of an artistic or decorative character. The same idea will be applied to the invention of machinery, or improvements in machinery, or the adaptation of machinery to the accomplishment of special ends. Inventions usually spring from individuals striving to lighten their own labor, or from some idea entering the brain of a genius. But we shall have professional inventors who will be called on to contrive original devices, and his success will depend on the sound and practical character of his prescriptions.

Proposed Exhibition of Bathing Appliances.

The Board of Health of this city has recently been notified that a Balneological Exhibition, to illustrate the various systems of bathing, bath appliances, and kindred matters, is to be held in Frankfort-on-Main, Germany, next summer. The exhibition will last from May to September, 1881.

© 1880 SCIENTIFIC AMERICAN, INC