

## Case No. 14,406.

## UNITED NICKEL CO. v. ANTHES.

{1 Holmes, 155; 5 Fish. Pat. Cas. 517; 1 O. G. 578; Merw. Pat. Inv. 672.}<sup>1</sup>

Circuit Court, D. Massachusetts. May 6, 1872.

PATENTS—NOVELTY—ABANDONED  
EXPERIMENTS—NICKEL PLATING.

1. Abandoned experiments, however suggestive, producing no practical and useful result, do not affect the validity of a subsequent patent to an original inventor.

{Cited in *United Nickel Co. v. Pendleton*, 15 Fed. 740: *Hood v. Boston Car-Spring Co.*, 21 Fed. 69.]

2. The patents granted Isaac Adams, Jr., for improvements in the electro-deposition of nickel, dated Aug. 3, 1869, and May 10, 1870, *held* valid.

{Followed in *United Nickel Co. v. Keith*, Case No. 14,408. Approved in *United Nickel Co. v. Harris*, Id. 14,407.]

{Final hearing on pleadings and proofs. Suit brought upon letters patent [Nos. 93,157, 102,748, and 113,612] for “improvements in the electro-deposition of nickel,” granted to Isaac Adams, Jr., August 3, 1809, May 10, 1870, and April 11, 1871. The difficulties attending the previous processes by which the electro-deposition of nickel had been attempted, are stated in the opinion. The description of the method by which the patentee prepares the solution from which the nickel is deposited is too lengthy to admit of quotation.}<sup>2</sup>

James B. Robb, for complainant.

R. Lund and L. R. Batchelder, for defendant.

SHEPLEY, Circuit Judge. The complainant corporation is the owner, by assignment from the patentee, of letters-patent granted to Isaac Adams, Jr., dated respectively Aug. 3, 1869, May 10, 1870, and April 11, 1871, for discoveries and improvements made by him in the electro-deposition of nickel.

Before the date of the experiments of Dr. Adams, the electro-deposition of nickel was as well known as that of other metals. Chemists and lecturers in scientific schools and experimenters in metallurgy had practically demonstrated that many different solutions could be made to yield a simple deposit of nickel. In experiments made to determine the value of electrolysis as a method of analysis, and to determine the laws of electro-chemistry which govern its reduction, and especially in experimental attempts to utilize it as a plating or coating for other metals, the electro-deposition of nickel had been made out of solutions of several of its salts. The object of those who were experimenting in the attempts to utilize this metal as a coating for other metals for practical uses appears to have been to discover a mode by which this metal could be deposited by the battery, readily, uniformly, and especially as continuously, as copper, silver, and gold, were deposited by the processes well known and in common use in the application of electro-metallurgy to the useful arts.

While it was well known that nickel possessed certain qualities which would render it of great value in the arts if it could be deposited thus readily, uniformly, and continuously by the battery, the practical difficulties, which had never been overcome, had prevented it from being used, except to a very limited extent and under very unfavorable conditions, as to the cost and the quality of the work, in the useful arts. One of these difficulties is, stated in the edition of 1867 of the "Manual of Electro-Metallurgy," by James Napier, as follows: "The great difficulty experienced is to obtain a positive electrode; the metal is very difficult to fuse, and so brittle, that we have never been able to obtain a plate or a sheet of it. Could this difficulty be overcome, the application of nickel to the coating of other metals would be extensive; and the property

of not being liable to tarnish would make it eminently useful for all general purposes.”

The evidence in the record, however, shows that the difficulties in the way of the practical electro-deposition of nickel were not confined to the positive electrode, but were also inherent in the character of the solutions of the salts of the metal which were employed. Different solutions of nickel salts, when subjected to the action of a galvanic current, were found to behave in very different ways: some of them depositing a mixture of reguline metal and secondary products; others depositing only an oxide, a sub-salt, or some secondary product, without any metal. Some solutions did not dissolve the anode, while others dissolved it so imperfectly, that, by use, the solution grew gradually weaker in metal. And these difficulties were not only inherent in the character of the solutions themselves, but in other cases were due to the presence of foreign elements, or the temperature or density of the solutions, or to the density of the current employed.

The patentee claims to have discovered the causes of all these difficulties, and a practical process, by which all these difficulties are obviated, so as to fulfil all the required conditions of electro-plating with nickel, so that the anode will supply the solution with nickel as fast as it is deposited, maintaining a uniform density in the solution, and so that the solution itself shall yield an amount of metal exactly or substantially equivalent to the amount of battery-power expended, and deposit the metal uniformly and continuously, so that the coating of nickel shall be compact, coherent, and tenacious.

The difficulties attending the practical deposition 726 of the metal, and the nature of his improvements, are well described by the patentee in his several patents. They relate to the method of preparing the solutions, to the method of preparing nickel plates for

the anode of the depositing cell, and to the properties and condition and character of the deposit itself.

In the patent of Aug. 3, 1869, the patentee claims: "1. The electro-deposition of nickel by means of a solution of the double sulphate of nickel and ammonia, or a solution of the double chloride of nickel and ammonium, prepared and used in such a manner as to be free from the presence of potash, soda, alumina, lime, or nitric acid, or from any acid or alkaline reaction. 2. The use, for the anode of a depositing cell, of nickel combined with iron, to prevent the copper and arsenic, which may be present, from being deposited with the nickel, or from injuring the solution. 3. The described methods for preparing the solution of the double sulphate of nickel and ammonia, and the double chloride of nickel and ammonium. 4. The electro-plating of metals with a coating of compact, coherent, tenacious, flexible nickel, of sufficient thickness to protect the metal upon which the deposit is made from the action of corrosive agents with which the article may be brought in contact. 5. The deposition of electrotype-plates of nickel, to be removed from the surface on which the deposit is made, and to be used separately therefrom."

In the patent of May 10, 1870, the patentee claims: "1. The combination with nickel to be used for anodes of a metal or metalloid, electro-negative to the nickel in the solution employed. 2. A nickel anode, combined with carbon, and cast in the required form."

The patent of April 11, 1871, claims: "A cast nickel anode as a new article of manufacture." All these claims are contended by the complainant to have been infringed by the defendant, except the fifth claim in the patent of Aug. 3, 1869.

The defendant, to prove that Adams was not the original and first inventor of the things patented to him, relies in his answer upon the following published works: Schubarth's "Chemistry," published in 1835;

Gove's "Theory and Practice of Electro-Deposition," published in 1860; "The Chemical News," of Sept. 6, 1862. In an amendment to the answer, he also relies upon Brande's "Manual of Chemistry," published in London in 1848.

The passages referred to in Schubarth contain no allusion to the electro-deposition of nickel. The processes described on page 60, § 118, of Gove's "Theory and Practice of Electro-Deposition," are clearly proved, by the uncontradicted testimony of experts, not only to be dissimilar to the processes described in the patent, but to be practically useless for the continuous deposition of nickel. Four different solutions are mentioned: the first, the nitrate of nickel solution, is demonstrated by experiment to be useless; and the three other solutions are proved, by reason of their alkalinity, to be practically useless for the purpose of the useful arts, as not properly dissolving the anode, and affording a uniform deposition or a continuous process.

The process described in the "Chemical News and Journal of Physical Science," No. 144, p. 126, is obviously a different process from the process described in the patent. This process does not contemplate the use of an anode to keep the solution in its normal state of density or concentration. It describes two methods of keeping up the density of the solution, and maintaining the uniformity of concentration. These methods of supplying the solution are by means of the oxide of nickel or the salt of nickel, placed at the bottom of the depositing cell. The difficulties attending these modes of supplying the waste in the solution are fully explained in the testimony of the experts in the case. It is sufficient for this case, however, to remark, that the processes are obviously inferior to and different from the process of the patentee, and do not anticipate his invention. Brande's "Manual of Chemistry" does not describe any

mode of electro-deposition of nickel. Two methods are described of making the sulphate of nickel, neither of them, according to the proofs, capable of producing a salt free from acidity or impurity.

These are the only published works referred to by the defendant in his answer, and there is nothing in them to invalidate the complainant's patents for want of novelty. The other published works referred to in the evidence for defendant do not describe any process of depositing the metal from a solution by means of electricity, excepting in the case of Smee's "Elements of Electro-Metallurgy," and "The Contributions to Chemistry" by Professor Gibbs, both of which refer rather to processes by which nickel can be electrolyzed out of a solution; but neither of them names a solution, or describes a process, which would meet the requirements and afford the conditions of, a process for practical use in the art of electro-plating other metals with nickel.

The testimony of Professor Sharpies, relied upon by the defendant, only proves the use by him of the process and solution described by Professor Gibbs in his paper before referred to, called "Contributions to Chemistry." He testifies that his solution was different from the one described in the patent, and different from the one used by the defendant. The evidence in the record incontestably proves that the art of electro-plating of metals, or the electro-deposition of one metal upon the surface of another, was old and well known. The mere electrolysis of nickel out of a salt of that metal was well known to chemists and metallurgists.

**727** A solution of the double sulphate of nickel and ammonia does not appear to have been unknown to experimenters in making experiments in electrolysis for the purposes of analysis. So the fusibility of nickel at a high temperature was known; and that fusion of nickel may have been, and probably was, conducted accidentally, and without any design, and without any

reference to any useful result, under such conditions as might, and perhaps did, leave an admixture of carbon and iron.

But it proves as incontestably that, prior to the discoveries of the patentee, the electro-deposition of nickel by means of such solutions as are described in the complainant's patent, prepared and used in the described manner, so as to be free, from foreign substances, and acid or alkaline reactions, which would interfere with the uniform, continuous and coherent deposition of the metal, was unknown in any practical application of it to the useful art of electroplating metals with nickel. It is equally clear that the use of such an anode as the patents describe, cast from the commercial nickel in the desired form, and combined with carbon and a metal or metalloid electronegative to the solution employed, was first successfully and practically made by him. The evidence of Remington shows an experiment with a cast-nickel anode; and we may perhaps reasonably conclude, from the conditions under which that experiment was made, that the product of the casting was a carbide of nickel; but if such was the result, it was one apparently not designed, appreciated, or discovered. The experiments of Remington with a cast-nickel anode appear to have been suggested by the discoveries of the patentee, and to have been unsuccessful and abandoned experiments. However suggestive the experiments of others may have been in electro-deposition of nickel from different solutions, or in the mere casting of nickel, they cannot be made available to defeat a patent granted to one who, after all other experimenters had failed to secure a practical and useful result, beneficial to the community and a valuable contribution to the useful arts, first succeeded so as to be able to disclose to the public a practically useful and successful process, by him first brought to perfection and first made capable of useful application.

The evidence of infringement is found in the defendant's admission that his process was the same as that of the Boston Nickel-Plating Company, which was the process described in the patents carried on by the company as licensees under the complainant. It is apparent, from the testimony of Professor Sharpies, that the solutions used by the defendant, and from the admission of the defendant himself, that the anodes used by him were substantially the solutions and anodes described in the patent.

As it is clear that the defendant has infringed the patents of Aug. 3, 1869, and May 10, 1870, both of which under the true construction of their claims, the court considers to be good and valid patents; it is not necessary in this case that the court should decide whether the patent of April 11, 1871, is, or is not, defective, although the impression of the court is, that as one process of casting is given by reference to a former patent, the patent itself may be maintained, if the evidence of the previous state of the art should correspond with the statements and claims of the patent. The decree and injunction in this case will therefore have reference to the patents of Aug. 3, 1869, and May 10, 1870.

Decree for account as prayed in the bill; injunction to be made perpetual as to the patents of Aug. 3, 1869, and May 10, 1870.

[NOTE. For other cases involving this patent see United Nickel Co. v. Keith, Case No. 14,408; United Nickel Co. v. Manhattan Brass Co., Id. 14,410; United Nickel Co. v. Harris, Id. 14,407; United Nickel Co. v. Melchior, 17 Fed. 340; United Nickel Co. v. Pendleton, 15 Fed. 739; United Nickel Co. v. California Electrical Works, 25 Fed. 475.]

<sup>1</sup> [Reported by Jabez S. Holmes, Esq., and by Samuel S. Fisher, Esq., and here compiled and reprinted by permission. The syllabus and opinion are



from 1 Holmes, 155, and the statement is from 5 Fish.  
Pat. Cas. 517. Merw. Pat. Inv. 672, contains only a  
partial report]

<sup>2</sup> [From 5 Fish. Pat. Cas. 517.]

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