

v.38F, no.2-9 ELECTRICAL ACCUMULATOR CO. V. JULIEN ELECTRIC CO. ET AL.

Circuit Court, S. D. New York.

March 18, 1889.

1. PATENTS FOR INVENTIONS—CONSTRUCTION OF CLAIM—FAURE SECONDARY BATTERIES.

The specification in letters patent No. 252, 002, issued January 3, 1882, to C. A. Faure, describes the secondary batteries invented by Gaston Plante, in which the plates have comparatively limited capacity, and require a long and expensive operation for their formation, and states the patentee's object to be to prevent such waste of time and money, and to construct a more powerful battery. Claim 1 is "as an improvement in secondary batteries, an electrode consisting," etc. *Held*, that a secondary battery, as distinguished from a primary one, is an element of the combination.

2. SAME.

There being well-known primary batteries, and well-known secondary batteries, though there are others not definitely classifiable, the term "secondary battery," as used in the patent will not be construed as including a primary battery which has been exhausted and partially restored by being charged from an independent generator.

3. SAME.

Claim 1 being for "an electrode," etc., and the words "a pair of electrodes" being used in another claim, and it appearing from a foreign patent and the file-wrapper and the domestic patent that the patentee's attention was drawn to the distinction between one and two electrodes, the claim cannot be limited to the use of two electrodes, but a battery containing one Faure electrode, though the other is dissimilar, is within the claim, if the two operate to receive and discharge electricity as stated in the specification.

4. SAME.

Claim 1 is for "an electrode consisting of a support coated on one or more faces with an active layer of absorptive substance such as metal or metallic compound applied thereto in the described condition so as to be or instantly become spongy, and thus capable of receiving and discharging electricity, as stated; in contradistinction to a metallic plate itself rendered spongy by the disintegrating action of electricity, substantially," etc. It is stated that the oxides or salts of lead not soluble in the electrolyte is deemed most advantageous for covering the supports, but that the invention includes generally substances capable of absorbing and storing electricity; for example, manganese, or any salt, the oxide of whose base is insoluble; that the active material may be applied in various ways as in the form of paint, paste, or cement, in the form of a deposit by galvanic action or chemical precipitation or otherwise. In charging, the electricity produces a reduced mass of porous lead on one electrode and a mass of peroxide of lead on the other, and in discharging the reduced lead becomes oxidized, and the peroxidized lead is reduced. *Held*, that the claim includes a coating soluble in the electrolyte and one which is applied after immersion by galvanic deposit or chemical precipitation from a solution in the liquid.

5. SAME—DATE OF INVENTION.

The patentee cannot claim the invention earlier than October 20, 1880, which was the date of his French patent, he being then a citizen of France.

6. SAME—ANTICIPATION.

The Electrician of 1863 contained an article entitled "Secondary Batteries," but there was no evidence that a successful secondary battery having the characteristics therein mentioned was ever

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made, though similar structures, were proved inoperative; and in charging such battery a reduced mass of porous lead on one electrode and a mass of peroxide of lead on the other were not produced. A person skilled in the art, after reading the article, would be Unable to produce a Faure battery in any of its practical forms. *Held* no anticipation.

7. SAME.

A witness testified to reading an article 25 years before, and to experiments and results by him which would amount to anticipation. The article was not

produced, and the witness was not corroborated, and some of his statements were shown to be inaccurate. Since then he had taken out more than 30 patents, and had written 5, 000 articles on scientific subjects, none of which referred to the alleged invention. *Held* insufficient to rebut the presumption of novelty arising from the grant of the patent

8. SAME.

An electrical engineer testified that in 1879 he suspended in dilute sulphuric acid a lead plate having a coating of lead powder secured to it by means of blotting paper, a strip of wood, and a string, and opposite this he suspended a plate of amalgamated zinc. He also made another cell by suspending two such coated lead plates in the electrolyte. He connected the two cells and charged them for several hours on each of several days. In one instance he made a coating of red oxide of lead and in another of litharge. His experiments were successful, and he made full memoranda of them, which were soon after destroyed by fire, and which he afterwards undertook to reproduce, though he did not describe particularly the batteries. In July, 1880, he laid in dilute sulphuric acid, in contact with metallic zinc, lead plates, some of which contained in a groove yellow oxide, and others sulphate of lead, whereby the oxide and sulphate were reduced to metallic lead, and the zinc was dissolved. He then suspended in one cell two plates which had contained sulphate, and in another two which had contained oxide, and charged them. These were afterwards lost. In September, 1880, he treated similarly plates which were filled with litharge and sulphate. On the issue of the Faure patent he demanded interferences, and was successful. He was corroborated in important particulars by three witnesses, who saw experiments. *Held* an anticipation, except as to the method of applying the layer to the electrode in the form of paint, paste, or cement.

9. SAME—DISCLAIMER.

As the real invention of the patentee was the application before immersion in the electrolyte of the active layer, in the form of paste, paint, or cement, insoluble in the electrolyte, so as instantly to become spongy, and was generally so understood, and as such invention was one of great merit, and as it is fully described in the specification, and the claim as to it would not be mutilated by a disclaimer as to the residue, the patent should be allowed to stand on filing such disclaimer, as authorized by Rev. St. § 4917, 4932, and complainant in a suit in which infringement is established may thereupon have a decree, but without costs.

10. SAME—SERIES OF CELLS—CONSTRUCTION OF CLAIM.

Claim 4 is: "In a secondary battery, a series of cells comprising each a pair of electrodes with an active, spongy layer thereon, combined with non-porous partitions between adjacent cells, substantially," etc. The specification states that it is advantageous to apply a non-porous partition to the plates so as to cut off all communication between the cells, and that this combination of non-porous diaphragms with the electrodes is a portion of the invention; that the arrangement permits the employment of thin sheets of lead, while securing sufficient stiffness, and affording means of securing the parts without leakage between adjacent cells on each side of the leaden plate; that when the supporting plates are to be placed so as to permit distortion by mechanical strain stiffness may be imparted by applying them on wood or hard rubber non-porous boards, so as to prevent the passage of liquid between the cells. *Held*, that there would be no invention in a mere aggregation of cells, but that the claim would be valid by limiting it to the combination of the electrodes with non-porous partitions as described.

11. SAME—PLATES FOR SECONDARY BATTERIES.

The claim of letters patent No. 312, 599, issued February 17, 1885, to J. W. Swan, is for a perforated or cellular plate for secondary batteries, having the perforations or cells extending through the plate in which the active material is packed. Such plates hold the active material securely, extend the area of electric communication between the continuous metallic conductor and the porous

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material, and by their use the warping or fracturing effects of the changes of oxidation are almost annulled. *Held*, that the construction of such plates involved patentable invention.

12. SAME—EXPANSION OF APPLICATION.

The original specification stated that the plate shown in the figures was constructed with cells or cavities for the reception and retention of spongy lead, and might be closed on one side, as shown in one of the figures. There was no evidence of alterations in the drawings, and the file-wrapper showed that the original drawings were in the office when the claim for a perforated plate was presented, which was after the original specification was filed. *Held*, that the original specification described a perforated plate, and that the patent in covering it did not unlawfully expand the original application.

13. SAME—DATE OF PATENT.

A statement in the specification that the patentee has obtained a prior foreign patent is not proof thereof, and does not carry the invention back to the date of such patent.

14. SAME—ANTICIPATION.

The application having been filed January 18, 1883, the English patent to John S. Sellon, though dated September 10, 1881, was not an anticipation, it not having been sealed until March 10, 1882.

15. SAME.

A witness testified that prior to August, 1881, he made perforated lead plates upon both sides of which he precipitated previously prepared lead sponge, covering the surfaces and filling the perforations. He also placed lead sponge on one or both of two perforated plates, and then united them, the sponge being retained between them and filling the perforations, thus making one electrode. He also placed the paste on cloth or asbestos, and inclosed it between perforated plates. Woven lead wire was coated with a paste by him also. Batteries thus constructed were successful. Corroborating testimony was given by two others and there was no conflicting evidence. *Held* an anticipation, and, if not complete, that there was nothing remaining of which to predicate patentable novelty.

16. SAME—PATENTABILITY.

In letters patent No. 318, 828, issued May 26, 1885, to J. W. Swan, the claim is: "In a battery plate or electrode composed of a conducting support combined with active material, the support in the form of a plate with angular or equivalent holes, cells, or perforations extending through the same, and separated from one another by webs, walls, or partitions of uniform cross-section, the active material being placed in said holes," etc. *Held*, that it covered no patentable invention, not included in the first Swan patent.

In Equity.

Bill by the Electrical Accumulator Company against the Julien Electric Company and William Bracken.

*Frederic H. Betts*, for complainant.

*Thomas W. Osborn* and *Horace M. Ruggles*, for defendants.

COXE, J. This is an action for the infringement of four letters patent, owned by the complainant, for improvements in secondary electrical batteries. One of these, No. 266, 262, granted to Shaw and Rogers, October 17, 1882, has been withdrawn from the consideration of the court. The three in controversy are No. 252, 002, granted January 3, 1882, to Camille Alphonse Faure; and Nos. 312, 599 and 318, 828, granted, respectively, February 17, and May 26, 1885, to Joseph Wilson Swan. The invention of Faure relates

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to that class of batteries which give no electricity of themselves, and are active only when rendered so by sending a current through them from an independent-source of electric energy; batteries which, being included for a time in a circuit generated from an ordinary galvanic battery, for example, become charged so that they subsequently give out electricity on the completion of a proper circuit.

This process may be repeated an indefinite number of times. When the battery runs down it can be charged again. The inventor describes the secondary batteries of Gaston Plante, in which, by a long and expensive operation involving weeks, and even months, the plates are formed, but with a comparatively limited capacity. To prevent this waste of time and money, and to construct a more powerful battery, was Faure's object. His electrodes are made, not by the formation of a porous layer by disintegration in the body of the metallic plates, but by adding to suitable supports a layer of active material, of the desired depth, in the form of a paint or paste, or otherwise, which is, or at once becomes, spongy or porous. This active layer may be rendered more porous by mixing with the material composing it some inert material, such as crushed coke. "In charging, the electricity acts to produce a reduced mass of porous lead on one electrode and a mass of peroxide of lead on the other. When the battery is discharged, the reduced lead becomes oxidized and the peroxidized lead is reduced, until the equilibrium is restored." The claims in controversy are the first and the fourth. They are:

"(1) As an improvement in secondary batteries, an electrode consisting of a support coated on one or more faces with an active layer of absorptive substance, such as metal or metallic compound applied thereto in the described condition, so as to be or instantly become spongy, and thus capable of receiving and discharging electricity, as stated, in contradistinction to a metallic plate itself rendered spongy by the disintegrating action of electricity, substantially as and for the purpose set forth."

"(4) In a secondary battery, a series of cells, comprising each a pair of electrodes with an active spongy layer thereon, combined with non-porous partitions between adjacent cells, substantially as and for the purpose set forth."

The general defense is want of novelty, which is subdivided as follows: *First*, prior use; *second*, anticipation in prior patents and publications; *third*, public use more than two years prior to the application; *fourth*, lack of invention; *fifth*, the claims are too broad, and include well-known prior inventions; *sixth*, the patent is ambiguous, and misleading, and does not point out the inventions; *seventh*, the original application was unlawfully expanded by amendments. Non-infringement of the fourth claim, if construed to mean that the electrodes must be applied to the partitions, is also alleged.

That the language of the patent is ambiguous, and especially so as it relates to the first claim, seems to be conceded on all hands. If other proof were needed that it is not written in the most perspicuous language, it will be found in the fact that the record contains nearly 2, 000 pages, the greater part of which, as well as of the briefs, which aggregate 411 pages, is devoted to an effort to ascertain its meaning,—an effort which has hardly crystalized into a demonstration upon any one of the points in controversy.

In construing the first claim it should be remembered that it is limited to an improvement upon the well-known batteries of Gaston Plante, who was the creator of practical

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secondary batteries. The art began with him. A secondary battery, as distinguished from a primary battery, is, therefore,



one element of the combination. *Telephone Cases*, 126 U. S. 572, 8 Sup. Ct. Rep. 778. A secondary or storage battery is a battery which has no original power of developing a current of electricity, and is active only when rendered so by sending a current, elsewhere generated, through it. The current produced by the secondary battery, because of the change in the surface of the plates, will run in an opposite direction to that of the current produced by the independent source of electric energy by which it is charged. A primary battery is a chemical generator, of electricity which is active by virtue of the materials of which it is made. The material of at least one electrode passes into solution during the use of the battery. A primary battery is active; a secondary battery, in its inception, is passive. The two differ as a spring differs from a reservoir. In the former the electrodes are dissimilar, and the battery is rendered operative by reason of the attack upon and dissolution of the positive electrode in the battery fluid. The other electrode collects the electric energy from the liquid. In the latter the electrodes are initially similar, or substantially so. They are not acted upon by the liquid, and either may be made the positive or negative electrode by its communication with the charging source of electricity. "A primary battery can only give a certain amount of current in a definite period of time, while in the secondary battery the amount of current which may be obtained from it depends entirely upon the resistance of the conducting wires discharging it." The current may be much stronger than that obtained from the charging battery. A primary battery which has become exhausted may be restored to partial effectiveness by sending a current "through it, always in a reverse direction, from an independent source of electricity, in the same manner, substantially, as a secondary battery is charged. Thus the normal condition of the cell may be approximately, but not wholly, restored, for the battery constantly loses capacity until it ultimately becomes useless. Upon this branch of the controversy, the question regarding which there has been the widest divergence of opinion is whether or not a primary battery, thus treated, becomes a secondary battery. It is insisted on the part of the complainant that it is only a partially regenerated primary battery; that it lacks the essential characteristics of a secondary battery. In a secondary battery there are two elements initially alike, or substantially so, in electric properties, and not separated in the electro-motive scale; both are in the first instance, chemically inactive, and practically insoluble in the electrolytic liquid; either may be connected with the positive pole of the charging battery, and at any time the current may be reversed; the process of charging and discharging may be repeated indefinitely without loss of force, or undergoing physical change. None of these distinguishing features are found in the restored primary battery. On the other hand, the defendants contend that a secondary battery may be one which at any stage of its existence has come to a state of electrical equilibrium so that it can give no electricity of itself; in other words, that a secondary battery may be a primary battery

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which has become exhausted, and charged from an independent generator; that the distinction between the two lies not in

the construction of the battery, but rather in its condition, so that the same battery may at one time be primary in its action and at another time secondary. When the chemical energy of the battery has an electric origin the battery is called a secondary one; when it has not such an origin it is a primary one. It is well-nigh impossible to reach an accurate and comprehensive definition, so that batteries of all varieties can be instantly classified. There are well-known primary batteries and well-known secondary batteries; but between these there is a narrow, debatable ground occupied by actual and suppositive hybridous structures which can hardly be included in any general definition or placed in either group. At this point it may be said, generally, that an ordinary well-known type of a primary battery, does not, it is thought, become a secondary battery, as that term is understood by electricians, because it is partially restored by sending a reverse current through it. The possession of the knowledge that this may be done would not aid materially in the construction and operation of a secondary battery. The patent is addressed to those having a peculiar and technical knowledge of the subject. *Loom Co. v. Higgins*, 105 U. S. 580, 585. Terms of art are used. When, therefore, one electrician speaks to another of a secondary battery he does not mean, and will not be understood to refer to, an exhausted primary battery, but to the structure before described. For the purposes of this case no greater particularity or refinement of definition is necessary.

The claim further provides "for an electrode consisting of a support coated," etc. It is insisted that by a necessary implication the claim is limited to the use of two similar electrodes. The argument in support of this theory is ingenious, but it is answered by the plain language of the claim. *An* electrode cannot mean *two* electrodes. Had the patentee thought otherwise he would hardly have used the words "a pair of electrodes," in the fourth claim. The French patent, the file-wrapper, and the patent in suit all demonstrate that the patentee had his attention sharply drawn to the distinction between one electrode and two electrodes, and that he deliberately and intentionally claimed the former. He must abide by his decision. *Sutter v. Robinson*, 119 U. S. 530, 541, 7 Sup. Ct. Rep. 376; *Shepard v. Carrigan*, 116 U. S. 593, 6 Sup. Ct. Rep. 493; *Roemer v. Peddie*, 27 Fed. Rep. 702; *Caster Co. v. Spiegel*, 26 Fed. Rep. 272. A secondary battery, therefore, containing one Faure electrode would be within the claim, although the other electrode were dissimilar, provided the two operate to receive and discharge electricity as stated in the specification.

The plates may be of metal, (lead, for instance,) or of a non-metallic substance, (carbon, for instance,) coated on one or more faces with an active layer of absorptive substance, which may be "metal, metallic oxide, or salt, which layer is or at once becomes porous or spongy." The porous coating may be of lead or any of the salts of lead. Metallic compounds, as well as metals, may be used. Preference is expressed for spongy lead, but

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other coatings are included. "This active material may be applied in various ways, so as to obtain a layer of the desired

depth, as in the form of paint, paste, or cement, in the form of a deposit by galvanic action or chemical precipitation or otherwise." It may be applied—that is, added to, and not formed out of, the plates—in any suitable way, so only it is of the desired thickness, and of sufficient uniformity to be an improvement on Plante. It must operate successfully in a secondary battery, and instantly become permeable to the liquid, and thus be capable of receiving and discharging electricity. It is asserted by the defendants that the claim is broad enough to cover an electrode the active layer of which is soluble in the electrolyte, and one to which the layer is applied after immersion in the battery fluid by galvanic deposit or chemical precipitation out of a solution in the liquid. The complainant, on the other hand, insists that the proper construction is that the absorptive substance, which is insoluble in the electrolyte, must be applied prior to the commencement of charging the battery, and, consequently, prior to the immersion of the electrode in the battery liquid. Each of these conflicting theories finds support in the contradictory and ambiguous statements of the specification. The experts seem to agree that the claim covers an electrode coated with a suitable active layer deposited thereon mechanically, chemically, or electrolytically. The complainant's witnesses think the method of application as a paint, paste, or cement to be the most advantageous, and that the specification indicates by strong implication that this was Faure's opinion also. They consider, however, that all the described methods are included in the claim, with no preference expressed for any one. When the layer is applied mechanically it naturally must be before immersion in the battery fluid, but it can hardly be said that galvanic action refers to another than the charging battery, or that chemical precipitation refers to other than the battery liquid. The patent does not express a preference for the pre-applied layer, and the most natural and sensible interpretation would seem to be that when the layer is to be formed electrically it shall be by galvanic deposit out of a solution in the electrolytic liquid itself. The plate can as well be coated there as in another liquid, and to coat it elsewhere would seem to be a cumbersome and inconvenient process. But it is said that the description of the charging and discharging process indicates that the coatings are pre-applied; that otherwise the charging would not operate to reduce immediately the layer to porosity or sponginess on one electrode, and peroxidize it on the other. It could not at once become spongy, unless placed there before the plates were put in the battery liquid. But it would seem that this contention can hardly be maintained in view of the express language used. Again, the patent is not specific upon the question whether or not the absorptive substance shall be insoluble in the battery fluid. The language which directly bears upon this point is as follows:

"The oxides or salts of lead not soluble in the electrolytic liquid are deemed the most advantageous for covering the supports of the electrodes. The invention is not, however, limited to these, but includes generally substances capable of absorbing and storing

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electric energy in the manner described; for example, manganese, or any salt the oxide of whose base is insoluble.”

Whatever may be said of the active layer, there can be no dispute that this language is insoluble. No one connected with the cause professes to understand it. It is unique as a specimen of close-woven ambiguity. The complainant's counsel admits that the first sentence implies that a soluble layer may be employed, but he thinks the second sentence indicates that this is not the correct view, and that the intention of the patentee was to include only porous layers which are capable of absorbing and storing electric energy in the manner described, namely, by deoxidizing on one electrode and peroxidizing on the other when the battery is charged, and by oxidizing the spongy layer and deoxidizing the peroxidized layer when it is discharged. It is insisted that this operation is not possible if the active layers go into solution; that they would not then absorb or store electricity. On the other hand, it is contended that the patentee did not intend to limit the invention to the oxides or salts of lead not soluble in the battery fluid, but wished to include generally all substances as materials for covering the supports which are capable of absorbing or storing electricity, electrolytically. The patentee specifically states that the invention includes manganese. A support would be within the invention, therefore, if coated with the sulphate of manganese, which is a salt soluble in the liquid, though the oxide of its base is insoluble. It is thought, then, that the language of the patent, although by no means clear, can hardly be construed to exclude a coating soluble in the electrolyte. Why the patentee, having invented a practical, efficacious, and meritorious method, should have used language which apparently includes an inferior and comparatively useless one is, indeed, inexplicable. That it was intentional can hardly be imagined. If these conclusions are correct it follows that the claim should be construed to cover—*First*, a secondary battery as distinguished from a primary battery; *second*, an (one) electrode in the battery, capable, in conjunction with the other electrode, of receiving and discharging electricity as described; *third*, the said electrode formed of a plate of metal or carbon or any suitable non-metallic substance; *fourth*, the active layer of sufficient depth and uniformity to operate successfully, added to the plate in any suitable way, as a paint, paste, or cement, or electrolytically, or chemically; *fifth*, the active layer of spongy lead or any metallic compound capable of satisfying the conditions of the patent as to porosity, etc; *sixth*, any suitable electrolytic liquid.

It now becomes necessary to ascertain whether the invention, as so described, is anticipated or rendered void for want of patentable novelty by anything disclosed in the prior art, and, if so, whether the real invention of Faure can be saved by a disclaimer of non-essential features inadvertently inserted in the specification. The defendants have introduced an immense number of exhibits, which show the steady evolution in batteries, both secondary and primary. As to a vast majority of these it is not pretended that they anticipate. They may be interesting from a scientific standing-point, but they shed little

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light upon the issues in controversy, and rather tend to confuse them. In order to determine who shall be rewarded in the race for invention it is not essential to note



the efforts of those contestants who have dropped out during the first half of the contest. Those who reach the goal are to be considered, and the one who reaches it first is entitled to the prize. It is only necessary, therefore, to examine those exhibits which show the closest approximation to Faure's invention.

The article from the *Electrician* of 1863 is entitled "Secondary Batteries." The writer, after describing a battery charged from an independent source, and which contains a couple like Planters, except that the positive element is of zinc, instead of leads, says:

"We have by preference employed for the primary battery a few Daniell's cells, which, although much less rapid in their action than the Bunsen cells, suffice for the production of the peroxide of lead, on which the efficiency of this secondary battery depends. The great power of the secondary combinations we have referred to is due to the presence of the peroxide of lead in contact with the negative elements in these combinations."

The writer then describes a negative element of platinum or lead, surrounded by a mixture of dilute sulphuric acid and peroxide of lead, and a positive element of amalgamated zinc in dilute sulphuric acid. He says further:

"By the action of a battery of any kind, provided the tension or electric motive force be sufficient, we may readily obtain a secondary couple, or any number of secondary couples constituted therein upon the principle of Grove or according to the plan of De la Rive, of using the peroxide of lead instead of nitric acid. Such secondary couples may be capable of remaining in action only for a few minutes, or for very much longer space of time, according to the period which they are charged by means of the primary battery."

The plan of De la Rive, referred to, describes as an electrode for a primary battery a thin plate of platinum placed in a porous pot, with a powder of peroxide of lead, and, in some instances, the peroxide of manganese, packed around it. This arrangement is quite similar to the negative electrode of Leclanche's United States patent, No. 165, 452, and to the Faure electrode shown in Fig. 2 of his drawings. In fact, if the other electrode shown in this figure were amalgamated zinc instead of "a piece of lead with its inner face covered by a paste of sulphate of lead," the analogy would be well-nigh perfect. The difficulty with the article as an anticipation seems to be that there is no pretense that in charging the battery therein mentioned "the electricity acts to produce a reduced mass of porous lead on one electrode, and a mass of peroxide of lead on the other." To one not versed in electrical science the operation described in the *Electrician* would seem to differ but little from the act of restoring a cell of De la Rive or Leclanche" by the application of a current from an external source sent through it in an inverse direction. The article is not illustrated by drawings, the descriptions are somewhat vague and general, and there is no evidence that a successful secondary battery having the characteristics mentioned was ever made; on the contrary, structures quite similar were proved to be inoperative and valueless. It would seem that the article "relates to that class of batteries which give

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electricity of themselves.” A person skilled in the art, after reading it, would not be able to construct a Faure battery in any of its

practical forms. It does not, therefore, anticipate, unless a very broad construction is given to the claim.

The report of the Smithsonian Institution for 1856 describes a secondary battery of any number of platinum plates containing a current of far greater electro-motive force than that of the charging battery. The plates were platinized,—that is, platinum black had been deposited thereon electrolytically, producing a microscopical film of finely divided platinum of a thickness “not far from the hundredth part of the thickness of a sheet of thin paper.” Though the operator obtained a better result with the plates thus coated than when they were bright, he seems to have been oblivious as to the reason therefor. The gas battery of Mr. Grove was made with two strips of platinum, covered by glass tubes holding oxygen and hydrogen gas, respectively. These strips were platinized, and the platinized metal formed with amalgamated zinc into a battery. Kirchoff’s United States patent, No. 31, 545, describes a battery, each cell of which contains a pair of platinum electrodes. The cells are glass cups, filled with a solution of the salts of lead. Upon being connected with a charging battery, “the negative electrode will turn black peroxide of lead, and the positive electrode will be surrounded by crystalized lead. This is a very positive element, and the former (peroxide) the most negative known to exist, and also a good conductor. By changing the proportions of the substances of the solution, more or less peroxide of metal will be deposited, and the conducting power, etc., may be increased or decreased in the same ratio.” This would seem to describe a secondary battery with two initially similar platinum plates, both coated by the charging current with a layer of active material. The criticism of this reference is that it shows a battery which, in the initial state, before charging, has no coating of any kind on the plates. The coatings are produced out of, and at the expense of, the battery fluid, and as the gradual and slow result of charging. But this criticism loses sight of the statement of the patent that the active layer may be deposited by galvanic action. Plants, too, described, in 1872, his attempts to produce a thicker layer of peroxide of lead by galvanic deposit at the expense of the liquid. He says:

“If we make use of alkaline solutions, the lead is deposited in a spongy form, which increases rapidly in volume, and presents an analogous inconvenience to the one just given. Further, the peroxide of lead once deposited is not attacked when immersed in the alkaline solution, as it is in water acidulated by sulphuric acid, so that there is obtained under these circumstances only a very feeble secondary current. I have therefore thus far limited myself to the employment of water acidulated with one-tenth of sulphuric acid, which has always furnished by its action upon the peroxide of lead a secondary current superior in intensity to that of all other combinations, either acid or alkaline.”

The idea of Percival, also, as shown in his United States patent, No. 53, 668, was to improve on Planters method by saving time and expense. He describes a secondary bat-

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tery consisting of one pair of electrodes placed in a water-tight wooden box, divided in its center by a porous partition. On each side of this partition is a layer of powdered

gas-carbon. These layers constitute the two electrodes, and when in use they are wet by a proper solution. For convenience in establishing connection with these layers there is on each end of the box a screw-cup, fastened to a strip of copper which is in contact with the carbon. "Lead, or any other suitable metal in the form of a coarse powder, may be substituted for the gas-carbon." This appears to be somewhat analogous to some of the forms described by Faure. The complainant contends that the reference is valueless for the reason that there is no suggestion of a conducting support-plate, like Faure's, which, holds the active layer, and, conducts electricity to each and all parts of it, so that the whole material instantly becomes spongy, and thus capable of receiving and discharging electricity. In short, that the Percival battery is without the, Faure support-plate.

Regarding the prior use sworn to by Prof. Van der Weyde, it must be held that upon his testimony alone the court would not be justified in overthrowing the patent. The granting of a patent raises a strong presumption of novelty. Clear and convincing proof must be advanced to offset it. Proof which leaves the mind in doubt, or evenly balanced upon the question, is not enough. It is permissible for the court to reject the evidence, unless it is of such a character as to remove uncertainty and doubt. *Coffin v. Ogden*, 18 Wall. 120; *Wood v. MI Co.*, 4 Fish. Pat. Cas. 550; *Howe v. Underwood*, 1 Fish. Pat. Cas. 160; *Loom Co. v. Higgin*, 4 Ban. & A. 88. In the present instance the witness testifies to what occurred 14 and 25 years ago. He is a man of great learning and research. Though visionary, and a confessed theorist, he is restless, energetic, and untiring in his labors "in the dark and profound mine" of science. During the period between his alleged discovery and his testimony the subjects that occupied his attention were numberless. As an illustration, he testifies that during these years he took out more than 30 patents and wrote at least 5, 000 articles on scientific subjects. That such a man, with his attention engrossed to such a phenomenal extent, should be able to recall with perfect accuracy experiments and results made and reached by him nearly a quarter of a century ago seems amazing. He may be mistaken; he may have confused experiments unintentionally; he may have exaggerated results. All this is possible, if not probable. In some matters his statements are clearly shown to be inaccurate. He is wholly uncorroborated. He asserts that his attention was called to the subject by reading in a foreign publication in 1864 an article which practically anticipated Faure. No such publication is produced, and it is hardly possible that it could have existed. He was therefore referring to something which he saw after the Faure invention, or he entirely misconceived the purport of the article. If he were the author of the great improvement made practical by Faure it is surely remarkable that he should have allowed the secret to perish. If he did not consider it of sufficient value to make it the subject of a patent, it would seem at least that he might have mentioned the fact in one of his 5, 000 publications. There is not a reported case where, upon such

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proof, unsupported by other evidence, a patent has been overthrown. In the *Telephone Cases*,

126 U. S. 546, 8 Sup. Ct. Rep. 778, a far stronger case of prior invention was made out for Drawbaugh. He was corroborated by a host of witnesses, but the improbability of his story induced the majority of the court to disregard it. That he should have made this wonderful discovery, and yet remain mute while the world was ringing with admiration for Prof. Bell's invention, was too far opposed to "the ordinary laws that govern human conduct" to receive the sanction of the court. But even if Prof. Van der Weyde's testimony were corroborated so as to leave no doubt as to the accuracy of his statements, his acts must, within the authorities, be regarded as unsuccessful experiments. His researches, so far as any useful result is concerned, were as abortive as those of the alchemists. He accomplished nothing. He made several experiments in a small way, but they were chiefly for his own instruction. As to several he admits that they were utter failures, and of others he says: "I did not consider them of much importance, as I never applied them to any practical results by constructing a storage battery. It is, perhaps, one of my defects to search out properties of substances, chemical or electrical, and, when I have found them, I neglect the practical application, being often led off in another line of research." This was apparently the difficulty in the present instance; he neglected "the practical application;" the matter passed from his mind; the implements used by him were forgotten amid the rubbish of his cellar. The language of the court in *Putnam v. Hollender*, 19 Blatchf. 48, 6 Fed. Rep. 882, can, with propriety, be applied. At page 62, 19 Blatchf., and 6 Fed. Rep. 896, Judge BLATCHFORD says:

"The defendants have not shown that the invention was complete and capable of producing the result sought to be accomplished. \* \* \* The thing was inchoate, and rested in experiment. The process pursued for its development failed to reach the point of consummation. However nearly Otto approximated to the end in view, he only made progress. The world derived no benefit from what he did. The recollection of it was stimulated by the success of De Quillfeldt's invention. But for that, Otto's structure would have still been reposing in the old trunk beneath the stairs, forgotten and worthless."

In *Adams v. Jones*, 1 Fish. Pat. Cas. 527, the court, at page 531, says:

"It is only when some person, by labor and perseverance, has been successful in perfecting some valuable manufacture, by ingenious improvements, and labor-saving devices, that their patents are sought to be annulled by digging up some useless, rusty, forgotten contrivances of unsuccessful experimenters."

See, also, *Putnam v. Vom Hofe*, 19 Blatchf. 63, 6 Fed. Rep. 897; *Gayler v. Wilder*, 10 How. 477; *Hall v. Bird*, 6 Blatchf. 438; *Tilghman v. Proctor*, 102 U. S. 707; *Andrews v. Carman*, 13 Blatchf. 307; *Hicks v. Otto*, 22 Blatchf. 94, 19 Fed. Rep. 749; *Clough v. Gilbert*, 106 U. S. 166, 1 Sup. Ct. Rep. 188; Walk. Pat. § 86.

The evidence of prior invention by Charles F. Brush is now to be considered. In determining this question, Faure, being at that time a citizen of France, is not permitted to

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claim the invention earlier than the date of his French patent, which was October 20, 1880, and, possibly,



not earlier than December 7, 1880, which is the date of the decree (*arrets*) under which it was delivered. Mr. Brush is an electrical engineer, and is a prolific inventor and patentee in connection with arc lighting and other electrical subjects. He testifies that in the latter part of 1878 he first became familiar with the discoveries of Plante, and learned that the lead plates constructed by him required several months of electrical treatment in order to produce the necessary active coatings on their surfaces. In December, 1878, or very early in 1879, he conceived the idea of making a secondary battery by applying mechanically to suitable plates an active or absorptive coating, so that such plates might be used at once, after suitable charging, for electrical storage purposes, without the tedious, preliminary, forming process described by Plant. In the summer of 1879 he embodied this idea; making a secondary battery by applying to suitable plates or supports, by mechanical means, an active or absorbent coating. For this purpose he took a piece of sheet lead about 3 inches wide and about 12 inches long, and sprinkled thereon finely divided metallic lead, in the form of a fine powder, which could be passed through a sieve. This layer was about one-sixteenth of an inch in thickness, and it extended the whole width of the plate, and about three-fourths of its length. The lead powder was held in place by blotting paper, the edges of which were turned back and under the plate at the sides and bottom. A narrow strip of wood was laid longitudinally on the blotting paper and the whole was wound tightly with a string. This plate was suspended in a tall glass jar nearly filled with dilute sulphuric acid, and formed the oxygen element of the cell. The hydrogen element was a plate of amalgamated zinc, suspended opposite the prepared lead plate in the glass jar. Soon after the completion of this cell he prepared two more lead plates in exactly the same manner as the one described, and hung them both in a tall glass jar filled with the same electrolyte. In this cell one of the prepared lead plates formed the oxygen element, and the other the hydrogen element. He connected this cell in a series with the one first described, and charged it by means of the current from a dynamo-electric machine. The strength of the current was not measured, but it was somewhere about five amperes. He charged the cell several hours on each of several days before commencing to discharge it. He discharged it through a fixed and constant resistance, and noted the time which the current lasted, and was thus able to compare the performance of this cell quantitatively with that of other cells discharging through the same resistance. This resistance consisted in the helices of the electro-magnet of a single-stroke electric call-bell. Upon the passage through this magnet of the current from the secondary battery cells its armature was strongly attracted. He found that the electrical storing capacity of the prepared plates was very much greater than that of the Plante plates of the same size. During the first few weeks, after the construction of the cell with the lead plates as described, he discharged and recharged it frequently, and sometimes daily. After that he always kept it charged,

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and discharged it less frequently, up to May, 1880. Besides ringing the electric call-bell he used the coil of this

battery in connection with other secondary cells for exciting a large electro-magnet, with which he magnetized permanent magnets. He also used it in connection with other cells for the heating of platinum and iron wires, and for the ocular demonstration to others of the storage of electricity. About the same time he made two other cells, alike in every particular, except that the coating was, in one instance, of red oxide of lead, and in the other, of litharge. He subjected these cells to the same treatment as the ones first described, with substantially the same result. He says of these cells that "they were all completed, finished, and operative storage batteries from the time of their construction and first charging up to the time of the fire, when they were destroyed. They all operated successfully and reliably during that time." All of the results obtained by Mr. Brush were carefully noted down and preserved; some in the form of entries in a diary, and some on loose sheets of paper. On the 6th of May, 1880, his laboratory, with its contents, was totally destroyed by fire. His diary, and the loose memoranda concerning his experiments, were all lost. In July, 1880, Mr. Brush made lead plates with deep grooves, and into the grooves of some he rammed yellow oxide of lead, and in others sulphate of lead. These plates were laid, grooved side up, in suitable vessels containing dilute sulphuric acid with a piece of metallic zinc in contact with the plates. By this electrical action, continued for many days, the oxide and the sulphate in the grooves were reduced to metallic lead, and the zinc went wholly or partly into solution. He suspended opposite each other, in a vessel of dilute sulphuric acid, two plates which had originally had sulphate of lead in their grooves; and in another cell he suspended two plates the grooves of which were originally filled with oxide of lead. These plates were four inches long by two wide, and were immersed till the grooved portion was covered by the liquid. These cells were charged by a Smee battery. They were charged and recharged many times. In March, 1881, they were accidentally lost during a removal. Early in September, 1880, he prepared six deeply grooved lead plates, and filled the grooves of two of them by ramming them full of litharge, and of two more similarly with sulphate of lead. He then treated them as he had the July plates, and in a few days the oxide of lead in one case, and the sulphate of lead in the other case, were reduced to the metallic state. He suspended the two plates which had been filled with oxide of lead opposite each other in a jar filled with dilute sulphuric acid, and treated similarly the pair having their grooves originally filled with Sulphate of lead and the pair whose grooves were not filled at all. He marked these cells, respectively, 1, 2, and 3; connected them in series, charged them from a dynamo, and made several tests. After the fire in 1880 a full memorandum was kept of the experiments and results obtained. After Faure's patent was issued in January, 1882, interferences were demanded by Brush, and resulted in decisions in his favor at all stages during the progress through the patent-office.

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In many important features of his testimony he is corroborated by the evidence of three witnesses who were present, and saw many of the

experiments referred to. After the fire, Brush undertook to reproduce from memory the memoranda which had been destroyed, and criticism is made that he does not describe with particularity the batteries which he now says he invented, though he does describe with great detail other and inconsequential experiments. It is unfortunate that his reproduced notes should be so meagre on the points in controversy, that his original apparatus should have been destroyed, and that, his battery of July, 1880, should have been lost. Improbabilities and inconsistencies in his statements are pointed out, and it is asserted that none of the experiments detailed by him amount to a perfected invention. Although it is unquestionably true that this proof might have been more convincing and satisfactory, it is also true that there is nothing opposed to it but presumption, conjecture, and guesswork, based upon its inherent defects. There is no fatal improbability, as in the case of the other alleged prior inventor, and the court would not be justified in rejecting for the reasons suggested the testimony of four intelligent, respectable, and apparently fair and honest witnesses. The testimony of Mr. Edmunds and Mr. Hayes is not inconsistent with the statements of Mr. Brush. It is not surprising that he did not care to disclose his experiments to Mr. Edmunds, and when they met and conversed in Paris his application was on file in the patent-office. Nor does it avail the complainant that the Brush structures were experimental, as distinguished from commercial batteries. If the invention was made it cannot matter how it was made, or for what purpose. It is only where experiments fail to reach the desired result, and are abandoned as failures, that they are rejected as proof of want of novelty. They are not rejected when they are carried to a successful consummation. *Waterman v. Thomson*, 2 Fish. Pat. Cas. 461; *Aiken v. Dolan*, 3 Fish. Pat. Cas. 197, 203; Walk. Pat. §§ 63, 86. The evidence of Mr. Brush as to what he accomplished in 1879 and 1880 must be accepted as true; and, although Faure was *de facto* the first inventor, Brush was *de jure* the first inventor of the electrodes described by him. It is not, however, contended for Mr. Brush that he applied the active layer to any of his electrodes in the form of a paint, paste, or cement.

It therefore becomes apparent that the combination of the first claim, construed, as it must be construed under the loose and inaccurate language of the specification, is anticipated in every form in which the active layer can be applied, save one, namely, in the form of a paint, paste, or cement. The question now to be considered is, can the patent be saved to this extent? The application in the form of a paint, paste, or cement was the real invention which Faure made. It was in this form that he gave it practical embodiment; it was this that the scientific world understood to be his improvement. An electrode for a secondary battery, with the active layer applied in this form, has many undoubted advantages over an electrode otherwise coated. It can be applied more evenly; it more readily adheres to the support; it does not shift its position; it "will also pack more closely and

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readily, and make an adherent layer from which air can be thoroughly excluded, so that uniform contact with the

plate and throughout the mass of applied material is secured," and, finally, a greater and less expensive storage capacity can be obtained. There can be little question, upon this proof, that Faure made his discovery as early as August, 1878. Scientific people at once recognized the progressive step taken, and to him was accorded the credit of an invention of extraordinary merit. Sir William Thomson says:

"I knew the Planté secondary battery prior to 1880. Paure's invention was a very great improvement on it; so great as to produce a valuable apparatus for large practical work, instead of merely an interesting and instructive scientific instrument, which Plante's secondary battery was."

It does not appear that Sir William Thomson had the Faure patent before him, but he considered that—

"Faure's invention was the application to two plates—preferably lead plates—of a thin layer of oxide of lead, mechanically applied prior to placing the plates in the battery fluid; the plates and their coatings being insoluble in the battery fluid, and the coatings becoming so altered by the charging current as to become capable of yielding a reverse current, and this, over and over again, an indefinite number of times. I consider the novelty of Faure's invention to be the application of the oxide of lead to the lead plates before passing an electric current through them, and the rendering of these coatings active by immersing them in the battery liquid, and passing the charging current through them."

Professor Barker, the expert witness for the defendants, says:

"To Mr. Faure was due, in my judgment, all the credit which accrued by producing the porous or spongy metallic layer by the method of applying a layer of active material prior to commencing to charge the battery over that due to Plants for producing substantially the same result by the method of disintegration."

And, again:

"I think an electrode formed mechanically would have an advantage of construction in most, if not all, cases over an electrode electrolytically coated."

Professor Van der Weyde says:

"I am of the opinion that there are three inventions which are of leading, supreme, and equal importance in the construction of a successful storage or secondary battery, to-wit: (1) The mechanical application of a previously prepared compound or paste of the active material; (2) the securing of such material to the plate or support by means of recesses in the plate which it entered; and (3) the use of an inoxidizable plate of support."

Mr. Vansize, an expert witness for the complainant, says:

"Faure made a discovery which threw additional light on the art of making commercially successful secondary batteries. As the specification states, he was familiar with Planters battery, and with its degree of effectiveness, but to just what that effectiveness or superiority was due does not appear to have been known prior to Faure's invention. Faure dis-

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covered that the efficiency of Planters battery was due to the use of finely divided spongy lead as a positive element, and his invention is embodied, and the discovery outlined, in the first claim of the patent.”

The inventor himself says of his earliest experiments:

“I took two plates of lead about two and a half inches wide; covered each plate on one side with a paste of litharge, etc. \* \* \* I do not claim to



have invented spongy lead, but I boast of being the first that produced it in large quantity on the electrode of a battery, and the first to recognize it as an efficient element of a secondary battery.”

It is, then, established with reasonable certainty that the discovery of a mechanically applied layer of lead or like substance insoluble in the electrolyte, and placed upon the supports in the form of a paste, paint, or cement prior to their immersion in the battery fluid, so as instantly to become porous, and capable of receiving and discharging electricity, was one of great merit. There is no doubt, either, that Faure was the first to make this discovery. Can he hold the fruits of his genius, or must the court decide that in attempting, through mistake or ignorance of what had previously been accomplished, to grasp more than he was fairly entitled to, he has lost what actually belonged to him? Believing that Faure is an inventor of more than usual merit, it can readily be inferred that the court enters upon this inquiry with every disposition to give him the benefit of his actual invention, if possible to do so under the law.

The proof establishes two propositions with equal clearness: *First*, Faure was the inventor of a secondary battery electrode coated in the manner stated; and, *second*, he was not the inventor of an electrode otherwise coated. If, by means of a disclaimer, the patent can be restricted to the actual invention, this course should, in fairness, be adopted. Section 4922 of the Revised Statutes provides that—

“Whenever, through inadvertence, accident, or mistake, and without any willful default or intent to defraud or mislead the public, a patentee has, in his specification, claimed to be the original and first inventor or discoverer of any material or substantial part of the thing patented, of which he was not the original and first inventor or discoverer, every such patentee, his executors, \* \* \* and assigns, \* \* \* may maintain a suit at law or in equity, for the infringement of any part thereof, which was *bona fide* his own, if it is a material and substantial part of the thing patented, and definitely distinguishable from the parts claimed without right, notwithstanding the specifications may embrace more than that of which the patentee was the first inventor or discoverer. But in every such case in which a judgment or decree shall be rendered for the plaintiff no costs shall be recovered unless the proper disclaimer has been entered at the patent-office before the commencement of the suit. But no patentee shall be entitled to the benefits of this section if he has unreasonably neglected or delayed to enter a disclaimer.”

Section 4917 provides as follows:

“Whenever, through inadvertence, accident, or mistake, and without any fraudulent or deceptive intention, a patentee has claimed more than that of which he was the original or first inventor or discoverer, his patent shall be valid for all that part which is truly and justly his own, provided the same is a material or substantial part of the thing patented; and any such patentee, his heirs or assigns, \* \* \* may, on payment of the fee required by

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law, make disclaimer of such parts of the thing patented as he shall not choose to claim or to hold by virtue of the patent or assignment, stating therein the extent of his interest in such patent. Such disclaimer shall be in writing, \* \* \* and it shall thereafter be considered as part of the original specification. \* \* \* But no such disclaimer shall affect any action pending at the time

of its being filed, except so far as may relate to the question of unreasonable neglect or delay in filing it.”

Mr. Walker, in his work on Patents, at section 193, has blended these two sections in one comprehensive and perspicuous explanation. He says, (section 194 *et seq.*)

“The primary fact which brings the law into play is the claiming by a patentee of materially more than that of which he was the first inventor. Such errors may spring from inadvertence; that is to say, they may spring from failure on the part of the writer of the claims to exercise proper care in penning them. So, also, they may arise from accident, from chances against which even diligent care cannot always guard. But mistake is the most common source of such errors; and such errors may arise from mistake of fact or from mistake of law. \* \* \* If the patentee is willing to eliminate from his claims everything which later information shows had been invented before him, he ought to be allowed to retain his exclusive right to the residue. \* \* \* There are cases where two or more inventions are covered by one claim, and in such cases a disclaimer may be made to expunge one of those inventions from that claim, without disturbing the others.”

Mr. Curtis says:

“Specifications may also be amended by another process,—that of filing a disclaimer,—whenever through inadvertency, accident, or mistake the original claim was too broad, claiming more than that of which the patentee was the original or first inventor, provided some material and substantial part of the thing patented is justly and truly his own. \* \* \* In *Seed v. Higgins*, 8 El. & Bl. 755, 771, the patentee \* \* \* entered a disclaimer, declaring: ‘For the reason aforesaid I do hereby disclaim all application of the law or principle of centrifugal force as being part of my invention, or comprised in my claim, except only the application of centrifugal force by means of a weight acting upon a presser, so as to cause it to press against the bobbin, as described in said specification.’ It was held by the court of Queen’s Bench, and affirmed by the Exchequer Chamber, that this disclaimer was valid, and that, the original specification being read in connection with it, the result was a claim for only the machine particularly described.” Curt. Fat. §§ 267, 286.

In *Aiken v. Dolan*, 3 Fish. Pat. Cas. 197, the patent was for an improvement in knitting needles, and the proof showed that the patentee was the first inventor of an improved latch needle with a curved elevation which was highest at the middle of the groove, and with such a corresponding elevation of the pivot that the end of the latch was depressed when it fell back at that extremity of the groove where the latch of the primitive needle had projected upwards. The claim was as follows :

“What I claim as my invention, and desire to secure by letters patent, is the application of a latch or tongue applied to the hook of the needle and Operated as herein described.”

The court says, (pages 206, 207:)

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“But when the actual invention is thus referred to this improvement alone, the claim in the specification is too broad. It states that the invention consists in the application of the latch or tongue in connection With the hook of the needle, sweeping freely back and forth upon the center pin. The general operation of a latch needle is described, without any specific restriction to the form represented in the drawings. \* \* \* The patent is therefore broader

than the actual novelty of the invention. By a proper disclaimer of the invention of latch needles without any such curvature, the patent would, however, be sustainable for the actual improvement.”

In *Myers v. Frame*, 8 Blatchf. 446, the claim was for “the employment or use of the deflecting plates, E, E, one or both,” etc. Judge BLATCHFORD held that—

“The disclaimer of the use of only one deflecting plate with the saw, and the limitation thereby of the first claim to the use of the two deflecting plates with the saw, was proper, and the disclaimer was in proper form.”

In *Taylor v. Archer*, Id. 315, the claim was for “the use and application of glue, or glue composition, in the tubing, substantially as described, for the purpose of making the flexible tubing gas-tight, whether of cloth, or rubber, or other gum.” A disclaimer, filed *pendente lite*, of that part of the claim “which claims, as an improvement in flexible tubing for illuminating gas, the use and application of glue, thereby limiting the claim to the use and application of glue composition in the tubing, substantially as described,” was held to be valid.

In *Tuck v. Bramhill*, 6 Blatchf. 95, the claim was for “the forming of packing for pistons of steam-engines, either in connection with an India-rubber core or without.” It was held that the claim was equivalent to two separate claims,—one for the forming of the roll with the core, and another for the forming of the roll without the core; that the former was new, but the latter was old; and the patentee had a right to disclaim what was old and retain what was new.

In *Schillinger v. Gunther*, 17 Blatchf. 66, it was held that a disclaimer which took out of the patent so much thereof as claimed a concrete pavement made of plastic material laid in detached blocks or sections, without interposing anything between their joints in the process of formation, and which limited the claim to such a pavement when free joints were made between the blocks by interposing tar paper, or its equivalent, was good. It was held further, that it was not improper, in connection with a disclaimer of a claim, to eliminate or withdraw by the same instrument the parts of the body of the specification on which the disclaimed claim) or part of a claim, is founded. See, also, *Schillinger v. Gunther*, 14 Blatchf. 152.

In *Roemer v. Neumann*, 26 Fed. Rep. 102, the patent, for a lock, was held void for want of novelty, on the ground that it could not be limited so as to include in the claim certain notches in the end-pieces. The court said:

“There is no reference, in terms, either in the specification or the claim, to notches or recesses in the end-pieces. The drawings, however, show the end-pieces formed with notches or recesses, and the patentee incidentally refers to a use to which the end-pieces may be applied in which, inferentially, the notches or recesses would be necessary. This falls far short of making the notches or recesses an essential feature of the invention. It

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cannot be doubted that the reference in the specification is to be treated merely as recommendatory of a form of lock-plate for a specified use, such as is shown in the drawing.”

After this decision was rendered, the patentee filed a disclaimer, disclaiming “in the first and second claims any blocks, B, that have not the notches formed in them as shown in the drawing,” and thereupon asked for a rehearing. A rehearing was ordered, Judge WALLACE observing:

“Such a disclaimer as has been entered in this case is sanctioned by the case of *Schillinger v. Qunther*, 17 Blatchf. 66. The case of *Hailes v. Stove Co.*, 16 Fed. Rep. 240, is not analogous in its facts.”

In *Libbey v. Glass Co.*, 26 Fed. Rep. 757, the court says:

“The claims of the patent are as broad as the specification, and are not limited to any particular compound. Since bringing suit the plaintiff has filed a disclaimer under the statute, in which he limits his claim to the gold-ruby compound. This the plaintiff had a right to do. Under the authorities cited by the plaintiff this was a patent where a part could be properly disclaimed. It did not require the importation of anything new into the specification, but simply the elimination of a part of what was originally claimed.”

See, also, *Silsby v. Foote*, 20 How. 386; *Hall v. Wiles*, 2 Blatchf. 194, 198; *O'Reilly v. Morse*, 15 How. 62, 121; *McCormick v. Seymour*, 3 Blatchf. 209, 222; *Seymour v. McCormick*, 19 How. 96, 106; *Singer v. Walmsley*, 1 Fish. Pat. Cas. 558, 574; *Clock Co. v. Clock Co.*, 4 Ban. & A. 121; *Christ-man v. Rumsey*, 17 Blatchf. 148, 160; *Coburn v. Schroeder*, 19 Blatchf., 377, 380, 8 Fed. Rep. 519; *Burdett v. Estey*, 19 Blatchf. 1, 7, 3 Fed. Rep. 566; *Manufacturing Co. v. Manufacturing Co.*, 8 Fed. Rep. 608, 610; *Tyler v. Galloway*, 20 Blatchf., 445, 447, 12 Fed. Rep. 567; *Gage v. Herring*, 107 U. S. 640, 646, 2 Sup. Ct. Rep. 819; *Brush v. Condit*, 22 Blatchf. 246, 254, 20 Fed. Rep. 826; *Matthews v. Spangenberg*, 20 Blatchf., 482, 19 Fed. Rep. 823; *Sessions v. Romadka*, 21 Fed. Rep. 124; *Dunbar v. Myers*, 94 U. S. 187; *Cartridge Co. v. Cartridge Co.*, 112 R. S. 624, 5 Sup. Ct. Rep. 475.

The law, as established by the foregoing authorities, permits the complainant to save what was really Faure's invention. The defendants, in opposition to this view, rely upon *Hailes v. Stove Co.*, 16 Fed. Rep. 242, affirmed, 123 R. S. 582, 8 Sup. Ct. Rep. 262. There seems to be a clear distinction between that case and the one at bar. In that case there was nothing in the specification to indicate to the public that the invention of the patentee was what he sought to make it by the disclaimer. He claimed “a perforated fire-pot,” etc., and when he found that this was old he sought by disclaimer to limit his invention to a particular kind of fire-pot, described for the first time in the disclaimer. At page 587, 123 R. S., and 8 Sup. Ct. Rep. 265, the supreme court say:

“A disclaimer is usually and properly employed for the surrender of a separate claim in a patent, or some other distinct and separable matter, which can be excised without mutilating or changing what is left standing. Perhaps it may be used to limit a claim to a particular class of objects, or even to change the form of a claim which is too broad in

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its terms; but certainly it cannot be used to change the character of the invention. And if it requires an amended specification or supplemental description to make an altered claim intelligible or relevant, while it may possibly present a case for a surrender and reissue, it is clearly not adapted to a disclaimer. A man cannot, by merely filing a paper drawn up by his solicitor, make to himself a new patent, or



one for a different invention from that which he has described in his specification. That is what has been attempted in this case. There is no word or hint in the patent that the invention claimed was a fire-pot with sides grated only half-way, or part of the way, from the bottom towards the top, or that such partially grated sides have any advantage over those grated all the way to the top. The first claim, as modified by the disclaimer, has nothing in the specification to stand upon; nothing to explain it, nothing to furnish a reason for it.”

The decision states no new law. It is entirely in line with the other authorities cited. Instead of forbidding, it would seem to sanction, a disclaimer in the case at bar. The facts here and in the *Hailes Case* are wholly different. Hardly one of the criticisms upon that disclaimer would apply to a properly drawn disclaimer here.

The part of the invention which *bona fide* belongs to Faure is an electrode in a secondary battery consisting of a support coated with an insoluble layer of active material in the form of a paint, paste, or cement, so as to be or instantly become spongy, etc. It was this that the scientific world recognized as a discovery of great merit and importance. It was this that the distinguished Scotch electrician regarded as “marvelous.” And this was the result of Faure’s genius. No one anticipated him. It is honestly his. What he did not invent was an electrode, in a secondary battery, coated with a soluble layer of active material. Neither did he invent an electrode on which the active material is applied by “galvanic action, or chemical precipitation, or otherwise.” The claim is broad enough to cover all these forms probably, and some of them certainly. What he is not fairly entitled to he wishes to give up, and keep what is certainly his own. He does not seek to broaden his patent, but greatly to restrict it. No one will infringe unless he constructs his battery in the one way to which the patent will be confined. This is the patentee’s Way, and it has many distinguishing characteristics which differentiate it from the ways pointed out by others. The matter to be relinquished is distinct and separate, and can be excised without mutilating what is left. No amendment is necessary. The claim, read in the light of the description, is too broad. It is sought to limit it. The disclaimer suggested will not make a new patent, or a different invention. The invention is fully described in the specification, and the limited claim will stand on that description. After giving the subject the most careful consideration it is thought that Faure was the originator of the invention just described, and that it would be unjust to him to declare the patent wholly void, if he is willing to restrict it to what is lawfully his own.

The fourth claim, if construed to cover the defendants’ structure, is void for want of novelty. It is for a combination containing the following elements: *First*, a secondary battery, *second*, a series of cells; *third*, in each cell a pair of electrodes, with an active spongy layer thereon; *fourth*, non-porous partitions between adjacent cells. The specification declares that—

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“Secondary batteries, like ordinary galvanic batteries, can be made with a series of cells side by side, or one above the other, with the intermediate walls

common to the two adjacent cells. In making such batteries it is advantageous, and in some cases essential, to apply a non-porous partition of rubber or other suitable substance to the plates, so as to cut off all communication between the cells. This combination of non-porous diaphragms with the electrodes in such secondary batteries constitutes a portion of the invention.”

In other words, the claim, if riot limited to, the peculiar construction shown in the specification and drawings, is for placing the electrodes of a secondary battery in an old form of cells. One of the expert witnesses for the complainant says: “I understand that the series of cells described in the fourth claim of this patent is simply the series of cells of the Cruikshank trough battery transferred to or used in a secondary battery.” Another of the complainant’s experts testifies that, in his opinion, “the claim covers substantially the use, in a secondary battery, of the well-known trough divided into cells by non-porous partitions long used in primary batteries, and in which Faure has replaced the primary battery electrodes by the secondary battery electrodes of his own construction.” And, again, he says: “The specification describes one way in which the elements of the combination may be constructed, and the language of the fourth claim is broad enough to cover, not only that specific construction, but any other construction substantially the same, by which substantially the same result is obtained.” Upon the statements of the patent itself without having recourse to the many structures, which the record discloses, containing a series of cells, no novelty can be maintained. It is to be observed that the claim is not necessarily confined to the Faure electrodes. After reading the specification, it may with plausibility be maintained that the patentee was of the opinion that invention was involved in doing in a secondary battery what had previously been done in a primary battery. He wished to claim a series of well-known cells when applied to a secondary battery. The claim covers, in a secondary battery, a series of cells, comprising each a pair of electrodes, with an active, spongy layer thereon. It is broad enough, therefore, to include the electrodes of Plante, and of others, as well as of Faure. An electrician who should place a series of Plante’s couples into a trough, like Wallaston’s for instance, divided into cells by diaphragms, would infringe. But there is obviously no patentable novelty in such an arrangement, especially in view of the fact that Plante” had employed almost the identical combination. In the descriptive memorandum of his patent (No. 78, 897) Plante” says:

“If it is desired to, connect several elements in series, the plates themselves can serve as the walls of the contiguous troughs, just as in the, Cruikshank voltaic battery.”

With the information derived from the prior art before him, the arrangement of the claim would have been obvious to a neophyte in electricity. It is not often that a single-cell battery is utilized in the arts. When a battery of more power is needed, the convenient but obvious arrangement of the fourth claim would suggest itself to any one who has sense enough to economize time, space and money. Even if the claim could be limited

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to Faure's electrodes, there would still be nothing of which to predicate patentability. A mere aggregation of cells, with no

result except such as is derived from multiplication, is not sufficient. If Faure had omitted the fourth claim, and all reference thereto, in the specification, no one else could have obtained a patent for a series of Cruikshank or Wilkinson cells containing Faure's electrodes. Neither can Faure. No matter how ingenious a devise may be there is usually no more of the inventive faculty displayed in placing it in a known series than if it were of the simplest character. Invention cannot be asserted for the aggregation because of the novel character of the segregated structures. There is no more ingenuity displayed in placing Faure's electrodes in a well-known trough than in placing there the electrodes of some one else. His invention was for a new electrode in a secondary battery. This he is entitled to, but he is not entitled to claim as new a well-known construction of cells because he puts his new electrodes into them. It is clear that a construction of the claim, which is broad enough to cover the defendant's battery, renders the claim invalid. *Bush v. Fox*, 38 Eng. Law & Eq. 1; *Holmes v. Alarm Co.*, 33 Fed. Rep. 254; *Holmes v. Stove Co.*, 123 U. S. 586, 8 Sup. Ct. Rep. 262; *Heating Co. v. Burtis*, 121 U. S. 286, 7 Sup. Ct. Rep. 1034; *Railroad Co. v. Truck Co.*, 110 U. S. 490, 4 Sup. Ct. Rep. 220; *Car Co. v. Car Co.*, 34 Fed. Rep. 130.

A limited construction can, however, be given the claim, which will render it valid. The defendants' expert insists that the claim must be confined to a combination in which the electrodes are combined with non-porous partitions between adjacent cells by being applied thereto. The manner in which this is done is described in the specification. It says:

"Fig. 6 is a cross-section of an electrode with non-porous partition, having the prepared plates secured on both sides, and adapted for use in a battery with series of adjacent cells. \* \* \* It shows the arrangement of parallel plates formed with an interposed wooden board. x This arrangement permits of employing thin sheets of lead, while securing at the same time sufficient stiffness, and affording means of firmly securing the parts, x, without any leakage between the adjacent cells, formed on each side of the leaden plate, a."

The specification further states that when the supporting plates are to be placed either parallel or in any other position permitting of their being distorted; by mechanical strain, stiffness may be impacted by applying them on wood or hard rubber non-porous boards, so as to prevent any liquid passing from one cell to another. The boards of these compound supports have edges fitted with india-rubber, in order to fender the cells perfectly liquid tight. It is argued with force and plausibility that it was the intention of the patentee, as shown by these extracts from the specification, to cover only his special construction, the novel feature of which is the non-porous partition with which the electrodes are combined, and to which they are applied. It is asserted that this intention is rendered more certain by an examination of the file-wrapper, where it is still more clearly disclosed; and

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that nowhere in the specification is there a description of the apparatus as constructed by the defendants. In view of

these facts, and because the patentee, in effect, disclaimed the construction sought to be placed upon the claim by the complainant; it would seem that the defendants' construction has much in reason and authority to support it, and is the more rational of the two. So construed, the defendants do not infringe the claim.

The patent granted to Joseph Wilson Swan, February 17, 1885, (No. 312, 599,) is for an improvement in secondary batteries. The application was filed January 18, 1882. The object and aim of the patentee was the production of plates having surfaces more suitable for holding the active material. In carrying out this idea he prepares plates with perforations, cells or holes extending through the plates, in which the active material is packed. He says:

"It should be understood that the form of the cells may be greatly varied without departing from the principle of my said invention, the object being to obtain an interstitial construction of plate capable of affording a very large amount of acting surface in a small compass, and to prevent the coating of oxide or spongy lead from falling away from the plate, as it would from a plain vertical surface, unless held in position by some material external to the said coating;"

The claim is:

"A perforated or cellular plate for secondary batteries, having the perforations or cells extending through the plate, and the active material, or material to become active, packed in the said perforations or cells, substantially as described."

The specification states that the patentee has obtained a patent in Great Britain for the same invention, dated May 24, 1881. It is argued that this allegation carried the invention back to the date of that patent, although the patent itself has not been introduced in evidence. No authority is produced to sustain this contention. Being a mere declaration, unsupported by proof, it is thought that it cannot be accepted as the date of the invention, which, in the absence of other proof, must be taken as of the date of the application, January 18, 1882. The advantages of a plate constructed in the manner described are well summarized by Sir William Thompson. He says.

"The making Of the support-plates perforated to receive the active oxide has great advantage over making them with mere grooves or roughenings, because it supersedes the necessity for felt or cloth to prevent the active material from falling off. \* \* \* I have found the oxide very liable to crack away and fall off when merely placed in grooves or pressed into hollows of a roughened plate. When pressed into perforations they remain very securely attached, forming, as it were, rivets.\* \* \* Even with bad usage it is a rare accident that one of the oxide 'rivets' breaks and falls out. The perforated plates have also the great advantage of extending the area of electric communication between the continuous metallic conductor and the spongy or porous material, and so minimizing the electric resistance. The application of the oxide in the form of numerous mutually detached parts separately

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held by the perforations had also a great advantage in almost annulling the warping Or fracturing effects of the expansion and contraction produced by the changes of oxidation to which the active material is exposed in the charging and discharging of the battery.”



In view of these facts, there is no difficulty in deciding that an electrode so constructed was patentable. The invention is a simple one, but something more than mechanical skill was required. Indeed, the experts on both sides agree that such an electrode has marked and peculiar advantages.

It is insisted that the patent, as issued, is an unlawful expansion of the original application, and therefore within the rule of *Railway v. Sayles*, 97 U. S. 563. The argument is based upon the assumption that in the original specification the patentee nowhere describes electrodes with perforations extending through the plates, and that it was not until March 24, 1882, that he mentioned a perforated plate. The complainant denies this, and asserts that Figs. 1 and 2 in the patent, as issued, are identical with these figures in the original drawings. Positive proof of this statement has not been found, but the presumption that it correctly states the fact is very strong. The original specification states that—

“The plate shown in Figs. 1 and 2 is constructed with cells or cavities, *a*, for the reception and retention of spongy lead. \* \* \* The cells may be closed on one side, as shown at *c*, in Fig. 2.”

The only rational construction would, seem to be that, as the last figure showed the cells closed on one side, the two others showed them not closed but open through the plate. It must also be assumed that the officials of the patent-office performed their duty, and did not permit a fraud to be perpetrated by the alteration of the drawings. There is absolutely no proof that such alterations were made, and, if the memoranda of the file-wrapper can be relied upon for any purpose, they show that the original drawings were in the office at the time the claim for a perforated plate was presented, and long afterwards.

The question, therefore, is whether there is anything in the art prior to January 18, 1882, which anticipates the claim, or renders it invalid. The English patent granted to John S. Sellon does not anticipate, for the reason that, though dated September 10, 1881, it was not sealed until March 10, 1882, after the filing of Swan's application. It was not made patent to the public, therefore, until March 10, 1882. *Smith v. Goodyear*, 93 U. S. 486, 498; *Bliss v. Merrill*, 33 Fed. Rep. 39, 40; *Siemens v. Sellers*, 123 U. S. 276, 283, 8 Sup. Ct. Rep. 117. But the evidence of Prof. Asahel K. Eaton, if it does not amount to a complete anticipation, so narrows the field of invention that nothing remains of which to predicate patentable novelty. It is thought, however, that as to some of the electrodes made by him there can be no doubt that they fully anticipate Swan's claim. If made now for the first time they would infringe; being made before the application, they anticipate. *Cook v. Tool Co.*, 4 Sup. Ct. Rep. 4; *Peters v. Manufacturing Co.*, 21 Fed. Rep. 319; affirmed, 9 Sup. Ct. Rep. 389, (March 5, 1889.) Prof. Eaton testifies that in 1881, and certainly prior to August, 1881, he made experiments in secondary batteries, using perforated lead plates for the electrodes. He finally adopted them, considering them preferable

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to others tried by him. These plates were perforated by means of a belt punch, which cut out small discs varying from a quarter to five-eighths

of an inch according to the size of the plates. Lead sponge previously prepared was then precipitated upon both sides of the plate so as to cover both surfaces and fill the perforations. He says:

“I afterwards adopted one of the methods which I had tried, where I used two perforated plates with the sponge deposited upon one or both of them, and the two plates put together so as to retain the sponge between them, the sponge filling the perforations. This made one electrode. The other electrode was made with two similar perforated plates, the peroxide being made into a paste with sulphuric acid and water, and pasted upon each side of a piece of asbestos. This was put between the two perforated plates, and pressed down, so that the paste covered the whole surface of each half plate, and filled the perforations. Some of these plates were perforated, so as to leave a burr projecting in one direction, which aided in the retention of the paste; the two burred surfaces being outside. This provided an enlarged cellular cavity.”

In July, 1881, he made another battery, with the assistance of one George Farrington, who corroborates him in part as to its construction. This battery was made by spreading the described paste upon either cloth or asbestos, and inclosing it between two perforated plates of lead. The perforations, in the absence of a proper tool, were made with a knife. This formed one element. The other element was made by precipitating lead sponge upon one surface of a similarly prepared plate, and covering it with another, plate, so as to make one, folded together at the edge. The paste was minimum, mixed with sulphuric acid and water. This paste filled the perforations in the plates. Prof. Eaton also made electrodes by coating with a similar paste a frame-work of woven lead wire. The batteries thus constructed by him were charged, and worked successfully. Besides Farrington, he is corroborated by Mr. Sleeper, who assisted in the construction of the batteries of August, 1881, by punching holes in regular order in the leaden plates. And Sleeper is, in turn, corroborated by entries made at the time in his diary, which also contains rough drawings of the perforated leaden plates. No evidence is offered by the complainant. Which at all conflicts with the verity of these statements. As before observed, the court is not permitted to reject the evidence of unimpeached and respectable witnesses, when they are corroborated, and there is nothing to cast a doubt upon the truth of their statements. Upon this evidence, therefore, the first Swan patent must be declared invalid.

The second patent granted to Joseph Wilson Swan is dated May 26, 1885, (No. 318, 828.) The application was filed May 3, 1883. The claim is as follows:

“In a battery plate or electrode composed of a conducting Support, combined With active material, the support in the form of a plate with angular or equivalent holes, cells, or perforations extending through the same, and separated from one another by webs, walls, or partitions of uniform cross-section, the active material being placed in said holes, cells, or perforations, substantially as set forth.”

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This would seem to be for the same subject-matter covered by the first patent to Swam It is conceded that the alleged invention is described

and shown in the first patent. The only difference suggested is that the second patent is for a, more limited subdivision of the same general invention. The patentee, in the specification, states:

“It should be observed that I do not claim herein broadly the use of plates provided with holes or perforations extending through the same, and having the active material, or material to become active, held in such holes or perforations, as this forms the subject-matter of patent granted to me on the 17th day of February, 1885, numbered 312, 599.”

One of the complainant's experts, after stating his understanding of the first patent, says of the patent in hand: “It has a specific claim,—a claim rendered specific by its limitation to uniform webs, walls, or partitions separating the perforations from each other.” Another of the complainant's experts says that his understanding is that the second patent covers plates or electrodes such as are described in the first patent, “with the additional limitation that the webs, walls, or partitions between the cells shall be of substantially uniform cross-section.” It will be observed that the drawing of the first patent shows a plate made in exact accordance with this limitation, and the specification states that the form of the cells may be greatly varied without departing from the principle of the invention. Even if the second patent can be distinguished from the first in the particular stated by the experts, it is entirely clear that the difference pointed out is wholly insufficient to sustain an invention. After the first patent there was absolutely no room for the second patent; which, upon the most favorable construction for the complainant, simply claims an arrangement which any one who had sense enough to make the perforations at all would most certainly adopt. When a patent has been granted for a plate containing rows of holes, another patent cannot be granted for the same plate containing uniform rows of holes. Neither can there be anything patentable in, the mere shape of the holes. A patent for a device containing round holes will preclude a subsequent patent for the same device with square, or triangular holes. *Manufacturing Co. v. Bushing Co.*, 31 Fed. Rep. 76; 79. Especially is this so when the applicant is confronted with his own express declarations that the shape is wholly immaterial. It is not necessary to consider whether a valid patent can be obtained for an invention described but: not claimed, by the applicant, in a prior patent issued to him; the application for the second patent being filed before the first patent issues. That is not this; case. Swan describes no invention in the first patent which is not covered by the claim of that patent. What is not claimed is not patentable.

It follows, therefore, that the complainant, upon filing a disclaimer limiting the first claim of the Faller patent to an electrode of a secondary battery to which the active layer is applied in the form of a paint, paste, or cement, insoluble in the electrolytic liquid, is entitled to a decree for an injunction and an accounting upon the claim as thus limited, but without costs.