BRUSH ELECTRIC CO. *v.* WESTERN ELECTRIC LIGHT & POWER CO.

Circuit Court, N. D. Ohio. August 15, 1890.

PATENTS FOR INVENTIONS—INFRINGEMENT.

Letters patent No. 219,208, to Charles F. Brush for an electric lamp, are valid, and cover all forms of mechanism constructed to separate two or more pairs or sets of carbons dissimultaneously or successively, so that the light is established between the members of but one pair or set at a time, while the members of the remaining pair are kept separate. The word "dissimultaneous," used in his claims, refers to that separation which results in the production of a single arc. This patent is infringed by patent No. 418,758 to Charles E. Scribner for an electric arc-lamp, notwithstanding that the primary or initial separation of the two pairs of carbons in the Scribner lamp is simultaneous.

(Syllabus by the Court.)

In Equity.

This was a bill in equity to recover damages for the infringement of letters patent No. 219, 208, issued September 2, 1879, to Charles F. Brush for an electric lamp. In the introduction to his specifications, he states that his invention "relates to electric lamps or light regulators, and it consists:

"(1) In a lamp having two or more sets of carbons adapted by any suitable means to burn successively; that is, one set after another.

"(2) In a lamp having two or more sets of carbons, each set adapted to move independently in burning and feeding.

"(3) In a lamp having two or more sets of carbons, adapted each to have independent movements, and each operated and influenced by the same electric current.

"(4) In a lamp having two or more sets of carbons, said carbons, by any suitable, means, being adapted to be separated dissimultaneously, whereby the voltaic arc bet Ween, but in a single set of carbons, is produced."

To effect this result, he employs and shows a system of mechanism of which a lifter, D, is a prominent feature. This lifter has a movement imparted to it by magnetic attraction due to the current operating the lamp, and in being raised lifts the upper or positive carbon of each set, not simultaneously, but one after the other, in such manner that the arc is formed between carbons last separated, which burn until they are consumed, when the carbon first raised is automatically lowered, and the arc formed, between the carbons first separated, which also burns until these are consumed. By multiplying the sets of carbons this process may be Continued until the last ones are consumed and the light thus indefinitely prolonged. While this mechanism is elaborately explained and described, the patentee is careful not to limit himself to that or any other, and in, his specifications says expressly:

"I do not in any degree limit myself to any specific method or mechanism for lifting, moving, or separating the carbon points or their holders, so long as the peculiar functions and results hereinafter to be specified shall be accomplished."

The claims alleged to be infringed were the first six, which are as follows:

"(1) In an electric lamp, two or more pairs or sets of carbons, in combination with mechanism constructed to separate said pairs dissimultaneously or successively, substantially as described and for the purpose specified.

"(2) In an electric lamp, two or more pairs or sets of carbons, in combination with mechanism constructed to separate said pairs dissimultaneously or successively, and establish the electric light between the members of but one pair, to—wit, the pair last separated, while the members of the remaining pair or pairs are maintained in a separate relation, substantially as shown.

"(3) In an electric lamp having more than one pair or sets of carbons, the combination; With said carbon sets or pairs of mechanism constructed to impart to them independent and dissimullaneous separating and feeding movements, Whereby the electric light will be established between the members of but one of said pairs or sets at a time, while the members of the remaining pair or pairs are maintained in a separated relation, substantially as shown.

"(4) In a single electric lamp, two or more pairs or sets of carbons all placed in circuit, so that when their members are in contact the current may

pass freely through all said pairs alike, in combination with mechanism constructed to separate said pairs dissimultaneously or successively, substantially as and for the purpose shown.

"(5) In an electric lamp wherein more than one set or pair of carbons are employed, the lifter, D, or its equivalent, moved by any suitable means, and constructed to act upon said carbons or carbon-holders dissimultaneously or Successively, substantially as and for the purpose shown.

"(6) In an electric lamp whereby more than one pair or set of carbons are employed, a clamp, C, or its equivalent, for each pair or set, said clamp, C, adapted to grasp and move said carbons or carbon-holders dissimultaneously or successively, substantially as and for the purpose shown."

Complainant was the assignee of this patent from Brush. The answer set up several patents, which were claimed to be anticipations, and denied infringement in general terms. The case was argued before Judge RICKS of the northern district of Ohio and Judge BROWN of the eastern district of Michigan.

L. L. Leggett and *H. A. Seymour,* for complainant.

John W. Munday, Ephraim Banning, and *George P. Barton,* for defendants.

BROWN, J, The progress of the art of electrical illumination has been marked by successive and well-defined steps from the early experiments of Sir Humphrey Davy, in 1810, to its present perfected condition. Sir Humphrey seems to have succeeded, with the aid of a galvanic battery of 2,000 cells, in producing an arc-shaped light between two pencils of charcoal; but, owing to the rapid combustion of his charcoal points, to the want of proper mechanism for adjusting his electrodes to compensate for wear, and to the great cost of his battery, his experiments were of no practical or Commercial value. The first of these obstacles was removed in 1844 by Foucault, who substituted for the soft charcoal points of Davy the hard gas carbon electrodes now in use; the second, in 1848, by Archereau, who devised an imperfect and clumsy regulating device, by which two vertical carbon electrodes were maintained in the same relative position, notwithstanding their combustion; and the last in 1870 by the invention of the dynamo-electric machine of Gramme, wherein a current of sufficient strength to render electric lighting commercially practicable is generated at a comparatively small expense. These discoveries, and in particular the dynamo of Gramme, opened up to electrical experimentalists new and unsuspected possibilities of usefulness, and henceforward inventions multiplied with great rapidity. Most of them, however, were directed to improvements in the material of which the carbons were made, in the brilliancy and steadiness of the light itself, to improvements upon the dynamos, and in the mechanism by which the carbons were held in the same relative position during the process of combustion. One difficulty, however, remained to be overcome. The electrical resistance of the carbons was such as to preclude

the employment of very long rods, and their Consumption by burning away was hastened by their adjacent ends becoming highly heated to a considerable distance from the arc. This difficulty was partially remedied

by covering the carbon pencils with a thin film of copper, electrically deposited thereon, by which the electrical resistance of the carbons was materially decreased, much longer rods were possible, and the light maintained continuously for from 6 to 10 hours. This was insufficient, however, for all-night lighting, and necessitated the extinguishment of the lamp and a renewal of the carbons at some time during the night, in order to keep up a continuous light.

To obviate this inconvenience, Mr. Brush invented the device embodied in the patent in suit, the most prominent feature of which is the use of double sets of carbons in such manner that when the first pair is consumed the arc is automatically established between the second pair, and is continued until they are consumed. This is accomplished by the use of certain helices, E, which, when the current is turned on, are energized and operated to raise a lifter, D. This lifter, acting upon two ring clamps, CC, surrounding the carbon-holders, tilts them, and causes them to clamp and lift the two carbon-holders, DD, not at exactly the same instant, but in a quick but perceptible succession, whereby the arc is established between the pair last separated, and held there until they are consumed, (the first pair being meanwhile retained in their position,) when the first pair automatically descend and take their place. By this means a steady light can be kept up, without any manual interference whatever, for a period of from 14 to 20 hours. This was certainly an important discovery, and even if his patent be not "pioneer" in the strict sense of the term, it is such a decided step in advance of anything which preceded it that defendants' experts, Warner and Kellogg, are constrained to admit, not only that Brush was the first to invent the principle of substitution in his double carbon lamp, but that the Western Electric Company could not successfully compete with the companies using his patent in furnishing all-night electric lighting plants unless it could provide double carbon lamps to its customers. Such being the undisputed facts, we think that complainant is entitled to the favorable consideration of the court, and his patent to a liberal construction,—a construction which, so far as consonant with the language the patentee has himself chosen, will protect him in what, he has actually invented. None of the devices set up in the answer contain the principle of the Brush patent; none of them are even worthy of being considered as anticipations, except the American patents to Day of 1874, Nos. 147,827 and 156,015, and the French patent to Denayrouse of 1877, Nov 3,170. The Day patents, upon which defendants chiefly rely as an anticipation of the Brush patent, as construed by the complainant, exhibit a single carbon lamp, having two carbons instead of one attached to each carbon-holder, so that in the operation of the lamp both branches of the carbon-holder are raised and lowered *simultaneously.* While the upper and lower carbons are in contact, the current is divided between them, but, when separated to form the arc, though the separation of both sets occurs at the same instant, owing to the difference in resistance

of the carbons only a single arc is formed. When this arc has burned for a few minutes, the arc will shift to the other pair of carbons, remaining until they are so far consumed

as to require additional feeding, when the arc is shifted back to the first pair, and they are thus caused to burn alternately, instead of successively, as in the Brush patent. This alternation is of Course owing to the fact that both sets of carbons are separated *simultaneously,* and not in succession, as in the Brush patent, in which one is held in reserve until the first pair is wholly consumed. The Day lamp, however, not only lacks the non-coincidence in the separation of the carbons, which is the prominent feature of the Brush patent, but in practice it never seems to have been a success. The shifting of the light from one pair of carbons to the other took place every few minutes, and was attended each time by a momentary extinguishment of the light, which occurred so frequently that it was not considered of any commercial value; and during the 16 years it has been in existence but two lamps seem ever to have been constructed in accordance with the patent, one of which was tested in 1879 and proved a failure, and the other of which was made in 1887 for the purpose of being used as an exhibit in this case. Not only was the light fluctuating and unsteady, but the idle pair of carbons so near the pair in operation threw a broad shadow back of them, which was transferred from one side of the lamp to the other as the arc shifted, and seriously impaired the commercial value of the lamp.

The French patent of Denayrouse, it is true, contained the principal feature of the Brush patent in the successive combustion of two pairs of carbons, but by means so different that they can by no stretch of construction be regarded as mechanical equivalents. The invention has no application to carbons placed end to end, as in the American patents, but to those lying side by side, as in the patent of Jablochkoff, who appears to have originated this arrangement. It is in fact a duplication of the Jablochkoff candle, with the addition of—

" An electric key for making and breaking contact with the electric current for each such candle. Tins key is worked by one arm of a lever, the other arm of which has a stud pressed by a spring against the candle, which is burning, near its lower end. When this candle is burned nearly down, so that the stud of the lever is no longer supported by the solid matter of the candle or carbon, the lever and key are moved by the spring, and contact is thus broken with the circuit for the nearly consumed candle, and is made with the circuit for a fresh candle, which is thereby kindled, and thus successively, as candle after candle becomes consumed, fresh candles are kindled automatically to take their place."

But as this patent is not seriously claimed as an anticipation, no further reference to it will be made. The main questions in this case turn upon the proper construction of the Brush patent. While the claims are undoubtedly broad, they ought not to be interpreted as for a function or result, since there is nothing novel in substituting one pair of carbons for another, and thus securing a successive combustion of two or more pairs. It was done long before the Brush patent, and may still be done by manual interference, by replacing one set of carbons with another, or by any mechanism which does not involve the dis-

simultaneous and dissimultaneously separating and feeding movement. What the claims purport to cover are briefly all forms of mechanism constructed to separate the two

or more pairs or sets of carbons "dissimultaneously" (a word coined for the occasions but readily understood) or successively, in order that the light may be established between the members of but one pair or set at a time, while members of the remaining pair are maintained in a separate relation, It is claimed by the defendant, however, that the words "dissimultaneously or successively, "contained in the first six claims of the patent, refer only to the exact instant, the very *punctum temporis,* of the separation of the carbons; and that as the Scribner patent, under which the defendants are operating, provides for the initial simultaneous separation of the carbons, there is no infringement, though the light is formed between but one pair, the other being held in reserve to a wait their consumption. If this contention be correct, then, it necessarily follows that Brush, who is acknowledged to be the actual inventor of the double carbon, and whom defendants' expert, Mr. Lockwood, frankly admits (page 243) to be justly regarded as having done more than any one else to make electric arc lighting on a large scale a practical success, secured by his patent the mere shade of an idea,—a wholly immaterial and useless feature,—abandoning to the world all that was really valuable in his invention. In determining the proper construction of his claims, two considerations ought to be kept prominently in view: (1) The declared object of the inventor; (2) the state of the art.

1. That he intended to secure for himself all he now claims, is evident upon the most cursory reading of his patent. In the introduction to his specifications he says that his invention consists—

"*First,* in a lamp having two or more sets of carbons, adapted by any suitable, means to burn successively; that is, one set after another. *Second,* in a lamp having two or more sets of carbons, each set adapted to move independently in burning and feeding. *Third,* in a lamp having two or more sets of carbons, adapted each to have independent movements, and each operated and influenced by the same electric current. *Fourth,* in a lamp having two or more sets of carbons, adapted each to have independent movements, and each operated and influenced by the Same electric current; Said carbons, by any suitable means, being adapted to be separated dissimultaneously, whereby the voltaic arc between a single set of carbons is produced."

—This last clause apparently for the very purpose of removing any doubt as to the object of the non-coincident separations of the carbons. Again he says:

"I do not in any degree limit myself to any specific method or mechanism for lifting, moving, or separating the carbon points or their holders, so long as the peculiar functions and results hereinafter to be specified shall be accomplished. * * * This function of dissimultaneous action upon the carbons or their holders, whereby one set of carbons shall be separated in advance of the other, constitutes the principal and most important feature of my present invention."

These peculiar functions, and results are subsequently described as follows:

"One pair is separated before the other; it matters not how little not how short a time before. This separation breaks the current at that point, and the electric current is now, passing through the unseparated pair of carbons,

A[1], and now, when the lifter, continuing to rise, Separates these points, the voltaic arc will be established between them, and the light thus produced." "It will be apparent by the foregoing that it is impossible that both pair of carbons, A, A[1], should burn at once. * * * This function, so far as I am a ware, has never been accomplished by any previous invention; and by thus being able to burn independently, and one at a time, two or more carbons in a single lamp, it is evident that a light maybe constantly maintained for a prolonged period without replacing the carbons or other manual interference."

This function is again restated in the second and third claims. It would seem that no language could make the object of the inventor clearer than that which he has chosen.

2. A reference to the state of the art, as already shown, demonstrates that Brush was a pioneer in this branch of electrical construction. As an experienced electrician, it could hardly have escaped his attention that it is practically impossible, with the most delicate adjustment of mechanism, to keep up, with the same current of electricity, two distinct voltaic arcs for any length of time, owing to the inevitably different resistance of the two sets of carbons. If there had been any doubt upon that point, a reference to the Day patents would have solved It. These patents exhibit two pairs of carbons separated apparently simultaneously, but as the patentee states—

"The current selects the route offering the least resistance, and therefore follows that pair of carbons in closest impact. When the points are separated, it continues to follow the same pair until the distance between them, resulting from waste, is too great, when the current weakens or breaks. * * * The current chooses another pair of carbons, the magnets come into play, and the light is re-established."

Indeed, it is quite apparent from all the experiments connected with the arc lighting that the establishment of the arc between one pair of carbons, instead of both, was not necessarily due to the initial non-coincidence in the separation of the carbons, but also to tho different powers of resistance of different carbons of low resistance, which seems inevitable, however delicately the mechanism be made or adjusted. In this view it is difficult to see what object Brush could have had in patenting this feature, and we think, therefore, that the word "dissimultaneous" used in his claims should be construed as referring to that separation which results in the production of a single arc.

It is argued, however, by the defendants, that, while the claims originally presented by Brush were broad enough to cover the feature of the successive burning of the two pairs of carbons, these claims having been rejected as functional, he subsequently accepted narrower claims, and that, under the familiar principle that a patentee who has once acquiesced in the rejection of a claim cannot thereafter claim it by construction, applies in this case. If the premises be true, the conclusion is undoubtedly correct. The specifications were originally filed May 15, 1879, and the first three claims were rejected as "too

broad or functional," but ho objection was made to the fourth. These claims were again presented, with a very slight and immaterial change, and were

again rejected July 8th, as "not materially changed." This called forth a protest from the patentee, who reformed his claims, but says in his letter that "these claims, being fully as broad as any yet presented, we anticipate the same objection, and will therefore endeavor to show wherein the examiner has erred." He then enlarges upon the importance of the invention, denies that the claims are too broad or functional, states that his invention is a principle or method of moving the carbons in a double carbon lamp, and that "to prolong the time that any electric lamp will continue its light without any manual interference or attention is a vitally important matter," and urges the allowance of the claims. The new claims were presented July 14th and 16th, apparently in person, and the patent was allowed on the following day. On comparing the claims as originally presented with those finally allowed, we find the changes to be of little consequence. The first claim was changed only by erasing the words, "whereby the voltaic arc is established between the members of but a single pair, to-wit, the pair last separated," but, as these words are substantially contained in the Second and third claims, the change was not an abandonment of this feature. Certainly the first claim is no narrower than it was before. In the second original claim the words, "each pair or set adapted to have independent separating and feeding movements," are erased, and the words, "in combination with mechanism constructed to separate said pairs dissimultaneously or successively," substituted, but with words added showing the object to be "to establish the electric light between the members of but one pair." In the third claim the word "dissimultaneous" is combined both with "separating" and "feeding" movements, indicating very clearly the object of the patentee. But it is quite unnecessary to analyze these claims at length. Taken in connection with the correspondence, they show that the examiner yielded to the views of the patentee, and allowed the claims in such terms as to express his theory of the invention.

In the view we have taken of the proper construction of this patent, the question Of infringement presents no difficulty. The defendant company admits that it used in Toledo, in the course of its business, for the purpose of commercial lighting, a number of double carbon lamps similar to the complainant's exhibit, "defendant's lamp;" but insists that such exhibit has been injured or changed by the twisting of the lifting lever and the bending of the clutch lever, so that it is in an abnormal condition. This exhibit shows a complicated piece of mechanism, by means of which the electric current entering the lamp is divided, a portion being used to energize two magnets, AA, the object of which is, through a system of levers, to raise the two carbon rods. When the arc is established between one pair of these carbons, the other is lifted, and held in reserve by a retaining magnet until the first pair is consumed. In this exhibit there is a perceptible dissimultaneous initial separation of the two pairs of carbons, and hence an infringement of complainant's lamp, even according to the narrow interpretation put upon it by the defendants; but it is insisted that

this is an accident in the construction Or use of this particular lamp. The testimony of Mr. Nolen, however, a witness

for the complainant, shows that in February, 1887, he examined a lamp at defendant's station in Toledo similar to complainant's exhibit, "defendant's lamp," and that the mechanism was such that one of the carbons was raised a little before the other, and that he noticed about 18 other similar lamps in operation in Toledo. Mr. Adams, another witness, swears that he visited Toledo the following year, and saw these lamps, and that all he observed were burning on the same side; that the next morning he looked at the same lamps, and always found the burned-out pair of carbons upon one side, and the other only partially consumed, and that, upon manual manipulation of some of these lamps, one or two separated their carbons with a visible want of coincidence. This is certainly strong evidence to indicate a purpose on the part of the designer or the manufacturer of these lamps that the separation of the carbons should be simultaneous. This testimony, however, is denied by defendants' witness Warner, who examined the same lamps, and found but two in which the separation did not take place simultaneously, which he judged to be due to rough handling by those having charge of them. We do not care, however, to discuss this testimony at length, or to dispose of this case upon the theory that defendant has made use of a few lamps which in practical operation may have separated their carbons dissimultaneously, and thus have infringed the Brush patent upon defendants' own interpretation of it.

The Scribner lamp, which defendants are using, undoubtedly contemplates an initial simultaneous or coincident separation of the two pairs of carbons, and in this particular differs from the Brush patent. They are alike, however, in the vital feature that the final or arc-forming separation is dissimultaneous, and in the total consumption of one pair of carbons before the other. In the Brush patent the order of combustion is *predetermined* by the initial non-coincidence of the separation. In the Scribner patent it is a matter of *chance,* or of the retaining magnets, depending upon the relative resisting power of the two carbons, which is first consumed; in other words, the non-coincidence is a function of both patents, but in one it is a matter of calculation, and in the other a matter of accident. Undoubtedly if the Scribner patent had preceded that of Brush, the latter would have to be limited to the initial non-coincidence of separation; but, as it precedes the other, we think it entitled to a liberal interpretation. If we are correct in this view, then as the Scribner patent contemplates a dissimultaneous arc-forming separation by mechanism, certainly not radically different from that of Brush, we are constrained to hold it an infringement. It is unnecessary to go into the details of the Scribner device, so long as by *mechanism* it accomplishes automatically the function of the Brush patent. We think the language of the supreme court in the case of *Sewing-Machine Co.* v. *Lancaster,* 9 Sup. Ct. Rep. 299, is applicable to this patent:

"He was not a mere improver upon a prior machine which was capable of accomplishing the same general result, in which case his claim would properly receive a narrower

interpretation. This principle is well settled in the patent law both in this country and in England. Where an invention is one of a

primary character, and mechanical functions performed by the machine are, as a whole, entirely new, all subsequent machines which employ substantially the same means to accomplish the same results are infrigements, although the subsequent machines may contain improvements in separate mechanisms which go to make up the machine."

We should have felt fully justified in disposing of this case by a simple reference to the opinion of Judge GRESHAM in the *Brush Electric Co.* v. *Ft. Wayne Electric-Light Co.*, 40 Fed. Rep. 826, in which the same construction was placed upon the Brush patent; but, in view of the importance of the questions involved, and of the elaborate preparation of counsel, we have deemed it proper to give it an independent consideration.

We are clearly of opinion that complainant is entitled to relief in this case, and a decree will therefore be entered for an injunction, and the usual reference to a master to assess and report its damages.

[1] No opinion was filed.