

BRUSH ELECTRIC CO. V. FORT WAYNE ELECTRIC LIGHT CO. ET AL.  
v.40F, no.14-53

*Circuit Court, D. Indiana.*

December 24, 1889.

1. PATENTS FOR INVENTIONS—ELECTRIC LAMPS—PATENTABILITY.

The claims of letters patent No. 219,208, issued September 2, 1879, to Charles F. Brush, for improvement in electric lamps, consisting of two or more pairs of carbons in combination with mechanism to separate such pairs successively and independently, so that the light will be established between but one pair at a time, while the other pairs are maintained in a separated relation, and so that when their members are in contact the current may pass freely through all said pairs alike, substantially as shown in the specifications, are valid, not being for mere functions or results, but being limited to the means described or its equivalent.

2. SAME.

The claims of said patent for the lifter and clamps which move the carbons, “substantially as and for the purpose shown,” is for such lifter and clamps in combination with the other mechanism described in the specifications, and is valid.

3. SAME—INFRINGEMENT.

Said patent is infringed by a lamp so constructed as to cause two pairs of carbons to be successively separated in identically the same way as the Brush lamp, though the infringing device uses a hinge clamp, instead of a ring clamp, to hold the carbons.

4. SAME—ANTICIPATION.

Letters patent No. 147,827, issued February 24, 1874, to Matthias Day, Jr., for an electric lamp in which each carbon is split vertically for a slight distance from the outer end, but is so rigidly connected at the clamp end as to act solely as a pair of separate carbons, and not as two or more independent pairs of carbons, is not an anticipation of the invention described in said Brush patent.

5. SAME—GENERAL SPECIFICATION—DISCLAIMER.

Where a patentee describes certain mechanism in his specifications, and then declares that he does not limit himself to such mechanism, or its equivalent, but refers in his claim to the mechanism “substantially as shown” he need not disclaim the broad language of the specification in order to validate his patent, since the scope of the patent is measured by the terms of the claim, and the general statement in the specifications is mere surplusage.

In Equity.

*M. D. & L. L. Leggett and H. A. Seymour*, for complainant.

*R. S. Taylor*, for defendants;

GRESHAM, J. This suit is brought for alleged infringement of letters patent No. 219,208, granted to Charles F. Brush, September 2, 1879, for improvement in double carbon electric lamps of the arc type. Brush assigned the patent to complainant before suit was brought.

When two ordinary, pointed, carbon sticks are in contact in an electric circuit, the circuit is closed, and the current freely passes through the carbons, without the production of any appreciable amount of heat or light at the point of contact. If, however, while the electric current is passing through them, the carbons are slightly separated, the current

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will continue to flow, and in crossing or leaping the small space intense heat and light will be produced. This is known as the electric arc lamp, and the one generally used for illuminating large buildings and halls, and for lighting streets. The incandescent electric light is produced by causing a current of electricity to pass through a filament in a glass bulb, from which the air has been exhausted. In its passage the current encounters great resistance, and, as a consequence, the filament is heated

to a degree producing a bright, white light throughout its entire length. This light is well adapted to use in-doors. As early as 1810, Sir Humphrey Davy, with a battery of 2,000 cells, succeeded in producing an arc light between two horizontal charcoal pencils, insulated, except a small portion at their ends; but, owing to the rapid combustion of the soft points, the great cost of the battery, and the short duration of the light, it was of no practical or commercial value. But little progress was made in the improvement of this light or lamp until 1844, when Foucault substituted pencils made of hard gas carbon for the charcoal pencils of Davy, and thereby, for the first time, produced a persistent, but short-lived, electric arc light. By a clock-work mechanism, Foucault fed the pencils toward each other, but imperfectly regulated their burning. The voltaic battery did not generate electricity on a sufficiently large scale. The light was expensive, and it did not go into general use. Later, the dynamo electric machine was developed, in which a powerful current of electricity was produced by revolving coils of wire in a field of magnetic force furnished by powerful, permanent magnets, after which the arc electric light was successfully used in lighthouses in England, and later (1867) in France. But up to this time no means had been devised for producing an adequate current of electricity for illumination at practicable cost; and it was not until the invention of the Gramme dynamo electric machine, in 1872, that electricity was produced in a manner, and of sufficient strength, to render electric lighting practical and useful. This machine was afterwards improved in details of construction. In this state of the art, Brush entered the field of invention, and on May 7, 1878, obtained patent No. 203,412 for his arc lamp, which was superior to any lamp that had preceded it. This lamp, however, was not capable of burning continuously more than 8 or 10 hours, and, when used for all-night lighting, it was necessary to extinguish the light and renew the carbons; and, in order to obviate this defect, Brush invented the lamp in suit. His invention, and the means by which it is carried out, are thus described in the specification:

“My invention relates to electric lamps or light regulators; and it 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, said carbons, by any suitable means, being adapted to be separated dissimultaneously, whereby the voltaic arc between but a single set of carbons is produced; *fifth*, in the combination, with one of the carbons or carbon holders of a lamp employing two or more sets of carbons, as above mentioned, of a suitable collar, tube, or extended support, within or upon which the carbon or carbon holder to which it is applied shall rest, and be supported. \* \* \* I desire to state, at the outstart, that my invention

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is not limited in its application to any specific form of lamp. It may be used in any form of voltaic arc light regulator, and would need but a mere modification in mechanical form to be adaptable to an indefinite variety of the present forms of electric lamps. My invention comprehends, broadly, any lamp or light regulator,

where more than one set of carbons is employed, wherein—say in a lamp having two sets of carbons—one set of carbons will separate before the other. For the purpose, merely, of showing and explaining the principle of operation and use of my invention, I shall describe it, in the form shown in the drawings, as applied to an electric lamp of the general type shown in United States letters patent No. 203,411, granted to me May 7, 1878, reissued May 20, 1879, and numbered 8, 718. The leading feature of this type of regulator is that the carbon holder has a rod or tube which slides through or past a friction clutch, which clutch is operated upon to grasp and move said carbon rod or holder, and thus to separate the carbons and produce the voltaic arc light; and I shall refer to such a lamp in my following description: A represents one set of carbons; A<sup>1</sup>, another set, each carbon having an independent holder, B, B<sup>1</sup>. The carbon holders, B, B<sup>1</sup>, may either be in the form of a rod or tube, and each of them is made to pass through a clamping and lifting device, C, C<sup>1</sup>, respectively. These clamps and lifters, C, C<sup>1</sup>, are shown in the present instance in the shape of rings surrounding their respective carbon holders, B, B<sup>1</sup>. This form, while I have found it for general purposes the best, is not necessarily the only form of clamp that may be used in carrying out my present invention. Each ring clamp, C, C<sup>1</sup>, is adapted to be lifted from a single point, thus tilting it, and causing it to grasp and lift its inclosed carbon holder. This tilting and lifting movement is imparted to the clamps, C, C<sup>1</sup>, by any suitable lifter, D; and this lifter may have its movement imparted either by magnetic attraction, due to the current operating the lamp, or by the expansive action of heat upon any suitable apparatus connected with the lamp; said heat generated by the electric current operating the lamp. 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 lifter, D, in the present instance, is so formed that when it is raised it shall not operate upon the clamps, C, C<sup>1</sup>, simultaneously, but shall lift first one and then the other; preferably, the clamp, C, first, and C<sup>1</sup>, second, for reasons which will hereinafter appear. 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. In the lamp shown in the drawings the lifter, D, is actuated and controlled through the agency of magnetic attraction due to the influence of the current operating the lamp, and this is accomplished as follows: One, two, or more Spools or hollow helices, E, of insulated wire, are placed in the circuit, within whose cavities freely move cores, E<sup>1</sup>. The electric current, passing through the helices, E, operate to strongly draw up within their cavities their respective cores, E<sup>1</sup>, in the same manner

as specified in my former patent, above referred to. The cores,  $E^1$ , are rigidly attached to a common bar,  $E^2$ , and the upward and downward movement of this bar, due to the varying attraction of the helices,  $E$ , is imparted by a suitable link and lever connection,  $E^3$ ,  $E^4$ , to the lifter,  $D$ . By this connection the lifter will have an up and down movement, in exact concert with the cores,  $E^1$ ; and it is apparent that this connection between magnet and lifter may be indefinitely varied without any departure from my invention, and therefore, while preferring for many purposes the construction just specified, I do not propose to limit myself to its use. The lifter,  $D$ , may be so constructed and applied as to separate the carbons,  $A$  and  $A^1$ , successively or dissimultaneously, by being so balanced that any difference, however slight, between the weights of the carbons,  $A$ ,  $A^1$ , or their holders,  $B$ ,  $B^1$ , shall result in one being lifted and separated before the other. In order properly to balance the attractive force of the magnets, a coil spring,  $F$ , or its equivalent, may be employed, substantially as shown; and, to insure a steady motion to the magnets and to the

carbon points, A, A<sup>1</sup>, a dash-pot, G, or its equivalent, should be employed, as this prevents any too sudden, abrupt, or excessive movement of parts. H, H<sup>1</sup>, are metallic cables, through which the current is conducted from above the clamps, C, C<sup>1</sup>, to the carbons, A, A<sup>1</sup>. By this provision is not only insured a good connection between the upper carbon points and the mechanism above it, but another important advantage is obtained, and that is the prevention of sparks due to any interruption of the current between the carbon holder, B, B<sup>1</sup>, and its clamp or bearings. This spark, if occurring too frequently, is liable to burn and roughen the rods, B, B<sup>1</sup>, or their bearings or clamps, and thereby render their operation uncertain, because it is important that a free movement to any degree, however minute, may be allowed the carbon holder. These cables, H, H<sup>1</sup>, while operating as just specified, are sufficiently flexible and yielding not to interfere with any movement of their respective carbons or carbon holders. The operation of my device, as thus far specified, is as follows: When the current is not passing through the lamp, the positive and negative carbons of each set, A, A<sup>1</sup>, are in actual contact. When, now, a current is passed through the lamp, the magnetic attraction of the helices, E, will operate to raise the lifter, D. This lifter, operating upon the clamps, C and C<sup>1</sup>, tilts them, and causes them to clamp and lift the carbon holders, B, B<sup>1</sup>, and thus separate the carbons, and produce the voltaic arc light; but it will be especially noticed that the lifting and separation of these carbons are not simultaneous. One pair is separated before the other. It matters not how little, nor how short a time before. This separation breaks the circuit at that point, and the entire current is now passing through the unseparated pair of carbons, A<sup>1</sup>; 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 pairs of carbons, A, A<sup>1</sup>, should burn at once; for any inequality of weight or balance between them would result in one pair being separated before the other, and the voltaic arc would appear between the last-separated pair. This function, so far as I am aware, 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 may be constantly maintained for a prolonged period without replacing the carbons, or other manual interference. In the form of the lamp shown, I can, with twelve-inch carbons, maintain a steady and reliable light, without any manual interference whatever, for a period varying from fourteen to twenty hours. It is for some reasons desirable that one set of carbons,—say the set A,—should be consumed before the other set commences to burn, although it is not essential, in carrying out my invention, that the carbons should be consumed in this manner, inasmuch as, if desirable, they may be arranged

to burn alternately, instead of successively. It is apparent, however, if one set of carbons can be made to entirely consume before another set begins to burn, that there will be less interruption of the light than if the different pairs were allowed to consume in frequent alternation. I have therefore shown, in the present invention, one method of securing a consumption of one set of carbons before another shall begin to burn. This I accomplish through any suitable support, K, and in such a construction of the lifter, D, that it shall be positive in its function of separating one set of carbons before the other, or, in case where more than two sets of carbons are employed, to separate said sets successively. In the lamp as shown in the drawings, the support, K, is in the form of a tube surrounding the carbon holder, B; and this support, K, is made of such a length that when the carbon, A<sup>1</sup>, shall have been sufficiently consumed, a head upon the carbon holder, B, will rest upon the top of the support, K, whereby the weight of the carbon holder, B, and its support, K, shall at all times and under any circumstances be supported by the lifter, D. Besides



the carbon holder, B, with its carbon, and the support, K, the lifter, D, (when the lamp is in operation,) should also be made to carry the carbon holder, B<sup>1</sup>, and its carbon. The lamp is primarily adjusted so that the magnets through the lifter, D, shall always carry a definite load, to wit, (in the lamp shown,) the carbon holders, B and B<sup>1</sup>, and support, K. The desirability of this construction and arrangement may be explained as follows: Supposing, as is designed in the present instance, the carbons, A, are first consumed. During that time, of course, the magnets are lifting both carbon holders, B, B<sup>1</sup>. Now, when the carbons, A, are consumed, if no provision was made to the contrary, the carbon holder, B, would not be lifted during the consumption of the carbons, A<sup>1</sup>; and this diminishment of the weight carried by the magnets would be liable to materially disturb the adjustment of the lamp, and impair its operation accordingly. To obviate this difficulty, I have provided the support, K, by which provision the magnets shall be made to carry both carbon holders, B, B<sup>1</sup> and the support, K. The difference in weight, owing to the consumption of the carbons, is a practically unimportant matter, and does not materially interfere with the operation of the lamp. In the case of a lamp where the carbon holders, B, B<sup>1</sup>, are very light, and where the weight of one might be relieved from the magnet, or other moving agent, without material disturbance, the support, K, might be dispensed with. Said support, K, might also be omitted, if desired, in a lamp where the lifter is actuated through the agency of the expansion of a metal wire or bar, by the action of heat generated by the current operating the lamp, inasmuch as, the force due to said expansion being practically irresistible, it would not be so necessary to obtain a balance between various parts, as is the case with a lamp as shown in the drawings. \* \* \*

“Thus far, I have mentioned but two ways of imparting dissimultaneous motion to the carbons of an electric lamp, viz., through magnetic attraction, and through the expansive action of heat. This function of my device may be accomplished by clock-work, or equivalent mechanical contrivance; and in this respect, as before stated, I do not limit my invention. L, L<sup>1</sup>, are metallic hoods or protectors for inclosing and shielding the upper projecting ends of the carbon holders, B, B<sup>1</sup>. In the form of lamp shown in the drawing, I obtain very satisfactory results by constructing the helices, E, according to letters patent No. 212,183, granted to me February 11, 1879. In each helix, E, two independent wires surround the lifting magnets, E<sup>2</sup>, one of fine and one of coarse wire, and each placed in the general circuit operating the lamp. These two wires, the fine and the coarse, are constructed and connected in such a manner as to carry current in opposite directions around the inclosed core, thus exerting a neutralizing influence upon each other, whereby a governing function is secured; for a better description and understanding of which reference is made to said patent No. 212,183. The poles of the lamp shown in the drawings are

constructed in the form of suspending hoops or loops, from which the lamp is suspended, and the corresponding hooks or loops with which they engage in the ceiling, or other locality where the lamps are used, are the positive and negative poles of the current-generating apparatus. Thus, by the simple act of suspension the lamp is placed in circuit.

“I will now specify a construction whereby the protecting globe surrounding the light can be raised and lowered for convenience in renewing carbons and handling the lamp. This I accomplish by making the platform or gallery, O, upon which the globe rests, vertically adjustable upon; a rod, O<sup>1</sup>, attached to the lamp frame in any convenient manner. A set-screw should be provided Whereby the globe can be adjusted to any desired position. By this arrangement, the work of renewing carbons and the reliable adjustment of the globe in relation to the voltaic are materially assisted. In order to accommodate

long sticks of carbon, the platform or gallery, O, should be perforated, to allow passage down through it of said carbon sticks. I prefer making the platform or gallery, O, of metal, and of such shape as that globules of molten copper from the covering of the carbons, in dropping away, shall not escape, to do damage. It will be particularly observed that in the form of dash-pot employed the cylinder is the movable, and the piston or plunger the stationary, element. This construction implies more than a mere reversal of the usual make and operation of the dash-pot; for, by making the cylinder the movable element, the general construction of a lamp can very often be materially simplified, as in the present instance. This form of dash-pot is designed to be employed in connection with any of the moving parts of the mechanism of an electric lamp, where it is desired to retard a downward movement.”

The lamp covered by patent No. 203,411 is referred to only for the purpose of illustrating the operation of the invention in suit, and the complainant's right to the relief prayed for does not depend upon the validity of that patent. The lower carbon of this lamp is held in a fixed position, and its upper carbon is carried by a sliding rod, which passes through a ring clamp just large enough to permit it to slide freely through when the clamp lies flat on the floor of the regulator case, but which binds upon the rod when it is lifted by one edge. The lifter which is upon the edge of the clamp is attached to a soft iron core, which plays inside a wire helix, through which the current producing the light circulates. The attracting strength of this coil is proportionate to the strength of the current flowing through it. When there is no current flowing through the lamp the coil has no attraction; and the core consequently rests at the lowest limit, and the ring clamp lies flat on its floor. In that situation the carbon rod slips freely through the clamp, and the upper carbon rests; in contact with the lower. Upon the establishment of the current through the lamp, it passes through the carbons with little resistance, because they are in actual contact. The current is therefore a strong one, and energizes the coil strongly; and it, in turn, powerfully attracts the core, and pulls it downward. This movement being communicated to the lifter, it, in turn, first lifts the ring clamp by one edge, which causes it to impinge closely upon the rod, and then lifts the rod and carbon, and so separates the carbon points. This establishes the arc. But the arc introduces a resistance to the current which diminishes its strength; the resistance increasing as the arc grows longer. Hence, as the arc lengthens by the consumption of the carbons, and the increase of the space between them, the current grows weaker; and the attracting power of the coil diminishes until it lets the core move downward sufficiently to release the grasp of the clamp on the rod, so that it slips downward. As the upper carbon approaches the lower, and so shortens the arc and diminishes its resistance, the current's strength increases; the coil again pulls the core upward, and so tightens the clamp upon the rod, and thus holds the upper

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carbon suspended at its normal distance from the lower. This process goes on until the carbons are, consumed.

It will be observed from the description of the lamp in suit that when the current is first passed through it the current divides at the lamp, and

passes through both pairs of carbons, and instantly energizing the solenoids, draws upwardly the cores, and, through the bar,  $E^2$ , link,  $E^3$ , lever,  $E^4$ , and lifter, D, separates the pairs of carbons, A. The separation of this pair of carbons does not operate to break the circuit and form an arc between them, but simply diverts the entire current through the remaining and unseparated pair of carbons, A. The lifter, D, continuing to rise, next separates the carbons, A, thereby interrupting the circuit, and establishing the arc between the last-separated pair of carbons, A. After the arc has been established between one pair the carbons of the remaining pair are held separated by the ring clamp; their initial separation being such that the idle pair will be retained in their separated relation while the regulator automatically moves and adjusts the burning pair, to separate or approximate them, as the conditions may require to regulate the length of the arc, and also to automatically feed them to maintain the arc. When the burning pair of carbons has been consumed the effective pull of the solenoids is diminished to such an extent that the carbons of the idle pair are brought into contact, which causes the entire current to be instantly diverted through them; the effect of which is to strengthen the solenoids, and separate the carbons again, and automatically establish the arc between them. The separation of the two pairs of carbons, so that the arc is established between one pair and maintained between the carbons of that pair until they have been consumed, and then automatically established between the carbons of the other pair and maintained between them until they have been consumed, is a dissimultaneous and successive arc-forming separation; and it is this feature which distinguishes the lamp in suit from all prior lamps.

The six claims of the patent which it is alleged are infringed read:

“(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 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 separated relation, substantially as shown. (3) In an electric lamp having more than one pair or set of carbons, the combination, with said carbon sets or pairs, of mechanism constructed to impart to them independent and dissimultaneous 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 separate 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

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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 wherein more than one pair or set of carbons are employed, a clamp, C, or its equivalent, for each said 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.”

It is admitted by the defendants' counsel that the patent in suit describes a new and useful mechanism for which Brush was entitled to a patent; but it is urged that the first, second, third, and fourth claims are for functions or results without regard to mechanism, and are therefore void. The claims are not open to this objection. The specification describes mechanism whereby a result may be accomplished, and the claims are not for mere functions; nor, fairly construed, can it be said that they cover other than equivalent means employed to perform the same functions. The first claim, construed in connection with the means described in the specification, is for an electric arc lamp in which two or more pairs of carbons are used; the adjustable carbons of each pair being independently regulated by one and the same mechanism, and in which there is a dissimultaneous or successive separation of the pairs, so effected as to secure the continuous burning of one pair prior to the establishment of the arc between the other pair. Thus construed, the invention claimed is limited to the particular means described in the specification, and their substantial equivalents. The second, third, and fourth claims also refer to the particular mechanisms described in the specification for the accomplishment of results covered by those claims. They are for combinations of specific mechanisms, and their substantial equivalents, and not for results irrespective of means for their accomplishment. It is true that in the specification Brush declared:

“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 particular functions and results hereinafter to be specified shall be accomplished.”

He did not say, however, that he claimed all mechanisms, irrespective of their construction and modes of operation. By this language he simply notified the public that he did not restrict himself to the particular lamp described in the patent, but that his invention, embraced that and all other lamps operated in substantially the same way, by equivalent mechanism.

It is urged that the fifth claim covers the lifter simply, and that the sixth claim covers nothing but the clamps, and, being only for detached parts of the lamp, incapable of separately performing the function ascribed to them, these claims are void. The fifth claim is for a combination of which the lifter, D, is an element, and, thus construed, the claim is for a novel and useful invention. The sixth claim is not for the two clamps aside from other connected mechanism. It is for the two clamps in combination with the mechanism described in the patent for actuating the clamps, and causing them to grasp and move the carbons dissimultaneously, substantially as and for the purpose described in the specification.

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Patent No. 147,827, issued to Matthias Day, Jr., February 24, 1874, is relied on as an anticipation of the first, second, and fourth claims of the patent in suit. This defense is based upon a construction of these



claims that gives no effect to their concluding restrictive language; which construction, we have seen, is not authorized. The patent in suit describes mechanism which designedly and positively effects a dissimultaneous separation of the carbons, and Prof. Barker, the defendants' expert, testified that the Day lamp was not so constructed, and did not so operate. It is true that the Day patent describes a lamp which contains two or more pairs of carbons, but not such a double carbon lamp as Brush invented. In the Day lamp, each carbon is split or divided vertically for a slight distance from the outer end, but so rigidly connected at the clamp extremity as to act solely as a pair of separate carbons, and not as "two or more independent pairs or sets of carbons." Owing to the constant and frequent shifting of the arc from one pair of carbons to the other in this lamp, it produced an irregular and unsatisfactory light. It was unlike the Brush lamp, both in construction and mode of operation.

The answer also denies infringement; but that defense, like the last one, is based on the theory that the claims are not at all limited by their concluding language. It is plain; from the evidence, that the defendants' lamp was designedly constructed so as to insure the dissimultaneous separation of the two pairs of carbons for the purpose of forming the arc between one pair only of the carbons, and that both lamps operate in identically the same way, and for the same purpose. The patent describes a ring clamp, and the defendants use a hinged clamp; but there is not the slightest functional difference between them. Both operate by grasping and holding, with varying pressure, the smooth rod which carries the carbons, thus allowing the rod to slide so as to secure a continuous feed by inappreciable degrees; while, under other conditions, the rod is allowed to slip suddenly, by gravity. The ring clamp was old, and Brush simply employed it, as suitable for his purpose, in combination with other elements with which it co-acts; and the substitution of the hinged clamp, without any change in the mode of operation or function, did not change the combination. In the Brush lamp the clamps rest on a flat floor, and the arms of the lifter are of unequal length, so that when the lifter is raised one clamp is tilted in advance of the other, and the carbons are Separated dissimultaneously. In the defendants' lamp the same result is accomplished by supporting the clamps in different planes, and employing a lifter with arms of the same length, so that in the operation of the lifter it will tilt one clamp in advance of the other. Brush did not claim that there was invention in the lifter and clamps, disconnected with other parts in the operation of the lamp; and the defendants cannot escape infringement by showing that they use a lifter and clamps not identical in construction with the lifter and clamps described in the patent: It is admitted that, if the claims are construed as embracing the mechanism described in the specification, the defendants use a lamp covered by the patent in suit; and that renders a further description of defendants' lamp unnecessary.

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It is finally contended that, while the patent describes, particular mechanism by which the functions stated in the claims can be performed,

the patentee expressly declared in his specification that he did not limit himself to this mechanism, or its equivalent, but claimed that his invention comprehended all means capable of accomplishing the results stated, and that, having thus claimed more than he was entitled to, the complainant cannot recover until he disclaims everything in the specification except the specific mechanism. An application for letters\* patent is accompanied by a specification giving a full general description of the alleged invention; and this is followed by what is known and well understood in the courts, as well as in the patent-office, as a "claim." What the patentee invents and describes in his specification, but fails to embrace in his claim, he abandons to the public, unless, by timely application, he obtains a reissue for it; and if, in the descriptive part of his invention, he inadvertently, or otherwise, includes as part of his invention that which is old, but does not claim it, his claim is not thereby invalidated. Such part of the specification is surplusage. It is only when the claim following the specification is too broad, in the sense of embracing something as new which is not new, that the patentee is required by section 4922 to disclaim. He is not required to disclaim anything in the specification not covered by his claim. The word "specification" is obviously used in the first clause of section 4922 as synonymous with "claim." I am aware of no decision holding that a patentee is required to disclaim anything in the descriptive part of his invention which is not fairly embraced within his Claim. In *Railroad Co. v. Mellon*, 104 U. S. 118, the court said:

"In view, therefore, of the statute, the practice of the patent-office, and the decisions of this court, we think that the scope of letters patent should be limited to the invention covered by the claim, and that, though the claim may be illustrated, it cannot be enlarged, by the language used in other parts of the specification. We are therefore justified in looking at the claim with which the specifications of the appellee's invention conclude to determine what is covered by his letters patent."

It is not material, for the purposes of this suit, whether Brush was a pioneer, or a mere improver. It is sufficient that he described and illustrated, in his patent, specific mechanism, or double carbon lamp, adapted to burn its carbons independently and successively; that he was the first to accomplish this result; and that the claims are for mechanism substantially as described in the patent, in combination with two or more pairs of carbons, or sets of carbons, for producing the result specified. We have already stated that what is claimed is not functions and results, but mechanism for producing functions and results. A decree will be entered in accordance with the prayer of the bill.