

WESTINGHOUSE ELECTRIC CO. V. SUN ELECTRIC CO.

*Circuit Court, D. Massachusetts.*

August 7, 1888.

PATENTS FOR INVENTIONS—INFRINGEMENT—DISTRIBUTORS OF ELECTRIC ENERGY.

Letters patent No 351,589, granted October 26, 1886, to George Westinghouse, Jr., assignee of Lucien Gaulard and John D. Gibbs, for improvements in methods and apparatus for the distribution and conversion of electric energy by an arrangement of converters in series, the specification disclaiming any other arrangement, are limited to the series system, and the use of the multiple are system is not an infringement.

In Equity. Suit for infringement of letters patent.

*Chauncey Smith, Frederick P. Fish, Thomas B. Kerr, and Hyde, Dickinson & Howe,* for complainant.

*James E. Maynadier, Robert S. Taylor, and William A. Macleod,* for defendant.

COLT, J. This suit is brought to enjoin the defendants from infringing letters patent No. 351,589, granted October 26, 1886, to George Westinghouse, Jr., assignee of Lucien Gaulard and John D. Gibbs, for improvements in methods and apparatus for the distribution and conversion of electric energy.

The case has been thoroughly and ably presented on both sides. The patent relates to that branch of the art of electric lighting known as the “incandescent.” The specification states that the

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“invention relates to the distribution of electrical energy for industrial purposes; and it consists in an improved art or method, and an organization of apparatus, whereby the same is carried into effect, by means of which we are enabled to transmit from a central or supply station, through a main conductor, a primary electric current of comparatively small quantity but of high potential, and at a point or points more or less distant, where the said electric energy is to be utilized, to transfer the energy residing in such primary current of high potential into one or more secondary currents of lower potential, but of greater quantity. At a point where the electric current is to be utilized for any suitable purpose,—as, for instance, in one or more incandescent electric lamps,—we place one or more secondary generators or converters, as shown at C in Fig. 1. The general principle of our secondary generator is analogous to that of the well-known inductorium, or induction-coil, with this exception, that while the induction-coil has heretofore usually been employed to transfer electric energy from currents of low potential and great quantity into currents of high potential and small quantity, the function of the secondary generator or converter, as applied in our invention, is precisely the reverse of this, namely, to transfer electric energy from currents of high potential to currents of low potential and increased quantity. We have constructed converters for affecting this result in a variety of forms, all of which involve the same principle. The most important and characteristic feature of our invention is that which renders it possible to make use of alternating and equal positive and negative currents of moderate quantity, but of very high potential, in the primary or main line circuit, and to convert these into secondary or induced currents of much greater quantity, but of correspondingly lower potential at the place of consumption, which secondary circuits are employed to do the required work. Any required number of converters of the general construction described may have their primary circuits united with or included in the conductors leading from the primary generator. The manner of connecting such converters, whether in series, multiple arc, multiple series, or otherwise, will be understood by those skilled in the art to which our invention relates without the necessity of further explanation.”

The specification then says that one arrangement is indicated in Fig. 3 of the drawings, which shows an arrangement of converters in series. Then follows this disclaimer: “We do not herein claim the connection of the converters in the line in any other arrangement than we have illustrated in the drawings.” Fig. 3 of the drawings shows an arrangement of converters in series. The defendants connect their converters in what is known as the “multiple arc system,” which is quite different in construction and mode of operation from the series system. There are five claims in the patent, the first being for the art or method, and the remaining four claims for the apparatus.

The first question which arises relates to the proper interpretation of the patent in view of the disclaimer. Undoubtedly, as originally drawn, the patent was intended to cover all

forms of converters which transferred electric energy from currents of high potential to currents of low potential and increased quantity, whether connected in series, as indicated in Fig. 3 of the drawings, or in multiple are or otherwise. The patent-office refused to grant so broad a patent, and instructed the applicants that, in order to avoid an interference, they must confine the arrangement of converters to the series system; that being the arrangement

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shown in the article in *Engineering*, of March 2, 1883, which the applicants declared contained a description of their invention. Thereupon the disclaimer was inserted. An examination of the file-wrapper and contents discloses that the patent-office believed this patent should be limited to the arrangement of converters in series, and that this was supposed to have been effected by the disclaimer, otherwise an interference would have been declared. The patentees avoided such interference by inserting the disclaimer, and it is too late now to say that the disclaimer means in effect nothing. If we construe the patent to cover broadly a dynamo producing alternate currents of high potential with a single reducing converter, then the disclaimer is meaningless, because such construction would embrace converters connected in multiple are or otherwise. The patent states that the invention is for a system of electric distribution. The true scope, therefore, of the invention is not confined to one converter, but to several converters arranged in a system; and, when the patentees disclaim all systems but the series, they should be held to it.

As we have said, Gaulard and Gibbs declare that the invention covered by the patent in suit is found in the article in *Engineering*, of March 2, 1883. The defendants deny that the article describes converters which transform the current from high potential to low. Whoever may be right, it appears quite certain that the high potential of the primary, and the low potential of the secondary, or the long thin primary wire, and the short thick secondary wire, which become so important in the patent under consideration, are not specifically described or shown with clearness in the article in question. The system described in the article was a general one, and was intended to meet the conditions laid down in the English electric-lighting act, which provided that the "undertakers" shall not prescribe to householders and others, to whom they supply the current, the use of any particular kind or form of lamp. The Gaulard and Gibbs invention has a twofold object, says the article: "*Firstly*, it aims at rendering it practicable for undertakers to supply current at the most economical potential permitted by the terms of their provisional orders; and, *secondly*, it is intended to make the user independent of the producer, and to enable him to apply the current he receives to any purpose he may please, such as are lighting, incandescence lighting, the generation of power or of heat." If the article does show a converter which transforms electric energy from high potential to low, it is evident that Gaulard and Gibbs did not at this time regard this as a great discovery, or it would have been more clearly indicated. Undoubtedly, the article was intended to outline a general system to supply to customers currents of high or low potential, as might be desired, by means of converters connected in series based upon the principle of the Rhumkorff coil; but that this was to be accomplished by means of a primary current of high potential, and secondary currents of low, is not apparent. Further, if the reducing converter, now made so important, was discovered by Gaulard and Gibbs, in March, 1883, and constituted such a great invention, why did it not form the subject-matter

of their subsequent American patent of April 29, 1884, and British patent of September 13, 1882? These things go to prove that the prominence given to the reducing converter in the patent in suit was based upon something else than the article in Engineering. I am led to think that it was based upon the fact that, between the date of the article and the date of the patent in suit, other inventions had come to light, and that it was these improvements which induced Gaulard and Gibbs to set up the claim they make in their last patent.

In the patent granted to E. Thompson, July 14, 1885, the converters are arranged in series. The object of the invention was to provide a safety-switch for the converters, but we there find described the primary or main current of high potential and the secondary current of low potential. The specification says: "The secondary coil is wound with such coarse wire, and the lamps used therewith are of such low volt potential, as not in itself to produce dangerous discharges or shocks." Thompson seems to take it as a matter of course, in view of the prior state of the art, that there was no invention in reduction from high potential to low through a converter. But the most important improvement was made by Zipernowsky and Déri, in their English patent of March, 1885. This patent describes minutely a system of distribution by induction through potential-reducing converters combined in multiple are, and it includes an alternating-current dynamo generating a current of high potential. We see, then, that the state of the art in 1883, when the article in Engineering was written, and in 1886, when the patent in suit was issued, was quite different. It became very important therefore, for Gaulard and Gibbs to obtain a patent for a single reducing converter, however it might be combined with others in a system. I think the importance given to this point in the patent an effort to expand the real invention of Gaulard and Gibbs as contained in the article in Engineering, and that the patent-office intended, and did, in effect, limit the patentees to all they were fairly entitled to, namely, the arrangement of their converters in series in a system of electric distribution.

But assuming that our interpretation of the effect of the disclaimer is wrong, and that Gaulard and Gibbs are entitled under their patent to claim the exclusive right to a converter which transfers energy from high potential to low in combination with a dynamo producing alternating currents, can so broad a claim be sustained in view of the prior state of the art? To uphold this position, of course, Gaulard and Gibbs have to go back to the article in Engineering of March 2, 1883, as the date of their invention, because this form of converter, in combination with an alternating dynamo, is clearly shown, as has been observed in the Thompson and Zipernowsky and Deéri patents of 1885. But, admitting that the date of the invention was March 2, 1883, I have much doubt whether Gaulard and Gibbs could obtain a lawful patent for so broad a claim. The counsel for the plaintiffs, in his closing argument, admits that the induction coil or inductorium or converter, in its

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general sense, as a device used for taking off from the line at different points a portion of the electric energy, whether of the same or higher or lower potential,

was well known. The article in *Engineering* states that the secondary generator or converter was based upon the same principle as the Rhumkorff coil. In the English patent granted to Paul Jablochhoff, November 9, 1877, we find described a system for producing and dividing electric lights, which consisted in carrying a main alternating current round an unbroken circuit, and transferring its energy by means of induction coils to consumption circuits at the points where it was to be used. The converters are placed in series, with one or more lamps in the secondary of each converter. But it is said that Jablochhoff contemplated a conversion from low to high potential, the reverse of Gaulard and Gibbs. At the same time it was well known that the converter would transfer energy from high to low, or low to high, as the primary wire was longer or shorter. Was it invention for Gaulard and Gibbs simply to reverse the coils and transfer the energy from high to low? In the English provisional specification of Edwards and Normandy, November 13, 1878, the inventors proposed to use either interrupted or alternating currents with a converter near every place where the light is to be produced. The specification says:

“At or near every point where it is required that a light shall be produced, we arrange a coil (or series of coils) of insulated, metallic wire or ribbon, (preferably surrounding a bar or wires of soft iron,) through which coil or coils the current from the principal wire first described can be passed when desired, or cut off by means of a key or lever. Round or adjacent to each coil of insulated wire described we form one or more secondary coils of insulated, metallic wire or ribbon, arranged so that the passage of the rapidly intermittent current of electricity, as described, through the primary coil or coils, generates a corresponding amount of electricity in each of the secondary coils. In order to facilitate the production of the induced electricity, and to diminish its intensity and increase its quantity, we prefer making the coil or coils in which the electricity is induced of a number of insulated wires or ribbons made up into a bundle or rope, the ends of the wires or ribbons at each end of the bundle or rope being in metallic contact with each other, which united ends are then joined to the conductor conveying the induced electricity.”

Here is found distinctly stated the principle of a reduction from high potential in the primary to low potential and increased quantity in the secondary, which Gaulard and Gibbs assert is their great discovery. The patent to J. B. Fuller, November 26, 1878, is for an improvement in induction apparatus for lighting by electricity. This invention embraces converters arranged in series like those of the patent in suit to be operated upon by an alternating current. It is not stated whether the potential is to be raised or lowered in the converters, but the drawings appear to indicate that it was to be raised. In the English provisional specification of J. H. Johnson, December 24, 1878, while the inventor contemplated the rising of the potential in his converters, yet he says: “The apparatus may be connected together in such manner as to augment either the tension or the quantity of the current.” Thomas A. Edison took out a patent May 29, 1883, (the application having been

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filed August 14, 1882,) for an apparatus for translating electric currents from high, to low tension. In his invention he uses a continuous



current of high tension in the main circuit, and reduces it to a continuous current of low tension in the secondary circuit.

This incomplete review of the prior state of the art would seem to show that at the date of the article in *Engineering* there was no invention in a single Converter which transferred energy from high to low potential, as distinguished from a conversion from low to high. It seems to have been assumed in prior patents, as a matter of common knowledge, that, by the Laws governing the inductorium, or converter, the electric force transferred could be either of the same potential or of greater or less, as might be desired. It required something further, something that might be called invention, to solve the problem of a successful system for electric distribution. Gaulard and Gibbs undoubtedly believed that in the article in *Engineering* they unfolded to the world a description of a successful system. So far as their system was a new invention, and is found incorporated in the patent in suit, they are entitled to be protected. But they are expressly limited by their disclaimer to the series system, and therefore the defendants, who use the multiple-arc system, do not infringe. Without entering further into the defenses raised, I am satisfied, for the reasons given, that the bill should be dismissed.