# ELECTRIC RAILROAD SIGNAL CO. *v.* HALL RAILROAD SIGNAL CO.

*Circuit Court, D. Connecticut.* April 5, 1881.

1. INVENTION—PRIORITY.

He who first reduces his invention to a fixed, positive, and practical form would seem to be entitled to a priority of right to a patent therefor.

2. SAME—SAME.

In such case, however, he who invents first has the prior right, if he uses reasonable diligence in adapting and perfecting the same, although the second inventor has, in fact, first perfected the same and reduced the same to practice in a positive form.

3. SAME—SAME—DILIGENCE.

In such case the determination of the fact of diligence is not to be reached by a comparison of the diligence of the two inventors.

4. SAME—SAME—SAME.

A. mentally worked out an invention about November 6, 1872, and, without making any efforts to reduce the invention to practice, applied for a patent May 15, 1873. B. independently reached the same result about December 21, 1872, and reduced the invention to practice in April, 1873. *Held,* where a patent was subsequently granted to A., that B. could not be held liable as an infringer for the use of this invention.—{ED.

*Charles E. Perkins* and *Franklin Chamberlin,* for plaintiffs.

*Simeon E. Baldwin,* for defendant.

SHIPMAN, D. J. This is a bill in equity to restrain the defendant from the alleged infringement of letters patent No. 140,536, issued to Frank L. Pope on July 1, 1873, and now owned by the plaintiffs, for improvements in circuits for electric railroad signals. Before the date of this invention electro-magnetism had been utilized for the automatic actuation of signals, denoting both danger and safety upon the line of a railroad. By Johnson's patent of 1858 a single battery

was mounted on each train, and was applied to turn the signals in succession. Each signal was operated alternately by two electro magnets; one to turn it to "danger," and the other to turn it to "safety." This plan required a battery for each train. Under Clark's patent of 1861 the signals were operated by the action of a railroad train; but his apparatus made use of a special battery, and an independent electric 604 circuit for each signal. The system of Thomas S. Hall, which was used on the Harlem Railroad in 1871, moved the signals by stationary batteries, and required two batteries to operate each signal.

The object of the system which Pope patented was to operate automatically a series of signals, in definite and predetermined succession, by the passage of a train, making use of a single battery. The patentee says in his specification: "My invention consists in a peculiar arrangement of electric circuits, in combination with a battery, and with two or more circuit closers, operated by moving trains or otherwise, whereby a series of two or more visual or audible signals, situated at intervals along the line of a railroad, may be operated by currents of electricity derived from a single battery, thereby obviating the inconvenience and expense of employing, as heretofore, one or more separate batteries, situated at or near each signal, for the purpose of actuating the same." The record shows that the invention was a new combination of old devices whereby a novel and useful result was produced, and was patentable. It is assumed that the same invention was placed on the Eastern Railroad of Massachusetts by the defendant, a corporation which has been engaged in the manufacture and erection, upon different roads, of signaling apparatus constructed in accordance with various patents of Thomas S. Hall, and that the change which was made, whereby the earth was used as a part of the circuit, was not a material change or modification of the

invention. Letters patent to Hall & Snow, No. 165,570, dated July 13, 1875, describe the defendant's method of electric circuits.

Upon this assumption the main question in the case is that of priority of invention, for it will be manifest that Pope and Hall were each independent inventors of the one-battery system, and that each mentally conceived of the same plan, in substance, in the summer and fall of 1872. Hall is the father of the plan of electric railroad signaling apparatus, which is in use in this country, and in 1872 was actively engaged in studies and experiments, and in the practical 605 application of the system, which he had then introduced upon the Harlem Railroad. In the same year Messrs. Pope and Hendrickson were actively engaged in attempts to introduce electric signals upon different roads, and in the summer and fall were employed on the line of the Pennsylvania Railroad in Pennsylvania. They were thoroughly in love with the business, were active, energetic, self-reliant, fertile in invention, and were diligent to secure by letters patent the results of their inventive skill. During this time, at the suggestion of one of the officers of the railroad company, Pope had constructed a device by which a primary and secondary signal were operated from the same battery. This device suggested to his mind another idea, and during the week prior to November 6, 1872, he first described to Hendrickson the plan of working a series of signals along the line of a railroad by the use of a single battery. This conversation took place in a jeweler's shop while they were waiting to have some broken wires resoldered, and as they went from the shop to dinner. It was the first definite manifestation or expression of the idea which Pope had in his mind, and establishes the date of the time when he mentally reached the result which was after-wards shown in his application for a patent. He made neither tests nor models nor

experiments. His mental result was not reduced, and was not attempted to be reduced, to practice. He intended to test the system before making application, but did nothing of the kind, and after April 25, 1873, he prepared his application, which was filed May 15, 1873. The system was not afterwards placed by Pope upon any road, and there is no evidence that anybody else, professing to act under this patent, has ever reduced it to practice, except that Pope constructed a working model of the whole apparatus in 1875 or 1876, which was set up in his shop in the city of New York.

The patent having been granted to Pope, and now being attacked on the ground that the patentee was not the first inventor, it is not enough for the defendant to show that Hall had conceived the same idea, and had made drawings or models, and experiments with his models, but the defendant 606 must establish that Hall reduced what he conceived to practice in the form of an operative machine, and embodied it in some practical and useful form before Pope made his application, it being a fact in the case that Pope had not reduced his idea to practice before his application. *Ellithorpe* v. *Robertson,* 2 Fisher, 85; *Union Sugar Refinery* v. *Matthiesson,* 3 Cliff. 639. The law on the subject of the priority of right between two independent inventors is substantially as it was laid down by Judge Story in *Read* v. *Cutler,* 1 Story, 590: "In a race between two independent inventors, he who first reduces his invention to a fixed, positive, and practical form would seem to be entitled to a priority of right to a patent therefor. The clause of the fifteenth section of the act of 1836, now under consideration, seems to qualify that right, by providing that in such cases he who invents first shall have the prior right, if he is using reasonable diligence in adapting and perfecting the same, although the second inventor has, in fact, first perfected the same and reduced the same

to practice in a positive form." *White* v. *Allen,* 2 Fisher 440; *Reeves* v. *Keystone Bridge Co.* 5 Fisher, 456; *Agawam Co.* v. *Jordan,* 7 Wall. 583.

Hall, during the summer of 1872, was thinking over the same idea which Pope had, and about December 21, 1872, came to the mental result that a one-battery system was feasible. He forthwith wrote to his son, who was in Boston, to join him in Meriden. The son complied with the request, and, with the assistance of other employes, made a working model in accordance with his father's instructions in the upper room of the defendant's shop. Hall, as the manager of the defendant corporation, was constructing at this time, for the Eastern Railroad Company, his system of signals upon the manifold-battery plan. Early in January, 1873, he described the new plan to the manager of the company, who agreed that it might be placed upon his road in lieu of the old plan, at the defendant's expense, if not subsequently approved. About January 20, 1873, Hall telegraphed to George H. Snow, his assistant, to stop work on the railroad and come to Meriden, where he was employed upon the signals 607 and instruments which the new plan required till the fall of 1873. In the latter part of April, 1873, a new track circuit closer was placed on the down track of the Hartford & New Haven Railroad at Meriden, and a line of telegraph poles was extended to the shop about an eighth of a mile away. Upon these poles wires were put which connected with the track and the battery in the shop. The signals were properly arranged, and were operated by all the down trains on the road. The mechanism remained in position for months. The arrangement described in Pope's patent and this Meriden arrangement were substantially the same.

Subsequently, in December, 1873, after the new track circuit closers were finished, Snow went to the Eastern Railroad to put the new system in operation.

Here a practical difficulty was experienced, which is thus explained by Alvah W. Hall, the son of T. S. Hall: "The first difficulty we found was that the magnets, being wound with coarse wire, and thus adapted for the short circuits and comparatively weak batteries with which they had previously been used, required too much battery power to work them on a long circuit. Therefore, when a battery was applied strong enough to work the most distant signal, which signal would have the longest circuit of any of them, it made the current too intense when the signal nearest the battery, which would be on the shortest circuit, was operated to work satisfactorily. The spark, on breaking contact with the circuit closer of this short circuit, following in a burning flame between the points of the circuit closer after the said points were removed from each other their proper distance, destroyed the points and burned them up." A change was made on February 14, 1874, which obviated the difficulty, and which mainly consisted in bringing the ground into use to form part of the circuits. This is the change which the plaintiffs insist was simply mechanical in its character, and which the defendant claims made its combination a new invention. Subsequently, the system of Mr. Hall was introduced upon other railroads, and a large amount of money was paid to his company therefor.

I am clearly of opinion that the application of the one-battery 608 plan to use on the Hartford & New Haven Railroad in April, 1873, was the reduction to practice in the form of operative mechanism, as distinguished from models, and was the embodiment of the idea in a practical and useful form, as distinguished from experiments, which the law requires. The mechanism to be used was of a peculiar character. It must be used upon and by the aid of a railroad, moving trains of cars as a part of the machinery. It is not to be expected that the inventor

could induce the owners of a railroad to expend money on an extensive scale in a new enterprise, neither could he be reasonably expected to place expensive structures upon miles of railroad track. It can only be reasonably required that the entire system should be subjected to practical, daily, and continuous use upon a railroad by whatever trains pass upon the track. Hall reduced the invention to practice prior to Pope's application, and while, so far as Pope was concerned, the new plan rested in theory.

The plaintiffs rely upon the qualification of the rule that he is the first inventor who has first actually perfected the invention; the qualification being that if the one first to conceive of the invention was at the time using reasonable diligence in adapting and perfecting the same, he is recognized as the first inventor, although the second to conceive may have been the first to reduce to practice. It is also true that the determination of the fact of diligence is not to be reached by comparison of the diligence of the two inventors. If Pope was reasonably diligent in perfecting his idea, it does not matter that Hall was exceedingly diligent and made more rapid advances.

The plaintiffs' position is that Pope had mentally worked out his invention by the first week of November, 1872; that Hall had reached the same result in the latter part of December, 1872; that Pope applied for his patent on May 15, 1873, and that there was no laches in this respect. All this is true; and if, meanwhile, he had been engaged in efforts to perfect his invention, his right to the patent could not be assailed on the ground that another was the first inventor.

It was an important step in this invention to originate the 609 idea of the one-battery system. It was more important and more difficult to overcome the practical hindrances which lay in the way of a successful application of the idea. An examination of

the testimony will show that Pope did nothing to perfect what he had accomplished until he had applied for his patent. He explained his plan to Hendrickson about November 6th, who, thereupon, drew a very rude and scanty pencil sketch, which Pope said represented his idea. On December 3, 1872, Hendrickson showed Pope a rough drawing of an improved signal machine which he, Hendrickson, had devised, and which he thought would be well adapted to be used in connection with the one-battery plan. Pope was favorably impressed with the sketch, and told Hendrickson to prepare a working model at once, and he, Pope, would prepare an application for a patent for the machine. The model was tested and found to work well, and Pope says: "I immediately proceeded to prepare an application for a patent, which was filed in the patent-office on the twenty-sixth of December, 1872. * * * As this signal was equally well adapted to be used in connection with the system of circuits which we already had in operation on the Pennsylvania Railroad and on the Lehigh Valley Railroad at Bethlehem, I described in the specification the signal as working in a system of this description, making no allusion to the proposed plan of working a number of them from a single batery, as the particular arrangements of circuits had no necessary connection with the features of the invention, which were considered to be new, and which were intended to be covered by the claims. I intended to take out a separate patent on this system of circuits after I had had an opportunity to test it, and therefore did not wish to make any disclosure of it in the specification of the patent of another invention. During the latter part of November and the early part of December, 1872, I was also engaged in the preparation of an application for letters patent intended to embody the improvements which I had made in the machinery and system which we had placed on the Pennsylvania Railroad; that is

to say, the independent locking magnet, the cut-off for transferring the battery circuit 610 from the main magnet to the locking magnet and secondary signal, the arrangement of the primary and secondary signals with reference to each other, and some other minor points. This application was completed about the twentieth of December, and immediately upon its completion I took it to Washington myself and filed it on the twenty-first of December, 1872."

On or about February 10, 1873, Pope had a conversation with Mr. A. G. Davis, superintendent of telegraphs on the Baltimore & Ohio Railroad, in regard to the introduction of a signal system on that road, and told Davis that he had devised a plan by which the requisite number of signals on eight or ten miles of road could be worked from one battery, and that he was willing to undertake to do this at any time. In March a single signal was put up on the road, but it is evident that this signal was not put up as a sample of the one-battery system. Sometime between February 10th and April 1st, Pope had one or more conversations with Edwin D. McCracken in regard to the system; but, giving to these interviews the weight which they have in Pope's mind, the conversations were simply an assertion of what he could do by this proposed plan. The only thing thereafter done was to make out the application. Mr. Pope says: "As the various parts of the combination, circuit closers, signals, signal machinery, etc., had already been thoroughly tested in practice, and almost continually, for over a year, it did not seem to me necessary to test the new combination in actual service before making an application for a patent, as it was a very easy matter for any competent electrician to calculate from existing *data* the amount of battery power, the size of conductors, and the proportionate electrical resistance of the different parts, so as to insure the satisfactory operation of the system in practice. After completing

and filing an application for a patent on an improved track connection which had been invented by Mr. Hendrickson, and which was sent to Washington and filed on the twenty-fifth day of April, 1873, I prepared the application for the patent, which was issued July 1, 1873, as No. 140,536, and is Exhibit A. This 611 application was filed as soon as the model was completed, and reached the patent-office on the fifteenth of May, 1873."

During the period between November 6th and May 15th, Pope was busy, but he was not busy about this invention. He was occupied with other inventions, but he was doing nothing with this one. The just and equitable principle of the law, which gives a patent to the inventor who first conceives of the invention, provided he is diligently engaged in perfecting it and adapting it to use, and overcoming the practical difficulties which are always to be surmounted before theory becomes fact, although he was slower in the race than the one who was second to conceive, does not apply to Pope. Who faintly conceived the idea is not known. Pope first attained a mental result. After that, he was actively occupied in the same branch of study, but he did not develop this system in wood and metal. Hall did develop it, made it useful and practicable, and achieved success. In my opinion it would be a great wrong to decide that the defendant is liable as an infringer.

Let the bill be dismissed.