SMITH v. DOWNING et al.

{1 Fish. Pat. Cas. 64.}[1]

Circuit Court, D. Massachusetts. June, 1850.

PATENTS—PATENTABILITY—ABSTRACT PRINCIPLE—"ART"—"MECHANICAL EQUIVALENTS"—SIMILARITY IN MODE OF OPERATION.

1. What is to be protected is not an abstract or isolated principle, but the embodiment of a principle into a machine or manufacture, as described in the specification.
2. What the patentee does not, or certainly what in the misty future he can not describe, he must be presumed not to have invented.
3. The word "art," in the patent acts, means a useful art or manufacture which is beneficial, and which is described with exactness in its mode of operation. Such an art can be protected only in the mode and to the extent thus described.
4. One machine or manufacture is not a violation of another, within the purview of the patent system, unless it is substantially the same. It need not be identical, but it must be similar in the principle or mode of operation.
5. By equivalents in machinery is usually meant the mere substitution of one mechanical power for another, or one obvious and customary mode for another, to effect a like result.

This was a bill in equity filed by the complainant {Francis O. J. Smith}, as assignee of S. F. B. Morse, to restrain the defendants {Hugh Downing and others} from infringing upon letters patent, granted to said Morse, June 20, 1840, reissued January 25, 1846, and again June 13, 1848, and letters patent granted to him April 11, 1846, and reissued June 13, 1848, both for "electro-magnetic telegraphs." The defendants were assignees of R. E. House, under letters patent granted to him April 18, 1846, for a "magnetic letter-printing telegraph." The issues of law and fact, and so

512 much of the evidence as is material, are stated in the opinion of the court.

C. S. Davis, C. M. Keller, and B. R. Curtis, for complainant.

C. L. Woodbury, George Gilford, and Rufus Choate, for defendants.

WOODBURY, Circuit Justice. This case is full of difficulty, in respect both to the facts and the law. The operations of the conflicting machines depend much on the principles of electricity and galvanism—two sciences not very well understood, except by those who have made them a special study; and the trouble in comprehending with clearness and fullness their operations here, is increased by the intricate and novel mechanism employed.

More especially is this last the case with the machine worked by the defendants, and alleged to have been invented by Mr. House, and which is made still more complicated by the use of the new species of magnetism called axial-magnetism, and by the use of air as an additional power to move parts of the machine. As these two inventions are both conceded to be remarkable in their character—relating to an improvement in telegraphic communication by electro-magnetism at great distances, with almost lightning speed, and thus forming one of the wonders of the age; and, as their value is estimated to be very large, both to their owners and the public, I have hastened to examine the rights of each party as early and as fully as other pressing avocations would permit.

The prayer of the bill, by Smith, the assignee of Morse, is for a permanent and final injunction in equity against those who are operating under House. And this remedy should be granted, if it appears on the whole evidence that Morse was the original and first inventor of what he really claims in his patent, and that the machine by House is not different in principle, but the same in substance as Morse's.

These two questions, with some incidental considerations under each, will be found to cover the whole case. In order to ascertain whether Morse was the original inventor of all which he claims, it will be necessary first to examine and settle how much he does claim—that is, how much is embraced in his specification.

This inquiry is made somewhat complicated by his having taken out two different patents on the subject of electro-magnetism and its use in telegraphs, and having renewed one of them twice and the other once, and having preceded the first patent by a caveat, describing its character and extent.

But what he claims does not seem material in this case, except as set forth in the first patent and its various renewals.

I shall, therefore, confine my inquiry to that, though the others must be at times adverted to the better to understand what was meant in that. As represented in his letter to the treasury department in 1837, Morse says he had been attempting, since 1832, to make electricity visible at a distance by signs, intelligible and certain, so as to communicate information. And in his caveat of October 6, 1837, he claims to have "invented a new method of transmitting and receiving intelligence by means of electro-magnetism." Or, in other words, in the same instrument. "a method of recording permanently electrical signs" at a distance. His specification, filed in 1838, April 7, is much the same in substance.

Following up a like idea in 1840, in his first patent he claims in that to have invented only a "new and useful improvement in the mode of communicating information by signals," and by the power of electro-magnetism.

Such is, in substance, the title of this patent in its original form and under all its renewals. In his last specifications in 1848, he claims to have invented

merely "a new method," or "a new and useful apparatus for a system of transmitting" intelligence, which puts in motion machinery for producing signs, and at a distance recording said signs.

From all these, standing by themselves, it would seem manifest that he makes no pretension to have invented or discovered any new principles in physics, or to have discovered the old principles of electricity or galvanism. Nor does he claim to have invented or discovered any new principle in mechanics—like a new power, resembling the lever or screw. As little would any one have supposed, that he meant to claim as his invention and as new—the application at all, of electro-magnetism to the purposes of telegraphing at a distance, whether by making intelligible marks or signs there, or in some other mode—if it had not been for some remarks in one of his letters in 1837, and some words in the eighth clause of his last specification, and the ground taken in the argument, recently, by his counsel.

Thus, in his letter in September, 1837, to Jackson, he seems to have believed he had some claim to this discovery, viz: as he describes it, "The original suggestion of conveying intelligence by electricity"—as well as to the invention, which he calls "the devised mode of doing it."

Yet nothing of this is believed to be inserted in any of his official documents, till 1848. In his last renewal, in 1848, there are introduced for the first time, some changes of language and some tendencies in a part of them, as well as in some of the arguments, to make the claim broader, and, as in the letter just quoted—to cover all application of electro-magnetism, if not of electricity—to convey intelligence, or to telegraph to a distance.

But as late as 1846, so far from claiming the discovery or invention of any new general principle, or art, and asking a patent to protect himself in the

exclusive use, as inventor of all telegraphs by electro-magnetism—he asks for protection of only his own improvement—his own method—his own apparatus. And he seems in his last specification, in 1848, to regard as the great excellence and 513 novelty of his invention, that it imprints the signals at one end, which were sent at the other, and in such characters as to be intelligible, without an observer to note them, and easily translated into English by means of his stenographic alphabet—and hence he there styles it a "recording or printing telegraph."

When there, for the first time, he also speaks of "the essence of my invention being the use of the electric or galvanic current," "however developed," "for marking or printing intelligible characters," "at any distance," being "a new application of that power of which I claim to be the first inventor or discoverer," he must, by all before said and done, be considered as claiming it in the form of his application—according to his machinery—and in the modes he had described in 1837, 1838, 1840, and 1846—rather than in this succeeding clause of 1848, and by it intending to cover the application itself of electro-magnetism to telegraphic purposes, in every possible form. Otherwise, his renewed patent of 1848 must be regarded as void for claiming too much, and for wishing to protect a mere principle, or effect, "however developed," and without reference to any method described by him, and to cover a principle, also before known.

But, limiting the patent to what is described as his method, or mode, and considering that in his "first claim" in 1848, he disclaims such broad views as appear in the "eighth claim," of that date, and expressly says: "I wish to be understood that I do not claim the use of the galvanic current, or current of electricity, for the purpose of telegraphic communications generally, but a new mode of using it, to move machinery, to

print signs, etc., as described." All is consistent, and confined substantially to the mode he sets out in his specifications and in his own testimony in the record.

What he thus sets out is the subject invented. What is to be protected is not an abstract or isolated principle, but the embodiment of a principle into a machine or manufacture, as described in the specification; and it is the invention, in conformity to that embodiment, or representation of its working, which the act of congress will protect. Boulton v. Bull, 2 H. Bl. 463, 468. 483, 8 Term R. 95; Webst. Pat. Cas. 208; Webst. Pat. 4,58,126–128; Bean v. Smallwood [Case No. 1,173]; Winans v. Boston & P. R. Co. [Id. 17,858]; Curt. Pat pp. 96, 145, § 4; Stone v. Sprague [Case No. 13,487]; Gods. Pat. 72; Phil. Pat. 90; Whitte more v. Cutter [Case No. 17,601]; Hind. Pat. 157. Because by those laws, the inventor is not to be protected, unless he describes plainly and fully what he has done, so that the public may copy or imitate, and use it after his term expires.

That is the consideration for the exclusive use during the period of the patent, and having this, prevents the patentee from claiming afterward more than he had invented when his patent issued. Webst. Pat. Cas. 719, notes 1, 2; 8 Term R. 100, 102; Curt. Pat. p. 205, § 128. And what he does not, or certainly what in the misty future he cannot describe, he must be presumed not to have invented. 2 H. Bl. 483.

As this broader claim goes far beyond what we have already seen was that made in the caveat, and in the first specification, and in the original patent, as well as in all the subsequent renewals—as it conflicts with much of the language in this very last renewal looking only to a new method and a mere improvement of what existed before, and as he seems to disavow it in his own evidence; and as, on everything in the case it is questionable whether he could have intended to patent anything except an improvement on what

before existed, I do not think it just to place a broader construction on his language, than the whole subject-matter, and description, and nature of the case seem to indicate as designed.

These are all to be looked to; and no fancied construction, traveling too far, on a new and doubtful ground, is to be adopted; rather what is natural and clear, considering what already exists on the same subject. Haworth v. Hardcastle, 1 Webst. Pat. Cas. 485; Davoll v. Brown {Case No. 3,662}; {Grant v. Raymond} 6 Pet. {31 U. S.} 218; Wyeth v. Stone {Case No. 18,107}; Blanchard v. Sprague {Id. No. 1,518}; 1 Leeman, 482.

And I the more readily adopt this course for his own protection, as such a broader view might subject his patent to be considered void, both for claiming too much, and for claiming also the invention of a mere principle. It would be claiming too much, as it would cover the application, in every way, of electro-magnetism to telegraphs, when this, as will be seen hereafter, by the history of this subject, and as is sworn to by a large number of highly intelligent experts, had been known publicly and for years before Morse's first attention to the subject, in 1832. Indeed, he himself virtually admits the truth of this in his testimony.

Others, no less than the persons cited, as well as the history soon to be given of the progress on this subject, show that several had, before Morse, not only made this discovery, but applied both electricity and electro-magnetism to the purpose of telegraphing. But if, by his alphabet and record, he had been successful in making an improvement in the use of electricity for that purpose, and wished to secure the new method of doing it, he was at liberty, in point of law, to take out a patent for that new mode, but for nothing more.

He came into the world too late for truly claiming much as new. A large galaxy of discoverers on this subject had preceded him. The avoidance of patents

for claiming too much is of frequent occurrence, and needs no explanation as to the reasons for it, when an applicant is so improvident or unjust to others as to claim for himself more 514 than he invented, and the credit or profit of which belongs to others rather than himself. See Wyeth v. Stone [supra]; Blanchard v. Sprague [supra]; Ames v. Howard [Case No. 326]; 1 Webst. Pat. Cas. 485; [Grant v. Raymond] 6 Pet [31 U. S.] 218; Davoll v. Brown [supra].

As to the second objection, that this would be seeking to cover, by a patent, a new principle, without reference to any mode or method of enforcing it, the patent laws are well settled never to permit it

The impropriety of claiming a patent for the invention or discovery of a new principle, however important it may be per se, rests on the idea that the exclusive use of the invention, for a term of years, is given to the patentee, to reward his genius and expense in making his invention, and pointing out, in his specification, how it can be used beneficially; and the machine, if it be a machine, easily made by any mechanic for general employment.

The patent is, in such cases, and must be in order to possess validity, not for the principle, but for the mode, machine or manufacture, to carry out the principle and to reduce it to practice. Webst. Pat. 45, 48. In short, the principle thus becomes the modus operandi, and rests in the new mode adopted to accomplish certain results. And though some expressions may have been used by one or two judges, which look like a sanction to patenting a principle, yet they are used in the above sense, of a principle in operation, in the manner set out in the specification, or, are used too loosely from haste and inadvertence. Except for this view as to the method, what use would there be in a specification describing the machine or method? So, where any judge speaks of patenting an art, it is not an art in the abstract, without a

specification of the manner in which it is to operate, as a manufacture or otherwise. But it is the art thus explained in the specification, and illustrated by a machine, or model, or drawings, when of a character to be. It is the art so represented or exemplified, like the principle thus embodied, which alone the patent laws ever are designed to protect. In the English patent acts, the word "art" is not used at all.

And in ours, as well as in our constitution, the word art means a useful art, or a manufacture which is beneficial, and which, by the same law, is required to be described with exactness, in its mode of operation; and which, of course, for the reasons already laid down. can be protected only in the mode, and to the extent thus described. Wyeth v. Stone {supra}; Kneass v. Schuylkill Bank {Case No. 7,875}; {McClurg v. Kingsland} 1 How. {42 U. S.} 204; Webst. Pat. 8, 9; Phil. Pat 74–76; Hind. Pat. 49; Curt Pat. 38, § 9.

No lawyer conversant with the patent system, could for a moment suppose, that because Arkwright first invented and perfected the art of spinning by machinery, he could have taken out a patent for this art generally, and covered and monopolized all kinds of future and different improvements in that art. On the contrary, he could shield no mode of the art but that which he devised, used, and described. So it has been held that a patent for cutting ice by human power does not cover any mode but that described. Wyeth v. Stone {Case No. 18,107}.

So, though Woodworth first invented planing boards by machinery—he could not take out a patent for that art principle, or system generally, and thus either monopolize or prevent future improvements, when differing substantially from his machine. But the whole effort of Woodworth's assignees has been to describe his particular mode of planing, so as not to omit any thing material, or to cover too much—and no attempt is made to protect any thing connected

with planing by machinery, except the mode thus described—or what is substantially the same.

Considering the opinions I have thus formed on this, and as will soon be explained, on other points of the case, it does not seem necessary to decide, on this occasion, whether the severe criticism, which has been made by the counsel for the respondents on several other portions of Horse's claims, are well founded or not; and more especially, whether his chief patent is not invalid, because covering too long a period—the time included by a previous foreign patent not having been deducted. It suffices now to add that the general conclusion as to the extent of Mr. Morse's claim in his specification, as amended or renewed, is, that he intended, in the words of the patent, to embrace only "a new and useful improvement." Or, as repeated in the specification itself, only "a new method," of communicating and recording signs by "electro-magnetism;" and he does not seem to have meant to cover merely a new object or purpose, to which an old principle or machine was to be applied, and which is not patentable,—Hind. Pat. 96; Webst Pat Cas. 208; Curt. Pat. § 42; Bean v. Smallwood {Case No. 1,173}; nor a new abstract principle to produce new results in telegraphing by means of electro-magnetism.

The essence of his method beyond what had before existed or been practiced, was to make the electro-magnetism, when excited and moving in a particular form, and marking at one end of the wires—not merely exhibit some evanescent sign at the other end, but a sign which the machine is made to trace, and thus record there permanently. This sign is excited by the closing and opening of the circuit by a stroke, or by lifting the wire from the cups, or by a knob pressed down and acting by a spring, and the mark by machinery is made to assume several forms; but the one generally practiced, is that of dots and straight

lines. These, traced in succession on the rolling paper, and by being different in number and combination, 515 are, by the stenographic alphabet, invented by Mr. Morse and embraced as a part of the system, made to represent all the letters, and when you please, certain words in most common use.

The great result of the improvement is, by this machinery and the alphabet of signs for letters, to trace at one end the dots and lines, which represent what it is wished to communicate, and thus to have the same traced at the other end or paper, by like dots and lines.

The great beauty of the system is the identity of the tracing at both ends by the new machine (whether through the type rule at the beginning or the breaking and closing the circuits through the type rule or thumb spring), and also the rapidity as well as the exactness with which this tracing or recording is accomplished.

Indeed, so impressed was the inventor with this striking peculiarity in his system, that in his last specification he proposes to characterize it as "the first recording and printing telegraph by electro-magnetism." Describing his invention as including these improvements, and limiting it to them, he escapes the imputation or fatal error of claiming too much, or claiming to have discovered only a new or a mere art.

The next question in connection with the first head of inquiry, is, if this improvement or method was original with Mr. Morse. He states that the first idea he formed in relation to the subject of communicating information by electricity to a distance, was on board the Sully, on his return from Europe, in the autumn of 1832. But from various obstacles and imperfections in existing batteries, and a want of pecuniary means, and the novelty and complicated nature of the proposed improvements, he was not able nearly to complete it till October, 1837, when he filed a caveat on the subject, and in April, 1838, put his specifications and

drawings on the records of the patent office, and in June, 1840, took out his first patent.

When his attention was first turned to the subject in 1832, not having before been particularly engaged in scientific pursuits, though possessed of good general information and much ingenuity, he did not appear to know with exactness what discoveries had before been made in the matter, and how far others, by vast ingenuity and science in the same path, had already carried into effect what then struck him as practical and likely to prove highly useful.

Whether he or Dr. Jackson spoke first, on that occasion, of what might probably be done to convert the power of electricity to use in recording ideas, as well as in communicating them to a distance, is disputed. It does not seem necessary to settle this point on this occasion; and it is a controversy very unpleasant to discuss, if avoidable, between two gentlemen of such high reputation and public usefulness.

It would seem probable, that, after the matter was broached by some one, Dr. Jackson, from the nature of his scientific studies, fresh from lectures in Paris, with an electromagnet in his baggage on board, and some recent books treating of some of the operations which had been performed with this power, could impart more information in respect to it, and to any probable movement in the use of it. While, on the other hand, it is certain, from what has taken place since, that Mr. Morse possessed the perseverance, industry, and skill to go on with inquiries concerning the subject, when once started, till he perfected an instrument or machine to accomplish what was then agitated; and that he is, therefore, under the patent system, alone entitled to be protected as the inventor of what is claimed and described in his specification—so far as it had not been completed before—by others. Bedford v.

Hunt [Case No. 1,217]; Washburn v. Gould [Id. No. 17,214]; Allen v. Blunt [Id. 217].

Undoubtedly much, which, in his first reflections on the matter, seemed to him novel, had been matter of deep inquiry and frequent experiments in the universities as well as private laboratories of Europe, and even of America.

It appears, on examination, that as early as 1746, Winkler at Leipsic, had used common electricity for telegraphic communications by the discharge of Leyden jars in connection with a long wire. In 1748, the same was done by Watson with two wires on an extended circuit of four miles. And in 1784 or 1787, Loneard, by frictional electricity and a wire extending thence into another room, transmitted telegraphic signals. In 1794, Reizer, by an electric spark and wires, illuminated letters of tinfoil at a distance on a glass plate. And in 1798, Betancourt, in Spain, sent this spark by Leyden jars and a wire, twenty-six miles; and in the same year, Salva, at Madrid, worked for many miles what was called "an electric spark telegraph."

If nothing more had occurred than these cases, it would be a little surprising that any one acquainted with the subject, should in 1832, near thirty-eight years after, anxiously inquire, as if a novelty and wonder, whether electricity could not be used for telegraphic communications.

But galvanism having been discovered in 1790, it is not strange, after the experiments with it for seventeen to nineteen years, that Soemering should, at Munich, in 1807, be able to erect a galvanic telegraph, and to make the voltaic pile decompose water, and show, as signals, air bubbles over the proper letters, and connect a wire to a trough, in which were thirty-five gold pins, with letters or numbers on each, and so arranged as to complete a communication of information.

Common electricity had been found too intense and erratic, and difficult to be confined, whereas, that generated by galvanism has 516 proved more quiet and manageable, and not costly. Inquiries, therefore, did not stop here, but under that were much multiplied and advanced, long before the year 1832. In 1813, Oersted, the Danish philosopher, commenced his experiments on the subject, and by 1819 or 1820, discovered that a magnetic needle at a distance might be deflected by a galvanic current, and thus mark information, and he is generally considered the discoverer of the magnetic properties of electro currents.

In the interim of 1816, Doctor John Redmond Cox, of Philadelphia, describes the use of galvanism as a telegraph by decomposing water. How its decomposition and the air bubbles enable the machine to act, is fully explained by Channing.

In the same year, Ronalds constructed a telegraph at Hammersmith, which operated for eight miles, and used the disc of clocks for his signals at both ends, keeping exact time, and one, when touched, indicating the same at the other end. But it worked very slowly, the interval between each being so great.

In 1820, Arago, Ampere, and Sir Humphry Davy, all experimented and discovered as much as Oersted had, and Ampere expressly stated, that the deflective needle would, in his opinion, be used for telegraphing by the magnetic fluid.

The use of magnetism in connection with electricity to make communications by telegraphs, thus became known and practiced to some extent, twelve years before Mr. Morse proposed to commence any improvements on the subject.

This last period was a new era in the science and the mode of operating by deflecting the needle or lever by magnetism. The preceding era, from 1790 to 1820, had been distinguished by decomposing water, ringing

a bell, exploding a pistol, and other great changes and improvements, introduced by galvanism, in a manner superior to common frictional electricity. All before that had been the circuit by wires, and the use, so far as practicable, of the spark and other signals connected with it, through ordinary electric power.

It is not a little remarkable, looking to both Morse and House as inventors, that Ampere's plan was to have as many wires as letters, and press down a key on each as wanted. And that the same year. Cavallo proposed the communication to be made by a spark as a signal.

The public mind, among the scientific and machinists, had got so excited on the topic four years previous to 1832, the period of the voyage in the Sully, that numerous attempts were made in 1828 to carry out into more practical use, and to perfect what had before been indicated so often and so distinctly, the use of electricity and electro-magnetism for the purpose of telegraphing. Jacob Green wrote on it. Travoilot proposed to act by a wire from Paris to Brussels, and Sturgeon actually constructed at Woolwich an apparatus with a horse-shoe magnet, and the end of a wire coiled around it, communicating with the opposite poles of a galvanic machine, and thus supporting a weight or bar of nine pounds.

It is believed that Prof. Henry had discovered and described as early as this, and shown at Albany in 1829, how to increase the power at little expense. And Feckner suggested that galvanism could thus be applied to telegraph from Leipsic to Dresden.

But the most surprising discovery on this subject, about this period, was by Harrison Grey Dyer, another enterprising American. In 1827 or 1828, he is proved by Cornwell to have constructed a telegraph on Long Island, at the race-course, by wires on poles, and using glass insulators. Doctor Bell fortifies this statement, having seen some of his wires, and understood its

operation to be by a spark sent from one end to the other, which made a mark on paper, prepared by some chemical salts.

Dyer's own deposition, taken since this cause was argued, and to be substituted for a letter from him to Doctor Bell, which was then objected to by the plaintiff, and ruled out, now verifies the truth of the letter, and goes into several details as to the condition of his invention, when abandoned in 1830, from fears of prosecution by some of his agents.

He used common electricity, and not electro-magnetism, and but one wire, which operated by a spark, which, after going through paper chemically prepared so as to leave a red mark on it, passed into the ground, without a return circuit. The difference of time between the sparks was, by an arbitrary alphabet, to signify different letters, and the paper was to be moved by the hand, while the telegraph operated, though machinery was contemplated to be introduced for that purpose. This device of an alphabet by spaces of time between sparks, evinced remarkable ingenuity, and differs, in some degree, from either Morse's, or House's, though much nearer in principle to the former.

It seems that in 1830, Booth, in Dublin, explained fully how electro-magnetism could be used to telegraph at a distance, and cause marks to be made by the fall of the armature from the horse-shoe magnet, when the circuit was broken.

But Barlow had failed of success in England from want of more power; and following out the new idea to increase the power of the magnet by closer coils of wire and otherwise, and when the want of greater power to operate further and quicker, and at less expense, seemed the chief desideratum, Mull, in 1830, succeeded in making a magnet which would sustain seventy-five pounds, and soon after one hundred and fifty pounds; and Prof. Henry, in 1831, completed one

that could sustain a ton. During 517 this last year, also, Farraday had matured fully the horse-shoe magnet, and caused, under Saxton, at a distance, a strong circular motion, and brought magnetic electricity almost to maturity.

While all these clearly preceded what took place on the Sully, and removed very much all novelty in some of the Ideas then suggested, yet it is certain that there yet remained to be constructed, on these or other principles, some practical machine for practical, popular, and commercial use, which would communicate to a distance, by electro-magnetism, and record quickly and cheaply what was thus communicated.

From that time forward, Morse is entitled to the high credit of making attempts to do this, however imperfectly informed he may then have been of what had already been accomplished toward it; and he has the still higher credit, among the experimenters from that time to 1837, of having then succeeded in perfecting what be describes at that time in his caveat and specification. Laboring on the same subject, and before 1838, Sturgeon, in 1832, had formed a rotary "electro-magnetic machine," which gave motion to working models of machinery, so as to pump water, saw wood, and draw weights. He had batteries of zinc, and electro-currents from them, and magnets with attraction and repulsion. And Baron de Schilling, the same year, or the next, constructed an electric telegraph, at St. Petersburg, which had thirty-six magnetic needles, and sounded alarms, and made signals by the deflection of the needle, which Indicated letters by numbers. In 1833, Dr. Soulther, at Zurich, caused a pendulum motion between two horse-shoe magnets, and Ritchie, with various others, showed how increased power could be cheaply created, and used at a distance.

And Professor Henry made experiments for this object, with success, and explained that the fall of the weights, or armature, would ring bells, etc. Gaus and Weber constructed the first magnetic telegraph, at Gottingen, the same year, carrying the wire above ground, and over houses, and making signs for letters. Some of their wires are still standing. And in 1834, Jacobi made one similar in some respects. And Mr. Gurley, at Dublin, made another; and in 1836, Taquin and Eutychausen carried another over the streets of Vienna. All which remained to complete what was desirable in a tracing or writing telegraph at a distance was to make dots or marks—intelligible or significant of letters and words—so as to be read or translated with ease, and to perform the operation with useful speed.

To make dots, and color them by the paper being chemical, had already been discovered, but not an alphabet in connection, unless by Dyer, in 1828; nor a movement of the paper on a roller, so as to make the dots and marks successive, unless by him with the hand. The struggle was such, in 1837, to finish what was wanted, that Morse became alarmed lest others might first complete and obtain patents, for the invention, and hence proceeded more actively with his, and in 1837, filed his caveat in the month of October.

In the same year, whether earlier or later is not known, Alexander formed an electric telegraph, by which, through signals somewhat like House's, he communicated and spelt out at a distance, the word Victoria. See evidence that this was done earlier, using a keyboard, and letters on each key, like House's. Davenport, too, in Vermont, announced another, and obtained a patent, in 1838. And M. Cook, Whetstone, and Steinheil, some using the needle, deflected; some making dots and lines; and some using the ground and water for a part of the circuit. Cook and Whetstone took out a patent for theirs in June, 1837, making the deflection of the needle point to letters on a board.

Steinheil that year had, at the Royal Observatory, an electro-magnetic telegraph, halt a mile long, on poles. This made dots and short marks on paper, and preceded Morse's caveat, being before July 19, 1837. It used the ground as part of the circuit, which had been before discovered, but which Morse does not appear to describe or claim, till his first renewal in 1848.

Nor did Morse use poles or posts at first, in 1844, when constructing a telegraph, between Baltimore, and Washington. Though they were used by Steinheil before 1839, and by Dyer, even in 1828, and were suggested to Morse early in 1840 by Prof. Henry, yet Morse thinks he himself invented them. After all this, there still was wanting a more perfect succession of marks to be made or recorded, which were letters themselves, or signs of letters, intelligible by an alphabet and power obtained and applied so as to do it quick enough for purposes of business. This deficiency was at length supplied.

Among about sixty-two competitors to the discovery of the electric telegraph by 1838, Morse alone, in 1837, seems to have reached the most perfect result desirable for public and practical use. This may not have been accomplished so wholly by the invention of much that was entirely new, as by "improvements," to use the language of his patent, on what had already been done on the same subject—improvements, ingenious, useful, and valuable. By the needle, or lever instead, not only deflected by the magnet, but provided with a pen to write, or, in other words, a pin at the end to make a dot or stroke, when thus deflected, as the circuit was held longer closed or broken, with machinery to keep the paper moving in the mean time, and so as to describe the dots and lines separately, and more especially with an alphabet, invented and matured, assigning letters and figures to these dots and lines according to their number and combination, he accomplished the great desideratum.

Thus the fortunate idea was at last formed 518 and announced, which enabled the dead machine to move and speak intelligibly at any distance, with lightning speed.

It will be seen, that amid all these efforts at telegraphic communication by electricity and electro-magnetism, more or less successful from 1745 to 1838, none had attained fully to what Morse accomplished. Some had succeeded in sending information by signals, even beyond the decomposition of water and the declivity of the needle. They had made persons at a distance recognize the sign used, and thus obtain intelligence. They had also made marks at a distance. But in no way does it appear that they had sent information to a distance, and at the same moment, by the same machine, traced it down and recorded it permanently, intelligibly, and quickly.

This triumph was reserved to Morse's inflexible perseverance in experiments and observation; and chiefly after arming the end of the needle or lever with a pin, by use of a roller, with appropriate machinery to move his paper, so as to trace successive dots and marks, and by a stenographic alphabet to explain the marks made on the paper, and by more power through his combined circuits, to effect all at a greater distance, and with greater dispatch.

Afterward by the improvements in batteries made by Daniel and Groves, in 1843, he was enabled, without these local circuits, to increase the power of the electro-magnet so as to accomplish this at any distance, and with a speed and economy which rendered the invention applicable to general use. Before 1843, Harse's battery was used, and was too feeble, and before that, Cruikshank's. The want of this increased power has rendered former attempts at times abortive for practicable purposes; and its being recently supplied by the science of Farraday and Henry, tended more speedily (by Daniel and Grove's

battery, founded on them) to remove the greatest obstacle to success.

Others had before, and about the same time, as has been noticed already, made marks on paper at a distance by the deflection of the needle, and by sparks, and attached special meanings to them, and the spaces between them. But the evidence is strong that Morse's, if not the very first, in these respects, was the most perfect and available for practical use, and the improvements by others in batteries came very opportunely to aid in its power for distant operations, beyond what even the local circuits had done. His special advance beyond others, except some new combinations, looks as if chiefly mechanical, but still it sufficed to promote the desired object.

By them and his new combinations, he was going a step further than any of his predecessors, for practical use, had accomplished, and this entitles him to protection and the fame he has achieved. This he and his assignees can therefore protect, but not particulars known long before him, or which he neither claimed, nor described, nor invented. As before explained, he must not be considered to have claimed the invention of the general principle or art of telegraphing by electro-magnetism, nor could he, as already shown, have protected it if he had. But all he clearly claimed was "a method" of doing it—"an improvement" in doing it, and these he has a right to protect, and these only. They were a pin to mark or trace in the end of his lever or needle—a happy thought, but the movement of the paper on a roller was almost as necessary to receive marks in succession—and his alphabet to be thus applied and used, was the crowning art of his invention.

Much more might be offered as to the details of Morse's machinery, and as to those inventions existing before and since—and how far the latter may have been imitative or independent. But it is not necessary to

explain or discuss them, for the purpose of settling the present case.

It is certain that in 1837, he had so far completed his invention as to announce it in his caveat, and have it described also, by a brother, in a public paper called the Observer, and in Silliman's Journal. And that though a specification followed in 1838, and a patent in 1840, without putting it in operation for practical purposes, yet, by the aid of congress in 1844, it was successfully used from Baltimore to Washington. It thus became perfected and turned to practical account; and is to be protected to its legitimate extent against every real violation.

However ingenious, then, have been some of the attacks on the originality of Morse's invention, and however cogent may be some of the objections to its validity, on other grounds urged in argument by the defendants, I do not find it necessary, as before remarked, to give an opinion on them in this case. Because, considering Morse's patent as good, if limited to the extent claimed in his specifications, as we have construed it on this occasion, and as we feel bound to construe it on the law of the case and the evidence before us, and considering it as original to the extent we have already explained—the situation of the House machine, as used by the defendants, is such as to render no further examination useful concerning the first two points.

The character of House's machine, and more especially as compared with Morse's, does not seem, to a very wide extent, to have been fully examined and understood.

Having ascertained, with some care, what must be considered the real claim of Morse in his patent, and how much of it is new we are prepared better to decide the chief and final inquiry, what there is in the machine used by defendants, and alleged in their answer, to have been invented by House, which

violates what is novel in Morse's. 519 Firstly. What is meant, in law, by a violation or infringement of a patent? It would amount to an infringement of such an invention as Morse's, or the patent for it, to adopt his mode of acting, operating, etc., or merely to change it by substituting some mechanical equivalent in a part of it, or altering only the form and proportion, so as not materially to affect results, or making any change merely evasive, colorable, and not "substantial," or "considerable" in its character. Jupe v. Pratt, 1 Webst. Pat. Cas. 146–149; Neilson's Case, Id. 342; Barrett v. Hall {Case No. 1,047}; Whittemore v. Cutter {Case No. 17,601}. But one machine or manufacture is not a violation of another, within the purview of the patent system, unless it is substantially the same. It need not be identical, but it must be similar in the principle or mode of operation.

When its results differ favorably and considerably, it is considered that there must be an improvement involved in it over and beyond the other, or this could not happen. So, when its mode of operation is unlike the other in material respects, the author of it is not culpable, and is of course not guilty of any mechanical piracy.

The same latitude for further inventions and improvements is open to others as was open to Mr. Morse himself. He was allowed to make any improvement on his predecessors; and others are equally allowed to make any improvement on him. To be sure, if his improvement was engrafted on a machine or manufacture before made and patented, he could use or patent only his improvement, and not what bad been previously patented, without obtaining first a license or purchase from the patentee. So of others in relation to him. But if his machine did not amount merely to an improvement on others, but to more—and did constitute a new and useful combination, he had a right to use it without license

from others. Eden v. De Costa, 37 Lond. Jour. Arts, 130.

So as to others, in respect to their improvements after his.

But the new combination, when the patent is for that, is not violated when only parts of it are used by others, and not all of them, which are material. Prouty v. Ruggles, 16 Pet {41 U. S.} 336. Scrutinizing the two machines together, the defendants insist that House's operates on a principle radically different from Morse's; that its results are greatly superior, and that it resembles Morse's in nothing which did not exist before Morse's invention, and which was not produced before by others rather than by him.

In answer to this, it is true that the general object of the two is the same, and so it is with all rival inventions. But this, of course, does not necessarily make all new inventions or patents for a like object an encroachment on all previous ones. Such a doctrine would discourage progress, rather than encourage useful arts, as the constitution wishes to be done by granting patents.

It would, after one invention as to the same subject, principle, or art, halt and bar all further advances on the same subject. It would petrify everything as it stood, to the great loss of mankind, and in derogation of both private and public rights to advance human improvement and human power. It would also render the first improver a monopolist, and exclude the exercise or reward of further genius, science and labor in the same line, however useful, and however much needed, beyond what has already been accomplished.

But limit the doctrine, as we have done already, to the particular improvement made, and the patentee of it is allowed to protect that improvement, as he ought to be—it being his own invention, his own property, and the fruit of his own exertion, though, of course, it does not protect, and should not, a

monopoly of what else may have been invented by others before, or may be invented by them afterward, on the same subject—the chief care must be, while allowing others their rights, to shield his, and not let others claim or use his method of improvement colorably or fraudulently, but only use what is substantially different. Elec. Tel. Co. v. Little, 34 Lond. Jour. Arts, 130.

Analyzing and comparing these inventions together in particulars, it will be difficult to designate anything in House's, which, in point of law or fact, amounts to a violation of the other—under the principles of well-settled law, applicable to the subject which we have laid down.

It is certain, on examination of the two machines, that they appear to the eye entirely unlike, except in some particulars as to wires, magnets and batteries, which were in existence and use before Morse's invention, or have been since improved by others.

It is certain, too, that Morse's is less complicated, and more easily intelligible, while House's is very difficult to be comprehended in its operations in detail, and works with the addition of two more powers—one, air, and the other called axial-magnetism.

Indeed, the difference is, in these respects, so strongly marked to the eye and to the mind, that while Morse's can readily be understood by most mechanics and men of science, it requires days, if not weeks, with some, thoroughly to comprehend all the parts and movements of House's. And House's, without any patent, has been sufficiently protected thus far from piracy, by the apparent inability of others to imitate it with success.

It is manifest, still further, that while Morse's operates rapidly, and records in a species of hieroglyphics or stenography, which has to be translated into English, House's moves much faster, at the astonishing rate of sixty or seventy strokes

or breaks in a second, and at once records‘ the information, by its own machinery, in Roman letters.

It literally gives “letters to lightning,” as 520 well as “lightning to letters.” In short, the system of Morse, in one respect, viz: in its tracing or writing, is essentially different as to its mode of recording from that of House‘s, and depends on machinery and devices original in Morse; whereas House‘s does not copy this, either in form or substance, but records in a different manner, and by new machinery, and by aid of one new power in axial-magnetism, and of another old, but different power in air, applied in a new way. And it does this in letters, not signs, and with wonderful speed and accuracy. This was a thing attempted before Morse or House, and, to a certain extent, realized, though not then, by the same powers, nor then so perfect as to be useful.

To be more minute, as before indicated, the chief principle or characteristic of Morse‘s, is, that by its type-rule or knob-spring at the starting place, it is able to make dots and lines, by breaking the circuit, for a longer or shorter time, and then being felt along the wires to the other end, trace there on paper, passing over or under the needle or pin, at the end of the lever, like dots or lines, which remain on it permanently written, to be afterward, by the stenographic alphabet, translated into Roman letters and words.

But this does not appear ever to have been accomplished before, so as to be turned to practical account, though developed in part and approximated as before described. But House‘s makes no such tracing at either end of the circuit. It acts at both ends by means of signals, and traces nothing, and at the closing end, by the power of air, operating on the type-wheel, it literally prints the letter signalized on the rim of the wheel. Such signals were known, and some used, long before Morse‘s patent, and they are

here perfected and printed by House, in a manner exceedingly ingenious, rapid, and interesting.

Without going into fuller details in explanation of the principle in House's machine, operating so unlike Morse's, it may suffice to add, that the machine of the former, at the starting point, does not trace any marks or dots, and lines, but has signal letters stamped on twenty-four keys, like those of a piano. The operator touches one of these, so as to hold the circuit closed till, by means of the machinery, the same signal letter is presented at the other end of the rim of the type-wheel, where twenty-four letters are separately attached. There the signal letter is not then traced on the paper like Morse's, by the movement and tracing which have taken place at the other end, but this real letter on the type-wheel is itself printed on the paper, and others in rapid succession follow, till the words and sentences appear, as the paper rolls onward, printed in perfect form.

It will, therefore, be manifest that one machine—Morse's—traces at the distant end what is traced at the other; while House's does not trace at either end, but makes a signal of a letter at the distant end which has been made at the other, and thus, by new machinery, and a new power of air and axial-magnetism, is enabled to print the single letter at the last end; and this with a rapidity marvelous, and at the same time novel, and practicable for commercial use. In short, one is a tracing or writing telegraph, the other a signal and printing telegraph.

This distinction between writing and printing may not be very material for some purposes when a name or assent is wanting on paper, as under the Statute of Frauds, or in voting (4 Pick. 313).

Yet the art of writing Is a different one from the art of printing; the latter being a modern invention, and the former a very ancient one, and everyone knows that the process to form each rests on principles wholly

different. Again, it must be conceded that House uses a moving power, such as the other does, for some purposes, when employing electro-magnetism between two stations. But this had long been employed by others for a like purpose before Morse or House used it; and hence the conduct of the latter in this respect is no infringement on anything original and duly patented by the former.

There are other material differences; the rest of the machinery in one, that is in Morse's, is simple, and in some respects new; while the rest in the other, that is in House's, is complicated, is aided by new forces, and causes new results, though founded on a theory of signalizing older than either of these inventions.

In the next place, an objection urged against House's is, that if not like Morse's in most material respects, it is in all of them a mere equivalent. By equivalents in machinery is usually meant the substitution of merely one mechanical power for another, or one obvious and customary mode for another of effecting a like result.

That these two machines are not equivalents seems manifest from a fact, admitted in the argument, and testified to by Foss, a witness for the plaintiff, that though by some changes House's could do all which Morse's does, yet Morse's could not be made to do all which House's does.

Looking, also, into details, it is manifest, that differences exist between Morse's and House's, which consist of nothing resembling equivalents, such as the different results produced by each on the recording paper, and this by a different mode of operation, and by the assistance of two different powers.

Another difference, which prevents the two from being equivalents, is not only the want in Morse's of much that is in House's, but vice versa. Besides what the latter omits, before enumerated, he throws

away entirely the "U" magnet, as well as other parts of Morse's as a combination.

Among other material things not used by House, which are used by Morse, and show the machines neither identical nor equivalent, are a local circuit—one of the two galvanic 521 batteries and one of the circuits of conductors—the mode of closing and opening the circuits—the pen and lever, etc.

Again, most if not all which House uses, that is in Morse's, was known before Morse's patent. Where House uses powers and machinery known before Morse, he does not use the same or an equivalent, which Morse invented or can protect. He has the same right to use all known and not patented before, as Morse had. Among them, we have already seen where the wires and the circuit—the galvanic battery—the use of the posts, and the ground for a part of the circuit—the breaks in it by various devices, as by lifting the wire out, or a blow—the making of signals and marks—the paper and the clock-work, and the needle deflected, if not the lever. There has been, too, in use in other business, numerous arrangements and machines for self-recording, such as gasometers for measuring the gas used, registers of tides and the quantity of rain falling, or work of certain kinds performed, direction of winds, distances traveled by men or carriages, etc. Some of these resembled much Morse's system of marks on paper. And to imitate those by like means would be permissible, though not by new means or machinery obtained from Morse.

It would likewise be difficult to consider House's as identical or equivalent with Morse's, when he uses neither of the new and distinguishing parts in Morse's, viz: the pin in the lever or needle to trace or record characters, nor the stenographic alphabet to make them intelligible.

House also uses some things, which seem new and peculiar to his machine, and prevent it from

being a mere equivalent. The supposed new discovery and use by House of axial-magnetism, operating perpendicularly within a cylinder, covered by coils of wire, and helping to produce the astonishing number of fifty-four or eighty-four vibrations in a second, are claimed to be important, and to aid materially in the operations of his machine. How that may be, must be decided by experts, where necessary, as also the importance of the air and air apparatus which he employs. It is true that air is as old as creation, and its use as a moving power, almost coeval with navigation; but the employment of this all-pervading and nearly spiritual element in telegraphic machinery, to move by Its vacuums, with superhuman strength and speed, and contribute to print rather than speak ideas, may be new and original.

But it does not seem useful, on this occasion, to go into details concerning either of them—considering how the machines stand on other grounds, and their external appearance in connection with it.

Indeed, we are compelled by the history of this subject, and the most decisive weight of evidence on the stand, to believe what is certainly not in accordance with our own previous general impressions, that much we supposed new in connection with both of these machines, is not new, nor to be protected against use by others. For instance:

The use of the electro-magnetism generally, for communicating intelligence at a distance, and there recording it, is, as heretofore shown, not new to either Morse or House. The idea had, as already explained, been long conceived prior to the experiments of either. But the want of a sufficient power to operate at a great distance, till after the discovery of galvanism and the horseshoe magnet, prevented its complete success for practical objects, leaving it rather, as then called, a "philosophical toy," in most places. After this discovery and improvement, the want of mechanism to repeat

the breaks rapidly enough for general use, and mark down the results, presented difficulties. To be sure, the marking down a dot at the distant end, made at the starting place, was known by the deflection of a needle and other devices, such as the spark, though not with the pin and the kind of machinery throughout used by Morse, or with the stenographic alphabet invented by Morse. So the signal of a letter at one end plainly understood at the other, was known before House's invention, but never made to work with the speed of his, and to print that letter as well as know it, at the distant place where it was signalized.

The lever, of which so much is said, seems only the old needle depressed at one end by the magnet, and of course elevated at the" other till the circuit is broken; and by putting a pin or a pen in the last end, a dot or stroke is made on the paper rolling above or below, and the stenographic signs are then recorded. One other view to illustrate, whether House has or has not encroached on what Morse invented, and we shall be done with this mode of investigating this branch of the subject. From the examination made, it appears that the novelties in Morse's patents are—first, local circuits—and for these his last patent seems chiefly to have been taken out; secondly, recording or writing at a distance by electric magnetism; and, thirdly, doing it by a regular stenographic alphabet on rolling paper. Now, as to the local circuits, they are not used at all by House.

As to the tracing or writing at a distance in any way and by the aid of electro-magnetism alone, it is not the mode in which House's machine operates. But, on the contrary, it records by a distinct art, viz: the art of printing, and by means of two additional powers in axial-magnetism and in air, and by new and different machinery. To be sure, he uses, also, the power of electromagnetism, but Morse did not invent that power or its employment in telegraphing.

Lastly, as to a stenographic alphabet, as invented and used by Morse—it is manifest that it is not employed by House at either end of his line, but the ancient Roman letters, unchanged and unmodified in any respect whatever. It seems thus demonstrable, 522 that all which Morse appears entitled to protect as new, is untouched by House.

If we proceed next to the opinion of experts, whether House infringes on Morse, or, in other words, whether the principle of the two machines be unlike or not, there seems to be a remarkable preponderance in favor of House's machine. Mr. Morse, himself, is the other way a gentlemen—not educated specially to any branch of science, but having the general information of a man liberally taught, and a highly ingenious mind. He was a painter by profession, according to his evidence, and beside him regarding House as infringing, is only Mr. Foss, an assistant in working one of his machines, but a baker and grocer till 1845. These are all against House's machine; and neither of them seem to be experts, such as usually are relied on to give scientific opinion rather than mere facts. On the other hand, {to show} that the principles of the two machines are clearly unlike, {there} are numerous experts, including some of the most experienced and talented men in this line of science in the country, and some of them also very practical men. They all, twelve or fourteen in number, unite in the conclusion, that the principle of the two is wholly different.

Some consider the two as unlike as "a goose-quill is to a printing-press." And several of them express a decided opinion that House's is superior—some think as a work of science, some as a piece of mechanism, and some as to its practical utility.

Though more complicated, its results are in Roman letters, and require no translation; its speed in action is greater; and is not so liable to mistakes in transmitting or construing and copying. Many of the patents or

inventions which have been upheld, are such slight changes from former modes or machines as to be tested in their material diversity chiefly by their better results, such as the flame of gas rather than oil, the hot blast rather than the cold, charcoal used in making sugar, hot water in place of cold in making cloth, etc.

The meaning attached to the word "principle," may lead to a part of the difference expressed by Messrs. Morse and Foss. But the larger number concurring in a different view—and the definition which the law, as heretofore explained," requires us to place on the favored principle, in the patent system, leave no doubt that, setting aside the use of wires, batteries, and electro-magnets—which neither Morse nor House invented—their machines or improvements rest on principles, in some respects, totally and clearly unlike.

Again, regarding Morse's as a new combination of old parts, or improvements with one new part, invented by him, which is perhaps nearest the truth, it is then manifest that if House's does not adopt the new part, or all the different elements of the new combination, it is not an infringement. Curt. Pat. 93; Barrett v. Hall {Case No. 1,047}

In order to violate a new combination, all the material parts of it must be used, or that is not used which the patentee claimed as necessary to constitute his new improvement. As before shown, on the evidence, it cannot be pretended that House uses at all many things material in Morse's, such as the "U magnet," the "clock-work," the lever, the pin, or pen, or type-rule, or local circuits. The last machine, there, in such a case, being in parts, in principle and combination, so unlike the first, except the general use of electro-magnetism, invented by neither, cannot be regarded as an infringement on the first, but its author has the same right to invent and employ it, as the author of the first had to invent that. The public, too, as well as men of genius, have the same right to make

and employ still further improvements, in telegraphing by electro-magnetism, and in recording the results, as Morse had in 1832, or in 1838. or 1840.

All, however, must take care not to use anything which Morse, himself, invented, but only, like him, use the fruits of their own perseverance and ingenuity. While they do not go beyond this, as the defendants under House do not appear to have done in this case, the plaintiff as assignee of Morse, is not entitled in equity to the extraordinary remedy of an injunction to stop forever the operations under House's machine.

On the evidence presented to me on both sides, and after a careful examination of that and the legal principles which should govern my decisions, I have been forced to the conclusion, contrary to my previous impressions, that the defendants have not been, proved guilty of any such wrong.

If I have fallen into an error in this conclusion, I deeply regret it; but it is some satisfaction to reflect that it can easily be corrected. For any views expressed by me in this ease in equity, can not only be revised by another tribunal, the supreme court, and, if erroneous, corrected, but another remedy exists at law, if the plaintiff supposes he will be able to prove there, with clearness, that the House patent is a violation of the principles involved in Morse's.

A decision by the district judge of Kentucky has been cited for the plaintiff on some of the points of this case. But as the defendants were not parties to it, and as it related to another telegraph than House's, it can not bind the defendants, and can not on any legal question, be an authority to govern this court, though its reasoning has received and is entitled to respectful consideration, where it refers to any legal principle. Injunction refused.

{For other cases involving these patents, see notes to Smith v. Clark, Case No. 13,027; Same v. Ely, Id. No. 13,043.}

[1] {Reported by Samuel S. Fisher, Esq., and here reprinted by permission.}