third claims of the patent, and the terret of the second claim. The complainant is entitled to a decree sustaining its patent, finding infringement, and for an accounting.

WESTINGHOUSE et al. v. BOYDEN POWER-BRAKE CO.

(Circuit Court, D. Maryland. March 11, 1895.)

1. PATENTS—INFRINGEMENT—AIR BRAKES.
The Westinghouse patent No. 360,070, for a fluid-pressure automatic brake mechanism, is not infringed as to claims 1 and 4, which are expressly limited to an auxiliary valve independent of the triple valve by the Boyden brake mechanism (patents Nos. 481,135 and 481,136), in which the main valve is made to do both main valve work and quick-action work, when needed.

2. SAME—FUNDAMENTAL INVENTIONS—DIFFERENCES IN FORM.
Claim 2 of the Westinghouse patent is not, however, thus restricted, and, as the invention is a broad one, *held*, that this claim is infringed by the Boyden mechanism, which attains the same result by means functionally equivalent, though differing in form.

3. SAME—DISCLAIMERS—AMENDMENTS IN PATENT OFFICE.
Amendments made to meet the objections of an examiner are not to be construed as a disclaimer of the patentee's actual invention, if such construction can be avoided without doing violence to the obvious meaning of the language used. Lake Shore & M. S. Ry. Co. v. National Car-Brake Shoe Co., 4 Sup. Ct. 33, 110 U. S. 229, and Reece Button-Hole Mach. Co. v. Globe Button-Hole Mach. Co., 10 C. C. A. 194, 61 Fed. 958, followed.

4. SAME—FUNDAMENTAL INVENTIONS—EFFECT OF SUBSEQUENT IMPROVEMENTS.
In the case of a fundamental invention, a defect which prevents the commercial success of the mechanism as originally patented, but which is not radical in character, and is readily corrected by the inventor after experiment, does not deprive the patent of its meritorious character, although the improvement itself becomes the subject of a subsequent patent.

This was a bill in equity by George Westinghouse, Jr., and the Westinghouse Air-Brake Company against the Boyden Power-Brake Company, George A. Boyden, president, Charles B. Mann, secretary, and William Whitridge, treasurer, for the infringement of a patent.

George H. Christy, I. Snowden Bell, Frederic H. Betts, and Bernard Carter, for complainants.

Lysander Hill, Hector T. Fenton, and Barton & Wilmer, for defendant.

MORRIS, District Judge. This is a bill in equity, in usual form, charging the defendant with infringing the Westinghouse patent No. 360,070, dated March 29, 1887, for a fluid-pressure automatic brake mechanism. The claims alleged to have been infringed by the defendant are claims 1, 2, and 4, which are as follows:

"(1) In a brake mechanism, the combination of a main air pipe, an auxiliary reservoir, a brake cylinder, a triple valve, and an auxiliary valve device, actuated by the piston of the triple valve and independent of the main valve thereof, for admitting air in the application of the brake directly from the main air pipe to the brake cylinder, substantially as set forth. (2) In a brake mechanism, the combination of a main air pipe, an auxiliary reservoir, a brake cylinder, and a triple valve, having a piston whose preliminary traverse

admits air from the auxiliary reservoir to the brake cylinder, and which by a further traverse admits air directly from the main air pipe to the brake cylinder, substantially as set forth." "(4) The combination, in a triple-valve device, of a case or chest, a piston fixed upon a stem and working in a chamber therein, a valve moving with the piston stem, and governing ports and passages in the case leading to connections with an auxiliary reservoir and a brake cylinder and to the atmosphere, respectively, and an auxiliary valve actuated by the piston stem and controlling communication between passages leading to connections with a main air pipe and with the brake cylinder, respectively, substantially as set forth."

The only defense now urged by the defendant is non-infringement.

The history of the pioneer inventions of George Westinghouse, Jr., in fluid-pressure brakes, by means of which the brakes of a train of railroad cars can be operated by air pressure controlled by the engineer of the train, and the history of the successive steps and inventions by which he has devised mechanisms adapted to apply that power so as to act automatically on each car, and the scope and fundamental importance of his later inventions, by which he has accelerated in an astonishing degree the quickness with which the brakes can be applied almost simultaneously on each car of a long train, consisting of as many as 50 freight cars, has been carefully and fully stated by Judge Townsend, who delivered the opinion in the case of Westinghouse v. Air-Brake Co., 59 Fed. 581; and by Judge Shipman in the same case on appeal (11 C. C. A. 528, 63 Fed. 962); and in the opinion of Judge Lacombe, filed December 27, 1894, in a case between the same parties in the United States circuit court for the Southern district of New York (65 Fed. 99).

The patent now in suit, No. 360,070, March 29, 1887, is the first of the Westinghouse patents in which he describes an additional function ingrafted upon his automatic air brake, which is to be used only in cases of unusual emergency, and which is intended to meet the difficulties of applying air brakes quickly on long trains. The purpose of the device was to increase the quickness of the serial action of the automatic brake mechanism on each successive car by making the triple-valve device of each brake mechanism set in operation the valves on the car immediately in its rear, and at the same time to make use of the train-pipe air vented for this purpose from the train pipe at each triple valve, so as to add its power to the power supplied from the auxiliary reservoir of each car. The result which Westinghouse was seeking in the new device described in patent No. 360,070 was, first and principally, to vent the train pipe at each car so as to quicken the serial action of the brakes from car to car; and, secondarily, to utilize the vented air, and not waste its power. Westinghouse discovered that he could accomplish this result by so constructing the ordinary triple valve of his automatic mechanism that, in an emergency, the engineer, by widely opening his engineer's valve and thereby causing a sudden and unusual release of pressure in the train pipe, could cause the piston of the triple valve to make an unusual and further traverse, and thereby actuate a valve which opened a port by which the train-pipe air was admitted suddenly and directly into the brake cylinder, without passing through the auxiliary reservoir. This sudden release of air

from the train pipe vented that pipe at the first car, and that, venting in like manner, released the pressure in the train pipe at the valve of the next car, and so on, from car to car, with almost instantaneous rapidity. It is shown that this device, as first constructed, was not entirely successful. It applied the brakes with greatly increased serial rapidity as compared with any former device, and with much greater power, but not so quickly but that the rear cars impinged against the forward ones with destructive shocks. The reason for this appears to have been that the operation of venting was not carried far enough, because the port opened by the auxiliary valve was not of sufficient size, and did not release the full volume of train-pipe air suddenly enough to vent it sufficiently. This defect was remedied by an improved mechanism devised by Westinghouse, and described in his patent No. 376,837, January 24, 1888. The success of this improved device has demonstrated that the invention by which the further traverse of the triple-valve piston beyond the extent of the traverse required for the ordinary application of the brakes is made to admit a large volume of train-pipe air directly to the brake cylinder was one of great importance. The proofs show that a quick-action automatic brake, which would give the results which this brake has accomplished, was earnestly sought after by inventors and car builders, and all had failed, until Westinghouse discovered that it could be done by this mode of operation. In the cases above referred to, in which this patent No. 360,070, and the improvement on it, No. 376,837, were discussed with reference to the state of the art and the scope of the invention therein disclosed, these were held to be patents of a fundamental pioneer class, describing an invention of primary importance. In those cases the defendants, who were charged with infringing, were using a separate and independent valve to open the port to the train pipe, and the question was whether or not Westinghouse was restricted to the form of independent valve and the precise mode of actuating it set out in his patent. It was held that he was entitled to a liberal construction of his claims, and that in respect to the emergency valve the form of his device was not of the essence of his invention.

In the Boyden mechanism, which is alleged in this case to infringe, I have not been able to satisfy myself that Boyden makes use of an "auxiliary valve" in the sense in which that term is employed in the specification and in some of the claims of the patent No. 360,070, now in suit. It appears from the specification of patent No. 360,070 that what Westinghouse meant by the auxiliary valve, which is made one of the elements of the combination in the first and fourth claims, is such a valve as he has described in his specification, and which is independent of and performs none of the functions of the main valve of the ordinary triple-valve device; and I am not satisfied, notwithstanding the very positive testimony of the complainants' experts, that the poppet valve 22 of the Boyden mechanism is such a valve, for Boyden's poppet valve 22 does, as I understand its operation, to some extent perform the functions of a main valve of the triple valve as well as the function of Westinghouse's

auxiliary quick-action or emergency valve. It is probably true that in the Boyden mechanism the stem valve, i, k, j, which I take to be the equivalent of the sensitive graduating valve shown in the Westinghouse patent No. 220,556, October 14, 1879, is so constructed that it may do, and probably in most cases does do, the work of ordinary braking; that is to say, by two or three successive applications of pressure through that smaller and more sensitive valve, the brake cylinder is filled, and the main valve 22 becomes nonessential, or, if lifted off its seat, is moved very gently. But valve 22 will, if the engineer uses his brake valve carefully, do the work of a main valve, as is demonstrated, I think, by the experiments in which the sensitive graduating valve, i, k, j, was plugged up. So I take it that defendant's valve, i, k, j, must be held to be the sensitive graduating valve usual in triple-valve devices since the Westinghouse patent No. 220,556 and the defendant's valve 22 must be considered to be the main valve, and that in defendant's mechanism he has been able, by an ingenious arrangement restricting the admission of auxiliary reservoir air to the triple-valve chamber, to cause the main valve to do both main-valve work, when needed, and to do quick-action work, when needed. As, by the explicit terms of claims 1 and 4, Westinghouse has restricted himself as to those claims to an auxiliary valve, independent of the triple valve, I hold that the defendant does not infringe those claims.

Claim 2.

Claim 2 reads as follows:

"(2) In a brake mechanism, the combination of a main air pipe, an auxiliary reservoir, a brake cylinder, and a triple valve, having a piston whose preliminary traverse admits air from the auxiliary reservoir to the brake cylinder, and which by a further traverse admits air directly from the main air pipe to the brake cylinder, substantially as set forth."

The first three elements of this claim are the usual mechanism of an automatic air brake. The remaining element, which was the only novel one at the date of the patent, is a triple valve having a piston which, by two distinct movements, performs two distinct functions,—the first, its preliminary traverse, by which it admits air from the auxiliary reservoir to the brake cylinder, which is the ordinary effect of the usual movement of the triple-valve piston; and the second, its further traverse, which is a new and distinct use, admitting air directly from the main air pipe to the brake cylinder, resulting in venting the main air pipe and in producing the quick action. Now this, as I understand it, was the invention which Westinghouse brought to light. He discovered, and by experiment demonstrated, that, by a further traverse of the triple piston, train-pipe air could be vented from the train pipe, and that it would give two very important results, namely: First, quickening of the action of the brakes from the forward to the rear cars, so that the application of the brakes became almost instantaneous on all the cars; and, second, utilizing the vented air for direct action in the brake cylinder.

Now, although quick-action emergency brakes were being sought for, no one before Westinghouse had accomplished this result,

and the means by which he accomplished it were entirely novel. Indeed, upon first impression, it is paradoxical and startling to find that, when a sudden, quick, and powerful application of brakes is needed in the face of impending danger, it is to be obtained by a sudden large release of the pressure in the train pipe, to the extent of 15 or 20 pounds below that in the auxiliary reservoir, and that by using this low-pressure air to operate the brake cylinder, instead of the air under greater pressure stored in the auxiliary reservoir, this remarkably effective application of the brakes is obtained. In the domain of quick-action brakes, this device would seem to belong to that class of pioneer inventions, the patents for which are to be construed so as to be coextensive with the real invention, if the language of the claim will permit it.

It is shown that Westinghouse was the first who used a further traverse of the triple-valve piston to perform the operation required to vent the train pipe into the brake cylinder to effect quick action. The result was new, and the means were new. His claim 2 is broad enough in language to cover every device in which that is done by the further traverse, admitting air directly from the train pipe to the brake cylinder, substantially by the means described in the specification; that is, by the further traverse actuating a valve which so admits the train-pipe air. The result accomplished by defendant's mechanism is identical with that of Westinghouse, and the means by which the mechanism is actuated so alike that in its published trade catalogue defendant claims that cars fitted with its valves can be used on the same trains with the Westinghouse quick-action brake, because the engineer in applying or releasing the air pressure may treat them as identical, the same functional operations of the valves and the same results being obtained from the same changes in the engineer's brake valve; so that there is strong prima facie reason to suppose that Boyden's way of using the same release of pressure to vent the train pipe and to actuate the valves, which produces identical results, may be Westinghouse's way.

In mechanisms actuated by air under pressure the transmission of power is not visible to the senses as plainly as when it is done by cranks and levers, and, being transmitted by an invisible agency in all directions in which the air can escape, the functions of the instrumentalities by which it operates are more important than their forms, and, in judging of an infringement, we are to direct our minds rather to functional equivalents than to mechanical equivalents.

The use by Boyden of a central opening through the triple-valve piston to admit train-pipe air to the triple-valve chamber was not new, nor the use of a poppet valve for the main valve of the triple; both of these constructions having been shown in the Westinghouse patent No. 141,685, May 24, 1873, and in others of his patents. So that there is nothing in the Boyden device not before exhibited in some one of the Westinghouse patents, except that he has been able to cause one of the valves of the triple (valve 22), at one stage of the application of brakes, to perform ordinary service

work, and at another to do quick-action work. This Boyden does by an ingenious construction, not before used, by which he restricts the passage of auxiliary reservoir air into the triple-valve chamber, so that, when the further traverse of the piston suddenly unseats the poppet valve 22, the port opened by it to the brake cylinder is so large, and the supply of auxiliary reservoir air through the restricted passage so feeble, that the train-pipe air raises its check valve, and vents itself into that chamber, and thence through the large port to the brake cylinder. For the mechanism embodying this ingenious contrivance, by which the poppet valve 22 is made capable of doing ordinary service work by a careful, intermittent, slow release of pressure by the engineer, and quick-action work by a quick, sudden release, patents were granted to Boyden (No. 481,134, August 16, 1892, and No. 481,135, August 16, 1892); but if this construction contains the underlying invention of the patent in suit, which was granted March 29, 1887, Boyden cannot make use of his improvement during the life of that patent.

It is true that, in searching for some device which would give quick action, Westinghouse had, before the date of the patent in suit, conceived the idea that it might be accomplished by venting the train pipe at intervals along the train. He had tried having two or three vents at intervals in the length of the train, controlled by electrical apparatus, and also had tried relief valves placed in the pipe coupling of each car, which would open to the atmosphere and vent the train pipe quickly, in case of accident or other sudden release of pressure in the forward part of the train. This was shown in the Westinghouse patent No. 217,838, July 22, 1879, but neither of these attempts was successfully applied, and they did not solve the problem of quick action.

The problem was not solved. Indeed, the first step in the direction of solving it does not appear to have been taken until the experiments which led to the Westinghouse patent now in suit. The substance of the method then devised is the use of the sudden further traverse of the triple-valve piston to open a valve in a manner different from the valve opening made by the preliminary traverse for service braking, thereby admitting train-pipe air to the brake cylinder without its passing through the auxiliary reservoir.

In the Westinghouse apparatus the further traverse of the triple-valve piston causes it to impinge against an additional separate valve, which admits the train-pipe air. In Boyden's apparatus used by defendant the further traverse pulls the poppet valve 22, which Boyden substituted for the ordinary main valve of the triple, suddenly off its seat, thereby, in the manner before mentioned, causing the train-pipe air to raise the check valve, and flow with volume through the triple-valve chamber direct to the brake cylinder. The device in Boyden's apparatus, by which the difference of pressures in the triple-valve chamber between auxiliary reservoir air and the train-pipe air is produced and used, is ingenious and admirable; but the result obtained is just the same as when in the Westinghouse apparatus the auxiliary valve is unseated, and the means used are, in my judgment, functionally equivalent.

Under the ruling of Sewing Mach. Co. v. Lancaster, 129 U. S. 263, 9 Sup. Ct. 299, and of the many cases cited in the opinion delivered in that case, the rights of a pioneer inventor are infringed by one who accomplishes the same result by means which, although never used for that purpose before, are mechanical equivalents for the means used by the inventor, under a liberal construction of his patent. It was said in that case by Mr. Justice Blatchford (page 273, 129 U. S., and page 299, 9 Sup. Ct.):

"Where an invention is one of a primary character, and the mechanical functions performed by the machine are, as a whole, entirely new, all subsequent machines which employ substantially the same means to accomplish the same result are infringements, although the subsequent machine may contain improvements in the separate mechanisms which go to make up the machine."

In McCormick v. Talcott, 20 How. 402, the controversy arose over a device which McCormick had added to his reaper called a "divider," intended to separate the standing grain which is to be left from that which is to be cut. The court said:

"If he be the original inventor of the device or machine called the 'divider,' he will have the right to treat as infringers all who make dividers operating on the same principle and performing the same functions, by analogous means or equivalent combinations, even though the infringing machine be an improvement of the original, and patentable as such."

In Machine Co. v. Murphy, 97 U. S. 120–125, it was said:

"Nor is it safe to give much heed to the fact that the corresponding device in two machines organized to accomplish the same result is different in shape or form the one from the other, as it is necessary in every such investigation to look at the mode of operation or the way the device works, and at the result, as well as at the means by which the result is attained."

The language of the supreme court in Consolidated Safety-Valve Co. v. Crosby Steam-Gauge & Valve Co., 113 U. S. 157–171, 5 Sup. Ct. 513, is applicable:

"The prior structures never effected the kind of result attained by Richardson's apparatus, because they lacked the thing which gave success. * * * Taught by Richardson, and by the use of his apparatus, it is not difficult for skilled mechanics to take prior structures, and so arrange and use them as to produce more or less of the beneficial results first made known by Richardson."

It is true that a patentee can claim nothing beyond the scope of his patent (Keystone Bridge Co. v. Phoenix Iron Co., 95 U. S. 274), but the scope and meaning of a broad claim in the patent can only be interpreted by an understanding of the real scope of the invention itself.

If the Westinghouse patent now in suit is for an invention of a primary character, and if the gist of that invention is the use of the further traverse of the triple-valve piston to open a valve which admits air directly from the train pipe to the brake cylinder, with the result that the train pipe is vented and the train-pipe air utilized, then it appears to me that the defendant cannot exculpate itself from the charge of infringement by the fact that in its device the train-pipe air is admitted through the triple-valve chamber and not through a by-passage, nor by the fact that in its device the further traverse of the piston opens the main valve in

a special manner, which produces the same result, but does not make use of a separate auxiliary valve, provided Westinghouse has not by the explicit terms of his claim 2 restricted himself to the use of an auxiliary valve.

I do not think Westinghouse has so restricted himself in claim 2, although he does appear to have done so in claims 1 and 4.

There is, without question, some difficulty and embarrassment in the broad construction of claim 2, growing out of the proceedings in the patent office, as shown by the file wrapper and contents; but, considering what was the real invention, I am not of the opinion that the legal effect of those proceedings is to restrict claim 2 to a device containing a separate auxiliary valve. From the contents of the file wrapper it appears that, as the application was prepared, the first claim of patent No. 360,070 differed from that which now appears in the patent as granted. The claim 1 first proposed was:

"(1) In a brake mechanism the combination of a main air pipe, an auxiliary reservoir, a brake cylinder, a triple valve provided with a device for admitting air directly from the main air pipe to the brake cylinder, substantially as set forth."

It was objected by the patent-office examiner that this claim, and also claim 2, were anticipated by patent No. 280,285, to G. A. Boyden, June 26, 1883, and the examiner requested that a working model of the triple valve should be furnished. Boyden's patent of 1883, No. 280,285, was a form of triple-valve mechanism intended for use with Westinghouse's automatic air brake, the object of which was to provide for replenishing the auxiliary reservoir of each car when the pressure therein had been lessened by leakage and while the brakes remained applied. This was done by the engineer causing, not a release, but a slight increase of the pressure in the train-pipe air, which, acting upon a check valve in the center of the triple-valve piston, by a peculiar arrangement of the valves, caused train-pipe air to pass, together with auxiliary reservoir air, to the brake cylinder. The object, function, and result of whatever was new and patentable in this Boyden device was altogether different from the object, function, and result of the Westinghouse device in patent No. 360,070, and there seems to be no analogy or comparison which can be made between them.

It is true that the "always open one way passage" in the Boyden patent, which, when the check valve was raised, allowed train-pipe air to reach the brake cylinder, was, in the language of the canceled claim 1 of No. 360,070, "a device for admitting air directly from the main air pipe to the brake cylinder," and there were other devices used by Westinghouse himself which this wording would include; and the claim was therefore justly open to the criticism of the patent examiner, but there was no similarity in the means by which the two devices were actuated, no similarity in the object to be accomplished, and no similarity in the mechanical principle of operation. It was simply a fact that there did exist in the Boyden device a passage for train-pipe air direct to the brake cylinder, which the engineer could cause to open by a slight increase of train-pipe pressure; but there was no hint or suggestion

of the important discovery how that fact could be utilized to accomplish the entirely new function necessary to create a quick-action brake, when, in an emergency, quick action was needed, and how, when quick action was not needed, it should not interfere with ordinary graduation and service stops. This Boyden device was not in the direction of quick action, but its opposite.

While, therefore, it was proper that Westinghouse's original claim 1 should be corrected so as to express more definitely his real invention, this was not because the Boyden patent in any manner whatever anticipated that invention or suggested it in any of its functions.

For the same reason there was then inserted in the specification of the Westinghouse patent No. 360,070 this clause:

"I am aware that a construction in which 'an always open one way passage' from the main air pipe to the brake cylinder is uncovered by the piston of the triple valve simultaneously with the opening of the passage from the auxiliary reservoir to the brake cylinder has been heretofore proposed, and such construction, which involves an operation different from that of my invention, I therefore hereby disclaim."

In the Boyden infringing device now used by the defendant, the passage from the main air pipe to the brake cylinder is not "uncovered by the piston of the triple valve simultaneously with the opening of the passage from the auxiliary reservoir to the brake cylinder." If it was, the defendant's mechanism would always be a quick-action brake, and never anything else; but, on the contrary, in the infringing device, the passage is not opened until there has been a sudden further traverse of the piston, which then brings it into operation for the distinct purpose of quick action. The statement of the so-called "disclaimer" is strictly true that the construction of the Boyden 1883 patent "involves an operation different from" the Westinghouse invention, and the so-called "disclaimer" in reality disclaims nothing which has relation to the Westinghouse quick-action invention. The disclaimer was substituted in the place of the following, which had been in the specification, and was canceled:

"Further, while in the specific construction described and shown the function of admitting air from the main pipe is performed by a valve separate from that which effects the preliminary admission of reservoir pressure to the cylinder, a modification in which the same office is performed by a valve integral with the main valve, and formed by an extension thereof, would be included in and embody the essential operative features of my invention."

The testimony tends to prove that this clause of the specification was taken out because the examiner objected that no such form of triple valve was illustrated in the drawings. For whatever reason it may have been canceled, it is not a necessary result that the patentee is precluded from claiming that his patent covers other forms of valve integral with the main valve, if such is his legal right when his invention, as disclosed in his patent, is found to be a broad one, and if he is not restricted by his claims, and if he has done nothing to impair his right to be protected in his whole invention. The effort should be to preserve, rather than to for-

feit, the inventor's rights. Manufacturing Co. v. Adams, 151 U. S. 144, 14 Sup. Ct. 295.

The object and scope of the invention, and the means employed to effect his object, are thus stated by Westinghouse in the specification of his patent in suit:

"The object of my invention is to enable the application of brake shoes to car wheels by fluid pressure, to be effected with greater rapidity and effectiveness than heretofore, more particularly in trains of considerable length, as well as to economize compressed air in the operation of braking by utilizing in the brake cylinders the greater portion of the volume of air which in former practice was directly discharged into the atmosphere. To this end, my invention, generally stated, consists in a novel combination of a brake pipe, an auxiliary reservoir, a brake cylinder, and a triple-valve device, governing, primarily, communication between the auxiliary reservoir and the brake cylinder, and, secondarily, communication directly from the brake pipe to the brake cylinder."

This language exactly describes the infringing mechanism of the defendant. The amendments made to meet the objections of the patent examiner are not to be construed to disclaim the patentee's actual invention, if such construction can be avoided without doing violence to the obvious meaning of the language. Lake Shore & M. S. Ry. Co. v. National Car-Brake Shoe Co., 110 U. S. 229–236, 4 Sup. Ct. 33; Reece Button-Hole Mach. Co. v. Globe Button-Hole Mach. Co., 10 C. C. A. 194, 61 Fed. 958.

It has been urged that the invention disclosed by the patent in suit is not of a meritorious character, because in the form in which it is there embodied, or, at least, in the first mechanism manufactured by Westinghouse, it failed of success in some essentials, and was immediately improved by Westinghouse in a manner which was the subject of a subsequent patent, before it was successful in the use for which it was intended. The defect developed by experimental test, and which Westinghouse in a few months remedied, was that the opening uncovered by the auxiliary valve was not sufficiently large to suddenly release the full volume of train-pipe air. This was not a defect inherent in the device. Westinghouse v. Air-Brake Co., 59 Fed. 581–591. There were structural objections to making that opening large, but, when made larger, the device answered the purpose for which it was intended. It was thought, however, better to remedy the difficulty by adding an auxiliary piston as well as an auxiliary valve, and it was in that line that Westinghouse carried his further improvements, and he has adopted that form as the best to be manufactured for general use. This defect in the patent in suit was not radical, and was only one of those defects common in the first forms of many pioneer inventions, which usually have to be improved upon before they attain commercial success.

It is further urged that in a doubtful case the scale should be turned by the fact that, subsequent to the date of the patent in suit,—indeed, more than two years after the institution of this suit,—patents Nos. 481,134 and 481,135, August 16, 1892, were granted to Boyden for the mechanism now used by the defendant. Boyden was entitled to patents for whatever was a patentable nov-

elty in the devices by which he was able to make his valve 22 answer for both service and quick-action work, in connection with the restricted passage, B, and for any other patentable novelty in the forms of his mechanism. The widely different forms in which he has illustrated his devices in the two above-mentioned patents show that, taking what Westinghouse had discovered and demonstrated to be the underlying principle of a quick-action brake, a skillful and inventive mechanic can devise many forms for applying it. But, in his specification of patent No. 481,135, Boyden alleges that his device differs essentially from Westinghouse's patent No. 360,070, and involves a new mode of operation. The question whether it does or does not was the very question then pending in this suit, and, so far as the examiner passed upon it in allowing the specification to stand, he did so upon the ex parte application of Boyden, and unassisted by testimony as to the state of the art at the date of the Westinghouse patent, and without testimony as to the scope of the Westinghouse quick-action invention, and its great importance and merit; and therefore without the opportunity of judging whether or not it was a pioneer invention of a fundamental character, entitled to a construction coextensive with the invention, or was simply a patent for an improvement in a known art, to be restricted to the form of the device shown in the model and illustrations. The determination of that question is the starting point in the consideration of the controversy, and, in my judgment, the fact that Westinghouse was the first discoverer of the vital underlying invention should turn the scale in his favor. The complainants are entitled to a decree for an injunction and account, with a reference to a master in the usual form.

GURNEY v. OAKES et al.

(Circuit Court of Appeals, First Circuit. February 13, 1895.)

No. 107.

PATENTS—INFRINGEMENT—DEVICE FOR BUILDING CARRIAGE TOPS.

The Oakes patent, No. 378,457, for an adjustable form for setting and building carriage tops, *held* infringed, as to claims 1 and 3, by a device made in accordance with the Quimby patent, No. 458,252. 62 Fed. 269, affirmed.

Appeal from the Circuit Court of the United States for the District of Massachusetts.

This was a bill by Judson E. Oakes and others against James W. Gurney for infringement of a patent. The circuit court rendered a decree for complainants (62 Fed. 269), and defendant appealed.

James E. Maynadier, for appellant.
William H. Clifford, for appellees.

Before COLT and PUTNAM, Circuit Judges, and NELSON, District Judge.