

CONSOLIDATED SAFETY-VALVE CO. V.
KUNKLE.

Circuit Court, N. D. Illinois.

January 8, 1883.

PATENTS FOR INVENTIONS—STEAM-VALVE.

In an action for infringement of a patent for a steam-valve, where the idea of regulating the escape of steam by a movable plate upon a spindle in the valve-head is older than patentee's device, and was public property when his invention was made, and old English and American valves were intended to work on substantially the same principle as the valve of the complainant, but which may have failed for lack of skill in making and using them, rather than because their inventors had not conceived the true principle upon which they were to work, held, that the use of a similar valve by defendant was not an infringement of complainant's patent.

In Equity.

Thomas W. Clark, for complainant.

J. H. Raymond, for defendant.

BLODGETT, D. J. This is a suit to enjoin the alleged infringement by defendant of two patents issued to George W. Richardson,—one, No. 58,294, dated September 25, 1866, for an "improvement in safety-valves;" and the other, No. 85,968, dated January 19, 1869, for an "improvement in safety-valves." The defenses relied upon are (1) that defendant does not infringe; (2) that complainant's patents are void for want of novelty, and for uncertainty in the specifications and claims. The peculiar feature of these two patents is what is termed by the experts the stricture, the operation of which is to secure an additional lifting force on the head of the valve beyond that of the initial pressure inside of the steam generator; and the second patent, which purports to be an improvement on the first, has an arrangement by which this stricture is made adjustable

by a peculiar device, which is minutely described. These patents have been several times before the courts, and so far considered, in the light of the state of the art, as to very much abridge the area for discussion or construction in this case.

In *Ashcroft v. Boston & L. R. Co.* 1 Bann. & Ard. 215, and in *Richardson v. Ashcroft*, not reported, the contest was between the Richardson patent and the Naylor patent, issued in England in July, 1863, and in this country in 1866, a month or two after the first Richardson patent, and Judge SHEPLY, before whom these cases were heard, held in the first-named case that the Richardson device did not infringe the Naylor patent, and, in the second case, that the Naylor patent did not infringe the Richardson.

The Naylor patent was for a safety-valve constructed with an extended area upon the head of the valve for the purpose of aiding in the lift, and in that respect it was claimed that Richardson infringed upon Naylor. Judge SHEPLY, in his opinion in the first-mentioned case, says;

“Without adverting to the patents of Hartley, Waterman, and other devices older than Naylor’s, we have seen that Naylor could not, with propriety, claim to have been the inventor of the combination, in a spring safety-valve, of every form of projecting, overhanging, downward-curved lip or periphery, with an annular recess surrounding the valve-seat, into which a portion of the steam is deflected as it issues between the valve and its seat.

“Naylor did not invent the overhanging, downward-curved lip or periphery, nor was he the first to use an annular chamber surrounding the valve-seat, into which a portion of the steam is deflected as it issues between the valve and its seat. His claims must therefore be limited to the combination of 734 the other elements *with precisely such an annular recess as he has described*, and operating in the described

manner, so far as such recess, separately or in combination, differed in construction and operation (if it did materially differ in those respects) from those which had preceded it. The claims cannot be made to cover a safety-valve like the Richardson valve, which, in its construction and mode of operation, is substantially different from the valve described in the Naylor patent, simply because the Richardson valve, in common with the Naylor valve, has the overhanging, downward-curved lip or periphery, and an annular recess surrounding the valve-seat, into which a portion of the steam issuing from between the valve and its seat is deflected.

“The differences between the Richardson and Naylor valves, in construction, are apparent upon an inspection of the drawings of the respective patents. The difference in the mode of operation is most clearly proved by the testimony of the experts in the case. In the Naylor valve, it appears that it was the intention of the inventor to use the impact of the issuing steam upon the concave lip of the valve to assist in lifting it, and only this, except so far as it was aided by the diminution of the atmospheric pressure on the top of the valve, consequent upon the issuing of a portion of the steam in an upward direction around the periphery of the valve, the annular chamber into which the steam is discharged on leaving the valve serving no other purpose than that of a conduit for the steam, when the valve is constructed in accordance with the drawings of the original patent. In the Richardson valve, when the valve opens the steam expands and flows into the annular space around the ground-joint, its free escape is prevented by a stricture or narrow space formed by the outer edge of the lip and the valve-seat. Thus the steam escaping from the valve is made to act by its expansive force upon an additional area outside of the valve proper, to assist in raising the valve; this stricture being enlarged as the valve is considerably lifted from

its seat, and varying in size as the quantity varies of the issuing steam. There would be no such variable stricture in the Naylor valve.”

This case went to the supreme court of the United States, and in its opinion affirming the case the court says:

“Taken as a whole, the facts show conclusively that the assignor of the complainant [Naylor] was not the first person to devise means for using the recoil action of steam to assist in lifting the seat of the steam-valve for the purpose described, and it follows that the patentee in suit must be limited to what he actually invented, which is the devices, shown in the specifications and drawings, to enable the party to avail himself of such recoil action.

“Coming to the specification that describes the steam-valve used by the respondents [Richardson’s] it will at once be seen that its construction and mode of operation is substantially different in important particulars, as follows: When the valve opens, the steam expands and flows into the annular space around the ground-joint. Its free escape, which might otherwise be too free, is prevented by a stricture or narrow space formed by the outer edge of the lip and the valve-seat. By these means the steam escaping from the valve is made to act, by its expansive force, upon an additional area outside of the device, 735 as ordinarily constructed, to assist in raising the valve; the stricture being enlarged as the valve is lifted from its seat, and varying in size as the quantity of the issuing steam increases or diminishes. Important functions, not very dissimilar in the effect produced, are performed by the two patented valves in controversy; but the means shown in the respective specifications, and the mode of operation described to produce the effect, are substantially different in material respects, which shows to a demonstration that the complainant cannot prevail unless it can be held that his assignor invented

the overhanging, downward-curved lip, and that he was the first to use an annular chamber, surrounding the valve-seat, into which a portion of the steam is deflected as it issues between the valve and its seat. Neither of those conditions can be found in favor of the complainant, and of course it cannot be held that the respondents have infringed his patent”

These patents were again before Judge Lowell, of the eastern district of Massachusetts, in a case where the present complainant sued the Crosby Valve Company for infringement, the opinion on the final hearing of the case having been delivered in April, 1881, and is made a part of the record in this case. In that opinion* Judge Lowell says:

“In this record the defendant introduces two English patents not brought out in *Richardson v. Ashcroft*, and I have examined two accomplished experts in relation to them. They also produce the American reissued patent of Waterman, which I suppose to have been before Judge SHEPLY in connection with the state of the art, but which, if we may judge from the pleadings, was not relied on to defeat the novelty of the Richardson patent. The original patent of Waterman, which was considerably older than Richardson’s, while claiming an improvement to a different part of the valve, showed a structure so much like Richardson’s that Richardson sought out the inventor, and they made a joint stock of their two patents, and procured a reissue of that of Waterman, in which he specifies a mode of construction by which, when the valve is raised from its seat, the escaping steam is so directed as to enter an overhanging or projecting annular chamber on the top or upper part of the valve, and outside of and beyond the ground-joint. He describes how this force may be modified by a modification of the overhanging or projecting annular surface. He goes into all the details of the necessary and proper construction, and, in short,

as I understand it, describes the Richardson valve, with a stricture and all, excepting that his additional lift was due wholly to the expansive power of the steam admitted to the annular chamber, while Richardson's used both the impact of the issuing steam and its subsequent expansive power. Naylor had used the impact only. * * * My opinion upon the issue of infringement makes it unnecessary for me to explain at large the conclusions concerning the state of the art—at which I have arrived after a patient study of the record—excepting to this extent: I consider it to be fully proved that some valves had been made before 1866 which operated on the same general principle with that of Richardson, and were of some value. Especially is this true of 736 the Naylor and Waterman contrivances, and probably of Beyer's. * * * In this state of the art, Richardson describes an annular chamber outside the ground-joint of a valve, and so regulated by the crack or opening between its lip and the main body of the valve that it will confine or “huddle,” as the experts say, the steam when it begins to escape from the chamber, and will presently afterwards open more widely and let the steam escape, and not interfere with the rapid fall of the valve before it has lost too much steam.”

The learned judge then particularly describes the Crosby device, the peculiarity of which is that, when the valve rises, an additional part of its under surface is exposed to the action of the steam in the chamber, this additional part is either masked or neutralized until the valve begins to rise, when it furnishes an additional lift proportioned to the additional area exposed, and concludes as follows:

“Now, it is plain that this contrivance does not come strictly within the language of the plaintiff's claim of a safety-valve, with the circular or annular lip, etc.

“Considering the state of the art as I have found it to be, that Richardson was not the first to invent and

apply, more or less well, the principle of the additional area, nor that of the stricture, he could not, whatever the words of his claim, successfully enjoin the use of a valve resembling his own only in its adoption of these general ideas.”

The result of these judicial constructions upon the Richardson device, as I understand them, is to limit the Richardson patent to the special devices therein shown for obtaining a common result. In other words, although Naylor showed an extended area of the valve-head, with a downward-curved lip or flange, thereby producing an annular chamber or recess by which the escaping steam was impeded in its progress to the open air, and an additional lifting force secured for raising the valve, and though Crosby showed an increased area of valve surface upon which the steam began to press as soon as it commenced to escape through the ground-joint, yet neither of these infringe the Richardson patents, because they are not just like Richardson's. They produce the same result, but each by a somewhat different mechanical appliance, and Richardson was not held entitled to invoke the doctrine of equivalents.

The defendant's valve shows an extended area of the valve-head, so as to form a flange and an extension of the valve-seat upwards, so as to form a ring encircling and reaching above the extended valve-head, so that the steam, as it escapes through the ground-joint, impinges upon the flange of the valve-head, and by its impact furnishes an auxiliary lift to aid in raising the valve still higher. The Kunkle 737 valve shows also a screw-ring attached to the valve-seat, and so arranged as to be movable up and down, thereby controlling, to some extent, the direction of the escaping steam, and causing it to impinge, more or less directly, upon the flange of the valve-head. But in the light of the testimony, and especially of the series of interesting and instructive experiments made

by Mr. Hoadly, the defendant's expert witness, with defendant's valve in comparison with the Richardson, Webster, Hartly, and Waterman valves, I fail to find in defendant's valve the stricture which is shown in, and especially provided for, by the Richardson valve. There may be some stricture,—that is, the steam may be, to some extent, huddled and compelled to exert its expansive force on the underside of the extended area of the valve-head, by means of the crooked or angular passages through which it makes its exit to the open air,—but a stricture, as such, was not the invention of Richardson. Mr. Forbes, complainant's expert, finds a stricture in the Webster patent and one in Ritchie's to such an extent that it can readily be converted into the Richardson valve by slightly reducing "the periphery of the supplemental flange;" and Richardson himself, in the Waterman reissue, must be held to have assented to the claim that the Waterman valve shows a stricture, while the Beyer, Hartly, Greene, and Naylor valves also show that the steam in its escape must be, to some extent, impeded and thereby compelled to exert some expansive force upon the supplemental areas of their respective valves; while in Richardson's valve the expansion of the steam in the annular chamber, made by the downward-curved lip, is the chief factor relied upon for an increase of lifting force, and this annular expansion chamber, acting in combination with the stricture or throttled escape passage for the steam from this expansion chamber, is the peculiar feature of Richardson's device.

Webster, it seems to me, shows not only a stricture, but the element of adjustability is clearly shown by the provision for raising or lowering the auxiliary plate or flange upon the spindle of the valve, so as to increase or diminish the opening for the escape of the steam from beneath the extended area of the supplemental flange.

I am certainly unable to find in Kunkle's valve such a stricture as is specially described by Richardson in his patent of 1869. In the specifications of that patent he says:

"The said means so patented, (referring to his patent of 1866,) consisting in forming the valve with a surface outside of the ground-joint for the escaping steam to act against, the said surface being surrounded by a projecting 738 lip, rim, or flange, leaving a narrow space for the escape of the steam when the valve is open, but which, although of greater diameter than the valve-seat by reason of the said lip, presents a less area of opening for the escape of steam than is produced at the valve-seat, so that the steam which escapes through the area between the valve shall exert pressure between the said surrounding surfaces, and thereby not only open the valve completely, but hold it up until the pressure of the steam in the boiler falls below the pressure by which the valve was opened."

This, as I understand it, is Richardson's definition of the construction and operation of his stricture, and requires in specific terms that the space for the escape of the steam between the flange and ring: encircling the expanded valve-head, shall be of less area than the area of escape at the valve-seat; a peculiarity not provided for in Kunkle's valve, and evidently not intended to be a part of his mechanism, as from the time the steam passes through the ground-joint of the Kunkle valve it is nowhere throttled and compelled to pass through a less area on its way to the open air, its exit passages increasing constantly in area instead of diminishing.

With strictures shown in the older stages of the art, I am therefore clearly of opinion that Richardson must be confined to his special mode of producing the stricture; and I am also of opinion that whatever of stricture the defendants show is more nearly, in the mechanical mode of producing it and in its operation,

like the older devices of Beyer, Hartly, Webster, Greene, Waterman, and Naylor.

It is true, the defendant uses a screw-ring in his valve, and that Richardson, in his patent of 1869, shows a screw-ring; but the screw-ring shown in the defendant's device is not, in its function nor relation to the operation of the defendant's patent, the same as the screw-ring of the complainant's device of 1869. The complainant's screw-ring was intended specifically to operate as a stricture, or to regulate the size of the opening for the escape of the steam,—a duty which is not performed by the defendant's ring.

The claim of Richardson in the patent of 1869 is “for a combination of the surface, beyond the seat of the safety-valve, with the means herein described for regulating or adjusting the area of the passage for the escape of steam, substantially as and for the purpose described.”

The specifications describe minutely the means for regulating or adjusting “the area of the passage for the escape of the steam,” to be by the operation of a screw-ring, in connection with a central aperture and the disk, F. Here was a peculiar method of throttling or holding the steam so as to make its expansive force available as an 739 auxiliary to help lift the valve, and the claim covers only that special combination. A new outlet for the steam, inside of the outlet between the expanded head of the valve and its extended seat, is provided in Richardson's later patent, and his claim must be held to cover only that peculiar mechanism by which the new outlet is provided for, and its function determined in combination with the other parts of his device; otherwise the new patent of 1869 would be for the same stricture shown and claimed in the patent of 1866.

After Webster had taught the world how to regulate the escape of the steam by his movable plate upon a spindle on the valve-head, and to hold it at the

proper point of adjustment by the set-screw, Kunkle was, it seems to me, at liberty to regulate the opening for the escape of the steam by means of a screw-ring upon the periphery of the valve-seator, by placing such a ring upon the extended, valve-head, if he saw fit to do so. The idea of so regulating even the size of the stricture by a movable plate is older than Richardson's invention, and was public property when his invention was made.

I will add that, from the experiments made by the experts in this shown in the proof, it seems quite probable to me that the improved practical working results obtained by the Richardson and Kunkle valves over those previously in use, is as much attributable to their improved finish and mechanical perfection as to any newly-invented element they contain. In the hands of a skillful manipulator, valves constructed according to the specifications of the Webster and Hartly patents, including the proportions given in those patents, did their work substantially as well as the Richardson and Kunkle valve.

The Webster, Hartly, and Waterman valves, when mechanically well made, showed results closely approximating to the best results of Richardson's device. It was long after the steam-engine was a complete conception in the mind of Watt, before skilled workmen were trained by experience, and in the use of suitable tools, to make it accomplish what he intended and theoretically knew it was capable of doing. So these old English and American valves, intended to work on substantially the same principle as Richardson's, may have failed for lack of skill in making and using them, rather than because their inventors had not conceived the true principle upon which they were to work.

The bill must be dismissed, because I find under the proof the defendant does not infringe the plaintiff's patent.

* 7 FED. REF. 768

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