ASHCROFT *v.* RAILROAD COMPANY.

1. Reissued letters-patent No. 3727, granted by the United States, Nov. 9, 1869, to Edward H. Ashcroft, assignee of William Naylor, for an improvement in steam safety-valves, being a reissue of original letters No. 58,962, granted to Naylor Oct. 16, 1866, cannot, in view of the disclaimer of said Naylor in his specification, upon which English letters-patent No. 1830 were sealed to him Jan. 19, 1864, and of the prior state of the art, be construed to embrace a combination, in every form of spring safety-valve, of a projecting, overhanging, downward-curved lip or periphery, with an annular recess or chamber surrounding the valve-seat, into which a portion of the steam is deflected as it issues between the valve and its seat, but must be limited to a combination of the other elements of his device, with such an annular recess of the precise form, and operating in the manner described, so far as such recess, separately or in combination, differs in construction or mode of operation from those which preceded it.
2. Said reissued letters, thus limited, are not infringed by the use of a steam safety-valve made in substantial compliance with the specification of letters-patent No. 58,294, granted Sept. 25, 1866, to George W. Richardson.

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

English letters-patent No. 1830, dated July 21, 1863, and sealed Jan. 19, 1864, were granted to William Naylor, of England, for improvements in safety-valves and in apparatus connected therewith. The specification describes his invention as consisting, "when using a spring for resisting the valve from opening, in the employment of a lever of the first order, one end resting by a suitable pin upon the safety-valve, and the other end of the lever resting upon the spring, the end resting upon the spring being bent downwards to an angle of about forty-five degrees from the fulcrum, so that when the valve is raised by the steam the other end of the lever is depressed upon the spring downwards, and at the same time is moved inwards towards the fulcrum, thus virtually shortening the end of the lever, and thereby counteracting the additional load upon the valve as it is raised from its seat by the greater amount of compression put upon the spring." He also describes a contrivance consisting of a lateral branch or escape-passage for a portion of the steam after it has passed the valve, the valve being made to project over the edges of the exit-passage, the projecting edges of the valve being made to curve

slightly downwards, so that the steam on issuing between the valve and its seat will impinge against the curved projecting portion of the valve, and a portion of it be directed downwards into the annular chamber surrounding the central passage, which chamber communicates at once with the branch exit-pipe, whilst the other portion of the steam ascends past the edges of the valve. He then says, "By this means I am enabled to avail myself of the recoil action of the steam against the valve, for the purpose of facilitating the further lifting of such valve when once opened; but I wish it to be understood that I lay no claim to such recoil action, nor to the extension of the valve laterally beyond its seat."

The specification of English letters-patent No. 1038, granted to Charles Beyer for improvements in safety-valves, dated April 25, 1863, and sealed Oct. 16, 1863, describes his invention as consisting "in forming a flange around the valve, commencing at the outer edge of the valve facing, which flange is under-cut and concave in shape, and the concave side is towards the seating of the valve, which has also a flange upon it, commencing at the outer edge of the valve-seating, but the upper surface of this flange is convex, and corresponds nearly to the concave surface of the flange upon the valve. There is a slight space between the concave and convex surfaces of the two flanges, which diminishes towards the outer edges of the flanges. When the steam begins to escape from between the surfaces of the valve, it gets between the concave and convex surfaces of the two flanges, and its force thus acts upon a larger area, and reacts upon the concave surface of the valve, and causes it to open to a greater extent than the ordinary valve."

Letters-patent of the United States No. 58,962 were issued, Oct. 16, 1866, to said Naylor for an improvement in safety-valves. The description of his invention in the specification is substantially the same as in that of his English patent. Nothing is said, however, of availing himself of the "recoil action of the steam against the valve, for the purpose of facilitating the further lifting of such valve when once opened;" nor is there any disclaimer, as in the English specification, of the recoil action and the extension of the valve laterally beyond its seat. The claim of the specification was the arrange-

ment in safety-valves "of bent levers of the first order, acting in combination with a spring or springs, the whole operating in the manner and for the purpose set forth." Sept. 8, 1869, Naylor assigned his letters-patent to Edward H. Ashcroft, who thereupon surrendered them for reissue. The specification of the reissued letters to Ashcroft, as the assignee of Naylor, which are No. 3,727, and bear date Nov. 9, 1869, declares that the main object to be attained by the invention, viz. the counteracting the additional load upon the valve as it is raised from its seat produced by the increased resistance of the spring, "is accomplished by using a lever of the first order, one end resting by a suitable pin upon the safety-valve, constructed and arranged as hereinafter described, and the other end of the lever resting upon a spring; but, in lieu of having this lever straight or nearly so, I propose to bend downward that end which is acted upon by the spring to an angle of about forty-five degrees, so that when the valve is raised by the steam the other end of the lever is depressed upon or against the spring downward, and at the same time is moved inward toward the fulcrum, thus virtually shortening the end of the lever, and thereby counteracting the additional load upon the valve as it is raised from its seat by the greater amount of compression or tension, as the case may be, which is put upon the spring; and my invention also consists in the valve C, constructed with projecting downward-curved lip or periphery, and in the annular chamber D, surrounding the valve-seat, whereby, as the spring is compressed by the lifting of the valve, the projecting lip of the valve and the annular recess are available in causing an increased pressure on the valve, and thus overcome the increased resistance of the spring, due to its compression, as hereinafter more fully set forth.

"Figs. 1 and 2 represent, respectively, a vertical section and front elevation of a safety-valve constructed according to my invention.

"A is the main thoroughfare, leading directly from the boiler; B, a lateral branch or escape-passage for a portion of the steam after it has passed the valve C. I make this valve to project over the edges of the exit-passage A, and to curve its projecting edges slightly downward, as shown in Fig. 1, so

that the steam, on issuing between the valve and its seat, will impinge against the curved projecting portion of the valve, and a portion of it will be directed downward into the annular chamber D, surrounding the central passage A, and communicating with the exit-pipe B, while the other portion of the steam ascends past the edge of the valve."

The claims of the reissue are: —

"1. The combination and arrangement, with the hereinbefore-described safety-valve, of bent levers of the first order, and the spring or springs, in the manner substantially as hereinbefore set forth.

"2. The safety-valve C, with its overhanging, downward-curved lip or periphery, and annular recess D, substantially as herein shown and described, and for the purpose set forth.

"3. The annular recess D, surrounding the valve-seat, substantially as herein set forth.

"4. The combination of the valve C and the annular recess D, as herein set forth, and for the purpose described."

Figs. 1 and 2 are as follows: —

Fig. 1.

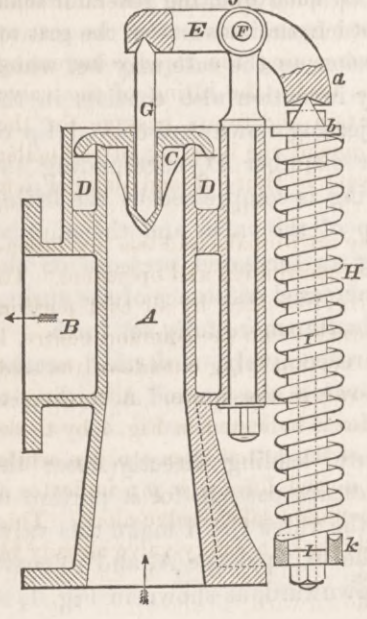
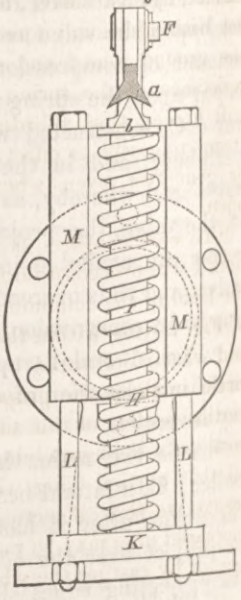


Fig. 2.



Dec. 14, 1869, this bill was filed by Ashcroft, to enjoin the alleged infringement by the Boston and Lowell Railroad Company of his reissued letters. The answer denied that they were for the same invention as that described in the original letters, that Naylor was the first and original inventor of the improvements specified in the reissued letters, or that they embrace the valve used by the company; and averred that the valves used by it were described by and embraced in letters-patent of a prior date to that of Naylor's invention, and were made under letters-patent No. 58,294, granted by the United States, Sept. 25, 1866, to George W. Richardson.

The specification of Richardson's patent describes his invention as follows: —

"E E is the valve seat.

"F F is the ground joint of the valve and seat.

"P is the countersink or centre upon which the point of the stud extending from the scale lever rests in the usual manner.

"The nature of my invention consists in increasing the area of the head of the common safety-valve outside of its ground joint, and terminating it in such a way as to form an increased resisting surface, against which the steam escaping from the generator shall act with additional force after lifting the valve from its seat at the ground joint; and so, by overcoming the rapidly increasing resistance of the spring or scales, insure the lifting of the valve still higher, thus affording so certain and free a passage for the steam to escape as effectually to prevent the bursting of the boiler or generator, even when the steam is shut off and damper left open.

"To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation. To the head of the common safety-valve, indicated by all that portion of Fig. 2 lying within the second circle from the common centre, I add what is indicated by all that portion lying outside of the said circle, in about the proportion shown in the figure. A transverse vertical section of this added portion is indicated, in Fig. 4, by those portions of the figure lying outside of the dotted lines *p p*, *p p*, while all that portion lying within the dotted lines *p p*, *p p* indicates a transverse vertical section of the common safety-valve alone. This increased area may be made by adding to a safety-valve already in use, or by casting the whole entire.

"I terminate this addition to the head of the valve with a circular or annular flange or lip *c c*, which projects beyond the valve-seat E E, Fig. 3, and extends slightly below its outer edge, fitting loosely around it and forming the circular or annular chamber D D, whose transverse section, shown in the figure, may be of any desirable form or size. This flange or lip *c c*, fitting loosely around the valve-seat E E, is separated from it by about $\frac{1}{64}$th of an inch for an ordinary spring or balance. For a strong spring or balance this space should be diminished, and for a weak spring or balance it should be increased to regulate the escape of the steam as required. Instead of having the flange or lip *c c* project beyond, and extend below and around the outer edge of the valve-seat, as shown in Fig. 3, a similar result may be attained by having the valve-seat itself project beyond the outer edge of the valve-head and terminating it with a circular or annular flange or lip, extending slightly above and fitting loosely around the outer edge of the flange or lip *c c* of the valve-head; but I consider the construction shown in Fig. 3 preferable.

"With my improved safety-valve, constructed as now described, and attached to the generator in the usual way, the steam escaping in the direction indicated by the arrows in Fig. 3 first lifts the valve from its seat at the ground joint E F, and then, passing into the annular chamber D D, acts against the increased surface of the valve-head, and by this means, together with its reaction produced by being thrown downwards upon the valve-seat F E, it overcomes the rapidly increasing resistance of the spring or balance, lifts the valve still higher, and escapes freely into the open air until the pressure in the generator is reduced to the degree desired, when the valve will be immediately closed by the tension of the spring or balance. The escape of the steam, by means of this safety-valve, is so certain and free, that the pressure of the steam in the generator or boiler will not increase beyond the point or degree at which the valve is set to blow off.

"What I claim as my improvement, and desire to secure by letters-patent, is a safety-valve with the circular or annular flange or lip *c c* constructed in the manner, or substantially in the manner, shown, so as to operate as and for the purpose herein described."

The drawings referred to in Richardson's specification are as follows: —

Fig. 1.

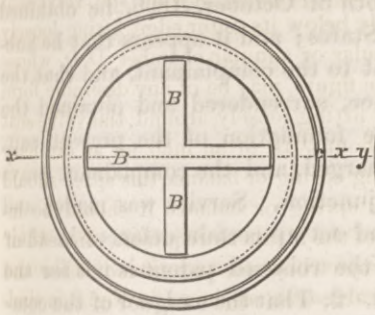


Fig. 2.

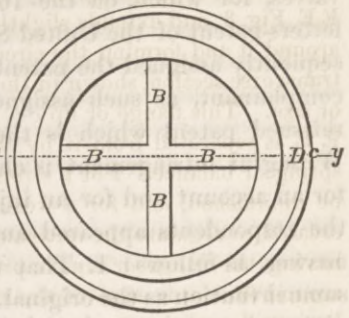


Fig. 3.

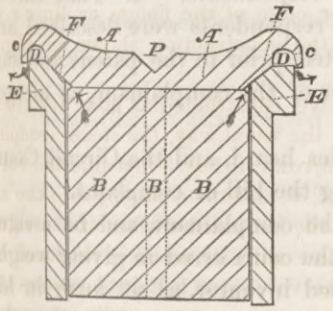
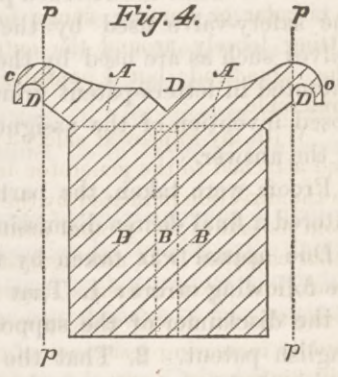


Fig. 4.



The court below, upon final hearing, dismissed the bill, upon the ground that there was no infringement. The complainant then appealed here.

Mr. Francis Forbes and *Mr. Thomas William Clarke* for the appellant.

Mr. Benjamin Dean and *Mr. J. G. Abbott, contra.*

MR. JUSTICE CLIFFORD delivered the opinion of the court.

Causes of action arising under the patent laws are originally cognizable, as well in equity as at law, by the circuit courts, or the district courts having the power and jurisdiction of a circuit court, subject to the condition that the final judgment or decree in such a case may be removed here for re-examination.

Improvements were made by William Naylor in steam safety-valves, for which, on the 16th of October, 1866, he obtained letters-patent of the United States; and it appears that he subsequently assigned the patent to the complainant, and that the complainant, as such assignee, surrendered and obtained the reissued patent which is the foundation of the present suit. Wrongful infringement is charged, and the complainant prays for an account and for an injunction. Service was made; and the respondents appeared and set up certain defences in their answer, as follows: 1. That the reissued patent is not for the same invention as the original. 2. That the assignor of the complainant was not the original and first inventor of the improvement. 3. That the reissued patent does not cover and embrace the safety-valve used by the respondents. 4. That safety-valves such as are used by the respondents were described and patented in letters-patent granted prior to the patent and supposed invention of the assignor of the complainant, as alleged in the answer.

Proofs were taken, the parties heard, and the Circuit Court entered a final decree dismissing the bill of complaint.

Due appeal was taken by the complainant, and he assigns the following errors: 1. That the court erred in giving weight to the disclaimer of the supposed inventor, as set forth in his English patent. 2. That the court erred in ruling that the patent of the complainant must be limited to claims for a combination of the valve described in the specification, with the annular recess surrounding the central chamber, as explained in the court's opinion. 3. That the court erred in deciding that the assignor of the complainant did not invent the overhanging, downward-curved lip, and that he was not 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 the seat. 4. That the court erred in deciding that the valve used by the respondents is not within the complainant's reissued patent. 5. That the court erred in deciding that there is a substantial difference between the valve used by the respondents and the valve described in the complainant's reissued patent.

Preliminary to the investigation of the inquiries suggested in

the errors assigned by the appellant, it becomes expedient to ascertain what is the construction of the patent described in the bill of complaint, and whether the same has been infringed by the respondents. Obvious convenience suggests that these two matters be first determined, for the plain reason that, if the proofs fail to establish the charge of infringement, most or all of the errors assigned will become immaterial in disposing of the case.

Persons seeking redress for the unlawful use of letters-patent are obliged to allege and prove that they, or those under whom they claim, are the original and first inventors of the improvement described in the patent, and that the same has been infringed by the party against whom the suit is brought. Both of those allegations must be proved by the party instituting the suit; but where he introduces the patent in evidence, it affords a *prima facie* presumption that the first allegation is true, and inasmuch as it is not controverted in the answer in this case, the finding in that regard must be in favor of the complainant.

Suppose that is so, still the charge of infringement is denied by the respondents, which issue cannot be satisfactorily determined without first ascertaining the true nature and character of the improvement secured to the complainant in his reissued letters-patent.

Three patents — one in England, two in the United States — were granted to the complainant or his assignor for the improvement which is the subject of the present controversy. Naylor, it is claimed, was the inventor of the patented improvement, and he took out his first patent in England, where he resided. As the patentee states, the invention relates to certain improvements in safety-valves, and consists, when using a spring for resisting the valve from opening, in the employment of a lever of the first order, one end resting by a suitable pin upon the safety-valve, and the other end of the lever resting upon the spring, the end resting upon the spring being bent downwards to an angle of about forty-five degrees from the fulcrum, so that when the valve is raised by the steam the other end of the lever is depressed upon the spring downwards, and at the same time is moved inwards towards the fulcrum, thus

virtually shortening that end of the lever, and thereby counteracting the additional load upon the valve as it is raised from its seat by the greater amount of compression put upon the spring.

Exceptional modifications in certain features of the improvement are subsequently suggested, and then the patentee proceeds to explain the functions of the different devices by reference to the drawings, in the course of which he states that he prefers to make the valve project over the edges of the exit-passage and to curve the projecting edges of the valve slightly downwards, so that the steam on issuing between the valve and its seat will impinge against the curved projecting part of the valve, which will direct a portion of it downwards into the annular chamber surrounding the central passage, while the other portion of the steam ascends past the edges of the valves. By that means the patentee states that he is enabled to avail himself of the recoil action of the steam against the valve, for the purpose of facilitating the further lifting of the valve when once opened; but he adds, what it is important to notice, that he wishes it to be understood that he lays no claim to such recoil action, nor to the extension of the valve laterally beyond its seat.

Prior to that, a safety-valve of substantially the same mode of operation had been patented in the same country to Samuel Beyer, and the reasonable presumption is that the disclaimer was inserted in the patent subsequently granted, because it had been previously invented by another.

Letters-patent to Charles Beyer were sealed Oct. 16, 1863; and the patentee states that his invention consists in forming a flange round the valve, commencing at the outer edge of the valve-facing, which flange is under-cut and concave in shape, and that the concave side is towards the seating of the valve, which has also a flange upon it, commencing at the outer edge of the valve-seating, but that the upper surface of the flange is convex, and corresponds nearly to the concave surface of the flange upon the valve. There is a slight space between the concave and convex surfaces of the two flanges, which diminishes towards the outer edge of the same. When the steam begins to escape from between the surfaces of the valve, it gets

between the concave and convex surfaces of the two flanges, and thus acts upon a larger area, and reacts upon the concave surface of the valve, and causes it to open to a greater extent than the ordinary safety-valve. Such a valve, the patentee states, will lift promptly when the required pressure is obtained, and will open to a much greater extent than the valve in common use prior to that invention. Extra pressure upon the valve will readily close it after it has lifted, but it does not shut self-acting till the pressure in the boiler has diminished several pounds below the pressure at which the valve was lifted.

Without more, these suggestions are sufficient to show that the Beyer patent, which antedates the invention of the complainant, contains substantially the same mode of operation to produce the recoil action of the steam as that disclaimed in the English patent, and shows that the disclaimer was in all probability made because it was well known to the patentee and to the officials who issued the letters-patent that another was the original and first inventor of the patented valve. Nothing of the kind is embraced in the claims of the English patent granted to the patentee, nor is there any thing in the specification which has any tendency to show that the patentee ever supposed that he invented that feature of the improved valve which he disclaimed.

Two patents for the improvement have been granted in this country, — one, the original, to the alleged inventor, and the reissued patent to the complainant, on which the suit is founded. Neither of them contains any disclaimer of the kind mentioned in the English patent, though it is conceded that both the original and the reissued patent were granted for the same invention as the English patent. Nor could that concession properly be withheld, as it is as certain as truth that the feature of the steam-valve in question was fully and clearly described in that specification, and that the patentee stated that he wished it to be understood that he did not lay any claim to the recoil action, nor to the extension of the valve laterally beyond its seat.

Explicit as that disclaimer is, still it is assigned for error by the complainant that the circuit judge erred in giving weight

to it; but the court here is of the opinion that there is no merit in that objection. Instead of that, the court decides that the patent in suit, in order that it may be held valid, must be construed in view of the disclaimer contained in that patent, and be limited to the particular devices shown in the specification for effecting such recoil action of the steam.

Taken as a whole, the facts show conclusively that the assignor of the complainant 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 patent in suit must be limited to what he actually invented, which is the devices, shown in the specification and drawings, to enable the party to avail himself of such recoil action.

Decided support to that view is found in the specification of the Beyer patent, which shows that the apparatus in question had an overhanging, downward-curved lip, and an annular recess into which the steam was directed downwards on issuing between the valve and its seat, while a portion of the steam impinged against the projecting part of the valve.

Viewed in the light of that suggestion, it is clear, as decided by the circuit judge, that the assignee of the invention in controversy cannot claim that Naylor was the original and first inventor of that feature of the improvement, nor can it properly be claimed that he invented the combination in a spring safety-valve of every form of a projecting, overhanging, downward-curved lip in such a device, with the annular recess surrounding the valve-seat, into which a portion of the steam is deflected as it issues between the valve and its seat. Limited in that way as the patent must be, in order that it may be upheld as valid, the question remains whether it has been infringed by the respondents.

Throughout, the steam-valve used by the respondents is the valve patented to George W. Richardson, whose patent makes a part of the record. He obtained his patent Sept. 25, 1866, nearly a month earlier than the date of the original American patent granted to Naylor. His invention, as he describes it, consists in increasing the area of the head of the common

safety-valve outside of its ground joint, and terminating it in such a way as to form an increased resisting surface, against which the steam escaping from the generator shall act with additional force after lifting the valve from its seat at the ground joint, and so by overcoming the rapidly increasing resistance of the spring or scales will insure the lifting of the valve still higher, thus affording so certain and free a passage for the steam to escape as effectually to prevent the bursting of the boiler or generator, even when the steam is shut off and the damper left open.

Safety-valves previously in use were not suited to accomplish what was desired, which was to open for the purpose of relieving the boiler, and then to close again at a pressure as nearly as possible equal to that at which the valve opened. Sufficient appears to show that Richardson so far accomplished that purpose as to invent a valve which would open at the given pressure to which it was adjusted, and relieve the boiler, and then close again when the pressure was reduced about two and one-half pounds to the inch, even when the pressure in the generator was one hundred pounds to the same extent of surface, which made it in practice a useful spring safety-valve, as proved by the fact that it went almost immediately into general use.

Other inventors prior in date to the Naylor invention attempted to make the desired improvement in the common safety-valve, and it is evident from what appears in the record that the efforts of one or more of them besides Beyer were attended with more or less success; but it is unnecessary to enter into those details, as it is obvious, from what appears in the Beyer patent, that Naylor did not invent the overhanging, downward-curved lip of the improved valve, 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; and the court here concurs with the circuit judge that his patent must be limited to the combination of the other elements with such an annular recess as he has described, and operating in the described manner, so far as such recess separately considered or in combination differs in construction and mode of operation from the patented steam-

valves which preceded it, as shown in the evidence giving the antecedent state of the art. It follows, therefore, that the claims of the reissued patent in suit cannot be held to cover the safety-valve used by the respondents, which in its construction and mode of operation is substantially different, as appears from a comparison of the models and an inspection of the drawings, as well as from the description given of the same in the respective specifications.

Support to that view of a decisive character is also derived from the testimony of the expert witnesses on both sides. Enough appears in the explanations of the specification and the expert testimony to satisfy the court that it was the intention of the inventor of the complainant's valve to use the impact of the issuing steam upon the concave lip of the valve to assist in lifting it without other aid, except so far as it was helped by the diminution of 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, if the valve is constructed in accordance with the drawings of the original patent.

Examined in the light of these suggestions, it is plain that the steam-valve used by the respondents cannot be held to be an infringement of that described in the specification of either of the three patents representing the invention claimed by the complainant.

Coming to the specification that describes the steam-valve used by the respondents, 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, as ordinarily constructed, to assist in raising the valve, the stricture being enlarged as the valve is lifted from its seat, and vary-

ing 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.

Confirmation of that conclusion of the most decisive character is found in the testimony of the experts, which will not be reproduced, as it would extend the opinion beyond a reasonable length.

Experiments almost without number were made by the experts, and the court is furnished with very many exhibits intended to explain the construction and mode of operation of the different steam-valves described in the various patents given in evidence in the case; but the court has not found it necessary to enter into those details, preferring to rest the decision upon the construction of the complainant's patent and his failure to show that it has been infringed by the respondents.

Decree affirmed.