

THE GENERAL ENGINEERING)
 COMPANY OF ONTARIO,) PLAINTIFFS;
 (LIMITED).....)

1899
 June 14.

AND

THE DOMINION COTTON MILLS)
 COMPANY (LIMITED), AND THE) DEFENDANTS.
 AMERICAN STOKER COMPANY)

Patent of invention—Furnace stoker—Combination—Infringement.

On the 15th October, 1892, Jones obtained a patent in Canada for alleged new and useful improvements in boiler furnaces. The distinctive feature of Jones' invention was that instead of using a fuel chamber or magazine bowl-like in shape, such as that claimed in Worthington's United States patent, he employed an oblong trough or bath-tub shaped fuel chamber with upwardly and outwardly inclined closed sides. This form of fuel chamber was suggested in the Worthington patent; but was not worked out by its inventor, it being his view apparently that several magazines or chambers bowl-like in shape could be used within the trough-shaped chamber. The Worthington patent was not commercially successful. Jones, using an oblong or trough-shaped chamber, was the first to manufacture a mechanical stoker that was commercially successful. Between Worthington's and Jones' there was all the difference between failure and success.

Held, that Jones' patent was valid.

ACTION for infringement of a patent of invention.

The facts are stated in the reasons for judgment.

The case was heard before the JUDGE OF THE EXCHEQUER COURT, at Montreal, on the 11th, 12th, 13th and 14th days of May, 1899.

J. L. Ross and *C. A. Duclos* for the plaintiffs, cited *American Dunlop Tire Company v. Anderson Tire Company* (1); *Incandeseent Gas Light Company v. De Mare* (2).

(1) 5 Ex. C. R. 194.

(2) 13 Canl. Pat. Cas. 301.

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D. Macmaster, Q.C. and *F. S. MacLennan, Q.C.* relied on *Brooks v. Lamplough* (1); *Thompson v. Moore* (2).

THE JUDGE OF THE EXCHEQUER COURT now (June 14th, 1899,) delivered judgment.

This is an action for the alleged infringement by the defendants of certain patents for improvements in mechanical stokers, of which the plaintiff company is the owner. The patent upon which the company principally rely, and the only one to which it is necessary to refer, is numbered 40,700, and was granted on the 15th day of October, 1892, to Evan William Jones, of Portland, Oregon, for alleged new and useful improvements in boiler and other furnaces.

It will, I think, be convenient before referring more particularly to this patent to examine one that was issued by the United States Patent Office on the 31st of December, 1884, to Amasa Worthington, of Chicago, Illinois, for a new and useful improvement in Self-feeding Gas Burning Furnaces. In his specification, Worthington states that:

" It is a universally admitted fact among furnace
" builders and users that to obtain the best results
" from coal as a fuel, it should be supplied in small
" charges, or, better still, fed into the furnace continu-
" ously in quantities or at a rate corresponding to the
" rate of combustion. Numerous attempts have been
" made, with more or less success, to accomplish this
" result; but the experiments have proceeded upon
" the theory that it is necessary to throw the fresh
" coal upon that which is partially consumed or in an
" incandescent state, or to deposit it at the side or in
" front of the fire, and thus permit the hydrocarbon
" gases to distill or partially distill from it before
" spreading it over the fire, both of which methods

(1) 16 Cutl. Pat. Cas. 41.

(2) 6 Cutl. Pat. Cas. 426.

" are attended with loss, not only in the direct absorp-
 " tion of heat by the coal, but in the sudden arrest of
 " combustion (caused in a measure thereby) of the
 " fixed-carbon or coke, as well as the equally sudden
 " liberation of the volatile gases in the fresh charge,
 " amounting often to thirty or forty per cent. of the
 " total heating power of the coal, which passes off
 " unconsumed, a large volume of smoke being an
 " attendant result. Aside from this, the loss in the
 " latter plan arises largely in the difficulty in main-
 " taining an even fire, and in the fact that certain
 " varieties of coal containing a large per cent. of non-
 " combustible matter are liable to become "puddled"
 " when the coke is moved in an incandescent state.
 " Moreover, it is difficult, if not impossible, in either
 " of these ways to diffuse the air throughout the mass
 " of coals and mix the same in a sufficiently even
 " manner with the evolving gases, while the same are
 " at a sufficiently high temperature to form a chemical
 " union therewith. The purpose of my invention is
 " to overcome these difficulties and to produce an
 " automatic feeding smokeless furnace, preferably
 " adapted to the use, without direct loss, of bituminous
 " coals of varying grades of fineness; said furnace being
 " arranged to so distribute said coals that combustion
 " may be uniform in its progress and intensity, and
 " that the principal heat-producing elements of the
 " coal—viz. the hydro-carbons and the fixed carbons—
 " may be so treated therein as that the combustion of
 " one may assist that of the other, each receiving the
 " required proportion of oxygen at the proper time
 " and in the proper place to support combustion.

" A further object is to so arrange said furnace that
 " the ashes and clinkers may be readily and easily
 " removed from the grate, and the fire broken up, if
 " necessary, without subjecting the latter to excessive

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“ and cooling drafts of air, the advantages and economy
 “ of which are obvious. I accomplish said object by
 “ feeding the coal from beneath the grate into a bowl-
 “ shaped receptacle situated at or near the centre of
 “ said grate, which is preferably round, and the bars of
 “ which radiate from the periphery of said bowl. The
 “ top, or periphery of the bowl, is provided with slots
 “ or openings, preferably made in a radial form, which
 “ communicate with a chamber beneath the bowl,
 “ into which a volume of air is forced either by means
 “ of a blower or a jet of steam. Said slots are so con-
 “ structed as to direct the jets of air, or air and steam,
 “ therefrom into and through the fresh coal at the
 “ earliest stage of combustion, in order to drive out
 “ the hydro-carbon and other volatile gases and reduce
 “ it to coke as rapidly as it is forced up into the fur-
 “ nace, and before it begins to spread out on the grate-
 “ bars, and to thus maintain the incandescence of the
 “ fire at the point on the surface from which the hydro-
 “ gen gases must escape, thereby reducing them to a
 “ thorough state of combustion as they leave the sur-
 “ face. As an auxiliary to this process I place an arch
 “ above, which serves as an accumulator to radiate its
 “ heat back upon the burning mass and maintain it
 “ in an incandescent condition. Openings above the
 “ grate in the usual way admit air, which, with that
 “ ordinarily passing through the grate, serves to com-
 “ plete the combustion of the coke by combining with
 “ the carbonic oxide that might otherwise escape and
 “ converting it into carbonic acid. As the coal is
 “ forced up at a given point from beneath, it tends to
 “ form a dome-shaped mass, the residue from the top
 “ rolling toward the base, at the outer circumference
 “ of which the ashes are deposited upon the grate-bars
 “ where the latter are the most widely separated from
 “ each other, thus lessening the waste of fuel through

“ the grate by retaining the unconsumed coals upon
 “ that more central portion of the grate where the bars
 “ are closer together. The coal is fed upward by
 “ means, preferably, of a single Archimedean screw or
 “ conveyor, which I prefer to place at angle of about
 “ forty-five degrees from the plane of the horizon, the
 “ lower end communicating with a hopper or recep-
 “ tacle containing the coal supply, while the upper
 “ end communicates with the bottom of the bowl or
 “ receptacle, forming a part of the grate. When the
 “ screw is revolved, as hereinafter shown, the coal is
 “ carried into the bottom of the bowl, and thence
 “ forced upward until it overflows the top and is
 “ pushed out upon the grate, the supply being in pro-
 “ portion to the required rate of combustion, all of
 “ which is hereinafter more fully stated, and definitely
 “ pointed out in the claims.”

And again with reference to the shape of the fuel receptacle chamber or magazine, the question on which the present controversy, it seems to me, turns, we find the following : —

“ It is clearly apparent that when a large grate-
 “ surface is required two or more conveyers placed
 “ side by side, with corresponding receptacles, D,
 “ may be used either with a like number of revolving
 “ grates, or a stationary grate, in which latter case,
 “ instead of two or more circular receptacles, a single
 “ oblong trough may be used, with which the several
 “ conveyers may connect. I do not limit myself,
 “ therefore, to the use of a single conveyer, nor to the
 “ form of receptacle shown, as it is evident that the
 “ same may be modified to produce substantially the
 “ same results.”

There is no Canadian patent for this stoker. It does not appear to have come into use, certainly not into general use, and the evidence of Professor Nichol-

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son shows that in the form in which it is particularly described in the specification, it is a failure in comparison with the stoker manufactured by the plaintiffs under the patents held by them, or with that manufactured by the defendant, The American Stoker Company. The difference between failure in the one case and success in the other, depends principally on the shape of the fuel chamber or magazine, an oblong trough or bath-tub shaped chamber, with the sides upwardly and outwardly inclined being that which best lends itself to the proper relation and adjustment of the elements that are combined to produce a mechanical stoker that may be worked successfully. All the elements of the Jones' stoker, or of that manufactured by The American Stoker Company, which is alleged to be an infringement of the former, are old: They, or their equivalents, are all to be found in the Worthington stoker, and different elements are to be found in various earlier patents. What Jones did was to work out Worthington's suggestion about the oblong trough. Instead of using a screw to feed the coal he used a ram or plunger; but the success of his stoker in no way depends upon that. The other elements being properly adjusted, it depends, as has been stated, on the shape of the fuel chamber or magazine. That is something which Worthington suggested, but did not work out. Jones was the first to work that out, and the first, in consequence, to manufacture a mechanical stoker, in which the best results are attained, that is, one in which the green fuel is reduced to coke before it reaches the zone of combustion, the gases distilled in the process of coking being burned and utilized without waste: Jones having succeeded Mr. Fullerton, who for over a year was selling the Jones stoker, and who is now the general manager of The American Stoker Company,

devised, so it appears by a letter of his in evidence, the stoker now manufactured by the latter company; he followed the Worthington stoker in using a screw to feed the coal, but improved upon it by placing it in a horizontal position, and in other ways, but in respect to the shape of the fuel chamber or magazines he adopted substantially that which Jones had found to be the best and most successful, and which he had used in the stoker or improvements for which he had obtained in Canada a patent.

This is what Jones himself in his specification, attached to Letters Patent No 40,700, says of his invention

“ My invention relates to an improvement in boiler
 “ and other furnaces, and it consists in a novel con-
 “ struction, combination and arrangement of means in
 “ which the fuel is forced into the mass of burning
 “ coals from a point below said mass, instead of being
 “ discharged on top of said mass, of burning fuel, said
 “ means serving to force the supply of air directly over
 “ the fresh or green fuel, and at the same time under
 “ the mass of burning fuel, thereby causing the gases
 “ from the green fuel, and the air supplied, to become
 “ thoroughly mixed before they pass through the
 “ burning fuel and off into the flue or flues; said
 “ means also serving to regulate the supply of air, and
 “ thus ensure complete combustion; said means also
 “ serving to prevent inconvenience from the formation
 “ of clinkers, and avoid the waste of fine coal, they
 “ also providing for the destruction of clinkers, in the
 “ event of such being formed; and the construction
 “ and combination being such that the fire can be run
 “ for a very long period without ashes or clinkers
 “ interfering with its perfect operation, and all the
 “ fuel shall be practically burned before it reaches the

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“ grates proper of the furnace ; and the quantity of
 “ fuel regulated.”

Then after a long and detailed description he adds :

“ In the furnace herein described, the fresh or green
 “ fuel is forced up into the body of the fire, and the gases
 “ which are liberated from this fuel pass through the
 “ body of burning coal which is above the fresh fuel,
 “ and the air for promoting combustion is supplied at
 “ the points where the fresh fuel is supplied to the
 “ mass of burning fuel above ; and the said furnace,
 “ herein described differs essentially from other fur-
 “ naces which are provided with fuel forcing means
 “ which do not constitute both a supporting fire bed
 “ for the underlying mass of fuel as well as the super-
 “ incumbent mass, and do not serve for conducting
 “ the fresh fuel directly up within the fire chamber
 “ amidst the mass of burning coal during the oper-
 “ ation of forcing the fresh fuel from the fuel box into
 “ the fire chamber by the ram.”

And in his claim, among other things, he claims, not in itself, of course, but in combination with other elements, a fuel chamber with upwardly and outwardly inclined closed sides. This, under the evidence, appears to be the distinctive feature of the stoker made by Jones, and it is more especially in reference to this feature or element of the combination that infringement is alleged.

Now I confess that at first, and during the greater part of the trial, I was strongly inclined to the view, that having regard to the Worthington patent, and other patents that are in evidence, it was in Canada open to any one, and so of course, open to the defendant, The American Stoker Company, to manufacture and set up and use the mechanical stoker of which the plaintiff company complain. It seemed to me that it was but a fair and reasonable development of the

Worthington stoker that might have been made by men skilled in the matter, and without invention. On that branch of the case I was inclined to differ with Professor Nicholson. But on further consideration I have come to the conclusion that he is right; that between the Worthington stoker and the Jones stoker there is a gulf, the gulf that lies between failure and success—that has not been bridged without invention, or that happy discovery or hitting upon things which pass therefor. And having come to that conclusion, I think the plaintiff company entitled to protection for the improvement which Jones made, and for which he obtained a patent.

There will be judgment for the plaintiff company, with costs.

Judgment accordingly

Solicitors for plaintiffs: *Rowan & Ross.*

Solicitors for the defendants: *Macmaster & Mac-*
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