BETWEEN:

ROBERT P. PORTER AND ARCHIBALD R. MACGLASHEN, ADMINISTRATOR WITH THE WILL ANNEXED, OF THE ESTATE OF GEORGE F. PORTER (DECEASED) ..... PLAINTIFFS;

1935
Nov. 13, 14 & 15.
1936
July 24.

AND

THE CORPORATION OF THE CITY OF TORONTO; THE FOUNDATION COMPANY OF ONTARIO, LIMITED, AND TORONTO IRON WORKS, LIMITED ..... DEFENDANTS.

Patent—Infringement—Anticipation—Invention.

The patent for invention herein relates to tunnels, more particularly to tube tunnels adapted to be constructed in sections which are mounted bodily in position and connected one with the other. One of its stated objects is the provision of a novel coupling structure for connecting the sections, and another object is to provide a coupling structure that will permit the sections to be shifted or swung into line after one side is coupled, thereby facilitating the coupling operation. The construction alleged to infringe plaintiffs' patent relates to a steel intake pipe built by the City of Toronto, extending some 4,200 feet into Lake Ontario.

The Court found that the form of coupling employed by the defendants was precisely that suggested by a prior patent other than that of the plaintiffs; that the patent in suit had been anticipated; that plaintiffs' patent did not disclose invention.

Held: That it is not invention to adopt a method to accomplish a result when that method is simply a case of engineering judgment or skill.

ACTION by plaintiffs to have it declared that Canadian Patent for Invention number 305,548 is valid and infringed by defendants.

The action was tried before the Honourable Mr. Justice Maclean, President of the Court, at Toronto.

H. A. Rose, K.C., H. G. Fox and *E. W. Tyrrill* for plaintiffs.

D. L. McCarthy, K.C., and *A. W. Langmuir* for defendants.

The facts and questions of law raised are stated in the reasons for judgment.

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THE PRESIDENT, now (July 24, 1936) delivered the following judgment:

This is an action for the infringement of patent no. 305,548 which issued to George F. Porter, now deceased, and Robert P. Porter, both engineers, on November 4, 1930, upon an application dated January 10, 1930. It will be convenient to refer hereafter to the plaintiffs as "Porter." The invention claimed is said to relate to tunnels, and more particularly to tube tunnels adapted to be constructed in sections, which sections are mounted bodily in position and connected one with the other. One of its stated objects is the provision of a novel coupling structure for connecting the said sections whereby they may be readily coupled together. Another object, the specification states, is to provide a coupling structure that will permit the sections to be shifted or swung into line after one side is coupled, thereby facilitating the coupling operation.

On this continent at least there seems to have been two standard methods of tunnel construction, the shield driven method, and the open trench method, the latter of which seems to be known as subaqueous tunnel construction. The shield driven method is one in which vertical shafts are sunk on land on each side of a body of water and from which shaft a cylindrical shield or bore is driven forward under land and water, the excavated material, by appropriate means, being carried to the surface. The tunnel so formed is lined usually with steel segments as the shield proceeds. This method of tunnel construction is apparently more expensive than the open trench type of tunnel construction in which a deep open trench is dredged in the bed of the water to be crossed, to receive the steel tunnel sections which are constructed on land; the sections are then by appropriate means conveyed to and sunk in the trench, where they are coupled together, the tunnel thus consisting of a single steel tube built in sections; the trench in which the sections are placed is afterwards covered by the previously excavated material. It was a well known practice in this type of construction to sink the tunnel sections on landing platforms constructed close to the bottom of the dredged trench, on which platforms certain portions of the ends of two adjacent sections would rest and

there be connected, usually by being bolted together; under and around the platforms and tunnel sections concrete would later be placed so as to afford a solid base for the sections.

The Michigan Central Railway tunnel, a double-tube tunnel, built between Detroit, Michigan, and Windsor, Ontario, in the years 1908 and 1909, was constructed according to what is known as the Hoff method, popularly known as the trench and tremie method, patented by one Hoff in 1908. In that case the steel tube sections were constructed on land, fitted with bulk-heads, and then towed into position and sunk upon the prepared landing platforms; the tubes were guided into place by what were called pilot pins and cones, the cones being on the section already sunk and the pilot pins on the section being sunk. In other words, one end of the section being placed in position had four projecting pins which were guided and forced into four corresponding holes in the end of the section already sunk. After the former section was in place, the flanges bolted, and the bulk-heads removed, the interior of the tube section was lined with concrete and the exterior was entirely surrounded by concrete deposited under water by what is called a tremie pipe. That was generally the type of tunnel construction first proposed to be followed in building a vehicular tunnel under the Detroit river, between Detroit and Windsor, with which construction Porter later became associated.

In April, 1928, as I understand it, contractors were invited to submit tenders for the construction of the Detroit-Windsor tunnel, comprising the land sections on either side of the Detroit river, and the subaqueous portion which was to comprise nine sections in number. When contractors were invited first to tender for the construction of this tunnel the plans provided for the Hoff type of construction, or some modification of it. The promoters of the Detroit-Windsor tunnel subsequently discovered that they were unable to secure sufficient capital to proceed with the tunnel according to the proposed plans or type of construction, but they advised contractors of their willingness to consider alternative proposals as to plans and method of construction, and cost of construction. Porter then submitted a proposal, which was later accepted, to construct the sub-

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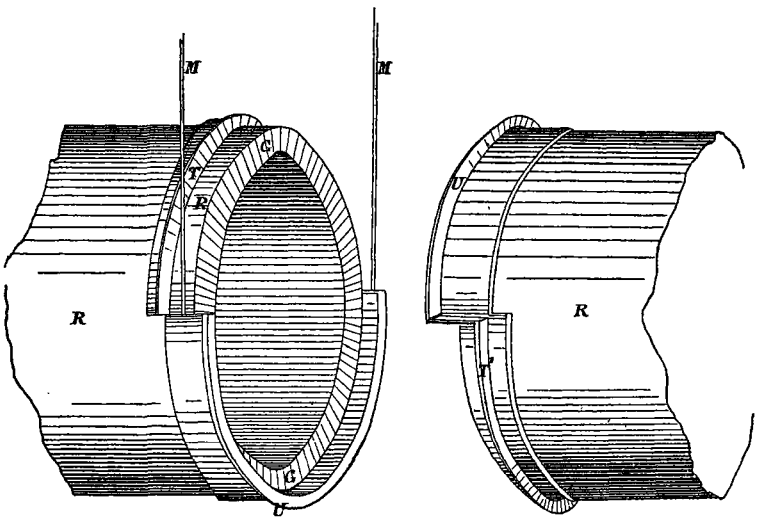
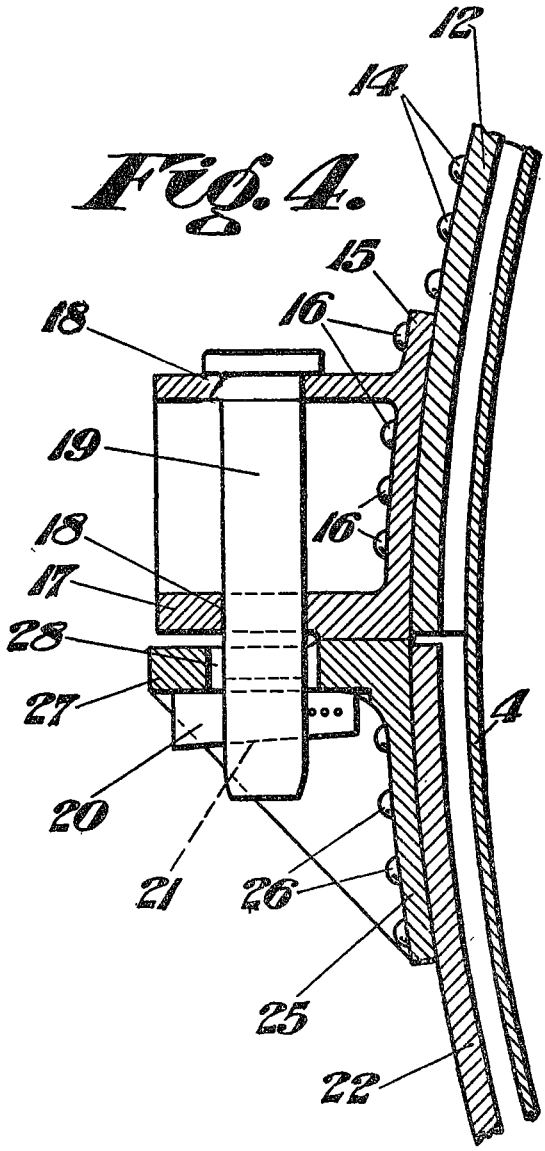
aqueous portion of tunnel by building the steel sections on land, there concreting the exterior and interior of the sections, except at the extreme ends of the sections, and then launching, sinking and connecting the same in the prepared trench. The Hoff type of construction, as already mentioned, called for the placing of the interior and exterior concrete after the sections were sunk and connected, and the bulk-heads removed. Porter at that time was particularly concerned with designing a type of construction which would meet the financial resources of the promoting company, and first he proposed the elimination of the landing platforms, which was a more or less expensive feature, and laying the tubes on the bed of the trench, after grading the same with sand or gravel, or both. Then in order to align the tubes when laid in the trench he proposed having bolted flanges on the lower half of the end of the cylindrical section already in place, and a corresponding flange on the upper half of the section to be sunk, so that when the latter was sunk it would rest upon the lower flange of the section already in place, at the correct elevation longitudinally. This, Porter claims, was to take the place of the landing platform whereon the ends of the adjacent sections were usually bolted together. Fig. 10 of the British patent to Raynor (1875) will more quickly and clearly disclose the nature and purpose of tunnel section flanges than I can do. The rods M, M, may be disregarded. It is as follows:

FIG. 10.



The idea of the flanges, whereby the ends of two adjacent sections might be nested together, Porter now claims as novel. Each flange in Porter occupied one half of the circumference of the sections; the sections were almost 250 feet in length, with an inside diameter of 31 feet and an outside diameter of 35 feet, and weighing when ready to be sunk seven or eight thousand tons.



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Porter then proposed attaching steel castings or lugs on each terminal of both the upper and lower flanges, with apertures in each, through which pins might be placed in horizontal position, to couple the sections together, but this, it was said, was not satisfactory because both pins would have to be put in simultaneously or the coupling would not be satisfactory; that coupling was abandoned and that described in the patent in suit adopted. Fig. 4 of the patent to Porter illustrates the construction and function of the lugs and pins.

It will be seen from this drawing that at or near the terminals of the upper and lower flanges are fastened steel castings or lugs with apertures through which tapered pins are placed vertically to couple the sides of the sections together. In the upper lugs the pins fit snugly but in the lower lugs the pins and apertures gave a very considerable tolerance; in actual practice the pins when in the lower lugs had a diameter of about five inches while the apertures in the same lugs were of a diameter of about fourteen inches, thus giving what is called a loose coupling. Generally, during construction, the practice was to couple first the adjacent sections on one side only, which, it is claimed, would give such a loose coupling as would permit a manœuvring or "wriggling" of the section at the free end so as to correct any deviation of any kind from the true alignment of the two sections; later the second pin would be placed in the lugs on the other side of the sections, but sometimes the two pins would be placed simultaneously in position. I perhaps should add here that, in Porter, after the pins were in place a sealing ring was secured in position over the joint formed by the abutting ends of the sections and concrete was then placed to cover the joint. Thus, the upper and lower flanges, the slotted lugs on each side of the flanges, and the tapered pins, gave what is called a loose coupling of the sections, and that combination is, as I understand it, what Porter claims as invention.

The construction which is said to infringe Porter relates to a steel intake pipe built by the City of Toronto and which extended some 4,200 feet into Lake Ontario, off Victoria Park. This work was designed by H. G. Acres, a consulting engineer, practising in Toronto. We are not concerned here with the form of construction on the land

end of the intake pipe. The portion of the intake pipe involved in this action was that part laid in the lake bottom, in sections, in an excavated trench graded with gravel. Landing platforms were not employed in aligning or coupling the adjacent sections. The sections were each about 100 feet in length, with a concrete finished inside of a diameter of about 8 feet, and a horse-shoe shaped concrete envelope outside which served the double purpose of an external protection for the steel shell, and footing for the pipe after it was laid. To each end of a section was riveted a projecting flange, called by Mr. Acres a butt strap, alternately on the upper half and then on the lower half of the periphery of the steel shell, substantially as in Porter and Raynor. Fig. 1 in the United States patent to Wight, which I shall later reproduce, is practically the same construction as Acres in so far as the flanges and coupling means are concerned, though perhaps not on the same scale. To obtain an accurate engagement of the upper and lower projecting flanges, what is called clip angles were bolted at right angles to each end of the upper and lower flanges, and in those angles holes of the same diameter were placed; when the flanges were nested together or brought into alignment a drift pin would be inserted and gradually worked into place through the holes of the upper and lower angles, by a diver. The pin was slightly tapered at the lower end, but the tolerance was slight and does not seem to have been an important factor in Acres' plans. Acres stated that in 1920 he used the same kind of flanges, or upper-hanging and under-hanging lips as he sometimes called them, in designing and fabricating the conduits for a large power plant at Queenston, Ontario. Acres stated that he had never seen the Detroit-Windsor tunnel, nor had he ever read anything concerning it, prior to designing the intake pipe for the city of Toronto, and which is claimed to infringe Porter. What Acres was concerned with was in getting as tight a joint as was possible, and the use of a drift pin he stated was the most practical method of so doing and was a well recognized method in the engineering profession for fabricating steel sections together.

The contractor, the Foundation Company of Ontario Ltd., one of the defendants, adopted the following method

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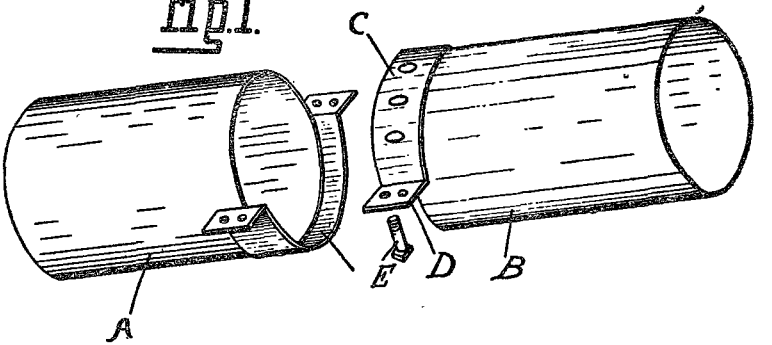
of effecting an alignment of the sections. The drawings of the plans to be followed by the contractor required, as I have already stated, an angle on both sides of the upper and lower flanges in which was a hole, and in the angles in the section already sunk in place the contractor drilled a second hole about an inch in diameter, and through these holes it put a cable which was secured at the bottom. The cables were then threaded through corresponding holes in the angles of the section hanging above the surface and about to be sunk, and which were held taut by a derrick; the pipe about to be lowered into position was then lowered down on the cables so that the end of the pipe being lowered had to fit over the flange or lip of the section already in position in the bottom of the trench, the cable serving as a guide in lowering the pipe into place and alignment. This was exactly what Raynor suggested except that he recommended the rods M, M, instead of the cables. Hoff suggested the use of cables in practically the same way, that is, if I read his specification properly. The flanges and angles, together with the pins, suggested by Acres, were simply a means of connecting the two sections together. Now that was one way of effecting an alignment and coupling, though somewhat different from Porter.

Referring now more specifically to some of the prior art cited in this case, to all of which I have already made some reference. I have already described Hoff and nothing further need be said concerning it. Raynor, which I have already mentioned, describes a subaqueous tubular tunnel constructed in sections on land, then sunk and placed on the bottom of an already excavated and graded trench. Figure 10 of that patent, which I have already reproduced, shows upper and lower flanges attached to the ends of contiguous tunnel sections, when the same are to be of cylindrical form. The flange arrangement is slightly different from that of Porter but they are essentially the same, and there is no necessity for taking time to point out the structural differences because they represent the application of the same idea. In Raynor the flanges of the contiguous sections are ultimately riveted together thus effecting a permanent connection between the sections, which is different from the type of coupling suggested by Porter. In Raynor, the rods M, M, in the section already in place, are intended

as guides for sinking and placing the next following section and in which section are two corresponding eyes projecting near the terminals of the upper flange; the section to be sunk follows through such eyes the rods M, M, and thus the two sections come into close contact. Hoff, I think, suggests as a guide the use of a line or cable, instead of rods, just as did the Foundation Company of Ontario Ltd., which concern constructed the alleged infringing work. The only other cited published patent to which I would refer is Wight, a United States patent which issued in 1909. This invention, the specification states, relates particularly to metallic sectional conduits, especially adapted to sewer work, and consists primarily in means for connecting or joining two abutting sections. In the drawings of this patent figure 1 is a perspective view of two abutting conduit sections, and is as follows:

Fig.1.



The specification states:

With reference particularly to the construction of conduit shown in fig. 1, A and B represent two abutting sections formed each of sheet metal, the meeting edges of which are riveted to form cylindrical sections. Each of these conduit sections is provided at its meeting edge with a segmental flange, as C, in this instance a metal band extending preferably half way about the conduit section and riveted thereto. These bands are also provided with lateral offset portions at their ends, indicated by the reference-letter D, which when the conduit sections are arranged in place register one with the other, and these registering portions are clamped by any suitable means, as bolts E. A conduit formed in this manner is especially adapted for sewer work,—as a sewer pipe,—for the reason that the meeting ends of the conduit sections abut, and the interior of the conduit is of uniform diameter throughout its length, there being no overlapping of the sections.

The idea of a flange, butt-strap, band, or lip being riveted onto the end of each section forming a tunnel or conduit, alternately on the upper half and lower half of the periphery of the section, so as to bring two abutting sections

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into engagement, in the bottom of a graded trench was plainly anticipated by Raynor. Raynor shows this in sub-aqueous tunnel construction where the sections were to be laid on the bottom of an excavated and graded trench. Acres turned to the same idea in constructing the city of Toronto intake pipe, and he employed the same principle in 1920 in fabricating conduits, cylindrical pipes, in connection with a large power plant at Queenston, Ont. Wight suggested the same idea for joining abutting sections of metallic conduits in sewer construction. Hoff also employed a form of flange which was riveted together, when the alignment of the section being sunk was accomplished. Something in the nature of a flange would seem to be necessary where conduit sections are to be fabricated, whether laid on the bottom of a trench or on a platform, and whether a water conduit, a sewer conduit, or a vehicular tunnel which is also a conduit. Then as to the lugs and pins. There is nothing to suggest that Porter experienced any difficulty in designing his means of coupling and some form of coupling would appear necessary, whatever the degree of flexibility, if as an engineer and contractor he was to complete satisfactorily his contract. He experimented with one form of coupling which he believed to be unsatisfactory, and as one would expect of a competent engineer, he quickly altered it to the form described in the patent, which in principle was similar to the one discarded. Some means of coupling being necessary I should think any skilled engineer would readily turn to something of the nature of slotted lugs or lateral offsets, or something of that nature, associated with pins or bolts. That is a well recognized method of assembling steel sections together. The precise method adopted would be simply a case of engineering judgment or skill, and skill is not invention. Wight suggested, what, so far as I can see, is exactly the same means of coupling adopted by Acres, and if that is so then the defendants cannot, in that respect, possibly infringe Porter. No distinction can, I think, be drawn between the means for coupling sewer pipe sections and tunnel sections. Then as to the idea of the loose coupling of Porter, made possible, it is claimed, by the small diameter of the pin when in the lower lug as compared with the larger diameter of the lower lug itself, which, it is claimed required invention. That seems to be the point on which the plaintiff

chiefly relies to sustain the patent, and it is claimed that this loose coupling was designed, not to make the connection water-tight, but to procure an easy alignment of the sections, a point which I cannot avoid thinking is somewhat exaggerated. Hoff does not seem to have had any difficulty in manœuvring the free end of his section when the pins and cones at the other end were in registration. It may have been desirable to make provision for manipulating the free end of the section being lowered, before placing the second pin in position, by allowing a liberal tolerance for the pin in the lower lugs. But would that be invention? I think this only required engineering skill, and the application of an idea which must have been old to skilled engineers, and very probably to laymen. The loose coupling suggested by Porter, I think, merely represents that mechanical skill which all engineers working in the art, particularly in certain circumstances, ought to be permitted to exercise. It does not present that amount of genius which should be rewarded by a patent. I take it to be well settled that no valid patent can issue for a conception which requires the mere exercise of the skill of the competent or skilled workman in any particular art as distinguished from the act of invention. My conclusion is that Porter does not disclose the sort of thing which can be described as invention. Further, as I have already stated, the flanges and the form of coupling employed by the defendants in the city of Toronto intake pipe construction is precisely that suggested by Wight, and if that is so, then there could not possibly be infringement of Porter by the defendants. It is not therefore necessary to discuss the matter of infringement.

Before concluding I should refer to a controversy that arose at the very end of the trial regarding the reception of certain evidence. On cross-examination Mr. Fox asked Mr. Acres if any persons working under him had seen the Detroit-Windsor tunnel while under construction, and the latter answered that he had no knowledge of any of his staff of employees having seen this work, and I accept that evidence of Acres. In reply there was called on behalf of the plaintiff a witness, Mr. MacGlashen, who was construction superintendent on the Detroit-Windsor tunnel work, and in answer to a question he stated that in 1928 or 1929,

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a person introducing himself as Andrews, and as being in the employ of Acres, asked permission to inspect the tunnel work and to see the plans of the same, and this permission was given him. This would seem rather unusual if Porter at that stage believed he had made an invention. Subject to objection this evidence was admitted. Mr. Fox did not suggest the name of Andrews to Mr. Acres when cross-examining him, and after reading the evidence carefully since I am now inclined to agree with Mr. McCarthy's objection to the reception of this evidence. Mr. Fox either should have called Andrews as a witness on behalf of the plaintiffs if he suspected that Andrews had visited the Detroit-Windsor tunnel construction and had seen the plans and the work under construction, and had communicated to Acres, his employer, what he had seen and learned, prior to Acres' preparation of the plans of the alleged infringing work, or, he should have asked Acres specifically if Andrews had seen the plans and section construction of Porter and had communicated or utilized any information thus and then acquired, in the preparation of the plans of the offending work, or something of that kind, and not left it as a mere innuendo. Even if the evidence of MacGlashen was admissible it is so general and vague that one could not safely draw any inference from it. In any event I believe the plans of construction of the city of Toronto intake pipe represent generally the considered ideas of Acres. I might observe that if Andrews did see the complete construction of Porter in 1928, or 1929, and was then in the employ of Acres, it is probable the same licence would have been extended to anybody else interested in such a work and making a similar request. I would think that would be perilously close to a publication fatal to the validity of Porter even if there were invention in it. An inventor who, before applying for a patent, uses his invention in such a manner as to convey to the public a knowledge of it will thereby render his patent just as invalid on the ground of want of novelty as if a prior public use and exercise by persons other than himself were shown to have existed. Porter did not apply for a patent in Canada until January, 1930. However, this point was not argued before me and I do not propose relying upon it.

The plaintiffs' action is therefore dismissed with costs.

Judgment accordingly.