BETWEEN:

JOSEPH MURRAY RIDDELL .....PLAINTIFF;

AND

PATRICK HARRISON & COMPANY LIMITED ..... DEFENDANT.

1956
Sept. 17-21, 24-28, Oct. 1-2

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Dec. 20

Patents—The Patent Act, 1935, S. of C. 1935, c. 32, ss. 2(d), 35(1), 47—Invention defined in claims to be considered—Presumption of validity of patent—Onus of proof of invalidity not easy to discharge—Unitary and simple result essential to validity of invention of combination—Obvious use of elements of combination not proof of obviousness of combination—Variation in elements of apparatus not a defence to charge of infringement if substance of invention taken—Ambit of claims dependent on language used—Onus of proof of infringement on plaintiff—Claim for invention invalid unless invention described in specification—Foreign patent not admissible to interpret validity of claim in Canadian patent.

The plaintiff sued for infringement of his patent No. 423,375 for "Shaft Sinking Apparatus", called the Riddell Mucker, which had for its object the performance by mechanical means instead of by hand of the "mucking" operation in mine shaft sinking, meaning thereby the removal of the loose rock or other material at the bottom of a mine shaft, called "muck", resulting from a blasting operation done in the course of sinking the shaft. The defendant attacked the claims for lack of novelty and inventiveness and denied infringement.

Held: That the Riddell Mucker was very useful. Its advent marked a great advance in mine shaft sinking, not only in time saved but also in the number of men required.

2. That the Riddell Mucker met with marked commercial success.

3. That what has to be considered in a patent case is the invention as described in the specification and defined in the claims rather than that described in the evidence.

4. That there is a statutory presumption of the validity of a patent under section 47 of *The Patent Act*, that the onus of proving its validity is on the defendant, that where there has been a substantial and useful advance over the prior art, as in the present case, the Court should not make the onus of showing the invalidity of the patent an easy one to discharge and that the defendant has not discharged it.

5. That the fact that the component parts of an apparatus were old is irrelevant in the case of the invention of a combination if the combination itself is new.

6. That it is essential to the validity of a patent for a combination invention that the combination should lead to a unitary and simple result, that the unitary and simple result of the plaintiff's invention was the more expeditious and economic sinking of a mine shaft and that this was not attributable to any of the elements but flowed from the combination.

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7. That prior to the date of the plaintiff's invention no one had conceived or formulated the idea of the combination of elements for use at the bottom of a mine shaft which the plaintiff had devised, described and claimed.

8. That the fact that the use of some of the elements of the combination may have been obvious does not warrant the conclusion that the combination was an obvious workshop improvement. The question is not whether the use of any particular element was obvious but whether the use of the combination was obvious.

9. That if the plaintiff's combination was obvious an apparatus for mechanized mucking would have been developed long before the plaintiff's apparatus was devised, that its success in solving the problem that mucking by hand presented after many attempts to solve it had not succeeded, and in solving the difficult problems involved in devising a mucking machine that could effectively and safely be used at the bottom of a mine shaft is a strong indication that it was not a mere workshop improvement over the prior art and that there was inventiveness in it.

10. That even if the defendant's apparatus did have some advantages over the plaintiff's that fact does not free the defendant from liability for infringement if, apart from such advantages, it took the plaintiff's invention. The basic issue is whether the defendant, "dealing with what he is doing as a matter of substance, is taking the invention claimed by the patent". *Nobel's Explosive Company, Limited v. Anderson* (1894) 11 R.P.C. 115 at 127 applied.

11. That a patent is not to be defeated because subsequent inventions improved the patented article or because of such improvements practically no articles were made in accordance with the specification or because of variations in details that do not affect the substance of the invention.

12. That there was no reason why a witness for the defendant should not be permitted to say that he could not see in the defendant's apparatus certain of the features specified in claims in suit.

13. That there was no real difference between the defendant's apparatus and the plaintiff's, that all the integers of the plaintiff's combination were present in the defendant's apparatus, either exactly or with variations of insignificant importance, that in each case the integers were combined in the same way, that the variations in some of the integers in the defendant's apparatus did not effect any change in its unitary result over that which flowed from the use of the plaintiff's apparatus and that the combination of integers that made up the defendant's apparatus was essentially the same as that which the plaintiff invented.

14. That the plaintiff was entitled to define his invention in the claims in such a way as to protect himself in the enjoyment of the monopoly of his invention, that he was the master of his claims, within the breadth of his invention, and entitled to draft them "in words wide enough to secure the protection desired" and that "the precise ambit of the claim must depend on the language used".

15. That the onus of proving infringement was on the plaintiff and that he has discharged it.

16. That it is a basic rule of patent law that an invention cannot be validly claimed unless it has been described in the specification in the manner required by law and that this requirement was not complied with so far as claim 11, a method or process claim, was concerned.

17. That it is not permissible to interpret the validity of a claim in a Canadian patent by resort to a patent issued in another country where the law and practice may not be the same as in Canada.

18. That the plaintiff's action, except as to claim 11, should be allowed.

ACTION for infringement of patent.

The trial was held before the President of the Court at Ottawa.

G. E. Maybee, Q.C., and *W. L. Hayhurst* for plaintiff.

Cuthbert A. Scott, Q.C., and *John Aylen* for defendant.

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

THE PRESIDENT now (December 20, 1957) delivered the following judgment:

These two actions are for infringement of Letters Patent 423,375, dated October 24, 1944, and issued to the plaintiff, the inventor of the invention covered by it. The second action was brought because of an alleged infringement subsequent to the date of commencement of the first one and the two actions were tried together. The plaintiff seeks damages and an injunction.

The defendant alleges that the Letters Patent are invalid for the reasons set forth in the particulars of objections and it denies infringement. The attacks on the patent, to which I shall refer in greater detail later, are, basically, the usual ones of lack of novelty and inventiveness. There are thus two issues for determination, the first being whether the invention described and claimed was patentable and the second whether the defendant infringed the plaintiff's rights.

In the specification the plaintiff's invention is entitled "Shaft Sinking Apparatus" and is said to relate "to apparatus for mucking while sinking mine shafts and particularly to operator-controlled, power-operated mucking machine for enabling rapid and economical excavation of the blasted material at the bottom of mine shafts during the shaft sinking operations". Its object was to perform the mucking operation in mine shaft sinking by mechanical means instead of by hand. "Mucking" is a technical term meaning, in effect, the removal of the loose rock or other material at the bottom of a mine shaft resulting from a blasting

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operation done in the course of sinking the shaft. Thus, the apparatus was called a mucking machine and was known as the Riddell Mucker.

Before proceeding to consideration of the invention I should set out the state of the prior art. Evidence of this and of the attempts to solve the problem involved was given by the plaintiff who is the Professor of Mining Engineering at the Michigan College of Mining and Technology at Houghton in Michigan. Prior to his appointment he had a long practical experience in mining and mine shaft sinking.

In this case we are concerned with vertical mine shafts of rectangular shape of the type known as hang shafts. As such a shaft is sunk it is necessary to construct a shaft frame. This serves two purposes, namely, one to prevent the walls of the shaft from caving in and the other to enable the shaft sinking operations to be carried on. The frame is built in sections as the shaft is deepened, each section being called a permanent set. The first set is suspended from a bearer set consisting of horizontal members, called bearers, inserted into the rock walls of the shaft. From time to time as the shaft is deepened similar bearers are inserted into the walls. This is what is meant by the term "hang shaft". The permanent sets are hung from the bearer sets which carry the weight of the sets suspended from them. Each permanent set has three compartments, one for use for the various services, such as ladder way, pipe way, electrical power cables and signal wires and other equipment, and the other two for handling the shaft men and the blasted material. The members that divide the set into the three compartments are called dividers. Each permanent set is connected with the one immediately above it by vertical members, known as studdles or posts, their nature and manner of connection depending on whether the shaft frame structure is of steel or of timber. As the frame is constructed it is necessary to use blocking between it and the walls of the shaft to keep the frame in plumb alignment.

Here I should describe the steps taken in a shaft sinking cycle where the mucking was done by hand. There were four operations. Firstly, holes were drilled into the bottom of the shaft according to a planned pattern of drilling, either benching or full cut. Then the holes were charged with explosives and the explosives detonated. This blasting broke

up the rock or other material, the blasted material being described as "muck". Then the mucking operation took place or, before it did so, a permanent set was added to the sets already in place. The materials for the set were lowered through one of the compartments and the set was constructed underground and connected with the one immediately above it. Finally, the mucking operation took place. This was done by hand by the shaft men working at the bottom of the shaft. They shovelled the blasted material into a large muck bucket. When it was filled it was hoisted to the surface by a cable operated from a hoist at the surface and emptied there. If there was a single drum hoist two buckets were used, a full one going up and an empty one down, but a double drum hoist might be used in which case there would be three buckets in the circuit, a full one going up, an empty one at the bottom ready to be filled and an empty one going down. The mucking operation continued until all the blasted material was removed and the bottom made ready for another shaft sinking cycle.

The hand mucking operation was done under difficult and time consuming conditions due to the fact that the shaft men had to shovel through loose rock without having a solid and even bottom from which to shovel and had to work in restricted quarters. As a consequence, the sinking of mine shafts was a slow and expensive operation. The specification states that 40% to 60% of the time spent in the conventional method of sinking mine shafts was used in shovelling the loose blasted rock and hoisting it to the surface. In the statement of defence it is alleged that this statement is misleading and inaccurate but Professor Riddell confirmed its accuracy. Moreover, it is supported by Peele's Mining Engineers Handbook, Third Edition, 1941, a treatise generally accepted as a reference work by mining engineers. I am satisfied that the statement is true and I so find.

Prior to the invention several attempts had been made to devise mechanical means to facilitate the removal of blasted material from the bottom of a mine shaft. Professor Riddell gave particulars of these attempts in a compilation filed as Exhibit P-16. These included a device, called a sackborer, for excavating soft or unconsolidated material, which is not now in use, an orange-peel excavating bucket operated from a crane on the surface for use in a drop shaft,

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with which we are not here concerned, and a device for use when the drilling was done by benching instead of by full cut and the muck was thrown up in a slope against one wall so that it could be scraped or rolled into a muck bucket reclining on the slope. Then he described what was called the Butte method of shaft-sinking. This consisted of hand mucking into loading trays or pans, hoisting them and dumping their contents into a car mounted on a cage. This required a specially designed cage. Later, there was a modification of the Butte method whereby the loaded trays or pans were dumped into a skip which was hoisted to the surface. But while the Butte method eliminated some of the hard work of hand mucking there was a substantial amount of hand mucking still to be done. There was also another method whereby a mechanically operated scraper was used to gather up the muck, go up a slide and dump the contents into a muck bucket. In addition, there were several mechanisms in the forms of shovels for excavating horizontal openings underground and loading the contents into a car but they were not used in vertical shafts, except in the case of the Butler Shovel which could be used in a large shaft and the Eimco Rocker Shovel which could remove some of the broken rock. Likewise, clam shell and orange-peel buckets were not successful in vertical shafts. Thus, while some progress had been made in solving the problems of hand mucking it was not until the Riddell Mucker was devised that mucking was really mechanized. I should add that there are cases where mucking is still done by hand and I may also say that the Butte method and the scraper method have gone into the discard.

Professor Riddell then gave an account of how he came to make his invention. In the summer of 1941 he was engaged in sinking two mine shafts at Barberton in Ohio. He was then the manager of the mining division of a company that had the contract for sinking the shafts. He had recently gained knowledge of the operation of a single-line clam shell excavating bucket, commonly called simply a clam shell, and conceived the idea that it might be used for mucking. He made an arrangement to have one sent to him for trial purposes and experimented with it by lowering it into the mine shaft and operating it from one of the drums of the main hoist at the surface. He found that there was sufficient room at the bottom of the shaft to swing the clam

shell over the muck bucket and empty it but it was not possible when it was being opened to control the discharge of its load into the muck bucket. The experiment was not successful. Professor Riddell then sent for a two-line clam shell bucket, one line being a holding line to enable the clam shell to be raised or lowered and the other a digging line enabling it to be closed or opened. This was lowered into the shaft and operated from the main hoist at the surface in the same way as the previous one. Its use was found satisfactory for it was possible to control the closing and opening of the clam shell. This was the first stage in the experiment.

Then Professor Riddell considered that the clam shell might be operated from a track frame with a carriage on it on which hoists to operate the clam shell and a propelling motor to move the carriage could be mounted. Drawings for such a structure were made on October 29, 1941, and an apparatus in accordance with them was built. The first apparatus had a one-wheel drive for the moving of the carriage but it was found that this was not satisfactory and revised drawings to provide for a two-wheel drive were made on November 26, 1941. The apparatus according to these drawings was assembled on the surface by mounting it on two wooden horses, like trestles, about twenty feet high and the clam shell was suspended from the carriage by cables connected with the two hoists on it. A quantity of muck was dumped on the ground and the experiment of how it could be disposed of proceeded. The structure was left there for about two and a half months so that the men who were to work with it could be instructed in its use. This might be called the second stage in the experiment.

Professor Riddell then set out some of the problems that had faced him. He was anxious to design an apparatus that would be safe and there was the problem of selecting the proper equipment. He realized that it was possible to make a combination of blasting set and track frame by sacrificing certain features of a blasting set. He defined a blasting set as a structure that is hung beneath the latest placed permanent set in a shaft with a three-fold purpose, namely, to absorb part of the shock of a blasting operation, to accord a partial shielding of the men working at the bottom of the shaft from material falling from above, and to serve as a

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staging from which to work when constructing an additional permanent set. Some of the features of the blasting set were incorporated into his apparatus by placing the track frame on the peripheral members of a blasting set, or by putting them under it, but other features, namely, the partitioning members, had to be eliminated for it was necessary to keep the track frame open for proper operation of the clam shell. The elimination of the partitioning members ordinarily in a blasting set made it necessary to put sufficient strength into the peripheral members to withstand the impact of the blasting. It was also necessary to take steps to protect the carriage. Consequently, it had to be strong and rigid. And it was conceived that the bottom of the carriage could be protected by hoisting the clam shell to its highest position and locking or chaining it in place immediately below it. It was, of course, also necessary to make the dimensions of the carriage such as to permit the free passage of the muck buckets through the compartments designed for them. There were also other problems, such as designing something that could be easily moved as desired, and perforating the bottom of the carriage so that the operators, two at first and later only one, could see what was happening at the bottom of the shaft. And consideration had to be given to matters of economy of cost and maintenance.

When the time came for taking the apparatus under ground the superintendent who was working under Professor Riddell declared that as soon as it was put underground he would leave the work because he considered it an unsafe piece of mechanism and two of the miners made a similar declaration. There were also some other difficulties with the other men but Professor Riddell was able to answer them saying that he would live on the job himself for 48 hours and that if it did not perform safely or efficiently he would have it taken out. When the apparatus was taken underground on February 21, 1942, the superintendent and the two miners left the job. About half the working force was neutral about the device and the others were opposed to it. But after 48 hours the men were all in favor of it. Professor Riddell then filed his application for a United States Patent on July 30, 1942, and his application for the Canadian one on June 3, 1943, and the Canadian patent was issued, as already stated, on October 24, 1944.

The evidence is conclusive that the Riddell Mucker was very useful. Its advent marked a great advance in mine shaft sinking, not only in time saved but also in reduction of the number of men required. In the specification it was stated, "As a result of the improved shaft sinking arrangements, there is a time saving of 25% to 75% of the time involved in mucking the loose blasted rock as compared with usual hand methods, and this may be accomplished with 50% to 75% less labor". It was alleged in the statement of defence that this statement was misleading and inaccurate but Professor Riddell stated that it was correct and his evidence on this point was not contradicted. It is substantiated by what happened at Barberton. Professor Riddell had introduced his mucking machine into the No. 2 shaft there at about the midpoint in sinking it. At the same time the No. 1 shaft was being sunk with hand mucking. A progress record for the sinking of the two shafts was kept and the details are set out in a paper filed as part of Exhibit P-18. It is not necessary to set out the details of the record, it being sufficient to point out that the advance per day in sinking No. 2 shaft after the Riddell Mucker was introduced was 8.33 feet, whereas the corresponding advance in sinking No. 1 shaft by hand mucking was 6.80 feet. And it is also noteworthy that, aside from the time saved in mucking, there was also an appreciable decrease in the time of the other tasks, such as drilling, loading and smoke delay, and steel shaft installation. In his paper Professor Riddell said that it appeared reasonable to conclude that the greater part of these time savings were attributable to the conservation of the physical reserve of the underground crew by the elimination of hand mucking. Later, in a study filed as Exhibit 39, Professor Riddell estimated that the saving in cost as between mechanized mucking by his apparatus and hand mucking was between 57 and 61 per cent or, to put it in dollars, between $31.45 and $37.92 per foot. I find that the statement in the specification to which I have referred is substantiated.

There was also the evidence of Mr. H. Gustafson relating to the use of the Riddell Mucker in sinking a shaft at Ironton in Michigan, in 1946. Mr. Gustafson had been the engineer in charge of the operation. The shaft had been partly sunk by hand mucking into a loading tray which was hoisted into a skip, which I have referred to previously

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as the Butte shaft sinking method. Then it was decided to deepen the shaft and use the Riddell Mucker. Detailed records were kept of the entire operation, showing the times for drilling, charging, smoke delay, other delays, mucking, installing steel and total time both in hours and in man hours. This record was filed as Exhibit P-27. It was possible from this record to compare the results of the hand mucking with those of the Riddell Mucker in the same shaft and under the same conditions. The comparative results were filed as Exhibit 28. As in the case of the record at Barberton it is not necessary to set out the details of the comparison. The increase in the rate of progress of the mucking by the Riddell Mucker over the hand mucking was 24.57% and the decrease in shaft labor man hours was 50 to 52%. The overall increase in the rate of progress for all operations was 13.67% and the decrease in shaft labor in man hours 43 to 25%. It should, perhaps, be stated that at Ironton the Riddell Mucker was not in precisely the same form as at Barberton. There was a difference in the construction of the car or carriage. The base or platform was not underslung below the rails but was above them and the carriage was more readily removable. Otherwise, there was no difference, the combination being essentially the same.

Moreover, the evidence establishes that in addition to being useful, and no doubt because of its usefulness, the Riddell Mucker has met with marked commercial success. It has been widely licensed in the United States under the plaintiff's United States patent and in Canada under its Canadian one. A list of licensees was filed as Exhibit P-24 and a graph showing a steady increase in the number of licenses as Exhibit P-25. In addition, it has been widely used in other countries where there is no patent coverage, namely, Mexico, Chile, Cuba, Belgium, Yugoslavia, Spain, Australia and South Africa. The comment in the professional and trade journals, compiled and filed as Exhibit P-18, has been laudatory of the machine and method. For example, in the February, 1943, edition of Mining and Metallurgy, the official organ of the American Institute of Mining and Metallurgical Engineers, an article by J. A. Carpenter spoke of the machine as giving excellent promise. Then in the February, 1951, issue of the Engineering and Mining Journal A. H. Hubbell, in an article in the nature

of an annual review, said: "The Riddell shaft mucker continues to be the most popular means of mucking vertical shafts mechanically. It has served in sinking more than 60 shafts, under a great variety of conditions, in 13 states and five foreign countries. Its use has minimized unit shaft-sinking costs and increased the sinking rate". And in the February, 1953, issue of the same journal the same author said: "Mucking, always mean when done by hand, is at its meanest in shaft bottoms. Mechanization of shaft mucking is one of the outstanding achievements in mining. The number of devices for this purpose have multiplied". And the author went on to say: "for mucking vertical shafts the Riddell shaft mucker continues to hold a substantial lead. It has seen service in practically all the important mining districts in the U.S. New Mexico has had 12 installations, Canada 8, Mexico, Europe, Africa and South America 10, collectively". And in the mid-March, 1955, issue of the Engineering and Mining Journal, an article by Roger Pierce, under the heading "Shaft-sinking Equipment" stated: "Riddell's patented mucker for vertical shafts is an accepted standard. This unit . . . has eliminated much of the labor involved in shaft mucking". While these extracts from journals are not proof of the facts stated I allowed evidence of them to be given as indications of the reaction of the profession to the machine and its work and the general acceptance of it. Moreover, I have no doubt that the statements in the articles could have been proved. It should, however, be pointed out that the commercial success of the plaintiff's invention was achieved by the Riddell Mucker in forms that were variations of the apparatus specifically described in the specification and illustrated by the accompanying drawings. I shall deal with this matter in greater detail later.

After the plaintiff had made his invention there were several other attempts to devise satisfactory mucking machines. Several of these were tried out and later discarded in favor of the Riddell Mucker. But there were some other machines that were successful, such as the Bucyrus Erie Hydromucker and the Cryderman Shaft Mucker, so that it cannot be said that the Riddell Mucker occupies the whole field. Moreover, many of the large Canadian mines do not use it. But, while that is so, Professor Riddell made the

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statement that up to the time of the action his apparatus had handled more cubic yards of material in Canada than all the other mechanical muckers combined. I see no reason for not accepting his statement.

In the course of his evidence Professor Riddell described the manner in which his apparatus was used. During the blasting operation the frame with the carriage on it was connected with the lowermost permanent set with the clam shell hoisted up and locked or chained immediately under the carriage in the manner already described. In order to accommodate the apparatus, when it was in that position, it was necessary either to take out the dividers in the permanent set above it or to leave them out until after the next lowest permanent set was put in place. After the blasting had been done and the smoke fumes had been cleared away care was taken to clear all loose rocks from the timbers so that they would not fall on the shaft men when they were working. When that had been done the frame was lowered to its desired position by the various devices used for the purpose. Then the necessary material for the construction of another permanent set was brought down and it was built and attached to the one above it, the dividers in it being either put in or put back if they had been previously removed. When the permanent set had been put in place, usually without the dividers, the apparatus was then lowered and temporarily attached to the bottom of it and preparations were made for the mucking operation. The carriage was manned, the necessary connections were made to the motor and the hoists on the carriage, the clam shell was unlatched and lowered to the bottom, an empty muck bucket was also lowered, the shaft men went down to the bottom and the mucking began. The operator on the carriage controlled the clam shell. When it had scooped up a load it was hoisted and moved so that it was above the muck bucket. It was then tripped open by one of the shaft men. This operation was repeated until the muck bucket was full. It was then connected with the hoist cable which had been disconnected from an empty bucket and hoisted up to the surface and emptied there. The operator of the carriage could see what was happening below him and by moving the carriage as desired could lower the clam shell as required. There were also tag lines on the clam shell by which the shaft men could pull the clam shell over near the corners

and sides. When all the muck was removed the bottom of the shaft was again ready for another drilling and blasting.

While Professor Riddell gave an account of how he came to make his invention and gave a general description of the manner of its operation it must constantly be kept in mind that what has to be considered in a patent case is the invention as described in the specification and defined in the claims rather than that described in the evidence. I, therefore, now turn to the specification. It is, I think, desirable in this case to refer in detail to the description of the invention substantially as it appears in the specification. By reason of the fact that I do not add the figures in the drawings to these reasons I have omitted the identifying numerals that appear in the specification. I have already referred to the fact that in it the invention is entitled "Shaft Sinking Apparatus" and that it "related to apparatus for mucking while sinking mine shafts and particularly to operator-controlled, power-operated mucking machine for enabling rapid and economical excavation of the blasted material at the bottom of mine shafts during the shaft sinking operations". It is also stated that it is an object of the invention to provide improved shaft sinking equipment capable of substantial decreases in the time and labor costs of shaft sinking and the provision of a simplified equipment which may easily be built at low cost from readily available materials. The invention with which we are concerned in this action is an apparatus for use down in a rectangular mine shaft and is illustrated in Figures 2, 3, 4 and 5 of the drawings accompanying the specification. Its construction and operation are clearly and fully described. It is a combination of parts enumerated briefly as follows, namely, a temporary set forming a trackway, a car serving as a platform on wheels running on the tracks, a propulsion motor on the car for moving it from one end of the shaft to the other, hoist mechanism on the platform for operating an excavating bucket suspended from it, and an excavating bucket for picking up the blasted material at the bottom of the shaft and dumping it into a muck bucket.

After describing how the permanent sets are fastened to each other by short vertical studdles, which are fastened to the sets by riveting, welding or bolting to splice bars, and sets, the method of fastening being dependent upon the

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material used and the apparatus available and after describing the four steps in a shaft sinking cycle where the mucking is done by hand the specification states that the removal of the blasted rock is accomplished by the invented mucking machine and then proceeds to describe the composition and operation of the invention. This, of course, involves a description of each element of the combination and how it cooperates with the other elements to accomplish the unitary result of the combination. Firstly, a temporary set is positioned below the lowest permanent set. This may be composed of standard railroad rail sections. The side frames and end frames are fastened together in any suitable manner as, for example, by welding or bolting and may be stiffened by channel irons if desired. Shapes other than railroad rail sections may be utilized for the purpose but rail shapes may usually be obtained locally at low cost and their use is recommended. Then the specification describes the manner in which the temporary set is operated. It is arranged to be supported from the permanent set above it, by temporary studdles at each of the corners of the temporary sets. The studdles are conveniently made in angle iron shapes and are provided with holes at the upper end for temporarily bolting them to the splice bars. In addition, there are hoisting devices which may be differential chain blocks positioned at the corners or ends of the temporary set. These hoists are connected at their upper ends to the permanent studdles or to the permanent sets and at the lower end to the temporary set or temporary studdles. When it is desired to lower the temporary set the temporary bolts between the temporary studdles and the splice bars are removed and the hoists are lowered so as to provide space below the lowermost permanent set for another permanent set, which thereupon becomes the lowermost one. Thereupon, the temporary set is again supported by temporarily bolting the temporary studdles and the splice bars. If desired, the main hoisting cable may be attached temporarily to the set to allow lowering to a new level.

There are other particulars regarding the temporary set. It may, if desired, be made slightly smaller than the permanent set so as to be capable of being lifted in the level position upwardly within the confines of the permanent set. If desired, also, the temporary set may be suspended at the corners by cables or chains attached to the permanent sets

above or the cables may be run to the surface. Furthermore, the corner cables may operate as a hoist for withdrawing the temporary set to a considerable elevation above the bottom, as during severe blasting, or for removal at the end of the operations and for lowering during working operations. It is obvious, of course, that if the temporary set is to be lifted within the confines of the temporary sets the dividers in them between the compartments would have to be removed or, in the alternative, not put in until later.

Secondly, it is stated that the side members of the temporary set form a trackway upon which there travels a car on wheels. The car comprises a plurality of cross-frame members and hangers at each end of them extending upwardly around the outside of the side frame members of the temporary set. The upper ends of the hangers are bent and receive angle brackets which are bolted in place with another angle bracket. The angle brackets and the hangers are provided with bearings through which an axle shaft extends. Upon the end of the shaft there are wheels which are spaced so as to roll along the side frame members. At the opposite side of the car there are additional hangers similar to the ones referred to and upon them there are mounted wheels which are rotatable upon stub axles. The hangers are stiffened by brace rods. The manner of construction described is illustrated by Figures 3, 4 and 5. Here I might interject that a drawing of the car in perspective was shown on page 3 of Exhibit P-17. It is apparent from the figures and the drawing that the platform of the car is underslung below the side members.

Thirdly, there is a motor on the car. Upon one end of the axle shaft there is a chain sprocket upon which the chain operates. It also runs on the drive sprocket of the motor, which may be either a reversible air motor or a reversible electric motor. There is a convenient operator control so that the operator on the car may control the motor so that the car may remain at rest or be propelled to the right or to the left as desired. It is apparent that the propulsion is from one end of the shaft to the other, that is to say, in the direction of its long axis for that is the only direction which it can go.

Fourthly, there are hoisting machines mounted upon the central portion of the car. These may be of either the air

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driven or electrical motor driven type and are provided with operator controls. The hoisting drums provide winding spaces for hoisting cables which serve as suspension and operating cables for the clam shell excavating bucket. If desired the controls may be brought to a central control portion by suitable mechanical, electrical or pneumatic connections, and the central control position may be on the car, above the car on a perch fastened to the permanent framing of the shaft, or below the car in a position to be operated by a workman at the mucking level.

Finally, there is a description of the clam shell bucket and its operation. It is preferably mouned so that it is suspended along approximately the central line of the rectangular shaft and it is of sufficient size that when it is open it has a reach of between 50% and 75% of the width of the rectangular excavation. It initially excavates the material along the central portion of the shaft. For cleaning the corners and sides an operator at the bottom of the shaft "worries" the shovel against the side walls and corners so that practically no hand cleaning is needed. During the excavating the shovel is lowered open and is then closed, hoisted and the load lifted to an elevation above the muck bucket. The car is then moved sideways until the clam shell is over the muck bucket and the load is dumped. During the time the muck bucket is resting on the rock heap at the bottom the hoist cable by which it is hoisted to the surface may be looped out of the way.

The specification then makes the statement that many obvious variations will be apparent to those skilled in the art and are intended to be within the purview of the invention therein illustrated, described and claimed. I shall refer to these variations later when I come to consideration of the issue of infringement.

The specification ends with 11 claims, all of which are in suit except claims 8 and 9 which relate to circular shafts. The claims in suit read as follows:

1. An apparatus for sinking mine shafts having permanent sets positioned at fixed intervals vertically along the walls of the shaft, from near the surface to a position a short distance above the bottom of the shaft where excavation is done, comprising a peripheral frame having substantially the same shape as the cross-sectional shape of the shaft being sunk, said frame having a load carrying rail spaced outwardly a short distance from the mine shaft wall, a platform extending across the mine shaft, said

platform having a lesser cross-sectional area than the frame so as to present an unobstructed space alongside the platform for hoisting excavated material, wheels on the platform positioned so as to bear upon the rail to be supported thereby, releasable support members extending from the permanent sets of the mine shaft to the peripheral frame for supporting it, a power hoist positioned on the platform, a power operated excavating bucket suspended from the hoist and operated thereby, and power means connected to the platform wheels for moving the platform on the rail within the confines of the mine shaft excavation.

2. The combination set forth in claim 1 further characterized in that the power operated excavating bucket is a clam shell bucket of a size such that when open it extends across a major part of the mine shaft cross-sectional area.

3. An apparatus for sinking mine shaft of rectangular cross-section, having permanent sets spaced vertically in the shaft excavation and connected together by permanent studdles, comprising a temporary set having a peripheral contour like the permanent sets of the mine shaft and having load-bearing rail surfaces spaced along the opposite sides thereof, disconnectable temporary means for suspending the temporary set in a substantially horizontal plane below the lowermost permanent set, a platform having a length slightly less than the distance across the rectangular mine shaft from one load bearing rail surface to the other, and a width substantially less than the other cross-sectional dimension of the mine shaft, wheels on the platform positioned so as to roll upon said rails, reversible operator controlled power means mounted on the platform and connected to wheels thereof for moving the platform sidewise along the rails within the confines of the mine shaft and operator controlled power operated excavating shovel means suspended from the platform.

4. The combination set forth in claim 1 further characterized in including hoist means connected to the permanent set of the mine shaft and the peripheral frame for lowering the frame as the shaft is excavated and temporary means connecting the permanent set and peripheral frame for stiffly supporting the peripheral frame during excavating operations.

5. The apparatus set forth in claim 4 further characterized in that the power operated shovel comprises reversible operator controlled air-motored clam shell excavating bucket.

6. The apparatus set forth in claim 4 further characterized in that the excavating shovel comprises a clam shell bucket operable along a plane extending across the rectangular mine shaft from one rail surface to the other.

7. The apparatus set forth in claim 4 further characterized in that the excavating shovel comprises clam shell bucket operable along a plane extending across the rectangular mine shaft from one rail surface to the other, and the clam shell bucket is suspended substantially midway between the rails and when opened has a dimension more than 50% of the distance across the mine shaft from one rail to the other.

10. An apparatus for sinking mine shafts of rectangular cross-section, having permanent sets spaced vertically in the shaft excavation and connected together by permanent studdles comprising a temporary set having a peripheral contour substantially like the permanent sets of the mine shaft and having load-bearing rail surfaces spaced along the opposite sides thereof, disconnectable temporary means for suspending the temporary set in a substantially horizontal plane below the lowermost permanent set,

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a platform having a length slightly less than the distance across the rectangular mine shaft from one load bearing rail surface to the other, and a width substantially less than the other cross-sectional dimension of the mine shaft, wheels on the platform positioned so as to roll upon said rails, reversible operator controlled power means for moving the platform sidewise along the rails within the confines of the mine shaft and operator controlled power operated excavating shovel means suspended from the platform.

11. A method of sinking a mine shaft, which comprises positioning permanent sets at fixed intervals vertically along the walls of the shaft to a short distance above the bottom of the shaft, suspending a temporary set from the lowest permanent set, supporting a movable carriage on said temporary set and arranging a power operated excavator on said carriage, and operating said excavator to remove loose material from the shaft bottom.

I find no difficulty in determining the issue of validity of the patent in favor of the plaintiff. There is, in the first place, a statutory presumption of its validity under section 47 of *The Patent Act,* 1935, S. of C. 1935, chapter 32, from which it follows that the onus of proving its invalidity is on the defendant: *vide The King v. Uhlemann Optical Co.*[1]. And in *O'Cedar of Canada Ltd. v. Mallory Hardware Products Ltd.*[2] I expressed the opinion that, in view of this statutory presumption, where there has been a substantial and useful advance over the prior art, as is the case here, the Court should not make the onus of showing the invalidity of the patent an easy one to discharge. In my opinion, the defendant has not discharged it in the present case.

It was alleged, in effect, on behalf of the defendant that the plaintiff's apparatus was not patentable, that its component parts were old, that their use in mine shaft sinking practice was well known and obvious, that such use required merely the exercise of mechanical skill and that, consequently, there was no invention.

There was complete agreement on the part of the witnesses that certain materials and devices used in the construction of the apparatus were well known before the invention. It is obvious, of course, that in sinking a mine shaft certain operations remained the same whether the mucking operation was mechanized or done by hand. Thus, there was nothing new about such structures as permanent sets, blasting sets or temporary sets or such appliances as studdles, splice bars, channel irons, cables, chains, or other

[1] [1950] Ex. C.R. 142 at 161. [2] [1956] Ex. C.R. 299 at 318.

means connecting permanent sets or lowering or suspending temporary sets, or such things and devices as muck buckets, hoisting cables and single or double drum hoists. Nor in connection with the plaintiff's apparatus was there anything new about such things as railway rails, a car or carriage running on wheels, a motor, a chain and sprocket, hoists, a single or double line clam shell excavating bucket and its suspension from a carriage or the means of operating it. Indeed, Professor Corlett went so far as to say that all the elements in the apparatus, such as railroad rails, wheels, axles, platforms, propulsion motors, hoists, clam shells, muck buckets, guide ropes and the like were old. There was one exception to this. The carriage element had to be specifically designed for the reason that mine shafts were not standardized and it was rare to find two mine shafts with the same horizontal configuration. Thus, the carriage had to be designed to suit the requirements of the shaft: there had to be sufficient width between the rails to allow a large muck bucket to pass between them and the other dimension had to be such as to clear the compartments.

But the fact that the component parts of the plaintiff's apparatus were old is irrelevant in the present case for his invention is a combination. And it is established, as stated in *The King v. American Optical Co.*[1] that it is not necessary to the validity of a combination invention that its elements should be new. Indeed, all of them may be old. If the combination is the invention, then it is immaterial that the elements are old if the combination itself is new. There is support for this statement in *British United Shoe Machinery Company Ld. v. A. Fussell & Sons Ld.*[2]; *Baldwin International Radio Co. of Canada Ltd. v. Western Electric Co. Inc. et al.*[3]; and Terrell on Patents, 8th Edition, pages 79-81. These cases also warrant the statement in the *American Optical Company* case (*supra*) in which, at page 355, I set out the test of what constitutes a patentable combination invention in the following terms:

> It is essential to the validity of a patent for a combination invention, apart from considerations of novelty and inventive ingenuity, that the combination should lead to a unitary result rather than a succession of results, that such result should be different from the sum of the results of

[1] [1950] Ex. C.R. 344 at 355.
[2] (1908) 25 R.P.C. 631 at 656, 657.
[3] [1934] S.C.R. 94 at 104.

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the elements and that it should be simple and not complex. The elements may interact with one another provided they combine for a unitary and simple result that is not attributable to any of the elements but flows from the combination itself and would not be possible without it.

And, according to Lord Tomlin in *British Celanese, Ld. v. Courtaulds, Ld.*[1], if a combination of old integers is to be patentable their working inter-relation must be such as to produce a new or improved result. In my opinion, the plaintiff's apparatus meets this test. The unitary and simple result of the combination was the more expeditious and more economical sinking of a mine shaft, as already explained. This was not attributable to any of the elements but flowed from the combination. And this unitary and simple result was a new and improved one.

And I am satisfied that the combination had all the necessary attributes of patentability. The evidence that it was new is conclusive. In the particulars of objections it was alleged, *inter alia,* that if there was any invention in the subject matter of the patent it was not conceived by the plaintiff but by one A. C. Johnson and also that the patent was invalid because the apparatus therein described and claimed was not novel but was within the common knowledge of the art and was previously commonly used, having been disclosed in the prior publication of certain specified patents and in the prior knowledge of certain specified persons. These allegations are unfounded. There was no basis for saying that the invention was conceived by A. C. Johnson. It was not. Moreover, the defence of anticipation by prior publication was abandoned, and properly so. And there was no evidence of anticipation by prior use. Evidence of certain patents was adduced on behalf of the defendant as evidence of the prior art but I have no hesitation in finding that such evidence really had no bearing on the issues under consideration in this case and I see no reason for making any reference to any of the patents filed on behalf of the defendant. In my opinion, the novelty of the invention is beyond dispute. No one had previously conceived or formulated the idea of the combination of elements for use at the bottom of a mine shaft which the plaintiff devised and has described and claimed.

[1] (1935) 52 R.P.C. 171 at 193.

Nor is there any need to repeat what I have said about the usefulness of the plaintiff's apparatus and its commercial success. The attribute of utility was abundantly present.

And I reject the suggestion that the invention was an obvious workshop improvement because the use of some of the elements of the combination may have been obvious. Such a conclusion is unwarranted. The question is not whether the use of any particular element was obvious but whether the use of the combination was obvious. The danger involved in determining the obviousness or otherwise of a combination by ascertaining whether the use of each of the elements was obvious was pointed out by Lord Justice Greene, in delivering the judgment of the Court of Appeal in *Albert Wood and Amcolite v. Gowshall Ld.*[1]. There he said, at page 40:

> The dissection of a combination into its constituent elements and the examination of each element in order to see whether its use was obvious or not is, in our view, a method which ought to be applied with great caution since it tends to obscure the fact that the invention claimed is the combination. Moreover, this method also tends to obscure the facts that the conception of the combination normally governs and precedes the selection of the elements of which it is composed and that the obviousness or otherwise of each act of selection must in general be examined in the light of this consideration. The real and ultimate question is: Is the combination obvious or not?

I do not see how it could reasonably be contended that the plaintiff's combination was obvious. If it had been, an apparatus for mechanized mucking would have been developed long before the plaintiff's apparatus was devised, for there had been many attempts to solve the problem that mucking by hand presented and they had not succeeded. The fact that the advent of the Riddell Mucker was hailed as a remarkable achievement is a strong indication that it was not a mere workshop improvement over the prior art. The problems involved in devising a mucking machine that could effectively and safely be used at the bottom of a mine shaft were difficult ones. Quite apart from the statutory presumption in favor of the validity of the plaintiff's patent, I have no hesitation in finding that there was inventiveness in the plaintiff's concept that the elements that he used

[1] (1937) 54 R.P.C. 37.

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could be combined for use down in a mine shaft in such a way as to accomplish the mechanization of mucking and his effective and safe embodiment of it.

Thus, all the necessary attributes of patentability were present in the plaintiff's apparatus and it was fully described and clearly defined. I find that claims 1, 2, 3, 4, 5, 6, 7 and 10 are valid. I shall deal with claim 11 later.

Thus far I have not found any difficulty in this case. Indeed, after hearing the evidence and the arguments of counsel, I am of the opinion that the only real issue is that of infringement. This turns on whether the apparatus used by the defendant in sinking a mine shaft for the Lyndhurst Mining Company Limited north of Noranda in Quebec infringed the plaintiff's patent. If it did, then it is agreed that the defendant also infringed at other places and that the quantum of damages should be determined on a reference.

Evidence relating to the infringement was given for the plaintiff by Professor H. R. Rice, head of the Department of Mining Engineering at the University of Toronto, and Mr. Patrick Harrison, the defendant's president, on his examination for discovery, and for the defendant by Mr. George Smith, the defendant's chief engineer, and Professor A. V. Corlett, head of the Department of Mining Engineering at Queen's University.

It is desirable at the outset to describe the defendant's apparatus as used at Lyndhurst. There was an inspection of it by Professor Rice on May 19, 1955. He made the necessary measurements and notes and then did a pencil drawing which was filed as Exhibit P-30, of which a photostatic copy was shown on Page 7 of Exhibit P-17. This shows the important features. The apparatus was being used in the lower portion of a shaft measuring 7′ by 17′8″. The shaft frame was of timber. The drawing shows a frame construction of several sections, the upper ones representing the permanent sets of a three-compartment shaft and the lowermost one the defendant's apparatus. This was a frame construction consisting of a rectangular timber frame at the bottom, vertical posts at the four corners and diagonal bracing made of iron or steel pipe, and a rectangular timber frame on top of the posts, the connections being by mild steel plates. On page 7 of Exhibit P-17 the whole frame is

designated as "blasting set" but this notation together with other notations was put on the drawing by Mr. Hayhurst of counsel for the plaintiff when he was examining Mr. Harrison for discovery. But Mr. Smith spoke of the lower rectangular frame as the blasting set. I shall refer to the confusion in the use of the term "blasting set" later. On the lower frame there was a trackway of two rails of 6″ wide flange structural steel which butted against the cross timber of the rectangular frame and was connected to it with plates and angle irons and U bolts, thus keeping the rails fixed and apart. On the trackway thus formed there was a carriage on wheels running on the rails and on the platform of the carriage there was a single drum hoist and also a reversible air motor. Below the carriage there was a clam shell excavating bucket suspended from the hoist on the carriage and operated by it. The clam shell was suspended substantially midway between the rails and operated across the shorter dimension of the shaft in the same way as shown on Figure 5 of the patent drawings and opened to a width of 78 inches as compared with a width of 52 inches between the rails. There was an air cylinder attached to the clam shell and an air line operated from above. The whole apparatus was suspended by chain blocks from a permanent set above it and carried by safety cables and safety chains and could be lowered by tightening the chain blocks and removing the safety chains. Thus far the description of the defendant's apparatus has been a general one. It indicates the presence of all the elements comprised in the plaintiff's invention with variations in some of them.

But Professor Rice went further than this. In reply to questions from counsel for the plaintiff he found in the defendant's apparatus all the features of the plaintiff's invention as defined in claim 1. I summarize this portion of his evidence. The defendant's apparatus was an apparatus for sinking mine shafts having permanent sets positioned at fixed intervals vertically along the walls of the shaft, from near the surface to a position a short distance above the bottom of the shaft where excavation was done. The apparatus comprised the following elements. It had a peripheral frame having substantially the same shape as the cross-sectional shape of the shaft being sunk. As a matter of fact Professor Rice said that, in plan, it was co-incident with

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the outside members of the permanent sets. The frame had a load carrying rail spaced outwardly a short distance from the mine shaft wall. Professor Rice put the distance at 18 inches from the outside of the frame to the inside of the rail. This did not include what is called the overbreak between the outside of the frame and the actual rock wall of the shaft. There was a platform extending across the mine shaft. The platform had a lesser cross-sectional area than the frame so as to present an unobstructed space alongside the platform for hoisting excavated material. The measurements taken by Professor Rice bore out this statement. The platform measured 46″ by 51″ and the frame 7′ × 17′8″ so that there was room for hoisting the muck bucket into the compartment intended for the purpose. There were wheels on the platform positioned so as to bear upon the rail to be supported thereby, two wheels on each side. The safety chains and safety cables already referred to constituted releasable support members extending from the permanent sets of the mine shaft to the peripheral frame for supporting it. A power hoist was positioned on the platform and a power operated excavating bucket was suspended from the hoist and operated thereby and there were power means connected to the platform wheels for moving the platform on the rail within the confines of the mine shaft excavation. Professor Rice stated that on the platform there was a single drum air hoist, and also a reversible air motor connected to an axle of the carriage by sprockets and a roller chain, together with the necessary controls, and that the clam shell was raised and lowered by the hoist.

This evidence was substantially confirmed by Mr. Harrison on his examination for discovery so that I need not refer to it further. Unless this evidence is shown to be unfounded it substantiates the plaintiff's contention that the defendant's apparatus as used at Lyndhurst infringed the plaintiff's invention as defined in claim 1. And, in that event it would not be necessary to consider the other claims.

While Professor Rice was not asked any questions about the other claims there can, I think, be no doubt that if he had been, he would have found in the defendant's apparatus all the features of the plaintiff's invention as defined in claims 3 and 10 and it would have followed that the features included in claims 2, 4, 5, 6 and 7 would also have been found.

The evidence of Professor Rice was not disturbed to any extent by Mr. Smith. He described the defendant's apparatus from a practical point of view. The defendant first used its mechanical mucker at Malartic Gold Fields in June, 1954. It did so as the result of knowledge gained by one of its suppliers who had made a tour of the mines in South Africa. At the time, Mr. Smith knew of the Riddell Mucker and gave as his reason for not acquiring it that from all the reports they had heard of the Riddell Mucker it was not putting up as great a footage as the defendant was getting by hand mucking. When the apparatus was first used at Malartic it was not quite satisfactory. There was trouble with the air-actuated clam shell. The power of the air cylinder was too great for the members of the clam shell and they gave way. The defendant then cut down the power of the air cylinder and strengthened the members of the clam shell. Otherwise, the apparatus used at Malartic was used at Lyndhurst. Mr. Smith then gave his evidence about it. He stated that the defendant took a standard blasting set and placed a trackway on it. I shall comment on this statement later. The rails were said to be ordinary railway rails. Mounted on the tracks was a carriage—a cut-down air trammer complete with air motor drive through a chain and sprocket. The other features consisted of a superstructure built up over the frame of the air trammer embodying a canopy for the protection of the operator, guide shoes that would run on the permanent guides of any shaft, means of attaching the main hoist cable to the carriage to move it up or down in the shaft, a single-drum air hoist mounted on the carriage and an air-actuated clam shell excavating bucket suspended by a cable from the air hoist. The carriage came with the motor on it and the single drum hoist was readily available. The clam shell was suspended by a single line which merely raised and lowered it but the opening and closing of it was by compressed air from an air cylinder. The action was different from that of a line from the hoist. The clam shell had its jaws open when it was dropped into the muck pile and the action of closing the jaws by the use of compressed air from the air cylinder forced them into the muck. But when the two line clam shell was used the closing of the jaws by the digging line caused an upward pull. The air cylinder was not up on the carriage but formed part of the clam shell and was controlled by an air line.

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Mr. Smith then proceeded to enumerate what he considered to be the advantages of the defendant's apparatus over the plaintiff's as specifically described in the specification and illustrated in its accompanying drawings and I set them out. In the first place, so he said, the defendant used a standard blasting set to start with, whereas the plaintiff's peripheral frame had to be specially fabricated. Next, the defendant's shaft mucker had a trackway mounted upon the blasting set, whereas the side members of the plaintiff's peripheral frame formed the trackway upon which the carriage ran. Furthermore, the defendant's carriage could be readily removed from the shaft bottom to the surface for maintenance repairs, whereas the carriage on the plaintiff's apparatus was not readily removable. Then Mr. Smith said that the defendant's carriage afforded the operator excellent visibility of the operations at the bottom of the shaft. He was able to see through the hole between his feet and on each side between the rails and the inside members of the frame down to the bottom of the shaft. It was Mr. Smith's opinion that the operator of the Riddell Mucker would have less chance of seeing what was going on at the bottom of the shaft than the operator of the defendant's shaft mucker. There were other alleged advantages. The defendant's mucker gave better protection to the timbers of the permanent sets and the upper rectangular frame could be used as a staging for placing the next permanent set. And there was also the advantage in the positive action of the clam shell in the defendant's mucker, to which I have referred, making for a more assured load and a greater chance of the full capacity of the clam shell being used. Thus also a single drum hoist was used instead of a double drum hoist or two single drum hoists. The advantages to which Mr. Smith referred were advantages, not differences, and were improvements.

On his cross-examination Mr. Smith admitted that at Malartic Gold Fields the defendant did not use the frame construction subsequently used at Lyndhurst but only the lower portion of it, that is to say, the portion without the four corner posts and the top frame. Mr. Smith also admitted that he knew that the mucker used by the plaintiff's licensee at Fecunis Lake had a frame like that used by the defendant at Lyndhurst and that the Fecunis Lake shaft was sunk before the defendant began its work at Lyndhurst,

although he said later that he had not himself seen the operation at Fecunis Lake but had read about it later. And he did not know who, in the defendant's employ, had conceived the idea of putting the posts and the top frame on the frame that had been used at Malartic. Mr. Smith also corrected his earlier statement that the rails on the defendant's apparatus were ordinary railway rails. They were of 6″ wide flange structural steel with a square 2″ × 2″ top welded on it on which top the wheels of the carriage ran.

Some of the alleged advantages enumerated by Mr. Smith were disputed. For reasons that I shall refer to later I do not agree that the defendant used a standard blasting set upon which it mounted its trackway any more than the plaintiff did. And, while Professor Rice admitted, on his cross-examination, that the defendant's carriage was simpler in design than the plaintiff's and more readily removable than that specifically described in the specification and illustrated in the accompanying drawings, there was the counter-balancing advantage of greater safety in the plaintiff's apparatus. And it was disputed that the layout of the defendant's carriage and the placement of the operator on it gave greater visibility of what was happening at the bottom of the shaft than was afforded by the plaintiff's apparatus. In my opinion, such greater visibility was not established. The advantages of the "bird cage" arrangement used by the defendant at Lyndhurst were limited to cases where the rock wall was safe and there was no danger of flaking, as explained by Professor Riddell, as set out later in these reasons.

But even if the defendant's apparatus did have some advantages over the plaintiff's that fact does not free the defendant from liability for infringement if, apart from such advantages, it took the plaintiff's invention. The principle to be applied by the Court in dealing with the issue of infringement is well settled. It was clearly stated by Romer J. in *Nobel's Explosive Company, Limited v. Anderson*[1] as follows:

> Several cases were cited to show the canons of construction on which the Courts have acted in different cases relating to infringement. But it is not necessary for me to deal with these cases in detail, for I desire emphatically to state that, in my view, one principle only governs all the cases, . . .; and that principle is this: In order to make out infringement, it must be established, to the satisfaction of the Court, that the alleged

[1] (1894) 11 R.P.C. 115 at 127.

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infringer, dealing with what he is doing as a matter of substance, is taking the invention claimed by the patent; not the invention which the Patentee might have claimed if he had been well advised or bolder, but that which he has in fact or substance claimed in a fair construction of the Specification.

Thus the basic issue in this case is whether the defendant took the invention claimed by the patent.

Before I deal with the evidence of Professor Corlett relating to alleged differences between the defendant's apparatus and the plaintiff's I should set out the facts regarding the variations which the plaintiff made in his machine. So far as the evidence goes the only mine shaft in which an apparatus constructed exactly as specifically described in the specification and illustrated in the accompanying drawings was used was at Barberton. Professor Riddell could not recall its use anywhere else. There were subsequent variations in design but no changes in fundamental principle. For example, it was possible to make changes in the controls so that the carriage could be managed with one operator instead of two. There was also a change in the means of supporting the track frame; instead of being bolted solidly to the lowermost permanent set it was hung by rods or cables, which made for less rigidity and greater capacity to withstand blasts, but this did not prevent the support members from being releasable or disconnectable within the ambit of these terms in the claims. But the evidence was more concerned with two other variations. One of these was used in the shaft that was sunk immediately after the shaft at Barberton. This was a timber frame shaft, whereas that at Barberton was a steel frame one. An adjustment was made to accommodate the scheme. In this modification there was a trackway on a timber rectangular frame and there was a change in the manner of securing the carriage. This modification was exemplified in a model of the apparatus filed as Exhibit P-5, of which an artistic drawing in perspective was shown on page 5 of Exhibit P-17. Here I might add that a perspective of the construction strictly according to the specific description in the specification and illustrated by the accompanying drawings was shown on page 3 of Exhibit P-17. The construction shown there was of steel, whereas that exemplified by Exhibit P-5 was of steel and timber. In the former the side members of the peripheral frame being of railway rails con-

stituted the trackway on which the carriage ran, whereas in the latter the trackway of railway rails was laid on the timber rectangular frame or, to put it in another way, a timber rectangular frame was put under the trackway. Professor Riddell agreed with Professor Corlett that it would have been possible to use a steel construction in a timber frame shaft but it was not advantageous to do so, for a timber frame under the trackway, being of a greater horizontal area than it, would give greater protection against the effects of blasting to the permanent sets above than the trackway itself would have done. The reason for this seems clear. The permanent sets in a timber frame set would require greater protection from blasting than those in a steel frame one and that could better be given by putting a timber rectangular frame under the peripheral frame of the trackway than by using a peripheral frame of steel by itself. This change would also involve a change in the manner of securing the carriage. In the apparatus specifically described and illustrated there were hangers, spoken of in the evidence as side members, extending upwardly around the outside of the side members of the peripheral frame, their upper ends being bent over the rails and receiving angle brackets bolted in place. In that way the carriage was secured so that it could not be derailed. It followed, of course, that this device rendered it less readily removable than it would otherwise have been. When the apparatus was being devised the problem of safety was a matter of vital concern and the device was a precautionary safety measure. It will be remembered that there was objection at Barberton to taking the apparatus down into the shaft on the ground that it would be unsafe. At that time, the feature of safety from derailment was an important one. Moreover, at Barberton it was never necessary to remove the carriage. But, if it had been, it would have taken only 15 minutes to do so. This could have been done by disconnecting the side members, putting a proper sling under the platform and hoisting it up by the cable operated from the hoist at the surface. Subsequently, it was found satisfactory to modify the device. The side members were eliminated and the problem of safety met by going into an underslung construction with a relatively low centre of gravity, but Professor Riddell stated that projection pieces that went below the track frame were bolted to

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the carriage and held it in place. According to the evidence of Mr. Gustafson, in the apparatus used at Ironton the base of the carriage was not below the rails but above them. The platform was still underslung below the axles of the carriage but not underslung below the rails. It was thus made more easily removable without elimination of the safety feature. In my opinion, the modifications exemplified by Exhibit P-5 were not departures from the principle of the patent but were covered by it. The variations were in matters of detail but the combination remained essentially the same.

This is also true of the other variation. This was sometimes called the "bird cage" arrangement. It consisted of a rectangular frame with a trackway on it, similar to that exemplified in Exhibit P-5, with vertical posts at its four corners and another rectangular frame resting on the four posts. This variation was first used in the Fecunis Lake Mine shaft that was sunk by Temiskaming Construction Company and Inspiration Mining and Development Company, these companies being licensees of the plaintiff under a license, dated December 1, 1953. The work was done by these companies in the deepening of a shaft, the upper portion of which had been sunk by the defendant. The "bird cage" arrangement was used by the licensees after a consultation with Professor Riddell. He was asked what he thought and his reply was that it was all right to use it, provided that the rock wall of the mine was very secure and there was little or no danger of scaling, that is to say, of rocks falling from the walls on the workmen below. The bird cage arrangement, a model of which was filed as Exhibit P-6, had certain advantages over the frame exemplified by Exhibit P-5. In the first place, if it was used it was not necessary to take the dividers out of the lowermost permanent set or to leave them out when it was constructed for there was enough room in the bird cage between the lower rectangular frame and the upper one to accommodate the carriage and its operator. There was also the advantage that the top frame of the bird cage could be used as a staging from which to construct and connect the next permanent set, whereas, if the Exhibit P-5 frame was used, the carriage was in the way and planks had to be put over it or it had to be hoisted up into one of the compartments. But the arrangement exemplified by Exhibit P-6 had a disadvantage

in that, since it was desirable to maintain a fixed distance from below the frame to the bottom of the shaft, it followed that there was a longer distance of unprotected rock wall below the lowermost permanent set than if a frame such as that shown by Exhibit P-5 had been used, which meant a greater hazard for the men at the bottom of the shaft. Thus the use of the bird cage arrangement was limited to cases where its use was rendered safe by the fact that the rock walls of the shaft were very secure and the danger of scaling, if any, was slight. Under the circumstances, I find that the so-called "bird cage" arrangement used by the plaintiff's licensees at Fecunis Lake was merely a variation in detail of the apparatus specifically described in the specification and illustrated by the drawings and that the combination involving its use was essentially the same as that described in the specification and defined in the claims.

Here I might add that even if the defendant's apparatus had patentable advantages over the plaintiff's, which is not suggested, and even if the plaintiff's apparatus was, except at Barberton, used in a form that was a variation of the form specifically described in the specification and illustrated in the drawings, the plaintiff's invention is not to be defeated on that account. There is support for this statement in the judgment of the Court of Appeal in *Edison and Swan Electric Light Co. v. Holland*[1] where it was held, *inter alia,* that the patent was not to be defeated because subsequent inventions improved the patented article, or because in consequence of such improvements practically no articles were made in accordance with the specification. *A fortiori* it is not to be defeated because of variations in details that do not affect the substance of the combination, for that is the invention.

I should also clear away the confusion in the evidence regarding the use of the term "blasting set". Professor Riddell agreed with Professor Corlett's definition of a blasting set as a temporary set suspended under the latest placed permanent set to protect the permanent sets from damage by flying rocks during the blasting phase of a shaft sinking cycle and Professor Rice gave a definition to the same effect.

[1] (1889) 6 R.P.C. 243.

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Professor Riddell explained that a standard blasting set was independent of all other frame work and was ordinarily hung from the latest placed permanent set by chains or other hanging devices, and not by studdles, in order that there should be freedom rather than rigidity so that the blasting set should be better able to absorb the impact of the blasting and so better protect the permanent sets from damage. An illustration of the common form of a blasting set was shown on page 31 of Exhibit P-16 and described in detail on page 29. There it was spoken of as a "blasting shield". According to this view of the term the substructure of the Riddell Mucker was not a blasting set. And Professor Riddell did not claim that it was. He made it quite clear in discussing the problems that faced him at Barberton that he could make a combination of blasting set and trackway by sacrificing some of the features of a blasting set, such as, for example, the partitioning members corresponding to the dividers between the compartments of the permanent sets, for, of course, they had to be eliminated in order that there should be a clear view of the bottom of the shaft from between the rails of the trackway. Consequently, Professor Riddell agreed that his peripheral frame was not a standard blasting set. He admitted that the use of the Riddell Mucker did not eliminate the use of a standard blasting set. If it was to be used it would have to be moved up to the bottom of the permanent sets. On the other hand, a standard blasting set was not necessarily required. But if the substructure of the plaintiff's apparatus was not a blasting set, in the ordinary sense of the term, neither was the "bird cage" frame of the defendant's apparatus or its lower rectangular frame a blasting set. Professor Riddell was, therefore, right when he said that he did not agree that the defendant mounted its carriage on a standard blasting set or that the motor was resting on a blasting set or that the track frame on his own drawing, filed as Exhibit G, was a blasting set, notwithstanding the fact that he had so marked it, or that the rails referred to in Exhibit H were mounted on a blasting set. Mr. Smith was, therefore, strictly speaking, in error when he said that at Lyndhurst the defendant took a standard blasting set and placed a trackway on it. It did not. The lower rectangular frame of the defendant's apparatus on which the trackway was placed was not a "standard"

blasting set. Nor was the frame shown on page 7 of Exhibit P-17 a blasting set in the ordinary sense, although it was so designated by counsel for the plaintiff and such designation was accepted by Mr. Harrison on his examination for discovery. Indeed, Mr. Smith admitted, on his cross-examination, that it might be a misnomer to call the "bird cage" frame a standard blasting set. And so it was.

But if the term "blasting set" is used loosely or is used to describe the support for the carriage, the peripheral frame of the plaintiff's apparatus, which was Professor Riddell's so-called combination of blasting set and trackway, with the necessary sacrifice of some of the features of a blasting set, was just as much a blasting set as the substructure in the defendant's apparatus. In neither case was there a "standard" blasting set but in each case an attempt was made to afford some of the protection that the use of a standard blasting set would have given. It may, therefore, be said that in each case there was a modified form of blasting set with no difference of substance between them.

I now come to consideration of Professor Corlett's evidence. He was called to prove that there were differences between the defendant's apparatus as used at Lyndhurst, with which he was familiar, and the plaintiff's or, to put it more nearly accurately, to show that there were features in the plaintiff's apparatus as claimed that were not present in the defendant's. The claims were read to him and he was asked whether he saw the various features specified in them in the defendant's apparatus. Counsel for the plaintiff objected to this line of questioning on the ground that it involved interpretation of the claims, a function exclusively for the Court and not for experts, but subsequently withdrew his objection. In my opinion, most of the alleged differences, if not all of them, could have been made the subject of argument by counsel and interpretation by the Court without the evidence of Professor Corlett, but there were some questions of fact involved and I did not see any reason why he should not be permitted to say that he could not see in the defendant's apparatus certain of the features specified in the claims. Since Professor Corlett's evidence was so strongly relied upon by the defendant, I shall deal with it in detail and make my findings in respect of each matter of contended difference. And first, I shall consider

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the features specified in claim 1 which Professor Corlett did not see in the defendant's apparatus. He did not see "a peripheral frame having substantially the same shape as the cross-sectional shape of the shaft being sunk". What he meant was that he did not see a peripheral frame such as that specifically described in the specification and illustrated in the accompanying drawings. What he saw was two rails, on which the carriage, or platform as it is described in the claims, rode on wheels, and they did not close to make a frame. Then, he said that he did see a peripheral frame, namely, the blasting set. Professor Corlett's answers illustrate the difficulty suggested by counsel for the plaintiff. He submitted that the term "peripheral frame" might properly include either the whole "bird cage" arrangement of the defendant's apparatus, as shown on page 7 of Exhibit P-17 and as exemplified by Exhibit P-6, or only the lower portion of it. But we are concerned with the kind of peripheral frame on which the wheels of the platform ran. Here Professor Corlett was in error when he said that the rails do not close to make a frame. They do. The evidence is that they butted up against the end members of the so-called timber blasting set and were secured to them by angle irons so that the trackway formed a frame. In the plaintiff's arrangement, as shown by the drawings, the peripheral frame was itself the trackway on which the wheels of the platform ran. Similarly, there was such a peripheral frame in the defendant's apparatus. It could be either the trackway by itself, consisting of the steel rails and the timber ends against which the rails abutted and to which they were secured by the trackway, or the trackway together with the so-called blasting set on which Mr. Smith said it was placed. In my opinion, there was a "peripheral frame" in the defendant's apparatus, namely, the trackway, consisting of the rails and the end members of the so-called blasting set, and the fact that it was placed on the so-called blasting set does not divest it of the character of being a "peripheral frame" within the meaning of the term as used in the claim.

Next, Professor Corlett did not see the "said frame having a load carrying rail spaced outwardly a *short distance* from the mine shaft wall". In his opinion, the defendant's apparatus had a load carrying rail placed *more than a short distance* from the wall. There is no substance in this

attempted differentiation. The term "short distance" is relative. The evidence indicates that the rails in the plaintiff's apparatus, as shown in the drawings, were nearer to the shaft wall than those in the defendant's apparatus but even if the rails in the defendant's apparatus were farther away from the shaft walls than those in the plaintiff's they were still only a short distance from them. The purpose of the requirement is clear, namely, that the rails should be placed such a sufficiently short distance from the walls that there would be enough room between the rails for the muck bucket to pass between them.

Then Professor Corlett did not see "a platform extended *across* the mine shaft". Here I might comment that the word "platform" is not used in the disclosures portion of the specification, except in respect of circular frame shafts with which we are not here concerned, but its meaning is clear. Professor Rice suggested that in the plaintiff's apparatus, as shown by Figure 5 of the drawings, the platform consisted of the planking of the carriage and that in the defendant's apparatus it was the deck of the carriage. Professor Corlett's reason for saying that he did not see the defendant's platform extending *across* the mine shaft was that it extended only part of the way across the mine shaft and was, therefore, not across it. But when the claim spoke of the platform as extending across the mine shaft all that was meant was that it extended in the direction of the short axis of the shaft or at right angles to the long one. No one in his senses would have read the word "across", in the context in which it appears, as indicating that the platform in the plaintiff's apparatus extended all the way across the shaft, for that would have involved an inoperative and impossible operation.

Then when Professor Corlett was asked whether he saw in the defendant's apparatus a "platform having a lesser cross-sectional area than the frame so as to present an unobstructed space alongside the platform for hoisting excavated material" he replied that he saw a platform having a lesser cross-sectional area than the frame, but did not see an unobstructed space *alongside* the platform for hoisting excavated material. In his view a space *alongside* the platform meant a space between it and the side member of

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the frame, whereas the unobstructed space in the defendant's apparatus was at the end of the platform, that is to say, in front of and behind it but not alongside it. But "alongside" means "along" or "parallel to the side of" and since the platform has four sides "alongside" may mean along the front or along the back or along either of the other two sides. What is meant is that the platform is so much smaller in cross-sectional area than the shaft that between it and the end of the shaft in the direction of its long axis there is an unobstructed space for hoisting excavated material. The difference between the two platforms is due to the position of the operator on the carriage. This is shown by photographs filed as exhibits. The photographs of the defendant's carriage, filed as Exhibits I, J, K and L, show that the operator faced in the direction of the long axis of the shaft with the result the platform was longer in the direction of the long axis than in that of the short one. It followed, of course, that the unobstructed space for the hoisting of the excavated material was either in front of the operator or behind him and, consequently, in that sense, either in front of the platform or behind it. On the other hand, Exhibit M shows that the operator of the carriage in the plaintiff's apparatus faced in the direction of the short axis of the shaft with the result that the platform was longer in the direction of the short axis of the shaft than in that of the long one. And it followed that the unobstructed space for the hoisting of the excavated material was on each side of the platform and, therefore, alongside. Consequently, it does not matter in the least whether the unobstructed space is described as being *alongside* the platform or in front of or behind it. The unobstructed space is the same in each case, namely, the space between the side of the platform, whether called side or front or back, and the end of the shaft in the direction of its long axis. All that is required is that the area of the platform should be restricted so that when the carriage is moved as desired there shall not be any obstruction in the way of making use of the compartments in the permanent sets for the purpose for which they were intended.

Next, in respect of claim 1, Professor Corlett did not see in the defendant's apparatus "wheels *on* the platform positioned so as to bear upon the rail to be supported thereby".

In his view, the wheels in the defendant's construction were not *on* the platform but *under* it. There is no merit in this attempted distinction. It was obviously not intended by the claim that the wheels should be on the platform, in the sense of being on top of it. What is plainly meant is that the wheels should be connected to the platform so that it should run on the rails on wheels. Since in each case the platform ran on wheels it could properly be said that there were wheels on the platform. And that was as true in the case of the defendant's apparatus as in that of the plaintiff's.

Finally, Professor Corlett did not see the excavating bucket in the defendant's apparatus as being operated from the hoist on the platform. His reason for that statement was that in the case of the defendant's apparatus the clam shell was opened and closed by compressed air from an air cylinder on the clam shell. But it was conceded that there was an operation of the clam shell from the hoist in that it was lowered and raised therefrom and, to that extent, it was operated from the hoist on the platform.

Thus, in respect of claim 1, subject to what I have to say about the defendant's general argument, I do not see any real difference between the defendant's apparatus as used at Lyndhurst and that of the plaintiff as defined in claim 1.

There were no differences in respect of the limitation in claim 2, so that I now turn to the features in claim 3 which Professor Corlett did not see in the defendant's apparatus. He saw a temporary set having a peripheral contour like the permanent sets of the mine shaft, but he did not see such a set "having load-bearing rail surfaces spaced *along* the opposite sides thereof". What bothered him was the word "along". The rail surfaces were removed from the sides of the shaft and positioned independently of the location of the peripheral frame. If "along" meant the same as "alongside" he could see the rail surfaces spaced *along* the opposite sides of the shaft. Rail surfaces spaced *along* the opposite sides of the shaft mean that they were parallel to the length of the shaft or extended through its whole length or from one end of the shaft to the other. That feature was present in the defendant's apparatus.

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Next, Professor Corlett did not see "a platform having a *length* slightly less than the distance across the rectangular mine shaft from one load bearing rail surface to the other, and a *width* substantially less than the other cross-sectional dimension of the mine shaft". In his view the *length* of the platform had no connection with the distance across the mine shaft and there was a similar difficulty with regard to its *length*. I have already, in dealing with claim 1, referred to the fact that by reason of the placement of the operator on the carriage, the platform in the plaintiff's apparatus was longer in the direction of the short axis of the shaft than in that of the long one from which it followed that such dimension was spoken of as its length, whereas the other one was called its width. In the defendant's apparatus the dimensions of the platform were reversed, the dimension in the direction of the short axis being less than in that of the long one. And this difference in dimensions is, of course, related to the fact that the rails in the plaintiff's apparatus are farther apart and, therefore, spaced a shorter distance from the walls of the shaft than those of the defendant's apparatus. That was, perhaps, partly due to the fact that at Barberton the shaft was 8 feet in width, whereas at Lyndhurst it was only 7 feet. But, in my opinion, this difference in the shape at the platform, due as it was to the placement of the operator, is not of any significant importance. It would be absurd, in my opinion, to suggest that the invention, as defined in claim 3, should be defeated because the platform in the defendant's apparatus was longer by 5 inches in the direction of the long axis of the shaft than in that of the short one, whereas the platform in the plaintiff's apparatus was longer in the direction of the short axis than in that of the long one.

And Professor Corlett did not see "wheels *on* the platform positioned so as to roll upon said rails". In his view, the wheels in the defendant's apparatus were *under* the platform and not *on* it but he conceded that if wheels *on* the platform meant wheels connected with it then he saw such a feature in the defendant's apparatus.

Finally, in respect of claim 3, Professor Corlett did not see "reversible operator controlled power means mounted on the platform and connected to wheels thereof for moving the platform *sidewise* along the rails". In his view, the platform

in the defendant's apparatus moved *lengthwise* and not sidewise. There is no substance in this contention. "Lengthwise" and *"sidewise"* are relative terms and the relationship has already been referred to. In the plaintiff's apparatus the operator faced in the direction of the short axis of the shaft so that any movement of the platform must be to his right or left and, consequently, sidewise, whereas in the defendant's apparatus since the operator faced in the direction of the long axis of the shaft the movement of the platform must be forward or backward and, consequently, lengthwise. But the fact of the matter is that in each case the platform moves from one end of the shaft to the other in the direction of its long axis for, obviously, there is no other direction in which it can move. Thus it makes no difference whether the movement is described as "sidewise" or "lengthwise". The terms both mean a movement in the direction of the long axis of the shaft.

Only a brief reference need be made to claim 10. It is essentially the same as claim 3 except that it is somewhat broader. It does not refer to wheels on the platform but speaks only of means for moving it sidewise along the rails. And it speaks of a temporary set having a peripheral contour *substantially* like the permanent sets of the mine shafts.

And no detailed reference need be made to the other claims in suit. Claim 4 is dependent on claim 1 and claims 5, 6 and 7 are dependent on claim 4.

In my opinion, the evidence of Professor Corlett does not show any real difference between the defendant's apparatus and the plaintiff's. On the contrary, it indicates that all the integers of the plaintiff's combination were present in the defendant's apparatus, either exactly or with variations of insignificant importance, and that in each case the integers were combined in the same way. The variations in some of the integers of the defendant's apparatus did not effect any change in its unitary result over that which flowed from the use of the plaintiff's apparatus. The reason for that is clear, namely, that the combination of integers that made up the defendant's apparatus was essentially the same as that which the plaintiff invented.

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Counsel for the defendant contended that the defendant's apparatus did not infringe the plaintiff's patent. In his argument he sought to confine the plaintiff's invention, primarily, to the car or carriage specifically described in the specification and illustrated in the accompanying drawings and then to the carriage and the peripheral frame described in the specification. At one stage of his argument he submitted that the carriage was the invention and, at an other stage, that it was the essential part of the invention and that the carriage and the peripheral frame were a single assembly designed for the purpose of preventing the carriage from being derailed during the shaft sinking operations. In this view of the invention, he was willing to concede that the plaintiff's apparatus had the necessary attributes of patentability but submitted that in these respects the defendant's apparatus was so different from the plaintiff's that it did not infringe. Counsel drew attention to the provisions of the specification for variations in material or design and enumerated the specified variations and submitted that, since the specification did not refer to any variations for the carriage or the peripheral frame, no variation of them was permissible under the patent. From this it followed that such variations of the plaintiff's apparatus as that used at Ironton and exemplified by Exhibit P-5 or the "bird cage" arrangement used at Fecunis Lake and exemplified by Exhibit P-6, were not within the ambit of the protection of the patent. Put generally, the argument was that the particular carriage and peripheral frame which the plaintiff had specifically described in the specification and illustrated in the accompanying drawings were essential parts of his combination and that, since it was not specified that any alternate means might be used for such carriage and peripheral frame, the plaintiff's invention as claimed must be confined to a shaft sinking apparatus having as two of its elements a carriage and peripheral frame of the kind specifically described and illustrated and that, since the carriage and temporary set in the defendant's apparatus were different the defendant's apparatus did not infringe. It was conceded that if claims 1, 3 and 10 were valid and infringed the other claims in suit, except claim 11, were also possibly infringed.

I do not agree with the argument thus put forward by counsel for the defendant. The plaintiff's invention was not confined to an apparatus having the carriage which was specifically described in the specification and illustrated in the accompanying drawings and the peripheral frame described and illustrated. A carriage and a peripheral frame were, of course, essential elements in the apparatus, in the sense that it would not be possible to have a mucking machine for use down in a mine shaft without them. But it would not be fair to say that all that the plaintiff invented was the carriage and peripheral frame specifically described and claimed. It is manifest that what he invented was a mucking machine. That was an invention of a combination of which the carriage and peripheral frame were only elements. It was necessary to have a peripheral frame as a trackway for the carriage or platform and to have the latter as a base for the motor and hoist and of such shape and size that it would not interfere with or obstruct the work of removing the muck. In the specification the plaintiff gave the best description of the carriage element of his invention of which he was then aware but he did not thereby limit his invention to the use of such a carriage. What he was concerned with was a machine that could be effectively and safely used at the bottom of a mine shaft and so mechanize the mucking operation. Having made that invention he was entitled to define it in the claims in such a way as to protect himself in the enjoyment of the monopoly of his invention. He was, in a sense, the master of his claims, within the breadth of his invention, and entitled to draft them "in words wide enough to secure the protection desired", as Green L.J. put it in *R.C.A. Photophone, Ld. v. Gaumont-British Corporation Ld. et al.*[1]. Consequently, he could, if he had so desired, have so drafted his claims as to confine his monopoly to that of a combination having the carriage and peripheral frame specifically described in the specification and illustrated in the drawings and, if he had done so, the defendant might not have been liable for infringement. But the fact is that the plaintiff did not put any such limitation in his claims. And, as Lord Wright M.R. put it in the case just cited, at page 186, "the precise ambit of the claim must depend on the language used". There is no limitation

[1] (1936) 53 R.P.C. 167 at 205.

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in the claims that would warrant support for the submissions of counsel for the defendant to which I have referred and I reject them.

The onus of proving infringement is, of course, on the plaintiff but I have no hesitation in finding that he has fully discharged it. In my judgment, the defendant has taken the invention claimed by the patent within the meaning of the principle stated in *Nobel's Explosives Company, Limited v. Anderson* to which I have already referred. The fact that its apparatus was not exactly the same as the plaintiff's does not free it from liability. There is infringement of a patent when the real substance of the invention covered by it is taken: *vide The Rheostatic Company Limited v. Robert McLaren and Company Limited*[1] where The Lord Justice Clerk (Aitchison) said:

> The broad test of infringement is whether the alleged infringer has taken the real substance of the invention as claimed, what Lord Cairns called "the pith and marrow" of the invention. The devices need not be absolutely similar, there may be variation, either addition or subtraction or substitution, and in each case it must be a question of fact whether the variation makes any real difference or is merely a distinction without a difference. An infringement is rarely an exact replica of the device infringed.

Vide also the statement to the same effect by Lord Morton of Henryton in *Raleigh Cycle Coy Ld. et al. v. H. Miller and Coy Ld.*[2] That is the case here. The combination in the defendant's apparatus was substantially the same as that of the plaintiff's. The unitary results flowing from the combinations were the same in each case. Indeed, it could not be otherwise for there was no real difference between the two combinations. The defendant's apparatus was plainly an infringement of the plaintiff's patent.

Under the circumstances, I have come to the conclusion, although my views inclined otherwise in the course of the trial, that it is not necessary in the present case to consider the doctrine of mechanical equivalence. In my opinion, the facts do not call for resort to its application. There was infringement without it.

[1] (1936) 53 R.P.C. 109 at 118. [2] (1948) 65 R.P.C. 141 at 159.

There remains the question of claim 11, the process or method claim. Its validity was strongly disputed by counsel for the defendant. He submitted that it was objectionable for two main reasons, one that it was too broad and the other that the process claimed in it was not described in the specification. I agree with his submissions. Section 2(*d*) of *The Patent Act*, 1935, defines "invention" as follows:

> 2. In this Act, and in any rule, regulation or order made under it, unless the context otherwise requires,
>
> (*d*) "invention" means any new and useful art, process, machine, manufacture or composition of matter, or any new and useful improvement in any art, process, machine, manufacture or composition of matter;

Thus, it is clear from this definition that the invention of a process, which may be called a method, is a different invention from that of a machine, as the plaintiff's apparatus was. And while the patent would not be invalidated by reason only that it was granted for more than one invention, *vide* section 37(1) of the Act, it is a basic rule of patent law that an invention cannot be validly claimed unless it has been described in the specification in the manner required by the law. The legal requirement has been made statutory by section 35(1) of the Act which provides in part as follows:

> 35. (1) The applicant shall in the specification correctly and fully describe the invention and its operation or use as contemplated by the inventor, and set forth clearly the steps in a process, . . . in such full, clear, concise and exact terms as to enable any person skilled in the art or science to which it appertains, or with which it is most closely connected, to . . . use it . . . In the case of a process he shall explain the necessary sequence, if any, of the various steps, so as to distinguish the invention from other inventions . . .

I am satisfied that this requirement has not been complied with so far as claim 11 is concerned. The plaintiff's apparatus has been correctly and fully described in the specification. It is defined as an apparatus and elements comprising it have been described. It is a mucking machine. The manner of its operation has been explained in such a way that any person skilled in the art could operate it as successfully as the plaintiff himself. But I am unable to find in the specification, which I have read several times, such a correct and full description of the process or method defined in

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claim 11 as the law requires, or any explanation of the necessary sequence of the various steps in the process. Professor Riddell described the method in his evidence but I am unable to find the necessary description in the specification. On that ground alone, without further comment on the undue breadth of the claim, I find claim 11 invalid.

I should add that in the course of the trial I ruled against the admissibility of the plaintiff's United States patent. Counsel for the defendant sought to file it for the purpose of showing that claim 11 was not in the United States patent and that, consequently, it was invalid when introduced in the Canadian application, as being too broad. Thus, it was sought to use the United States patent to interpret the Canadian one. In my opinion, it is not permissible to interpret the validity of a claim in a Canadian patent by resort to a patent issued in another country where the law and practice may not be the same as in Canada.

For the reasons given, there will be judgment in favor of the plaintiff declaring that the claims in suit, except claim 11, are valid and have been infringed by the defendant and granting the injunction sought. If the parties are not able to agree on the quantum of damages there will be a reference as to damages to the Registrar or a Deputy Registrar of the Court and judgment for such damages as may be found on the reference. The plaintiff will also be entitled to costs to be taxed in the usual way.

Judgment accordingly.