
1930 HIS MAJESTY THE KING..... PLAINTIFF;
 Oct. 20-24. AND
1931 MYERS CANADIAN AIRCRAFT COM- } DEFENDANTS.
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Patents—Action to impeach—Scire facias—Information—Exchequer Court Act—Commissioner of Patents—Patent Act, Section 48.

Held, that the present action to impeach and annul certain patents of invention instituted in this Court by Information in the name of the Attorney-General of Canada was properly instituted under Rule 16

- notwithstanding the provisions of section 37 of the Patent Act providing for procedure by *Scire Facias*.
2. That the Exchequer Court Act authorizes the Crown to institute proceedings upon the Information of the Attorney-General of Canada to impeach a patent of invention, without showing that it is otherwise a party interested.
 3. That, upon the evidence in this case, the two patents in question herein should be annulled upon the ground that both alleged inventions lacked utility, and should be revoked.
 4. That, the Commissioner of Patents has no authority to assess the compensation to be paid by the Government of Canada, for use by it of any patented invention, under section 48 of the Patent Act, unless the said Government admits its use and is a consenting party to such enquiry by the Commissioner.

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INFORMATION by the Attorney-General of Canada to set aside certain letters patent for invention granted to the defendant Myers and later transferred to Myers Canadian Aircraft Company Limited.

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

W. L. Scott, K.C., Louis Côté, K.C., and C. Scott for plaintiff.

O. M. Biggar, K.C., and R. S. Smart, K.C., for defendants.

The essential facts are stated in the Reasons for Judgment.

THE PRESIDENT, now (May 18, 1931), delivered the following judgment.

This is an action to annul patent no. 146,917, issued to the defendant Myers on March 25, 1913, and patent no. 187,882 issued on November 10, 1918, to the same person; the dates of application for the said patents are respectively, June 20, 1912, and July 25, 1917. I shall hereafter refer to these patents as no. 146 and no. 187 respectively. The defendant company is the assignee of the defendant Myers. This is one of three actions brought by the plaintiff to revoke patents of invention relating to alleged improvements in flying machines, granted to the defendant Myers, and these actions are officially numbered 7,024, 10,856, and 11,083. It was agreed that the evidence given in one action, should be evidence in the others, in so far as applicable thereto. While the patents involved in this

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particular action are sought to be voided upon many grounds, yet the chief ground of attack is, that the alleged inventions described in the specifications lack utility and are therefore void; but before considering that phase of the issue, there are one or two preliminary points to which I desire to make brief reference.

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At one stage of the trial I was disposed to doubt whether these proceedings were properly instituted. The Patent Act states that anyone desiring to impeach a patent must proceed by a writ of scire facias, and sec. 37 prescribes the exact procedure. In any action instituted in a Provincial Court to impeach a patent, I have no doubt but that the procedure prescribed by sec. 37 would have to be strictly observed. But the jurisdiction of this court in such a case is supplemented by the Exchequer Court Act. Sec. 22 gives the Exchequer Court, jurisdiction as well between subject and subject as otherwise, in all cases in which it is sought to impeach or annul any patent of invention. Then by sec. 30, the court is also granted concurrent original jurisdiction in Canada, in all cases in which it is sought at the instance of the Attorney-General of Canada, to impeach any patent of invention. The Exchequer Court Act empowers the judges of the Exchequer Court to make general rules and orders for regulating the procedure of and in the Exchequer Court. Pursuant to that power, Rule 16 was enacted, and that rule provides that any action to impeach or annul any patent of invention may be instituted by Information in the name of the Attorney-General of Canada, by Statement of Claim filed by any person interested, or by a writ of scire facias as provided by sec. 37 of the Patent Act. This proceeding was instituted by Information in the name of the Attorney-General of Canada. From all this I am satisfied that the proceedings herein were properly instituted. The Rules also require that with any Information to impeach a patent of invention, there shall be filed with the Registrar of the Court a sealed and certified copy of the patent and of the petition, affidavit, specification and drawings relating thereto. It will be seen therefore if the proceeding to annul a patent is by way of Information, it is grounded on the same record as if the proceeding had been by way of writ of scire facias.

The plaintiff alternatively asks for a declaration that the plaintiff had not during the war, or subsequent thereto, or at any time, manufactured or used aeroplanes which infringe any of the claims of the two patents in question. I am not satisfied that the Patent Act as it presently stands authorizes the commencement of that sort of action, although in effect that might follow in an infringement action. The statute plainly authorizes the commencement of an action by the Attorney-General, to revoke a patent, but it is not clear to me that the statute authorizes proceedings for a declaration that any aeroplane or seaplane used by the plaintiff does not infringe any or all of the claims of the patents in suit. I shall not however pronounce definitely upon the point, and it is not necessary for me to do so.

The plaintiff also urged that patent no. 147 was void for non-manufacture of the invention in Canada. I have considered this contention very carefully, but I am in doubt as to the effect of the statute in its present state, in respect of this patent upon the point of non-manufacture, or whether it is capable of satisfactory interpretation at all. Were it not, that in my view this action may be disposed of upon other grounds, I would request further argument by counsel upon the point.

The plaintiff uses a considerable number of aeroplanes and hydroplanes in the public services of Canada, and contends that he is a person interested in the annulment of the patents in suit for the following reasons. It appears that the defendant Myers, brought an action against Canadian Vickers Ltd., manufacturers of aeroplanes, for infringement of the patents in suit, and the action was settled without trial by Canadian Vickers Ltd., by the payment to Myers of a substantial sum, it is said. The plaintiff at the times material here, used aeroplanes manufactured by Canadian Vickers Ltd., and similar to those which Myers claimed infringed his patents here in question. Then the defendant Myers petitioned the Commissioner of Patents, under sec. 48 of the Patent Act, to determine the compensation payable by the Crown to Myers, on the ground that the Government of Canada had during the war and subsequent thereto manufactured and used aeroplanes which infringed the patents in question, par-

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ticularly claims 12, 14, 26 and 31 of patent no. 146, and claims 2, 3, 4, 6, 7, 8, 11 to 15, 17 to 19, and 25 of patent no. 187. I am satisfied that sec. 48 of the Patent Act does not confer any authority upon the Commissioner of Patents to assess compensation for the use of any patent, unless the Government of Canada was a consenting party. I think it is very clear that this provision of the statute was only intended to be invoked, in a case where the Government of Canada admitted the use of a patent, and that it was a consenting party to the enquiry by the Commissioner of Patents to assess the compensation. However, if an interest has to be shown by the Attorney-General in order to impeach the patents in suit, then I think Myers' petition, though futile, constituted a threat of infringement which the Crown is justified in repelling. However, I am inclined to the view that the Exchequer Court Act authorizes the Crown to institute proceedings, upon the Information of the Attorney-General, to impeach a patent of invention, without showing that he is otherwise a party interested.

Referring now to patent no. 146. The patentee states that his invention relates to flying machines and has, besides other objects, "the providing of an inherently stable aeroplane." The frame work of the aeroplane as described in the specification is comprised essentially of a series of flat annular or circular planes arranged one below the other, and of successively lessening diameter. These planes, which are held apart by braces, would present their edges to the air, if moving forward. Immediately below the series of annular aeroplanes is another plane, the lower part being of saucer shape, with a dome or top directly above, and forming a part of the same. The specification states that the whole of the forward portion of this plane normally presents its surface at an upturned angle of incidence, which I might at once observe is hardly correct because the top part of this plane has a negative angle of incidence. The propellers for driving the machine forward are placed on opposite sides of the car which underlies the annular planes, the car being an enclosed space for the operator and machinery. The propellers are operated by an engine supplied with power from a boiler, which is run on wheels over a track, and by running the boiler backwards or forwards

the aeroplane may be tilted on its transverse axis, and thus the centre of gravity of the machine may be changed and the aeroplane tilted to the angle desired, allowing the machine, it is said, to rise or fall when in motion through the air. By means of levers, the patentee states, the propellers may either be put out of action, or one made to go faster than the other, making it possible to turn the aeroplane to the right or left, thus making the propellers to act as rudders. It is also claimed that as each of the propellers are overlapped by the saucer shaped plane, the propeller on one side when in motion will throw a volume of air under that side of the plane, and tend to raise that side, and therefore would be of service in securing lateral equilibrium. It is also claimed that the two propellers may be turned in reverse directions, drawing more air under one side and thus lifting it, while at the same time depressing the other side. The patentee in his specification also describes an auxiliary plane, a parachute or safety device, which is attached to the top of the annular plane. This, I think, sufficiently describes the alleged invention set forth in this patent.

In patent no. 187, the invention is said to relate to certain new and useful improvements in flying machines. The aeroplane consists of a number of annular planes arranged in series one above the other, their diameters lessening from the topmost to the lowermost of the series, much as in patent no. 146. The drawings in this patent show a lesser number of annular planes, but no explanation is given for this particular change. Below the annular planes is a bowl-shaped or saucer-shaped aeroplane, the top being flat and without a dome, as in the alleged invention described in patent no. 146. The lower portion of the machine consists of an annular plane suspended by suitable rods from the upper structure or planes, and is provided with a walking board or car for the operator. To suitable uprights between the upper and lower structures are hinged one or more vanes, controlled by operating ropes, so that the vanes may present their flat surface to the wind, thus turning the machine to the right or left as desired. These vanes are really rudders, and are located a short distance in front of the main driving propellers. The machine is provided with two engines, oppositely disposed, and upon the hori-

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zontal shafts of these engines two driving propellers are mounted, on each side of the machine, and it is stated that the two propellers may be coupled to their shafts simultaneously so as to drive the machine forward, and by operating one of them, or by driving one of the engines faster than the other, the machine can be steered to the right or left. Stabilizing means are provided for by three propellers or helicopter screws on vertical axis, placed equidistantly around the platform of the machine, there being one vertical propeller in the front, and two near the rear. These propellers are actuated by ropes from the main engines, with clutches and levers for putting either of them in or out of action. By driving one of the two rear propellers the patentee claims to be able to tilt the machine laterally, and by driving the front propeller or the two back propellers simultaneously, it is claimed that the machine may be tilted fore and aft. By using the vanes, or by varying the speed of the engines, it is claimed the machine may be turned.

Experience has demonstrated that certain fundamental factors must necessarily be found in a heavier than air machine, before it can be successfully flown, and they may be briefly stated. As soon as an aeroplane is propelled forwards, the air-stream flows over the both surfaces of the wings or planes. The wings of an aeroplane must have what is known in aeronautics as an angle of incidence, in relation to some portion of the machine, as for example the axis of the propeller shaft, its thrust line, and the angle of incidence means, that the wings are normally inclined to the impinging air. The modern aeroplane is so organized that when standing on the ground, the horizontal line of the propeller shaft becomes an angular one. To get the maximum of effect out of the wings it is desirable that they meet the air at an angle, in order to be lifted, and accordingly when the plane is in the air and travelling horizontally, the set of the wings is such that the air will strike the wings at an angle, and it is that permanent inclination of the wings to the thrust line of the propeller, that is called the angle of incidence. The angle of incidence may be increased while in motion, by the action of the elevator, thus increasing the tilt of the machine, and this angle is then generally referred to as the angle of attack.

Then the planes should be cambered, which means that the surface of the planes or wings are curved in a fore and aft direction, which causes the air passing over the front part of the upper surface to be increased in velocity which causes a decrease in pressure over the surface of the wing; in the meantime the pressure on the lower surface has been increased by slowing up the air, the effect of these two changes in pressure is to give a lifting force upon the whole machine. Another desirable characteristic in a useful machine is that which is known as the "aspect ratio," that is to say, the wings should be long and narrow, that is, a long span with a relatively small fore and aft dimension. A good ratio gives a higher efficiency. Then there must be a fore and aft control, a lateral control, and a directional control, of the machine when flying, otherwise the machine would not be useful or operable. In most modern aeroplanes the lateral control is secured by what is known as "ailerons," movable sections of the rear end of the wings or planes; fore and aft control is secured by what is usually called "elevators," which are movable sections of the rear end of the tail planes; and the direction of the machine is controlled by the rudders. These different controls, or their equivalents, must be found in any useful aeroplane, otherwise it is not a useful or operable aeroplane.

Upon the evidence presented in this case, I am of the opinion, that the two patents in question should be annulled upon the ground that both of the alleged inventions lack utility. No aeroplane, constructed according to the specification of either patent, has ever been flown, or ever used. While the question of the utility of the alleged inventions described in these two patents is to be ascertained as of the date of the grants, yet the fact that since their issue no one has ever successfully used aeroplanes such as are described in these patents, adds strength to the evidence given on behalf of the plaintiff, which was to the effect, that the Myers aeroplanes described in the specifications here in question never possessed utility.

Referring specifically now to patent no. 146. Capt. Stedman, of the Royal Canadian Air Force, testified that in his opinion the invention described in this patent was not useful and lacked utility. He stated that generally the shape of the machine rendered it inefficient; that the annular

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planes being flat and without cambered surfaces were low in efficiency in the lift; that while the lower plane was cambered on both surfaces, it would produce very little lift because of its poor aspect ratio. It was claimed by the patentee that by driving one propeller faster than the other, it would cause more air to pass under the lower plane and thus elevate the machine. Capt Stedman was of the opinion, based on his own experience, that as the lower part of this plane has a downward camber, the additional air caused by the faster revolving propeller would not drive the machine upwards because of its shape, but would more likely pull it downwards, and he stated as his opinion that if this plane was flat it would be more efficient in lifting one side, if that side was low, and it was desired to elevate it. Then it was pointed out by Capt. Stedman, that if one propeller was driven faster than the other, this would create a rotary motion about another axis, which would have to be corrected and to do so the operator would require to speed up the other propeller, which would tilt the machine back into the position in which it was originally, and in the correction of which a rotatory motion was brought about. Further, he testified that in reducing the speed of any one propeller, the machine would lose height and in some circumstances, this would be obviously dangerous. He also expressed the opinion that the movement of the centre of gravity, by moving the boiler, for fore and aft control has never been successfully employed. In Capt. Stedman's opinion there was no efficient or practical fore and aft control, or lateral control, or directional control, in the alleged invention described in the specification, that it lacked lifting qualities because of its form of construction, and upon these grounds it was utterly lacking in utility. Mr. Brown, another expert witness called by the plaintiff, who gave his evidence in a very fair manner, concurred with Capt. Stedman in all this, and it is not necessary to review his evidence. Mr. Parkin, Assistant Director of Physics in the National Research Laboratory testified that this machine would be unstable longitudinally and laterally, which means that the machine could not be successfully operated. Then there is the evidence of Orville Wright given in respect of a United States patent granted to Myers, and which corresponds to patent no. 187, the second patent in

suit. I shall refer to this evidence when considering the next patent, but I think that everything Wright stated respecting that patent, is applicable to the patent presently under consideration. Upon the evidence before me, I am satisfied that the aeroplane described in this patent always lacked utility, and that the patent did not describe a new and useful invention and should therefore be annulled.

Coming now to patent no. 187. Mr. Parkin, Assistant Director of Physics in the National Research Laboratories, made an aerodynamic test of a model of the aircraft described in this patent. This test was made in what is called a wind tunnel, at Toronto University, and this is the standard method adopted in all countries for testing aircraft in respect of lift, drag or resistance, efficiency and centre of pressure; centre of pressure is that point on the plane where the resultant force, representing all the air forces, might be imagined to be applied. It is not necessary to describe the details of the test, but I perhaps should observe that a test of a model showing only the wings or the supporting surfaces, without the means of propulsion or control, is as satisfactory as if the whole machine had been thus tested. The air reaction on a model held stationary in an air-stream of a certain velocity, is the same as would be exerted on the model if it were moved at the same speed through still air. This test showed that the Myers aerofoil system has a maximum lift coefficient of about 0.26 at an angle of attack 28° , which is a very large angle, and this means that when landing, the Myers aeroplane would need to be tilted up at an angle of 28° to the horizontal. Normal planes have a much larger lift per unit area and this maximum occurs at smaller angles, at about 16° . The low lift of the Myers planes described in this patent, means that for the load usually carried per unit area of plane surface, the landing speed of the Myers aeroplane would be very high, whereas the landing speed should be low upon the ground of safety. The test shows that the resistance is almost half the lift, and that if the aircraft were allowed to glide without engine power, it would descend at an angle of 1 in. $2\frac{1}{4}$ ft. which is a very steep angle; this means that in travelling $2\frac{1}{4}$ feet horizontally the machine would drop 1 foot, which means that the machine is descending at a very steep angle with a high

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vertical velocity which is undesirable and indicates low efficiency, the resistance being nearly half the total weight of the machine. Therefore, in order to obtain the necessary lift, the Myers machine would need to be tilted up at a large angle as established by the test figures of Parkin. When in this position there would be a tendency for the machine to tip over backwards. It being thus unstable it would be necessary to correct this tendency by working the controlling helicopter propellers, in order to keep the machine in balance, but if the engine for some cause or other was not working, the helicopter propeller could not be operated, and the aircraft could not thereafter be maintained in control. The control therefore not being effective, the machine being unstable, it cannot well be said that the machine is operable or possesses utility.

Myers in his specification states that a wind gust striking the forward edge of the advancing outer periphery of the aeroplane, would tip up the front portion of the aeroplane, and then striking the rear portion of the inner periphery almost immediately afterward would lift up the rear portion of the aeroplane and thus re-establish the equilibrium. That would not be the case, according to Parkin, because the air after passing over the front portion of the annular plane would be deflected downwards. This deflection downwards of the air is called downwash, and is the direct result of obtaining lift. If we imagine the plane stationary and the air moving, then the air meets the plane, and is deflected downwards by the plane, at the same time causing a force on the plane which is the lifting force. In any one of Myers' annular planes, the air after passing the front section of the plane has produced lift on it, and has consequently been deflected downwards, so that by the time it reaches the rear section of the plane, it is already moving downwards, and consequently meets this rear section at a smaller angle than that at which it met the front section. This smaller angle means that the rear section must give less lift than the front section, because with all planes the lift increases as the angle of attack increases, up to a definite limit. In one of the tests made by Parkin it was demonstrated that the air passing out of the interior of the combined annular planes, passed over the top of the rear planes when the angle of attack was large, this no doubt being due to eddies formed at these large

angles. At smaller angles of attack the air passed out between the rear sections of the planes as I have already stated. Parkin stated in his evidence, that the tests he made indicate that the machine is unstable longitudinally and laterally, which means that when the machine is once displaced, the air forces on it tend to increase the displacement. It is a fair inference from the tests made by Parkin that this machine lacks utility.

Capt. Stedman's evidence in respect of the aeroplane described in this patent was that the annular planes had a low efficiency because they were flat, and that the bowl-shaped plane was definitely cambered downwards and would give a negative lift, that is, it would push downwards, unless inclined at some definite angle. He said the whole machine would be more efficient if turned upside down, and that in his opinion the machine was inefficient and inoperative. It was the opinion of Brown, another witness for the plaintiff that this machine lacked stability and utility. Coming now to the evidence of Orville Wright, a distinguished personage in the aeronautical world, who with his brother were the first to fly a heavier-than-air machine with a pilot aboard. He gave evidence at Dayton, Ohio, before the Deputy Registrar of this Court, acting as Examiner, respecting United States patent no. 1,226,985 issued to Myers, the specification of which describes the same invention as does the patent presently under discussion. I shall quote from his evidence, question and answer, but without comment.

Q. Is it your opinion that the Myers patent no. 1,226,985 discloses a practical or operative airplane?—A. It does not.

Q. Will you briefly give some of the grounds on which you base that opinion?—A. It is deficient in all of the important respects. It is inefficient dynamically. It is inefficient in control. It is inefficient structurally. The specifications and drawings show a large bowl or saucer shaped surface beneath the superposed annular planes. The annular planes themselves are very inefficient as compared with rectangular planes as used in flying machines generally. The large bowl with the convex side downward and the concave side upward at ordinary angles of flight would produce a negative lift; as this negative lift would necessarily have to be carried on the annular planes, the drag on the annular planes would be increased in addition to the increased drag on the bowl itself.

Q. You are looking at the drawings of the patent, Mr. Wright?—A. Yes, sir. The drawing shows plain instead of cambered surfaces. Plain surfaces are less efficient than cambered surfaces. The drawings and specifications show three lifting screws for maintaining the fore and aft and the lateral balance, F-1, F-13, and F-14 on Fig. 3 attached to the patent. Lifting screws are inefficient for lateral balance for several

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reasons. They necessarily will be slow in operation, because in order to get any appreciable lift, considerable velocity must be given to the propeller blades. They are inefficient because the propellers or lifting screws will have a large amount of drag when the machine is in forward motion. The downward draft of air created by the lifting screws in recovering or maintaining equilibrium also creates an additional drag to the machine. A column of air such as that produced in the wake of a propeller, offers a resistance similar to that of a solid body. The lifting screws are inefficient for equilibrium because when one screw is used for maintaining lateral balance, it tends to destroy the fore and aft balance of the machine. On the other hand, ailerons such as used in modern flying machines are very quick to respond to the controls of the pilot. They produce powerful correcting movements without appreciable increase of the drag of the machine.

Q. What effect has the stopping of the motor or control in a machine constructed with modern ailerons, and compare that with the effect in the case of the machine covered by the Myers patent?—A. The stoppage of the motor in machines using the aileron type of control has no effect on the use of the ailerons in maintaining and restoring equilibrium, while if the motor should stop in a machine of the type shown in the Myers patent with three lifting screws for maintaining equilibrium, all of the effect of the lifting screws for equilibrium would be destroyed or done away with.

Q. Suppose a machine constructed in accordance with the specifications and plans of this patent were equipped with the best modern engine or motor, would that enable the machine to fly, or to be flown?—A. It would not. I do not think it would be possible to lift a machine of the design shown and described in the Myers patent with any modern motor, using the common knowledge of 1903, and I very seriously doubt whether it would be possible to make such a machine lift, modified according to our latest scientific knowledge.

Q. You, I think, mentioned the inefficiency of an annular plane. Would that be less or greater with a superposed series of annular planes as in the patent?—A. There is always a loss in superposing one surface above another at all of the angles of attack used in flight.

Q. Is there anything shown or described in United States Patent 1,226,985 providing effectively for inherent stability, whether longitudinal or lateral?—A. I find nothing except the low centre of gravity. This, however, does not provide effectual inherent stability.

Q. How do you find in the patent that the lifting screws F-1, F-13 and F-14, Figure 3, are put into operation?—A. They are put into operation through means of clutches.

Q. Are ailerons ever operated through the means of clutches? I mean modern ailerons?—A. I have never known of any ailerons being operated in that way. In fact, such operation would be dangerous in the use of ailerons.

I have no difficulty in arriving at the conclusion that the flying machines described in these two patents are unstable, inoperative, lacking in utility, and do not constitute invention. The plaintiff therefore succeeds in his claim for a declaration that these patents of invention are null and void and should be revoked. Costs will follow the event.

Judgment accordingly.