

BETWEEN:

THERMIONICS LIMITED, CANADIAN MARCONI COMPANY, THE CANADIAN GENERAL ELECTRIC COMPANY LTD., CANADIAN WESTINGHOUSE COMPANY LTD., AND ROGERS - MAJESTIC CORPORATION, LTD.

PLAINTIFFS,

1940
Dec. 12-14,
17-20.
—
1941
July 28.

AND

PHILCO PRODUCTS LIMITED, AND CUTTEN-FOSTER & SONS, LTD. ...

DEFENDANTS.

Patents—Action for infringement—Subject-matter—Invention—Anticipation—Admissibility of parol evidence in construing prior publications—Patent Act, 25-26 Geo. V, c. 32—Combines Investigation Act, R.S.C., 1927, c. 36—Alleged combination in restraint of trade as defence to action for infringement—Patents held valid and to have been infringed.

The action is one for the infringement of two patents acquired by the plaintiff Thermionics Limited, by way of assignment from the patentees. The other plaintiffs are licensees under the patents so assigned.

1941
 THEER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.

The Langmuir patent relates to an "Electron Discharge Apparatus" and the invention claimed is the combination of a highly evacuated tube, three electrodes, namely, a cathode, an anode, and a grid which is claimed to comprise certain novel features, and a method or means for connecting and supporting the electrodes in predetermined relationships. The Freeman patent had for its principal object the provision for radio service of a tube which may be used in the ordinary receiving and amplifying circuits with alternating current on the filament, thereby eliminating the major alternating current hums or noises and obviating the necessity of storage batteries or of dry cells for supplying the filament current. Other objects of Freeman were the provision of a vacuum tube structure wherein a high voltage amplification factor might be obtained while simultaneously securing a comparatively low plate impedence, and the provision of a vacuum tube device adaptable for quantity production methods of manufacture and which would embody parts capable of manufacture in existing automatic machinery with minimum expenditures of time and of money.

The Court found that there was fit subject-matter for a valid patent in Langmuir, especially in the inclusion of a fine wire grid, wound upon and supported by a frame-work or bars, in the combination of elements described by him and that any structural distinctions between the device of Langmuir and that of defendants were not of substance or of a character to avoid infringement. The Court also found that Freeman contained subject-matter and was a patentable combination since it was a novel and useful one and no one had ever combined the same elements together in order to accomplish the results described by Freeman in his Specification, he being the first to disclose a device which could use alternating current and at the same time eliminate the major alternating current hums or noises. The Court also found that the defence of anticipation of Freeman failed and that defendants' device was only a slight departure in form from that of Freeman and infringement could not be avoided since in principle they were practically the same.

Held: That though every invention capable of supporting a patent must be a new manufacture, it does not follow that every novelty, though an important and useful one, is good subject-matter, and a new combination which is obvious and consists merely in putting together known things, each being applied to do that which it had been used to do before, without making any other experiments or gaining other information, is not proper subject-matter, neither is the mere duplicating of a known thing, though the result is eminently useful.

2. That the art of combining two or three parts, whether they be new or old, or partly new and partly old, so as to obtain a new result, or a known result in a better, cheaper or more expeditious manner, is valid subject-matter, if it is presumable that invention in the sense of thought, design, or skilful ingenuity were necessary to make the combination.
3. That in order to establish that a patent has been anticipated, any information as to the alleged invention given by any prior publication must, for the purpose of practical utility, be equal to that given by the subsequent patent; the latter invention must be described in the earlier publication that is held to anticipate it, in order to main-

tain the defence of anticipation, and where the question is solely one of prior publication it is not enough to prove that an apparatus described in an earlier specification could have been used to produce a certain result; it must be shown that the Specifications contain clear and unmistakable directions so to use it; it must be shown that the public have been so presented with the invention that it is out of the power of any subsequent person to claim the invention as his own.

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.

4. That a mosaic of facts derived from prior publications, or a symposium of facts known to physicists, does not constitute anticipation.
5. That the question of anticipation by prior publication is one of construction and that parol evidence is only admissible for the purpose of explaining words or symbols of art and other similar technical matters and of informing the Court of relevant surrounding circumstances.
6. That evidence of prior user in support of a plea of anticipation, depending upon the recollection of witnesses over a number of years, and implying fine distinctions or close diversities between two things, should be considered with great caution and should be disregarded unless established beyond a reasonable doubt, before it is accepted to defeat a patent under which a patented article is made, and particularly where it has gone into substantial use by the public. *William H. Cords et al. v. Steelcraft Piston Ring Co. of Canada et al.* (1935) Ex. C.R. 38.
7. That the Patent Act 25-26 Geo. V, c. 32 and amending Acts protect the particular exclusive rights attaching to patents and exempt them from the operation of those provisions of the Combines Investigation Act and the Criminal Code which are designed to restrain and punish anything in the nature of a combine or conspiracy in restraint of trade and commerce, and which might be against the public interest.
8. That if different patentees should combine in such a way as to offend against the intent and spirit of the relevant provisions of the Combines Investigation Act, or the Criminal Code, the procedure of attack would be that set forth in such statutes, and not by way of a defence in an action for infringement of a patent or patents.

ACTION by plaintiffs herein to have it declared that two patents owned by Thermionics Limited—the other plaintiffs being licensees under the patents—are valid and have been infringed by defendants.

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

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

W. F. Chipman, K.C. for Canadian Marconi Company.

D. L. McCarthy, K.C., *E. G. Gowling* and *J. C. Osborne* for defendants.

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

1941

THE-
MIONICS LTD.

ET AL.
v.

PHILCO
PRODUCTS
LTD. ET AL.

Maclean J.

THE PRESIDENT, now (July 28, 1941) delivered the following judgment:

This is an action for the infringement of two patents of invention. The plaintiff Thermionics Limited (hereafter called "Thermionics"), at the date of the commencement of this action was, by assignment, the owner of a patent of invention granted in August, 1921, the invention of one Irving Langmuir, relating to the invention of improvements in an Electron Discharge Apparatus, and which patent is numbered 213,178. This patent expired since the commencement of this action, and the remedy of the plaintiffs, if any, is restricted to that of damages. Thermionics is also, by assignment, the owner of a patent of invention granted in November, 1926, numbered 265,517, relating to improvements in Thermionic Vacuum tubes, the joint invention of Herbert M. Freeman and Wallace C. Wade. The plaintiffs other than Thermionics are licensees under the said patents. It will be convenient to refer to the first-mentioned patent as "Langmuir" and to the other as "Freeman."

The invention of Langmuir, the first to be considered, relates to electron discharge devices, that is, discharge tubes having an incandescent cathode. As the Specification points out devices of this nature are provided with an electron-emitting cathode, an anode, and a conducting body, commonly termed a "grid," consisting ordinarily of an electrical conductor located between the cathode and anode for statically controlling the electrical discharge conditions of the tube. The Specification, after stating that electron discharge devices of the nature therein described may be operated at exceedingly high voltages, and have a high load capacity, and that they are suited for use in a much wider field than former devices of this nature which were limited to low voltages and very feeble currents, proceeds to state:

The present invention comprises various structural features of novelty which co-operate to increase the range and capacity of a device of this type. For example, in accordance with my invention the grid is supported on a frame-work in such manner that mechanical displacement of the grid by static strains or by mechanical shocks cannot easily occur. Other features of novelty are pointed out with particularity in the claims.

In the accompanying drawings various forms of apparatus are shown illustrative of my invention. Fig. 1 illustrates an electron discharge tube with its parts assembled, and Figs. 2 to 5 inclusive show alternative forms of electrode and grid construction.

As shown in Fig. 1, the various parts of the apparatus may be mounted in a tube, or globe 1 upon a pedestal 2 similar to the mount employed for incandescent lamps. The cathode construction is shown in Fig. 2. It consists of a substantially straight filament 4 consisting of highly refractory material, preferably tungsten, and provided with terminals 5, 5'. The filament 4 is mounted, preferably attached to a light spring 6, between two oppositely disposed supports 7 and 8 constituting a frame-work, which may consist of insulating material, such as glass or quartz, but in some cases may to advantage consist of metal. Upon this frame-work is wound a wire 9, the turns of which are closely adjacent to each other and are also very closely adjacent to but are out of contact with the incandescent cathode. The conductor 9, which may be very fine, constitutes a grid which by means of applied potential exerts a static control upon the electron discharge, as explained fully in my copending application, Serial No. _____ filed.

The supporting frame-work for the cathode and grid is attached to a rod 10, mounted upon the stem of the tube. Adjacent to the cathode grid is the anode 11 which in the present case has been indicated as consisting of a wire strung in a zig-zag manner over hooks 12 upon fork-shaped supports 13 and 14 but it is not necessary that it should assume this particular form. Both anode and grid preferably consist of tungsten, but other gas-free refractory metals may be used. By constituting the anode a continuous conductor it can be conveniently heated by passage of current during evacuation of the device and for this purpose is attached to leading-in conductors 15, 15'. The cathode terminals 5, 5' are supplied with current through leading-in wires 16, 16'. Although it is not necessary for all purposes to provide connections for each end of the grid it is desirable to do so when the potential applied to the grid is small and in the case of a straight or linear cathode the potential gradient along the grid may to advantage be the same as that on the filament. In this manner the potential drop from grid to cathode is the same along its length. The grid is indicated in Fig. 1 as being attached to leading-in conductors 17, 17' at opposite ends.

In some cases it is desirable to use a V-shaped incandescing conductor for the cathode and to attach to its bight a spring as shown at 18, 19 in Fig. 3. In this manner contact of the conductor with the grid by sagging when the metal is expanded at high temperature is prevented. In Fig. 3 a plurality of loops are used in order to increase the amount of cathode surface. The filaments are connected in parallel by means of conductors 20, 20'.

In Fig. 4 the cathode 4 has been shown as being mounted in a frame 21, consisting of ferrochrome, tungsten, or other suitable metal upon which the wire 22 constituting the grid is wound. As the grid wire is thus wound upon a conductive frame its turns are in parallel and electrical contact may be made directly to the frame 21 by conductor 23. The leading-in conductors 5, 6 for the cathode are insulated from the frame by glass supports 24 as indicated.

Upon the frame 21 are placed mica sheets 25 and 26 which serve to insulate the wire 27 constituting the anode from the grid. The leading-in conductors 28, 28' to which the ends of the wires are anchored may be attached to glass beads 29 fused upon the frame 21.

In Fig. 5 not only the grid 32 is wound upon the frame 33 but also the cathode wire 34 is wound upon stout metallic conductors 35, 36, consisting preferably of tungsten. The conductors 35, 36 are attached respectively to an anchoring wire 37 and to two springs 38 and 39 serving

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941

THE-
MIONICS LTD.
ET AL.

v.

PHILCO
PRODUCTS
LTD. ET AL.

Maclean J.

to hold taut the turns of the tungsten wire constituting the cathode and to prevent them from coming into contact with the grid wire 32. A stranded copper conductor 40 may be used to conduct current to the cathode.

In preparing the apparatus, the preliminary exhaust is carried out by the most improved methods such as used in incandescent lamp manufacture. The anodes are then subjected to an electron discharge, or bombardment, by impressing a suitable voltage between the cathode and anode. When the anode consists of a conductor such as wire 11, Fig. 1, it is preferably heated by passage of current either before or during the bombardment. When the anode is plate-shaped the heating may form part of the treatment by electron bombardment, the discharge current being made heavy enough to heat the anode, but heating is not essential. The removal of the gas from the anode is not due to heat alone, but is due to an electrical effect. The voltage should be so chosen, at the beginning of the electron discharge treatment that blue glow is absent in the tube as this indicates that ionization of the residual gas by collision of gas molecules with electrons is taking place and under these conditions disintegration of the cathode is apt to take place. The discharge voltage is progressively increased, the gas being removed as fast as evolved, preferably by a Gaede molecular pump. This treatment is ordinarily continued until the discharge voltage is higher than the voltage at which the device is normally operated but this rule will not hold true when the operating voltage is very high as substantially all the gas may be removed before the operating voltage is exceeded. Evacuation of the device should preferably be carried to a pressure as low as a few hundredths of a micron or even lower although no definite limits may be assigned. In any event evacuation should be so low that no appreciable gas ionization takes place during normal operation. When the cathode and anode are very close together and the discharge is confined to a direct path, a greater gas pressure is permissible than when the opposite is true.

An electron discharge tube may be used in various electrical systems, for example, as in receiving systems for radio-telegraphy, the passage of electron current across the evacuated space between cathode and anode is controlled by the static potentials impressed upon the grid. A tube prepared as above described may be used to transmit currents limited in potential only by the dielectric strength of the glass, quartz or other material of the tube and the mechanical strength of parts subjected to static forces.

The claims relied upon by the plaintiffs may conveniently be stated here, and they are the following:

2. The combination of a highly evacuated envelope, an electron-emitting cathode, a co-operating anode, rods spaced apart and adjacent said cathode, a conductor constituting a grid supported by said rods, and having a plurality of sections transverse to said rods, and external connections for said electrons and said grid.

3. An electron discharge apparatus comprising an evacuated envelope, an electron-emitting cathode, a co-operating anode, a frame-work spaced about said cathode, and a conductor mounted thereon closely adjacent said cathode.

4. An electron discharge apparatus comprising an evacuated envelope, a refractory conductor, connections for transmitting energy to incandesce said conductor, bars located on opposite sides of said conductor, a wire wound with closely adjacent turns on said bars to constitute a grid, but

out of contact with said incandescing conductor, a second set of bars closely adjacent to the first set but insulated therefrom and a conductor constituting an anode mounted thereon in a plane substantially parallel to said grid, and leading-in conductors to said grid and anode.

5. A vacuum discharge tube comprising a highly evacuated envelope, a cathode adapted to be heated, a co-operating anode, a frame-work located adjacent thereto, a conductor mounted thereon, and located between the cathode and anode, and external connections for said electrodes and said conductor.

As the title indicates it is an "Electron Discharge Apparatus" that is the subject of the patent of invention in question. Substantially, the invention claimed is the combination of a highly evacuated tube, three electrodes, namely, a cathode, an anode, and a grid which is claimed to comprise certain novel features, and a method or means for connecting and supporting the electrodes in predetermined relationships. All these elements assembled together in the manner described in the Specification co-operate to function as an electron discharge apparatus, a combination patent for which invention is claimed. It will be observed from the Specification that the patent addresses itself to certain constructional details of a three-electrode vacuum tube. It describes how the tube or envelope may be evacuated so that no appreciable gas ionization takes place during the normal operation of the device. It describes certain structural features in each of the three electrodes, the method of their support in order to ensure rigidity and to prevent their sagging and coming into contact with each other, and the mounting of the three electrodes in such a way as to confine them in fixed or predetermined relation to one another. The characteristic feature of the cathode is a single longitudinal wire supported at both ends by springs to keep it taut, or a V cathode similarly supported at the apex of the V, or, a spirally wound cathode supported by the grid. The characteristic feature of the grid is a fine wire wound upon and supported by two or more parallel rods or wires, referred to in the Specification as a "frame-work," and which frame-work is embedded in the glass press, the turns of the wire being closely adjacent to each other and closely adjacent to but out of contact with the incandescent cathode, and which wire, it is said "may be very fine." The characteristic feature of the anode is that of a wire strung in a zig-zag manner over hooks upon fork-shaped supports, or, two plates supported by wires embedded in the glass press. The important fea-

1941

THEER-
MIONICS LTD.
ET AL.

v.
PHILCO
PRODUCTS
LTD. ET AL.

Maclean J.

1941
THER-
MIONICS LTD.
ET AL.
v.
PHILCO
PRODUCTS
LTD. ET AL.
Maclean J.

or 1932 and onwards to and including 1938, the defendants equipped a large number of imported radio sets with tubes made in Canada by licensees under the patent in suit, but in 1939 they began to import into Canada the same type of tubes, the infringing tubes, which were made abroad by manufacturers who were not licensed in Canada; in fact the second named defendant, in 1938, entered into a licensed radio tube sales agreement with the plaintiff Canadian Marconi Company, which tubes comprised the invention here in question. This, I think, may fairly be treated as some evidence of weight that the defendants must have regarded Langmuir as being a device that was meritorious and not something that was obvious to those competent in the art, or to manufacturers of and dealers in such a type of tubes, though, of course, such a course of conduct is not necessarily conclusive of subject-matter. It is probably not now open to the defendant Cutten-Foster & Sons Ltd. to contest the validity of the patent, and that was a submission made by Mr. Smart. Then, it is to be mentioned that it was stated by Mr. Gowling that the defendants deliberately refrained from importing and vending the offending tubes until the expiration of a patent granted to Langmuir in Canada, in 1920, which described and claimed a highly evacuated tube, which I understood Mr. Gowling to say was substantially the same highly evacuated tube as that described and suggested for use in the electron discharge device in question. It was contended that all the possible patentable merits disclosed and claimed in the patent in suit were obtainable from the highly evacuated tube disclosed in the patent granted to Langmuir in 1920. On the expiration of this patent in Canada the defendants commenced to import and vend the alleged infringing tubes in this case, and it is now one of the defences urged against infringement here that the expiration of the 1920 patent to Langmuir permitted the defendants to import and vend such tubes without incurring infringement of the patent in suit. This seems to me tantamount to an admission that the combination patent of Langmuir here in question would have been infringed if the offending tubes in this case had been imported and sold in Canada during the life of Langmuir's patent of 1920. That contention seems to suggest that while the combination patent here in question may have been valid up to the time of the expiration of the patent granted to

Langmuir in 1920, that validity terminated with the expiration of the patent of 1920. Such a contention, it seems to me, fails to realize that it is a combination patent with which we are here concerned, and that it matters not whether the evacuated tube or envelope in the combination patent in suit was something old or something new, or whether it was patented or not. If the combination patent in suit were valid at the time of issue I do not apprehend that as a matter of law that that validity terminated merely because one of the elements in that combination had been earlier patented by Langmuir, and which patent had expired during the life of the combination patent in suit. I think that if the patent in suit were a valid one at the date of issue it was still valid at the time material here, and it is to be pointed out that invention was not separately claimed for the highly evacuated tube in the combination patent here in question. And finally, it is to be pointed out that in a consideration of the question of invention in respect of any patent it is essential to keep in mind the date of the alleged invention, which here was in 1913, and the state of the art at that date, now more than twenty-five years ago. As the authorities have frequently urged, we must beware of the wisdom that comes after the event, and this is a case where that admonition must be carefully observed, for there is always the danger of viewing the disclosures of a patent which has run almost its whole period, or which perhaps has even expired, in the light of subsequent developments in the particular art involved in that patent. Prior to 1913 three-electrode vacuum tubes were, I think, comparatively new devices in the art, and it is fairly clear from the evidence that the behaviour of such tubes was not uniform or dependable, or even too well understood, and attempts at improvements in the same would likely have the attention of trained experimental workers in the art, a very technical art, so that it may fairly be assumed that if any patented improvement made in such devices came to be recognized when disclosed as of importance and utility, and gradually went into almost universal use, it must have possessed in some degree such qualitative merits as are usually regarded as evidence of invention. All the foregoing matters which I have mentioned are, I think, fairly to be considered in determining whether or not there is subject-matter in Langmuir.

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941
THE-
MIONICS LTD.
ET AL.
v.
PHILCO
PRODUCTS
LTD. ET AL.
Maclean J.

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1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941
THER-
MIONICS LTD.
ET AL.
v.
PHILCO
PRODUCTS
LTD. ET AL.
Maclean J.

I come now more specifically to the question of invention. In the first place, Langmuir required the use of a highly evacuated tube, not merely an evacuated tube, and the Specification describes how the envelope containing the electrodes may be highly evacuated; he suggests that evacuation should preferably be carried to a pressure as low as a few hundredths of a micron or even lower, although he assigns no definite limits; and he appears to suggest also that the electrodes be so thoroughly freed from gas that gas would not be liberated from them during the operation of the device. It is agreed that the earlier types of vacuum tubes, such as the DeForest audion, were not at all well evacuated and there was a deal of gas left in the bulb at the completion of the evacuation process which made the tubes very erratic and undependable in their behaviour, that is to say, tubes supposedly similar had very different characteristics and would not act consistently, due to the effect of the residual gas in the tube, and which irregularities had previously been thought inherent in vacuum discharges from hot cathodes. Langmuir recognized the value of a highly evacuated tube, such as he suggests for his electron discharge device, in correcting the irregularities found in the operation of tubes that were not completely evacuated. Now, having stabilized the tube against irregularities of action due to irregularities of gas content, he found the importance and value of fixing the spatial relations of the electrodes the one to the other for particular purposes, and maintaining such relations by the structural arrangements which he minutely describes, and he points out that by varying such spatial relations he could make the tube available for many uses from which it had been excluded up to that time. The highly evacuated vessel or tube was not specially stressed before me as contributing invention to the combination, yet, it would appear that the direction to use a highly evacuated tube, so as to practically eliminate irregularities in the action of the tube due to irregularities of gas content therein, was of great importance and productive of useful results. The predetermined spatial relationships of the electrodes in the tube and the maintenance of the same was, I think, of very substantial importance and value because this made it possible to predetermine tube operation and thus the construction of tubes for special performances, as Langmuir pointed out in

his Specification, and Langmuir seems to have been the first to suggest how this might be done, and this construction has been followed now for many years and it therefore must have been considered, by those competent to judge, a desirable and novel structural improvement in three-electrode vacuum tubes.

But it was the inclusion of a fine wire grid, a wire grid wound upon and supported by a frame-work or bars, that the plaintiffs particularly relied upon to sustain their claim to invention, in the combination of elements described by Langmuir. The wire grid, which may be of very fine wire, thus wound and supported, is claimed to have effected new and advantageous results in the operation of an electron discharge device, and this was made possible by supporting the fine wire wound grid upon a frame-work or bars, such as that described, or something equivalent thereto. A grid in its normal form is a wire structure of some formation or other, or a metal sheet with perforations therein, interposed between the plate and the filament; the electrons passing from the filament to the plate have to go through the openings in the grid whatever its precise form, and their passage to the plate is controlled, as I understand it, to any desired extent by the potential of the grid with respect to the filament. The grid was the notable invention of DeForest, in which case the wire was spirally formed, with considerable spacing between the turns of the wire, and the wire was of sufficient strength to maintain its original form when placed in position. It is correct to say, I think, that a wire grid will exercise the most control over the electrons when its wires are fine and closely wound together, and I find that stated in a reliable text book, and it was this form of construction Langmuir disclosed in his Specification; and it is conceded, as I have already stated, that this form of grid construction was not earlier disclosed in any of the published prior art, and, it was not said, that this form of grid had been earlier used by others. In that form the fine wire grid accomplished certain results which Langmuir desired, that is to say, its form and substance were inseparable, and the form given to the grid by Langmuir expressed his idea of means and alone could accomplish the results he desired. Now this grid, it is claimed, made possible the use of high voltages; it increased the load capacity of the tube; it made a better amplifier by increasing the capacity

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941

THE-
MIONICS LTD.
ET AL.

v.

PHILCO
PRODUCTS
LTD. ET AL.

Maclean J.

of the electrical end of it; and it made the tube, by reason of its rigid structure, safe from short circuits occasioned by mechanical shock or by reason of the application of high voltages which would have destroyed the DeForest tube had they been applied to it, and, I think, the evidence sustains all those claims. It is claimed that the two significant things about the grid structure of Langmuir is the wire wound grid supported on a frame-work, and the structural arrangements which maintain that frame supported grid in proper position with respect to the other electrodes, and the other electrodes with respect to each other and to it. Langmuir was the first, I think, to point out the importance of the spatial relationships of the electrodes in the tube and thus made it possible to predesign and predetermine tube operation, and to build a large number of types of tubes for special performances. By combining together all the structural features and arrangements which I have mentioned, and by the elimination of the irregularities due to gas, there resulted an electron discharge tube on which might be used plate voltages amounting to hundreds of thousands of volts instead of being limited to voltages of thirty or forty volts, which was characteristic of earlier known devices of this nature, and which was characteristic of the DeForest audion. And since 1920 or 1921 practically all three-electrode vacuum tubes have used the Langmuir wire wound grid. For the foregoing reasons, I have reached the conclusion that Langmuir possessed fit subject-matter for a valid patent.

If there were invention in the patent in question, as I hold, then I find no difficulty in holding that there was infringement. True, there are to be found structural departures from Langmuir in the offending devices of the defendants. But they are very slight and by no means substantial, and for all practical purposes, the devices are the same. I cannot attach any weight whatever to the various contentions advanced on behalf of the defendants wherein it was sought to establish real structural distinctions between the different elements in the two devices, or in the method of their assembly, or in their operation. There is no real difference between the two devices. I therefore find that Langmuir contained subject-matter and was a valid patent, and was infringed by the defendants.

I come now to a consideration of Freeman, the second patent in suit, a structural patent, but which goes further in that it introduces new means of heating the cathode of a vacuum tube. I might at once attempt to describe in general terms this patent, before referring to the objects and any particular description of the invention to be found in the Specification, or in other material before me.

1941
THE-
MIONICS LTD.
ET AL.
v.
PHILCO
PRODUCTS
LTD. ET AL.
Maclean J.

The ordinary filament type of cathode is primarily intended for use with a continuous current source, such as a battery, as the source of heating energy. Such a cathode if heated by means of commercial alternating current from the ordinary lighting circuits will introduce objectionable hum in the vacuum tube circuit. This patent covers a cathode made of electron emitting substances such as thorium oxide moulded into a tiny tube about the size of the lead of an ordinary pencil. Inside this tube is introduced a heater in the form of a spirally wound metal wire which is heated by the alternating current. The heater is electrically insulated from the electron emitting cathode tube by some refractory substance and the heat is transferred through this refractory substance to the cathode. The cathode in this arrangement is at the same voltage at every point of its surface which is an advantage in a vacuum tube, and it is also electrically independent from the alternating current used in heating, with the resultant elimination of what is usually referred to as "hum." This heater type cathode apparently is used universally to-day in all radio devices intended to be operated from the house lighting circuit as, for instance, the modern broadcasting receivers in use in the home and also in almost all commercial receivers, amplifiers and radio devices.

The principal object of Freeman was to provide for radio service a tube which may be used in the ordinary receiving and amplifying circuits with alternating current on the filament. As was explained to me, a tube of this kind will obviate the necessity of storage batteries with their constant need of attention or of dry cells with their frequent replacements, for supplying the filament current. It is not feasible to use the common type of receiving tube satisfactorily with alternating current supply because of the pronounced 60-cycle hum that is introduced into the telephones, although a number of circuits have been developed which reduce this hum to a considerable extent. Another

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

object of Freeman was to provide a vacuum tube structure having highly desirable operating characteristics, wherein a high voltage amplification factor may be obtained while simultaneously securing a comparatively low plate impedance, and a still further object was the provision of a vacuum tube device, of the class described in the Specification, adaptable for quantity production methods of manufacture and which would embody parts capable of manufacture in existing automatic machinery with minimum expenditures of time and of money.

In his Specification Freeman sets forth the causes why it was not practical theretofore to use an alternating current on the filament in the ordinary receiving and amplifying circuits used in tubes constructed for radio service, and how he proposed to solve the problem. The Specification states:

Heretofore, it has not been practical to employ alternating currents for the excitation of the cathode or filament of a receiving or amplifying tube for the reason that such currents introduce variations in the plate current of the tube. Such variations are thought to be due to the following causes:

- (1) The variations in the intensity of the magnetic field established by the alternating currents traversing the filament, thereby resulting in a variable deflection of the electron stream emanating from the filament;
- (2) The variations in the electric field around the filament which are caused by the reversals in the potential distribution along the filament;
- (3) The variations in the emissivity which are caused by the alternate heating and cooling of the filament.

We have found that the desirable results outlined hereinabove may be obtained by applying a cathode construction having an operating cathode surface which has no fall of potential along its surface, that is, a so-called "equipotential surface." Such cathode surface may be rendered thermionically active in a number of different ways, as by subjecting the same to heat or to an electron bombardment. In one form of embodiment of our invention, we provide a cathode construction comprising a central heater element and a co-operating equipotential cathode surface which is positioned immediately adjacent to the heater element. The thermal energy of the heater element may be transferred to the cathode surface either by conduction or by radiation.

With these and other objects and applications in view, our invention further consists in the combinations and details of construction and in the circuit arrangements hereinafter more fully set forth and claimed and illustrated in the accompanying drawing, . . .

There was introduced into evidence by the defendants an article contributed by Freeman to a publication called *The Electric Journal*, in December, 1922, wherein he discussed in fairly simple and understandable terms the problems which he enumerated in his Specification, their causes, and the method or means by which the causes have been

substantially removed. It is agreed that this article by Freeman describes the invention under discussion. I think I may therefore usefully quote freely from this article, and this will obviate the necessity of my referring to the detailed and perhaps more technical description of the various embodiments of the invention in question, their construction and principle of operation, as set forth in the Specification. The passages which I propose to recite will make clear the nature of the invention here claimed, and if in that description of the invention there appears to be included some material which is not to be found in precisely the same form in the Specification, that will not however modify the substance or principle of the construction of the device described in the Specification. In this publication the following passages occur:

The hum that is heard when alternating current is used to light the filament of the ordinary receiving tube is due to three factors. The first one is the variation of temperature produced in the filament, which causes the emissivity of the filament to vary periodically and consequently produces periodic variations in the electron current in the plate circuit.

The hum due to this cause can be eliminated by burning the filament at a temperature high enough to produce temperature saturation of the electron current, in which condition slight variations in filament temperature will not change the electron flow. Also by having sufficient mass in the filament, the heating lag may be made great enough so that the temperature of the filament will not follow the rapid changes in current.

The second contributing cause of hum is the magnetic field which surrounds the filament when the heating current is flowing. The effect of this field is to deflect some of the electrons leaving the filament so that they must traverse a path longer than normal in their transit from filament to plate. When the field is produced by a direct current this effect is constant, and a constant plate current is obtained. But if the filament is heated with alternating current the magnetic field periodically reverses its direction, and the consequent changes in the paths of the electrons produce fluctuations in the plate current which give rise to an audible hum in the receivers. This source of disturbance is a function of the current required for heating the filament, and is particularly prominent in the case of the simple straight or helical filament. The hum can be reduced by making the filament in the form of an inverted V with the two sides close together, and by cutting the heating current to as low a value as possible.

The third most pronounced cause of disturbance from the use of alternating current filament supply is due to the voltage drop along the filament caused by the heating current. For example with the WD-11 tube used as a detector, a circuit may be used as shown in Fig. 1 The plate P is at a potential of 22.5 volts positive with respect to the end A of the filament, and will therefore draw from that point a number of electrons determined by that potential. The end B of the filament is positive with respect to A by an amount equal to the voltage drop

1941
 THE
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

along the filament, which in this case is about one volt. The plate is therefore only 21.5 volts positive with respect to the point B, and fewer electrons will reach the plate from that position and from the point A. At the same time the grid is at the same potential as the point B but is 1.5 volts positive with respect to point A. Therefore the number of electrons reaching the plate from the point A will be still further increased over the number from the point B. We thus have the condition that the stream of electrons flowing from the filament to the plate is not of uniform density over the whole length of the filament. If direct current is used on the filament, this condition does not seriously affect the operation of the tube, the only noticeable effect being that the characteristics of the tube will depart widely from what would be expected from a theoretical consideration of the structure.

If, however, the 1.5 volt battery of Fig. 1 be replaced by a source of alternating current with a peak voltage of 1.5 volts, the situation described above will exist only for the instant during which the end A of the filament is at the negative peak of the alternating potential, and as the cycle progresses the distribution of the density of the electron stream will change to the condition where more electrons will reach the plate from the point B than from the point A. This variation in the distribution of current density in the space between filament and plate gives rise to a very pronounced hum in the telephone receivers. This same effect exists whether the tube is used as a detector or as an amplifier.

There have been numerous attempts to reduce the effect of this potential drop along the filament, as for example by making the ground connection to a centre tap on the winding of the transformer used for lighting the filament or to the midpoint of a resistance bridged across the filament terminals. None of these methods has proved satisfactory, although it is possible to reduce the hum to a certain extent in this way.

In the tube here described, each of these three possible sources of disturbance has been considered, and the cathode element has been designed to eliminate the effects described above. The obvious way to combat the difficulties arising because of the fall of potential along the cathode is to utilize some form of equipotential surface as a source of electrons. Such devices have been used in a number of cases, the electrons being obtained from a surface which is heated by some means entirely independent of the actual electron circuit. Nicholson, Round, and Morecroft have described tubes for radio work in which the cathode consists of a metallic cylinder which is heated by radiation from a straight or helical filament at the axis of the cylinder. There is considerable practical difficulty in obtaining sufficient heat for the cathode surface by this method, and the difficulty due to the magnetic field around the filament is not overcome.

In the tube here described, the equipotential surface is obtained by the indirect heating of the cathode surface, with a special construction which eliminates the effect of the magnetic field and at the same time permits a more efficient heating of the cathode than the radiation method described above. The cathode of this tube consists of a cylinder or sleeve of nickel coated on the outside with a mixture of barium and strontium oxides. The material of which the sleeve is made is 0.003 inch thick, and the complete cylinder $\frac{7}{8}$ inch long with an inside diameter of approximately 0.09 inch. The heating element is a filament of tungsten 0.0035 inch in diameter and 2 inches long, in the form of a V with the

sides parallel and about 0.010 inch apart. To maintain the relative positions of sleeve and filament, and to insulate the sides of the filament from one another, a tube of refractory insulating material is used. This tube has an outside diameter of 0.085 inch and is pierced with two longitudinal holes 0.005 inch in diameter and 0.010 inch apart. Fig. 2 shows the filament, insulating tube, and cathode cylinder before assembling, and Fig. 3 shows the complete cathode assembly ready for the grid and plate.

* * *

The insulating tube conducts the heat directly from the filament to the cathode surface, thus making possible a sufficient heating of the cathode with less filament current than is required where the heating is accomplished by radiation alone. The tube described here operates satisfactorily with an alternating current of 0.85 ampere at about 5.5 volts. The hairpin construction of the filament eliminates the effect of the magnetic field through the opposing of the magnetic fields of the two parallel sides.

The grid is a helix of nickel wire, and is $\frac{3}{16}$ inch inside diameter and $\frac{1}{2}$ inch long. The plate is a cylinder of nickel $\frac{3}{8}$ inch in diameter and $\frac{3}{4}$ inch long. Grid and plate are supported co-axially with the cathode structure. The complete assembly ready for sealing in the bulb and the finished tube are shown in Fig. 4.

* * *

The circuits in which these alternating current tubes may be used are in all essential particulars similar to the conventional circuits employed with direct current tubes. The important feature to be observed in designing circuits for use with this tube is that, as far as possible, all leads carrying alternating current be kept out of the actual radio circuits, or at least be kept to as low a resistance as possible in order to reduce the voltage drop in the leads. A circuit built up with careful attention to this detail will operate with direct current tubes exactly like the conventional circuits, and at the same time can be used with the alternating current tube, with no further change.

* * *

The foregoing is a very brief description of the first truly practical tube for alternating current operation. The tube described has the very desirable feature of being workable in almost any type of radio circuit without the necessity of any special apparatus or wiring. The object of the development has been to eliminate the objectionable storage batteries or dry cells heretofore found necessary for filament lighting. There are a number of ways in which alternating current can be used to supply the voltage for the plate in a tube circuit but all of them require elaborate circuit arrangements and special equipment, and in general demand extremely delicate adjustment for satisfactory operation. The ordinary B battery gives such excellent service that it seems hardly desirable to sacrifice the convenience and simplicity of this means of obtaining plate voltage in favour of a complex and expensive arrangement which is at best only partially satisfactory.

By using the above described tube and retaining the B battery, a receiving set can be made which is in every way as simple and convenient as the common set for direct current operation, while giving

1941
 THE
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

much better results than can ordinarily be obtained with direct current. No auxiliary equipment is required, the substitution of a transformer for the filament lighting battery being the only change necessary.

The Claims of the patent upon which the plaintiffs rely may now be stated and they are as follows:

1. In combination, an equipotential cathode structure comprising an equipotential surface, a non-inductive electrical heater for rendering said surface thermionically active and an alternating current supply circuit operatively associated with said electrical heater for energizing the same.

4. In a cathode structure, a mass of refractory material and a filament comprising branch portions disposed in said mass, said branch portions being so arranged that the magnetic fields established by currents traversing the branch portions balance one another.

8. In a space-current device, the combination with a heater element comprising adjacently disposed portions so arranged that the magnetic fields established by currents traversing said portions balance, of a member providing an equipotential cathode surface and refractory means for insulatingly supporting said heater element and for providing a thermally conductive path between said heater element and said member.

24. In a vacuum-tube device, a heater element in the form of a U-shaped conductor, the parallel members of said conductor being so closely adjacent that the resultant field is without substantial effect on the space current.

57. In an electron-discharge tube, a cathode member comprising a tubular casing having an outer surface adapted to emit electrons and a heating element comprising a plurality of parallel disposed wires within said casing, said heating wires being insulated from each other and from said casing by tubular insulating members individually surrounding said heater wires.

58. In an electron-discharge device, a cathode member having an outer surface adapted to emit electrons when heated, a U-shaped heater wire longitudinally disposed in said tubular casing and refractory tubular members for insulating the same with respect to each other and to the walls of said outer casing.

The principal ground of defence raised by the defendants in regard to this patent was the lack of subject-matter having regard to the state of the art as shown by earlier patent specifications, and other publications. Before entering upon a consideration of the state of the prior art as pleaded here it will be convenient at this stage to state what appears to be the settled law upon the subject of anticipation by publication. As was laid down in *Canadian General Electric v. Fada Radio Ltd.* (1), any information as to the alleged invention given by any prior publication must be for the purpose of practical utility, equal to that given by the subsequent patent. The latter invention must be described in the earlier publication that is held to anticipate

it, in order to sustain the defences of anticipation. Where the question is solely one of prior publication, it is not enough to prove that an apparatus described in an earlier specification could have been used to produce this or that result. It must be shown that the specifications contain clear and unmistakable directions so to use it. It must be shown that the public have been so presented with the invention that it is out of the power of any subsequent person to claim the invention as his own. Another concise and searching test of anticipation by prior publications was stated by Lord Dunedin in *British Thompson-Houston Co. v. Metropolitan-Vickers Electrical Co.*, (1), and it was this, as applied to this case: Had the attention of Freeman, in his early experimental work directed to the problem of eliminating the noises or hums resulting from the use of alternating currents in ordinary receiving and amplifying circuits, been directed to any one of the prior publications here cited as anticipations, would it be likely or possible for him to say "this publication gives me what I wish," or, "from this publication I can readily construct a tube which may be used in the ordinary receiving and amplifying circuits with alternating current on the filament, which will do away with storage batteries and dry cells, and will practically eliminate the hum that is heard when alternating current is used to light the filament." I may perhaps here add also that it is well settled law that a mosaic of facts derived from prior publications, or a symposium of facts known to physicists, does not constitute anticipation. As has been frequently observed, there is scarcely a discovery in the arts or in physics for which some antetype may not be found in the earlier writings.

Again, in considering prior publications cited as anticipations of the invention in controversy, it is well settled, for example, as laid down in *Canadian General Electric Co. v. Fada Radio Ltd.*, just above mentioned, that the question of anticipation by prior publications is one of construction and that parol evidence is only admissible for the purpose of explaining words or symbols of art and other such-like technical matters, and, of course, of informing the Court of relevant surrounding circumstances. It is the true construction of the document itself which alone can be looked at or relied upon to ascertain the intention of the author, or

1941
 THEER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941
THEER-
MIONICS LTD.
ET AL.
v.
PHILCO
PRODUCTS
LTD. ET AL.
Maclean J.

to determine whether or not it constitutes anticipation of another and later disclosure described in the specification of a patent or other publication. Conversations between the author of the earlier document with others, or drawings not reproduced in the earlier document, are not proper evidence if they purport to add to or subtract from, or in any way modify that which is described in that document, and should not be considered in a construction of it. The question always is whether or not the prior publication describes the invention claimed in the patent attacked, and the reason for that will be obvious upon reflection. Whether a prior publication constitutes anticipation of an alleged invention is entirely one of the true construction of that publication.

Now, in the light of these settled principles of law, I may turn to a consideration of two publications relied on as anticipations of Freeman, and the first I would mention is the British patent, No. 6476, which issued in 1915, to Marconi and Round, and which may hereafter be referred to as "Marconi." It is quite clear from the Specification of Marconi that the main object of the invention there, as expressed in the one and only Claim, was the employment of "a cathode formed of a tube of platinum and heated by an internal filament or filaments substantially as described." It was proposed to heat the tube by means of an internal filament and not by passing the heating current through the platinum tube itself, and by this means, the patent states, the platinum might be heated to the high degree necessary more readily than if the heating current were passed through the platinum. Marconi was not concerned with any of the problems resulting from the use of alternating current in a receiving and amplifying circuit, and there is no suggestion whatever of the use of an alternating current; in fact, the specification states that the tube or sleeve of platinum was to be heated by carbon filaments connected to a B battery, and, I think, it may be asserted with confidence that Marconi had in mind the use of direct current only, and therefore he could not have contemplated the use of his cathode for the purposes proposed by Freeman, nor did he give directions so to construct and use it. The cathode of Marconi, if required for the purpose of eliminating some of the hums caused by the use of alternating current, might, with certain alterations, be successfully used for that purpose, but Marconi does not suggest the use of

his cathode for such a purpose and there is nothing remotely suggesting that this was his object, and it is entirely improbable that he had this in mind at all. I cannot conceive of any reasonable ground for construing Marconi as an anticipation of Freeman. It fails to meet the tests applicable to a prior publication pleaded as an anticipation of an invention described in a subsequent patent, here the patent to Freeman.

The other publication pleaded as an anticipation of Freeman is the United States patent, No. 1,368,584, granted to one Torrissi in 1921, and it was this publication that was particularly stressed by the defendants to sustain the defence of anticipation by publication. This patent was the subject of considerable evidence adduced at the trial, of evidence taken in the United States on behalf of the defendants, pursuant to agreement between counsel, and of lengthy argument by counsel at the trial. The object of this invention was stated to be the elimination of the filament cathode, and substituting for it a cathode which was constructed so as to contain in its inside a heating coil, heating the cathode walls, causing the walls to emit electrons, and which heating coil was renewable from the outside of the instrument. The Specification states that a recognized defect in the filament cathodes then in use was its small exposed surface and its duration of life, which although lasting a reasonable length of time, eventually must burn out, thus making the whole instrument useless, and it is stated that one object of the invention was to provide a cathode which had "a larger surface." There is no mention of the purpose of a cathode with "a larger surface," and it appears to relate merely to "its duration of life"; and there is no mention of this feature of the cathode in the Claims. Broadly, the cathode is described as being made of metal, preferably nickel, cylindrical in shape, and airtight. The Specification states that "running through the whole length this tube is a rod of mica, porcelain or any other heat resisting composition F wound on its tip with the heating coil C with leads E running down this rod to the outside of the tube making two connections J and M"; this rod running through the tube with the heating coil wound thereon was removable, and this would appear to be the main object of the invention, and that feature is claimed. There is no reference in Torrissi to the

1941
THE-
MIONICS LTD.
ET AL.
v.
PHILCO
PRODUCTS
LTD. ET AL.
Maclean J.

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

use of alternating current, or to alternating current hums and their elimination, and everything indicates the patentee contemplated only the use of direct current. It is not suggested that the cathode construction described was designed for any other purpose than that of making the heating coil or filament removable, and of course for heating the walls of the cathode. There is nothing in the Specification to indicate any special winding of the heating coil upon the rod enclosed in the cathode, or that it was intended for any purpose other than to heat the walls of the cathode, and particularly is there no suggestion or direction that the winding of the heating coil upon the rod was to be so arranged as to eliminate the magnetic hum, assuming an alternating current was to be used. This cathode never went into commercial use. On any fair construction of the Specification, aided by the drawings, I cannot see how it is possible to hold that Torrasi discloses and describes that which is described and claimed by Freeman, or that there is in his Specification any directions to use his device for the purposes for which Freeman was designed. On any fair construction of the Specification of Torrasi I do not think the invention there described can be held to anticipate Freeman and I entertain no difficulty in reaching that conclusion.

But I should perhaps comment a little further upon Torrasi because of the importance attached to it by the defendants. The debate over Torrasi largely revolved around the question as to whether or not the winding of the heating coil was a double or a single helix. If the winding of the heating coil took the form of a double helix, that is turning the heating coil back upon itself, it might function so as to eliminate the magnetic hum due to alternating current heating, but not so if it took the form of a single helix winding, and it was contended that it was a double helix winding that Torrasi intended, and showed by his drawing Fig. 2. But there is no suggestion in the Description of the Specification that the winding of the heating coil should take the form of a double helix, thus being the equivalent in function and purpose of the U heater of Freeman, or that such a winding would overcome the magnetic hum due to the use of alternating current but which is not suggested or directed in the Description. Mr. Hogan, the expert witness of the plaintiffs, was of

the view that Fig. 2 of Torrasi was suggestive of a single helix, but that in any event the drawing was in this respect ambiguous. Dr. Chaffee, the expert witness of the defendants, was of the opinion that Fig. 2 indicated a double helix winding. It is clear that in the corresponding original drawing accompanying his application in the United States Torrasi showed a single helix winding; nearly two years later that drawing Fig. 2 was replaced by the present Fig. 2, but no material amendment was made in the Description of the invention. Again, there is nothing in the Specification suggesting that the wires of the heating coil should be placed closely together which rather negatives the idea of a double helix being intended or designed for the purpose of eliminating any objectionable effect caused by the magnetic field. Now, if the Description of the invention and Fig. 2 of the drawings are so in conflict, or that the drawing is so ambiguous, as to cause a diversity of opinion between the two experienced experts as to the interpretation of Fig. 2, then the Specification may fairly be held to be ambiguous, or, lacking in that clarity required by the Patent Act, and the contention of the plaintiffs in this regard must, I think, prevail; and it would appear most inequitable to destroy a patent that has been almost universally used for so many years, a very practical and useful device, upon the meaning attributed by the defendants to a patent drawing which at best is ambiguous, or upon the parol testimony of Torrasi himself and others, which purports to give to that drawing a meaning that cannot clearly be gathered from the whole Specification. My own conclusion is that Torrasi never intended to show, when his Specification was signed and filed, a double helix, or that his cathode was ever intended to function for the purpose of avoiding the magnetic hum due to alternating current heating. If that were in his mind it is difficult to believe he could have failed to make this plain and unambiguous in his Specification. It is well settled that a specification must be complete without requiring the public to perform further research; a patentee must not set a problem and call it a description. Further, the American evidence introduced to elucidate or explain what should have been clearly stated in the Specification of Torrasi, given about twenty years after the date of the patent, is not the sort of evidence that should be lightly accorded any weight in construing that Specification, and I feel that I cannot fairly

1941
 THE
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

do so. I had occasion to discuss evidence of this character in the case of *Cords v. Steelcraft Piston Ring Co.* (1), and to that I would refer. I think a great deal of the American evidence was probably inadmissible but in my view of the case I do not think it is necessary that I should pause to engage in any analysis of it.

It was next contended that Freeman was invalid for the lack of invention, and it was sought to sustain that contention on the following grounds. First, Mr. Gowling argued, a Canadian patent granted to Nicolson, in 1915, described an equipotential cathode, that is, a cathode in which all parts of its active surface can be maintained at the same potential, thus eliminating the electrostatic field and the consequent hum. There is no suggestion in this patent of the use of an alternating current, nor is there any direction to use such a current, but it was, I think, agreed that the cathode described by Nicolson might be used on alternating current and might overcome the portion of the electrostatically produced hum caused by the voltage drop along the emitting surface of the cathode, but it is perhaps doubtful whether it would overcome the portion due to the electrostatic induction along the wire. However, Mr. Gowling argued that Nicolson having shown how to eliminate the electrostatic field by an equipotential cathode, it was to be presumed that this would be known to Freeman. And then he argued that inasmuch as Nicolson employed a straight wire heating filament Freeman would at once know there would be a magnetic field surrounding that wire, he would know that if an alternating current were used the magnetic field and the electron stream would alternate, and if he got a hum he would at once recognize the magnetic field as its source. Then, in the same connection, he contended that a patent granted to Sutherlin, in 1933, showed how to eliminate the magnetic hum by doubling the filament wire back upon itself, and this he seems to say would be known to Freeman because Sutherlin worked with or under him on the development of this invention in the same laboratory in the United States, and that thus having acquired knowledge of the results developed by Sutherlin he, Freeman, filed his application for the patent which is here in question, and that therefore there was no invention by Freeman as to this feature

of his patent. As I construe the evidence, Freeman appears to have made his invention prior to Sutherlin, but the evidence is somewhat confusing to me. However, in my view of the case that is not of serious consequence. It was conceded on behalf of the plaintiffs that Sutherlin might reduce but would not eliminate substantially the electromagnetic hum caused by alternating current, because, if I understand it correctly, the close proximity of the active cathode wire ends shown in Sutherlin would not neutralize the magnetic field at the cathode surface where the electrons are emitted. However, be that as it may, from all this Mr. Gowling argued that Nicolson having earlier solved the problem of the electrostatic hum, and Sutherlin the electromagnetic problem, two of the three problems claimed to have been solved by the device of Freeman, there would remain only the question of how to overcome the thermal hum, the third cause of hum, and this Mr. Gowling contended required no invention. The objectionable thermal hum was overcome by Freeman, it is claimed, by having his cathode and heating element of the requisite "mass" to effect that result. Mr. Gowling contended that while theoretically an alternating current causes a heating and then a cooling of the heating filament, yet this, and the thermal hum, is automatically overcome by the use of an equipotential cathode because its weight or mass will prevent it cooling instantly, just as an electric iron will retain its heat for a time after the current has been withdrawn from it, and while at one precise instant of time there is no current heating the filament of an equipotential cathode that, Mr. Gowling contended, is of no consequence in the case of such a cathode, because of its "mass". From that Mr. Gowling proceeded to argue that as the Nicolson and Sutherlin cathodes had in fact sufficient mass to overcome automatically the thermal lag and hum, Freeman would have observed this, or would be presumed to know it, and accordingly there could be no invention in the means described by him for overcoming the thermal hum resulting from the heating of the filament with alternating current. In this way Mr. Gowling built up the contention that there was no invention in the combination of Freeman, because Freeman merely suggested the putting together what was earlier disclosed by Nicolson and Sutherlin, what were matters of common knowledge or

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941
THER-
MIONICS LTD.
ET AL.
v.
PHILCO
PRODUCTS
LTD. ET AL.
Maclean J.

knowledge acquired from a fellow-worker in the art, and what was elementary in physics; and thus, it was claimed, Freeman constructed the particular device described in his patent, what is known in patent law as an aggregation of known and independently operative means, which cannot constitute a true combination patent, and was therefore unpatentable.

I think the line of argument adopted by Mr. Gowling against the validity of Freeman, for lack of invention, and which I have just outlined, is fallacious. In the first place, I do not think that the receiving radio tube of Freeman is in fact open to the criticism of its being a mere aggregation of independently operative means. All the principal elements of the combination described by Freeman must co-operate in order that the device may perform the functions and bring about the results for which it was designed, and it is, I think, a good example of a true combination patent. Then, in the next place, if it requires a mosaic of extracts from publications and annals spread over a series of years, and of isolated facts alleged to be elementary in physics or of common knowledge, to prove the contention that there was no invention in Freeman, that contention, I think, stands thereby self-condemned. It appears to me quite clear that Freeman contains subject-matter, and is a patentable combination; even if some of the elements of the combination and their functions had been earlier disclosed yet the combination described by Freeman was a novel and useful one, one that was not, I think, obvious, and no one, so far as I am informed, had ever combined the same elements together in order to accomplish the results which Freeman described in his Specification, and which combination appears to have been accorded a very favourable reception from the interested and discerning public. Any receiving radio tube which would dispense with the use of direct current and enable the use of commercial alternating current instead, and at the same time eliminate alternating current noises or hums, seems to me to merit a patent of invention. There can be no doubt that it was obviously desirable that generally radio receiving tubes be operated, if possible, by commercial alternating current, and apparently that was an object that engaged the attention of prominent workers in the art, prior to the date of Freeman. Freeman was the first to disclose a device which

could use alternating current and at the same time eliminate the major alternating current hums or noises, and his device has been almost universally used for the purposes described and directed by him. It seems to me that a very strong case has been made for sustaining the validity of this patent. My conclusion is that Freeman is a true combination patent, a novel and useful device, almost universally used in all receiving and amplifying radio circuits using alternating current, and apparently it solved problems which were recognized, the solution of which was deemed desirable and sought for by others, and that there is subject-matter in Freeman.

Holding then that there is invention in Freeman, there remains the question of infringement to dispose of. That the tubes of the defendants infringe Freeman seems to me so obvious as to require little discussion. The offending tubes show an equipotential cathode, comprising an equipotential surface, and which is indirectly heated. They show a heater element within the cathode structure, the sides or legs of which heater are in parallel and arranged so close together that the magnetic field established by currents traversing one portion or section substantially neutralizes the magnetic field established by traversing the other section. The heater element in the cathode of the defendants is in the form of an M, which is clearly, I think, the equivalent of Freeman's U shaped heater element, and infringement cannot be avoided by this slight departure in form from that of Freeman, for in principle they are precisely the same. Then the defendants' cathode structure comprises a mass of refractory material in the form of a slender solid cylinder of such size as will receive the filamentary heating element, and of such proportions as will eliminate substantially the effect of the potential drop along the surface of the cathode, that is, the temperature of the cathode will not follow the rapid changes in the alternating current, thereby overcoming substantially the so-called thermal hum, and in fact owing to the construction of this cathode there is no serious thermal hum found in the defendants' tubes. Broadly, that describes the material features of the defendants' structure and I think there can be no doubt but that it is substantially the same as that described and claimed by Freeman. I see no fundamental distinction in the structural or operating

1941

THE-
MIONICS LTD.
ET AL.

v.

PHILCO
PRODUCTS
LTD. ET AL.

Maclean J.

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

means embodied in the patent of Freeman and in the offending tubes of the defendants; if Freeman possesses subject-matter it does not appear doubtful to me but that the defendants' tubes embody the invention of Freeman and that there has been infringement. The written admissions made on behalf of the defendants, and to which I referred in my discussion of the Langmuir patent, are intended, I understand, to apply to the Freeman patent as well. If I am right in that assumption then my comments in connection with Langmuir, in reference to the importation, licensing and sale of radio tubes by one or other of the defendants, would be applicable in the case of the patent to Freeman and need not be repeated.

A defence of another character entirely has been raised in this action, and must now be considered. It is that the assignments of the patents here in question, to the plaintiff Thermionics Ld. (hereinafter called "Thermionics") by the other named plaintiffs, were made for an illegal consideration, and in pursuance of an agreement among the plaintiffs, or some of them, whereby the plaintiffs control and unreasonably enhance the prices at which radio tubes are sold to dealers and users, thereby restricting competition, and detrimentally affecting the public, contrary to the provisions of the Combines Investigation Act and the Criminal Code. It is therefore claimed that the assignments by which Thermionics acquired and hold the patents in suit are invalid because made for an illegal consideration, and that therefore the plaintiffs are not entitled to bring this action, or entitled to the relief claimed therein.

At an earlier stage in this action the defendants (hereafter called "Philco") moved for leave to amend their statement of defence by adding thereto the following paragraph:

4. The defendants deny the allegations in paragraph 4 of the plaintiffs' amended statement of claim and put the plaintiffs to the strict proof thereof, and the defendants allege that the plaintiffs, or some of them, together or with others, have entered into an illegal conspiracy or combine contrary to the common and statute law of the Dominion of Canada, and, in particular, contrary to The Combines Investigation Act (R.S.C., 1927, c. 26) and The Criminal Code (R.S.C., 1927, c. 146) and are disentitled to any relief in this action because:

(a) The assignments, transmissions, agreements or other means whatsoever, by which rights in the patents in suit are claimed, were made in pursuance, or as a result, of the said conspiracy or combine and were ineffective to convey such rights; or

(b) In the alternative, if any rights in the patents in suit were acquired, such rights have been used, in this action and otherwise, in pursuance of the said conspiracy or combine in such a way as to disentitle the plaintiffs to any relief.

On that motion for leave to amend the statement of defence it was ordered that the question whether or not the proposed defence could be an answer to an action for the infringement of a patent be set down for argument as a question of law for decision by the Court in advance of the trial. Subsequently, and after hearing counsel, I determined that question in the negative, holding that the proposed amendment could not be raised as a defence in this infringement action, and from that decision an appeal was asserted to the Supreme Court of Canada. The appeal was dismissed by the Supreme Court of Canada, the final order for judgment stating: "This Court did order and adjudge that the judgment of the Exchequer Court of Canada should be and the same was affirmed, and that the said appeal should be and the same was dismissed without prejudice to the right of the appellants to apply to amend their defence by properly framed amendments." In the judgment of the Supreme Court of Canada, delivered by the learned Chief Justice, no pronouncement was made upon any question of law, but it was held that the proposed amendment was not a proper one and ought not to be allowed, on the ground that the proposed pleading was merely a bald allegation of an illegal conspiracy in restraint of trade, contrary to the law of the Dominion of Canada, and that the facts constituting the illegality were not set up. The judgment expressed doubt on the proposition that in no circumstances could the existence of an illegal conspiracy in restraint of trade, to enhance the prices for example, be an answer to an action for the infringement of a patent, because of the principle that no cause of action can have its origin in fraud. This principle, the Court thought, would apply to an action for infringement of a patent where the plaintiff must necessarily prove, in order to establish his cause of action, or in order to establish his title to sue, that he was a party to an illegal conspiracy upon which his cause of action rested, or that his title was founded upon an agreement which amounted to a criminal conspiracy to which he was a party, and that in such a case the plaintiff could not succeed.

1941
 THEER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

Subsequently, on application made before me, I granted leave to Philco to amend its statement of defence, the question whether or not the proposed amended defence was one which constituted a good defence to this action to be determined when the action came on for trial. In due course the following amended defence was pleaded:

7. The defendants allege that the assignments by which the plaintiff, Thermionics, Limited, purports to have acquired and held the patents in suit are invalid because they were given for an illegal consideration, having been made in pursuance, or as a result of an agreement between or among the plaintiffs or some of them, whereby the said plaintiffs fix control, and unreasonably enhance the prices at which radio tubes are sold to dealers in and users of the said tubes, thereby restricting competition and detrimentally affecting the public, all of which is contrary to the provisions of the Combines Investigation Act, R.S.C., 1927, chap. 26, section 2, and amending Acts, and the Criminal Code, R.S.C. 1927, chap 36, section 498.

It was contended on behalf of the plaintiffs that the defence now proposed adds no new material to that set out in the first proposed defence, that the facts constituting the illegal acts complained of are not now set up any more than they were in the pleading pronounced upon by the Supreme Court of Canada, and that in fact the defence now proposed is considerably narrower in its scope than was the former one. The first proposed defence alleged (1) an illegal conspiracy or combine contrary to the common and statute law of Canada, (2) that the assignments or agreements by which any rights in the patents in suit were claimed were made in pursuance of the said conspiracy or combine and were ineffective to convey such rights, and (3), in the alternative, that if any rights in the patents in suit were acquired, such rights were used in pursuance of the said conspiracy or combine in such a way as to disentitle the plaintiffs to any relief. The defence presently proposed appears only to allege that the assignments by which Thermionics acquired and holds the patents in suit are invalid because given for an illegal consideration, or because made in pursuance of an agreement whereby the plaintiffs control and fix the prices at which radio tubes are sold to dealers and users, and which have the effect of restricting competition and unduly enhancing the said prices, thus detrimentally affecting the public interest. This defence seems to allege that the matters complained of were inherent in the assignments themselves from the beginning, and not by reason of any subsequent conduct

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

on the part of the plaintiffs. In fact, no illegal conspiracy or combine is alleged in specific terms, no facts constituting the alleged illegal consideration are set up, and it is not alleged in what manner competition was restricted or the prices of radio tubes were enhanced, or how or in what sense the public interests were detrimentally affected. It is to be emphasized that sub-paragraph (b) of the original amended defence, which alleged illegal use of the patent rights in suit subsequent to the assignments, is now entirely abandoned. It may also be mentioned that the proposed defence does not allege any direct injury to Philco occasioned by reason of the alleged illegal acts complained of, or that the same constituted an equitable defence available to Philco. It was contended by counsel for the plaintiffs that the amended defence, in substance, merely pleads the provisions of the statute law mentioned, and that it sets forth nothing more than that the assignments transmitting rights in the patents in suit were invalid because made contrary to the provisions of the statute law of Canada, and consequently for an illegal consideration, and that therefore no valid title was conveyed thereby to Thermionics. Consequently, it was urged, that the judgment of the Supreme Court of Canada was as applicable to the amended defence now proposed as it was to the first proposed amended defence, and that the said judgment of the Supreme Court of Canada was conclusive of the matter.

In the course of his argument in support of maintaining the amended defence Mr. McCarthy referred to certain evidence earlier taken on discovery, at the instance of Philco, the witness being Mr. John C. MacFarlane, an officer of Thermionics; to an agreement entered into between the plaintiff Canadian General Electric Company and Thermionics, which I understood to be illustrative of agreements entered into between other of the plaintiffs and Thermionics, under which said agreement Canadian General Electric Company agreed to grant to Thermionics licences to make, use and sell, and the right to grant to others licences to make, use and sell, radio tubes under each of the patents owned or controlled by it; and also an agreement entered into between the plaintiff Canadian Marconi Company and Cutten-Foster & Sons Ltd., under

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

which the former as a manufacturer licensed by Thermionics agreed to sell to the latter as a "jobber" such radio tubes as might be mutually agreed upon from time to time pursuant to the terms of that agreement, and this agreement I understood to be illustrative of other agreements entered into between other of the plaintiffs and other jobbers.

The substance of the said agreements, was, I think, fairly and succinctly stated by Mr. McCarthy, and if I can accurately restate his summary of such documents I shall have sufficiently set forth such of their provisions as are material here, and their purpose and effect. First, there was assigned to the plaintiff Thermionics by the other named plaintiffs, their right, title and interest in the patents in suit, and other patents as well, and it was by virtue of such assignments that Thermionics is one of the parties to this action, and the other named plaintiffs are parties to the action because they in turn became licensees of Thermionics to manufacture and sell radio tubes. The consideration for the assignments apparently was that Thermionics was to grant to the assignors, the other named plaintiffs, the right to manufacture and sell radio tubes under the patents so assigned, and such other plaintiffs in some way not explained became shareholders of Thermionics. The effect of the assignments, agreements and licences referred to was apparently to constitute what is frequently referred to as the pooling and cross-licensing of patents, by and between the owners of such patents. Thermionics was, Mr. McCarthy said, in effect a holding company, which licensed the other named plaintiffs to manufacture and sell radio tubes protected by the patents or patent rights assigned to Thermionics by such other plaintiffs. Thermionics does not itself manufacture or sell radio tubes, and receives no royalties or profits from its co-plaintiffs licensed to manufacture or sell such tubes; to this I understand there was one exception but that is unimportant and I need not pause to explain the reasons for this exception. The plaintiffs so licensed to manufacture radio tubes would in the ordinary course sell such radio tubes to jobbers at the manufacturers current price list, but these prices had to be approved by the manager of Thermionics, after consultation with a committee of Thermionics. Mr. McCarthy suggested that the selling

prices of the jobber to the retailer were in turn regulated by the manufacturer but there is nothing in the documents mentioned which would indicate this, and Mr. McFarlane testified on discovery that Thermionics did not attempt to regulate the prices at which the jobber should sell to the retailer or to the public. The effect of the assignments or agreements, which I hope I have interpreted with reasonable accuracy, was, Mr. McCarthy urged, that prior to 1936 the plaintiffs other than Thermionics were each exercising their rights under their patents and in open competition, but in consequence of the arrangements entered into the fixing and control of the prices of radio tubes manufactured and sold in Canada under such patents, including those in question here, were placed in the hands of the one concern, Thermionics, thus eliminating all competition and stifling trade therein, all contrary to the statute law of Canada, and to the detriment of the public.

It was upon the state of facts above related that Mr. McCarthy, largely if not wholly, proposed to rely in establishing the alleged illegal acts complained of, and which he contended constituted a bar to the success of the plaintiffs in this action. It was not proposed to tender evidence for the purpose of showing that the prices of radio tubes had been unduly enhanced by reason of the assignments, agreements or licences, mentioned; he plainly stated that he was not "concerned with the prices or whether they were fair or unfair," which I understood to include the prices exacted by either the manufacturer, the jobber, or the retailer. He relied, at least I so understood him, upon bringing the plaintiffs within the provisions of the Combines Investigation Act and the Criminal Code by showing that the prices of the licensed manufacturers to jobbers were fixed or controlled by Thermionics, the holder of the titles to the patents in suit and the licensor of the said manufacturers, which, he said, was beyond and in excess of any monopoly rights acquired under the patents owned or held by Thermionics, and which had the effect of restricting competition and unduly enhancing the price of radio tubes to the public.

I come now to the question as to whether or not the proposed defence could constitute an answer to the action for the infringement of the patents in suit. I fear I cannot usefully add much, if anything, to what I said in my

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941
 THER-
 MIONICS LTD
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

reasons for judgment in refusing the first application to amend the statement of defence. I would refer to what I said in my former judgment in respect of the procedure laid down for the enforcement of the provisions of the Combines Investigation Act, and the provisions of the Patent Act which provide relief in the case where it is alleged that there has been an abuse of the exclusive rights granted under a patent of invention. The latter provisions appear sensible and practical, and while they may curtail or suspend the exclusive rights of the patentee they do not deprive him of his property rights in his patent, which would be the practical effect here if the proposed defence were to constitute an answer to the action for infringement of the patents in suit. It was not contended before me that there was any legal impediment in the way of the assignment of a patent by the owner thereof, or in the acquisition by a patentee of any other patents covering improvement in his patent of invention, or, in fact, in the pooling of patents and the establishment of a system of cross-licensing by and between owners of patents, and there would, I think, be no penalty for doing so unless it be that the same were consummated with the intent of entering into some conspiracy or combine in restraint of trade, and which did in fact restrain trade and restrict competition and was detrimental to the public interests. It is conceivable that a pooling of patents with cross-licensing arrangements, such as we have here, might be in the public interests. Such arrangements in connection with patents have been the subject of much discussion, both for and against, in the United States, but I do not know of any case where such arrangements were held to be from the beginning illegal; and I do not think that this can be inferred or presumed from the assignments or agreements put in question here. Mr. McCarthy appeared to me to contend that the illegal acts complained of were inherent in the documents themselves, and he stated that he did not propose to adduce evidence to show that the prices of radio tubes had been unduly enhanced by reason of the agreements complained of. I do not think that it was intended that the provisions of the Combines Investigation Act and the Criminal Code should operate as an answer in actions for the infringement of a patent where another statute of Canada purported to make ample provisions for relief, on behalf of interested parties and of

the public, in the case where there had been an abuse of the exclusive rights granted under a patent. I do not mean to say that there cannot be such a thing as an unlawful combine in restraint of trade, within the meaning of the statutes mentioned, by and between patent owners, or that parties thereto may not be subject to the penalties and consequences provided by such statutes, but that must be established in the proper way and by the prescribed procedure. I fail to see, for example, how sec. 498 of the Criminal Code could be an answer to an action for infringement of a patent unless the party bringing such action had first been indicted, tried and found guilty, of the offence therein mentioned. Further, I am of the opinion, for the reasons earlier enumerated, that the proposed defence does not meet the requirements laid down by the Supreme Court of Canada in connection with the first proposed amendment to the statement of defence, and that of itself is, I think, conclusive of the matter.

The question arising here has frequently been considered, in actions for infringement of patents, by the Courts of the United States, where so-called anti-trust legislation, corresponding in principle to the Canadian statutes in question here, is to be found. In *Western Electric Company v. Wallerstein* (1), a motion was made to strike out various paragraphs of the answer to an action for infringement of patent rights wherein it was alleged that the title of the plaintiffs, as licensees of the patents in question, derived from an agreement which was claimed to constitute a violation of the anti-trust laws and a combination in restraint of trade. It was held that violation of the anti-trust laws was not a proper defence in a patent suit for infringement of patent rights, that a defendant who was an infringer could not shield himself from liability on any such ground, and the paragraphs of the answer in question were ordered to be struck out. In *Radio Corporation of America et al v. Majestic Distributors* (2), a motion was made to strike from the record a paragraph in the defendant's answer in a patent infringement suit which alleged that the plaintiffs had no standing in a Court of Equity in that case because the plaintiffs were parties to agreements which formed an unlawful combination in restraint of trade contrary to the statutes

1941
 THE
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

(1) (1930) 48 F.R. 2d, 268.

(2) (1931) 53 F.R. 2d, 641.

1941

THE-
MIONICS LTD.
ET AL.

v.

PHILCO
PRODUCTS
LTD. ET AL.

Maclean J.

of the United States, and because one of the plaintiffs, Radio Corporation of America, derived its alleged titles and rights from the provisions of the said illegal agreements. The motion was granted, it being held that the paragraphs of the defence in question were irrelevant to the cause of action and afforded no defence to the allegations set forth in the bills of complaints. In *Radio Corporation of America et al v. Hygrade Sylvania Corporation* (1), an action for infringement of patents, the plaintiffs moved to strike out certain paragraphs of the defendant's defence, alleging, *inter alia*, that the plaintiffs had by several agreements acquired numerous patents and patent rights in the radio art, including the patents there in suit; that they had combined and pooled their patents and had agreed to license only those in the combination to manufacture under the patents, and had refused to grant the right to others, for the purpose of restraining competition; that they had by cross-licensing and exclusive licensing agreements combined to restrain and prevent all competition; and that they had refused to license the defendant on reasonable or any terms. Upon those and other grounds it was pleaded that the infringement action of the plaintiffs should not be maintained. The motion to strike out the paragraphs in question was granted, the Court holding that the law was too well settled to question the general rule that an allegation in a suit for infringement of a patent to the effect that the plaintiff is a party to an unlawful combination does not constitute a defence. The subject of patent monopoly in relation to the anti-trust laws of the United States is treated at length in Chapter 16 of Volume 2 of Deller's Edition of Walker on Patents. The author states, at page 1500, that it is no defence to a bill for alleged infringement of a patent that plaintiffs have entered into a combination or conspiracy among themselves or with third parties to violate the anti-trust laws, and apparently that is well settled law in the United States. I was referred by Mr. McCarthy to the case of *Ethyl Gasoline Corporation v. United States of America* (2). That was a suit brought by the Government of the United States, in a District Court, under the provisions of the Sherman Anti-Trust Act, to restrain Ethyl Gasoline Corporation from granting licences under patents controlled

(1) (1934) 10 F. Supp. 879.

(2) (1939) 309 U.S.R. 436.

by it to jobbers, and from enforcing certain provisions in licences granted to oil refiners which restricted their sale of the motor fuel in question to the licensed jobbers, as violations of the Sherman Anti-Trust Act. The trial court granted the relief sought, generally on the ground that the corporation had by its licensing system exercised unlawful control over the jobbers, and the case then went on appeal to the Supreme Court of the United States which sustained the decision of the District Court. In short the Supreme Court held that while the corporation could by virtue of the power conferred by its patent lawfully exclude any and all others from selling the patented article, it did not follow that it could lawfully exercise that power in such manner as to control the patented commodity in the hands of the licensed jobbers who had purchased it, or their actions with respect to it in ways not within the limits of the patent monopoly: "and conspicuous among such controls which the Sherman law prohibits and the patent law does not sanction is the regulation of prices and the suppression of competition among the purchasers of the patented articles." Now that case differs in many respects from that under consideration, but particularly in that the action was not one for the infringement of a patent and in which alleged violations of the anti-trust laws were pleaded as a defence. I do not think that case furnishes any assistance here.

In the result, the plaintiffs succeed and are entitled to the relief claimed, and with costs. If in any interim proceeding in this action the matter of costs was reserved and remain undisposed of, the same may be spoken to on the settlement of the minutes of judgment.

Judgment accordingly.

Following are the reasons for judgment delivered by the learned President on May 4th, 1939, and referred to above:

This action was brought by the plaintiffs against the defendants for the infringement of two patents of invention, of which the plaintiffs are owners, or licensees thereunder. The defendants now move for an order permitting them to amend their statement of defence by inserting the following:

"4. The defendants deny the allegations in paragraph 4 of the plaintiffs' amended statement of claim and put the plaintiffs to the strict proof thereof, and the defendants allege that the plaintiffs, or some of them, together or with others, have entered into an illegal conspiracy or combine contrary to the common and statute law of the Dominion of

1941
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.

1941

THE-
MIONICS LTD.
ET AL.

v.

PHILCO
PRODUCTS
LTD. ET AL.

Maclean J.

Canada, and, in particular, contrary to *The Combines Investigation Act (1923, c. 9, s. 1)* and *The Criminal Code (R.S. c. 146, s. 1)* and are disentitled to any relief in this action because:

(a) The assignments, transmissions, agreements or other means whatsoever, by which rights in the patents in suit are claimed, were made in pursuance or as a result, of the said conspiracy or combine and were ineffective to convey such rights; or

(b) In the alternative, if any rights in the patents in suit were acquired, such rights have been used, in this action and otherwise, in pursuance of the said conspiracy or combine in such a way as to disentitle the plaintiffs to any relief."

Sec. 2 of the Combines Investigation Act Amendment Act, 1935, Chapter 54 of the Statutes of Canada, 1935, defines "combine" as meaning a combination having relation to any commodity which may be the subject of trade and commerce, of two or more persons by way of actual or tacit contract, agreement or arrangement having or designed to have, *inter alia*, the effect of preventing, limiting or restraining the manufacture, production and supply of commodities, or lessening competition therein, or enhancing the price thereof, or otherwise restraining or injuring trade or commerce in such a way as is likely to operate against the interest of the public. Sub-s. (4) of s. 2 defines a "merger, trust or monopoly", and it states that the same applies only to the business of manufacturing, producing, transporting, purchasing or dealing in commodities which may be the subject of trade and commerce, and it is therein provided that this subsection "shall not be construed or applied so as to limit or impair any right or interest derived under the Patent Act, 1935, or under any other statute of Canada."

The Combines Investigation Act provides for an investigation and enquiry, and report, into any alleged combine, and if an offence against the Act has, in the opinion of the Minister administering the Act, been established, the Minister may remit to the attorney general of any province within which such offence shall have been committed, any evidence, returns, or any report of the Registrar, relative to the offence, for such action as such attorney general may be pleased to institute.

Section 498 of the Criminal Code provides that every one is guilty of an indictable offence and liable to certain penalties for certain offences therein stated, and which for all practical purposes here may be said to be those which fall within the definition of a "combine" in the Combines Investigation Act.

Prior to April, 1937, the Combines Investigation Act contained the following provision, sec. 30, in respect of patents:

"30. If the owner or holder of any patent issued under the Patent Act has made use of the exclusive rights and privileges which as such owner or holder he controls, so as

(a) unduly to limit the facilities for transporting, producing, manufacturing, supplying, storing or dealing in any article which may be a subject of trade or commerce; or

(b) to restrain or injure trade or commerce in relation to any such article; or

(c) unduly to prevent, limit or lessen the manufacture or production of any article; or

(d) unreasonably to enhance the price of any article; or

(e) unduly to prevent or lessen competition in the production, manufacture, purchase, barter, sale, transportation, storage or supply of any article; such patent shall be liable to be revoked.

2. If the Minister reports that a patent has been so made use of, the Minister of Justice may exhibit an information in the Exchequer Court

of Canada praying for a judgment revoking the patent; and the Court shall thereupon have jurisdiction to hear and decide the matter and to give judgment revoking the patent, or otherwise, as the evidence before the Court may require."

The above mentioned provision of the Combines Act, Sec. 30, was repealed by sec. 13 of Chap. 23 of the Statutes of Canada, 1937. I have no doubt the repeal of this section was attributable to the fact that the Patent Act, 1935, by sections 65 to 75 inclusive, conferred upon the Attorney General of Canada, or any other interested party, the right to apply to the Commissioner of Patents, after three years from the date of the grant of any patent, for relief, in the case where it was alleged that there had been an abuse of the exclusive rights granted under any such patent. Those sections of the Patent Act set forth the circumstances under which the exclusive rights under a patent may be deemed to have been abused, and they provide certain remedies for any such abuses. Parliament would appear, in my opinion, to have deliberately legislated so as to exclude from the operation of the Combines Investigation Act and the Criminal Code, anything in the nature of a monopoly derived from the exclusive rights under a patent, and the Patent Act provides the procedure and the remedies for the case where there has been an abuse of such exclusive rights. Sub-s. 4 of s. 2 of the Combines Investigation Act, to which I have already referred, in defining a "monopoly" expressly preserves any right or interest in the nature of a monopoly derived under the Patents Act, 1935. The long title of the Combines Investigation Act is "An Act to provide for the Investigation of Combines, Monopolies, Trusts and Mergers". The exclusive rights and privileges granted to a patentee are those of making, constructing, using and vending to others to be used, his invention, during the life of the patent.

I think the motion of the defendants must be denied. The Patent Act and the Combines Investigation Act seem designed to protect the particular exclusive rights attaching to patents, and to exempt them from the operation of those provisions of the Combines Investigation Act and the Criminal Code which are designed to restrain and punish anything in the nature of a combine or conspiracy in restraint of trade and commerce, and which might be against the public interest. If different patentees should combine in such a way as to offend against the intent and spirit of the relevant provisions of the Combines Investigation Act, or the Criminal Code, which is conceivable, then the procedure of attack would be that set forth in such statutes, and not by way of a defence in an action for infringement of a patent or patents and I do not think that anything else was ever intended. Even if there were established a combine or conspiracy relative to a particular patented article it would not, I think, thereby follow that the patented article might not be infringed, or that the patent would thereby become invalid. That situation is not contemplated by the Combines Investigation Act or the Criminal Code, and it would seem unreasonable if they did. The infringement of a patent is one thing, and whether patentees have entered into a combine or conspiracy in restraint of trade is another thing. My conclusion is that the proposed amendments to the statement of defence cannot be raised as defences in an infringement action, and must be refused, and with costs to the plaintiffs.

It was agreed by counsel that this motion should be treated as an order of the Court directing that the questions of law involved therein be raised for the opinion of the Court, in advance of the trial, under Rule 151. And I so treat the motion.

1941
 THE
 THER-
 MIONICS LTD.
 ET AL.
 v.
 PHILCO
 PRODUCTS
 LTD. ET AL.
 Maclean J.